

## FRIENDS OF PLEASANT BAY NEWSLETTER



*Seasons of the Bay*



*Photographs by Barry Donahue*

### Lots of Horseshoe Crabs And No More "Jet Skis"

By Jeff McLaughlin

There is good news to report about Pleasant Bay this winter of 2002, and the Friends have played a key role in two important developments: Research shows that the bay has a large and robust population of horseshoe crabs; and legislation assures that noisy and polluting "Jet-skis" will have no place on the bay's waters when the boating season resumes in spring.

--- The Commonwealth has approved local by-laws that ban PWCs (Personal Water Craft, a.k.a "Jet-skis") from Pleasant Bay and Nauset Estuary waters adjacent to Cape Cod National Seashore. The National Park Service previously announced a federal ban would go into effect in April, and the local regulations dovetail with it. The Friends were early vocal supporters of such restrictions, and continued to press the case with state environmental officials after voters in Chatham, Orleans, Harwich and Eastham last year overwhelmingly voted their approval of local bans. The Commonwealth had never before approved local by-laws banning PWCs.

--- The population of horseshoe crabs in Pleasant Bay is 500,000 adults, far more than some widely circulated non-scientific estimates that have helped fire a controversy dating to 2000. The hard data were among the first to emerge from an ongoing Boston University Marine Program study that was commissioned by FOPB. The Friends believe facts, not anecdotes, are what should guide resource management decisions. The Friends continue to raise funds towards the full \$55,000 cost of the research.

However a US Fish and Wildlife Service ban on the taking of crabs, even for life-saving biomedical uses,

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### The President's Letter

By Patricia Anthony

Yesterday, I took my dog, Bonnie, for a long walk. We trotted down Route 39 to Church Street and on down Bay Road, ending up alongside the beach on Route 28. It was, as always, a glorious view, and I turned to Bonnie and said, "Well, here we are at 'our' bay."

I think my sentiments --- delight and responsibility in equal measure --- are shared by all who have the great fortune to live near this beautiful body of water. However I feel even more fortunate because I am a member of the Friends of Pleasant Bay, the primary community caretakers for the Bay.

Although I am a late arrival, having lived on the Cape full-time for only six years, my link to Cape Cod has been a long and vital one. As a four-year old, my parents and

sisters exhorted me to "swim to the raft" moored a short distance from the marsh edging Barnstable Bay. As an adolescent, I sailed in the shadow of Sandy Neck. As a college student, I waitressed at "Lobster in the Rough" on 28. However, marriage moved me away from the Cape, and for about fourteen years, I no longer was a summer visitor.

But as we all know, life makes strange twists and turns, and in 1987, I found myself a professor at the University of Massachusetts at Amherst, and the Cape beckoned. In 1996, I became the Director of the Cape Cod Lighthouse Charter School, and a full-time resident.

Again, life took a turn in the right direction. The school's outstanding sixth-grade science teacher, Barbara McManus Haines, told me how she had been asked to lead one of the five task forces examining a variety of human uses

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## Letter to the Friends (Continued from page 1)

on Pleasant Bay, which had recently been declared an Area of Critical Environmental Concern. Although Barbara wanted to participate in the task force work, she was hesitant about being a chair, and asked if I would take her place. I immediately said yes, having recently begun sailing again, out of Arey's Pond, and already in love with Pleasant Bay.

The work with the Alliance task forces was a turning point in my life. I not only became acquainted with folks who had lived here forever and deeply loved the Bay, I began to soak up knowledge about our precious environment, and what each of us could do to preserve this wonderful resource.

My lifelong learning continues through my membership and board work with the Friends of Pleasant Bay. The board, is comprised of deeply committed people, many of whom hold particular expertise in areas that are extremely helpful in promoting proper oversight of Pleasant Bay. Our Board members include: a biologist who explains in layperson's terms the more complicated chemical changes affecting the bay's health; a boatyard owner and builder of cat boats, who constantly searches for ways to mitigate the impact of boat maintenance on the bay; an architect, involved in examining the impact of development; artists, who educate the public through their work; a journalist, who truly uses the pen as his sword in spreading knowledge and love for the bay; and those who have sailed for years all over the Bay and bring an intimate knowledge of its environs to discussions. They do good work in promoting educational grants for schools, publishing pamphlets and books on the Bay, studying research relevant to the bay's well-being, and writing about research findings in the FOPB newsletter and in letters to the editors of local newspapers.

