

# Times

## Gulf of Maine

Promoting Cooperation to Maintain and Enhance Environmental Quality in the Gulf of Maine

### Cultivating water pollution control on farms in Gulf

By Suzy Fried  
Editor

**Gulf of Maine** — Few creatures look as innocuous as a dairy cow, yet the dewy-eyed beasts are among the major causes of water pollution that originates on farms and affects watersheds in the Gulf of Maine region.

To prevent Bossie and other agriculture-related factors from damaging nearby and downstream waters, US and Canadian farmers, farm-related business associations, provincial, state, and federal government agencies, agricultural lobbyist groups, and environmental organizations are collaborating to find and correct existing water pollution problems and

prevent future ones.

This spider's web of organizations offers information and technical assistance to farmers in implementing best management practices (BMPs), environmentally-minded methods for operating a farm. BMPs encompass measures from using pesticides appropriately to controlling where animals are allowed to graze. Many of the groups also help link farmers with funding for water pollution control projects.

"There's been a huge investment in conservation by America's farmers," said Mark Maslyn, Deputy Executive Director

FARMS

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### Tribes weave stewardship from tradition, technology

By Suzy Fried  
Editor

**Gulf of Maine** — Present-day science and activism intermingle with cultural traditions dating back as far as the Ice Age in aboriginal communities addressing environmental concerns in the Gulf of Maine.

Spokespeople for several tribes in the Gulf watershed described conservation of rivers and coastal waters as having always been important elements of their culture. Traditionally, tribe members harvest only as much of any resource, whether sweetgrass or salmon, as they need, leaving enough for others, and for the earth to regenerate.

But tribal sources say that while this philosophy continues, ancient traditions of conservation are taking on new forms as well. Many tribal governments now have natural resource departments that monitor water quality and undertake restoration projects. Sometimes they collaborate with state, provincial, or federal governments, or grassroots organizations

in neighboring non-native communities. And at least one native activist group is vocal in the Gulf region.

Tribal members and tribal government staff attribute these developments to a collection of changes that have affected indigenous people over the past two decades. For example, environmental concerns have become more pressing and numerous. "The tribes came out of the woodwork about the environment because they didn't like what was going on," said Jim Sappier, Region 1 Indian Coordinator for the US Environmental Protection Agency (EPA).

"When the salmon stop running and the fish stop running and your tribal members are dying of cancer, it's time to say, 'Stop,'" said Sappier. A member and former Tribal Governor of the Penobscot Nation, he commutes weekly to his Boston office from the tribe's Indian Island reservation in the Penobscot River, just above Old Town, Maine.

TRIBAL STEWARDSHIP

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Photo: Suzy Fried/Gulf of Maine T

**Who me?** — Livestock are a major contributor to water pollution that is generated by farms and that can affect nearby rivers. Keeping cattle and other animals away from streams and wetlands is a start. Farmers are encouraged to use such measures, called best management practices (BMPs), to address a variety of pollution sources on their farms.

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The Gulf of Maine Council on the Marine Environment was established in 1989 by the governments of Nova Scotia, New Brunswick, Maine, New Hampshire, and Massachusetts to foster cooperative actions within the Gulf watershed. Its mission is to maintain and enhance environmental quality in the Gulf of Maine to allow for sustainable resource use by existing and future generations.

Visit the Gulf of Maine Council on the Marine Environment's web site at:  
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# Learning to apply sustainable development principles

Donald D. Gay  
Minister

*New Brunswick Department  
of Fisheries and Aquaculture*

As commercial aquaculture activities continue to expand in the Gulf of Maine, it is important to ensure that they proceed in a fashion that is both environmentally and economically sustainable.

Nova Scotia, New Brunswick, Maine, New Hampshire, and Massachusetts all share a common ecosystem, the Gulf of Maine. However, each one of these jurisdictions has unique environmental conditions and a unique aquaculture industry.

Our jurisdictions are united by the realization that development will have an impact on our common ecosystem. The emergence of commercial aquaculture on the east coast of North America over the years has forced us to be ever more vigilant in mitigating the impact of this development on our precious coastline. Besides, aquaculturists are the first beneficiaries of a healthy marine environment.



Photo: GOMC

The progressive growth of the New Brunswick Atlantic salmon aquaculture industry in the Bay of Fundy has resulted in the need for adequate research and monitoring to better understand the interactions of aquaculture and the environment. Research began early and has been ongoing. As our industry changes, so has our understanding of this interaction.

In New Brunswick, a key tool in applying sustainable development principles to aquaculture development is the research partnership among industry, government, and scientists that has developed through the Aquaculture Environmental Coordinating Committee [AECC]. This committee identifies the research priorities related to the aquaculture/environment interaction. It also makes recommendations to the Minister of Fisheries and Aquaculture on policies and programs that direct efforts to reduce negative impacts and monitor these impacts on an annual basis.

The AECC recognizes the Environmental Management Plan as a critical method for evaluating ongoing impacts. Under this plan, each site is monitored and rated annually. The committee is currently in the process of refining the annual monitoring program under the Environmental Management Plan to reflect the increased knowledge about the ecological impacts of aquaculture and in

order that the program better satisfy public concern regarding impacts.

The AECC is also in the process of developing recommendations for a Site Remediation Plan. This will be activated when the environmental monitoring program identifies conditions at specific sites that trigger a need for remediation. This policy will formalize a remediation process that has been ongoing. It will also create accountability in the industry through the development of a site-specific remediation plan that is signed by the Minister and where implementation is monitored.

No doubt, similar committees to provide advice on important aquaculture/environmental interaction questions exist in other jurisdictions in the Gulf of Maine.

I suggest that it is time for the Gulf of Maine Council to create a committee to address aquaculture/environmental interactions. This mechanism will be of value to the Gulf of Maine ecosystem and to the agencies involved, allowing exchange of research information and discussion on policy directions. I encourage the Gulf of Maine Council members to promote this Gulf-wide dialogue on the important ecological questions arising from aquaculture development.

## Letter to the Editor: Eelgrass story headline alarming

I was horrified to read the headline "Eelgrass: Essential or expendable in the Gulf" [*Gulf of Maine Times*, Vol. 2 No. 2, page 5]. I am concerned that people that don't get beyond the headline will remember this statement and conclude that eelgrass is expendable.

I agree with Bob Steneck that other habitats are important too, but rather than taking eelgrass off the "extra protection list," we should be adding other important habitats to the list (e.g., kelp beds, boulder fields, and cobble beds). I believe that most of the areas that Bob is talking about are subtidal; and therefore, would principally be impacted by large projects that hopefully would receive major scrutiny by the federal and state agencies. I am most concerned with small projects that are unlikely to receive a high level of scrutiny.

Eelgrass occurs in the areas that are

likely to be impacted by small development projects. For this reason, eelgrass is a habitat that should be flagged for extra attention and protection. Also, I would add unconsolidated sediments to the "extra attention" list, particularly the mud and sand flats that may be impacted by intertidal development (e.g. piers, boat ramps, lobster pounds). We need to identify the location of all of these special areas, eelgrass included, so that they receive the necessary protection. The diversity of Maine's (and the Gulf's) plants and animals is dependent on the diversity of its habitats.

If I really thought that "essential or expendable" was the question that the majority of the people you quoted are debating, I would be even more discouraged than I am about our habitat protection efforts. Thankfully, I know and have

worked with the majority of these people (except Bostwick and Sharp) for years and know that they are committed to habitat protection. I do not believe that any of them are suggesting that eelgrass is expendable. I believe Bob Steneck was merely voicing his frustration about the lack of protection for other important habitats, seemingly because eelgrass gets special attention. That does not mean it is expendable. I hope that no natural habitat would ever be considered expendable.

Sincerely,

Lee Doggett  
Marine Biologist  
Division of Environmental Evaluation  
Maine Department of  
Environmental Protection

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# Coalition, landowners preserving wetlands in coastal Maine

By Suzy Fried  
Editor

**Woolwich, Maine** — Bob Dale and his wife, Jean Parker, share their backyard with osprey, an assortment of waterfowl, foxes, deer — and a few porcupines and raccoons that don't hesitate to help themselves to Dale's fruit trees. For two decades, the couple has lived on a 40-acre/16-hectare island — a rugged chunk of paradise set down in the Sasanoa River's Brookings Bay in Maine's Lower Kennebec River region.

Occasionally Dale and his wife may have to wait for the tide to recede before they can drive across the wooden bridge that links them to the mainland across about 350 yards/320 meters of marsh, but they relish their rustic life, growing fruits and vegetables, raising bees, and cutting their own firewood to heat their solar-powered home.

"We think it's a wonderful life," said Dale. "[The island] has a feeling of remoteness or seclusion, and yet I can go by boat to Bath in 15 or 20 minutes, or go by car in 15 minutes."

Safeguarding the island's serenity and natural beauty for future generations and preserving its habitat for wildlife were on Dale's and Parker's minds when they recently worked with Maine Coast Heritage Trust (MCHT) and the Lower Kennebec Regional Land Trust (LKRLT) to grant a conservation easement on their property. Held by the LKRLT, the easement protects the island from development. "It's a perfect place. I feel like I've been blessed to find this, and that's one of the reasons I wanted to protect it. I think future generations should see what this is like," said Dale.

Dale and Parker are an important part of a larger preservation effort being undertaken by the Maine Wetlands Protection Coalition (MWPC), which has protected hundreds of acres of land in coastal Maine with help from federal grants and gifts from landowners.

## Coalition pools abilities

Chaired by the Maine Department of Inland Fisheries and Wildlife (IF&W), the MWPC includes Ducks Unlimited, the Maine Chapter of The Nature Conservancy (TNC), Maine Coast Heritage Trust, the US Fish and Wildlife Service (USFWS), and local land trusts. These have included Quoddy Regional Land Trust, the Phippsburg Land Trust, Friends of Merrymeeting Bay, and the Lower Kennebec Regional Land Trust.

MWPC turned its attention to the Lower Kennebec River/Merrymeeting Bay region in 1992. With mapping assistance from the USFWS Gulf of Maine Program, the coalition identified 27,000

acres/11,000 hectares of high-value lands and habitat in the region. Then it began working with land trusts and other conservation groups, and applying for federal grants.

"Collectively, we've gotten things done that couldn't have gotten done here with one organization or one organizational capability," said Lois Winter of the USFWS Gulf of Maine Program.

"It's been a real partnership between all the groups on almost every project," agreed Caroline Norden, MCHT Senior Project Manager. "Everyone contributes their particular expertise and knowledge to get the job done, whether it be mapping resources, assessing the conservation values of a property, negotiating purchases, or drafting easements. We've worked hard to make sure we use our staff and volunteer resources as effectively as possible so we don't duplicate efforts. It's great."

