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Fertilizer and Stormwater Runoff Outreach Program in Newcastle, NH

David Anderson

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Fertilizer and Stormwater Runoff Outreach Program in Newcastle, NH

A Final Report to

The Piscataqua Region Estuaries Partnership

Submitted by

David Anderson, Project Coordinator
New Hampshire Coastal Protection Partnership
Portsmouth, NH

12/30/2010

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Abstract

The New Hampshire Coastal Protection Partnership (NH Coast) implemented a year long pilot public education and outreach program in the Town of New Castle aimed at reducing nitrogen pollution from lawn fertilizers and promoting rain gardens as a solution to stormwater runoff and nonpoint source pollution. A total of 77 landowners representing 138 acres of land pledged to either not use lawn fertilizers or use only low phosphorus, slow release nitrogen brands. The program also resulted in the installation of New Castle's first demonstration rain garden.

Executive Summary

In 2010, the New Hampshire Department of Environmental Services once again listed parts of the Great Bay Estuary and its tributaries as impaired by nitrogen pollution.¹ The total nitrogen load to the estuary increased by 42 percent in just five years, according to the 2009 State of the Estuaries Report.² The dramatic spike in nitrogen levels has been attributed in part to an increase in stormwater runoff. Nitrogen from nonpoint sources, including lawn fertilizers and septic tanks, accounted for 65 percent of the total nitrogen load. These findings suggest that outreach programs aimed at preventing the eutrophication of the Great Bay Estuary need to target individual landowners.

This final report documents NH Coast's work to implement a multiphase pilot public education and outreach program designed to motivate landowners in the Town of New Castle to take action to reduce nitrogen pollution on their own properties. The program targeted two sources of local nitrogen pollution: lawn fertilizers and stormwater runoff. Landowners received copies of outreach materials describing estuary friendly approaches to lawn care. They were also asked to sign a pledge to either (1.) not use lawn fertilizers or (2.) use only low phosphorus, slow release nitrogen brands that have less of an impact on the

¹ New Hampshire Department of Environmental Services. 2010. Final EPA 2010 List of Threatened or Impaired Waters That Require A TDML. Surface Water Quality Assessment Program. Retrieved from: http://des.nh.gov/organization/divisions/water/wmb/swqa/2010/documents/2010_final_sub_3_03d.pdf

² Piscataqua Region Estuaries Partnership. 2009. State of the Estuaries 2009. Retrieved from: http://www.prep.unh.edu/resources/pdf/2009_state_of_the-prep-09.pdf

estuarine environment. NH Coast completed installation of New Castle's first demonstration rain garden.

The program was successful in terms of distributing information designed to raise public awareness about the linkages between lawn fertilizer use and nitrogen pollution in the Great Bay Estuary and its tributaries. While only 77 landowners signed our pledge, around 1,500 received hard copies of our outreach materials. Hundreds more received links to digital copies via our monthly e-newsletter and social media outreach on Facebook and Twitter. New Castle residents often reported hearing about the program from friends and neighbors prior to being contacted by NH Coast staff and volunteers.

As a result of this program, NH Coast has developed a community action toolkit that can be used to establish similar programs in communities through New Hampshire's coastal watershed. NH Coast has already begun the process of expanding the geographic scope of the program beyond the shores of the island of New Castle. Thanks to a small grant from the Lamprey River Advisory Committee, we were able get an early start on plans to introduce the program to the towns of Barrington, Durham, Newmarket, and Nottingham during the summer and fall of 2010.

NH Coast also developed an effective cost-sharing model for installing demonstration rain gardens in local communities. We invited a number of partners from the local community to participate in the installation of New Castle's first demonstration rain garden. Each made a financial or in kind donation of services or supplies to the project. This approach broke the total cost of the project down into more manageable chunks. It also provided local residents with the opportunity to play a hands-on role in the installation, thereby enhancing the project's demonstration value. NH Coast plans to use this model to install new demonstration rain gardens in local communities, including one planned for the Town of Barrington in 2011.

Introduction

The issue of nitrogen pollution in the Great Bay Estuary has been at the forefront of NH Coast's work to protect the natural resources of New Hampshire's coastal watershed since our official founding as a 501(c)(3) nonprofit organization in 2008. The pilot program described in this final report represents the culmination of more than two years worth of program development and planning by our leadership team. Its implementation provided us with the opportunities to put our ideas to the test in the real world. The lessons we learned along the way will help us make key program improvements in the years to come.

Special thanks is due to the organizations that provided the major funding for this program, including the Piscataqua Region Estuaries Partnership, Lamprey River Advisory Committee, and the New England Grassroots Environmental Fund.

Project Goals and Objectives

The primary objective of this project was to develop a public outreach model designed to motivate landowners to reduce the amount of nitrogen and other stormwater pollutants entering the surface waters that form the Great Bay Estuary.

Activities

Lawn fertilizer reduction campaign

Nitrogen Reduction Pledge:

NH Coast staff and volunteers asked landowners to sign a pledge to help reduce nitrogen pollution in the surface waters that make up the Great Bay Estuary by either (1.) *not using lawn fertilizers* or (2.) *using only low phosphorus, slow release nitrogen fertilizer*. The pledge form was circulated at program events and workshops, posted on the NH Coast website, and featured prominently in outreach materials distributed over the course of the year. Pledge takers were also asked to take a short survey aimed at collecting information about past lawn fertilizer use and property location and acreage.