Over the past several years, the Friends have supported research studies that have provided me with the following information:

- Dog poop is not fertilizing the soil; it is adding nitrates to already overloaded estuaries.
- I do not need to fertilize or pesticide my lawn; instead, planting indigenous bushes and flowers where my lawn used to be is a better alternative.
- Some ingredients in household cleaners, pet supplies, etc., are very harmful to our water supply.
- Composting is a much better alternative than a garbage disposal.
- PWCs are not just annoying, noisy crafts; they are harmful to the environment as well.
- Building more docks and other shoreline structures would be detrimental to the health of the Bay and its inhabitants.

The Friends' support of research studies continues, supplying the public with valuable scientific knowledge that informs behavior, and compels policy changes in Bay management. The current comprehensive horseshoe crab study funded by the Friends and conducted by Dr. Ivan Valiela and Ruth Carmichael of the Boston University Marine Program at Woods Hole, is such a study. One year into their project, the scientists have provided us with

**TIME TO RENEW!**  
**FOPB membership dues and contributions**  
**are tax-deductible. Please be generous in your**  
**support of our beloved Bay.**



*Photograph by Barry Donahue*

preliminary data substantiating the existence of a healthier horseshoe crab population in the Bay than was originally surmised.

The work of Dr. Valiela and Ms. Carmichael is groundbreaking. Pleasant Bay is the first site on the eastern seaboard where the "stage-based matrix modeling" technique will be applied to quantify the status of the horseshoe crab population. Findings from this study have application to waters regionally and even around the world.

This work and other studies cannot happen without your intellectual and financial support.

Intellectually, we count on you to take this information that is presented to you, our members, and to educate your neighbors, friends, children, grandchildren, and anyone else who lives near the Bay.

Financially, we will be calling on you to help us in funding this current year and one additional year of the horseshoe crab study.

We all are fortunate to live by Pleasant Bay, to drive by it on the way to work, to sail on its waters, to walk its beaches. We also are fortunate to play a part in securing the future of the Bay, and through our membership, act as Keepers of "our" bay.



By Louise Russell

As development on Cape Cod continues unabated, with increasing numbers of large homes, year-round residents and visitors, we are beginning to experience contamination of our drinking water and the potential death of ponds and estuaries from excessive intrusion of phosphorus and nitrogen.

Since human activities provide the vast majority of the phosphates found in the watershed and ultimately the fresh-water aquifer, it behooves us to limit our use of phosphate-containing products which contaminate our sole source of drinking water.

At its November meeting, the FOPB Board decided to create a new committee to research household products and propose ways to inform current and potential homeowners about the deleterious effects of phosphates entering the Pleasant Bay watershed. The watershed contains some 40 freshwater ponds and two brackish embayments --- Muddy Creek and Frost Fish Creek and Marsh. The 40 ponds are distributed throughout the four-town watershed area: Chatham has 14, Brewster has 7, and Orleans 15, while 3 span Harwich and Brewster, and one is shared by Brewster and Orleans.

Development around these ponds and embayments is increasing --- to the point that some are already showing unmistakable signs of nutrient overloading, namely the increased algae blooms that are obvious during the summer months.

The best-studied pond on the Lower Cape in terms of nutrient loading (primarily phosphate loading) is Long Pond, which straddles Harwich and Brewster. Although this pond lies just outside the Pleasant Bay watershed, it is a model for all the other ponds in the region.

Long Pond studies have shown that phosphates come from various sources. These include:

Household wastewater:	43.4%
Roof runoff:	24.8%
Road runoff:	11.3%
Cranberry bogs	4.1%
Water fowl	4.1%
Lawns	0.5%

which together account for 88% of the phosphate loading, the remainder being regenerated from pond-bottom sediments.

