

# **Ambassadors of the Bay 2005 Final Report**



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*To stand at the edge of the sea, to sense the ebb and flow of the tides, to feel the breath of a mist moving over a great salt marsh, to watch the flight of shore birds that have swept up and down the surf lines of the continents for untold thousands of years, to see the running of the old eels and the young shad in the sea, is to have knowledge of things that are nearly eternal as any earthly life can be.*

Rachel Carson

## The Ambassadors of the Bay seek to:

- Gain an appreciation for the beauty and diversity of Frenchman Bay
- Identify stresses on water quality and marine resources
- Develop a bay-level perspective on the challenges for inhabitants and users of this unique coastal environment
- Publish a report on observations and experiences for use in comprehensive planning, land use and conservation decision-making, and education.

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### **The Ambassadors of the Bay Made Waves.**

It was a journey of surprises. Wherever the group of teenagers beached their kayaks in order to ask questions of and learn from the folks who live on, love or look to Frenchman Bay for work and sustenance, they were met with excitement and appreciation. The worm diggers who had risen long before dawn in north-central Mattawamkeag seemed surprised that anyone, much less young folks, would be interested in them and the grueling way they wrest a living from the mud flats off Thompson Island.

### **The Ambassadors of the Bay Made History.**

It was the first time that area youth ever had made a concerted effort to ‘take a snapshot’ of the bay’s health. Their eyes and video cameras captured images ranging from local wildlife to burgeoning oceanfront development, from cruise ships to aquaculture. They did it all from their red and yellow kayaks, giving them a unique perspective on Frenchman Bay. They took their snapshot using their compassion as well as their brains. An injured seagull, wrapped in the netting of a mussel aquaculture raft, caused them first to try to save the bird - and then to ask hard questions about ethics and industry.

### **The Ambassadors of the Bay Made Connections.**

The growing sense of a shared mission to protect the fragile waters of Frenchman Bay was palpable during a picnic lunch at Hadley Point that brought together a clam digger, an environmentalist with a summer home along the shore, the owner of a proposed mussel farm, concerned residents and local media. The conversations among them flew as quickly as the giant bowl of steamed mussels emptied. All through it, the kids were kept hopping as they took notes, asked questions, shot footage, learned, taught and plotted the next steps of their journey.

*By Abigail Curtis*

## Why did we embark on this journey?

The MDI Water Quality Coalition has been working with citizens on water quality related projects in Frenchman Bay since 1997. Over the last decade, many issues of concern to the residents and users of the bay have come up. These issues include polluted runoff from paved streets and parking lots, increasing development in the upper reaches of coastal watersheds as well as right on the shoreline, nutrient enrichment of bays, over harvesting of marine resources, shifting of mussel harvesting techniques to aquaculture, building of piers, increasing visitation by cruise ships, contamination of swim areas, declining eelgrass populations, shoreline erosion, and blooms of toxic phytoplankton. We decided it was time to gather a team of community members to traverse the bay, make continuous observations, talk to people on both sides of the bay, and discover what issues emerged as most important to address in the immediate future. This team would serve as Ambassadors of the Bay, able and willing to communicate the concerns of residents and users of the bay, as well as share their observations about the state of the bay: its beauty and its challenges to sustain native flora and fauna while providing for the needs and wants of local people.

In the fall of 2005, students and community members set out on a four day kayaking expedition with the aim of understanding the state of Frenchman Bay, the stresses on water quality and marine resources, the issues that are important to local residents, and to gain a bay-level perspective on a unique coastal environment. Twelve ambassadors: students in the Maine Coast Learning Expedition Program at the MDI Water Quality Coalition, MDI Water Quality Coalition staff and volunteers, a newspaper reporter, a College of the Atlantic professor, a Jackson Laboratory biologist, and a marine extension agent from Sea Grant who served as a registered Maine kayak guide, all

joined together as a collaborative learning community. Their plan: to record observations and conversations with coastal residents, document the state of the bay, generate a list of impacts both on shore and offshore, and produce a report for use in land use planning, conservation consideration, and education.

This report is written in the ambassadors' own words. It reflects a citizen effort to discover the truth about the state of the bay. This report should not be considered a comprehensive guide to the state of the bay; it has some answers to many of the questions asked. But more questions were raised than answered.

In the end, the ambassadors came to realize that all of the issues in the bay are interrelated. Each impact on the bay has repercussions that affect resources, or someone's livelihood, or someone's sense of place. Loss of eelgrass impacts water clarity, sediments in the water column carry nutrients throughout the bay, nutrients cause algal blooms, and green shores affect property values, diminish visitor experiences, and impact coastal businesses. Runoff

invariably carries bacteria, bacteria make water unsafe for recreational water contact and shellfish harvesting. Piers, rafts, coastal developments, and cruise ships all change the view people remember and the experience they have both on the land and out at sea.

The ambassadors realized that they had gained insight from their journey and could follow up on issues by giving testimony at public hearings, participating in comprehensive planning, collecting additional data, and assisting in grant writing for efforts to establish long term plans for protecting and managing resources in Frenchman Bay. And so their journey isn't over.

*This team would serve as Ambassadors of the Bay, able and willing to communicate the concerns of residents and users of the bay, as well as to share their observations about the state of the bay: its beauty and its challenges to sustain its native flora and fauna while providing for the needs and wants of local people.*

*By Jane Disney*

## Who are the Ambassadors?

**Dr. Jane Disney** has a B.S. degree in biology, a M.S. degree in genetics from Penn State University, and a Ph.D. in zoology from Washington State University. She currently serves as the executive director of the Mount Desert Island Water Quality Coalition and teaches environmental studies in an interdisciplinary semester program for high school students called Maine Coast Learning Expedition (MCLE). She dreamed of a program like MCLE when she was involving her students in water quality monitoring around Mount Desert Island as a biology teacher at MDI High School between 1992 and 2001. She took her MCLE students and a group of committed community members on a kayaking expedition in the fall of 2005, to begin the process of documenting the state of Frenchman Bay. This was her first sea kayaking venture but not her last.

As the education director of the Mount Desert Island Water Quality Coalition, **Gwenn Kubeck** works with students and teachers on Mount Desert Island to collect meaningful water quality data that are used by local and state agencies to inform resource management decisions. She brought to the Ambassadors of the Bay journey several years of experience as an environmental educator for various marine-based research and citizen science organizations. Graduating from Lewis and Clark College in Portland, Oregon with a degree in both environmental studies and biology, Gwenn is especially interested in learning how to create collaborations between a diversity of people who all rely on a common resource. Gwenn is a PADI SCUBA Divemaster and a Wilderness First Responder, and has a special fondness for tide pool creatures.

**Natalie Springuel** is a marine extension associate with the Maine Sea Grant College Program, based at College of the Atlantic in Bar Harbor. As a Master Maine Sea Kayak and Recreation Guide, she served as the Ambassadors of the Bay's leader on the water. The Gulf of Maine Expedition, a five-month sea kayaking expedition to raise awareness about the ecology and cultural legacy of this vast watershed, was Natalie's brainchild. Natalie's outreach and applied research programs with Sea Grant address sustainable tourism planning, recreation impact monitoring, waterfront access, and expedition-based education throughout the Gulf of Maine. Through workshops, presentations, publications, field research, and on-the-water educational programs (often by sea kayak), Natalie provides programming that seeks to bridge the gap between traditional waterfront uses and the rapidly growing interest in sustainable and nature-based tourism opportunities.

**Zack Steele** was an Americorps Volunteer Leader at the MDI Water Quality Coalition where he was project manager for the Stanley Brook Watershed Survey at the time of the Ambassadors of the Bay journey. A Maine native and College of the Atlantic graduate, he brought experience in land use planning and geographic information systems to the expedition. Zack is a Wilderness First Responder who enjoys backpacking, hiking, skiing, and kayaking in his spare time.

**Maddy Johnson** is a thirteen-year-old research fellow in Maine Coast Learning Expedition (MCLE). She has attended school at Conners Emerson in Bar Harbor since first grade, though this is not her first participation in the programs offered by the MDI Water Quality Coalition. In 2003, Maddy took part in some of the classes offered by that semester's MCLE program. She was an apprentice in the Community Environmental Health Lab, and in the fall she took the environmental writing workshop taught by Candice Stover and the team-building classes offered by Camp Beech Cliff. In April 2004 she was a River of Words poetry finalist. In sixth grade Maddy was part of a red tide monitoring group at Conners Emerson that went out once a month on the Bar Harbor dock. She continued this program through seventh grade, and helped produce a brochure to educate the public about phytoplankton towing and red tide. She also went to the KIDS Student Summit with the same group of sixth and seventh graders, where groups from all over New England presented various service learning projects, and helped present a power point presentation on their phytoplankton studies. Kayaking this semester for Maddy was an amazing experience and real immersion into an unfamiliar area – Maddy had never before went on the ocean in a kayak. She expects, though, she will be out again soon enough.



*The Ambassadors left to right: Terrence Reid, Maddy Johnson, Zack Steele, Jake Van Gorder, Mary Forest, Helen Hess, Gwenn Kubeck, Abby Curtis, Natalie Springuel, and Jane Disney (not pictured Zephyr McDonnell). Photo taken by Kathy Van Gorder*

## Who are Ambassadors?

At age 16, **Zephyr McDonnell** started volunteering to monitor water quality for the MDI Water Quality Coalition, testing for red tide, among other things. The following fall, Zephyr became a Maine Coast Learning Expedition research fellow. Up until then, he had been home schooled all his life, and had been learning through high school textbooks. Zephyr is a PADI Open Water Diver, a Wilderness First Responder, an avid rock climber and a hiker who has explored all over Acadia National Park, as well as in Zion National Park. While in Zion, he hiked eight miles in knee-to-chest-deep water up a river in a slot-canyon. With hopes of someday becoming a biologist, Zephyr loves the outdoors and feels it is important to monitor and protect it.

**Terrence Reid** is an 18-year-old senior at MDI High School. He lives on Verona Island just out of sight of Fort Knox. Terrence's Maine Coast Learning Expedition experience became his senior project. A second-degree black belt in karate and an Eagle Scout, Terrence has spent two summers as a trail builder, one with the Maine Conservation Corps. He is looking forward to pursuing a college degree in one of the environmental sciences.

**Jake Van Gorder** has been a student and research fellow with Maine Coast Learning Expedition for three years. Starting in fall 2003, he ventured on a trip up Mount Katahdin, followed by intensive cruise ship monitoring throughout the fall of 2004. In the spring of 2005, Jake volunteered with the MDI Water Quality Coalition to monitor for *Phaeocystis*, a species of phytoplankton that can clog the gills of fish if present in large numbers. Jake has also volunteered his time to work with students in conjunction with the MDI Water Quality Coalition outreach program. Jake has been home schooled throughout his life and has spent considerable time involved in creative endeavors with the Gilbert and Sullivan Society and with the Summer Festival of the Arts. Jake recently became a certified Leave No Trace Camper.

**Dr. Helen Hess** is a professor at College of the Atlantic (COA), where she teaches marine biology and stream ecology among many other things. She received a B.S. in Biology from UCLA in 1985 and a Ph.D. in zoology from the University of Washington in 1991 and has been on the faculty at COA since 1994. Her formal training as an invertebrate zoologist has led her to develop courses that take her and her students wherever invertebrates are found, including local rivers, Maine's rocky intertidal shores, and Caribbean coral reefs. Her interest in water quality issues has stemmed directly from her teaching and research activities as well as her hobbies; she is an avid whitewater canoeist and sea kayaker. Being part of the MCLE Ambassadors of the Bay journey was an ideal combination of education, conservation, and recreation.

**Mary M. Forest** has a marketing degree from Central Connecticut State University, with additional credits from College of the Atlantic. She is an educator in training for social studies and business education. As a volunteer, she shares her life experiences with Mount Desert Island Water Quality Coalition, providing historical references and business experiences to "think outside the box".

When not paddling alongside the Ambassadors of the Bay, **Abigail Curtis** can be found covering the Mount Desert Island beat for the Bangor Daily News. She has a long-standing interest in working with youth and helping empower them to make positive change in the world. Before reporting full-time, Abigail worked with youth as an advocate for mid-coast Maine domestic violence project New Hope for Women and then was a wilderness counselor at a northern Maine camp for troubled teenage girls. She also has served as the youth radio coordinator for community radio station WERU-FM. Abigail enjoys hiking and spending time in Maine's beautiful outdoors.



*Maine Coast Learning Expedition research fellows share their kayaking experience with interested community members. From left to right: Maddy Johnson, Jake Van Gorder, Zephyr McDonnell, and Terrence Reid.*

## Where did we journey?

### Ambassadors of Frenchman Bay Kayak Expedition

By Gwenn Kubeck

Last fall marked the beginning of a hugely successful new MDIWQC initiative, the Ambassadors of Frenchman Bay Kayak Expedition. Four high school students involved in Maine Coast Learning Expedition, along with MDIWQC staff and community members, made a tremendous leap into the public eye when they embarked on the four-day kayak journey to better understand the state of Frenchman Bay, the stresses on water quality and marine resources, the issues that are important to local residents, and to gain a bay-level perspective on this unique coastal environment.

Frenchman Bay, located in the Gulf of Maine, is home to an active and diverse coastal community which settled near the bay to enjoy or utilize its many resources. For decades, the bay has been heavily fished for both finfish and shellfish. Aquaculture leases are growing in number, both offering an alternative to conventional fishing practices and putting more pressure on existing resources. Intertidal areas offer valuable clam and worm resources. Eelgrass, which offers critical habitat for juvenile species and helps stabilize substrate, is in decline. In addition, many businesses capitalize on the beauty of Frenchman Bay through the large and ever-growing tourism industry. The bay also attracts a growing amount of coastal development, which led to the town of Bar Harbor passing a moratorium on development in order to align development practices with current planning goals.

As a collaborative learning community, the kayak team recorded and documented observations and conversations that addressed the people, the ecology and the issues of Frenchman Bay. Throughout the trip, they learned about and adhered to Leave No Trace philosophies. A day-by-day outline of the extraordinary Ambassadors of Frenchman Bay Kayak Expedition follows:

#### Day 1 September 19, 2005

Our leader and a Maine Coast Kayak Guide, Natalie Springuel, helped us whittle our gear down to the essentials and pack it all into three tandem and two solo kayaks. In addition to Natalie, our core expedition team was comprised of Dr. Jane Disney, executive director of the MDIWQC and the visionary who gave birth to this idea; Zack Steele, an Americorps volunteer coordinator for a local watershed survey; Gwenn Kubeck, education director of the MDIWQC; Dr.

Helen Hess, a professor of invertebrate biology at College of the Atlantic; and our Maine Coast Learning Expedition students, Maddy Johnson, Zephyr McDonnell, Terrence Reid, and Jake Van Gorder, our graduate MCLE research fellow. In addition, the expedition was made a success by the many people and organizations that supported its mission (see Appendix I)



GIS map  
by Jake  
Van Gorder



## Where did we journey?

While we were carrying our gear to the launch point on Thompson Island, two commercial worm harvesters caught our attention and allowed us the opportunity to begin our documenting process by entertaining our questions about the issues they feel are impacting Frenchman Bay. We departed from Thompson Island at 10 am. From there, we past Thomas Island and traveled between a uniquely beautiful pair of islands called the Twinnies, on the way to Hadley Point. On the way, students photo documented and recorded in their journals the types and abundance of sea birds and areas where the coastline was eroding. Jacques Seronde, a local riparian land owner, met up with us on the water and offered insight into the changes that have taken place in the Frenchman Bay ecosystem over the generations that his family has been settled here.

For lunch, the expedition landed at Hadley Point. This is the dynamic site of a proposed bottom mussel aquaculture lease. Adjacent to the proposed lease site is a long standing clam resource. The Bar Harbor Town Council, using data collected by students and the MDIWQC, recently passed a two-year clam flat conservation closure at Hadley Point and made long term changes to the amount of harvestable clams for commercial and recreational purposes. Historically this area has had a healthy population of eelgrass, which is now much diminished.

At Hadley Point, we met up with commercial clam harvesters, representatives from the Bar Harbor Marine Resource Committee, media reporters, mussel aquaculturists, representatives from the tourist industry, and residents. Students facilitated the opportunity for everyone to share their opinions about the proposed mussel aquaculture lease and the state of Frenchman Bay. The presence of young people and an open and trusted venue in the spirit of an expedition provided a rare opportunity for stakeholders to come together and share their concerns in a non-confrontational way.

From there, the Ambassadors paddled to Lamoine State Park, where they visited a Maine Department of Marine Resource (DMR) laboratory facility. The DMR scientists gave us a tour of their operations and an overview of their projects. They too were motivated by the spirit of our expedition and shared not only their basic information, but also their insights into some of the bacterial and biotoxin issues around Frenchman Bay. Later, they joined us at our campfire to talk about the bigger picture of instilling bay management plans and ensuring public health for bay users.