With the backing of more than \$3.5 million in federal grant money, the coalition's preservation methods have incorporated charitable sales or donations of land, conservation easements, fee acquisition, state bond funds, and donations of technical assistance. The grants were made available through the USFWS, primarily from the North American Wetlands Conservation Act and the National Coastal Wetlands Grant programs.

Typically, IF&W administers the grants and takes ownership of any land bought with the federal money. The land trusts retain any easements they negotiate, although those easements can be used to meet matching donation requirements for federal grants.

Using the grants in combination with matching landowner contributions, "We've accomplished about six million [dollars] plus in land conservation," said Ken Elowe, IF&W's Director of Resource Management.

## A decade of preservation

The Maine Wetlands Protection Coalition formed in 1989 when a federal program, the North American Waterfowl Management Plan, directed states to identify wetlands in need of conservation. The coalition began its efforts in the Cobscook Bay area near Eastport, securing two grants for land preservation there. In 1992 it turned its attention to the Lower Kennebec/Merrymeeting Bay complex, receiving two more grants for work there. MWPC is waiting to hear about a third grant it hopes to use primarily in Merrymeeting Bay, which, along

with the Lower Kennebec area, is among Maine's five Focus Areas identified under the Atlantic Coast Joint Venture of the North American Waterfowl Management Plan.

Situated 17 miles/27 kilometers from the ocean, fed by six rivers, and draining a watershed of 9,500 square miles/24,600 square kilometers, Merrymeeting Bay is mostly fresh water, thanks to "The Chops" a land formation that pinches the mouth of the bay. At low tide, fresh water from the bay can move out into the Lower Kennebec, which flows from the bay to the ocean. But at high tide, The Chops prevent the rising river's brackish water from entering the Bay.

The back-up of freshwater on the bay side of the Chops results in water level increases of up to six feet/two meters in the bay, creating freshwater wetland vegetation, mud flats, and sand bars that provide feeding and resting areas for waterfowl, and spawning areas for fish that swim upstream from the ocean.

The Lower Kennebec River consists of more typical estuarine habitat with brackish water, tidal mud flats, and vast salt marshes representing more than 18 percent of the salt marsh in the state. The 9,000-acre/3,600-hectare system is critical year 'round habitat for waterfowl as well as osprey, eagles, short-nosed sturgeon, piping plover, and least and roseate terns.

"Primarily we've been seeking to protect the highest value wetland habitats," said Jack Witham of the Lower Kennebec Regional Land Trust. But, he said, "Because sometimes people are not willing to sell just a wetland parcel, but want to sell the whole piece, we often have to buy the upland habitat as well. That helps us create upland buffers around wetland habitat."

Noting that land acquisitions can take



Photo: US Fish & Wildlife Service

The Maine Wetlands Protection Coalition is preserving lands in the Merrymeeting Bay/Lower Kennebec region that include valuable habitat for this great blue heron and many other species of fish and wildlife.

years to complete, Bruce Kidman of TNC's Maine Chapter observed, "A lot of the spade work we're doing today will reach fruition a decade or two from now. We'll see the impacts on habitat protection for many years to come."

## Landowners' role essential

The coalition's land trust members have recruited numerous landowners to participate in its preservation efforts, including the protection of hundreds of acres of important salt marsh and river shoreline representing about a dozen properties in the Merrymeeting Bay/Lower Kennebec River region.

"In order to get any [federal] funding at all, you need to have matching gifts of land and easements available," said Norden. "We really worked hard with our partners to begin outreach in these areas and see if there were landowners that might be interested in conserving their lands. Early on [TNC] received a generous gift of land. That, combined with easement donations to local land trusts, provided enough match for our first grant," she said.

"Without cooperation and thoughtful and intelligent consideration by landowners, nothing would go forward," said Kidman.

Granting easements or giving gifts of land may also make landowners eligible for tax relief or estate planning assistance. Easements can be custom-designed, according to Witham. "It can be everything from a forever-wild easement where no human intervention will take place at all, to a limited-development easement where you allow a certain number of houses to be built and no more," he said.

Landowner participation is crucial to preservation in light of growing development pressures, said Betsy Ham, Executive Director of Friends of Merrymeeting Bay, noting, "Members of the aging generation are holding 100-plus acre tracts. When they pass on and next generation gets the land, we're not sure what will happen." Said Dale, "The conclusion I came to was, there better be a few unpopulated areas where people can come and just find solace. If not, I think that would be a horrible world to live in."

**Web site for more information**  
**Friends of Merrymeeting Bay**  
[www.col.k12.me.us/mmb](http://www.col.k12.me.us/mmb)



Photo: US Fish & Wildlife Service

Landowners have been essential participants in the Maine Wetlands Protection Coalition's preservation of lands such as this salt marsh on the Lower Kennebec River. Nearly 20 percent of Maine's salt marshes are found in the region, attracting many wildlife species.

# Isles of Shoals hold lifetime lure for NH boat captain, teacher

By Suzy Fried  
Editor

**Rye, New Hampshire** — Stepping aboard *Uncle Oscar*, cup of coffee in hand, dressed in sneakers, sweatshirt, and shorts, and squinting into the fog of a June morning, Susan Reynolds looks as at home on her boat as most people do on their back porch. Only, instead of scattering seed for backyard birds, she brings along bread for the gulls.

"I've always, always had a real love of the ocean," Reynolds says, recalling childhood summers with her family boating and exploring along New Hampshire's seacoast. In her adulthood, she's spent much of her time as a school-teacher, naturalist, and local history devotee, sharing that enthusiasm with people of all ages. She is also a licensed boat captain who runs her own business, Island Cruises Inc.

Reynolds moved from Massachusetts to the New Hampshire seacoast town of Rye 30 years ago and began teaching in nearby North Hampton Elementary School. She makes



Susan Reynolds

the most of local natural resources, bringing her students out to investigate the coastal environment. "I always like to get the kids to be hands-on," she says. "We have such a nice estuary here," that includes a salt marsh, stream, mud flats, and a barrier beach. "You can get all the different parts of the estuary displayed very vividly for them."

Once school is out for the summer, Reynolds closes up her classroom and moves to another venue, spending seven days a week running cruises into Rye Harbor for an hour-long lesson on lobstering in the mornings, and afternoon trips to the nine-island cluster known as the Isles of Shoals.

For awhile, Reynolds brought her cruise passengers out to the Shoals in a 37-foot/11-meter, six-passenger sailboat. But that wasn't profitable enough for a single parent with a son in college, so in

1995 she bought a lobster boat that can carry 20 passengers at a time.

## Painters and pirates

"The Shoals" sit five and a half miles/nine kilometers off the coast, straddling the New Hampshire/Maine state line. The remote enclave is rich in natural and cultural history, not to mention tales of pirates, buried treasure, and ghosts. And Reynolds is well-versed in every detail.

Since the days when she and her brother and sister would take their sailboats out to the Shoals, Reynolds has been fascinated by them. She wrote her master's thesis on the islands. Her boat, *Uncle Oscar*, is

named for Oscar Laighton, a lighthouse keeper's son who lived there for 99 years and became an institution to summer visitors. His sister, poet Celia Laighton Thaxter and her husband, Levi Thaxter, founded a writers' and artists' colony on Appledore Island — the biggest of the group — that drew the likes of Henry Wadsworth Longfellow, Ralph Waldo Emerson, Harriet Beecher Stowe, and impres-

sionist painter Childe Hassam.

Hotels once dotted the Shoals. Now, Shoals Marine Lab leases most of Appledore Island. Star Island is home to a Unitarian Universalist church organization that has a conference center there. Seavey Island is the site of a tern restoration project overseen by the New Hampshire Audubon Society and the New Hampshire Fish and Game Department. And Duck Island, formerly a target bombing area for Pease Air Force Base, has since recovered to become a prime breeding and pupping area for harbor seals. Lobstermen's summer homes can be found on some of the islands as well.

Reynolds says New Hampshire history began on the Shoals, evidenced by the fact that a year round fishing settlement greeted Captain John Smith when he happened upon the islands in 1620. She helped develop a program that brings North

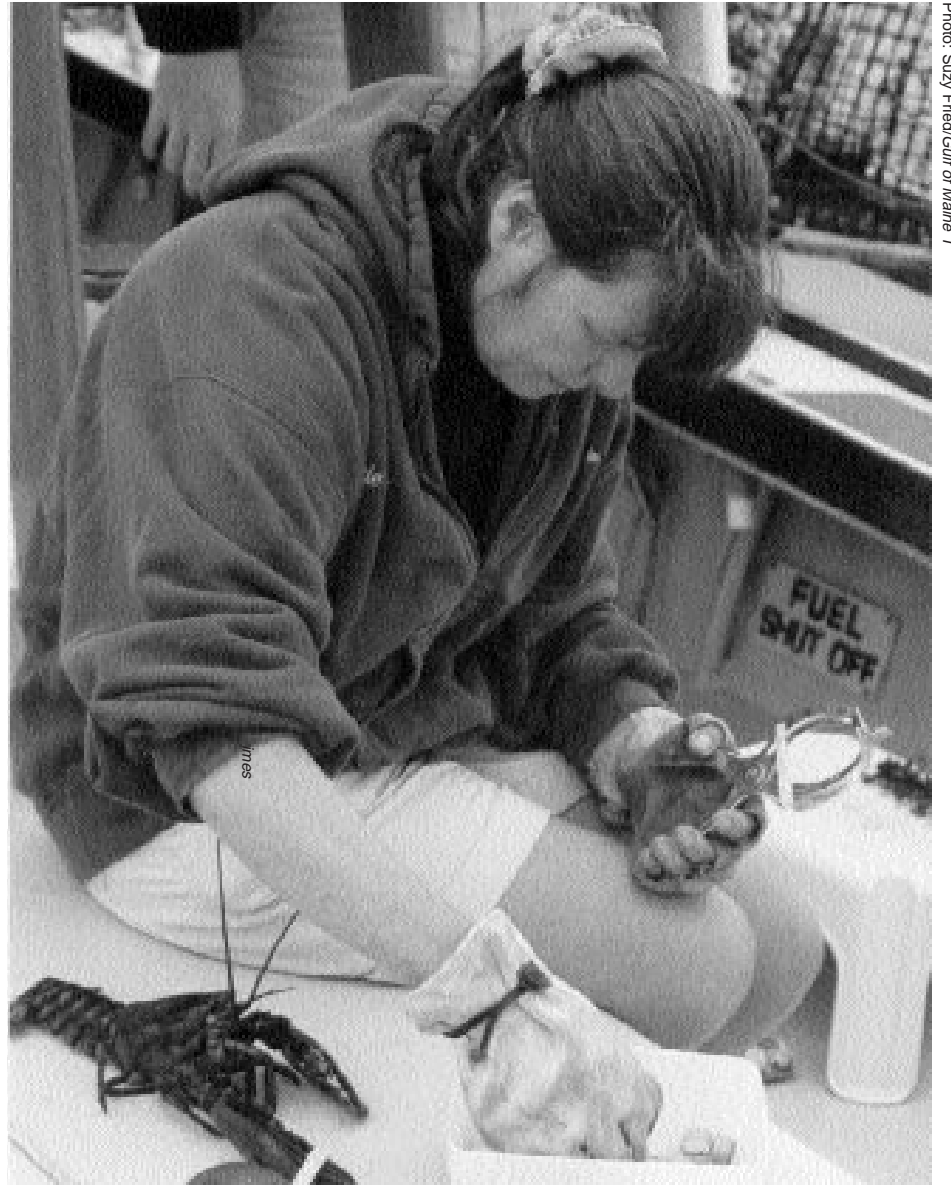


Photo: Suzy Fried/Gulf of Maine T

Susan Reynolds bands lobsters caught during a morning lobster cruise into Rye Harbor. She also runs cruises to the Isles of Shoals off the coast. Having been enamored of the "Shoals" since she first explored them as a teenager, she now shares that interest with passengers.