Research:

The Project Coordinator visited a number of retail stores located in the New Castle area to develop a list of slow lawn fertilizer products that exceed the requirements found in the New Hampshire Comprehensive Shoreland Protection Act (CSPA). Under the CSPA, low phosphorus, slow release nitrogen fertilizers can be used within 25 to 250 feet of the highest observable tide line of coastal waters like the Great Bay Estuary. State law requires that only 15 percent of the nitrogen found in a fertilizer be in slow release form in order for it to be sold as slow release fertilizer.³ More than 90 percent of the nitrogen in three of the lawn fertilizers we analyzed was found to be in slow release form. These brands were recommended for use landowners who opted to continue using lawn fertilizers.

A number of local landowners requested that we provide them with information on how to maintain a healthy lawn without using lawn fertilizers. To answer these questions, the Project Coordinator engaged in a lengthy literature review and also consulted with Julia Peterson, a local expert on eco-friendly lawn care at the University of New Hampshire Cooperative Extension. The following materials provided the basis for our recommendations to landowners:

Guillard, K. 2008. New England Regional Nitrogen and Phosphorus Fertilizer and Associated Management Practice Recommendations for Lawns Based on Water Quality Considerations. University of Connecticut. USDA CSREES Grant # 2006-51130-03956. Retrieved from: http://www.usawaterquality.org/NESCI/Focus_Areas/Landscaping/pubs/NE_WQ_Fert_Rec.pdf

Greenscapes MA Coalition. 2008. "Tips and Special Offers for a Healthy Yard & Healthy Wallet." Retrieved from: http://www.greenscapes.org/files/file/GS_Guide_2008_LOWRES.pdf

Hagen, Margaret and Puglisi, Sadie. 2008. "Low Input Lawn Care: 14 ways you can protect the environment." UNH Cooperative Extension. Retrieved from: http://extension.unh.edu/resources/files/Resource000877_Rep923.pdf

³ Neal, Catherine. 2003. Slow Release Fertilizers for Home Gardens and Landscape. University of New Hampshire Cooperative Extension

Neal, Catherine. 2003. "Slow-Release Fertilizers for Home Gardens and Landscapes." UNH Cooperative Extension. Retrieved from:
http://extension.unh.edu/resources/files/Resource000494_Rep516.pdf

Peterson, Julia. "Green Grass and Clear Water: Water Friendly Lawn Care Recommendations". NH Sea Grant and UNH Cooperative Extension, Water Resources. USDA CSREES Grant #2006-51130-03565

Publications:

A two-sided tri-fold brochure titled "Making Estuary Friendly Decisions About Lawn Fertilization" (Appendix 1) was developed for use at public events and workshops. The brochure incorporates the following elements:

- A statement urging landowners to help reduce nitrogen pollution in the Great Bay Estuary by either (1.) not using lawn fertilizers or (2.) using only slow-release nitrogen, low phosphorus lawn fertilizers
- A list of our recommended slow release nitrogen lawn fertilizer products
- Information on "How to read a fertilizer label" to determine slow release nitrogen content
- A pledge form
- A list of upcoming campaign events

A more detailed 10-page manual dubbed the "Seacoast Nitrogen Reduction Campaign Home Action Kit" (Appendix 2) was also produced for use in the program. In addition to the information found in the aforementioned brochure, the manual includes the following information:

- A one page summary describing the problem of nitrogen pollution in the Great Bay Estuary, including the threat of impending eutrophication
- A description of how lawn fertilizers can contribute to the problem of nitrogen pollution
- Basic tips for fertilizer free lawn care
- A brief description of the relationship between nonpoint source nitrogen pollution and stormwater run-off
- Step by step instructions on how to build a rain barrel
- Other steps local residents can take to help reduce nitrogen and other types of runoff pollution, including picking up pet waste, installing porous pavement, building a rain garden, and maintaining septic tanks

Tabletop Display:

NH Coast developed a tabletop display for use at public events and workshops. The display defines the term "watershed" and describes the problem of nitrogen pollution in the Great Bay Estuary. It also lists local non-point sources of nitrogen pollution, including fertilizers, septic systems, and pet waste.

Workshops:

NH Coast hosted three public workshops as part of the pilot program. All three events were free and open to the public. Participants were provided with information on how to (1.) reduce nitrogen pollution from lawn fertilizers and (2.) install a rain garden or build a rain barrel to reduce stormwater runoff.

- “Earth Day Workshop: Backyard Solutions to Water Pollution in the Great Bay Estuary” took place on April 20th at the Urban Forestry Center in Portsmouth
- “Backyard Solutions to Water Pollution in the Great Bay Estuary” was held on June 8th onboard the Gundalow Company’s *Captain Edward H. Adams* near the University of New Hampshire Pier in New Castle
- “Make your own rain barrel workshop” was hosted at a private residence in Barrington on August 22nd

Public Events:

Staff and volunteers manned information booths at a number of public events. Campaign materials were distributed and local residents were asked to sign the pledge form.