*Students are interviewed at Hadley Point by Susan Farley for Channel 5 Television.*

*The kayak team observes buoys that mark sites of wild mussel dragging between Thomas Island and the Twinnies.*



*Abigail Curtis (right), a reporter from the Bangor Daily News, joined the Ambassadors for the first leg of their journey.*



*Ambassadors and stakeholders share a lunch of mussels provided by Great Eastern Mussel Company.*



## Where did we journey?

### Day 2 September 20, 2005

From Lamoine, we traveled to Googin's Ledge where a raft mussel aquaculture venture is located. Students intended to sample for phytoplankton around the mussel raft to learn about the effects these rafts have on the base of our oceanic food chain. Instead, we found a seagull caught in the netting that surrounded the net. The gull was alive, but in dire condition, and as a group we were confronted with the ethical dilemma of how to proceed. Due to rough weather



*Seagull trapped in the netting around a mussel aquaculture raft.*

conditions and safety concerns, we left the gull and pulled into a nearby landing where we called the DMR and asked them to pursue freeing the bird.

We then headed to Hancock Point, passing many mussel draggers on the way, which raised questions about the relationship between mussel dragging, mussel aquaculture and the effects of these activities on



*Ambassadors regroup to call for help for the seagull and get warm before heading to Hancock Point.*

the bay ecosystem. At Hancock Point, we met up with Barb Welch, the executive director of the Frenchman Bay Conservancy. We gathered and documented information about conservation easements and lands trusts, and started to apply these concepts through discussion and journaling to what we were learning about Frenchman Bay.

### Day 3 September 21, 2005

Before leaving Hancock Point, we went to the local boat dock and sampled the water there to observe phytoplankton types and abundance. Students reflected on previous phytoplankton samples taken across the bay and inferred from these data that phytoplankton types were evenly distributed around Frenchman Bay. After embarking in our kayaks, the expedition was struck by the magnitude of horizon occupied by cruise ships and reflected on the impact cruise ships may have on the bay's people and ecology. Students were able to draw on the cruise ship work done by past MCLE students to gain perspective on these questions.

During lunch at Sorrento, we discussed "Leave No Trace" philosophies and learned about overboard discharges in Maine from a DMR scientist. The main destination of this day was Stave Island, an uninhabited island that has been largely put into a land trust. Due to the unique nature of this island, we all eagerly anticipated exploring its nooks and crannies while doing our best to minimize impact



*Students use a field microscope to identify phytoplankton taken from Hancock Point.*



*Lunch at Sorrento.*

## Where did we journey?

on the land and spirit of the place. We were among very few people who have been given permission to camp on this land. But due to the educational and collaborative nature of the expedition, we were welcomed upon arrival by Bob DeForrest, a representative from Maine Coast Heritage Trust. He led us around the island and pointed out ecological points of interests, while also informing us about the conservation easement particular to Stave Island, and how that relates to land conservation all around Frenchman Bay.

### Day 4 September 22, 2005

Waking to a magnificent sunrise, we savored the remoteness and beauty of our location. We packed our kayaks slowly knowing that soon we were heading back to “civilization.” We departed from Stave Island leaving very little trace of our stay but taking many rich experiences and valuable information. The Ambassadors of the Bay Kayak Expedition ended at College of the Atlantic (COA), where parents and community members greeted us. Kara Johnson from Allied Whale, a COA-based marine mammal education and research organization, talked to the group about marine mammals in Frenchman Bay, habitat displacement and the impact cruise ships and transport ferries can have on whales and other marine life.

In conclusion, we gained tremendous insight into many of the issues facing Frenchman Bay during the course of our journey. One of the greatest successes of the journey was the connections made between people who all had a different but vested interest in the future of Frenchman Bay. To a large extent, it was the people who led us to understand more deeply the issues and ecology of our local bay, and it was amazing how willingly and openly people shared with us their thoughts and perspectives. People wanted to share their stories and were glad to have a group of students and community members who wanted to listen and document each of their voices. When we unpacked our kayaks for the last time after landing at College of the Atlantic, it was clear to us all that we had only just begun to delve into the diverse learning that this journey had sparked. The Ambassadors of the Bay Journey provided a wealth of opportunity for the Maine Coast Learning Expedition students and their teachers to dig deeper in the subsequent semester by collecting more data and oral histories, and by participating as active citizens in the field, lab and classroom, as well as at town meetings and in public discourse.



*The Ambassadors practiced Leave No Trace throughout their journey, in this case camping with permission on an island's durable grassy substrate.*



*The Ambassadors make their final landing at College of the Atlantic.  
(Photo by Bob DeForrest)*

## Ecological Observations on the Ambassadors of the Bay Journey 2006

By Maddy Johnson and Jane Disney

The ecological issues that were focused on during the Ambassadors of the Bay Kayak Journey included:

- **Phytoplankton**
- **Lobstering**
- **Fishing**
- **Eelgrass**
- **Invertebrates**
- **Marine Mammals**
- **Birds**

There were many more issues that we could have focused on regarding the ecology of the bay, but on a four-day journey, with limited time, we decided to look at the most accessible and observable ecological details of the bay.

### Phytoplankton

The student Ambassadors had been looking at phytoplankton populations on the Bar Harbor side of the bay before departure. *Eucampia*, a microscopic multi-cellular chain, had been the dominant phytoplankton species at multiple locations in Frenchman Bay for weeks before the journey. While we were at Hancock Point, we decided to tow for phytoplankton and see if *Eucampia* was the dominant species on the other side of the bay as well. Sure enough, it was. Our view from Hancock Point over to Bar Harbor was spectacular. Centrally



*Examining phytoplankton through field microscope.*

*Eucampia, the dominant phytoplankton species at the end of 2005.*



located in our field of view was a cruise ship anchored in Bar Harbor. We began to realize that if phytoplankton could evenly disperse throughout the bay, so could anything, like pollutants from an illegal discharge or oil from an accidental spill, or a non-native species from ballast water. We realized at that moment how interconnected everything is in the bay and how events on one side of the bay could have profound impacts everywhere in the bay.

When we returned from the journey, we did an analysis of phytoplankton data collected over two years by students and teachers and interns working at the Community Environmental Health Laboratory located at the MDI Biological Laboratory [see appendix II]. We found that although *Eucampia* was the dominant species (accounting for 26% of all species observed) in 2005; it accounted for only 1% of the



*Towing for phytoplankton at Hancock Point.*

*The view from Hancock Point includes a cruise ship on the horizon, anchored in Bar Harbor.*



## What did we learn?

observed species in 2004. We realized that the make-up of the bay is ever changing. This is probably a natural thing. So one has to be careful when talking about the ecology of the bay. It depends on when you look.

Both on the journey and after the journey, a lot of questions emerged about what the ecology of the bay was in the past and how it compared to the present ecology of the bay.

### Lobstering

We decided to talk with Skippy Dunton, who has been a fisherman in this bay for over fifty years, and ask him: “What did you see fifty years ago? What do you see now?” We learned that in terms of fisheries, things are different now than they were then [see GIS maps c1950 and 2005, below]. And this is probably not a natural thing.

For example, 50 years ago there were not as many lobster traps in Frenchman Bay. There were essentially no traps between Thompson Island and Hadley point. Skippy had thirty traps between Hadley Point and Sand Point. It was generally understood among lobstermen that thirty was a good limit so as to not deplete the lobster stocks. Now there are ten times that many traps between Hadley Point and Sand Point. And around 600 traps in the upper bay

## The Ever-Shifting Ecology of Frenchman Bay

as well. There is no telling how long the bay can sustain this level of lobster harvesting.

### Fishing

One of the reasons that everyone is going after lobsters is because there aren't as many other kinds of resources in the bay anymore. Around 1950, structures called herring weirs were placed in numerous places around the bay. Built out of birch logs with seaweed and eelgrass filling in gaps, they trapped herring as they swam along the coast in the night. Skippy remembers six herring weirs from the middle of last century. They could be found from Thomas Island to Hulls Cove.

There are no more weirs currently in Frenchman Bay – mostly because there are few herring left.

Herring aren't the only fish that can't be found anymore. Skippy talked about flounder too, how as a boy in Salisbury Cove he could go out and catch a flounder dinner for his whole family. Now, mostly due to boats that dragged for flounder and took them all out of the bay, there are few flounder left.

Skippy Dunton Oral History



Skippy Dunton Oral History



### Eelgrass

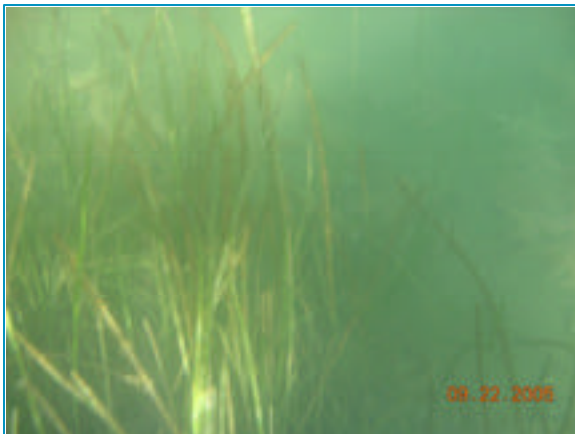
Eelgrass is also less abundant than it was in earlier times. We saw wonderful eelgrass beds at Hancock Point and off of Stave Island, but not at Hadley Point. Skippy told us about the abundant eelgrass around Thomas Island, the Twinnies and Hadley Point in 1950. Eelgrass was so thick in upper Frenchman Bay, fishermen had to be careful about going out at too low of a tide, because propellers on their boats would jam with eelgrass. You couldn't pull up a lobster trap without having to disentangle it from the eelgrass.

Eelgrass is important for juvenile finfish and shellfish species. They can hide there and find food as they grow. It is hard to know how declining eelgrass populations might have affected fish populations. No one was studying all of these things 50 years ago. Adolescent lobsters, though not entirely dependent on eelgrass, much prefer eelgrass beds to an empty bottom. Surprisingly, there has been no evidence of a decline in lobster populations in anyone's memory.

### Invertebrates

We saw many different types of marine invertebrates, although we were not attempting a census of these creatures. Our journey revealed many surprising species – either ones we didn't intend to find or ones we didn't even know existed. We had the privilege of having Dr. Helen Hess, a professor at College of the Atlantic and invertebrate expert, join us on this expedition. She taught us about various tide pool creatures, from seastars to bryozoans. We didn't see any non-native species of marine invertebrates on our journey, although we know that some have been sighted in the Gulf of Maine. When we

returned from the journey, we decided to visit with Dr. David Towle, a crab researcher at the Mount Desert Island Biological Laboratory. He told us that



*Eelgrass (Zostera marina).*



*A lesson in sea star biology off of Stave Island.*

green crabs, a European invader, have been abundant in Frenchman Bay for over a century. He gave us more information about invasive species including non-native bryozoans and tunicates. He also informed us that there had been a credible identification of the invasive Asian crab sighted on a shore near Lamoine in the last year.

### Marine Mammals

Marine mammals are fewer in number today than in the middle of the last century. Skippy reported that a pod of humpback whales moved into Frenchman Bay and fed for several days while delighted residents of Mount Desert Island watched them from the shores of Degregoire Park in Bar Harbor. This would seem very unusual today. We kayaked around Frenchman Bay for four days and in that time there were four seal sightings and a porpoise sighting. On the last day of our journey we visited with Kara Johnson from Allied Whale at College of the Atlantic who informed us that these numbers of sightings were lower than she would have expected.

In conclusion, the ecology of Frenchman Bay, and all other ecosystems around the world, is always changing, and always will be changing. Data on these changes are essential; data will help us define what changes result from our own impacts on the environment.

### Discussion with Allied Whale

By Zephyr McDonnell

When we landed at College of the Atlantic at the end of our kayak journey, Kara Johnson of Allied Whale was there to answer some questions as well as to prompt other topics. The main questions we had for her were: What should we have done about the entangled bird? Who should we have called? Is this type of thing common? What are some of the issues Allied Whale sees as most relevant? She told us that if we had called Allied Whale they could not have done anything about the gull that we found trapped in the mussel raft netting. Apparently they don't have the resources to go after gulls, since they deal primarily with marine mammals. Kara advised us not to touch, or even approach any animal in such a state. According to her it is unusual to find an animal that is still alive but entangled. Most of the time Allied Whale finds animals that are dead and/or stranded, though not always.

In order to find out what we could have done about the bird on the mussel raft, we talked to Rich MacDonald, an ornithologist. He said that, had it been an eagle, we could have called Birdsacre in Ellsworth. But he thought that no group would feel like it was worth it to send the gear and people out just for a gull, which is a very common bird. A few days later we found out that the owner of the raft had dealt with the situation. The owner said entanglements happen quite often, even though he has decoys on the raft to deter birds from approaching. Apparently better decoys will have to be manufactured. The raft owner stated that he has been pecked badly before, illustrating Kara's point about not approaching a trapped animal.

Since it seems that birds landing on mussel rafts is a common thing, one wonders: will all the bird poop going down into the water with the mussels create a health hazard? Also, the mussel rafts might influence the population of phytoplankton in the area, either creating blooms

because phytoplankton feed on nutrients or lowering dissolved oxygen levels through eutrophication.

Kara also mentioned that Allied Whale doesn't euthanize animals. She told us a case where that might be warranted: if a whale beaches itself, it sends out distress signals that cause the entire pod to follow it, thus endangering them all. If the first one to beach is euthanized, the rest may be kept safe. Killing one for the good of the rest must be a tough decision to make as a person trying to save whales.

One of the main issues Allied Whale deals with is habitat displacement. For example, if you get close enough to a seal so that it raises its head to look at you, it's been impacted. Kara recommended that people maintain a distance of one mile from any seals, because they may abandon pups in fright. A main cause of local habitat displacement is the *Cat*, a local ferry boat. It produces a lot of noise that is very disruptive to local marine animals. Also, Allied Whale tested and determined that, due to the *Cat's* design and the fact that its engines are in the back, a whale (or anything else for that matter) that is in front of the cat CANNOT HEAR IT! This may be why the *Cat* has hit 2 whales. Luckily the *Cat* has been forced to reduce speed until they make it beyond a certain point in the Bay. There are observers on board to look for whales.

Most of the ship-strike records Allied Whale gets are from the Navy. Kara pointed out that this is probably just because the Navy is sure to report all ship-strikes. Allied Whale helped to create a training video for the Navy that helps them see what a whale looks like at distance, so they may better avoid hitting them.



*Kara Johnson from Allied Whale discusses marine mammal issues with some of the Ambassadors.*

## Ambassadors of the Bay 2005: Bird Census

We decided to do a census of birds visible during the trip. Maddy brought binoculars and a bird guide to aid with identification. She's had some practice with bird identification, as she is somewhat of an amateur birder. Other members of the Ambassador's team helped with identification when we could. We saw :

### Day One:

Bonaparte Gulls  
 Double Crested Cormorants  
 Herring Gulls  
 Eider Ducks  
 Black Guillemots  
 Common Loons  
 Belted Kingfisher  
 Turkey Vulture  
 American Crows  
 Least Sandpiper  
 Semipalmated Sandpiper  
 Bald Eagle  
 \*Bald Eagle nest

### Day Two:

Semipalmated Sandpipers  
 Herring Gulls  
 Bald Eagle  
 Black Guillemots  
 Double Crested Comorants  
 Common Loons  
 \*One injured Herring Gull

### Day Three:

Bald Eagle  
 Herring Gulls  
 Double Crested Cormorants  
 Black-backed Gulls  
 Osprey  
 Bonaparte Gulls  
 Black Guillemots  
 Eider Ducks  
 Common Loons  
 Raven  
 \*Spotted Sandpiper maybe

### Day Four:

Bonaparte Gulls  
 Herring Gulls  
 Black Guillemots

### TOTALS for the Journey (best estimates)

<b>Cormorant, Double Crested</b>	<b>66</b>
<b>Duck, Eider</b>	<b>50</b>
<b>Eagle, Bald</b>	<b>3</b>
<b>Guillemot, Black</b>	<b>32</b>
<b>Gull, Herring</b>	<b>100s</b>
<b>Gull, Black-Backed</b>	<b>7</b>
<b>Gull, Bonaparte</b>	<b>80</b>
<b>Kingfisher, Belted</b>	<b>1</b>
<b>Loon, Common</b>	<b>4</b>
<b>Osprey</b>	<b>2</b>
<b>Sandpiper, Least</b>	<b>3</b>
<b>Sandpiper, Semipalmated</b>	<b>11</b>
<b>Sandpiper, Spotted</b>	<b>2</b>
<b>Vulture, Turkey</b>	<b>2</b>

In addition to these birds, we saw a bald eagle nest on one of the Twinnies.



*Right: Calidris sandpiper.  
 Far right: Maddy pauses to record the bird species she has observed.  
 Upper right: Bald Eagle.*





## Skippy Dunton's History of Frenchman Bay

By Maddy Johnson and Jane Disney

### Concerning Eelgrass:

**Then: 1940's-50's – before mussel draggers.** Eelgrass was unbelievably thick. Up the Jordan River until the low tide mark (eelgrass must be submerged totally to grow), the stretch between Israel Point and Thomas Island and Thomas Island and the Twinnies, along the left sides of Israel and Hadley point, there were forests of it. Every time you pulled a trap up, you'd have to disentangle the thick masses of eelgrass that blocked the trapped lobsters from view. You could barely run your boat at low tide without having the motor getting jammed with long strands of it. People used to walk along the beach and pick up the plants they saw washed up on shore for garden mulch. Half of it was eelgrass, the other half seaweed.

