

Great Bay

MATTERS

*Promoting research, education
and stewardship throughout
the Great Bay Estuary*

GET TO KNOW GREAT BAY



TWENTY
GALLONS OF WATER FILTERED
PER DAY BY A SINGLE OYSTER



2004 BELLAMY IV DAM
REMOVED,
OPENING UP
A QUARTER MILE
OF FISH HABITAT

8,671



NUMBER OF INVASIVE PLANTS REMOVED USING
GBNERR TOOL LOAN LIBRARY IN 2012

PARKING LOTS



source of half the
salt entering
freshwater
streams



2,995



total GBNERR
volunteer
hours in 2013

90,000 EGGS A FEMALE
HORSESHOE CRAB
CAN LAY EACH
SEASON



42%

increase in nitrogen levels in
the estuary in the past 5 years

5,802

HOURS SCHOOL GROUPS SPENT
AT GBNERR DURING
2013 FALL PROGRAM



60% GREAT BAY WATERSHED COVERED BY FORESTS



GBNERR Projects



Great Bay National Estuarine Research Reserve (GBNERR) is an estuary comprised of 7,300 acres of tidal waters and 2,935 acres of coastal land. Acquired through land purchases and conservation easements, GBNERR was designated on October 3, 1989 to be preserved for the purposes of education, research, and resource protection.

GBNERR

Manager: Cory Riley

GREAT BAY DISCOVERY CENTER

Education Coordinator:
Kelle Loughlin

GREAT BAY STEWARDS

President: Jack O'Reilly



89 Depot Road,
Greenland, NH 03840
603-778-0015

Great Bay Matters is published cooperatively by GBNERR and the Great Bay Stewards

Editor: Kelle Loughlin
Design: Victor Young
Cover Photo: © Doug Ross



GBNERR is funded by the National

Oceanic and Atmospheric Administration and the New Hampshire Fish and Game Department. The Reserve is supported by its non-profit friends group, the Great Bay Stewards



This publication is printed on FSC certified 50% total recycled content/ 25% post consumer content paper.

manager's corner

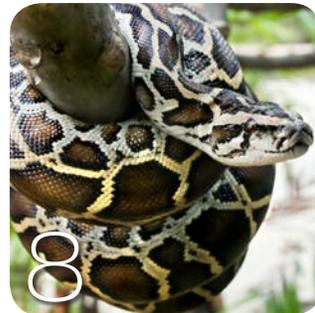


Spring is here; and I think it's appropriate that we are starting a new look and format for Great Bay Matters in the season of regeneration and growth. Based on reader feedback, we will have a topical theme for each edition of the magazine that focuses on the scientific information, editorials and work that we highlight. The theme that we explore in this issue is restoration. You will find articles about river restoration, oyster restoration and young forest restoration efforts that are happening in our region today. The projects we present are interesting and important, but it is critical to keep in mind that restoration is a last resort for how we approach natural resources. Our primary goal should be to protect and lessen our impact on natural resources so that degradation does not happen in the first place.

Often the most effective restoration option may be to let nature take its course. However, sometimes the harm we have done is too severe, and things that we care about are compromised beyond what could recover naturally or in a timeframe that meets human needs and desires. So we engage in more active restoration activities to help nature along. Restoration is typically expensive, complex and can be controversial. Natural resource managers restore species and/or habitats that humans value or think are important. As with any decision that involves values, the choices about what to restore, where to focus efforts, and what success will look like are subjective. As you read this issue and as you watch the estuary come alive this spring, I welcome you to marvel at the complexity of our relationship with nature.

Cory Riley, Reserve Manager, GBNERR

contents



2 Feature: Restoration on the Half Shell
Restoring oyster populations in Great Bay

4 Feature: Undoing the DAM-age
Working to Restore New Hampshire's Rivers Back to Health

5 Estuary Almanac: American Woodcock
A species closely associated with young forest

6 NERRS NEWS: New Regional Surveys
Identifying Gaps in Coastal Education

7 Educational Offerings: Bayventures 2014
Summer program schedule for kids entering grades 1-6

8 A National Perspective: Restoration
Rookery Bay NERR, Florida

8 Volunteer for Great Bay: Exhibit Room Volunteer
For more information visit www.greatbay.org/volunteer

9 Soak Up The Rain: Managing Stormwater Run-off
The NHDES is working to tackle the problem

9 Presidents Corner: Nitrogen Discharge Limits
Upgrading treatment plants to meet EPA standards

R E S T O R A T I O N
on the

HALF SHELL



To the French poet Léon-Paul Fargue, eating an oyster is “like kissing the sea on the lips”. Sometimes described as tasting of cucumber, citrus, melon, copper and smoke, American oysters (*Crassostrea virginica*) are just plain delicious, once serving as a staple food item for Native Americans along the entire Eastern seaboard. Not only are oysters important recreationally and as a food source, they also provide important functions for the Great Bay Estuary.