- New Castle Annual Town Meeting (May)
- Portsmouth Sustainability Fair in Portsmouth (May)
- Winnicut River Watershed Coalition’s kick-off event in Greenland (May)
- Green Waste Day in New Castle (May, June)
- Solar Fest at the University of New Hampshire in Durham (May)
- New Castle Day (June)
- NH Coast Summer Solstice Soiree in Portsmouth (June)
- Newmarket Farmers’ Market (July and August)
- Nottingham Farmers’ Market (August)
- Olde Home Day in Newmarket (August)
- “Make your own rain barrel” workshop (August)
- 1st Annual Pirates of Portsmouth Regatta in Portsmouth (October)
- Oyster River High School Holiday Bazaar (November)

Media:

The Project Coordinator issued two press releases describing the campaign and participated in phone interviews with local reporters. Recognizing the importance of new media, NH Coast also used the Internet to promote the campaign:

- Facebook: Promoted workshops and public events via New Hampshire Coastal Protection Partnership Facebook group (375+ members)
- E-newsletter: The campaign was featured in three editions of our monthly e-newsletter, *The Sandpiper*
- Event descriptions were posted on a number local online community calendars and local green living websites, including *GreenAlliance.biz* and *GreenGuideNH.com*
- @NHCPP Twitter account (250+ followers) was used to promote links to upcoming events and related media coverage

Door Hanger Campaign:

The Project Coordinator worked with a student volunteer from the University of New Hampshire to deliver copies of the “Seacoast Nitrogen Reduction Campaign Home Action Kit” to households in Durham, Newmarket, and New Castle.

Collaboration:

A number of organizations partnered with NH Coast on this campaign:

- New Castle residents formed the ad hoc work group that partnered with NH Coast to implement the campaign
- The New Castle Conservation Commission posted links to the campaign webpage on its website and helped to promote campaign events
- The Green Alliance posted event descriptions on its website
- The Gundalow Company and Urban Forestry Center provided free venues for public workshops campaign workshops
- Organizers of the Newmarket Farmers’ Market, Newmarket Olde Home Day, Nottingham Farmers’ Market, Portsmouth Sustainability Fair, Pirates of Portsmouth Regatta, and University of New Hampshire’s Solar Fest provided free tabling space to NH Coast

Demonstration rain garden:

Design:

NH Coast recruited a LEED certified civil engineer who works at Appledore Engineering in Portsmouth to volunteer to develop the design for the New Castle rain garden.

Siting the Project

Members of the New Castle Conservation Commission and Great Island Garden Club were consulted to identify a suitable location for the rain garden. The town owned Recreation Center at the Great Island Commons was selected based upon several factors:

- The project was to be sited on public land
- As home to the New Castle Public Library and one of the town’s few venues for public events, the Recreation Center is a popular destination for local residents
- The site of the rain garden had been visibly eroded by stormwater run-off and was prone to flooding
- The Great Island Garden Club had already identified the site as a suitable location for a rain garden in a sustainable landscaping plan for the facility

The Project Coordinator attended two meetings of New Castle Selectboard to secure approval for the demonstration rain garden location. Members of the New Castle

Conservation Commission and Great Island Garden Club also attended both meetings to express their support for the project. As a result, the Town of New Castle generously agreed to provide space for the project on public land.

Installation:

The Town of New Castle required that we contract a fully insured landscaping company to complete the pre-planting phase of the demonstration rain garden. After meeting with several local landscaping companies, NH Coast hired LJH Landscapes of Rochester, a local company dedicated to sustainable landscaping practices. The pre-planting phase of the installation was completed over the course of two days in late August. The Project Coordinator was on hand to oversee the installation and document the process via photos and video.

Planting:

The New Castle Conservation Commissions and Great Island Garden Club each covered half the cost of plants for the rain garden. They also provided volunteers to do the actual planting in mid-fall.

Interpretive Signage:

Rocky Coast Brand Identity of Dover was contracted to develop a design for the interpretive signage, working from a draft produced by the Project Coordinator. The interpretive signage uses high quality graphics and user-friendly text to describe the environmental benefits of the rain garden and demonstrate how it works.

Media:

NH Coast distributed one press release describing the demonstration rain garden project. In addition, the project installation was documented photo and video format. NH Coast has also worked to promote the project online:

- Provided regular project updates to the 500+ subscribers to our monthly e-newsletter
- Posted a video of the installation on YouTube
- Posted photos of the installation on Flickr
- Links to project video and photos posted on Twitter and Facebook

A project webpage is also being developed and will be featured on our website, NHCoast.org.

Outcomes

Lawn fertilizer reduction campaign:

Nitrogen Reduction Pledge:

A total of 77 property owners representing approximately 138 acres of land have signed the pledge to date. Of that amount, 57 of the pledge takers were located in the initial target community of New Castle. The remaining pledge takers reside in the Great Bay watershed communities of Dover, Durham, Greenland, Hampton, Newington, Nottingham, Newmarket, and Portsmouth. All of the pledge takers were individual homeowners.

The discrepancy between the number of copies of materials containing the pledge that were distributed (1,500+) and the number of pledge signatures collected (77) can be explained in part by the challenges NH Coast encountered while working to implement the campaign in New Castle. Due to its small size, New Castle has relatively few well-attended public events. The Project Coordinator spent a number of hours manning information booths at sparsely attended public events on the island, including New Castle Day and monthly Green Waste Days. However, volunteers were successful in collecting dozens of petition signatures at the Annual Town Meeting, an event attended by hundreds of New Castle residents.