**Now:** Eelgrass is sparse, decimated in some places. Mussel draggers have wiped it out almost everywhere besides up the Jordan River, where it is still plentiful. These are the suspicions, as they're large, heavy boats, capable of tearing up mussels, they're certainly capable of pulling up eelgrass, and the mussel draggers pass through almost all the eelgrass beds. When you pull up a trap, there is no hassle of pulling up the thick weed – none is there to get tangled in your trap. Where mulch-collectors used to pick up eelgrass, they are now using all seaweed. It is unlikely, impossible even, for the eelgrass to grow back. Mussels grow back every two years for dragging. Eelgrass takes eleven undisturbed years to grow back.

*"We still think things are limitless – gas, oil – we're ruining this planet inch by inch."*

### Concerning Lobstering:

**Then:** Between Sand Point and Hadley Point 30 lobster traps were understood to be the limit. Sometimes Skippy had that stretch completely to himself. Three to five lobster boats, bay-wide, were the most seen checking their traps daily. The biggest threats against their prey were the predatory cod, halibut and haddock.

**Now:** Bay-wide, there are now close to 7,000 lobster traps, about 800 traps being the lawful amount allowed to be set by a single lobster fisherman. There are 30-40 boats in all of Frenchman Bay. Between Sand Point and Leland Point there are 300 traps. Between Thompson Island and Hadley Point there are twice that. The lobster numbers remain fairly steady, and have gone up in number as the populations of the fish that preyed on larval lobster have gone down. It's a little surprising

that with the dramatically declining eelgrass, as adolescent lobsters much prefer eelgrass to bare mud, and sometimes use eelgrass as a winter habitat, by burrowing into them, that the lobster population is not decreasing as well.

### Concerning Fish:

**Then:** Flounder was thick. When Skippy was a boy, his mother used to send him out in his little boat, and in fifteen minutes he'd be back with eight flounder for dinner. Dogfish were plentiful as well. The MDI Biological Lab scientists, who use dogfish in their studies, had a boat they sent out into the bay to catch as many as they needed. Around six herring weirs were spread out through upper Frenchman Bay, where hundreds of bushels of herring were collected. Coincidentally, the weirs, made out of birch branches, were reliant on eelgrass and seaweed to fill in the breaches in the weir walls. The biggest industries were the ones harvesting the big predatory fish, such as the cod, halibut and haddock.

**Now:** Flounder draggers wiped out the flounder, but these bottom dwelling fish are now making a comeback in the bay because of the absence of flounder draggers (now illegal) and limits put on the number of fish you can catch. The MDI Biological Lab now has to special order their specimens, or find them in other bays off the coast of New England. Though the skeletons of the weirs remain, and are visible at low tide, they are no longer in use – mainly because there are no herring left in the bay. Cod, halibut and haddock populations are not only suffering in Frenchman Bay, but are lower than they've ever been worldwide, due to severe over-fishing.

*"One word is going to ruin this planet, just one word – greed. It's – pathetic."*

### Concerning Marine Mammals:

**Then:** The number of whales that came into the bay regularly was not recorded nor regarded as important to keep track of, but there was one memorable time when seven or eight large humpback whales followed a large school of herring into the bay and stayed there several days.

**Now:** It is a rare thing to see whales any closer than 20 miles off shore around Mount Desert Island. Even farther out they are sparse, as their prey are sparse. With declining cod, populations of humpbacks and other toothed whales have suffered with them. With the increased number of boats in Frenchman Bay, whales may feel intimidated to come any closer to shore than they already are.

*"We sure didn't do a good job of protecting the bay."* – Skippy Dunton

## Jacques Seronde's Oral History of Frenchman Bay

My name is Jacques Seronde. My family has owned land immediately adjoining the western third of Great Eastern Mussel's (GEM) proposed lease area since around 1920. My own grandchildren are the seventh generation of my family to walk on and enjoy that very beautiful portion of the shore of Mount Desert Narrows – the shore of Eden.

My father Joseph Seronde was a biologist. In the 1930s he used to drag the bay bottom in the Narrows and Eastern Bay in his wooden sloop (built by Bion Farnsworth in Hulls Cove), collecting specimens of marine organisms that he sold to the MDI laboratory at Salisbury Cove to earn his way through college. He used to tell us about the diversity and abundance of diverse creatures he would find.

When I was a child (in the 1950s), there was a herring weir in the channel between MDI and the inner Twinnie; I remember it being hard to walk barefooted across to the Twinnie at low tide because of the extensive mussel beds. There were a lot of clams along our shore – perhaps not as many as in the days when the Indians' shell heaps accumulated at Old Point and in the cove near the Twinnies west of us, but enough for the clammers to fill their lugs quickly with big ones. Also at low tide, there were always a dozen or more seals growling on the outermost rocks (just west of the lease area); and I would see flounders scooting off into the shallow eelgrass when I went down to the edge of the water.

In the 1960s through 1980s especially, and on up to last year, we would often anchor and sometimes moor our sloop off our beach, about 700 feet from the northwest corner of the proposed lease area and on its outer edge. There always was eelgrass where we anchored, and there was eelgrass under us as we rowed in, all the way to the moon low tide line. Also, I would often in late spring drive over to Hadley Point to collect the piles of eelgrass wrack at the high tide edge, for our garden.

In the 1970s and 1980s, I remember my dad commenting about the decrease in number and type of marine organisms from what he remembered; I began to have a sense the bay's abundance being in decline. In the late 1990s, I first became aware of mussel draggers working off our shore, so close in at high tide it seemed they were only a few hundred feet from our door. Last year, I was struck that there was no eelgrass to collect at Hadley Point, and I wondered about that. Then this year the aquaculture lease application was filed, and I began to learn more about the situation.

Note: The above text is from Jacques's testimony at a September 2005 Department of Marine Resources hearing on the GEM Aquaculture lease application at Hadley Point. Jacques provided this text to the Ambassadors for this project.

## Mussel Harvesting in Frenchman Bay

By Jake Van Gorder and Jane Disney

On the journey we discovered that there are many ways to go about harvesting mussels. Three distinct methods of harvesting are going on in Frenchman Bay. These are **wild dragging**, **raft mussel aquaculture**, and **bottom mussel aquaculture**.

On the journey we saw mussel draggers and buoys marking good mussel dragging locations between Thomas Island and the Twinnies. There are more mussel draggers in Frenchman Bay than ever before, in large part because red tides, prevalent everywhere in Maine during the spring and summer of 2005, did not occur in upper Frenchman Bay. (Shellfish cannot be harvested in areas where there are red tide blooms. Red tide blooms cause shellfish to become toxic.)

When we arrived at Hadley Point on the first day of the journey, we talked with representatives of Great Eastern Mussel Farms and other people who had opinions about the proposed bottom mussel aquaculture site there. People had a lot of concerns about farming mussels from the bottom. Some thought that sediments would get suspended in the water when mussels were being harvested and could smother clams on nearby flats. Others worried that the wake from the boat at high tide could cause erosion along the shoreline.

Some felt that the eelgrass should be allowed to grow at this site, since the area had been abundant with eelgrass a decade ago. The Ambassadors took notes and recorded the voices of concerned residents and the responses of the Great Eastern Mussel Farm representatives. The representatives assured people that they too are concerned about preserving the ecology of Frenchman Bay. They explained how bottom mussel aquaculture might have fewer impacts on the bay than wild dragging. They felt that natural wind and wave activity is responsible for stirring up sediments and causing erosion along the shoreline.

On the second day of the journey, we kayaked out to the mussel rafts near Googin's Ledge. At first, we couldn't see the rafts. As we got closer, we realized how small they seem in the broad expanse of Mt. Desert Narrows. When we arrived at the rafts they seemed more imposing. This might have been due to the rough seas that we encountered on our paddle out there. When we got close to the raft we saw a live herring gull stuck in the predator netting under the raft. It had a severely damaged wing. We had trouble getting close to the bird; the wind and the tide were working against us. We ended up calling the Department of Marine Resources (DMR) and asking them to come up with a plan to help the bird. Later we found out that they called the harbormaster; he informed the owner of the raft of the situation.



*Gathering of stakeholders in the future of Frenchman Bay, Hadley Point, Sept. 19, 2005.*



*Ambassadors encountered marker buoys between Thomas Island and the Twinnies, left by mussel draggers to indicate good drag locations.*



*Wild mussel dragger off of Hadley Point.*

Realizing that our experiences on the journey didn't necessarily inform us of the efficacy of these different methods of harvesting mussels, we decided to do some more research when we returned. We traveled back to the mussel rafts one time to collect water quality data and see whether or not birds attracted to the rafts were leaving behind enough feces to affect bacterial levels around the raft. We went out on a dry day. Although the smell from the rafts was strong, there was little fecal matter in the water, and we did not detect any bacteria in water samples we collected.

Fortunately, there were a couple of public hearings in the fall of 2005 at which we could ask questions and get more information about both bottom mussel aquaculture (September 29<sup>th</sup>) and raft mussel aquaculture (October 13<sup>th</sup>).

We learned that small mussels must be gathered from a different location and seeded onto the bottom mussel aquaculture site. One place that small mussels are being harvested is off of Stave Island, where we camped on the third night of our journey. This is done in such a way as to not disturb the whole mussel bed. Still, some worm harvesters at the public hearing felt that the harvesting of mussel seed disturbed areas where they want to dig for worms. For raft aquaculture, seed mussels can settle naturally out of the water column onto suspended ropes. We also offered testimony on raft aquaculture leases based on our observations, our research, and our conversations with people around the bay (see pages 23). We were told by the DMR that our comments were helpful, insightful, and appreciated.



*Herring Gull entangled in a net surrounding mussel rafts near Googin's Ledge.*

*Jane's Journal Entry  
9/21/05*

*Yesterday was a different kind of day from our first one where the sun was shining and at each stop we met up with people enthusiastic about our journey and eager to talk about the issues affecting the bay. Yesterday we met one lone creature face to face in our four-hour journey. We had paddled against the current and the wind to look at the sole set of mussel rafts in the bay. From a distance, it didn't look so imposing. Perhaps concerns of Salisbury Cove residents were unfounded. We took photos and took GPS coordinates so that we could map what the structure looked like from that point. As we approached, we saw him. His eyes looked so tired. Wings caught in the netting under the raft, he had the look of one who has been crucified. We talked about all the possible strategies: Cutting the net, putting the bird in a fleece jacket, taking him to the Bio Lab and calling Ann Rivers of Acadia Wildlife Foundation- calling Charlie Phippen, the harbor master and having him bring Ann to the raft-but wait, with two cruise ships in - would one gull make a difference? Would Charlie be too busy? How about Rob Goodwin, and Merky and John Fendl [from the DMR]? They told us at our last stop that they'd do anything to help us. We had trouble holding onto the raft as the seas got stronger, waves were kicking up, and fog was rolling in so we decided to head to a cobble beach nearby and call the DMR. Rob said he'd try to get in touch with College of the Atlantic and Allied Whale. They had a boat and rescue capabilities. I had to leave it in Rob's hands as the fog was growing thicker and the waves getting higher. We decided to hug the shore and head off to Hancock Point. We missed the Bio Lab entirely—we'll come back another day.*

*I have been thinking about the gull; what he represents. I wish we could talk to him—Just before we reached the raft we were asking each other questions: If you could do one of two things: fly or talk with animals, which would you pick? If you could talk to only domestic or wild animals, what would you choose? Natalie, our fearless guide, said wild animals. Later she told us that in all her kayaking travels, she had seen numerous dead birds, but never one in this situation. Not even on a 6-month journey in the Gulf of Maine. Why now on this four-day venture in a single bay?*

*It was fresh on our minds when we landed in Hancock and were picked up by Barb and Mary and brought to Barb's cozy house to dry out and warm up. We told Barb our story. She mentioned the house cat statistic. My cats have killed birds-why does this one gull story stand out?*

**Comparing Three Mussel Harvest Techniques**

By Jake Van Gorder

Distinctive features of wild **dragging**, **bottom** mussel aquaculture, and **raft (or suspended)** mussel aquaculture.

**Mussel Dragging:**

- The equipment needed is a boat and a net with a cutting bar or a chain sweep.
- The net is dragged along the substrate, uprooting and collecting mussels.
- It can take about 6 years before wild mussels reach marketable size.

**Bottom Mussel Aquaculture:**

- Seed mussels are collected from the wild and spread over the lease site.
- Lease site is maintained against predators.
- Mussel are harvested by dragging.
- It takes 18-24 months for the mussels to reach marketable size.

**Raft Mussel Aquaculture:**

- Seed mussels are collected in the wild and attached to ropes hung in the water.
- Mussels are harvested using a crane that lifts the ropes to a boat.
- It takes 12-24 months for the mussels to reach marketable size.

	<b>Wild Dragging</b>	<b>Bottom Aquaculture</b>	<b>Suspended Aquaculture</b>
<b>Expenses</b>	Boat	Boat, Lease	Boat, Lease, Raft
<b>Impacts on Eelgrass</b>	Kills if dragged	Kills if dragged (lease site might not have Eelgrass)	No effect
<b>Nutrient pollutants</b>	Churns up sediment when dragged	Sediment off the mussels churned up, not off the bottom	Attracts birds
<b>Predators</b>	Starfish, Eiders	Starfish, Eiders	None (Net prevents birds from reaching mussels)
<b>Quantity of mussels</b>	Natural populations	Higher density due to seeding	30 tons/year 40X40 ft.
<b>Quality of mussels</b>	Variable	More meat, less pearls (than wild)	More meat, less pearls (than wild)
<b>Aesthetic Impact</b>	Boat, Noise,	Boat, Noise, Buoy	Raft, Boat, Noise, Lights

*This table compares mussel harvesting methods in terms of a number of different criteria.*



*Students work with the Department of Marine Resources to test water quality around a mussel raft.*

## Overview of Raft Mussel Aquaculture Issues

By Jane Disney

*(Note: this was offered to students as a model testimony before the raft aquaculture lease public hearing described at right.)*

Raft mussel aquaculture is a relatively new way to grow and harvest mussels. It has many advantages over the more traditional practice of dragging for mussels. Growing mussels on ropes suspended from rafts may minimize impacts on the bottom of the bay. The mussel seed may settle out of the water column onto the ropes, so that collection of mussel seed, often a disruptive process from both an ecological point of view and from the wormers' point of view, is unnecessary.

There are many other considerations with regard to raft mussel aquaculture. For one, the rafts can attract a lot of birds. Mussel rafts in Frenchman Bay have, at times, had hundreds of birds floating nearby and/or gathered on the rafts. There is extensive deposition of bird feces on and around the rafts. Bird waste contains bacteria that can be filtered through the mussels, rendering them unsafe for human consumption. With the addition of more rafts to Frenchman Bay, the number of birds attracted to the lease area may increase. Water quality testing is imperative to protect human health and to determine the maximum density of rafts in the bay.

Another consideration is the risk of wildlife entanglement in the nets surrounding the mussel rafts. On September 20<sup>th</sup>, 2005, students and community members documented the struggles of a gull trapped in the net beneath the raft while on a four-day kayaking journey aimed at documenting the state of the bay. The kayakers contacted the Department of Marine Resources (DMR), who contacted the owner of the raft. The owner confirmed that this event had occurred before. The kayakers consulted with Ann Rivers of Acadia Wildlife Foundation who commented that nets are often a problem for wildlife, both on the water and on the land. She suggested that a much smaller mesh net might prevent entanglement of birds in the future. This should be considered when approving new raft aquaculture leases in Frenchman Bay and elsewhere.

## Maine DMR Public Hearing on Raft Aquaculture (10/13/05)

by Zephyr McDonnell

At the beginning of the hearing, Tim Levesque, a local mussel raft operator, and Carter Newell, biologist with Great Eastern Mussel, stood up and talked about the mussel rafts proposed, as well as the experimental ones already in operation. They said they already had three 40' by 40' rafts, and were shooting for three more, and wanted to expand the lease to 8 acres. When asked how many rafts they could legally have in this lease, they said in theory, as many as would fit, possibly up to ten small rafts. They explained that the mussels will settle naturally on a bare rope, around the first of July. Newell said that it takes 6 weeks to harvest a raft, working 2 days per week, 12 days per raft. The lease is for ten years, and can be renewed.

Levesque and Carter estimate that the raft will create \$700,000 of financial activity in Maine. Early last year the rafts were hit by ice, which caused parts of the raft to sink. The timbers on the raft are two feet apart, allowing birds to fall through, but not fly back out. They have a couple of fake eagles on the raft, and are working towards better solutions to keep birds off. Carter Newell said that, over an undetermined number of years, he has seen 8 to 10 birds entangled on twelve different rafts. Tim Levesque said the mussels are tested for public health safety in Lamoine on a regular basis.

Jon Lewis, a DMR Biologist and aquaculture environmental coordinator, gave the first testimony. Lewis visits every mussel raft in Maine. He showed an underwater video taken under the experimental raft. The video was shocking. It showed thousands of crabs and starfish, piled up layer upon layer, in some places so thick the bottom couldn't be seen! Jon Lewis' concerns are that the bottom may become overloaded, or soured, by lots of animals underneath the raft. He described under the raft as having a "physical reef structure." He said that over time methane builds up under rafts in small patches from all the creatures.