Oysters grow in “reefs” or “beds”, and the structure provides excellent habitat for fish and invertebrates. Even the way oysters feed is beneficial to the health of the bay. As filter feeders, oysters remove phytoplankton and excess nutrients from the water, improving water quality and clarity and ultimately helping to promote better conditions for other important species like eelgrass. In Great Bay, a combination of threats has caused severe declines in oyster populations.

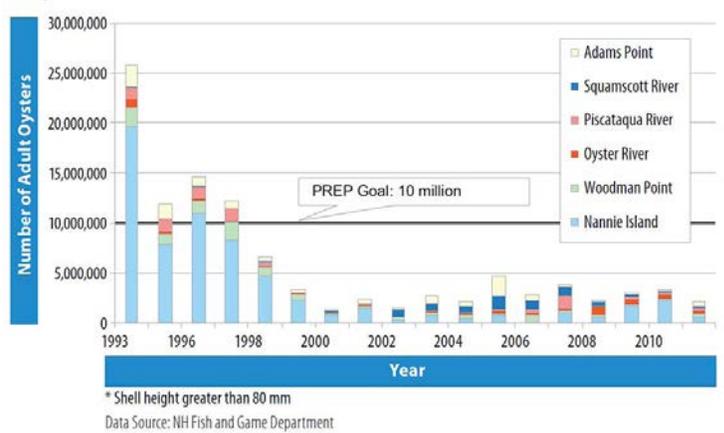
Restoring oyster populations may be a critical step in addressing the water quality problems that face Great Bay today. But how did we get to the point where our oyster populations need to be restored? Historical accounts indicate that the extent of oysters in Great Bay in the late 1700s was enormous. One resource mentions oyster reefs a half mile in length in the Oyster River alone. A century later in 1874, a U.S. Coast Guard Survey team mapped channels in Great Bay and found extensive and healthy

oyster beds. The report brought attention to a resource that people did not know much about at the time: in fact the study was “looked upon almost as an original discovery of the beds”. With this public announcement, came five years of commercial decimation of Great Bay oysters. The harvest was so good that close to forty men were taking about five bushels a day per man. Winter was no obstacle, as oystermen cut long holes in the ice and systematically stripped the beds with horse-drawn dredges.

Clearing land for agriculture and logging led to sedimentation; development along the water’s edge led to pollution; and an appetite for oysters in the region led to overharvesting between the late 1700s and the mid-1900s. Finally, in the early 1990s the oyster population of Great Bay suffered a massive die-off due to the shellfish diseases Dermo and MSX. Today, there are six documented natural oyster beds in the Great Bay system; Nannie Island, Woodman’s Point, the mouth of the Squamscott River, the Oyster River, the Piscataqua River and off of Adams Point.

For the past 25 years, many partners in the Great Bay region have been working together to restore the oyster population. Since 2009, the University of New Hampshire (UNH) and The Nature Conservancy (TNC) have led efforts to add 13 acres of oyster reef and 3 million oysters to the estuary. Because young oysters will only settle on “hard surfaces”, restoration efforts in New Hampshire focus on building up reefs with reclaimed oyster and surf clam shell and then adding young oysters (spat) to the reefs. The Coastal Conservation Association has helped collect oyster shell from area restaurants and TNC and UNH contract barges to add tons of shell into the estuary to build reefs. Good candidates for oyster

FIGURE 12.2 Number of adult oysters* in major Piscataqua Region beds



Reprinted from the 2013 State of the Estuary Report.

restoration include places where the bottom of the bay or river is firm enough to support the shell being deposited, the water flow is strong enough to create good feeding conditions for young oysters, there is some fresh water influence, and there are live oysters near-by to contribute to the recruitment of spat on the new reef. Restoration sites must avoid other sensitive habitats like eelgrass beds. Locations chosen are closed to harvesting to allow the new reefs protection to grow.