Research:

Program research was used to develop a community action toolkit NH Coast will use to expand the campaign into new communities in 2011 and beyond.

Publications

The campaign was highly successful in terms of distributing outreach materials describing steps local landowners can take to help reduce nitrogen pollution in the Great Bay Estuary and its tributaries. More than 1,500 printed copies of our “Making Estuary Friendly Decisions About Lawn Fertilization” brochure and “Seacoast Nitrogen Reduction Campaign Home Action Kit” were distributed in Barrington, Durham, New Castle, Newmarket, and Nottingham as result of this campaign. These materials provide the core of our new community outreach toolkit.

Tabletop Display:

The tabletop display developed for use in this campaign is also a part of our new community outreach toolkit.

Workshops

Attendance at the first two workshops was low, though both events were well publicized. A total of 10 participants attended the first workshop at Urban Forestry Center. Less than 5 attended the second workshop aboard the gundalow in New Castle, probably due to bad weather.

Adding a “hands on” component to the final workshop helped to reverse this trend. NH Coast partnered with the Greater Seacoast Permaculture Group to host a free “Make your own rain barrel” workshop in Barrington. Within a few days of the event being posted on Meetup.com,

all of 15 of the available slots event were filled. The first ten participants to sign up received materials used to build their own rain barrel free of charge, thanks to our grant from the Lamprey River Advisory Committee. All 15 participants made their own rain barrel and received copies of the “Seacoast Nitrogen Reduction Campaign Home Action Kit”.

Public Events:

Farmers’ markets and well-attended community events like Olde Home Day in Newmarket proved to be great venues for distributing outreach materials. Pledge signups at these events was limited however, with attendees generally preferring to take home printed materials to learn more. Hundreds of copies of the “Seacoast Nitrogen Reduction Campaign Home Action Kit” and the “Making Estuary Friendly Decisions About Lawn Fertilization” brochure were distributed at public events. Although these printed materials included a pledge form that could be mailed back to NH Coast, no completed pledge forms were received back.

While pledge signups were limited at public events, more than 100 local residents did sign up to receive more information about the campaign by subscribing to NH Coast’s monthly e-newsletter.

Media:

Campaign press releases and interviews with local reporters resulted in a number of hits in the local media:

Kanner, Matt. 2010, April 14. On Behalf of the Planet. The Wire. Retrieved from: <http://www.wirenh.com/features-mainmenu-18/cover-stories-mainmenu-53/4056-on-behalf-of-the-planet.html>

Macarchuk, Alexis. 2010, April 18. Seacoast groups embrace the earth. Seacoast Online. Retrieved from: <http://www.seacoastonline.com/articles/20100418-NEWS-4180324>

Choate, Dave. 2010, May 25. High nitrogen levels choking Great Bay. Seacoast Online Retrieved from: <http://www.seacoastonline.com/articles/20100525-NEWS-5250390>

2010, May 30. Tips to keep Great Bay Estuary clean. Foster’s Daily Democrat. Retrieved from: http://fosters.com/apps/pbcs.dll/article?AID=/20100530/GJCOMMUNITY_01/705309989/-1/FOSNEWS03

Door Hanger Campaign:

The door hanger phase of the campaign resulted in the distribution of more than 1,000 copies of the “Seacoast Nitrogen Reduction Campaign Home Action Kit” to households in New Castle, Newmarket, and Durham. Each door hanger packet contained a printed copy of the pledge form. NH Coast anticipated that at least some of the pledge forms would be completed and returned via mail. None were. Due to time and budget constraints, we primarily focused our efforts on delivering large numbers of door hanger packets, rather than attempting to engage individual homeowners in lengthy conversation at each door. In retrospect, a quality over quantity approach that emphasized personal conversations may have resulted in a greater number of pledge signatures being collected during this phase of the campaign.

Collaboration:

As a result of our collaboration with members of the New Castle Conservation Commission and of the ad hoc citizens groups that helped to implement the lawn fertilizer campaign, NH Coast has established a strong presence in the New Castle community. We hope to use these relationships to make the New Castle campaign self-sustaining in the years to come.

NH Coast has also already begun the process of collaborating with watershed groups and communities interested in established similar campaigns throughout the Granite State's coastal watershed. The pilot campaign we implemented in 2010 is generating a great deal of interest locally. Conservation Commissions in communities as far away as Brookline, New Hampshire have contacted the NH Coast to discuss the campaign. The Project Coordinator has also worked actively to promote the campaign by providing presentations at intermunicipal gatherings organized by the Seacoast Stormwater Alliance and PREP.

Demonstration rain garden:

Design

Joseph Persechino, a LEED certified civil engineer at Appledore Engineering, volunteered to develop the design for the New Castle's rain garden. This in kind contribution eliminated a significant cost from the project budget. Mr. Persechino also joined NH Coast's leadership team in 2010, providing our organization with the capacity to develop designs for future rain garden installations at little to no cost.

Installation:

NH Coast oversaw the successful installation of New Castle's first demonstration rain garden in 2010, marking a successful start to our Community Rain Garden Program. The project was also the first rain garden installation undertaken by LJV Landscapes, a local sustainable landscaping company. Owner Luke Hydock donated all of his own time on the project, resulting in a substantial reduction in the cost of installation.