The biomass associated with the mussel rafts can attract predators such as seals and seabirds. Mesh size in nets on the raft is key to avoiding entanglements. It has been tested: to catch a seal, 12-inch mesh is needed. The mesh on the raft is 2-inches. Seals are very unlikely to get caught, because they are very aware, having spent their whole life avoiding obstacles. It was learned

that there is no regulation of mesh size around mussel rafts. The nets around the rafts go down 50' because eider ducks can't dive that deep. According to Carter Newell, Eiders once ate 30,000 pounds of mussels in 5 days. When asked whether the mussel raft may create a dependency problem for stars and crabs, it was said that in the scale of things a 40x40 foot square is not that big of an impact.

Verbal testimony was given by Maddy Johnson, who is a student of MCLE (Maine Coast Learning Expedition), and by myself, Zephyr McDonnell. Maddy's testimony centered around solutions to the problem of birds congregating on the mussel rafts. Other written testimonies, including Terrence Reid's, were submitted to the DMR for consideration.

Lynn Thompson, a Bar Harbor resident, also gave testimony. Her concerns seemed to be about safety: whether there was adequate lighting on the raft, and if the raft might cause water quality issues.

In conclusion, it seemed that most people were worried about their own life being impacted, which seems typical of humans. One woman's concern was that with the rafts being where they were, it was hard to tack around them in her sailboat, which she later mentioned has a motor.

### *Testimony by Terrence Reid*

A couple of weeks ago, several other students and myself did a tour of Frenchman Bay to see for ourselves what the issues of the bay were. On the first day we met with a group of people to discuss the costs and benefits of a proposed bottom aquaculture lease. On the second day, to continue on that trend we traveled out to the experimental mussel raft that currently sits in front of Salisbury Cove.

When we got out there we found several things, the first was a bird trapped in the nets around the raft. The seagull had apparently landed inside the raft despite the eagle decoy on it. Although we did not see them, it was evident that many more birds used the raft than just the one trapped in the net. There was bird dung (I think that's the right term) all over the raft and since birds are not known for their aim, a good deal more dung had probably been dissolved into the water about the raft.

A group of students went out on Thursday to collect water samples. We ran tests for fecal coliform, dissolved oxygen, and oxygen consumption and examined phytoplankton. It had been dry for several days, a reason that may have led to our negative results. We are currently looking to repeat the tests on a rainy day when the bird scat may have dissolved into the water.

In conclusion, we are gathering data in relation to potential health issues we found from our visit to the mussel raft. However, at this time we lack enough evidence to conclude whether the health issues we predicted are or are not real issues.

### *Testimony by Zephyr McDonnell*

My name is Zephyr McDonnell, and I say this as a water quality monitor with the MDI Water Quality Coalition. I, amongst other people, went to the experimental mussel raft in Frenchman Bay with John Fendl, who works for the DMR. We did some testing for harmful bacteria and phytoplankton, and made some observations. Although there were a lot of bird feces on top of the raft, the bacteria tests came back negative. This could change, however, if there was a storm that caused the feces to be washed into the water more. It seems that if there were bird feces in the water with the mussels, the mussels might filter out some of the bacteria, rendering them unfit for human consumption.

A few weeks ago, my fellow students went on a kayaking journey around Frenchman Bay. While on this journey they noticed a gull trapped in some netting on the raft. We later learned that this is not uncommon. When we went out to the raft again recently, we saw hundreds of birds flocking around the raft. Although there was a decoy on the raft, it did not seem to discourage birds from landing on the raft. Maybe there should be other ways to keep birds off, perhaps using some sort of bird-repellent coating or different netting.

### *Afterthoughts by Jake Van Gorder*

I was on a kayaking trip that went by the experimental raft that is out there now. When we got closer to the raft we saw a bird that was ensnared in the netting around the raft. It was still alive but it looked like it had been there for some time. There was a fake eagle on the raft that must have been there to scare away birds. There was lots of white bird feces on the wooden frame of the raft.

After the trip we thought, "What if the extra mussels sucked up all the phytoplankton in the water." And then we thought, "What if the birds discharge in the water and the birds intestinal bacteria is eaten by the mussels and the mussels are eaten by people, and the people are eating harmful bacteria!!!"

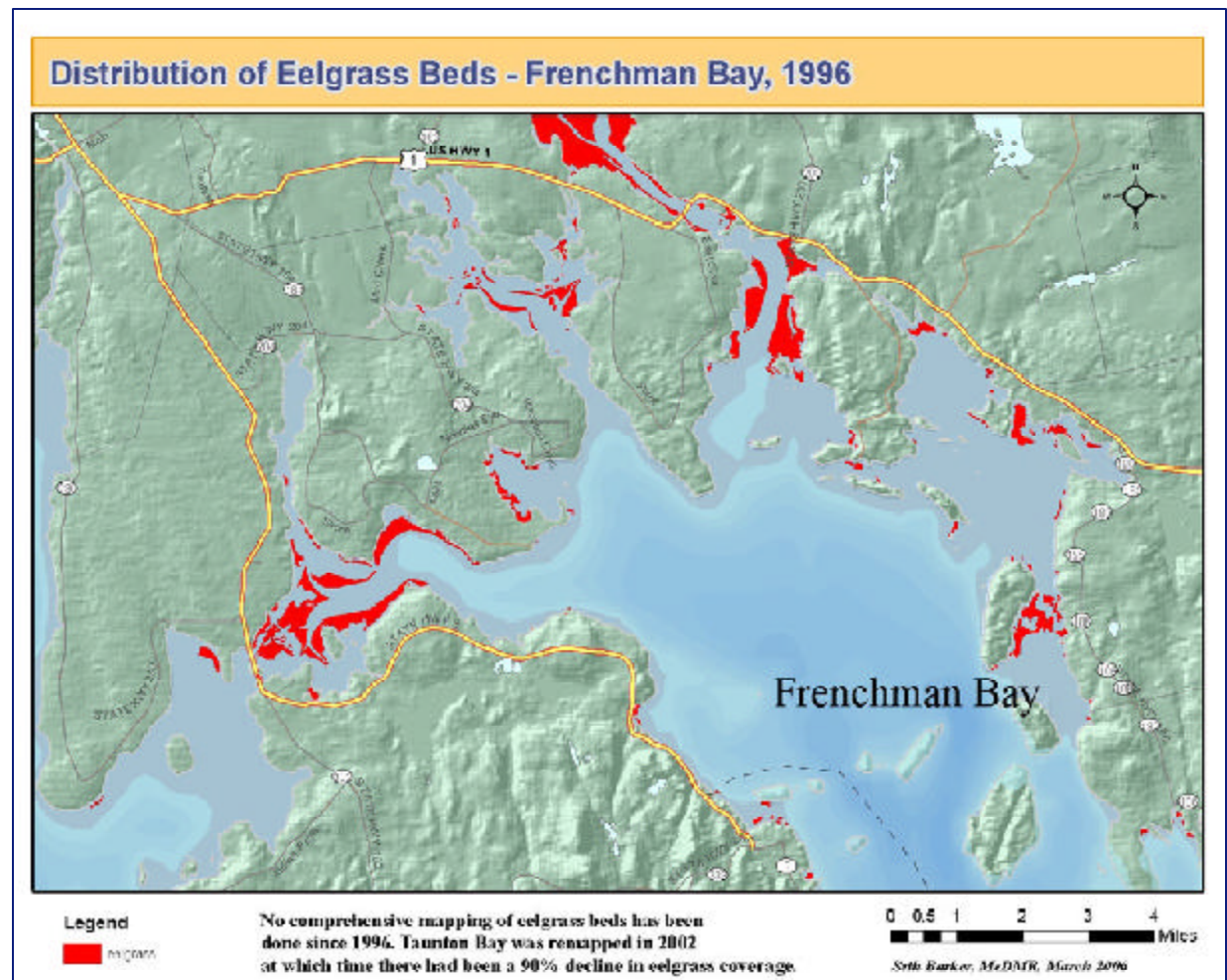
So we returned to the raft one day and took some water samples to look for bacteria. We also looked for toxic phytoplankton. We did not find any fecal coliform bacteria in the water around the raft at the time we took the samples.

**The Story of Hadley Point: From Clam Conservation to Bottom Mussel Aquaculture; A Model for Bay Management**

By Gwenn Kubeck

**Introduction**

Hadley Point, located along Route 3 in Bar Harbor, has long been valued as a natural and public resource. Century old shell middens nearby indicate that this area provided an important food resource to native peoples who occupied this area long ago. The area of water surrounding Hadley Point, called the Mount Desert Narrows, has been a popular site for the commercial harvest of mussels by dragging in recent decades. In December 2005, the Maine Department of Marine Resources (DMR) approved a bottom mussel aquaculture lease in this area. The shores of Hadley Point host a valuable clam resource, which recently received protection as a clam conservation site. Just offshore is potential eelgrass habitat. Aerial photographs, taken in 1996 by Seth Barker of the Maine Department of Marine Resources, show that healthy populations of eelgrass once existed around Hadley Point (see map). Today, comparably very little eelgrass is present. Additional uses of the Hadley Point area include a proposed boat ramp and mooring field, although dates and scope of this undertaking have yet to be determined. This is also a popular site for recreating, and one of the few public access points to Frenchman Bay in Bar Harbor. This diversity of uses for the resources associated with Hadley Point have led to recent conversations and collaborations that could help lay the groundwork for stakeholder processes that could create more sustainable management of resources in Frenchman Bay.



*Eelgrass distribution in Upper Frenchman Bay in 1996 including Hadley Point. Map provided by Seth Barker, Maine DMR. Map is based on aerial photography by DMR.*



### Clam Resources

Hadley Point has been a well-utilized site for both recreational and commercial clambers. In the summer of 1999, anecdotal evidence of a depleted clam resource led the Bar Harbor Marine Resource Committee (MRC) to gather data that would indicate the health of the Hadley Point clam resource. Working with the Mount Desert Island Water Quality Coalition (MDIWQC), and a group of teachers from the Mount Desert Island area, they conducted a clam flat survey that revealed relatively few clams of legal harvestable size (greater than two inches). MDI High School students confirmed the results of this survey by digging 100 sample plots from Hadley Point to Salisbury Cove in the fall of 1999 (see Appendix III). These data were submitted to the MRC which recommended to the Bar Harbor Town Council a year-long clam conservation closure on the east side of Hadley Point. Another survey by MDI High School students in 2000 revealed that an additional year was needed for the clam resource to recover. The MRC conducted a follow-up survey in 2001 and confirmed that a full two-year closure did indeed provide enough time for recovery of the clam resource.

After this time, the MRC attempted to manage the Hadley Point clam resource by using six-month open/closed cycles on the east side of Hadley Point. By 2004, there was anecdotal evidence that the clam resource was in decline on both the east side and the west side of Hadley Point. The MRC recommended rotating two year conservation closures on the east and west side of Hadley Point to the Bar Harbor Town Council. In addition, the MRC recommended limiting both commercial and recreational harvesters to one peck per day. The Town Council agreed, but asked to see data by Fall 2005. In 2005, MDI High School students worked with College of the Atlantic students to assess the status of the clam flats at Hadley Point. They found mostly small clams, which supported the MRC recommendation of a rotating two year conservation closure at Hadley Point (see Appendix IV).

### Mussel Harvest off Hadley Point

Traditionally, mussels in Maine are harvested using boats and machinery to scrape mussels from the bottom substrate where they naturally attach. Except for leased areas, Frenchman Bay is open to wild dragging, and there is no official management of this resource. Currently there are 14 wild mussel draggers in Frenchman Bay, and according to testimony given at a public hearing, the area adjacent to Hadley Point is a popular location for wild mussel dragging.

### Hadley Point Clam Data 2005

*By Chris Petersen and Kipp Quinby, College of the Atlantic*

These data represent sampling by the Marine Biology class at COA on three dates over a month's time in the fall of 2005, supervised by Dr. Chris Petersen and Kipp Quinby. Plots were located at fifty-foot intervals and clams were measured to the lower quarter inch and recorded in size intervals.

The open northwest side of Hadley Point had an average of 28 clams/plot, while the closed southeast side had an average of 40 clams/plot. This could either be due to the closure or to our sampling areas coinciding more or less with the areas of heavy spat. The vast majority of clams are very small—generally less than an inch.

Hadley Point has clearly experienced a large settlement event that is reflected in an extremely high abundance of small clams over previous years. While spat distribution is spatially patchy, there is no apparent difference between conservation closure and open area. There does appear to be a difference in the size frequency distribution between the two sides, with higher abundance of legal clams on the closed side of the point than on the open side. None of these data have yet been tested statistically.

For future monitoring efforts, COA plans to continue sampling annually with several classes, which should yield relatively consistent data for the town to use. It is also likely that students in conjunction with classes can provide some analysis.

## What did we learn?

Great Eastern Mussel Farm (GEMF) is a Maine business that employs wild draggers, and buys and sells mussels obtained by wild harvest. Simultaneously, GEMF has pioneered an effort to employ both bottom and raft mussel aquaculture methods in Maine waters. In 1980, GEMF representatives traveled throughout Europe to research the latest mussel farming techniques. The Dutch style of bottom mussel aquaculture, practiced for over three centuries, stood out as a feasible way to maintain competitive prices in the mussel industry in Maine (see GEMF website, [www.eatmussels.com](http://www.eatmussels.com)). Although the Dutch have been farming mussels via bottom aquaculture for decades, this is new technology for Maine.

Early in 2005, GEMF applied to the DMR for a ten-year bottom mussel aquaculture lease totaling 47.16 acres off of Hadley Point to be managed by Aquaculture Harvesters, a subsidiary of GEMF. Mussel aquaculture proposes a more managed system of harvesting mussels commercially. Mussel aquaculture requires a lease, which is regulated by the DMR.

### Eelgrass Resources

The U.S. Geological Survey has classified eelgrass as critical habitat for a variety of commercially valuable fin and shellfish species. Eelgrass beds offer protected habitat and nursery areas for numerous juvenile species, and provide food for many aquatic birds. Eelgrass beds can help reduce water pollution by absorbing nutrients and then complex root system can help stabilize sediments and prevent erosion.

A 2005 USGS report stated that “preliminary evidence pointed to commercial mussel dragging as the source of habitat disturbance [in Maquoit Bay]—large bare areas within the eelgrass meadow were marked with distinctive, linear dredge scars on the bay bottom.” (*USGS: Negative Effects of Commercial Mussel Dragging on Eelgrass Beds in Maine*. Hilary A. Neckles, Frederick T. Short, Seth Barker and Blaine S. Kopp. 2005.). This report also states that once disturbed by dragging, eelgrass beds require 11 years to re-vegetate to a level of 95 percent.

According to an aerial photo taken by the DMR in 1996, Hadley Point once had an abundance (60-80% coverage) of eelgrass. In a written testimony submitted to the DMR, Jacques Seronde, a local landowner, commented that he remembered seeing eelgrass in the Hadley Point area from the 1960s to the 1980s, “all

*Eelgrass from Hadley Point, not as common as it used to be.*



*Bottom mussel aquaculture site off of Hadley Point. Buoy in middle of photos marks lease site. Low tide: top Mid tide: middle High tide: bottom*



## The Blue Mussel

the way up to the low tide line.” He states, “I would often in late spring drive over to Hadley Point to collect the piles of eelgrass wrack at the high tide line, for our garden.”

Eelgrass is not as abundant in this area any more. Photos taken at low tide in areas adjacent to Hadley Point reveal dragging scars, indicating that the areas farther offshore where eelgrass is able to exist have also been dragged for mussels. At the site of the proposed bottom mussel aquaculture lease at Hadley Point, the DMR estimated 10-15% coverage of eelgrass. Oral histories from long-time Frenchman Bay fisherman, Skippy Dunton, revealed that those who are on the water have seen a decline in eelgrass populations in this area, as well.

### Ambassadors of the Bay

Because Hadley Point hosts a myriad of different coastal and marine resource users, it was an ideal location for concerned citizens and stakeholders to come together during the MDIWQC initiated “Ambassadors of the Bay” kayak expedition. The aim of this community and student led journey was to better understand the state of Frenchman Bay, the stresses on water quality and marine resources, the issues that are important to local residents, and to gain a bay-level perspective on this unique coastal environment.

*Photos by Jaques Seronde, looking from his family’s property adjoining Hadley Point, towards the Twinnies Islands, fall 2005.*

Those that met the kayak team at Hadley Point included Barbara and Ray Rappaport, longtime residents near Hadley Point as well as retired biologists. David Dunton, who is a commercial clammer in Bar Harbor and a member of the Bar Harbor Marine Resources Committee, was also at Hadley Point to meet the kayak team. Theo and Fiona de Koning, owners of Aquaculture Harvesters and advisors to GEMF were there too. They have recently moved to the Bar Harbor area from the Netherlands and are the proprietors of the bottom mussel aquaculture lease at Hadley Point. Jacques Seronde, a conservation biologist whose family has resided near Hadley Point since the



1920s helped escort the kayak team to shore and representatives from local newspapers and television stations were present to greet them and cover this unprecedented meeting of stakeholders.