Over the years, UNH and TNC have learned how to improve restoration success with each attempt. 2013 was a very successful year with efforts focused in the Lamprey in Newmarket and in the Piscataqua in Dover, and they hope to create an additional five new acres this summer along the western channel of Great Bay.

How will we know if oyster restoration will work, and how will we know if we have succeeded? The Piscataqua Regional Estuary Partnership led a stakeholder driven process in 2010 to establish a restoration goal of 20 new acres and 10 million adult oysters by 2020. This represents a number close to the population recorded around 1995. In order to reach that goal, we need to continue oyster restoration efforts and learn more about how oyster restoration, an emerging aquaculture industry in the area, and our natural reefs interact with each other to create a healthy population. As with any restoration effort, there is still a need for more information about how oysters in Great Bay reproduce, where the larval oysters will settle and why, and how much nitrogen oysters can actually filter from our waters. This type of information will help aquaculture professionals, restoration practitioners and natural resource managers like those at New Hampshire Fish and Game. If this article has made your mouth water for a local oyster, look for local aquaculture products in our regions restaurants, or contact NH Fish and Game for an oyster license <http://www.wildlife.state.nh.us/marine/shellfishing.html>.

GET INVOLVED!

To learn more about the progress being made in oyster restoration in New Hampshire, visit www.nature.org/nhoysters. In addition to large scale reef building, citizens around the bay have been raising oysters on private docks and moorings since 2006 as a part of the Oyster Conservationist Program. To learn more about the Citizen Oyster Conservationist Program, contact Kara McKeton at kmcketon@tnc.org.



Oyster spat growing on clam shells in the Lamprey River, Great Bay, NH.

Kara McKeton Photo / Inc.org

Cory Riley, Reserve Manager, GBNERR

undoing the DAM-age

Working to Restore New Hampshire's Rivers Back to Health

Coastal rivers and streams are like the veins and capillaries of our bodies, the heart functioning like the ocean, rhythmically pumping the tides in and out, revitalizing and rejuvenating as it flows. A blockage anywhere in the body, much like a dam, can be a deadly obstruction.

In pre-colonial times, diadromous fish (life cycle requires migration between freshwater and saltwater) such as Atlantic salmon, American eel, American shad and river herring were abundant throughout New Hampshire rivers. Historic records indicate that salmon ascended 400 miles up the Connecticut River to Beechers Falls, Vermont, and 180 miles up the Merrimack River to Profile Lake in Franconia, New Hampshire. But by 1900, every river and many of the tributaries throughout the Piscataqua region and beyond were dammed.

Today, there are over 3,000 active dams obstructing New Hampshire rivers, with more than 800 of them classified as “hazardous” because the flooding produced by their failure would result in loss of life or significant downstream property damage. In the last three decades, coastal managers and scientists have advanced our understanding of rivers and have shed light on the significant negative impacts dams have on the ecological integrity of a river system.

Dams are still important cultural features for many towns throughout New Hampshire, providing water-based recreation, water supply, hydro power and in a few cases flood control. Many historic dams in the state are closely tied to people’s sense of community and rustic town charm. The issue of dam removal and river restoration has been contentious in many towns not only in New Hampshire, but throughout the nation. However, according to Cheri Patterson,

Supervisor of Marine Programs for the New Hampshire Fish and Game Department, “Fragmentation of river systems due to dams, is the single greatest threat to the maintenance of riverine ecosystem integrity and native biodiversity.” Dams disrupt the natural ecosystem of a river, alter water temperatures, disrupt sediment and nutrient export, redirect river channels and transform floodplains. These impacts change the biological make-up of rivers, trapping and isolating populations of fish and wildlife. “Removing a dam eliminates anthropogenic obstructions, restoring the river back to a healthy ecosystem rather than an impoundment that prevents natural sediment and nutrient transport. It improves overall water quality, restores fish passage for both native diadromous and resident fish, and increases dissolved oxygen levels,” says Patterson.

