

The Watershed

Vol. 7, No. 2

The Oyster Pond Environmental Trust Newsletter

Summer 2003

OPET, P.O. Box 496, Woods Hole, MA 02543-0496

OPET Officers and Directors Elected for the 2002/2003 Term

Officers

Jonathan Davis
President

Eric Davidson
Vice President

Patricia Kerfoot
Clerk

Dana Rodin
Treasurer

Directors

John Dowling

Susan Gagosian

Cameron Gifford

Melinda Hall

Jason Hyatt

Robert King

Peter Valtin

Martin White

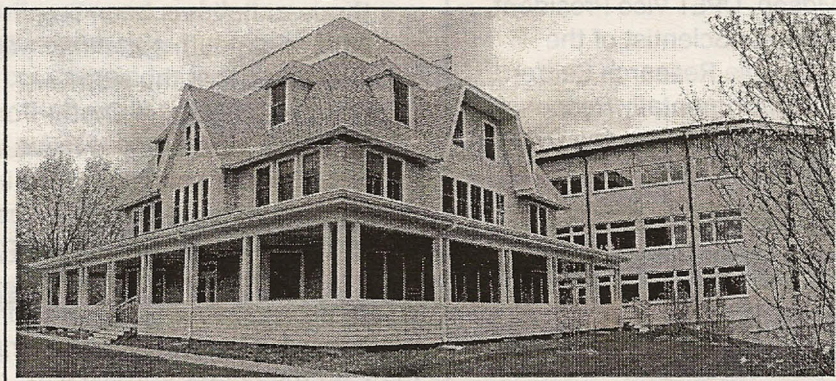
Honorary Boardmember
Robert Livingstone

OPET Board meetings are open to all OPET members. Meetings are usually held on the third Sunday of the month, at 4 pm in the Treetops Clubhouse.

We'd love to have you come! For information call 508-540-7345.

OPET does not have an official phone, but you can leave a message at 508-540-7345. We'll gladly get back to you!
Or e-mail opus132@rcn.com or brose@cape.com. And do visit our website, www.opet.org.

The Woods Hole Research Center to Host OPET's Annual Meeting Special Building Tour for OPET Members



OPET's annual meeting will be held at the new Woods Hole Research Center (WHRC) building, 149 Woods Hole Road (across the street from Treetops), on Thursday, July 17. All OPET members are invited and encouraged to attend. In order to conduct a tour of the building while there is still some natural lighting, the agenda of the meeting this year will be a bit different from previous years:

6:30 – 7:15 PM: Guided tours of the building for OPET members. Gather on the front deck of the WHRC building 7:00 – 7:30: light hors d'oeuvres will be served on the deck.

7:30: Meeting begins in the conference room, lower level of the building.

(Continued on page 2)

PROFILE: Bob Livingstone, OPET Founder

Made 117 drags and caught
127,000 pounds of haddock
(does not include whiting,
halibut, skates, flounders etc.)
and measured 63,000+
haddock and 72,000+
whiting...

So reads an entry from Bob Livingstone's journal dated August 3, 1956, written aboard the Albatross III shortly after Bob's arrival in Woods Hole, from Newark, Delaware, at an invitation to join the Groundfish Group and John R. Clark's Haddock Investigation. Bob may not have known it at the time, but he had found what was to be his home for the next 47 years (and counting!), as he pursued a career at the National Marine Fisheries.

In 1957, Bob and his first wife

Francis bought a home at 1 Fells Rd. on Oyster Pond, where they raised 3 sons and a daughter. By 1995, after moving first to Treetops and then to Nobska Road, Bob was already deeply involved in the concerns and science of Oyster Pond. Some brown-bag lunch sessions in WHOI's Redfield Building, back in the mid-eighties, gathered folks with varying fields of expertise to discuss the changing water quality of Falmouth's coastal ponds. Out of these discussions

(Continued on page 4)

(ANNUAL MEETING...Cont. from page 1)

- Welcome by Dr. George M. Woodwell, Director, The Woods Hole Research Center
- OPET annual business meeting for all members
- Presentation by Dr. Eric A. Davidson, OPET Vice President, and Senior Scientist of the Woods Hole Research Center: *"An Environmentally Responsible Institution within the Oyster Pond Watershed"*

The Woods Hole Research Center (WHRC) moved into its new, energy efficient, environmentally friendly, "green" building in March. The WHRC conducts scientific research and policy assessments on the important environmental topics of our times, including global warming, deforestation and reforestation, energy, and pollution.