The “Ambassadors of the Bay” landing at Hadley Point offered a very amiable opportunity for stakeholders and residents concerned with the future of Hadley Point to introduce themselves and share their insights or concerns. The Rapports shared their apprehension that the proposed lease site encroached too closely on the recreational resources at Hadley Point. Ray added that routine dragging at the lease could increase wave action in that area, leading to increased erosion of adjacent banks. David Dunton, who grew up around Bar Harbor, noted his observations of overall diminishing shell and finfish resources in Frenchman Bay. One of his primary concerns was the “geometric progression” of lease sites since there is no regulation that sets limits on wild dragging or mussel leases. Theo shared his perspective that aquaculture provides an opportunity to manage mussel resources in a more sustainable way. Fiona expressed her willingness to listen and dialogue with local people about the



*From Hadley Point, looking west.*

proposed lease and any concerns associated with this. Jacques Seronde referred to Hadley Point as “Eden.” He shared his observations on the decrease of “abundance, diversity and beauty” of this coastal area over recent decades. He expressed concern that those who rely on the bay have taken too much and advocated for collaborations to conserve and use the remaining bay resources in a sustainable manner.

### Public Discourse

Following the “Ambassadors of the Bay” gathering at Hadley Point, Jacques Seronde worked with Jane Disney, executive director of the MDI WQC and chair of the MRC, as well as Theo and Fiona de Koning of Aquaculture Harvesters to draft conditions for the proposed mussel aquaculture lease at Hadley Point. These conditions included site assessment prior to aquaculture activity, a monitoring program to assess, track and evaluate the impact that aquaculture activities may have on intertidal fauna and flora, the design and implementation of eelgrass habitat restoration efforts, equitable cost allocation for the above efforts, and specified time frames for monitoring based on communicated aquaculture activities. The MRC met on September 28<sup>th</sup> and approved support for the above conditions on the proposed lease.

At a public hearing hosted by the DMR in Bar Harbor on September 29<sup>th</sup> 2005, Theo de Koning and Carter Newell of GEMF gave testimony regarding the proposed lease application and activities. The DMR also provided testimony based on a site visit which revealed that the lease site contained a diversity of creatures such as sand shrimp, sea stars, anemones, mussels and more (for more details, see the Department of Marine Resources Findings of Fact, Conclusion of Law and Decision for this hearing). The DMR estimated 10-15% coverage of eelgrass in the proposed lease site. Other submitted testimony shed light on additional concerns regarding the proposed lease, such as wild mussel draggers who claimed that the proposed lease site was a regular area for wild dragging, testimony by wormers about the possible effects an aquaculture lease might have on worm resources and possible controversies arising due to the close proximity of the proposed lease to a proposed boat ramp and new moorings in the area. The DMR concluded this hearing by asking representatives from the MDIWQC, the DMR, GEMF, MRC, as well as Jacques Seronde, the riparian land owner concerned about eelgrass populations, to meet in order to generate a list of conditions to be added to the lease, which could be submitted to the DMR for consideration at a later date.

After several rounds of dialogue and negotiations, this group agreed on a list of conditions and submitted them to the DMR on October 13<sup>th</sup>, 2005. The new version of lease conditions committed the lessee to attend at least three Marine Resource Committee meetings each year for the life of the lease and provide a planned schedule of lease activities for the upcoming months. This would provide an opportunity for the lessee to meet with other stakeholders periodically, including, but not limited to, the Town of Bar Harbor as represented by the Marine Resources Committee, the MDIWQC, concerned riparian landowners, and clambers and wormers holding valid licenses and interested in using the intertidal zone adjacent to the lease site. The conditions of the lease

submitted to the DMR also prohibited the lessee from dragging anywhere in the area between the lease boundary and the adjacent intertidal zones to the south and west of the lease area.

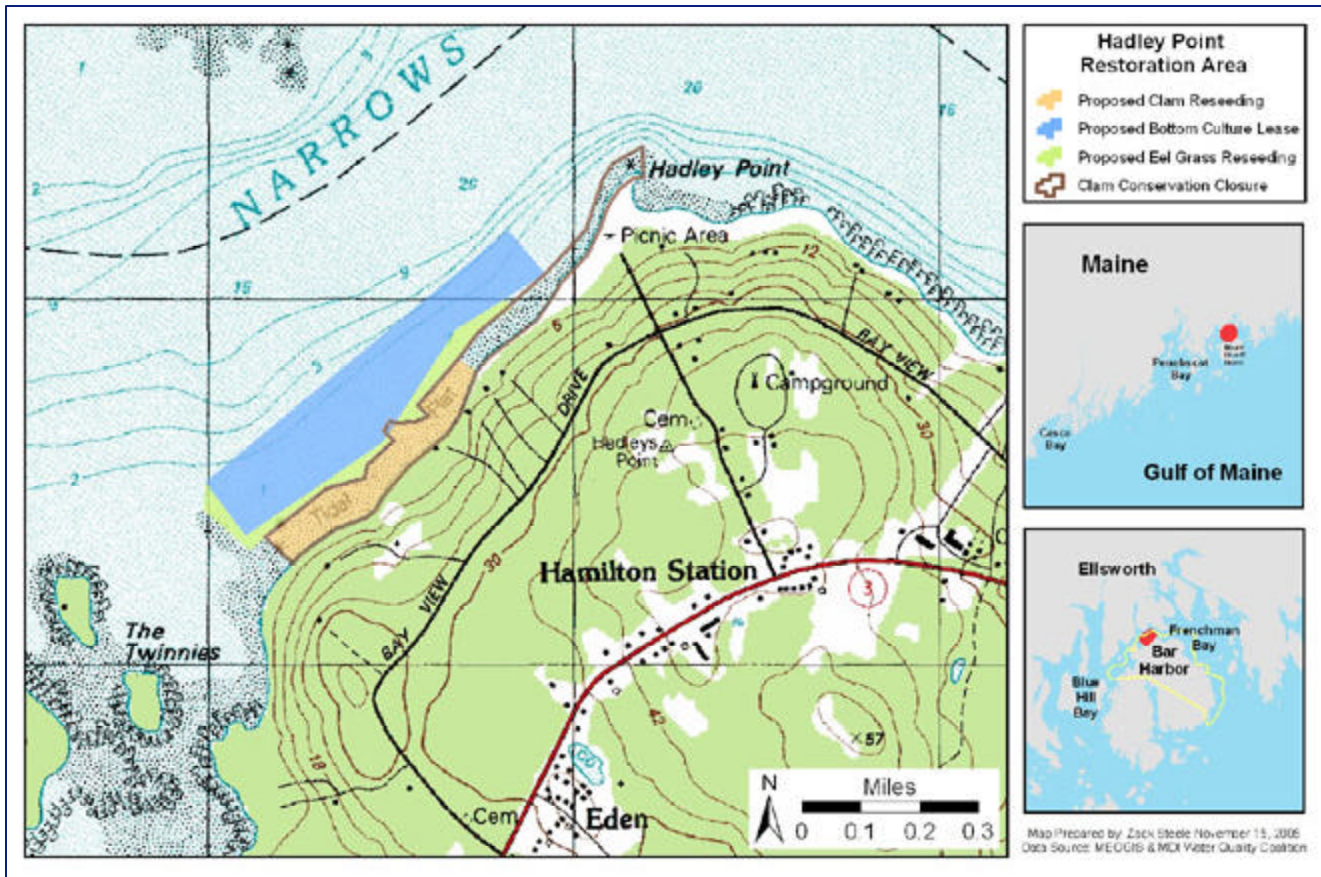
The bottom mussel aquaculture lease at Hadley Point received approval from the DMR on December 14<sup>th</sup>, 2005. The only condition that was accepted by the DMR was the condition that prohibited dragging in the described area between the lease and the shore. This is important because it provides a buffer between off shore aquaculture activities and on shore clam harvesting and other resource uses. This buffer area is a prime site for possible eelgrass restoration efforts. However, wild draggers are still able to drag for mussels there, al-

though, according to the lessee, the topography would make that difficult. Dr. Jane Disney sought out protection for this area from any dragging by contacting Senator Dennis Damon.

**Stakeholder Processes towards Future Bay Management Plan**

The unprecedented collaborations that took place between stakeholders concerning the bottom mussel aquaculture lease at Hadley Point sparked interest in the Town of Bar Harbor that bringing together stakeholders to create sustainable decisions regarding common resources is possible. On November 18<sup>th</sup> 2005, the Town of Bar Harbor applied for a Habitat Restoration Grant Program being offered by the Gulf of Maine Council on the Marine Environment/NOAA Habitat Restoration Partnership called *Bar Harbor Clam Flat and Eelgrass Habitat Restoration Project*.

The primary intent of this application was to restore a portion of 17 acres of degraded clam flats and nine acres of eel-



grass beds off of Hadley Point in Frenchman Bay to a more productive and sustainable condition. At the same time, the Town and its partners viewed this restoration project as a strategic effort to build community awareness of the importance of these marine resources and, by engaging the community in their protection, to generate support for development and adoption of a future Bay Management Plan.

This grant asked for support to continue, and expand upon, volunteer stewardship efforts to survey clam flats and eelgrass beds, test water quality, re-seed clam flats, and replant eelgrass beds. A project coordinator would be hired to help identify and involve stakeholders, including mussel draggers, clambers, wormers, aquaculture harvesters, among others in working with riparian land owners and other interested parties to protect and monitor the habitats that would be restored. The Town of Bar Harbor would partner with the MDIWQC to bring together a diverse group of students, scientists, other interested parties, and the general public through an education campaign of newspaper articles, an informational pamphlet, hands-on displays and a Restoration Guide for Community Nonprofits.

On January 24<sup>th</sup> 2005, the Town of Bar Harbor received notice that the *Bar Harbor Clam Flat and Eelgrass Habitat Restoration Project* proposal did not receive funding. The response from the Gulf of Maine Council on the Marine Environment indicated that the lack of a “clear set aside for restored clam and eelgrass habitat that would be a “no take” zone over the long term” lowered the rank of this grant proposal and led to its dismissal. However, the Gulf of Maine Council on the Marine Environment response also indicated that a revised application that addressed this issue would be seriously considered in subsequent years due to the level of community collaboration and support for these efforts.

### Collaborations Continue

Collaborations around common resources at Hadley Point continue. The MDIWQC, in collaboration with the MDI Biological Laboratory, is laying a foundation of community education and understanding about the importance of eelgrass for a healthy marine environment. At the same time, MDIWQC is partnering with local schools, College of the Atlantic, and the MRC to continue monitoring water quality at Hadley Point and collect data about clam populations in this area.

Even after the bottom mussel aquaculture lease at Hadley Point was approved, the conversation continued and a memorandum of understanding between the MRC and GEMF was drafted and approved. This agreement includes ongoing communication between the lessee and the Town of Bar Harbor and other stakeholders via attendance at three Marine Resource Committee meetings each year for the life of the lease. At these meetings, the lessee will report on any activities conducted on the lease and provide a planned schedule of lease activities for the upcoming months. In turn, the MRC and other stakeholders will provide updates on activities relating to inter tidal monitoring, eelgrass conservation and reseeded at Hadley Point and other matters of mutual concern and interest.

All involved parties have acknowledged the importance of monitoring water quality around the lease site prior to and during the life of the lease and the Bar Harbor Marine Resource Committee has committed funding to begin these tests in spring 2006. A mutual sharing of information relevant to the aquaculture lease has been agreed upon and Fiona and Theo de Koning expressed a willingness to try and attend any relevant Marine Resource Committee or Town Council meetings. It is clear that the involved stakeholders maintain a willingness to work together, not only to best manage the multiple resources at Hadley Point, but also to produce a model of collaboration among stakeholders for more sustainable management of marine and coastal resources in the future.



*Collaborations have continued into 2006 as the MRC, COA, MDIWQC and MDI High School students partner to survey the clam flats at Hadley Point.*

**Polluted Runoff: A Reality in the Watersheds of MDI**

*By Zephyr McDonnell*

One of the things we learned about this semester was the importance of watersheds and the many kinds of problems that can occur in watersheds. A watershed is the geographic area of land in which all water drains to a specific body of water. Example: the land that drains to Northeast Creek is the Northeast Creek watershed. Watersheds are necessary for life in those areas. They provide habitat and recreation, they recharge aquifers, and filter toxins. Watersheds can be devastated by pollution problems, if the problems are not prevented or stopped quickly. Watershed pollutants are classified as being Bacterial, Nutrient, Sediment, Toxic, or Thermal. Examples include: Bacterial-feces in the watershed, Nutrient-organic matter or fertilizer, sediment and soil from erosion, toxic-pesticides or fuels, thermal heat from impervious surfaces.

Runoff is the most common source of pollution in watersheds. Rain from a storm can pick up pollutants on its way to a stream or lake or bay. This problem is increased if there are many impervious surfaces in the watershed. An impervious surface is anything water cannot go through on its way into the ground, like a house roof, road, or parking lot. Since water cannot go through the impervious surface, it goes over and around it. This means that there is more water in some areas than there used to be when it could just disperse into the ground across a wide area. Imagine a huge parking lot, with only a few drains in it. Where do you think the majority of the water that hits the lot is going? The water that entered the storm drains has also carried all the pollutants that were on the pavement with



*New development in Town Hill*



*Degraded road at Birch Bay Village*

it. Impervious surfaces, in addition to increasing the chances that pollution hits the water, greatly speeds up erosion. Evidence of this can be seen at Birch Bay Village, in Hulls Cove. In late fall of 2005 there was a large rainstorm, and a little less than half of the upper part of the road to Birch Bay Village was destroyed. Unfortunately, they seem to have rebuilt the road in the same exact way, which means this is probably going to happen again.

When 10% of a watershed is covered by impervious surfaces it is considered impacted, at 20% it is considered impaired. This means the watershed is less able to do its job, resulting in more erosion, less filtering of toxins, etc. An example of sedimentary pollution is a construction site in Hulls Cove. Around the same time as the washout at Birch Bay Village a hole was being dug at a site close to the beach. The hole was for pipes for some buildings that were being built. In order to not flood the hole, the contractor had a pump pumping



*Polluted runoff from nearby construction hitting Hulls Cove Beach.*

water out of the hole. Unfortunately the sediment laden, brown water was going straight into a storm drain, and out onto Hulls Cove beach. As a result of nutrient enrichment from polluted runoff, algae can grow on beaches. On Hulls Cove beach, some *Enteromorpha* algae have grown, possibly because of the runoff, and possibly because there is a sewer line on the beach that breaks on occasion.

The sewer line at Hulls Cove beach was scheduled to be removed in 2005, but is still there at the time of this writing (February 16<sup>th</sup>, 2006). The bacteria types we tested for this semester were fecal coliform and *Enterococcus*. These are both indicators that there could be harmful bacteria in the watershed. Counts at Hulls Cove are sometimes so high that one person got sick just by sampling there! For fecal coliform, safe levels for clam flats are a geometric mean of 14 colonies per 100 ml. over 30 sampling days. Counts at places like Hulls Cove, and Eddie Brook in Bar Harbor, can be in the thousands. Bacterial levels at the Bar Harbor town beach and at Hadley Point have been low in past years. [See Appendix V and Appendix VI]. A safe level of *Enterococcus* for a swim beach is below 100 colonies per 100 ml.

One of the ways we can tell if the bacteria in an area are from humans is by testing for optical brighteners. Optical brightener tests involve pieces of cloth that have never been treated with detergents placed in a water body or stream for a week, then placing the cloth under an ultraviolet light. If there is human waste water in the area, the pads will glow from the detergents. We tested Eddie Brook, and the culvert near Northeast creek for optical brighteners. Eddie Brook was slightly positive and water coming from the culvert was not positive

What are ways to help reduce polluted water as a landowner? Well, you can employ Best Management Practices (BMPs). Examples include keeping animals/animal dung away from streams or wetlands, placing buffers (gravel beds, bushes, etc.) between possible pollution sources and streams or lakes, keeping the impervious surfaces on your property to a minimum, and cleaning up spills promptly. One important way to keep people interested is through public education. Gwenn Kubeck, Jake Van Gorder, myself, and Joe Adams have been teaching phytoplankton monitoring to 6<sup>th</sup> through 8<sup>th</sup> graders from around the island. This type of public education is vital to maintaining a population of citizens who are educated and concerned about watershed issues.



*Zephyr  
sampling in  
Northeast  
Creek  
Watershed.*



*Enteromorpha algae on Hulls Cove  
Beach.*



## Land Use and Coastal Development

By Terrence Reid

On the Ambassadors of the Bay journey, I noticed a lot of coastal development. I wondered if development had an effect on water quality. I obtained fecal coliform data collected by the Department of Marine Resources (DMR) over the past ten years (fecal coliform is type of bacteria that is present in the feces of animals; high colony counts usually indicate agricultural or septic leaching into water supplies). I also obtained Bar Harbor tax records for the same time period. The tax records included a map of undeveloped and developed properties, which I used to visually determine where developed properties had increased along the Bar Harbor waterfront over the past ten years. I noted that there was an increase in development at Blunt's Point, and so I decided to focus on this area. Using the data from the DMR, I calculated the geometric mean of fecal coliform colony counts per year between 1995 and 2005. Beginning as far back as 2000, fecal coliform counts appeared to be on the rise at Blunt's Point. In 2005, the geometric mean skyrocketed to over 21 counts per 100 milliliters of water [Appendix IX]. One of the requirements to justify a shellfish harvesting closure is a geometric mean of 14 fecal coliform colonies per 100 milliliters of water.