Hampton School's fourth-graders out to the islands each September aboard the *Granite State*, a whale watch boat operating out of Rye Harbor, to spend a couple of days learning about the islands and their role in history.

The students dabble in impressionism after Childe Hassam; learn lessons in applied science and marine biology, measuring salinity and collecting plankton samples; and try out some practical math applications, such as calculating fishing catches. They also write poetry in the spirit of Celia Laighton Thaxter, and read historical fiction about the islands. One story tells of the pirate Blackbeard's abandoned yet hopeful fifteenth wife, who's said to roam the shore crying out, "He shall return!"

## Lessons in lobstering

Although *Uncle Oscar* was purchased equipped with lobstering gear, Reynolds didn't begin running lobster cruises until the year after she bought the vessel, in the mean time adding railings and nets to her boat to make it passenger safe in accordance with Coast Guard specifications. Then she bought some lobster traps from a retiring lobsterman, refurbished them, and started showing passengers how lobstering works.

Reynolds, who has a commercial lobster fishing license, had learned the trade one winter more than 20 years earlier with a seasoned lobsterman named Harold. "I wanted to learn how he navigated with a watch, a compass, a recording depth sounder, but no chart," she says. She went with Harold on weekends as he set out his 12 eight-trap trawls. "That was the extent of it, other than being childhood friends with lobstermen's children and hauling a trap in a dory," she says of her previous lobstering experience. As she empties her dozen traps, Reynolds shows observers how to measure a lobster to see if it is of legal size. She baits the traps using frozen bait (it's less smelly and offensive to passengers than unfrozen) and sets them

again. Fishing single traps with buoys rather than trawls with several traps allows her to "talk with passengers without having to worry about gear in the water." Her customers, she says, have ranged from the "just curious," to people considering starting their own small-scale lobstering ventures. "It's been real popular."

Sometimes, Reynolds brings one of her students on board to help, but at least one day a week her son, Peter — a college junior and also a licensed boat captain — crews for her, occasionally manning the wheel so his mother can talk with passengers or demonstrate how to measure and band lobsters.

The two make a comfortable team. When Peter was 11, they took a two-month boat trip to the Bay of Fundy, and have made several boat deliveries together, cruising from the Bahamas to North Carolina, and from Long Island Sound to New Hampshire. "It's interesting, though sometimes a challenge that we're so much alike," says Reynolds, finding the resemblance in their persistence, self-sufficiency, and analytical natures.

During the summer, Peter crews most days on another Rye Harbor captain's whale watch cruise. For now, mother and son get along better that way, laughs Susan Reynolds. Peter agrees, though he's considering the idea of joining the family business after he graduates from the University of New Hampshire. Reynolds isn't holding him to it just yet, as she figures that someone his age is seldom sure of his course in the long term.

Reynolds is sure of hers, however. It's the course that has brought her out to the Shoals for as long as she's been able to handle a boat. But as much as she loves visiting the Shoals, even mooring her boat and staying for a week at a time, she doesn't want to become a resident. "To live there year round — it's too remote and lonesome for me. I'm too social." Sharing her love of the Shoals with others is the whole point.



Peter Reynolds checks one of his mother's lobster traps aboard *Uncle Oscar* in Rye Harbor, New Hampshire.

# Northwest Atlantic Marine Alliance

## New group advocating community management of marine resources

By Suzy Fried  
Editor

**Gulf of Maine** — A new community-based approach to managing marine resources has hooked some conflict-weary fishermen in the Gulf.

Regulators, researchers, fishermen, conservation organizations, recreators, and other interest groups often disagree on how to manage marine resources for ecological and economic health.

But a new organization, the Northwest Atlantic Marine Alliance (NAMA) is working to create a collaborative local management system to restore and sustain "an enduring Northwest Atlantic marine system which supports a healthy, diverse abundance of marine life and commercial, recreational, and aesthetic uses."

For nearly three years, NAMA kept a low profile as it painstakingly sorted out its goals and organizational structure. Meanwhile, behind the scenes, the group was helping to facilitate meetings and discussions on various fishery issues, according to Coordinating Director Craig Pendleton, a Saco, Maine fisherman. Last spring, the group began to publicize its work.

NAMA emerged from discussions that began when Conservation Law Foundation (CLF) attorney Peter Shelley asked Dee Hock, founder and CEO of VISA USA and VISA International, and now an organizational reform consultant, to help the various interests in the Gulf find ways to collaborate to restore declining fish stocks and otherwise enhance the Northwest Atlantic marine system.

In 1991, CLF successfully sued the US Department of Commerce and National Marine Fisheries Service to stop overfishing of groundfish, resulting in the closure of Georges Bank in 1994. But Shelley, CLF's lead attorney on that case, said he was concerned that the measure would simply be part of a cycle in which the fishery was closed when stocks declined, and opened when stocks recovered, only to be fished out again.

Local management based on conscience and common sense seemed a better approach. According to Pendleton, while NAMA acknowledges that government plays a role in managing marine resources, "If a bunch of people agree that you shouldn't be fishing on spawning fish in state waters, you don't need a law. You just agree and you don't do it."

A form of self-management is already at work in the Gulf. Maine's lobster zone councils have the authority to make rules on certain lobstering practices according to local tradition and needs. Even so, Shelley said, those councils, created by the Maine legislature, are "an extension of government, while the NAMA initiative is coming from self-government and self-management."

### Seeking organized chaos

Speaking at CLF's annual meeting in Boston on May 27, Hock described himself as a "country kid with passion for nature," and said he has worked to develop human organizations based on biological principles of organization incorporating both competition and cooperation. "Every cell in your body competes for every atom of nutrient or oxygen, but will give it up for the good of the whole," he explained.

Successful and effective organizations, according to Hock, emphasize individual responsibility, cooperation, and initiative, and their decision-making includes all affected parties rather than consisting of orders handed down from above. "Management by combat doesn't work," he maintains. When the credit card industry was suffering from institutional problems, Hock guided the banks in forming regional, national, and international com-



Photo: Suzy Fried/Gulf of Maine Times

NAMA supports community-based management in which all involved — from fishermen to representatives of the tourism industry, to conservation organizations — participate in deciding how to sustain marine resources in the North Atlantic.

munities based on these principles.

Hock calls his approach "chaordic" organization combining chaos and order. Assistance from several foundation grants enables his not-for-profit Chaordic Alliance to work on NAMA at no charge.

Pendleton said when he and other fishermen were first approached to meet with Hock and other groups they were reluctant, but, "At that point we were just so sick of fighting with each other. I really think that first meeting was out of sheer frustration. There had to be a better way."

Still, they were skeptical. "We thought at first, 'We're going to listen to some banker. What does he know?' But every issue we brought up, he could relate to Visa. It was a very interesting meeting. And when we got him off to the side, [we found out] he was retired and he was a farmer. He got dirty. He was a nice guy."

### Local perspective emphasized

NAMA has avoided taking positions on specific controversial issues. "We don't want to be an advocacy group," said Pendleton. "We want to work with other groups so they can be advocates for themselves. Local leadership is usually pretty good."

The group proposes that Gulf of Maine communities form local alliances including recreational and commercial fishermen, scientists, government representatives, conservationists, and others who would collaborate to form wider and wider regional associations that address management issues. The alliances would provide more opportunities for individuals to participate in decision-making. Pendleton said NAMA hopes by next May to launch five such alliances in Maine, New Hampshire, and Massachusetts.

The group wants to involve Canadian representatives as well. "We can't manage without including them," said Pendleton, but, "The difference in [fishery] management styles has caused us quite an inability to get together."

NAMA members can continue to participate in other fisheries management groups or organizations, said Shelley. But Pendleton said fishermen may find NAMA more to their liking. Pendleton, who formerly served as president of the Maine Fishermen's Cooperative Association, said that organization was less effective than he would have liked. "We'd hear only our side of story. Usually there were only a handful of people at the meetings."

Pendleton now works full-time in NAMA's Saco, Maine office. He's hired someone to run his boat, and gets out on the water only occasionally. Instead, he spends his time on projects such as a grant

application he recently wrote seeking funds for a NAMA boat-broking program in which fishing boats could be used as platforms for scientific projects. Pendleton's own boat is already involved in this sort of partnership, which he said helps facilitate trust between fishermen and scientists to the benefit of both.

According to Pendleton, NAMA affords fishermen more opportunity to speak than fishery management councils. "A lot of the guys have good ideas and are not listened to. Being able to come and speak openly and frequently — we've had some people who have found just that appealing." And interest in NAMA is growing, he said, noting that 50 people attended the group's January recruitment meeting.

For more information contact Craig Pendleton at NAMA's Saco, Maine office at (207) 284-5374.

## Workshop in MA spotlights salt marsh monitoring

By Chris Cornelisen  
MA Coastal Zone Management

**Ipswich, Massachusetts** — Scientists, resource managers, wetland consultants, and interested individuals from around New England learned about methods for monitoring salt marshes and their restoration at a June 2 workshop at Castle Hill overlooking the Great Marsh — the region's largest contiguous salt marsh.

Salt marshes help prevent erosion of coastal lands, serve as pollution filters, and provide habitat for fish and invertebrates. But structures such as roads and undersized culverts prevent natural tidal flow into and out of many salt marshes. Some were filled during construction and dredging, and others were drained by mosquito control ditches excavated through the 1930s.

Projects addressing these impacts should be monitored to track their progress and effectiveness, according to Robert Buchsbaum of the Massachusetts Audubon Society, a workshop sponsor along with the Great Marsh Summit Initiative, the Gulf of Maine Council, and the Massachusetts Wetland Restoration & Banking Program.