Planting:

By inviting the New Castle Conservation Commissions and Great Island Garden Club to contribute plants to the rain garden and complete the planting phase of the installation, NH Coast created a hands-on learning opportunity for local residents. NH Coast will follow up with these groups with the goal of collaborating to install rain gardens on privately owned land in New Castle in 2011.

Interpretive Signage:

On site interpretive signage will educate local residents about the environmental benefits of rain gardens for years to come.

Media:

A press release discussing the demonstration rain garden resulted in two local media hits:

2010, June 14. Fundraiser for community rain gardens. Seacoast Online. Retrieved from;
<http://www.seacoastonline.com/articles/20100614-NEWS-6140334>

2010, June 14. Portsmouth fundraiser planned for community rain gardens. Foster's Daily Democrat. Retrieved from:
http://www.fosters.com/apps/pbcs.dll/article?AID=/20100614/GJNEWS_01/706149915/-1/FOSNEWS

Appendices 1 and 2: Outreach brochure and manual

New Castle Nitrogen Reduction Campaign

Help NH Coast reduce nitrogen pollution in the town of New Castle! Visit our website or contact us to learn more, volunteer, become a member, or make a donation:

NH Coastal Protection Partnership
162 Thornton St.

Portsmouth, NH 03801
(603) 617-0679
info@nhcoast.org
www.nhcoast.org



This publication was funded in part by a grant from the Piscataqua Region Estuaries Partnership, as authorized by the U.S. Environmental Protection Agency's National Estuary Program.



How to read a fertilizer label

To determine the nitrogen/phosphorus content of a fertilizer:

Find the **guaranteed analysis**

Example: (15-1-3)

(Nitrogen-Phosphorus-Potassium)

Phosphorus: If the middle number is a 2 or below you are good to go!

The percentage of **slow release nitrogen** is found below the guaranteed analysis. *Water insoluble, slowly available, and slowly available soluble* may be used as substitutes for the term "slow release".

Take this number, divide by the percentage of total nitrogen, and multiply by 100 to determine what percentage of the nitrogen is actually slow release. For example:

(10-2-1)

Contains 5% slow release nitrogen

$5/10 \times 100 = 50\%$ of the nitrogen in this lawn fertilizer is slow release



HELP SAVE GREAT BAY!

Nitrogen pollution from lawn fertilizers is contributing to the rapid decline of key species in the Great Bay Estuary:

- 64% decrease in eelgrass biomass from 1990-2008

- 92% decline in adult oyster populations from 1997-2009

You can help! Look inside to get free tips on how to make estuary-friendly decisions about lawn fertilization and take the New Castle Nitrogen Reduction Pledge today!



Two ways to help reduce water pollution from lawn fertilizers in the Great Bay Estuary:

1. Stop using lawn fertilizers
2. Use only slow release nitrogen, low phosphorus fertilizers

Recommended Fertilizers:

Milorganite Organic Nitrogen Fertilizer:

90% slow release nitrogen
2% phosphorus

Available at:

Home Depot - 100 Arthur Bradley Rd. in Portsmouth, NH
(603) 431-0517

Lowe's - 1440 Greenland Rd. in Greenland, NH
(603) 373-2158

Scamman's Home & Garden - 69 Portsmouth Ave in Stratham, NH
603-778-0201

Scotts Organic Choice or Natural Lawn Food:

90% slow release nitrogen
2% phosphorus

Available at: Home Depot in Portsmouth; Lowe's in Greenland; Scamman's Home & Garden in Stratham

Organica Lawn Booster:

93% slow release nitrogen
1% phosphorus

Available: Scamman's Home & Garden in Stratham, NH



Green Waste Days:

Stop by our information table for free refreshments and more great tips on how to take action to save Great Bay!

When: 8 AM to 11 AM on the following Saturdays - 8/7, 9/11, 10/9, 11/20

Where: New Castle Common, next to the library

Take the New Castle Nitrogen Reduction Pledge:

I pledge to:

- Not use lawn fertilizers
- Use only slow release nitrogen, low phosphorus fertilizers

I previously:

- Used lawn fertilizers
- Used only slow release fertilizers
- Did not use lawn fertilizers

Property Acreage: _____ Acres

Name:

Address:

Email:

Phone:

Please mail your pledge form to:

**NH Coastal Protection Partnership
111 Porpoise Way
Portsmouth NH 03801**

Or visit www.nhcoast.org to take the New Castle Nitrogen Reduction Pledge online!



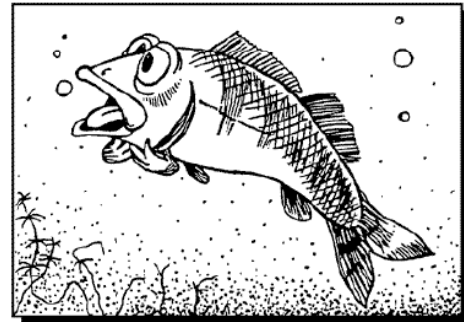
Seacoast Nitrogen Reduction Campaign Home Action Kit

New Hampshire's coastal waters are in danger. In 2010, the NH Department of Environmental Services listed parts of the Bellamy River, Cochecho River, Exeter River, Great Bay, Lamprey River, Oyster River, Piscataqua River, and Salmon Falls River as 'impaired' or threatened by nitrogen pollution.