While every river and every dam has



These images show the before (top) and after (bottom) removal of the Bellamy River crib dam in 2004.

a unique set of circumstances, many studies have revealed that dam removal can be a highly effective tool to restore rivers and help reverse the negative impacts caused by blocking the natural flow. In January 2000, the New Hampshire River Restoration Task Force was formed with the common goal of exploring opportunities to selectively remove dams for a variety of reasons, including for the purpose of restoring rivers and eliminating public safety hazards. The task force is comprised of over twenty members including multiple state and federal agencies, conservation organizations, local interests and others.

To date, two “head-of-tide” dams have been successfully removed in Seacoast New Hampshire – one on the Bellamy River in Dover and the other on the Winnicut River in Greenland. In 2004, a remnant timber crib dam was removed from the Bellamy River. A timber crib dam is generally constructed with crossed timbers filled in with earth, rock or concrete and covered with timber planks. Fish species such as

river herring, smelt and American eel had a very difficult time navigating past this haphazard obstruction. Within days of its removal, a more natural unobstructed river and fish passage was restored.

As a member of the Task Force, Patterson is currently providing technical assistance to the dam owner and review of feasibility studies currently underway for the removal of the next two dams on the Bellamy River, as well as others under consideration in the Seacoast. These studies help dam owners have a clear concept of the options when making decisions on what to do with their ageing dams. “Along with removing potential safety and flooding hazards another goal for these dam removals is to ultimately restore our rivers back to their natural dynamic character,” says Patterson.

*Kelle Loughlin, Education Coordinator, GBNERR
Director, Great Bay Discovery Center*

Estuary Almanac

American woodcock (*Scolopax minor*)

Extensive farmland abandonment around the turn of the nineteenth century has resulted in fairly even aged forests throughout much of New Hampshire. A diverse range of forest ages are needed in order to support maximum diversity of species. Currently in the Seacoast, several restoration projects aim to create shrub land and young forest. These areas provide dense cover along with an abundance of berries and fruit not found in older forests. The hope is to provide habitat for wildlife such as the eastern towhee, black racer snake, ruffed grouse and the state endangered New England cottontail. Another species closely associated with young forest is the American woodcock, otherwise known as the “timberdoodle”, “night partridge” or “bogsucker”.

Natural history

Woodcock are mostly nocturnal. They inhabit young forest, old fields and low wet thickets. The best cover has scattered evergreens in the understory. When feeding, a woodcock probes its bill into soft soil to locate earthworms, which typically make up about three-quarters of its diet. Woodcock are migratory and breed in New Hampshire March through May. Males display acrobatic mating flights during which they fly upward 100 to 300 feet and come spiraling down, making a warbling song. After landing, they



© Steve Byland / Dreamstime.com

sit and make their distinctive “peent” call. Chicks are precocial and can leave the nest only a few hours after hatching.

Unique adaptations

The woodcock is a shorebird that has evolved to live in upland settings. Its mottled brown markings help it blend in with leaf litter and other debris. Its large eyes are set well back and high on the sides of the head to allow it to watch for danger in all directions. Their bills are prehensile at the tip to help seize prey. Woodcock eggs split lengthwise, unique among birds.

Population status in New Hampshire

Woodcock populations have declined by about 30% since the 1970s. Research has

shown the loss of young forest and shrub land is the primary cause. With the creation of new areas of this habitat, we hope to see this population trend change over time.

Where to see around Great Bay

East Foss Farm, off Foss Road in Durham. Managed by the University of NH Woodlands Office. <http://colsa.unh.edu/woodlands/properties/eastFossFarm>. If you take a walk around dusk during the spring you may be lucky enough to see and hear spectacular courtship displays in open fields throughout the Seacoast.

*Rachel Stevens,
Stewardship Coordinator, GBNERR*

NERRS NEWS

Program News and Events From GBNERR

NEW REGIONAL SURVEYS WILL IDENTIFY GAPS IN COASTAL EDUCATION

Ensuring the effectiveness of NERRS education programs is a national priority for the Reserve System. As part of this effort, a Market Analysis and Needs Assessment are underway in the Great Bay Watershed.

Findings from the market analysis will enable the Reserve to better understand the extent of existing K-12 coastal education programs, foster collaborations with other regional education providers and identify gaps that the Reserve may be able to fill.

A complimentary needs assessment survey will be used to identify the coastal

education needs of teachers and students in New Hampshire. Of particular interest is the new Next Generation Science Standards teachers throughout the nation will be asked to adopt.

