
Photo: Pieter Beck

PRESERVE • RESTORE • PROTECT •
Falmouth WATER Stewards

MESSAGE FROM THE PRESIDENTS

By Cheryl Holdren and Deborah Siegal

"Climate change, once considered an issue for a distant future, has moved firmly into the present," says the U.S. National Climate Assessment (released May 2014). In 2014, both the US and China agreed to establish targets for the reduction of greenhouse gas emissions. By mutually agreeing to curb emissions, both countries acknowledge their contributions to the problem of climate change and to the solution.

Why are we writing about this? Why is the agreement significant to Falmouth, and Falmouth Water Stewards? First, reducing emissions of heat-trapping gases such as CO_2 is crucial to combatting perhaps irreversible global climate change. Second, since China and the U.S. are the world's largest emitters, reduction of emissions will have a direct impact on global levels of the gases and the indirect, but critical, effect of setting an example for other developed and developing nations to follow suit. Third, coastal communities like ours are particularly vulnerable to certain effects of climate change, including rising sea level (which will greatly alter coastlines and have severe economic consequences), increased ferocity of storms (with resulting property damage, loss of life, and shoreline erosion), and both warming and acidification of ocean waters.


Bloom of macroalgae in Cape Cod National Seashore. *Photo by Chris Waldron, USGS MA-RI Water Science Center.*

These changes can lead to a cascade of other ill-effects. For example, warming water temperatures are related to increases in algal blooms, in both fresh and salt waters. Algal blooms, which are increasing in numbers around the country, are not simply unsightly or smelly, they can contaminate drinking water and poison shell-fish and fin fish. Blooms of certain algae, such as the red-tide algae, threaten fisheries, marine mammals, and human health.

Here in Falmouth, we have seen both freshwater and salt water bodies choked by excessive algal growth. In many cases, algal blooms are associated with increased nutrient (nitrogen and/or phosphorus) runoff from septic systems, fertilizer applications, stormwater, and livestock operations. Algal mats, often visible in our estuaries, reduce the amount of sunlight necessary to sustain eelgrass beds, which serve as nurseries for shellfish and juvenile fin fish. Algae are short-lived and when they die back, bacterial populations increase, leading to lower dissolved oxygen in the water, which threatens the survival of fish and other aquatic organisms. Effects of climate change are likely to only worsen these problems.

Continued on p. 7

IN THIS ISSUE

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Mission

Falmouth Water Stewards' mission is to educate and inspire citizens to preserve. protect and restore Falmouth's bays, salt ponds, estuaries and fresh waters, and to advocate for healthy water bodies.

Administrator & Editor

Jill Holdren

The FWS Newsletter is published twice a year and is available in PDF format on our website. Sign up for electronic delivery by writing to:
info@facesfalmouth.org.

NATURALIST'S CORNER: Where have all the Robins Gone?

By Priscilla Moor

Photo by Tomas Castelazo

Where had all the Robins gone? I realized I had not seen any Robins for weeks. Maybe the worms they fed on were missing too. Perhaps the worms were missing their food source too. The drought this summer could be the problem.

The live "Christmas " trees planted as ten inch youngsters and now of ten, eleven, or twelve years of age were yellow and missing their needles. Wintergreen, wild blueberries, and Huckleberries were dried up on their branches. I noticed that I could not get a shovel tip into the garden path edge — it was hard as cement. The chipmunks, though, were delighted, for they could live under this hard path area, moving easily from one bird feeder or tomato bed to another. They were concealed from their enemies, popping up wherever they wished by gnawing small holes in the one to two inch thick hard surface.

How had this drought affected the ability of Robins to find food from the lawns? Perhaps the Robins could not hear their prey through the dried up hard packed lawn. And if they did, how would they capture them? The worms had already descended deep into the earth where more moist soil rich with organisms could be found. I wonder about all the lawns being watered everyday? I cannot say that I have seen those lawns thick with Robins but this is but another question.