Attendees visited a Great Marsh monitoring site where the National Marine Fisheries Service (NMFS), the town of Ipswich, and The Trustees of Reservations, a Massachusetts land preservation organization, plan to enlarge a road culvert to restore natural tidal flow in an attempt to reestablish native salt marsh plants and restore access to the marsh for fish such as mosquito-eating mummichogs.

Participants also discussed monitoring tidally restricted marshes in Massachusetts; implementing a monitoring program for restoration projects funded by the New Hampshire Coastal Program; and methods for monitoring vegetation, fish, invertebrates such as snails and mussels, birds, and hydrology.

"When evaluating restoration projects, it is very important that scientists and managers agree on the methods used for collecting data," said Buchsbaum. A future workshop will focus on developing volunteer monitoring programs.

Contact Robert Buchsbaum via E-mail at [rbuchsbaum@massaudubon.org](mailto:rbuchsbaum@massaudubon.org) or call (978) 927-1122 for more information.



Photo: Chris Cornelisen

Measuring mummichogs (mosquito-eating fish) on a salt marsh is one part of monitoring the success of a salt marsh restoration project.

### FARMS Continued from Page 1

of the Washington, DC office of the American Farm Bureau Federation, a lobbying group that holds training sessions for farmers on controlling pollution. "A lot of this is education. People who were farming the way their dad and granddad did are now having to learn new ways. It's getting people to understand how what they do affects their watershed," he observed.

"Farmers really are concerned," said Wendy Omvlee, Secretary Manager of the New Brunswick Agriculture Environmental Council in Fredericton. "A lot of them want to be good responsible citizens and they find out what they've been doing for the past 20 or 30 years may not be good and [guidelines and regulations] can be overwhelming sometimes."

Educating the public about farming practices, such as use of insecticides, is also necessary, according to farm advocates. "What many urbanites think is that the farmers are out engaging in recreational spraying when they have nothing else to do," said Allan Noe, water and biotechnology program spokesman for the Washington, DC-based American Crop Protection Association.

"These days there's two things that really speak against that. One is that the farmer is out there living on the land on which he is growing his crops. You don't find too many people willing to jeopardize his family's or his own health. And secondly, these days at the cost of the chemical controls, anybody who applies more than necessary or more often than is necessary isn't going to be in business very long."

### Effects on water bodies varies

Experts disagree on the degree to which nonpoint source pollution from agriculture — as compared with that from forestry, urban centers, and other types of land use — directly affects rivers and coastal waters in the Gulf region. For example, farming is rated by the US government as the biggest pollution threat to the country's rivers related to human activity, with urban runoff — rainwater that flows over land and into receiving waters — ranked last. Yet, less than 10 percent of pollution in Massachusetts surface waters is caused by agricultural activity, according to Bruce Rosinoff, US Environmental Protection Agency (EPA) Nonpoint Source Coordinator for the state.

"We don't know exactly the entire extent [to which agriculture affects coastal waters], but it does appear to be important in some areas," said Jan Smith, Director of the Massachusetts Bays Program, an EPA-funded National Estuaries Program.

Given significant urban development in Massachusetts, "I would say urban runoff is of perhaps the greatest concern," acknowledged Vicky Boundy, Coastal Resources Coordinator for Eight Towns and the Bay, a Massachusetts Bays Program local committee on the Upper North Shore. "However," she added, "Farms certainly have an impact on the water quality, despite their many benefits and contributions to the economy." But others assert that if land now used for agriculture were urbanized, it would be a source of much more runoff and pollution.

By the time they reach the ocean by way of a river, pollutants originating on farms may be diluted to negligible amounts, said John Sowles, Director of the Maine Department of Environmental Protection's Marine Program. But the pollution can cause problems for the river itself. Most of Maine's agricultural activity takes place in the state's northern counties, where it has more of an influence on lakes and rivers than on coastal waters, he noted.

Maine considers its lakes most vulnerable to agricultural pollution, but measures in place to protect them benefit rivers as well, he said. And, Sowles pointed out, "Rivers, streams, and lakes are directly linked to the health of the overall Gulf ecosystem in that they are spawning,



Cattle traffic has worn away the bank on this portion of the Annapolis River in Nova Scotia. Preventing cattle from crossing rivers and streams helps protect banks from erosion and runoff that pollute those water bodies.

nursery, and energy processing centers for so much of the Gulf's life."

In New Brunswick and Nova Scotia, very little land in the Atlantic region is farmed — only five percent and eight percent respectively. Yet, in Nova Scotia's Annapolis River Valley, farming is believed to have a direct impact on the Bay of Fundy.

### Pollution, erosion prevalent

According to the EPA, a 1,000-cow dairy can produce approximately 60 tons/54 tonnes of waste per day — about the same amount of sanitary waste a town of 20,000 people produces. The manure can be used as fertilizer, but has to be stored and applied properly to prevent pollution of nearby waters.

EPA encourages the use of "closed-loop" manure storage systems that keep manure in leak-proof facilities until it has aged and can be used as fertilizer. But often, manure is stored in a pile somewhere on the farm — a more affordable method for many farmers. If the pile sits directly on the ground instead of on a concrete pad that is built to control runoff, it can contaminate groundwater and surface waters, and is the main element that links agriculture and water pollution.

Along with nutrients and bacteria found in manure, runoff from agricultural land can also collect nutrients from fertilizers, and toxic substances from pesticides and herbicides that have been applied to croplands without using soil and water conservation practices. Nutrients that enter nearby rivers and streams can cause algae overgrowth that robs the water of oxygen needed by other organisms. Bacteria and toxic substances can pollute wildlife habitat, and result in fish

advisories, shellfish bed closures, and beach closures.

Although water testing may show especially high levels of bacteria at a cattle crossing or near a manure pile, the pollution source is difficult to confirm when it is discovered downstream, which is why it is referred to as nonpoint source pollution.

Soil erosion is a related issue that affects water quality and a farm's productivity. Animals grazing on stream banks or in fields eat and trample the vegetation that helps keep soil in place. Water that runs off of a farm can pick up loads of soil, depositing the nutrient-laden sediment into nearby waters, contributing yet more to excess algae growth, filling in areas in rivers and streams where fish rest and feed, and blocking light needed by aquatic plants. Gritty sediment is also abrasive to fish gills, according to Jeff Schloss, an aquatic biologist at the University of New Hampshire's Cooperative Extension, who described sediment as the "most intrusive pollutant in New England."

Schloss trains watershed stewardship groups to work with farmers to identify and correct water pollution problems. The use of buffers — vegetation planted to filter and trap runoff, absorb nutrients, and trap sediments — is one of the most important issues to evaluate on a farm, he said.

In the US, the National Conservation Buffer Council, a private nonprofit organization "dedicated to the promotion of agricultural conservation practices" is encouraging farmers to help create two million miles/3.2 million kilometers of conservation buffers by the year 2002, noting that federal funds are available to

help.

Other factors to evaluate on a farm, according to Schloss, are drainage; livestock pens; methods used to keep thirsty animals from roaming into wetlands, streams, or other sensitive areas; manure management; and the collection and treatment of wastewater generated in dairy farm milking operations.

### Piecing together funds

Reducing water pollution and erosion on farms can be as expensive as building a manure containment and treatment system or as comparatively inexpensive as building a fence to keep cattle from wading into a stream. Federal assistance programs for such projects have been pared down in Canada and the US, and providers of technical assistance to farmers in the provinces and states work continually to cobble together financial support.

As once-rural areas of New England become increasingly urbanized, agricultural field staff anticipate federal funding in those regions will shrink even more, reducing money that pays for raw materials, contractors, and staff in offices where farmers go for technical advice.

"It's easy to say that things need to be changed but sometimes the economics and things that need to be done don't always add up," said Omvlee.

In Canada, agricultural officials say there is very little federal funding for pollution control projects on farms in the Maritimes, though the provinces and other organizations such as the Eastern Habitat Joint Venture have some small-scale funding programs in place. New Brunswick has a new cost-sharing program, funded by the province's Environmental Trust Fund, that addresses manure storage. The Eastern Canada Soil and Water Conservation Center in Grand Falls, New Brunswick also provides some funding for pollution control projects on farms, according to John-Louis Daigle, the center's Director.

### Farm assessment and planning guides

**In the Atlantic Provinces** *Environmental Farm Plan* Developed by provincial agricultural agencies and agricultural federations. For information, contact: Atlantic Farmers Council (506) 858-6555.

**In the US** *On-Farm Strategies to Protect Water Quality: An Assessment and Planning Tool for Best Management Practices* Developed by the New England Small Farm Institute (NESFI) for Massachusetts state agencies. For information, contact: New England Small Farm Institute, Belchertown, Massachusetts (413) 323-4531.



These crops were planted using the conservation tillage method, in which last year's crops are left in place to protect soil from erosion while new crops are planted among the old growth.

US farmers and agricultural officials hope the Clean Water Action Plan proposed in February by US President Bill Clinton will make more money available for agricultural water pollution control. It proposes doubling current funding to help states implement nonpoint source programs on a watershed basis, and proposes adding \$100 million to the Environmental Quality Incentives Program (EQIP), an agricultural financial assistance program.

Betty Herrick said she wants to fix pollution problems on her dairy farm in Rowley, Massachusetts. Chemicals that keep pipelines clean in the milk room now drain into the Mill River, as does runoff from her pastures. "It is not a very pleasant situation," said Herrick, although she pointed out that the farm did install a fence to keep its cows out of the river.

During four years of conversations with conservation officials, Herrick was not able to get the funding and technical assistance her farm needs to eliminate pollution problems. Finally, in August, funds from EQIP and Massachusetts Coastal Zone Management (MCZM) became available for work that will begin this year, according to Andrea Cooper of MCZM's North Shore office.

"It's very different from working with an industry or municipality where there's really the potential for them to have the resources to put measures into place," said Rosinoff. Many farmers, he said, are "barely surviving. We're trying to be reasonable and go after the ones causing most of the big problems."

Under Clinton's proposed Clean Water Action Plan, the EPA plans to focus on reducing water pollution caused by feedlots, especially large ones. "We're looking to potentially bring a lot of these feed lot operations into compliance with national water quality standards," Rosinoff said.

#### Agencies working in the field

In Massachusetts and the Atlantic Provinces, farm assessment and planning guides, along with training programs, help farmers determine whether and how their farms may be causing water pollution, and develop plans for correcting those problems and preventing future ones.

In Canada, provincial farmers' federations and departments of agriculture help farmers put those conservation measures into place. "We have a very strong environment act, and farmers are covered by it just as much as anybody else," said Dennis Moerman of the Nova Scotia Department of Agriculture and Marketing's Resource Stewardship Branch. He said the province requires farmers who purchase or use agricultural pesticides to undergo training and become certified by the Nova Scotia Department of Environment. But generally, according to Moerman, the province emphasizes voluntary compliance "rather than heavy handed enforcement."