The Reserve strives to offer relevant, quality education programs and is looking forward to incorporating the results into the next education strategic plan.

CLIMATE PLANNING “ROLE-PLAY” HELPS PREPARE DOVER

Over a hundred leaders from all sectors of city life participated in the Dover Climate Change Adaptation Role-play simulation workshops. The simulated city committee meeting was developed by the New England Climate Adaptation Project (NECAP), a collaborative research effort involving the Massachusetts Institute of Technology Science Impact Collaborative, the Consensus Building Institute, the National Estuarine Research Reserve System (NERRS) and four New England cities, including Dover. The project is funded by the NERRS Science Collaborative, with the goal

of testing role-play simulations as a method to build a healthy community dialog around science-heavy issues. By participating in the simulations, it is hoped that participants gain an understanding of the diversity of perspectives around the issue and the importance of community interaction to help Dover proactively prepare for climate change.

The “committee” was charged with passing, or not, several ordinance changes dealing with stormwater that were geared toward protecting infrastructure from more intense rain storms. A climate assessment was also prepared for Dover as part of the project and it predicts a significant increase in precipitation which can result in more frequent and severe flooding events. Participants not only learn about other’s perspectives but get to experience the art of compromise and leadership. As participants debriefed the experience it was clear that this exercise could only help the planning process. Currently survey and interview data are being analyzed, so look here for results in the future.



MEETING A CRITICAL NEED FOR ECOSYSTEM MONITORING

A new partnership in the Northeast Coastal region, extending from Long Island Sound to Canada, has been formed to start to address the need for comprehensive ecosystem monitoring in our coastal region. A Northeast Sentinel Monitoring Steering Committee, led by the Northeast Regional Ocean Council (NROC) and the Northeast Regional Association of Coastal and Ocean Observing Systems (NERACOOS), has been formed with a goal of implementing a sentinel monitoring program in the Northeast coastal region that integrates existing regional monitoring efforts, assets, and resources to identify the status and trends of coastal ecosystems with a focus on the effects of climate change. Great Bay NERR Research Coordinator

Paul Stacey is representing Reserve, New Hampshire and NOAA interests on the Committee and is joined by representatives from the EPA, state agencies, and universities within the region.

This Integrated Sentinel Monitoring Program for the Northeast Coastal Region is off to a great start, having assembled scientists representing over 35 entities for three workshops to design and implement this collaborative approach to monitoring. The program itself will not be conducting the monitoring, but will host a database of active and historical monitoring programs with data relevant to ecosystem change that will be openly shared and interpreted by researchers, managers and the public. More information is available at: www.neracoos.org/sentinelmonitoring.

NEW EDUCATION PAVILION COMPLETED AT GREAT BAY DISCOVERY CENTER

With summer just around the corner, visitors and school groups alike can now enjoy the new Blue Heron Pavilion at the Great Bay Discovery Center. Constructed by Excel builders and funded in part by the Great Bay Stewards, the pavilion has nine picnic tables, three of them with accessible ends. The pavilion is available to the public on a first come first serve basis, year round.





Educational Offerings



BAYVENTURES 2014

Wednesday summer programs for kids – Sign up for one or the super summer series of seven!

July 2nd

Wonders at the Waterfront

Join us to discover the thrill of mucking around in Great Bay. Try finding an eel under a rock or seining for juvenile flounder. Make a craft to take home.



July 16th

Oysters are Awesome!

Did you know oysters help to clean Great Bay? Learn how they do this, by dissecting an oyster and exploring a nearby oyster bed. Make an oyster ornament to take home.

July 23rd

Who's Who on Great Bay?

People who lobster, work on research vessels or patrol the waters all need to know how to get around Great Bay. What does it take to pilot the Bay? We'll learn basic chart skills and build our own model boats to float.

July 30th

Mystery on Great Bay

Join us for a day of mystery games and activities. If you like surprises, you will be sure to have a super day near Great Bay! Make a mystery craft to take home.

August 6th

Bumble Bee Watch

What's all the buzz about bumblebees? Take part in a citizen science project to document bumblebees around the Discovery Center. These insects play an important role in pollinating the plants around us. What plants do they prefer and how many different species are present? Come find out! Make a bumblebee craft to take home.