Skunks too were unable to dig their endless surface holes looking for grubs and worms. And perhaps the squirrels could not find as many acorns this drought period. Acorn numbers were also impacted by a small wasp that was attacking the Black Oaks and killing them. The squirrels became more dependent on the black oil sunflower seeds and the bird bath water. Rabbits seemed to be more scarce but perhaps the flowers that the rabbits loved were all dried up. The animal paths to the birdbaths became more pronounced.

Finally, in late October the rains returned. The first Robin showed up, where else but taking a bath! He was, however, of a dark red and black variety, which often indicates a newcomer migrating from the North to try to find a wintering habitat. Many of these Robins had switched from ground food to Cedar, Holly and other late fall bush berries. But where had our spring/summer visitors

Continued on p. 7

Join FWS Today!

Falmouth Water Stewards, formerly FACES, is a 501c3 non-profit organization that is mainly supported by member dues and donations from neighborhood associations, community organizations, local businesses, and concerned citizens.

Please renew your membership or join FWS today so we can continue to work to protect, preserve, and restore our fresh and coastal waters. Or, donate in any amount to help us fulfill our mission.

Membership Dues

Student	$5
Individual	$20
Family	$25
Organization	$40
Supporting	$50
Benefactor	$100

Dues or donations in any amount may be sent to:

Falmouth Water Stewards
PO BOX 156
Falmouth, MA 02541

Or pay or donate online:

www.facesfalmouth.org

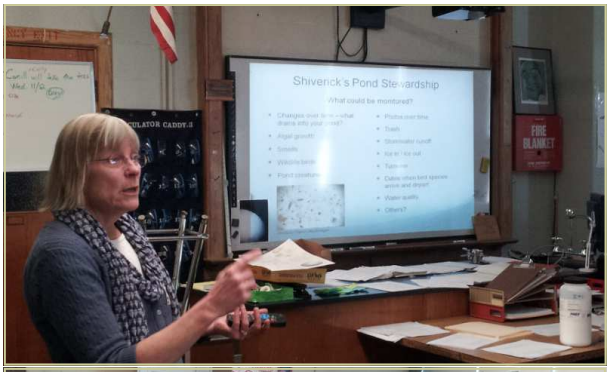
Thank you for your generous support!

Donations and dues to FWS are always tax-deductible.

FWS WORKS WITH LAWRENCE STEM CLASSES

Under the guidance of Lawrence science teachers Kristin Tribou, Derrick Zarra and Bob Heller, the 8th grade STEM (Science, Technology, Engineering and Math) classes at Lawrence School are developing a stewardship project focused on Shiverick's Pond, the pond adjacent to the school.

While science classes at Lawrence have been collecting data on various aspects of the pond's health for many years, this year, the classes decided to expand their efforts to include a series of educational signs placed around the pond to inform visitors to the pond about local waterways and the organisms they support, the threats they face, and steps each one of us can take to protect them.



Top: FWS Board Member Patty White talks to Lawrence STEM students. Bottom: 8th grade STEM students ham it up for the camera.

Falmouth Water Stewards (FWS) has been interested for some time in finding ways to work with kids and schools on water issues. When Lawrence's STEM teachers contacted us, we were eager to get involved. Board member Patty White, a geologist who has been working for over 20 years on the assessment and management of contaminated sediments in rivers, estuaries and bays, and who is herself a former high school science teacher, went to the classes and gave a lively presentation on water issues in Falmouth covering topics ranging from how a septic system works to eutrophication, permeable reactive barriers, composting and urine-diverting toilets, and stormwater runoff. She also shared our 'Keep It Blue' Stormwater education materials and even lugged in one of the Keep It Blue Campaign signs we posted at beaches all around town last spring.

FWS looks forward to continuing to work with Lawrence on their water stewardship project and hopes to develop projects in conjunction with other schools in town.

If you're an educator, student or parent at a local school and want to talk to us about potential projects or simply arrange to have us come talk to your class about local water issues, we'd be delighted to hear from you. We are happy to work with you to tailor our presentation to fit your needs, interests and timing. To learn more, send us an email to info@facesfalmouth.

RIVER HERRING ON CAPE COD: Will learning about the babies help us save the species?