Given that so little of the province is farmable, one of the biggest difficulties its farmers face is manure storage, said Moerman. "Often farmers don't have



Terracing and contour farming are common approaches to preventing or reducing erosion and runoff on farmland. This New Brunswick farm is using a soil and water conservation terracing system.

enough land to apply manure in an environmentally safe way," he observed. The province is encouraging farmers to divert wastewater from manure storage areas to artificially constructed wetlands that filter and clean the water, which can then be deposited onto fields, ditches, or streams.

In Maine, Massachusetts, and New Hampshire, state agencies and staff from federal agencies work with farmers on watershed protection measures. The staff in district offices of the US Department of Agriculture's (USDA) Natural Resource Conservation Service (NRCS) and Cooperative Extension Service help US farmers with technical assistance and by applying for grants to help them address pollution issues such as nutrient management.

A law passed in Maine last March makes it mandatory for farms that have 300 or more cattle — or a comparable amount of other livestock — to have a nutrient management plan, said Norm Marcotte, Nonpoint Source Program Coordinator for Maine's Department of Environmental Protection Bureau of Land and Water Quality. He described Maine farmers as "very responsive" to water pollution concerns.

The New Hampshire Department of Environmental Services (DES) has used funds received by the state under the Federal Clean Water Act to address agriculture-related water pollution problems in the Great Bay watershed. On one dairy farm on the Squamscott River, several projects are being undertaken by a combination of state and federal agencies and

organizations working with the farm owner to address water pollution, said DES Aquatic Biologist Steve Landry. One project is construction of a concrete feedlot for dairy cows that are currently pastured on the banks of a tidal estuary.

#### Help from grassroots groups

Environmental groups working on watershed protection are also involved in agricultural water pollution control. "We've been working, in collaboration with the USDA and NRCS, directly with farmers helping them implement BMPs."

said Kathy Leahy, Co-Director and Advocacy Program Coordinator for the Massachusetts Audubon Society's North Shore Branch.

"We've also been doing educational outreach to groups of horse owners. In most cases, the larger stables and farms are more aware of the runoff issues than the smaller backyard operations. People who keep one or two horses and a manure pile in their backyard down by the stream tend to be less aware of the impact they're having," Leahy explained.

Cuvilly, an educational farm on Massachusetts' North Shore, is very aware of such issues and recently received a grant from the Eight Towns and the Bay Committee and the Massachusetts Bays Program to improve its manure handling system, said Silke Fuchshofen, Cuvilly's agricultural consultant. The farm constructed an asphalt pad for manure storage with a curb to contain runoff, and also created a composting site. Both of these will

be used in educational demonstrations on organic gardening, she said.

The Nova Scotia Organic Growers Association (NSOGA) in Margaretsville has developed educational programs for organic and conventional farmers, and has promoted methods that help prevent water pollution, according to Janet Wallace, Coordinator. While NSOGA works mainly with organic farmers, Wallace said increasing numbers of conventional farmers are taking an interest in the group's programs.

"The agricultural community here, at least in our watershed, is very cooperative," said Steve Hawboldt, Program Director of the Clean Annapolis River Project (CARP), based in Annapolis River, Nova Scotia. The group works with interested farmers on issues such as stream bank reforestation, erosion control, controlled animal access, and constructed wetlands for agricultural runoff, providing referrals for technical and financial assistance.

But CARP leaves it to the farmers to persuade their peers to undertake water pollution control projects. "If you get three or four farmers on a road involved, it isn't very long before that three or four leans on the fifth one," Hawboldt said.

The Sheepscot Valley Conservation Association in midcoast Maine is seeking funding to work with farmers on pollution control projects on the Sheepscot River, according to Watershed Outreach Coordinator Jeff Reardon. The Sheepscot is one of seven rivers identified under the state's Atlantic Salmon Conservation Plan as providing important salmon habitat.

#### Data on progress lagging

Though more work remains to address pollution and erosion on farms, Maslyn, of the American Farm Bureau Federation, maintains that farmers' efforts to date are not showing up in state reporting under the Clean Water Act, because the states can't afford to monitor progress adequately.

"Lots of things have happened on the agricultural landscape that are good news for water quality that have not been recognized," agreed Tom Van Arsdall, Vice President of Environmental Policy for the National Council of Farm Cooperatives in Washington, DC. "Most of the water quality data we have doesn't reflect that progress yet because a lot of that data haven't been recorded yet," he concurred.

Arsdall said progress is also being made in less quantifiable areas. "What's fascinating to me is the increasing approach, instead of confrontation between farmers and their downstream neighbors, of partnerships," he said. But, he said, farmers do have another incentive to address water pollution aside from friendly neighbor-relations. "If these problems go unaddressed, regulation is an option, and regulations rarely mesh with a farmer trying to stay in business."

#### Web Sites for more information

National Association of State  
Departments of Agriculture  
<http://www.nasda-hg.org/>

Eastern Canada Soil and Water  
Conservation Center  
[www.ccse-swcc.nb.ca](http://www.ccse-swcc.nb.ca)



Well-managed pastures and paddocks keep pollution out of nearby streams and rivers by controlling runoff. Environmental agency staff say some small farm owners are not as aware of their property's impact on water quality as those whose farm is shown here.

## TRIBAL STEWARDSHIP

Continued from Page 1

### Governments relating

Another reason for the emergence of formalized approaches to environmental issues is the centralization of previously scattered tribe members following land claims settlements in the US and Canada since the early 1980s, and the recognition of Native American tribes and First Nations as distinct governments.

The US and Canadian federal governments are each charged with a fiduciary trust responsibility to ensure that resources used by native people on native lands are available and healthy. Every federal department in both countries has a policy outlining its particular responsibility in upholding that trust.

According to Sappier, when tribes address environmental concerns, "You have a hard time telling where the people stop and the government begins. On the reservation, tribal governments are more apt to listen to someone who just comes in to talk to them. One elder can change the whole system in a tribe in regard to an issue."

"Our tribal government council is very sensitive to environmental issues," agreed John Banks, Penobscot Nation Natural Resources Director. "Our decisions are based on what's really happening in nature. We believe in a set of natural laws that govern what we do. Our connection to the land and the resources in the Penobscot River Valley goes back to the Ice Age," he said. Banks chairs EPA's National Tribal Operations Committee, which includes 20 tribal representatives who advise EPA Administrator Carol Browner on Indian policy.

"Collaboration among tribes in the US and Canada has been ongoing for some time," but the two countries' federal governments have not worked together much on aboriginal issues, said Sappier. However, two US/Canadian organizations, the Gulf of Maine Council and the Global Program of Action Coalition, have stated their interest in inviting participation by indigenous tribes.

### Acting on interest

Growing consciousness among native people of their rights under tribal agreements with the US and Canadian federal governments is another development prompting more action on environmental issues, according to tribal sources.

"I believe the interest has always been there. From our side of it, the woods and the water systems are a way of life for us. It's just that now, there's more awareness" of the rights of indigenous people, said Chief Patrick Francis of the Woodstock First Nation in New Brunswick, one of several bands of Maliseets that live along the Saint John river system. He said native

people are also relearning traditional practices, now that the days of forced assimilation are over.

Availability of more federal government funding for the staffing and undertaking of environmental projects by tribal governments is also making monitoring and restoration projects possible. And more interest from non-native organizations in collaborating on projects has also helped, said David Joseph, Water Resource Manager for the Houlton Band of Maliseets in Maine, and a band member.

### Water quality top priority

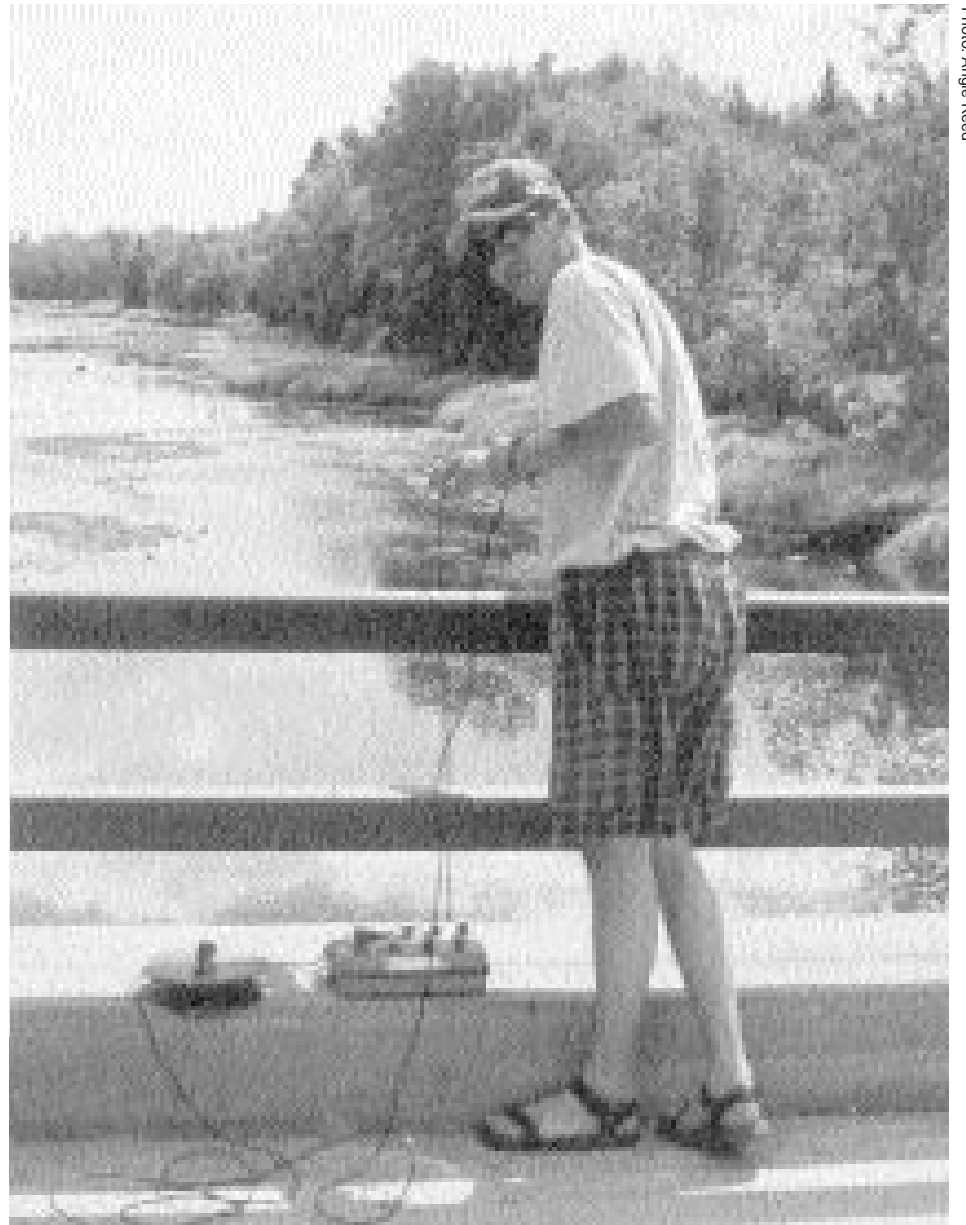
A few examples show that water quality monitoring is important to tribes working on watershed issues in the Gulf of Maine. "The tribes depend very heavily on being able to fish in coastal waters and being able to take fish for their own use whether for consumption or for ceremonial uses," said Heidi Leighton, Environmental Planner for the Pleasant Point Passamaquoddy Indian Reservation north of Eastport, Maine.