The new building is meant to serve as a statement and an example of how organizations and individuals can live and work effectively and comfortably, while also being cognizant of the consequences of their actions on the environment. About 1/3 of the building's electrical consumption is currently generated by solar panels. Additional energy is derived from a groundwater source heat pump for heating and cooling the building. A denitrification system treats the wastewater, removing nitrogen before it enters the groundwater that feeds Oyster Pond.

These and other features of the building will be described in the special tour of the building for OPET members and in Davidson's presentation.

Salinity Debate

Long-time readers of The Watershed know that one of OPET's main concerns in maintaining the health of Oyster Pond is salinity regulation. The weir that was constructed in 1998 has been successful in this regard: Oyster Pond's salinity is now relatively uniform at 2.4 ppt (parts per thousand). It has been suggested by Falmouth's shellfish warden, however, that the alewife population spawning in Oyster Pond might enjoy greater reproductive success at lower salinities, even in freshwater; the flip side is that residents around the pond are concerned that fresher water may result in overgrowth of algae or coontail (the plant that has formed large mats on the pond's surface in recent years). To provide some context for management decisions regarding Oyster Pond, the OPET board hired Deborah Rutecki, a recent graduate of the Boston University Marine Program (B.U.M.P.), to conduct a literature search on the effects of varying salinity on alewife reproduction and on vegetation found in Oyster Pond. Her report can be found in full on OPET's website; here we summarize some of her findings.

First, she found that most research on alewife reproduction has been conducted on landlocked populations, and hence its applicability to Oyster Pond is unknown. That being said, alewife eggs have been reported at salinities of 0-3 ppt, while peak larvae abundance has been reported as occurring at either 1-5 ppt or 0-3 ppt, depending on the study. However, other environmental factors also influence egg and larval success, notably temperature. Although most of the literature reports reduced incubation time with increasing temperature, others report an optimal temperature of 20.8 C (69.4 F), with

29.7 C (85.5 F) being lethal for the eggs. Also, alewives lay their eggs in water as shallow as 15 cm: water this shallow would be at the edges of Oyster Pond, where the water may be fresher than the average 2.4 ppt. The combined effects of temperature and salinity are apparently not reported; and of course the temperature of Oyster Pond cannot be controlled in the same way salinity can.

As far as plant salinity tolerances go, a 2001-2002 study by the Marine Ecology class of B.U.M.P. found that most of the aquatic vegetation in Oyster Pond tolerates a rather broad range of salinity, while species located slightly inland from the pond edge (e.g., *rosa rugosa*) have lower salinity tolerances. "*Ceratophyllum demersum*," the coontail species mentioned above, can survive in salinities ranging from 0 to 6.5 ppt, but it requires a minimum temperature of 20 C (68 F) to grow, as well as high levels of inorganic nitrate: indeed, in 2002, the "*C. demersum* biomass increased with increasing wastewater nitrogen load..." in Oyster Pond. There is also concern that reducing the salinity of Oyster Pond to 0 ppt (freshwater) could result in a blue-green algae bloom with harmful consequences for the pond's ecological health.

The take-home message from this review of the scientific literature is that many different factors affect the success of fish and plant populations in habitats like Oyster Pond. Clearly, not enough is known about alewife reproduction and submerged weed growth to say with confidence how varying the salinity of Oyster Pond will affect them. Most scientific studies on these topics consider salinity ranges well beyond the relatively narrow range of 0-3 ppt that Oyster Pond usually

experiences. The results of scientific studies in coastal ponds also seem to be idiosyncratic, applying to the nearly unique conditions of each pond.