Luckily, there are steps that we can all take to help mitigate nitrogen pollution at home. This user-friendly guide will show you how! Inside you'll find eco-friendly lawn care tips and step-by-step directions you can use to build your own rain barrel!

Why is nitrogen pollution a problem?

Excessively high nitrogen levels in a water body can trigger explosive algae growth known as algal blooms. As the algae dies, it depletes dissolved oxygen levels in the water and blocks out sunlight, potentially leading to a loss of habitat for fish and aquatic plants. This deadly process is called eutrophication.



Nitrogen Pollution & Great Bay

The Great Bay Estuary is already exhibiting signs of eutrophication. The total nitrogen load to the estuary increased by 42% in just 5 years. Adult oyster populations plummeted from 125,000 in 1997 to just 10,044 in 2009. Similarly, eelgrass habitat in the estuary declined by 65% between 1990 and 2008, with nuisance macroalgae replacing eelgrass habitats in 5.7% of the estuary.

Urgent action is needed to save the Great Bay Estuary. You can help

Printed on 100% recycled paper

Lawn Fertilizers & Nitrogen Pollution



Most lawn fertilizers sold on the market today contain nitrogen, a nutrient that helps grass grow. Unfortunately, this nitrogen doesn't always absorb into your lawn. It can run-off into local streams, rivers, and estuaries, contributing to the problem of nitrogen pollution.

Going fertilizer free is often a great way to reduce your nitrogen footprint. Naturally, there are exceptions to every rule. It may be beneficial to apply fertilizers to a newly planted lawn or to encourage grass growth in bare spots that have been eroded away by run-off.

Fertilizer free lawn care tips

These no cost and low cost actions can help you save money and protect the environment, while also maintaining a healthy lawn:

- Mow high - Taller grass has deeper, healthier roots. 3" or higher is recommended
- Leave grass clippings behind - Grass clippings are a free source of nutrients for your lawn
- Aerate your soil - Aeration allows water, air, and nutrients to penetrate more easily
- Love clovers - Clovers supply your lawn with nitrogen naturally. They also help to smother weeds and prevent erosion. Clover flowers do attract pollinators, so we don't recommend this one to folks who are allergic to bees
- Plant low maintenance grass - Seed with mixtures that contain high proportions of fescue grasses. Fescue lawns are drought resistant. Other grass types often go dormant during summertime dry spells, opening the door to invasive weeds and crabgrass. Fescue lawns also require less frequent watering and mowing

Get more free tips online:

"Low input lawn care - 14 ways you can protect the environment". UNH Cooperative Extension

http://extension.unh.edu/resources/resource/877/Low_Input_Lawn_Care-14_ways_you_can_protect_the_environment

Use only slow-release lawn fertilizers



CoolClips.com

Not quite ready to make the leap to a fertilizer free lawn? Try using slow release lawn fertilizers. The nitrogen found in slow release brands is less likely to run-off of your lawn and end up in local streams, rivers, and estuaries. However, not all slow release fertilizers are created equal. New Hampshire law only requires that 15% of the nitrogen found in a fertilizer be comprised of slow release components in order for the product to be labeled as 'slow release'.

Experts recommend using lawn fertilizer brands that contain a much higher proportion of slow release nitrogen.

Recommended lawn fertilizer brands:

Organica Lawn Booster - 93% slow release nitrogen. Available at: *Scamman's Home & Garden* - 57 Portsmouth Ave in Stratham, NH. (603) 778-0201

Milorganite Organic Nitrogen Fertilizer - 90% slow release nitrogen. Available at: *Lowe's* - 1140 Greenland Rd. in Greenland, NH. (603) 373-2158. *Home Depot* - 100 Arthur Bradley Rd. in Portsmouth, NH. (603) 431-0517
Scamman's Home & Garden

Scotts Organic Choice or Natural Choice: 90% slow release nitrogen. Available at: *Home Depot*, *Lowe's*, and *Scamman's Home & Garden*

**Note: Be sure to call ahead to check on the availability of these fertilizers.*

Apply less!

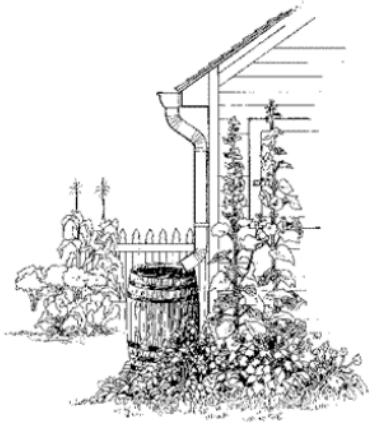
Knowing how much fertilizer to apply can save you money and help to ensure that the nutrients you pay for actually get absorbed into your lawn.