*Development near Hadley Point.*



*Horse pasture near Northeast Creek.*



*Northeast Creek culvert.*



After talking with representatives of the DMR and surveying the surrounding area, other possible sources of pollution, besides development, were uncovered. A campground just north of the test site had had previous issues with its septic system; it was possible that the septic was leaching into the sea. Another potential problem was a stream that ran through a horse farm above the test site. Earlier in the fall of 2005, I worked with the MDI Water Quality Coalition to do fecal coliform testing of this stream, which flows through a culvert, under Route 3, and eventually into Northeast Creek. There were elevated levels of fecal coliform bacteria in the stream. The data revealed a positive correlation between rainfall and fecal coliform levels suggesting that bacteria were being flushed into the stream from surrounding areas. It also showed that bacteria levels decreased as the stream flowed toward the bay, meaning the bacterial pollution wasn't being washed in by the tide. Although the size of the stream where the testing was done was too small to be the only contributor to the elevated DMR fecal coliform counts at Blunt's Point, it may be a factor [Appendix X]. Testing is being done around the campground septic field by the DMR to determine if that is the cause. If the campground septic is good and it is not a source of fecal coliform bacteria at Blunt's Point, then it is possible that failed septic systems in new developments in the Blunt's Point vicinity have contributed to elevated fecal counts.

### Recommendations for looking at impacts of development on water quality

*By Terrence Reid*

1. Collect baseline data for areas slated for development. If the conditions of the undeveloped area are unknown, there is no way of determining whether the development had an impact or not.
2. Continue monitoring in identified problem areas. If the campground septic proves to be the problem for Blunt's Point, it would showcase this idea. Even though the septic system worked for a while, eventually it broke down again. By continuing testing in already identified problem areas, new problems can be quickly found and fixed.
3. Use our comprehensive plan to guide land use ordinance changes. Bar Harbor is in the process of making a new comprehensive plan. When many towns make their comprehensive plans they don't put any teeth in them and developers do whatever they want. Incorporating land use policies into the comprehensive plan would give it teeth, which could be used to keep development away from fragile environments.
4. Consider the cumulative impact of existing problems when evaluating new development. This basically means that if an area already has problems, it is going to be less able to handle additional impacts of new development.

## Land Conservation

By Jane Disney

### What we learned from Barb Welch, executive director, Frenchman Bay Conservancy

Barb taught us what a conservation easement is. It is an agreement with a landowner that restricts how land can be used. She gave us the analogy of a bundle of sticks. The sticks represent all the things that you have the right to do on a piece of land. These include the right to occupy, use, lease, sell, and develop the land. An easement involves the exchange of one or more of these rights from the landowner to a land trust like the Frenchman Bay Conservancy. People who get conservation easements on their land recognize that some of those things might not be good for the local environment and they are willing to give up some of those rights in exchange for tax reductions and the peace of mind that they have done a good thing for the land and surrounding water. Conservation easements are legally binding agreements that are publicly recorded and run with the property deed for a specified time or in perpetuity. So if a piece of land is sold, the conservation easement can stay in place. There can be problems. People sometimes want to change or amend easements. These decisions are not always easy. Sometimes changes can be made. If the amendment benefits the landowner financially, then it cannot be done.

*“In considering land protection, one should consider the effect of land use on water quality.”*  
—Barb Welch



### What we learned from Bob DeForrest, Maine Coast Heritage Trust

Bob taught us that many islands off the coast of Maine have conservation easements or are owned by land trusts like the Maine Coast Heritage Trust. Some people get confused, thinking a conservation easement makes a piece of land open to the public, but that is not necessarily true. They think that land conservation areas are like Acadia National Park, set aside for the public to use and enjoy. It is not easy for the public to figure out where conservation easements are, maps of these areas are often confidential because of the confusion about these areas.

There are many reasons why conservation easements are important. Since the primary purpose of a conservation easement is to conserve natural or man-made resources on the land, the easement itself is described in terms of the resource it is designed to protect. The conservation easement might protect farmland or forests, a historic structure, an open space, or a wetland or other type of resource.

There is a conservation easement on Stave Island; some of the land has been given to Maine Coast Heritage Trust and the rest has conservations easements that restrict use of the land to some purposes. We were given permission to camp on Stave Island. Bob helped us to think about leaving no trace of our time there. We were careful with all of our wastes. Everything carried in was carried out.



*Upper right: Thomas Island was recently placed in a conservation easement by Maine Coast Heritage Trust.  
Middle right: Bob DeForrest shares a map of protected land in Frenchman Bay with Ambassadors.  
Bottom right: Zack Steele and Dr. Helen Hess review map of conserved lands on Stave Island.*

## How Did We Do It?

### The Nuts and Bolts

by Jane Disney

#### Journey Inspiration

The Gulf of Maine Expedition, a 1,200-mile journey from Cape Cod to Nova Scotia sponsored by Maine Sea Grant in 2002, inspired the idea for the Ambassadors of the Bay journey. We used similar methodology as described in “Celebrating our Coastal Heritage” the Final Report of the Gulf of Maine Expedition 2002, which can be found at [www.gomexpedition.org](http://www.gomexpedition.org).

The Ambassadors of the Bay was a learning experience for the kayaking team on many levels and for people we engaged along the way.

To get ready, we first decided on a focus for the journey and then chose a time frame, travel route, and daily destinations. We decided to assemble a kayak team that included a diversity of community members including students. We decided to depart on September 19<sup>th</sup>, 2005 and return on the first day of autumn, September 22<sup>nd</sup>, 2005.

#### Journey Focus

The focus of the journey was to meet up with residents and users of the bay and discuss the issues they felt were important to the future of the bay. Along the way, we planned to look for indicators of ecosystem health like phytoplankton populations, bird numbers and distributions, eelgrass beds, and marine mammals.

#### Travel Route Planning

We chose destinations where we could easily meet up with people and make the observations we were interested in. We planned to travel from Thompson Island, around the Twinnies to Hadley Point, because there were issues related to mussel dragging and worm harvesting, mussel aquaculture, and clam conservation in these areas surrounding Mount Desert Island. Hadley Point was a convenient stopping place where people could easily meet with us. We planned to travel from Hadley Point to Lamoine State Park in order to meet up with Department of Marine Resource (DMR) biologists at our campsite.

The DMR laboratory is located right at the park. We planned to travel from Lamoine State Park to the MDI Biological Laboratory so that we could meet up with residents of Salisbury Cove and visit with marine scientists. The

residents of Salisbury Cove had special concerns about mussel aquaculture and the building of piers and we wanted to hear their views. We planned to travel from the MDI Biological Laboratory to Hancock Point so that we could visit mussel aquaculture rafts near Googin’s Ledge and gain a bay-level perspective as we traveled across the expanse of open water. We planned to visit with Frenchman Bay Conservancy representatives who lived at Hancock Point to learn about land conservation and its role in protecting the bay. We planned to travel from Hancock Point to Stave Island to gain perspective on issues related to islands and practice and assess the efficacy of Leave No Trace principles. We planned to travel from Stave Island to College of the Atlantic in Bar Harbor to visit with students and representatives of Allied Whale.

#### Kayak Team

We decided that the kayaking team should include young environmental stewards and community members who could support the students’ efforts to understand and communicate the relevant issues in Frenchman Bay. The students were all research fellows in the Maine Coast Learning Expedition Program at the MDI Water Quality Coalition. These students, by enrolling in the program, had committed themselves to a full semester of environmental stewardship work on Mount Desert Island.

#### Maine Coast Learning Expedition

Maine Coast Learning Expedition is a semester-long environmental stewardship program for high school students. The program has been approved by the state of Maine as a limited purpose school. The MDI Water Quality Coalition headquarters in Town Hill is where students, instructors, and community members work together and learn from each other in an informal educational setting. The Community Environmental Health Laboratory, located at the MDI Biological Laboratory, is where students conduct their water quality-related research, as part of a collaborative outreach and education program with the MDI Biological Laboratory.

#### Funding and Support

This project could not have occurred without the generous support of many individuals and organizations. Maine Sea Grant supported the journey by dedicating Natalie Springuel’s time leading the team on the water and later, designing this report. Maine Sea Grant also provided funding for journey

## How Did We Do It?

supplies and camp food, administration, and production of this report. A riparian landowner contributed funds, National Park Sea Kayak Tours donated the use of kayaks and affiliated equipment and gear, Aquaculture Harvesters provided a lunch on the journey and Frenchman Bay Conservancy provided a dinner. We intended to stop at the MDI Biological Laboratory where lunch was being provided, but due to weather, we had to change course and head directly to Hancock Point. We put together a ground crew to help support us on our journey. Mary Forest and Deb Lane helped to move gear on the ground and make sure we were fed and dry. Land crew volunteers donated their time and mileage, and provided prepared meals to the kayak team.

### Overnight Accommodations

We arranged for camping at Lamoine State Park, Hancock Point, and Stave Island. We encountered bad weather and heavy rains on the second day of the journey and were invited to stay with Barb Welch, of the Frenchman Bay Conservancy. We received special permission to stay on Stave Island, part of which is owned by Maine Coast Heritage Trust (MCHT). Bob DeForrest, a staff member at MCHT, met us at Stave Island to direct us to a camping area and teach us about the island.

### Preparation and Training

A packing list and contact information sheet was developed for every journey participant in the journey. We shared equipment and clothing and shared past experiences with outdoor adventures. We visited with David Lamon, director at the Somes Meynell Wildlife Sanctuary to explore our own sense of place through journaling and reflection and in a series of directed activities. We also engaged the MDI Paddlers in helping us plan for our trip and train team members in kayaking skills and safety measures. We used Echo Lake for training the week before our journey. Every team member learned how to do a “wet exit” and practices rescue scenarios. We got an introduction to Leave No Trace principles and got oriented for our journey.

### Education

We produced a brochure highlighting our journey, our focus and our mission and shared it with people before, during and after the journey. We invited reporters to join us at locations where we were gathering. Abigail Curtis, a reporter from the Bangor Daily News, visited with the kayak team the week

before departure, and joined us on our first leg of the journey. She wrote articles explaining the focus of the journey. Susan Farley of Channel 5 News interviewed the kayak team and citizens who had come to share their issues at Hadley Point. Reporter Laurie Schreiber and photographer Peter Travers also joined us at Hadley Point and conducted interviews. We produced a slide show and shared our journey with the public several days after the journey. Each student research fellow followed up on one issue that came up during the journey and researched it over the next three months. They presented their findings to the public at a presentation at the Maren Auditorium at the MDI Biological Laboratory on December 12<sup>th</sup>, 2005. They submitted some of their data and analyses to the Bar Harbor Town Planner for inclusion in the comprehensive plan.

## The Seven Principles of Leave No Trace

1. Plan Ahead and Prepare
2. Travel and Camp on Durable Surfaces
3. Dispose of Waste Properly
4. Leave What You Find
5. Minimize Campfire Impacts — Kindle No Fires
6. Respect Wildlife
7. Be Considerate of Other Visitors

*Background photo: footprint in the intertidal mud.*

## How Did We Do It?

### Perspectives from the Guide's Cockpit

By Natalie Springuel

Everyday, there is something new at sea: a seastar prying open a mussel for a tasty snack; a lone sandpiper fluttering in the arrival of fall migration. I have been lucky in life, spending thousands of hours pushing my body over the seas of the Gulf of Maine in the company of fellow explorers, each in our own boat. Sea kayaking is a fantastic way to journey, as more and more people are discovering. Expeditioning, especially for days on end, fully immerses the boater into the ocean environment, tasting sea salt on sun-cracked lips, and living as creatures of the marine realm.

What do I want to say about the Ambassadors of the Bay journey? There are dramatic days at sea – a peregrine swooping off an island cliff – and there are still days, the water's placid reflection, a symphony in symmetry. Then, there are the days that make you think. Day 2 of our four-day Frenchman Bay trip is one of those thinking days.

The waves and the wind and the mood and the tangled bird and the rest of it have me wondering, for what feels like the thousandth time: at what point are there too many people paddling and exploring and learning on the ocean? I mean physically. When is tourism, recreation, boating, sailing, picnicking, clamming, paddling, even experiential education like this, like us, when is all of that combined activity on our ocean, for the benefit of humans, too much for the coastal environment?

This question hit me hard after the incident with the bird. As the students, Jane, Gwenn and I discuss the fate, now in our hands by default of the fact of our arrival, of this pitiful Herring Gull, I watch the weather like a hawk, and sense change. Wind is picking up, a good 15 knots at this point, and here I am a mile offshore with six beginner paddlers, and me, their leader. We're off a buoyed mussel raft, with mooring lines extending under us from the platform to the seabed, just the kind of place I once had

to rescue folks in a tandem kayak. Distracted paddlers (or paddlers preoccupied by something other than the conditions at hand such as a suffering bird) can overlook these lines, paddling too high over them and ending up in the water.

The fog's a-thickening, the winds a-flapping, and the waves undulating. One student is twisting in his cockpit to open his rear hatch to find a cell phone to call the Department of Marine Resources about the dying bird. This is how accidents happen, I think. One small thing leads to another... There are waves crashing and I am giving the nod to opening a hatch because of a suffering bird. Not wise. It's time to make a sound judgment call and move on, which is exactly what we do.

With moods dampened, I silently check hatches to make sure no one takes on water, glance at the fog bank, take a compass bearing figuring we'll lose sight of land in minutes (we do), and gently lead the group through the waves. Kayakers safe, I think like a score keeper; wildlife, not exactly so. It is troubling.

It is one of those days, not dangerous if you pay attention, but perhaps threatening to beginner paddlers. Now that we've moved away from the mooring lines, I am fairly certain no one, all in their stable hard to flip tandem kayaks, will capsize. Yet there is another issue at hand: wind piles a sea-chop right through the misty rainy fog, penetrating the tiny pores in nylon rain gear. There's a chance some of the crew's already getting cold. They are certainly wet. Me too, I'm a bit wet, but it feels pretty normal for wet-weather paddling, and I am comfortable regulating my temperature in dismal gray weather. I'm thinking of the group though. Other than me and Zack, no one's carrying extra insulation, the natural kind, and I consider the chance of hypothermia in the smaller members of the group. I need to land these folks and get them in warm clothes, feed

## How Did We Do It?

them some high energy snacks, get their spirits up. The bird's pain lingers in everyone's eyes.

We'll land very soon, I announce, sensing that everyone's tolerance for watery weather is withering. Someone points to the nearest beach and suggests why not there? I pause, look at the shore, and spot the house. Rats. My mind flips through all the information needed to make a quick decision. The most important factor: we are not in an emergency situation. Some in the group are a bit charged by the conditions and certainly all seem shaken by the bird, but everyone is capable of paddling another 300 yards. I take a deep breath and call back to the group "Let's keep paddling around the next bend up the shore a bit..." I can see the lack of understanding in the cocked heads of a couple of the adults in the group, through their hats and raincoats, but my decision is made, and for the first time of the trip I am not inviting discussion. Why? This relates back to the question that hounds me on all my trips: at what point are there too many folks using a particular bay, building, fishing, farming, playing, and living. When is there so much use that we can't comfortably go about what we do without imposing on each other, or worse, without harming the seascapes through which we travel?

Perhaps that was a summer home, I think to myself, or perhaps a year-round residence. I can't tell and I'm a bit too conscious of keeping an eye on my crew to figure it out. The fact is, though, there was a house. Most of the shoreline in this part of Frenchman Bay is private. And privacy is a bit of a fanatical thing in America. I have encountered no less than half a dozen landowners from Cape Cod to Maine utter dismay at me when I have landed a group of paddlers on their shore. People who own shore land don't want anyone on their beach. I just don't do it anymore... unless it's an emergency. I'd rather avoid the negative repercussions of landing there, especially with a cold and already depressed group. I only wish there remained more public and undeveloped shore. To the bottom of my core, I hope the other side of the bend delivers a house-free beach on which to land.

Five minutes later, a lovely high tide cobble shore is alive with tiny exciting surf. I land first. One at a time, I call each boat in and help catch it before it broaches on landing waves. No one went into the drink at the mussel raft, I joke out loud, and it isn't going to happen here either!

Everyone is on shore, relieved. Me too: there are no houses here. We can relax. I take the time needed to open hatches and dry bags, pull out extra fleece layers. One kid is really cold, shivering, but reluctant to admit it, so I cajole on the layer with humor. And gorp. You can never go wrong with gorp. There is a track-and-field kid in the group; he devours nearly the whole bag. I am glad to pull out tomorrow's stash, so everyone can get their fill today. Jane calls DMR about the bird. Everyone watches the waves which splash more than crash now and the tension begins to ease. The bird situation starts settling into everyone's soul, tucked away for continued reflection. Death is a fact of nature. And so are humans. On the water, when you travel in that amphibious zone between land and sea, it is hard to separate the two.

We pack up the snacks, discover one student lost sunglasses forever in the seaweed, batten down the hatches, and launch for the last few miles to Hancock Point where Barbara awaits... she promises hot cocoa and pizza. The rest of the group seems comforted, yet somehow, my heart stays with the boats, down at the beach, where the waves and fog keep them company.