This conclusion leaves us with a stark choice between two options: (1) continue to manage the pond's salinity at about 2 ppt or lower, depending on the decision of the Falmouth shellfish warden, and hoping that we are doing the right thing; or (2) attempt to sponsor and promote research specifically on the salinity of Oyster Pond. This is one of the

reasons that we are asking OPET members to fill out a survey on priorities for OPET. Spending money on research on the effects of salinity on coontail growth, for example, means that there will be less money for land acquisition, education outreach, and so forth. The resources of OPET, alone, are probably insufficient to support the depth and breadth of scientific research needed to clarify the salinity management issue, but OPET could provide important seed money that would facilitate acquisition of additional research grant

money. The OPET board of directors seeks your input as to where research on how pond salinity, fish, and aquatic weeds fits into your list of priorities for OPET resources.

Mindy Hall

Salinity and Water Temperature Readings, Oyster Pond, Winter-Spring 2002

Between mid-January and mid-June of 2002, I collected 31 samples at the weir and 24 from the dock at Sphor's Garden. Water temperatures were recorded in centigrade; salinity samples were taken to Prof. Valiela's MBL laboratory where salinity was determined by Marci Cole of Boston University's Marine Program.

At the weir salinities ranged from 2 to 28 ppt (parts per thousand) and averaged 5.3 ppt.. (see sidebar). At the Sphor's Garden dock salinities ranged from 1 to 5 ppt and averaged 3.8 ppt.

Water Temperatures were generally similar at both locations from a low of 6°C in mid-January to 25°C by mid-June.

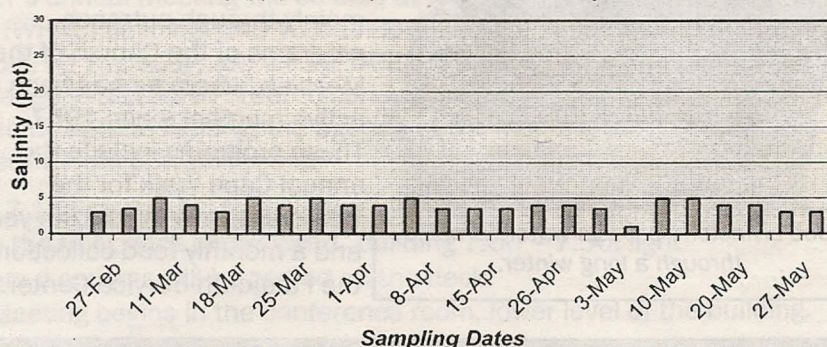
I collected these samples for two reasons. I thought OPET needed more data from a time of year when the "spring bloom" or period of biological productivity was beginning for phyto and zoo plankton, underwater vegetation, and the spring spawning of fish species especially alewife (herring).

The other reason was to collect salinity data for Paul Montague, Town Shellfish Warden (also in charge of herring runs). Paul believes the salinities for spawning alewife should be 0 to 2 ppt, somewhat lower than the salinities I collected (see above).

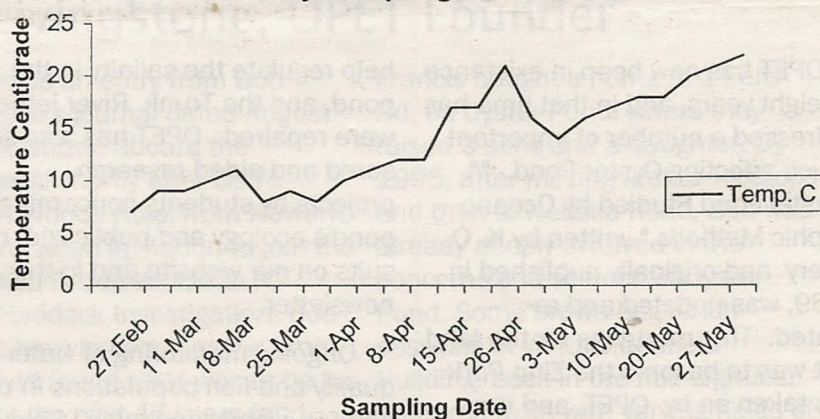
OPET has now started a literature search to help answer this question about the need for such low salinities which probably favor the over production of underwater vegetation. Perhaps the data I collected, though seemingly high, will add to our knowledge about the "spring bloom" time of year in Oyster Pond.