When shellfish beds in Passamaquoddy Bay were closed due to contamination, the tribal government began collaborating with the state Department of Marine Resources, the Cobscook Bay Clam Restoration Project in Eastport, and Canadian partners on several water quality monitoring and pollution detection projects. With funding from an EPA Environmental Justice Grant, the tribe is also testing tissue samples from fish and shellfish in the Cobscook and Passamaquoddy bays for heavy metals and dioxin.

In the Penobscot Nation, among the tribe's other environmental priorities, its government has a cooperative agreement with state of Maine to conduct the water quality monitoring for the watershed, which drains 10,000 square miles/25,900 square kilometers of Maine. Some of the analysis is done at the tribe's own water quality lab on Indian Island, said Banks, who described the tribal government's approach to environmental issues as combining "a cultural, historical, and traditional outlook on natural resources management with a modern scientific approach."

"The results of our monitoring have shown that our fish are contaminated," said Banks, noting that both the state of Maine and the tribe have issued consumption advisories for fish caught in the river, which the Penobscots describe as their spiritual center, or heart. At one time it was also their means of sustenance. Now, according to the tribe, dams and mills on the river are affecting its flow and the quality of its water.

The tribe blames high tribal cancer



David Joseph, Water Resource Manager for the Houlton Band of Maliseets, tests Meduxnekeag River water samples for dissolved oxygen and temperature.

rates and contamination of fish and other resources on dioxin it says is discharged by the Lincoln Pulp and Paper Mill into the river, upstream of Indian Island. The Penobscot Nation is pursuing ways to force the paper mill to stop releasing dioxin into the river, and is exploring legal remedies for problems it blames on the discharges.

A tribal grassroots organization, Indigenous Resistance Against Tribal Extinction (IRATE), plans to use a postcard and newsletter campaign to raise awareness about the issue that IRATE Coordinator and Penobscot Nation member Rene Attean calls "environmental genocide."

### Efforts converge on Meduxnekeag

According to Sharri Venno, Environmental Planner for the Houlton Band of Maliseets, "Most of our water quality issues come from off reservation. We need to be part of a watershed-wide effort." Venno is not a tribal member, but co-chairs the Meduxnekeag Watershed Coalition, which is working on erosion control, restoration, and cleanup on the river.

"We're part of the land just as much as the water's part of the land," said Joseph, explaining that, for him and his family, a healthy river means "supper on the table." The band's tribal government has sponsored workshops on water quality issues, is working with farmers to address agricultural sources of water pollution, is monitoring water quality in the river in coordination with the state, and hopes to get federal funding to clear out and prevent the growth of thick mats of algae that clog the river at low water during the summer. The algae hinders canoes and fishing, and raises concerns for fish habitat.

Also active on the Meduxnekeag River, but in New Brunswick, is the Woodstock First Nation. According to Chief Francis, the Maliseet band is restoring salmon habitat on the river, as well as conducting fish surveys to monitor

salmon populations with technical assistance from the Canadian Department of Fisheries and Oceans.

In the past, the Woodstock First Nation also worked with a local non-native community organization, Partners with the Meduxnekeag (PWM). According to Wayne Annis, who was involved with that group at the time, the band's "interest in fisheries seemed to lend itself to habitat restoration projects." The Woodstock First Nation adopted Marvin's Brook, a tributary of the Meduxnekeag, for habitat restoration, and also led efforts to raise salmon for the river, he said.

Now working with the Keswick River Society, Annis said that organization is collaborating with another Maliseet band, the Kingsclear First Nation, on habitat restoration and public education projects. Of the partnerships, Annis said, "It's certainly been a positive experience for both them and us. I think things like this can really help develop an understanding between native and non-native communities."

But according to Sappier, in some cases, an even more immediate priority of tribal environmental programs is to find out "what's killing Indians."

#### Web sites for more information

**Assembly of First Nations**  
www.afn.ca

**Native Americans and the Environment**  
http://conbio.rice.edu/nae

**US Environmental Protection Agency**  
www.epa.gov/Indian/

**Canadian Dept. of Indian Affairs and Northern Development**  
www.inac.gc.ca



The Woodstock First Nation in New Brunswick surveys fish populations on the Meduxnekeag River. First Nations and Native American tribes are undertaking watershed management efforts throughout the Gulf of Maine.



# Fisherman helping scientists track leatherback sea turtles

By Suzy Fried  
Editor

**Wolfville, Nova Scotia** — Their images grace posters in storefront windows. They spend hours basking in the sun and dining on exotic snacks. Delighted fans snap their photos at every opportunity.

In Nova Scotia's coastal communities, the leatherback sea turtle is becoming a celebrity of sorts, as scientists and fishermen collaborate to gather information that will help in developing conservation measures for the engaging, and endangered, creature.

On average, leatherbacks measure about eight feet/two and a half meters long from head to tail, weigh nearly half a ton/450 kilograms, and can stretch their flippers to spans of six feet/two meters. But neither their hardy physique nor international endangered status has prevented drastic declines in their populations, according to Mike James of Acadia University in Wolfville, Nova Scotia, coordinator of the North Atlantic Leatherback Turtle Working Group.

The group formed in 1995 under Chris Harvey-Clark, head veterinarian at Dalhousie University in Halifax, who developed a plan to guide leatherback conservation efforts in Nova Scotia and the other maritime provinces. But when other job responsibilities prevented Harvey-Clark from pursuing the project further, the group languished for a couple of years until James, who is researching leatherback turtles for a master's degree, revived it.

Since then, the working group has recruited more than 100 fishermen in the province to call in turtle sightings, and to photograph the animals when possible.

The working group hopes that turtle conservation efforts will benefit from better understanding of the turtles' travels and the risks they face. Funding from World Wildlife Fund Canada and the Canadian Wildlife Federation have supported the group's efforts along with \$2,000 raised by third-graders at an Ontario school.

## Mysterious travelers

The turtles' primary nesting areas are French Guyana and Surinam in South America, but they can also migrate as far north as Baffin Island, between Canada and Greenland. When they turn up in Nova Scotia waters each summer, researchers get a glimpse of at least part of their migration route.

"We do not really understand what exactly is accounting for such a huge decline" in leatherback turtle populations, said James. He explained that once the hatchlings are out of the nest, they are hard to track — especially males, who don't come ashore to nest as females do. Scientists estimate leatherback turtle populations by counting females found on known nesting beaches, he said.

In 1982, scientists counted 115,000 nesting female leatherbacks. By 1995, that number had dropped to 34,500, with beaches that may have been visited by up to 300 females in the past being used for nesting by only a dozen, James said.

James has given water-resistant single-use cameras, donated by Fuji Canada, to fishermen working off of Nova Scotia's east and south shores, where leatherbacks arrive in June, and are spotted most in August and September. Photos are valuable in tracking individual animals, which can be identified by distinctive markings on their heads.

The working group was also making plans during the summer to track turtles using passive integrated transponder (PIT) tags that are implanted into the shoulder muscles of turtles caught in fishing gear or stranded in Nova Scotia waters before they are released back into the sea.

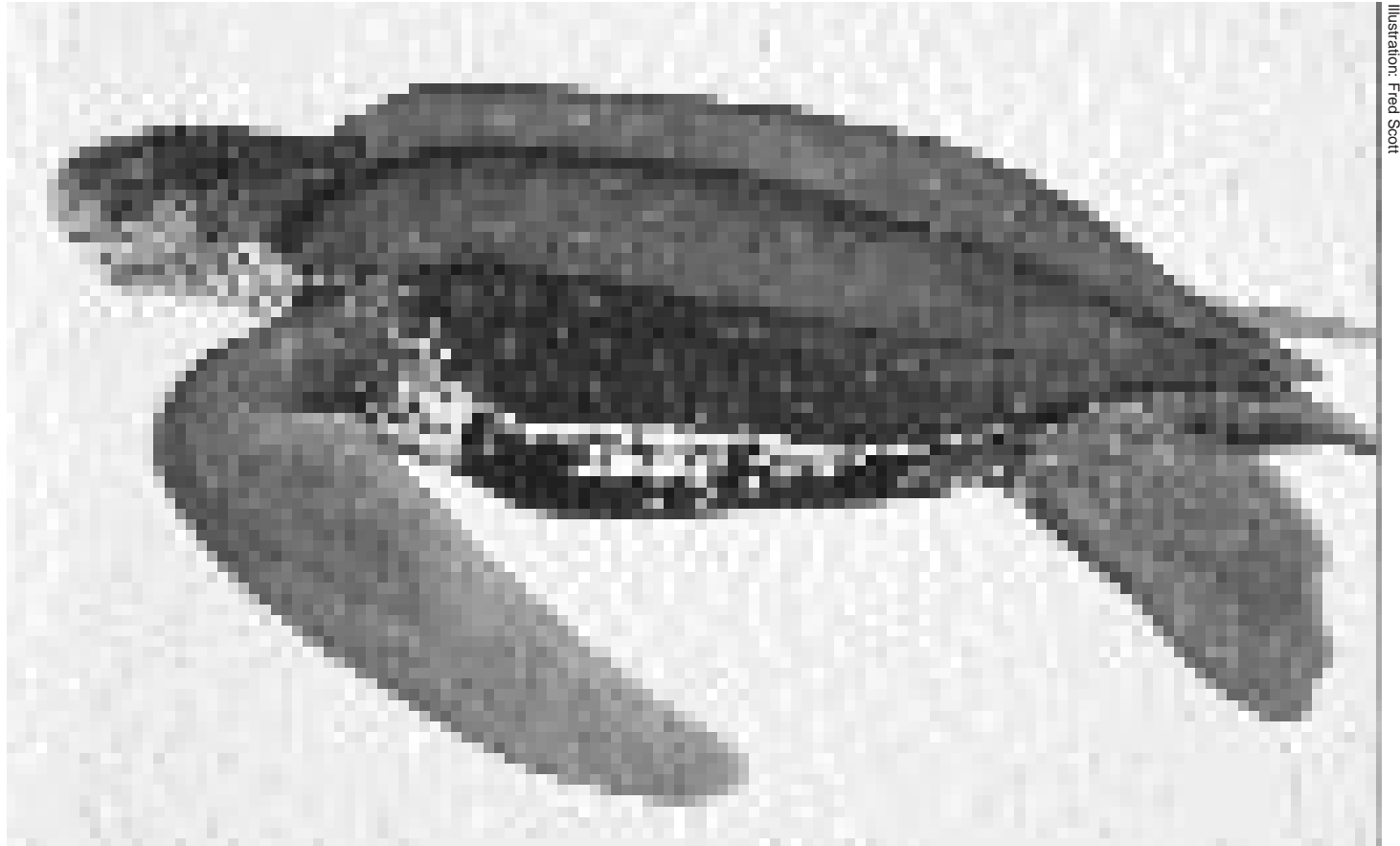


Illustration: Fred Scott

With the help of Nova Scotia fishermen, scientists are trying to find out more about the endangered leatherback turtle's migration pattern to determine the factors affecting its ability to survive. During the late summer, leatherbacks appear off the coast of Nova Scotia.