August 13th

Eelgrass, Eelgrass Everywhere

Did you know eelgrass beds are the most abundant habitat type in Great Bay? This flowering plant provides an ideal place for many animals to hide. We'll make an eelgrass craft to take home and put on an "eelgrass theater" presentation at the end of the program for parents to watch.

August 20th

Sweet Trail Trek

Grab your lunch, backpack and water bottle and join us for an adventure on the 4-mile Sweet Trail that starts near the Great Bay in Newmarket and ends in Durham. We will search for signs of local wildlife, complete a scavenger hunt and play games along the way.

Note: *This is an off-site, all-day adventure. There will not be pre or after-care for this program. Drop off will be at 9:30 at beginning of trail. Pick-up will be at 3:30 at end of trail. Directions for drop-off and pick-up will be provided at registration.*

All programs are for children entering grades 1st-6th in the fall of 2014. Please have children bring a lunch, change of clothes and a towel. Call (603) 778-0015 or email beth.heckman@wildlife.nh.gov to register. Each Bayventure program is \$35 (or \$225 for all 7 programs) for Great Bay Stewards members and \$40 (\$280 for all 7 programs) for non-members. There is a \$5/sibling/day discount for the normal program hours. Pre-care is \$5/day. After-care is \$10/day. Regular camp hours 9:30a.m.-3p.m. Inquire about how to become a member to get children's program and other discounts. Make checks payable to GREAT BAY STEWARDS and send to the address below marked ATTN: Beth.

"Once Upon an Estuary"

A summer program for 2-5 year olds on Thursdays from 9:45 a.m.-11:00 a.m. The cost is \$2 per child. Children, with an adult, are invited to come listen to a story, play games and make a craft. Most activities will be outside so come dressed ready to play and have some fun! Children may be registered for two programs at a time. Visit greatbay.org for the calendar of programs.

Great Bay Discovery Center
89 Depot Rd, Greenland, NH 03840
603-778-0015 • greatbay.org





A National Perspective: *Restoration*

Rookery Bay NERR, Florida

Our nation is blessed with a variety of amazing species of plants and animals. Unfortunately, not all of them belong here. Enter Florida's giant constrictors – great big, slithering, hungry reptiles. The NERR's southern-most Florida Reserve (Rookery Bay) has a challenge in dealing with these invasive species that we in New Hampshire, thankfully don't.

New species of insects, fish, and reptiles are being discovered there at an alarming rate. These flying, swimming, and slithering invaders have either ar-

rived accidentally, escaped captivity, or have been freed by their former owners who have become unable or unwilling to care for them any longer.

In January 2010, staff and visiting investigators at the Rookery Bay NERR in Naples Florida, first began seeing large exotic snakes, primarily Burmese pythons, while conducting field research. Since then, more than thirty large snakes have been captured within the Reserve, clearly indicating these snakes are spreading out from their original point source near Everglades National Park. Preserving natural habitats and native plants and animals within the boundaries is a priority issue for the Reserve because these invaders pose a significant threat to native predators now in competition with pythons for food. The Reserve has begun to undertake steps to better understand the effects of this predator in its

new environment and prevent further infestation to the fullest extent possible.

By inserting transmitters inside female snakes and releasing them during breeding season, scientists are able to locate and capture many male snakes attracted by hormones. DNA samples and stomach contents from captured snakes are studied so that more can be learned about what they are eating and how they are faring there.

In case you were thinking about heading south to capture a Burmese python for the cause, the Reserve would kindly ask that you refrain from volunteering to remove this invasive species yourself. Really?

Reprinted in part from the Rookery Bay NERR website. For more information visit www.rookerybay.org.

Kelle Loughlin, Education Coordinator, GBNERR Director, Great Bay Discovery Center



© Rookery Bay NERR

Volunteer for Great Bay!

- **Exhibit Room Volunteer:** Interact with the public and help them learn about the estuary through our exhibits! The Great Bay Special Collections room will also be open the first Sunday of every month and is a fun area to volunteer your time.
- **Volunteer Educator:** Teach school age children about the natural and cultural history of Great Bay. Help students learn about this wonderful area and gain an appreciation for its importance!