Robert Livingstone III

Salinity (ppt) at the Sphor's Garden Dock Oyster Pond 2002

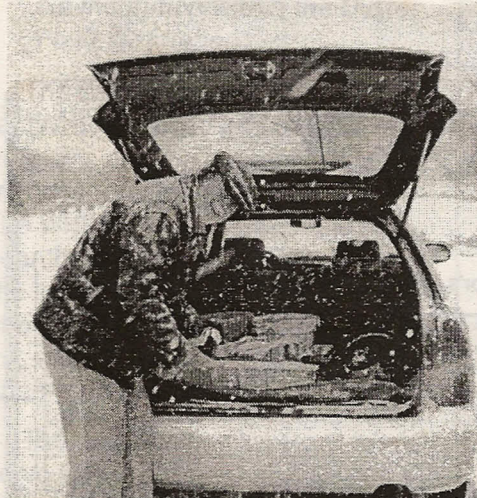


Water Temperatures at Sphor's Garden Dock OP by Sampling Date 2002



(LIVINGSTONE...Continued from page 1)

grew the Pond Watchers Project, and, eventually, OPET. Today Bob prefers to be an "honorary" rather than regular boardmember because, at the age of 82, he doesn't want to feel too guilty if he misses an occasional board meeting. But Bob's dedication to the pond is unwavering: last winter, in the middle of one of our many severe snowstorms, I came across Bob

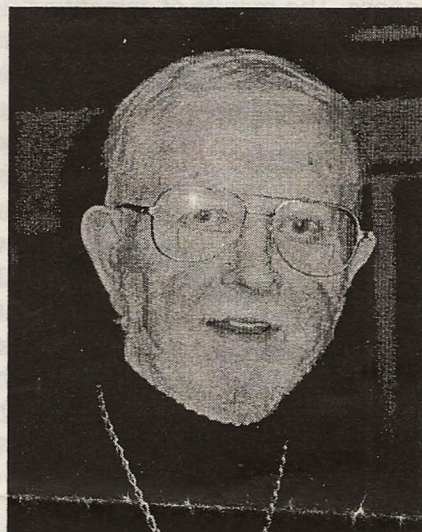


Bob Livestone collects water samples through a long winter.

taking pictures down by the weir!

Bob has had a colorful career, his undergraduate schooling at Oregon State University interrupted by World War II and three years of service in the U. S. Army, including 9 months in the 4th Infantry Division in "The Battle of the Bulge." After finishing his B.S. at Oregon State (where he was a member of the Phi Gamma Delta Fraternity), he pursued graduate studies for two years at the University of Washington School of Fisheries. Bob has had a long-standing interest in conservation issues, and has been an avid birder since his days in Oregon.

Besides being an invaluable knowledge resource in OPET matters – he is our resident fish expert – Bob is active in the community in other ways as well, mainly through outreach programs of the Church of the Messiah, where he has been an active member since 1957. These programs include the annual Cape Walk for the Homeless, now in its 18th year, and a monthly food collection for the Falmouth Service Center.



Somehow, Bob also still finds time to play a little tennis (this is how he met his current wife Laura), practice digital photography, and enjoy music, especially jazz. Between the two of them, Bob has 8 grandchildren and Laura has two. With all of Bob's other interests, we are grateful that he continues to make time for Oyster Pond projects!

Mindy Hall

OPET Survey Seeks Input from Members

OPET has now been in existence for eight years, and in that time has addressed a number of important issues affecting Oyster Pond. "A Coastal Pond Studied by Oceanographic Methods," written by K. O. Emery and originally published in 1969, was updated and reprinted. The mortgage for the land that was to become the Zinn Park was taken on by OPET, and the mortgage was subsequently paid off. The weir was constructed on the pond side of the culvert at the southern end of Oyster Pond, to

help regulate the salinity in the pond, and the Trunk River jetties were repaired. OPET has also sponsored and aided research projects by students concerning the pond's ecology and publicized results on our website and in this newsletter.

Ongoing monitoring of water quality and fish populations in the pond is clearly desirable. Beyond that, however, there are many possibilities for investing the resources of OPET, and at this juncture, your

boardmembers seek your input on prioritizing these issues. To that end, we have included a survey on the back of your membership renewal form, and ask that you return it to us in the return envelope. Please feel free to include additional comments on another piece of paper. Replies will be most helpful if received by the end of the summer, when the new OPET boardmembers for year 2003-2004 begin their work; however, a late reply is preferred to none at all! Thank you for your input.