Unlike nitrates, which promote algal bloom in salt water, phosphates promote plant growth in fresh water. This means that increases in the phosphate content of pond water result in increased algal growth, which in turn reduces the oxygen content of the water. Fish, crustaceans, mollusks and the like require oxygen levels higher than the levels needed

by plants. Thus we see fish kills and mollusk dieoffs due to asphyxiation as an obvious and very disturbing result of excessive algae.

The new FOPB committee, the Phosphate Study Group, set itself three tasks:

First, it will compile a list of phosphate-free products and assess their availability in local retail outlets. These encompass household cleaning products, including bathroom, kitchen and laundry soaps; glass cleaners; shampoos; and dishwasher detergents.

Second, it will research current legislation, including no-phosphate-discharge zones, bans on products containing phosphates, and loopholes or oversight in current law.

Third, the committee will devise ways to convey the information it gathers to residents, real estate brokers, builders, designers, landscapers and distributors of products. Methods being considered include creation and distribution of an informational pamphlet; a column written for local newspapers; and an article designed for the FOPB website.

Until our list and research is complete, it is useful to know that Massachusetts has in place a ban on phosphates in most household cleaners and laundry detergents. However the ban does not extend to dishwasher detergents. Many households run a dishwasher once, twice or even several times in a day. Some detergents --- Cascade 'Skip the Sink' gel, for example --- contain as much as 1.33 grams of phosphorus in each tablespoon. The Electrosol brand powder contains 0.8 grams per tablespoon. A convenient way to visualize these amounts is in terms of diamonds: The 1.33 grams in the Cascade gel is like a 6.7-carat diamond in a tablespoon; the Electrosol example is the equivalent of a 4-carat diamond

The Phosphate Study Group welcomes input and member participation in its efforts. Many of you have long experience with these issues. Reading the labels on products is a good first step. Becoming familiar with phosphate levels in detergents allows a responsible choice.

Two phosphate-free dishwasher detergents that are available to us are Seventh Generation and Ecover. Seventh Generation has won 15 awards from environmental organizations for its attention to environmental safety issues, and Ecover is also highly recommended by environmental watchdog groups.

The Star/Shaw's Supermarkets carry these products in their Wild Harvest sections, and local whole-food and organic-food markets do so as well. The committee is proposing that these products be made available in every store that stocks dishwasher detergents.

*Each year, the Friends award grants to area teachers for class projects that enhance their, and our, appreciation of Pleasant Bay. Each grant recipient gives a presentation at our annual meeting in July. Here are mid-year updates from the teachers..*

## Chatham High

By Erik Berg

The study of Muddy Creek's biodiversity has been going great. The fall section of the Marine Science class made five trips to the Muddy Creek Estuary at Jackknife Harbor, from early October to late November. We are currently working on a web page that will discuss our studies and results. The site will be accessible through the Chatham High School Science Dept.'s marine science page, at: <http://www.chatham.k12.ma.us/Pub/eberg/courses/marine.htm>.

We had excellent weather for our field studies last fall. On our first trip to Muddy Creek our missions were to learn the proper techniques for using seine nets and zooplankton nets, to identify some of the common organisms in the area, and to develop controlled methods for sampling that the entire class would follow later in the study. We then made four more trips over the course of the semester --- one approximately every two weeks. Students worked in groups, each going to a different site along the beach stretching from the river's mouth to the golf-course restraining wall.

The students collected small fish and invertebrates using the seine nets. Specimens were brought back to the classroom and kept in aquaria for display and further study. Zooplankton were sampled using zooplankton tow nets. They also were brought back to the classroom, where they were identified and counted under microscopes.

HOBO data loggers were used to measure the temperature and sunlight intensity at the site over the course of the study. The class spent the winter analyzing the data to determine how biodiversity changed with the seasons, and if biodiversity was affected by sample locations. The results of this study will be posted on the web site.

The spring-semester section of marine science will

continue the study when the weather becomes more favorable for marine field work.

The grant money from Friends of Pleasant Bay was used for transportation, waders, HOBO data loggers, collection nets, a 55-gallon aquarium and miscellaneous laboratory supplies related to the study.