- **Adopt-A-Garden:** Help us maintain the beautiful gardens at the center and at Chapman's Landing in Stratham, by adopting a particular plot. This program is just beginning, so you can help us shape it into a program that will grow and thrive!
- **Special Projects:** Want to be in the loop when special projects come up? We are always looking for help with "one-time" events such as staining a

viewing platform, native planting days, office and administrative jobs and more! Email Melissa Brogle to be added to the Special Projects list AT melissa.brogle@wildlife.nh.gov or call 603-778-0015, if you have questions or want to be added to an email list.



For more information visit www.greatbay.org/volunteer and our calendar of events at www.greatbay.org/events.



Kudos to the Town of Newington's Sewer Commission which has proposed, and the Town's Budget Committee has recommended, a nine million dollar bond to allow upgrading their plant to meet the new lower EPA Nitrogen discharge limits. At the end of 2012, Newmarket agreed to accept the EPA nitrogen limits for its wastewater treatment plant, and started the process toward upgrading that plant. In January of 2013, Exeter agreed to accept the EPA's limits as well. The hope is that other communities around Great Bay will follow suit (instead of filing suits, as some have done). It is encouraging to see that more and more communities and states recognize that protecting our water

resources requires involvement and some time investments on all of our parts if we are to be successful.

Nitrogen is recognized as one of the leading causes of pollution of our water resources, and there too, things are happening. The Great Bay Stewards in an effort to combat non-point source nitrogen pollution in the local waters adopted the SOAK UP THE RAIN project involving installation of rain gardens on properties that might otherwise contribute runoff into the Bay. We think this program has tremendous potential. One installation was completed in 2013. The Stewards were just awarded a grant to install 10 more gardens over the next two years! (see below). Congratulations to those who put so much time in working on this grant application. Although there were many who helped, I would personally like to thank Board Member Laura Byergo and Executive Director Peter Wellenberger for the many hours they spent working on the application.

Jack O'Reilly, President, Great Bay Stewards

soak up the rain NEW HAMPSHIRE

“Rain, rain go away come again another day. No, wait, the sun is baking, the trees are dying. I'm spending hours watering my garden.” How can we manage the rain so we have it where we need it? The rain pours off our roofs, highways, parking lots and runs across our lawns into the stormwater drainage system. Gutters and drains channel the rainwater even more directly, to get it away from our foundations and off our lawns. But excess chemical nutrients and other pollution flow with the rainwater into our rivers, lakes and estuaries. Research shows that stormwater causes or contributes to over 80% of the water pollution problems in New Hampshire.

The New Hampshire Department of Environmental Services (NHDES) is working to tackle this problem with the “SOAK New Hampshire” program. The solution is to prevent rainwater from flowing directly into the built drainage systems and instead infiltrate most of it, especially the first rush, into the ground. Rain gardens, rain barrels, buffer strips, and other techniques help to capture the rain and give it a chance to soak into the ground. Rain soaked into the ground is filtered by the earth removing many of the pollutants collected off our impervious surfaces. Additionally, it feeds the ecosystem, and replenishes our aquifers. Channeling stormwater runoff directly into the closest water body or carrying it along to the wastewater treatment plant overburdens both systems.

DES started SOAK NH in 2013 with pilot training projects, one of which was with The Great Bay Stewards. The program



© NHDES

will expand in 2014. Look for opportunities to participate and learn as we will be recruiting homeowners and volunteers who want to help SOAK New Hampshire.



PLEASE JOIN US!

All interested parties are cordially invited to become Great Bay Stewards. Members receive Great Bay Matters and other pertinent mailings.

Annual dues may be paid by check made payable to the **Great Bay Stewards** and sent to: Membership Committee, 89 Depot Road, Greenland, NH 03840

- Guardian \$150 Protector \$75
- Steward/Family \$35 Student \$20 Other \$ _____

name _____

address _____

town _____

state _____ zip _____

email _____



Fantastic Kayak Raffle!

Get your raffle tickets for a
2014 Wilderness Systems Kayak Pungo 120!

Tickets are \$5 each or 5 for \$20 and can be purchased at the Great Bay Discovery Center, or online at greatbaystewards.org. The kayak was provided by Eastern Mountain Sports - Portsmouth location.

Eastern Mountain Sports is committed to supporting companies like the Great Bay Stewards, whose missions are to conserve and protect the outdoors!

68 LOCATIONS | Portsmouth Location:
100 Arthur F Brady Drive
Portsmouth, NH 03801
(603) 334-6141

EASTERN
MOUNTAIN
SPORTS®
online: ems.com