09.20.2005

## Recommendations

### What the Ambassadors of the Bay see as Necessary after their journey and their work in the community, Fall 2005

1. Support collection of baseline data around Frenchman Bay in order to understand impacts from growing industries, changes in land use, and increases in impervious surfaces.
2. Develop a plan for the future of the bay with all stakeholders in order to ensure a healthy future for Frenchman Bay. These stakeholders may form a local alliance that can interface with regional bay management councils. Stakeholders include:
  - Resident Associations
  - Fishermen Co-operatives
  - Shellfish and Worm Harvester Groups
  - Towns
  - Educational and Research Institutions
  - Local Organizations
3. Develop a plan for the future of mussel harvesting in Frenchman Bay that protects habitat and sustains the fishery.
4. Encourage people to get involved in the future of their bay. Involvement could include participation in:
  - Local government (town councils, committees, comprehensive planning)
  - Community forums and scoping sessions
  - Public hearings
5. Promote public education to raise awareness about bay issues by supporting:
  - Ambassadors of the Bay Journeys
  - Outreach to local schools
  - Opportunities to volunteer as environmental stewards
6. Form a citizen group (Friends of Frenchman Bay) to research issues and help to provide answers to questions that arise during the process of developing a plan for the future of Frenchman Bay.

09.22.2005

*Stave Island sand bar with Bonapartes Gulls LATIN*



## Appendix I

### People involved with the 2005 Amabassadors of the Bay

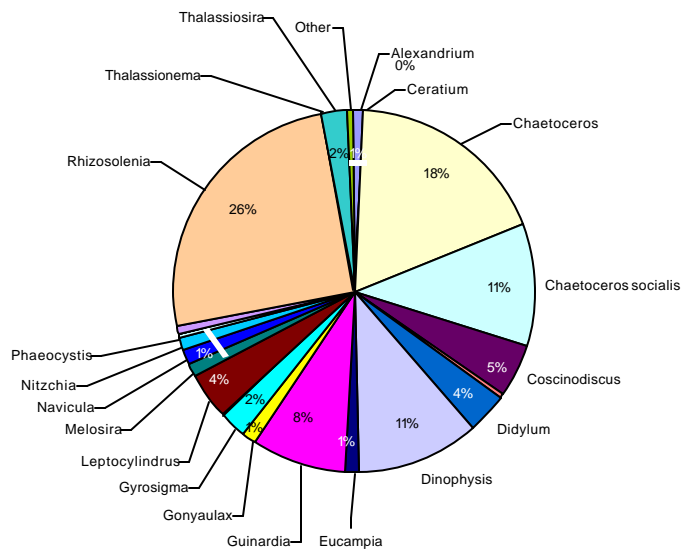
*Compiled by Jake Van Gorder*

First Name	Last Name	Position
Mary	Forest	Ambassador of the Bay as Ground Support
Deb	Lane	Ambassador of the Bay as Ground Support
Natalie	Springuel	Ambassador of the Bay Journey Kayak Guide and Maine Sea Grant
Helen	Hess	Ambassador of the Bay and College of the Atlantic
Zack	Steele	Ambassador of the Bay (Stanley Brook Watershed Survey Coordinator)
Terrence	Reid	Ambassador of the Bay (MCLE Student)
Maddy	Johnson	Ambassador of the Bay (MCLE Student and Bird Counter)
Gwenn	Kubeck	Ambassador of the Bay (MDIWQC Education Director)
Jane	Disney	Ambassador of the Bay (MDIWQC Executive Director)
Jake	Van Gorder	Ambassador of the Bay (Videographer and MCLE Graduate Student)
Zephyr	McDonnell	Ambassador of the Bay (MCLE Student)
Mike	McKernan	MDI Biological Laboratory Education Director
David	Towle	MDI Biological Laboratory (Crab Scientist)
Theo	De Koning	Mussel Aquaculturist, Great Eastern Mussel Farms
Fiona	De Koning	Mussel Aquaculturist, Great Eastern Mussel Farms
James	Houghton	College of the Atlantic Staff
Rich	MacDonald	College of the Atlantic Staff and Bird Expert
Ariel	Durrant	College of the Atlantic Student
Llewelyn	Sullivan	Coastal Kayaking Guide
David	Dunton	Commercial Clammer and Member of Bar Harbor Marine Resources Committee

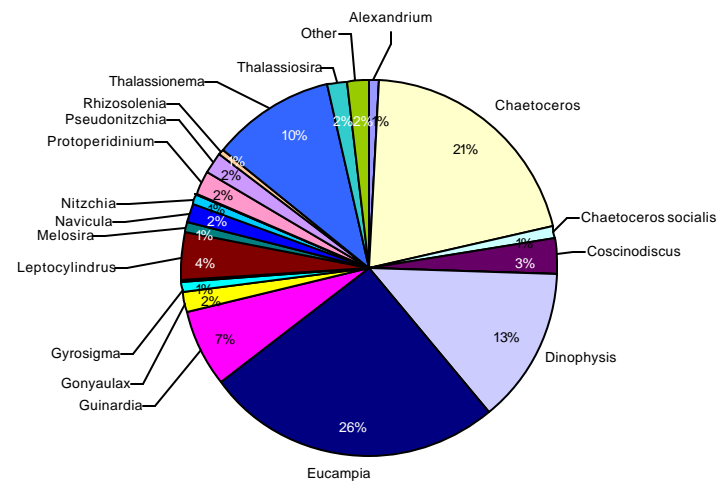
First Name	Last Name	Position
Jacques	Seronde	Conservationist and Frenchman Bay Landowner
Bob	DeForrest	Conservationist and Maine Coast Heritage Trust
Barb	Welch	Conservationist-Frenchman Bay Conservancy
John	Fendl	DMR Scientist
Rob	Goodwin	DMR Scientist
Merky	Cumbo	DMR Scientist
Jay	McGowan	DMR Scientist
Laurie	Schreiber	Reporter (Bar Harbor Times)
Pete	Travers	Photographer (Bar Harbor Times)
Sarah	Hinckley	Reporter (Mount Desert Islander)
Susan	Farley	Reporter (WABI TV5)
Abby	Curtis	Reporter, Bangor Daily News
Kara	Johnson	Allied Whale
Ray	Rappaport	Resident/Retired Scientist
Barbara	Rappaport	Resident/Retired Scientist
Kathy	Van Gorder	Volunteer
Doug	Van Gorder	Volunteer
Kendrew	Van Gorder	Volunteer
David	Lamon	Volunteer
Robert	Shaw	National Park Kayak Tours
Skippy	Dunton	Long time lobsterman in Frenchman Bay
Ron	Greenberg	MDI Paddler

# Phytoplankton of Frenchman Bay

Phytoplankton of Frenchman Bay in 2004



Phytoplankton of Frenchman Bay in 2005



## Phytoplankton Data 2004-2005

Source: Students and teachers from Conners Emerson School in Bar Harbor and student and teacher interns at the Community Environmental Health Laboratory, a collaborative outreach program between the MDI Water Quality Coalition and the MDI Biological Laboratory.

Analysis of Data: Maddy Johnson, Research Fellow, MDI Water Quality Coalition.

Data were sent to the Maine Department of Marine Resources for evaluation. *Alexandrium* is the type of phytoplankton responsible for red tide closures.

There were extensive closures in both 2004 and 2005. Although this type is 1% or less of the total phytoplankton population in Frenchman Bay, it has profound effects on the toxicity of shellfish.

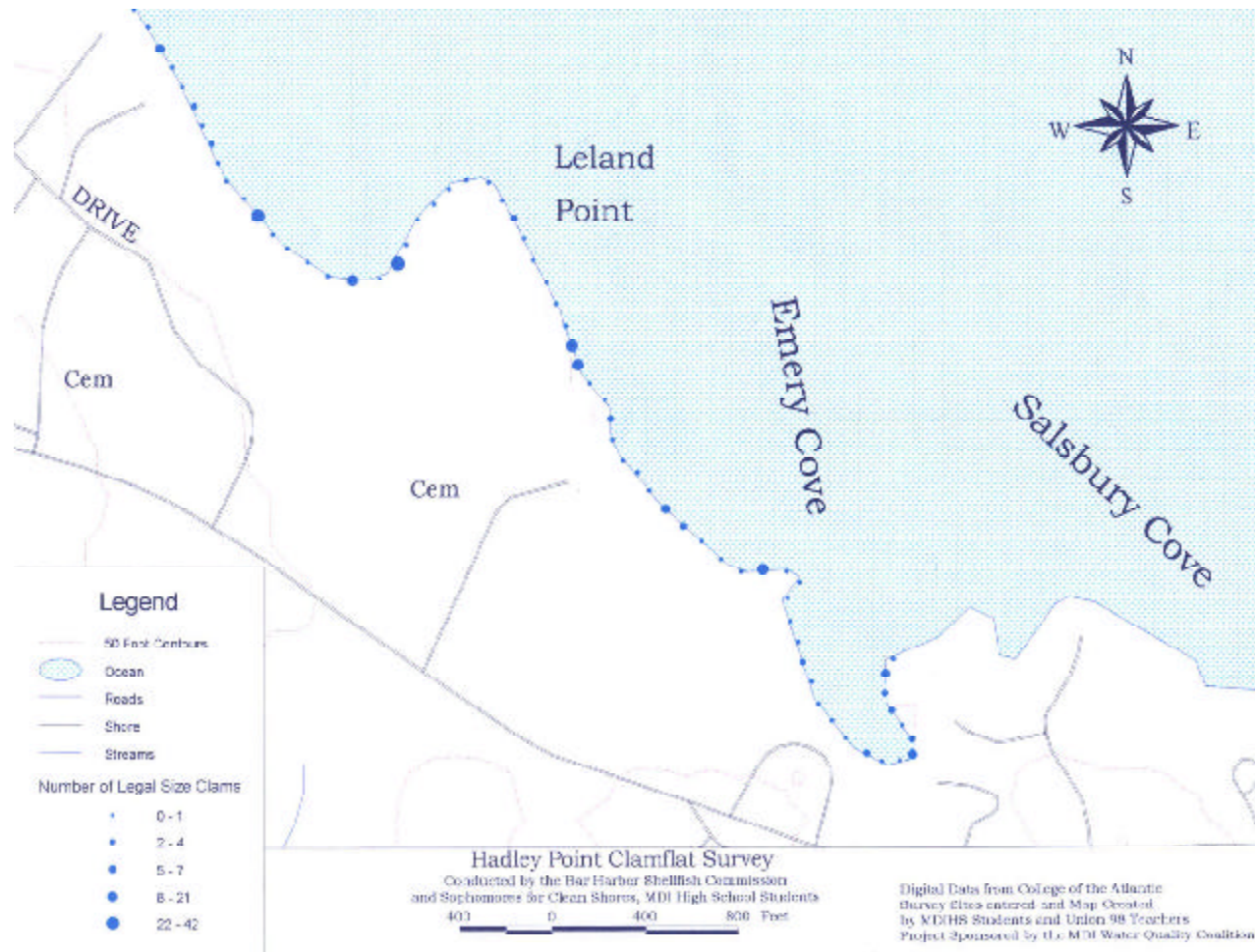
## Appendix III

### Results of Clam Flat Survey from Hadley Point to Emery Cove 1999

Source: MDI High School Students and Union 98 Teachers

Analysis of Data: Lelania Avila, Advisor, MDI Water Quality Coalition

This map was generated from data collected by Union 98 teachers and MDI High School sophomores in 1999. The map shows that there were some areas with a lot of legal size clams (>2 inches) in 1999, but not many. These data prompted the first conservation closure of a clam flat in Bar Harbor. This clam flat area remained closed until 2001 after the population of clams re-bounded.



## Appendix IV

### Clam Flat Data at Hadley Point

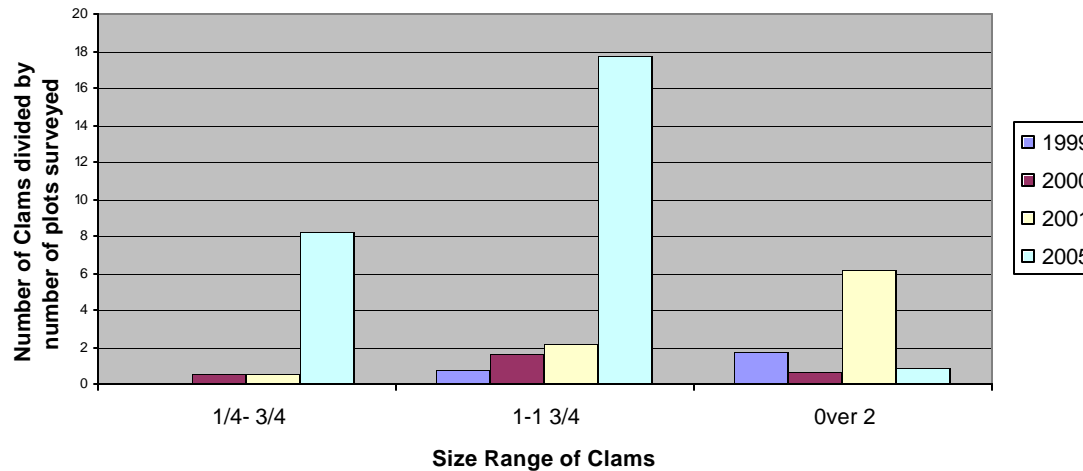
1999-2005

Source: Bar Harbor Marine Resources Committee and MDI High School Students

Analysis of Data: Jane Disney, MDI Water Quality Coalition

Citizens working with the Marine Resources Committee in Bar Harbor have surveyed the clam flats on the east side of Hadley Point repeatedly over the last several years. A conservation closure in 1999 and again in 2000 resulted in a rebounding clam population by 2001. Shorter 6-month closures have not protected the harvestable (over 2 inch) clam populations in recent years. In the fall of 2005 numerous undersized clams were counted (only data from MDIHS is shown). With proper management of the clam flats, the number of harvestable clams may again increase.

Distribution of Clams at Hadley Point East

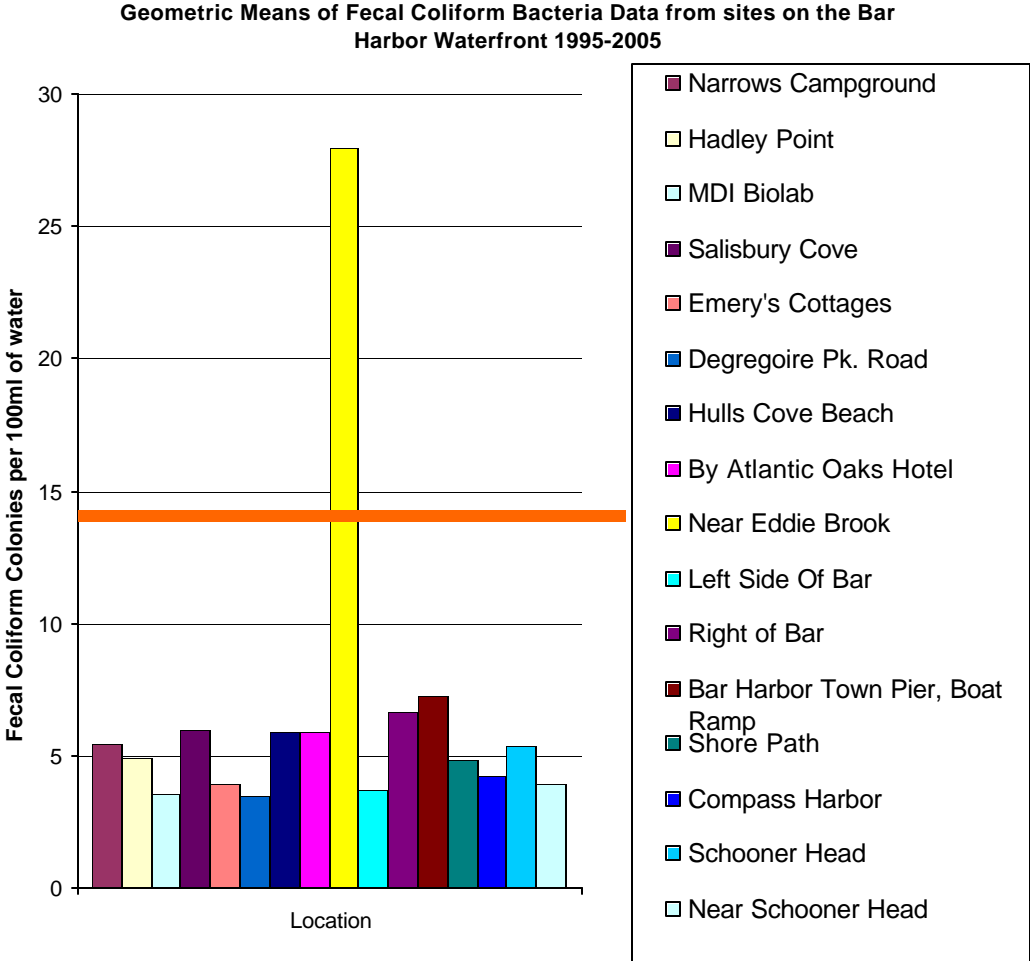


# Appendix V

## Water Quality Data along Bar Harbor Shorefront 1995-2005

Source: Maine Department of Marine Resources  
 Analysis of Data: Zephyr McDonnell, Research Fellow, MDI Water Quality Coalition

This graph shows that there are low levels of fecal coliform bacteria around the Bar Harbor Waterfront with the exception of Eddie Brook. Fecal coliform bacteria are used as an indicator of sewage pollution. Geometric means are used to look at multiple samples over a period of time. The geometric mean reduces the influence of the very high and very low numbers on the data set. Geometric mean levels above 14 colonies/100 ml of water (the red line on the graph) indicate that shellfish are not safe to eat from these areas. The Department of Marine Resources may close clamflats due to high levels of bacteria, or if there is a potential for bacterial contamination, like near a sewage outfall or overboard discharge from a private property.