## Harwich High

By Richard Houston

My economics and history classes have initiated a web page designed to expand public awareness of Pleasant Bay and the towns along its shores. The site includes virtual tours of Chatham Light, the Route 28 vistas of Pleasant Bay in Harwich and Chatham, and the Kent's Point Conservation Area in Orleans. Visitors to the page also can travel with a Pleasant Bay water-quality testing team as it carries out its important tasks.

The students are also using the computer, software and digital camera financed under the grant to work on other projects that will add to the online tours; to research key conservation and other environmental issues that affect the bay's well-being; to examine economic activity related to Pleasant Bay; and to trace the history of the area. Current plans call for trips to Pah Wah Point, Round Cove, Muddy Creek and other locations.

The students have initiated a News Section on the web site that links visitors to articles relating to Pleasant Bay that have appeared in local newspapers. Links have also been established to access many other web sites that provide relevant information --- including the FOPB web site. The links include maps, satellite photos, webcams and Paine's "History of Harwich."

You are invited to follow the expansion of the web page as the year progresses by visiting:

<http://www.harwich.edu/depts/history/PB/PB.htm>.

## Bay News (Continued from page 1)

remains in place in Monomoy waters, and FOPB members are among those urging Fish and Wildlife to hold public hearings before making this ban permanent.

However there is also disturbing news about the bay to report this winter: In December the Pleasant Bay Resource Management Alliance released preliminary results from the second year of its water-quality monitoring program. The results confirmed what was revealed in the first-year data: Nitrogen-loading is a serious problem in much of the bay, with eight of 18 sampling stations showing immediate and severe threats of eutrophication and ecological upheaval.

The trained volunteer teams that collect water samples for the Alliance include many FOPB members, and the Friends as an organization will be paying close attention to proposed remediation and prevention efforts as municipal governments and other groups seek ways to keep nitrogen-loading from radically altering the ecology of the bay.

Meanwhile, FOPB is also looking to involve individual homeowners and summer residents in taking steps to improve the environmental health of the bay and its watershed. The Board of

Directors recently voted to establish a new committee, the Phosphate Study Group, that seeks to educate people about the harmful effects of another kind of human intrusion --- phosphate-loading --- on the freshwater ponds and brackish embayments around Pleasant Bay.

The state already bans phosphates in many kinds of cleaning agents, but when that law was passed, a loophole was allowed for dishwasher detergents. The Phosphate Study Group is beginning to address that issue, as its report in this newsletter shows.

Our School Grants program for 2001-2002 brought teachers and students from Chatham High and Harwich High to the shores of the bay, and progress reports from both schools also appear in this newsletter.

Work and residence changes, along with schedule conflicts, have required four valued board members to resign in recent months. Nancy Church of West Barnstable, Richard C. Hiscock of East Orleans, Jay Harrington of South Orleans, and Maureen W. Vokey of Chatham all will be missed. Two new members have joined the board: Fred Dunford of Brewster and Kathleen Wesp of Harwich.

## Horseshoe Crab Study Breaks New Ground

By John Kelsey

The horseshoe crab study commissioned by Friends of Pleasant Bay is in its second year. In January, the researchers from the Boston University Marine Program at Woods Hole, under the direction of Dr. Ivan Valiela, gave the Board a presentation of results to date. These preliminary results are very encouraging.

The initial literature search, started in the fall of 2000, proved to us and the general public what professional scientists have been saying from the beginning: There really isn't enough known about the population of this curious creature for us to knowledgeably manage its future. The search basically justified the remaining study.

Fieldwork began in May and went on through the summer. Lead researcher Ruth Carmichael and Debbie Rutecki became familiar sights out on the Bay in the boat provided for their use by board member Tony Davis.

New ground was being covered from the start.

For the first time, data were being collected on the whole population of crabs from a single estuarine ecosystem. Previous studies have been limited to adult crabs only, during spawning season, on single beaches.

With the FOPB-sponsored work, accurate data have been gathered for the first time on sex ratios, abundance, size, and density for a whole population, including mature and immature animals. As reported originally by Ruth at FOPB's annual meeting last summer, the estimated population of adult crabs in the Bay is approximately a half-million --- orders of magnitude greater than some dire estimates that had been given currency in local newspapers. This tally of 500,000 crabs is in addition to the abundance of juvenile crabs. The juvenile-crab data are currently being tabulated.