By Martha Hauff and Joel Llopiz

Ask a Falmouth old-timer about river herring and he or she is likely to regale you with tales of fish migrating in the spring in such great numbers that they filled up streams (like the aptly named Herring Brook) from bank to bank. According to lifelong residents, the fish were often so abundant they could be scooped up by hand! Nowadays the story is quite different. River herring have experienced dramatic declines in recent years, not just on Cape Cod but throughout their native New England range, with 2014 populations at a mere 1% of historic sizes. Moratoriums on the harvesting of river herring have been in place since 2006 in Massachusetts, yet there is still little evidence of recovery. The situation is so dire that scientists and conservationists have petitioned to have river herring included as threatened species under the Endangered Species Act.

So why are the river herring of New England in such trouble? To understand the problem fully, we must examine the biology of the fish themselves. "River herring" is actually a collective term that includes two similar-looking species, the alewife (*Alosa pseudoharengus*) and the blueback herring (*A. aestivalis*). These species of fish are both anadramous, meaning that they migrate annually between salt and fresh water. Most of the year, river herring are offshore, cruising around the ocean with their relatives, the Atlantic herring (*Clupea harengus*) in large schools. However, each spring they are overcome with an urge to reproduce, at which point they split from their purely oceanic cousins and head for the coast. They move into estuaries and make their way up through the salt marshes into freshwater streams, seeking out suitable spawning sites. For a river herring, an ideal spawning site is one in which its babies will have the optimal chance of survival. A pristine freshwater pond fits the bill—it is protected, it is free from many of the dangerous marine predators that would quickly gobble up any tiny eggs or newly hatched herring larvae, and it also offers a rich feeding ground full of microscopic crustaceans on which the herring larvae can prey.

Alewives and bluebacks make their way up the Coonamessett River in April 2014. Can you tell which is which? *Photo by Andy Jones.*

Once the adults have spawned they leave their offspring behind and swim back out to sea. The babies remain in the inland ponds and streams for the duration of the summer, feeding and growing until finally making their first migration to the coast in late fall. If they are lucky, the surviving young herring will reach the ocean before cold temperatures set in and the ponds and streams ice up.

Given the wide range of habitats that they occupy over their lifetimes, river herring have very wide-ranging economic and ecological importance. They are critical components of several different food webs in marine, estuarine, riverine, and lacustrine (lake) ecosystems. Moreover, because of their cosmopolitan nature, they are particularly vulnerable to many diverse human impacts throughout their migration pathway.

The causes of continued recent declines in both species of river herring are not well understood, but the start of the drastic decrease seems to have coincided with intense offshore harvesting by foreign fishing fleets that came into North American waters in the 1960s and 1970s. Since then, multiple measures have been taken in an effort to stimulate recovery, yet these fish seem unable to bounce back. Various factors may be responsible for the continued decline or lack of significant recovery of river herring in Massachusetts. These include offshore commercial fishing and incidental bycatch (meaning that herring are often caught inadvertently when fishers are targeting other species).

Another major concern is the widespread degradation and obstruction of spawning habitat. Pollution, dam building, and development have compromised (if not destroyed) many of the streams and ponds that herring rely on in order to

Continued on Page 6

UPDATE ON TOWN WATER QUALITY ACTIVITIES *By Virginia Valiela*

With passage of a $49 million bond last May, the Town of Falmouth has moved quickly to implement the various water quality projects approved:

- Design of a wastewater collection system for the residential areas in Maravista and Falmouth Heights surrounding Little Pond.
- Design for two new lift stations, one near the Falmouth Mall, and one behind the Teaticket School.
- Upgrade of the Wastewater Treatment Facility including two new sand filter beds for discharge of treated water.
- Upgrades to the collection system in Woods Hole, installed in about 1950.

The design packages were submitted to the MA Department of Environmental Protection by the October 15th deadline for applications to the State's 0% Revolving Loan Fund. Falmouth has met the requirements for a 0% loan, which will save $1 million a year in interest payments. The Town is now waiting for the State's review and approval of the design plans before going out to bid in the January/February timeframe. Construction should start in April.

The approved bond also funded a $5 million project to widen the Bourne's Pond Inlet from 50 feet to 90 feet. The Town has contracted with GHD Engineers to begin the preliminary design and start coordinating with the various permitting agencies that will be involved. The design and permitting will take about a year.