## Appendix VI

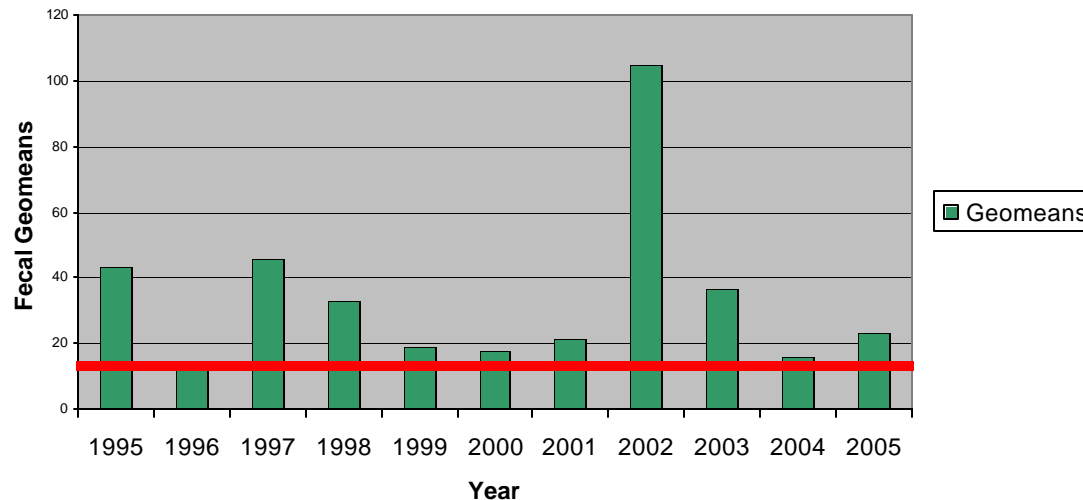
### Water Quality Data at the Mouth of Eddie Brook 1995-2005

Source: Maine Department of Marine Resources

Analysis of Data: Zephyr McDonnell, Research Fellow, MDI Water Quality Coalition

The fecal coliform bacteria levels at the mouth of Eddie Brook have consistently exceeded established standards for shellfish harvesting areas over the last 10 years (14 colonies per 100 ml., indicated by red line). There is a valuable shellfish resource at the mouth of Eddie Brook and on the Bar in Bar Harbor that cannot be harvested due to this contamination. The high levels of bacteria are probably due to combined sewer overflows and storm water discharges at the mouth of the brook.

**Fecal Coliform levels at the mouth of Eddie Brook**



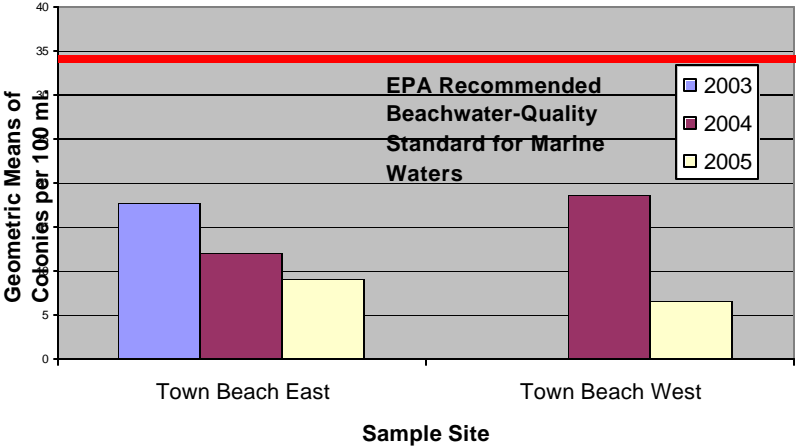
# Appendix VII

## Water Quality Data at the Bar Harbor Town Beach 2003-2005

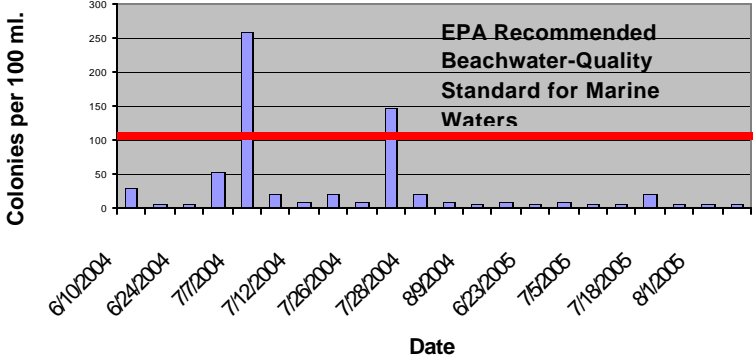
Source: MDI Water Quality Coalition  
 Analysis of Data: Jane Disney, MDI Water Quality Coalition

The MDI Water Quality Coalition collected water samples at Town Beach over three summers as part of the Maine Healthy Beaches Program. The Bar Harbor Town Council voted in the summer of 2004 not to participate in the Maine Healthy Beaches Program and did not post signs in response to data, although the signs would have indicated a clean beach, open to the public to enjoy. The EPA recommended beachwater-quality standard for marine waters is a geometric mean of 35 colonies per 100 ml. of water. Geometric means at the town beach in Bar Harbor have never exceeded 35 colonies per 100 ml. of water. The EPA recommended beachwater-quality standard for marine waters for a single sample is 104 colonies per 100 ml. of water. The Maine Healthy Beaches monitoring protocol recommends re-sampling the next day when the standard is exceeded. Twice in 2004 the EPA standard was exceeded, but the level of bacteria was back down to acceptable levels by the next day. The MDI Water Quality Coalition continued to supply information to the town through the summer of 2005, which was the cleanest year at the beach on record.

**Enterococcus Levels at Town Beach in Bar Harbor**



**Enterococcus Levels at Town Beach West 2004-2005**



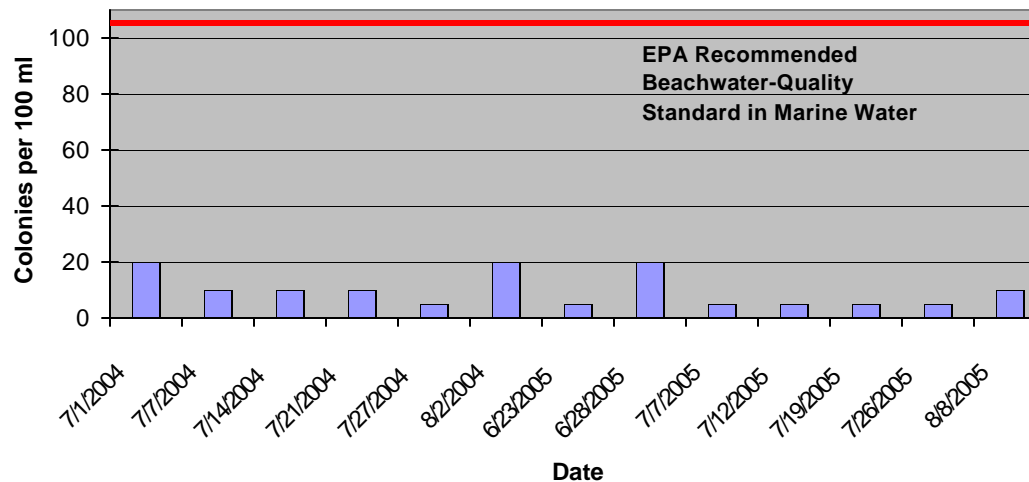
## Appendix VIII

### Water Quality Data at Hadley Point 2004-2005

Source: Interns at the Community Environmental Health Laboratory  
Analysis of Data: Jane Disney, MDI Water Quality Coalition

The MDI Water Quality Coalition has been monitoring water quality at Hadley Point in Bar Harbor as part of the Maine Healthy Coastal Beaches Program since 2004. *Enterococcus*, a type of bacteria found in the gut of warm-blooded animals, is used as an indicator of the potential for swimming illness. The levels of bacteria at Hadley Point have been consistently low over the last two years. A boat ramp is planned for Hadley Point in the near future. This may increase boat activity and public use of the Hadley Point area. Continued monitoring of water quality in this area is imperative to ensure that public health is protected.

Enterococcus Levels at Hadley Point 2004-2005





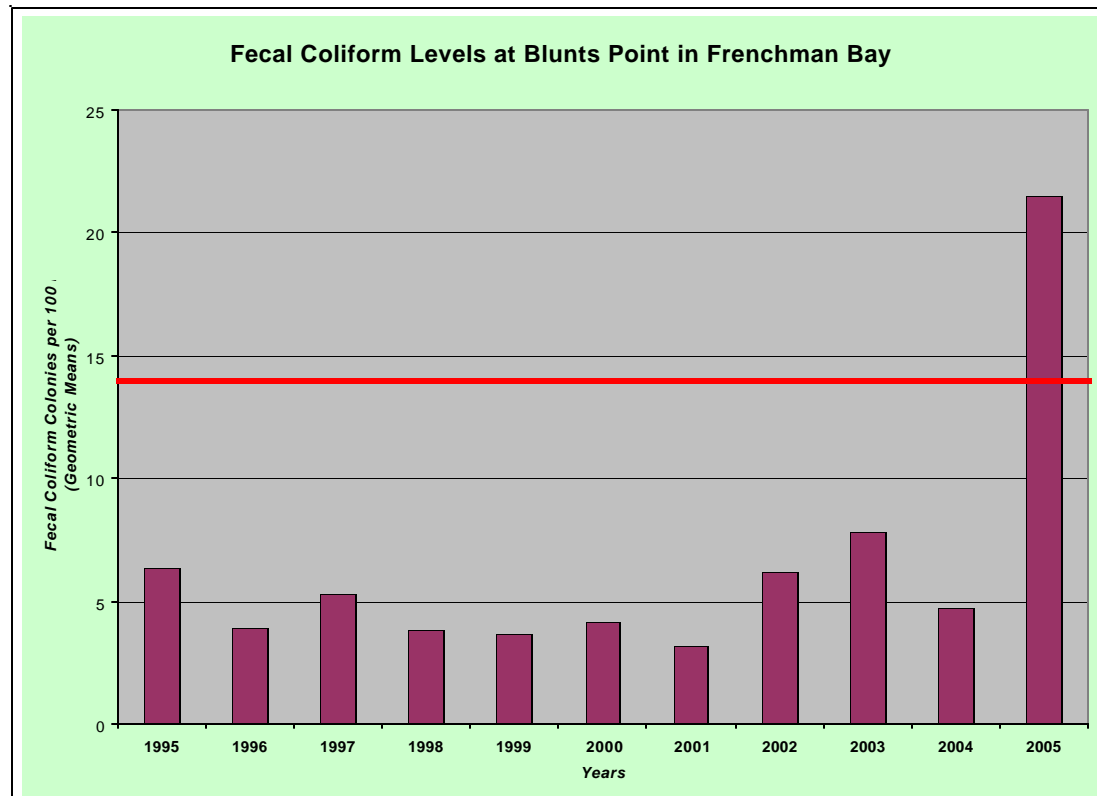
## Appendix IX

### Water Quality Data at Blunts Point in Frenchman Bay 1995-2005

Source: Maine Department of Marine Resources

Analysis of Data: Terrence Reid, Research Fellow, MDI Water Quality Coalition

This graph shows that there were low levels of fecal coliform bacteria at Blunts Point in Bar Harbor until recently. Geometric mean levels above 14 colonies per 100 ml. (the red line on the graph) indicate that shellfish harvested from this area may not be safe to eat.



## Appendix X

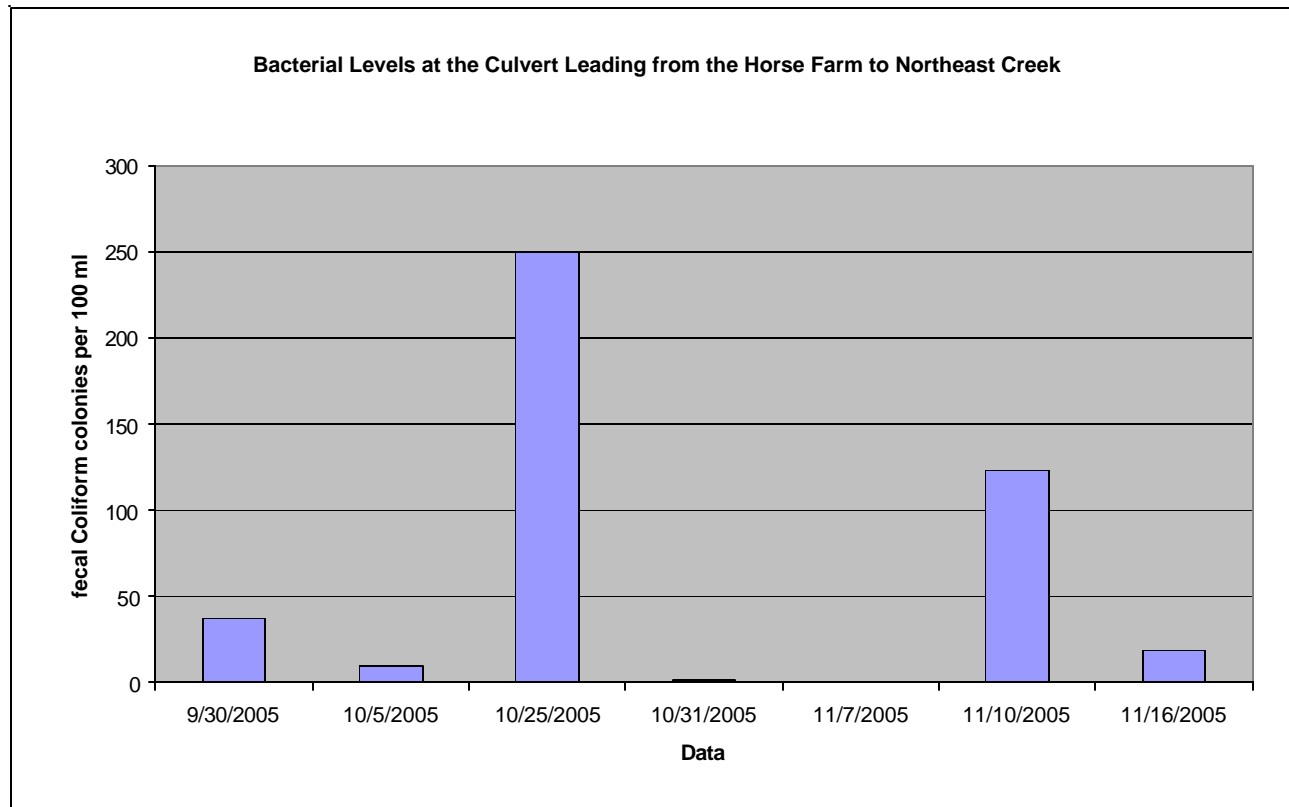
### Water Quality Data at the Culvert Leading to Northeast Creek

Fall 2005

Source: Maine Coast Learning Expedition

Analysis of Data: Terrence Reid, Research Fellow, MDI Water Quality Coalition

This graph shows that there are occasional high levels of bacteria in the culvert leading to Northeast Creek. The high levels correlate with rainfall. The culvert drains a pasture with horses. Horse manure may account for the elevated counts during the fall.



# Maine Coast Learning Expedition

## We Believe

- One person can make a difference.
- Joy is found in the richness and diversity of the connections we have to our community and the environment.
- Young people need connections to their community to prepare them for finding their place in the world.
- Parents and community members can be key partners with teachers in education and inspiring young learners.
- Community and mutual respect is strengthened through stewardship.
- Stewardship is holding something in trust for another.
- Students learn better when they encounter subject matter in real world contexts.
- Students are empowered to solve problems in creative ways when they are educated in interdisciplinary environments by teachers and community members who know them well.
- Engaging in Environmental Stewardship should be an integral part of every citizen's education (and life experience).
- Teaching and learning in an interdisciplinary way through authentic work and community service or stewardship activities requires a flexible schedule with large blocks of open time.
- Reflection is as important as "doing" in the process of learning.
- Teaching and Learning are rich human endeavors that cannot be separated from the rest of the human experience (having friends, being part of a community, exploring the inner self).

## Our Mission is based on these beliefs

The mission of the Maine Coast Learning Expedition is to create a learning community that cares deeply for local environments and works toward the goal of understanding and preserving the integrity of local watersheds and wildlife habitats on Mount Desert Island.

## Vision

The students and teachers participating in Maine Coast Learning Expedition will be a community of learners who connect knowledge in purposeful ways to accomplish goals by working collaboratively in variety of local settings, valuing each other as teachers and appreciating each other as learners. Students will gain self-confidence for the tasks that lie ahead. Students will be fully empowered to seek out resources to solve problems of importance to themselves and their community.

*Maine Coast Learning Expedition, Fall 2005 Students and Leaders  
Left to right: Maddy Johnson, Zephyr McDonnell, Terrence Reid, Jake  
Van Gorder, Gwenn Kubeck, Zack Steele*



One way to open your eyes is to ask yourself,  
"What if I had never seen this before?  
What if I knew I would never see it again?"  
Rachel Carson

END



*Art by Maddy Johnson*