The population estimate of 500,000 was derived from sampling at 105 sites throughout the bay, and after the FOPB annual meeting, the researchers revisited selected sites to confirm their findings. Dr. Valiela said in January that the population estimate is accurate to within plus- or minus-two percent.

Laboratory analysis started in the fall and has focused on updating data, preparation of explanatory diagrams and charts, identification of age classes, and analysis of growth rates for juvenile and adult crabs. Additional study of the data will reveal a very accurate scientific picture of the Pleasant Bay horseshoe crab population. In the fall of this year the researchers will summarize their findings in a presentation to the Friends of Pleasant Bay and the general public, as well as in three papers which will be submitted for peer review and publication in scientific journals.

The data are so impressive that a natural follow-up study presents itself. The Board has not yet secured all of the funds necessary to cover the current study but is now considering a second phase. Ultimately, what are called stage-based matrix models could be applied to the data to estimate population growth and help us understand how the population responds to outside pressures such as

harvesting. The model could, for example, be used to determine what catch limits to apply over a season to maintain a population at a chosen density. The application of this model could extend to populations of crabs elsewhere on Cape Cod or even to populations world-wide. Thus the FOPB-sponsored study by the Boston University Marine Program could be not just a major step forward in responsible stewardship for our bay, but a potential breakthrough in marine conservation efforts wherever horseshoe crabs are found.

## Dunford, Wesp Join Board

We are pleased to welcome two new members of the board of Friends of Pleasant Bay. They are Fred Dunford of Brewster, and Kathleen Wesp of Harwich, and each adds another intriguing perspective to the board's work, particularly to the various educational efforts that are among FOPB's top priorities.

Fred is interim director of education at Cape Cod Museum of Natural History and an archaeologist. He was awarded his Ph.D. from the University of Massachusetts at Amherst last September, and this summer will mark his 20<sup>th</sup> anniversary at the Museum. His 1997 book, "Secrets in the Sand: The Archaeology of Cape Cod," co-written with Greg O'Brien, is a compelling account of the First People of Cape Cod, the hunter-gatherers who were the original settlers of the land we all call home.

One of the pieces to the puzzle of the Cape's prehistory emerged from Fred's investigation of a shell midden on the south side of Pochet Neck on Pleasant Bay, where he uncovered details about the lives of the Monomoyick tribe that lived there between 3000 and 800 years ago. "That original research in 1991 was supported by a very generous grant from the Friends of Pleasant Bay," notes Fred. "So it is great to be on the board and maintaining that close connection between the Friends and the Museum."

Kathy is a retired teacher with a special interest in outdoor education and an abiding love of Pleasant Bay and of sailing on its shallow waters. Here's how she tells the story:

"Family, friends and Pleasant Bay, that's how it started thirty-seven years ago. My parents, and family friends, bought adjoining lots off Route 39. There was an ancient way that formed a boundary to our family lot. It led into the woods just east of the house. We followed it about a mile to reach Round Cove, and that was the beginning of my interest in Pleasant Bay. Boating, clamming, swimming, walking, all in and around Pleasant Bay.

"In time, good friends were made through 18 years of sailing on the bay, at Chatham Yacht Club, and later, Pleasant Bay Cruising Club. My husband John, sons Bart and Dan, as well as our daughter Mary, all perfected sailing skills on Pleasant Bay. It was the obvious place for us to retire to after teaching a collective fifty-six years. John and I both left the classroom the same day in June 1998.

"My teaching was in the primary grades, which also included certification to teach outdoor education in day use and residential locations at Long Island's state parks and national seashore. One of our activities received New York State recognition as a cooperative venture with students, parents, and state conservationists.

"Now, being a part of the Friends of Pleasant Bay adds to the wonder of it all."

## FRIENDS OF PLEASANT BAY

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## Friends of Pleasant Bay

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**Check Out Our New, Improved Website:**  
<http://www.fopb.org>

Thanks to Roy Terwilliger, Don Cameron and Marie Gould for their fine work on the website.

We welcome feedback on this newsletter, and invite members to contribute to the next issue coming in July.

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