In the meantime, the second year of the three year Aquaculture project in Little Pond is drawing to a close. Data have been collected all summer long on the quality of the water in Little Pond and the growth of the oysters. These oysters will soon be relayed out of Little Pond to other water bodies (e.g., Quissett, West Falmouth Harbor, Green Pond) where they will grow from the current 2" size to 3" or more, at which time they will be legally harvestable. The oysters from the 2013 relay (the first year of the project) have already been harvested. There were no problems with the 2013 relay.


West Falmouth Harbor. Photo by Jeff Williams

As part of a comprehensive review of water quality status, the Water Quality Management Committee is now beginning a review of all the other estuaries in Town, beginning in North Falmouth with water bodies connected to Buzzards Bay. Then the remaining water bodies on Nantucket Sound will be reviewed, ending up with Waquoit Bay. Falmouth "shares" the watershed of Waquoit Bay with Mashpee and Sandwich. Plans for improving water quality in this area will involve a commitment by the Boards of Selectmen to work together in developing a plan and a schedule. This future plan will also be shaped by the Section 208 Cape Cod Area Wide Water Quality management Plan being developed by the Cape Cod Commission and the MA Department of Environmental Protection. We'll have more on that in a future newsletter.

Falmouth has been awarded a $250,000 grant in partnership with the Buzzards Bay Coalition. The grant from the Southern New England Coastal Watershed Restoration Program will fund a study to reduce nitrogen inputs to West Falmouth Harbor from approximately 20 homes close to the Harbor by installing and monitoring innovative/alternative septic systems (I/A systems). Each home will receive a $10,000 incentive to install an approved I/A system or eco-toilet.

The water quality in West Falmouth Harbor is close to meeting the total maximum daily load limit of nitrogen. Part of the grant will fund water monitoring to see if the I/A systems reduce sources of nitrogen close to the Harbor and improve water quality. The Water Quality Management Committee and the Dept. of Public Works will oversee the project. Anastasia Karplus of ScienceWares, Inc. will do the fieldwork. The Buzzards Bay Coalition will provide outreach and in-kind services.

BECOME A PONDWATCHER

The Falmouth Water Stewards Pond Watch Program performs weekly water quality monitoring at fifteen ponds around Falmouth. Program volunteers measure dissolved oxygen, water temperature, salinity and turbidity. The data are reviewed and consolidated by Dr. Chris Weidman of Waquoit Bay Estuarine Research Reserve (WBNERR) and published each week in the Falmouth Enterprise.

FWS (then FACES) initiated the Program in 2006 in an effort to stimulate public interest in protecting our waters by making information about their health available to the public.

Salt Pond, Falmouth. *Photo by Jill Holdren.*

In addition to increasing public awareness, Pond Watch provides important information to the scientific community on changes in water quality over time.

The Pond Watch Program is always looking for new volunteers. Volunteers work in teams and collect samples once a month for a couple of hours on a Monday or Tuesday morning. It's a great opportunity to get to know Falmouth's beautiful ponds, meet new and interesting people, and make a difference.

If you would like to get involved, or simply learn more about the program, please contact Ted Schmuhl at (781) 929-9803 or teds@cape.com, or contact FWS staff by emailing us at info@facesfalmouth.org.

SHARE YOUR STORIES!

Tell us about your connection to your favorite bay, pond, saltmarsh or stream!

We all enjoy and benefit from Falmouth waters in different ways. Whether it's a vernal pool that appears in your neighborhood every spring, a special kayaking spot, a really good fishing hole, a favorite cove you sail to, or your dog's preferred swimming pool, tell us about it!

You can share your thoughts, experiences and photos by email: info@facesfalmouth.org or snail mail: PO Box 156, Falmouth, MA 02541. If you like, we'll include them in a future newsletter.