- Use less - Try applying only 1/3 to 1/2 of amount recommended on the lawn fertilizer packaging. Save the rest for later! If your lawn looks healthy, don't apply more fertilizer.
- Be patient - Slow release lawn fertilizers release nutrients over time. It may take 6-8 weeks for the effects of a single application to become visible.
- Know your lawn - Establish lawns that are more than 10 years old often don't need to be fertilized
- Get your soil tested: The UNH Cooperative Extension provides soil testing and nutrient recommendations. Learn more: <http://extension.unh.edu/Agric/AGPDTS/SoilTest.htm>

Stormwater Run-off and Nitrogen Pollution

Run-off from your roof, lawn, and driveway can travel unfiltered into local streams, rivers, and estuaries – even if it enters a storm drain. Along the way it can pick up all sorts of nasty pollutants. From 2006 to 2008, run-off nitrogen pollution from sources like lawn fertilizers, pet waste, and leaky septic systems accounted for 65% of the total nitrogen load to Great Bay Estuary.

Build a rain barrel to harvest rainwater!



Rain barrels capture stormwater before it can run-off, helping to reduce run-off nitrogen pollution. Installing a rain barrel can also save you money on energy and water bills. If you already own the right tools, you can build a quality rain barrel for around \$40 or less. We'll show you how!

Where to find a cheap 50-60 gallon drum

A local recycler in Northwood sells used food-grade plastic drums for \$12 each. They are located at the entrance to Masten Place, right by the intersection of Route 4 and Route 9. Look for the sign on the side of the road.

Why food grade? It is important to make sure that the container you use did not contain harmful chemicals in a former life.

Tools

- power drill
- 1" hole saw
- 1 3/4" hole saw
- 2 1/2" hole saw
- wrench



Supplies:

- spigot: 3/4" American Valve Boiler Drain With Pex End (plastic nut) – Lowe's \$10.48
- overflow outlet & hose: Parts2O 24' Universal Fit Hose Kit – Home Depot \$9.66
- screen: Elite Line Stainless Steel Mesh Drain Strainer – Christmas Tree Shop \$1.29
- caulk: GE Premium Waterproof Silicon Kitchen/Bath/Plumbing – Lowe's \$3.94 for 2.8 FL OZ
- washer: 1" washer – Lowe's \$1.18
- silicon tape – Home Depot \$1.18

Step by step directions:



Step 1: Clean & rinse the barrel. Let dry



Step 2: Use 3/4" hole saw to drill a spigot hole near the bottom of the barrel



Step 3: Apply a thin bead of caulk around the hole



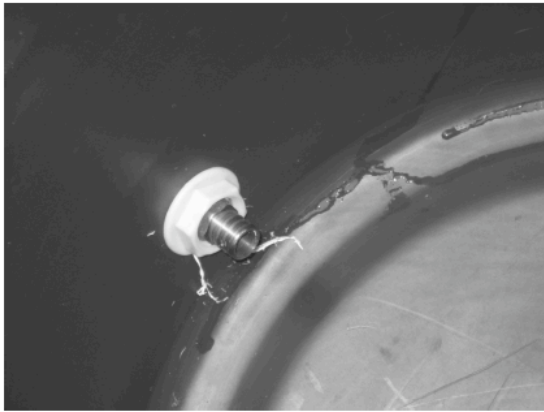
Step 4: Wrap silicon tape around threading on spigot 2-3 times



Step 5: Place washer on end of spigot



Step 6: Screw spigot into hole



Step 7: Inside the washer, turn the plastic nut onto the spigot until tight



Step 8: If needed, have one person inside barrel hold nut tight w/wrench while a second person on outside turns the spigot until tight



Step 9: Use 1 3/4" hole saw to drill hole near top of barrel for overflow



Step 10: Screw 1 1/2" adapter into the hole



Step 11: Attach discharge hose to adapter



Step 12: Use 2 1/2" hole saw to drill a hole in the top/lid of the barrel



Step 13: Place screen in hole on top of the barrel. Finished!

Buying a cheap rain barrel:

The New Hampshire Coastal Protection Partnership makes and sells rain barrels for the below market price of \$45 to \$75. Each rain barrel is handmade by our staff and volunteers using recycled food-grade plastic drums. You can place an order by filling out the enclosed survey form or by calling Dave at (603) 617-0679. Or order online by visiting www.nhcoast.org.

Capacity: 50 to 60 gallons

Color: Adobe



Economy rain barrel: \$45 each

No overflow outlet. Not recommended for downspout hookup or installation near foundation.



Deluxe rain barrel: \$75 each

Includes 1 1/4" by 24' overflow outlet and discharge hose. Recommended for downspout hookup and installation near foundation.

Other ways to help reduce nitrogen pollution:

- Pick up pet waste - In addition to nitrogen, a single gram of dog poop can contain up to 23 million fecal coliform bacteria. Picking up after your pet helps to keep nitrogen and fecal bacteria out of our water, keeping it safe for swimming and drinking
- Install porous asphalt - Stormwater drains through driveways paved with porous asphalt, reducing or even eliminating run-off. Porous asphalt also acts as a stormwater filter, removing hazardous pollutants like motor oil and heavy metals
- Plant a rain garden - A rain garden is an eco-friendly landscaping feature designed to reduce run-off and remove pollutants from stormwater. A rain garden can also be used to reduce flooding and control erosion on your property.
- Maintain your septic tank - Make a commitment to keep sewage inside your septic tank and out of the water we drink and swim in



Images:

Clip art images courtesy of the University of Wisconsin Cooperative Extension.