"It sounds invasive, but for an animal that can be 450 kilograms or larger, it is a vary small impact," according to James, who describes the turtles as "dinosaur-esque."

Scientists have been tagging nesting female turtles with signal-emitting devices using various methods, with different degrees of success. The PIT tag does not emit a signal, but can be scanned the way product codes on groceries are scanned at the checkout, allowing scientists to track the turtle's travels, provided they can get close enough to the animal to scan its tag.

## Poachers one of several threats

Though a definitive cause of the turtles' population decline is not clear, scientists know of several contributing factors. One is that poachers steal their eggs and sell them in local or Asian black markets as a delicacy and alleged aphrodisiac, according to James. The turtles leave huge tracks on the beach, making their nests easy to find, and since leatherbacks are not aggressive, poachers can easily rob a nest even if the nesting turtle is present.

Another factor is loss of nesting habitat due to both development and natural causes such as beach erosion. Vessel strikes may also injure or kill some turtles. But

even more of a problem is the proliferation of trash in the ocean — especially plastic bags, which resemble the jellyfish on which the turtles feed.

The inside of a leatherback's esophagus is lined with razor-sharp pointed spines that help it swallow jellyfish, but that also prevent the turtle from spitting up garbage it has swallowed by mistake. "Leatherbacks that have been necropsied on beaches have shown lots of plastics, tar, Styrofoam, garbage. It eventually plugs their digestive tract and they starve to death," said James.

And, like other marine animals, leatherback turtles can get entangled in fishing gear. Typically, their front flippers get caught and they can often be freed, but if the whole turtle is caught in a net, it may drown.

"You can't penalize accidental bycatch, and you don't want to," James asserted. "We want to maintain good relationships with fishermen. It is the fishermen who report valuable information the working group needs," he said, adding that he believes most Nova Scotia fishermen release turtles from their gear alive.

"The majority of fishermen in this province really do seem to like turtles. I

don't think we're getting that high a rate of fishery related-mortality here," James said.

Terry Baker, a fourth-generation fisherman who fishes for swordfish and lobster east of Halifax down to Sable Island, has spotted leatherbacks in the water since he started going out on fishing boats with his parents as a young boy. He became involved in the turtle-watching project through the Fishermen and Scientist Research Society, after James came to the group's annual meeting two winters ago. "We don't mind keeping an eye out for them," said Baker. "We're there anyway. We don't see them often but we see some."

## Expanding the fan club

"I've probably gone to 50 fishing villages" distributing posters and brochures and talking to fishermen about the turtles, "but there are a lot more to go to," said James. Fishermen, their wives and partners, along with teachers and other volunteers, are helping to publicize the project. In thanks, they receive baseball caps featuring an image of a leatherback turtle. These also help promote the group's work, he said.

The working group intends to broaden its effort with a curriculum unit on leatherback turtles it is developing for use in Maritime schools, said James.

High school science and oceanography teacher Albert D'Entremont of West Pubnico, a community south of Yarmouth, Nova Scotia, is a working group volunteer who joined after encountering several leatherbacks two summers ago while sailing off the coast of Nova Scotia with his wife, Myrna. He plans to incorporate leatherback turtles into his lesson plans this school year.

Meanwhile, leatherbacks continue to charm Nova Scotia's coastal communities. As he prepared to leave for another sailing trip this past July, D'Entremont said he hoped he would spot the turtles again, perhaps this time with tags or known identifying markings. "These are gorgeous animals. Like the kids would say, 'they're awesome.' They're totally captivating."

For more information on the Leatherback Turtle Working Group's efforts, call Mike James at 1-888-729-4667 from Atlantic Canada or (902) 585-1705 from the US.



Photo: Vern Skalski

Leatherback turtles nest on beaches in South America, the Caribbean, and South Africa. This turtle seems unfazed by onlookers on this Trinidad beach. The leatherbacks' non-aggressiveness makes them prime targets for poachers who steal their eggs.

# GULFLOG



Photo: Suzy Fried/Gulf of Maine T

**Awaiting Friendship** — At the Salem Maritime National Historic Site in Massachusetts, Jeremy Bumagin (left) and Rose Witte prepare rigging for *Friendship*, a replica of a 171-foot/52 meter, three-masted merchant tall ship launched in 1797. Chief Rigger Dave Mullen (not shown) also rigged the *USS Constitution* during its recent restoration. *Friendship* is being built by Scarano Boat Building Inc. of Albany, New York, under contract with the US National Park Service, and is expected to arrive in Salem by early fall.

## US President calls for focus on oceans' health

**Monterey, California** — At the National Oceans Conference here June 11-12, US President Bill Clinton called for more protection and study of the world's oceans, proposing "a \$224 million initiative to enhance the health of our oceans while expanding ocean opportunities in responsible ways for the environment."

The National Oceans Conference was organized by the Department of Commerce and the Department of the Navy, at the urging of US legislators, to serve as the official US forum on national interests in the ocean during the twenty-first century.

During the conference, Clinton extended the nation's moratorium on offshore leasing for 10 more years, while permanently prohibiting drilling in marine sanctuaries; called for a cooperative effort with the fishing industry to rebuild fish stocks within 10 years; asked Congress to fund his \$2.3 billion Clean Water Action Plan to address nonpoint source pollution; and announced other measures.

He also requested a long-term federal oceans policy from his cabinet and voiced support for creation of an oceans commission. The Oceans Act of 1997, introduced as companion bills in the US House and Senate, also calls for a commission on oceans policy. Canada passed a comprehensive Oceans Act in January 1997.

## CZ 99 Web Site

*Coastal Zone 99 — The People, The Coast, The Ocean: Vision 2020* takes place July 24-30, 1999 in San Diego, California. Visit [omega.cc.umb.edu/~cz99](http://omega.cc.umb.edu/~cz99) or E-mail Chantal Lefebvre at [cz99@umbsky.cc.umb.edu](mailto:cz99@umbsky.cc.umb.edu) or fax (617) 287-5575 for more information.

## Georges Bank panel plans public hearings

**Halifax, Nova Scotia** — In preparation for a decision on whether to extend beyond January 1, 2000 a Canadian drilling moratorium on Georges Bank off of southwestern Nova Scotia, public hearings on the environmental and socio-economic impact of petroleum exploration and drilling on the bank are to take place in Nova Scotia this winter at locations to be announced.

The Georges Bank review panel must make a report and recommendations on the results of the meetings to the Canadian

Minister of Natural Resources, and to the provincial Minister responsible for the Nova Scotia Accord Act by July 1, 1999. The ministers must decide whether to lift the moratorium by January 1, 2000.

A drilling moratorium on the US side, enacted under former President George Bush, and recently extended by President Bill Clinton, is in place until the year 2012.

Visit [www.ycn.library.ns.ca/georges/](http://www.ycn.library.ns.ca/georges/) for more information, or contact the Georges Bank Review Secretariat. From Canada call 1-800-370-2282. From the US call (902) 424-0858 or E-mail [gbreview@ycn.library.ns.ca](mailto:gbreview@ycn.library.ns.ca) or fax (902) 424-0528.

## US, Canada pursue right whale protection

**Halifax, Nova Scotia** — The Canadian Right Whale Recovery Team plans to hold public consultations in New Brunswick and Nova Scotia in 1999 on recommendations for increasing the endangered North Atlantic right whale population.

Dates of the consultations are to be announced, according to Jerry Conway, recovery team Co-chair and marine mammal advisor for the Department of Fisheries and Oceans.

Scientists believe approximately 300 of the whales now live in the North Atlantic. They give birth to their calves off the coast of Florida and Georgia during the winter, then migrate north, reaching the Bay of Fundy by late summer. In decades past, the whales were hunted to near extinction. Present-day threats to the whales include collisions with ships, entanglement in fishing gear, and loss of habitat.

In an effort to prevent ship collisions, systems are in place in the US and Canada

in which ships are informed of right whales' whereabouts using information provided by aerial surveys. This summer, the International Maritime Organization was considering a US proposal that would require commercial ships entering the whales' calving and feeding grounds to report by radio to the US Coast Guard, which would then inform the vessel of whales' locations.

The New England Aquarium and the Gulf of Maine Council have respectively convened informational discussions on whale/ship collisions. And several high speed ferry operators in the North Atlantic have agreed to work with consultants and researchers to reduce potential risks to whales from their vessels.

Addressing the issue of whale entanglement in fishing gear, in the US, the National Marine Fisheries Service (NMFS) is developing a rule regulating the kind of fishing gear that can be used in right whale habitat. Lobstermen objected to an earlier version of the rule, asserting that it would put them out of business and would not necessarily prevent whale entanglements. Now, some are participating in NMFS-funded disentanglement and gear modification research in fishing areas off of Cape Cod, the Great South Channel, and the Gulf of Maine.

An interim final rule entered into the Federal Register in July 1997 was still in place a year later, pending enactment of a final rule according to NMFS Research Communications Chief Teri Frady.

## National Conference on Marine Bioinvasions

January 24-27, 1999  
Sponsored by the MIT Sea Grant College Program

Massachusetts Institute of Technology,  
Cambridge, Massachusetts

Visit <http://massbay.mit.edu/exoticspecies/conference.html>  
or E-mail [exotics@mit.edu](mailto:exotics@mit.edu) for information.

## Maine sponsors YOTO conference

**Rockport, Maine** — Maine will observe the International Year of the Ocean with a conference here October 9-10 that will take a critical look at the status of the state's resources and explore promising new management approaches.

Among the topics to be explored during the conference, *Sea & Shore: Maine's Shared Resources in the International Year of the Ocean*, will be human-induced impacts on the marine ecosystem, the status of commercial fisheries and new

approaches for fishery management, and the implications of growth and development in the coastal zone.