HERRING *Cont. from p. 4*

reproduce each year, and with the destruction of this crucial habitat, reproduction is severely impaired. Up to now, population restoration efforts have largely focused on removing obstructions in freshwater streams in order to allow spring migrating herring to access their spawning habitats. Yet, while increasing adult herring access to spawning sites is crucial to recovery, any factor that impacts the survival of the larvae and juveniles—even ever so slightly—can also have substantial effects the population as a whole. In other words, while it is right for us to be concerned about the ability of adult herring to find safe passage to their spawning grounds, it is also important that the baby herring find themselves in a location in which they can thrive.

Although some basic biological information is known about the larvae of alewives and blueback herring, scientists argue that we need to find out much more about the factors that actually influence the growth and early survival of these species. To this end, researchers at Woods Hole Oceanographic Institution are beginning a new investigation into these exact questions. This coming spring they will be collecting herring larvae from local ponds to assess their health, their growth rates, and to try to gain some insight into what might be done to improve survival during this very vulnerable phase in the herring lifecycle.

If you'd like to learn more about this work, or about river herring in general, stay tuned and join us in the spring . . . we'll have our second annual "River Herring Walk and Talk" in April, a free FWS event at which local fish biologists and herring experts will offer insight as we stroll along the Coonamessett River in search of any intrepid herring that might be making their way up stream. We hope to see you there!

NATURALIST *Cont. from p. 2*

Red-breasted Robin. *Photo by Dakota Lynch, Wikimedia*

gone? Probably they left early for the south and water and lawns full of worms. And where had all the worms gone? With the rains coming, the lawn and edges looked full of the worm hills (casts) we see in April and May. The worms were beginning to aerate the soil. The worms it seemed had managed to migrate vertically up and down in soil and lived through the drought. The seasonal Robins were lucky for they could fly away to habitats with better water supplies and food.

Once again, the rest of us animals are completely dependent directly on clean drinking water and indirectly on food produced in clean water areas. Unfortunately, we cannot simply fly away or dig deeper to find a new place to live — we must protect and preserve the places we inhabit.

CLIMATE *Cont. from p. 1*

Falmouth (and Cape Cod) are economically dependent on our beaches, on commercial and recreational fishing, and on a special sense of place to attract tourism and businesses. And certainly, healthy waters and coastline are important to all of us who make our homes here.

As we confront the increasing threats to our waters posed by nutrient pollution and climate change, it's important that we consider what steps we can take both as a community and as individuals to reduce our contributions to both of these problems and protect this place we call home.

This is a first installment of a series on climate change and what it means to our precious resources and town. In the next installment, we'll investigate what plans Falmouth, other Cape towns, and the Cape Cod Commission have developed and are implementing.

In the meantime, each one of us can take actions that impact our carbon and nitrogen footprints, from turning off lights and using our cars less, to buying energy efficient appliances.

On that note, we hope you will join us in February for a showing of the inspiring short film series, "Young Voices for the Planet", which features young people taking matters into their own hands and finding creative and effective ways to combat climate change. More details on the film series can be found on the last page of this newsletter. Stay tuned for time, date and place details!

WATER TALKS

If your community organization, business, neighborhood association or school is interested in learning more about what's going on with Falmouth's fresh and salt water resources and what you can do to protect them, contact Falmouth Water Stewards and we'll come talk to your group about the issues and the solutions.

Keeping Falmouth's waters blue and Falmouth a vibrant coastal community depends on all of us.

Falmouth's Water: KEEP IT BLUE

Get informed, get involved and do your part to keep it blue!

CONTACT US at info@facesfalmouth.org.

JOIN US IN FEBRUARY

Photo by Arturo de Frias Marques, Creative Commons

for a showing of the film series *Young Voices for the Planet* and a discussion with **Lynne Cherry**, the films' producer and director, and award-winning author of *The Great Kapok Tree, A River Runs Wild*, and numerous other acclaimed children's books. The series of short films feature young people around the world who are taking matters into their own hands to combat climate change, from planting a million trees to putting solar panels on their school. Stay tuned for details.

GIVE A GIFT FWS MEMBERSHIP

From now until December 31st, members of Falmouth Water Stewards can purchase $5 gift memberships for friends and family who want to protect Falmouth's ecological and economic vitality. Sign up on the enclosed form or online at:

www.facesfalmouth.org