Sources and acknowledgements:

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Credits:

This guide was produced by:



David Anderson, Project Coordinator
New Hampshire Coastal Protection Partnership
162 Thornton St.
Portsmouth, NH 03801

Phone: (603) 617-0679
Email: info@nhcoast.org

www.nhcoast.org

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Lamprey River Advisory Committee
C/O Sharon Meeker, Chair
203 Wadleigh Falls Rd.
Lee, NH 03861

Phone: (603) 659-5441
Email: S-Meeker@comcast.net

www.lampreyriver.org



PISCATAQUA REGION
Estuaries
Partnership

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Seacoast Nitrogen Campaign Reduction Survey & Pledge Form:

I pledge to:

- Not use lawn fertilizers
- Use only slow release nitrogen lawn fertilizers

I previously:

- Used lawn fertilizers
- Used only slow release fertilizers
- Did not use lawn fertilizers

Rain barrel usage:

- I already have a rain barrel
- I plan to build my own rain barrel

Rain barrel order form: Please enclose a check made out to "NH Coast"

- Economy rain barrel - enclose \$45
- Deluxe rain barrel - enclose \$75

Want more information about steps you can take to reduce water pollution?

- Yes, please add me to your email list. Email address: _____
- No thank you!

Support the work of the New Hampshire Coastal Protection Partnership by enclosing a tax-deductible donation. Make checks out to "NH Coast"

- I want to become a member of NH Coast (\$20 or more)
- I'm enclosing a general donation for \$ _____

Rain garden installation

- I'd like to learn more about installing a rain garden on my property

Acreeage of property (i.e. 1.5 acres): _____ acres

Your Name: _____

Address: _____

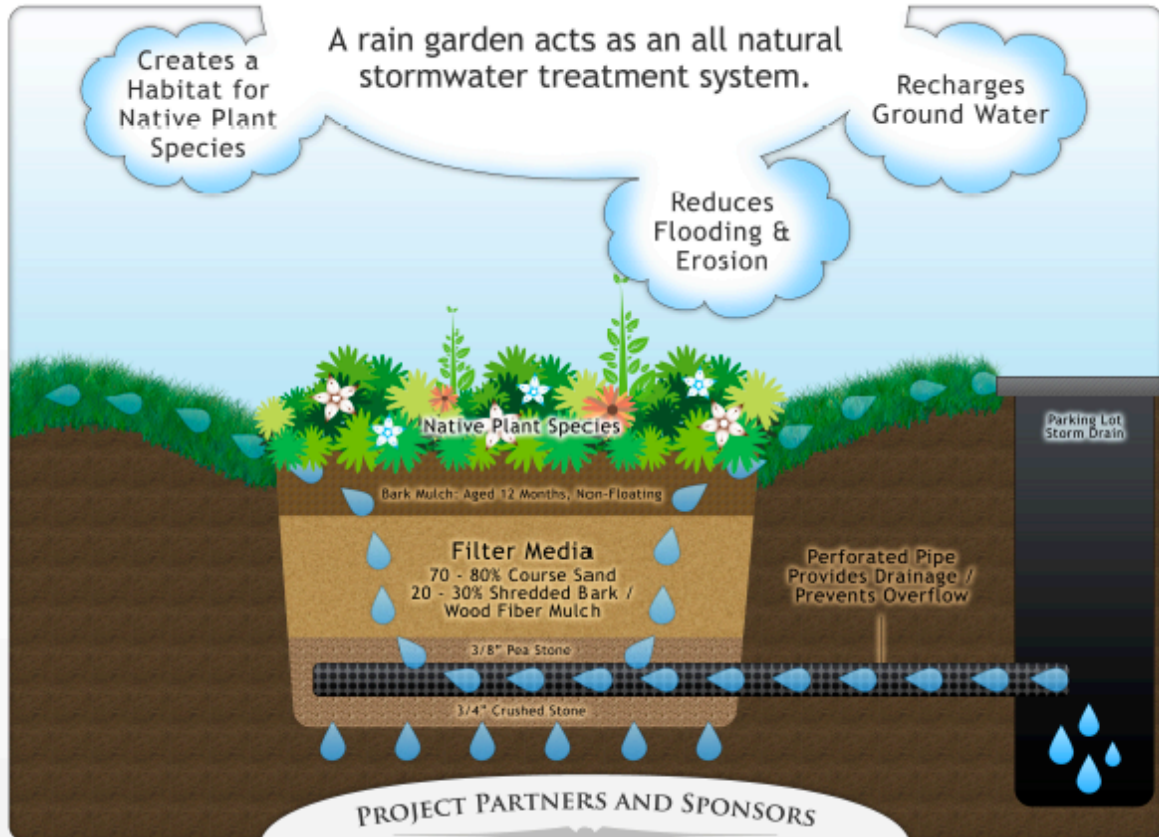
Email or Phone Number: _____

Please mail your completed pledge form and any enclosed donations or payments to:
David Anderson, Project Coordinator
New Hampshire Coastal Protection Partnership
111 Porpoise Way
Portsmouth, NH 03801

Or email your responses to info@nhcoast.org. We'll send you an electronic invoice for any purchases or donations.

Appendix 3: Rain garden signage

NEW CASTLE COMMUNITY RAIN GARDEN



PROJECT PARTNERS AND SPONSORS



Great Island Garden Club

CORNERSTONE



TOWN OF NEW CASTLE



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