In addition to the Maine Coastal Program and the Gulf of Maine Educators Association, other conference organizers include the University of Maine Sea Grant and Cooperative Extension Programs, the Island Institute, the Chewonki Foundation, College of the Atlantic, Casco Bay Estuary Project, and the Maine Department of Marine Resources. For information, visit the Maine State Planning Office web site <http://www.state.me.us/spo/mcp/confer.htm> or call (207) 287-3261.

## GPAC workshop targets land-based pollution

**South Portland, Maine** — Participants in a November 15-17 workshop to be convened here by the Global Program of Action Coalition for the Gulf of Maine (GPAC) will identify actions for protecting the Gulf ecosystem from harmful impacts of land-based activities.

In 1994, Canada, Mexico, and the US established the Commission for Environmental Cooperation (CEC) to address transboundary environmental concerns in North America. The Global Program of Action for the Protection of the Marine Environment from Land-based Activities (GPA), was developed under the United Nations Environmental Program in 1995, recognizing that approximately 80 percent of all marine pollution comes from human activities on land.

The CEC chose the Gulf of Maine as the site of a pilot project in 1996, and convened individuals from the US and Canada to create the GPAC to determine the priority problems requiring regional action.

Participants in an April GPAC workshop in Saint John, New Brunswick identified priority habitat and pollutants in the region. November workshop participants will assess activity currently under way to address pollutant and habitat issues, identify new projects, and form implementation teams.

For a copy of the April GPAC workshop report, or for more information, contact Heather Mair at the ACAP-Saint John office. E-mail [acapsj@fundy.net](mailto:acapsj@fundy.net) or call (506) 652-2227.

## Gore announces funds to restore NH estuaries

**Durham, New Hampshire** — Vice President Al Gore announced the availability of up to \$1.6 million in new federal resources to help speed the restoration of New Hampshire's seacoast estuaries and reopen shellfish beds four years earlier than planned.

The Vice President said federal agencies will work with the state, with farmers, and with other property owners to reduce contaminated runoff, sewage, and other harmful pollutants. He also called on Congress to fully fund President Clinton's Clean Water Action Plan, which provides additional resources to communities and property owners to protect rivers, lakes, and coastal waters.

The new funds will support the reopening of more than 700 acres/283 hectares of oyster and softshell clam beds in Portsmouth, the Great Bay Estuary, and the Hampton/Seabrook Estuary by 2001 — four years earlier than anticipated under state cleanup plans.

The money will also assist farmers in Maine and New Hampshire in protecting seacoast estuaries, and will create new models for locally led water protection.



Fishing boats materialize in Rye Harbor, New Hampshire, as a morning fog lifts.

Photo: Suzy Fried/Gulf of Maine T

# Council Currents

## News from the Gulf of Maine Council on the Marine Environment

### Coastal Wetland Restoration Database a resource for restoration groups

By Chris Cornelisen  
MA Coastal Zone Management

**Boston, Massachusetts** — Over the past two years, the Gulf of Maine Council has led an effort to document, for the benefit of groups working on restoration projects, the work ongoing throughout the region by government and non-government organizations, scientists, consultants, educators, and advocates to protect and restore coastal habitats and species.

Information compiled and available electronically or on hard copy includes contacts, such as consultants and researchers; notes on monitoring restoration projects; and information collected for specific projects.

Promising restoration efforts that have taken place in recent decades include restoring tidal flow to salt marshes, transplanting seagrass, providing fish passage at dams for salmon and herring, and building wetland habitat for waterfowl.

Information on projects involving tidal marshes, tidal flats, and seagrass is organized in a Coastal Wetland Restoration Database. It covers approximately 100 tidal marsh restoration projects, more than 100 freshwater impoundments in Canada, and several

Photo: Chris Cornelisen



The Gulf of Maine Council's Coastal Wetland Restoration Data Base includes information on restoration efforts taking place on coastal habitat throughout the Gulf.

innovative projects aimed at restoring seagrass and tidal flats. In addition to these projects that are underway or have been completed, the database includes information on more than 400 potentially restorable tidal marshes, representing more than 2,000 acres/809 hectares.

These restoration projects as well as efforts to restore seabird and anadromous fish populations are described in a companion report to the database.

The database, the report, and a fact sheet on habitat and species restoration may be accessed or downloaded from [gulfofmaine.org](http://gulfofmaine.org), the Council's home page. Click on *What's New*, or *Our Library/Regionally Significant Coastal Habitats/Coastal Habitat Restoration*. For a hard copy of the report, fact sheet, a copy of the database on disk, or if you have new information on a restoration project to add to the database, please contact Susan Snow-Cotter at Massachusetts Coastal Zone Management, (617) 727-9800 ext. 210.

*Chris Cornelisen developed the Coastal Wetland Restoration Database as part of a fellowship he recently completed with Massachusetts Coastal Zone Management.*

### GOM Council promotes Gulfwide beach cleanup

**Gulf of Maine** — Marine debris data collected during this year's Gulfwide coastal cleanup will support the Gulf of Maine Council's efforts to control a problem that jeopardizes marine life.

Marine animals that eat trash they find in the ocean can die as a result of suffocation, starvation, poisoning, and injury. Others can become entangled in discarded nets, fishing line, plastic bags, or other material and drown. Marine debris is, at the least, unsightly to humans, but can also endanger barefoot beachgoers.

More than 10,000 participants picked up and tallied refuse on beaches in the Maritime Provinces, as Beach Sweeps took place there during the first week of June, according to Clean Nova Scotia, the nonprofit environmental organization that has organized the program there for nine consecutive years. Moosehead Breweries sponsored the Beach Sweeps.

Coastal cleanups are also scheduled to take place in Maine September 26 through October 3, in New Hampshire September 18-19, and in Massachusetts starting September 19 and continuing into October.

The Council will release the results of the Gulfwide cleanup later this year.

### GOMC, NE Aquarium organize info forum

**Boston, Massachusetts** — The first of a series of forums to be organized by the Gulf of Maine Council and the Boston-based New England Aquarium will take place at the Aquarium and the Massachusetts Institute of Technology (MIT) November 4-6, focusing on electronic information exchange among groups and individuals working on Gulf of Maine issues.

The forum is funded by the Cabot Family Charitable Trust and the National Oceanographic and Atmospheric Administration.

"The goal is to build upon work done

by the Gulf of Maine Council and other organizations to improve information exchange via computer," said Maggie Mooney-Seus of the New England Aquarium. "We want to take it to the next step and reach more people including scientists, teachers, and resource managers with more information on the Gulf of Maine, in an easier way," she said.

Sponsors of the forum include the Canadian Department of Fisheries and Oceans, the Collaboration of Community Foundations for the Gulf of Maine, Environment Canada, the Gulf of Maine Council, the Maine Department of Marine Resources, the Maine State Planning Office, Massachusetts Coastal Zone Management, MIT Sea Grant, and the Regional Association for Research on the Gulf of Maine.

### Gulfwatch reports on first five years

**Gulf of Maine** — Sponsored by the Gulf of Maine Council, Gulfwatch has released a report on the marine monitoring program's first five years collecting baseline information on the health of the Gulf at 62 sites in Nova Scotia, New Brunswick, Maine, New Hampshire, and Massachusetts.

Under the program, launched in 1991 by the Gulf of Maine Council, US and Canadian scientists analyze blue mussels that live in shallow coastal habitats throughout the Gulf in pristine to heavily populated areas, examining them for the presence of toxic contaminants including mercury, lead, and pesticides.

This analysis has provided the first long-term, comprehensive picture of the potential presence of toxic trace metal and organic contaminants in the Gulf of Maine, and can be used to evaluate how changes in the marine environment may be affecting the health of the Gulf, providing a focus for Gulf-wide cooperation on issues affecting the US and Canada.

The December *Gulf of Maine Times* will include a feature on the Gulfwatch program. For a copy of the report call Steve Jones at (603) 862-2175, or Peter Hennigar at (902) 426-6191.

### GOMC hosts shipping forum, NS takes gavel

**Salem, Massachusetts** — Ship strikes involving North Atlantic right whales and the potential dangers of exotic species in ballast water drew representatives of industry, environmental organizations, government, and the military to the Gulf of Maine Council's Marine Shipping Environmental Forum at the Peabody Essex Museum here June 4.

Ship strikes are currently the number one documented cause of right whale deaths. The shipping industry, government, and environmental organizations are working to address the issue, but experts say more solutions are needed to prevent this threat to the endangered whale.

Those participating in the forum also

discussed how live organisms contained in ballast water brought from other ports could invade Gulf of Maine harbors, causing economic and environmental problems.

On June 5, the Council Secretariat officially moved from Massachusetts to Nova Scotia. "Balancing and protecting the concerns of this valuable ecosystem will be a priority of the Secretariat in Nova Scotia," said Keith Colwell, Minister of Nova Scotia's Department of Fisheries and Aquaculture, who will serve as the Secretariat for the Council through June 1999.

The Gulf of Maine Council is an international body brought together to foster cross-border cooperation among government, academic, and private groups on implementing sustainable management strategies for the Gulf, which extends from Cape Cod to the Bay of Fundy. Visit [www.gulfofmaine.org](http://www.gulfofmaine.org) for more information.

## Resources

### Year of the Ocean materials

Canada's Department of Fisheries and Oceans is making materials available to help teachers, community groups, and others working on educational and promotional activities for the International Year of the Ocean. Contact Tim Hall via E-mail at [hallj@mar.dfo-mpo.g.ca](mailto:hallj@mar.dfo-mpo.g.ca) or call (902) 426-4116.

### Whale help video

A video, *Whales and Fishermen: A Plan to Reduce Entanglements*, produced by the National Marine Fisheries Service, the New England Aquarium, the Center for Coastal Studies, the Maine Department of Marine Resources, and other state and federal agencies, is available from University of Maine Sea Grant Communications. Call (207) 581-1440.

### CEC's "ecoregions"

The Collaboration for Environmental Cooperation's (CEC) publication, *Ecological Regions of North America: Toward a Common Perspective*, is part of a major regional effort to redraw the North American map in terms of ecosystems and ecological regions instead of political boundaries. The electronic versions of all materials prepared for the publication are available under the "Environmental Conservation" section on <http://www.cec.org/english/resources/publications/> the CEC's Internet site.

### Sea corals report

*The Distribution and Status of Deep Sea Corals off Nova Scotia* is a 60-page report summarizing a study conducted to map the distribution of corals fishermen call "trees" on the Scotian Shelf and George's Bank. Contact The Ecology Action Center via E-mail at [eac\\_hfx@istar.ca](mailto:eac_hfx@istar.ca) or by calling (902) 429-2202. There is a charge for this publication.

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