YOUR LAND. YOUR WATER. YOUR SOLUTION.

Jillian McCarthy

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

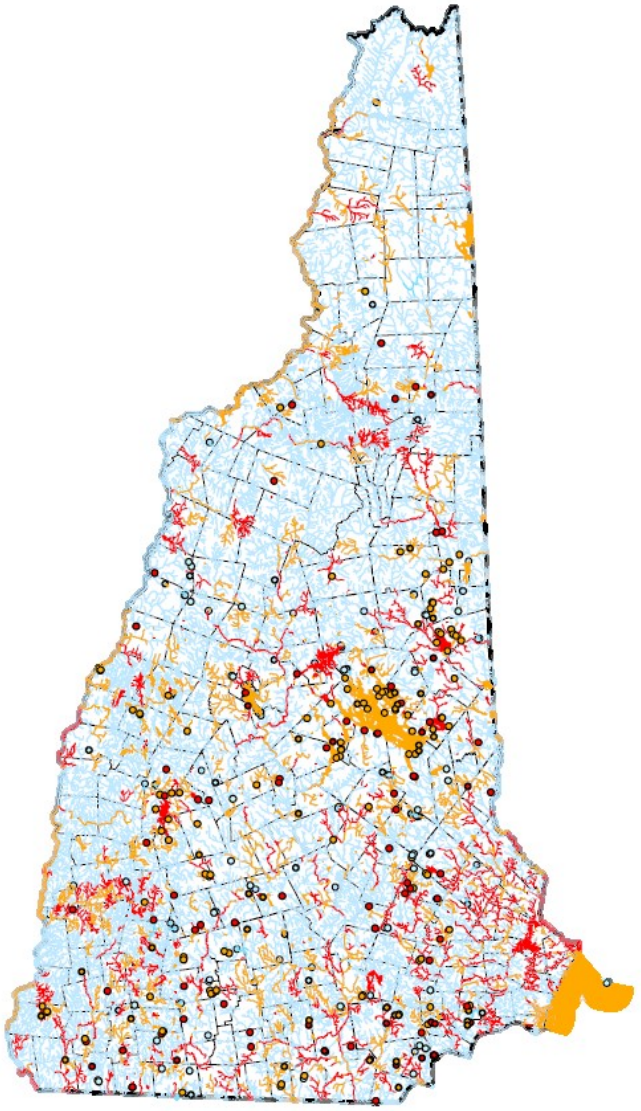
Clean Water Act Section 319
Nonpoint Source Program

NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION U.S. DEPARTMENT OF COMMERCE

2014 Competitive Project of
Special Merit Grant

Why Soak Up the Rain?

Stormwater runoff causes or contributes to over 90% of the water pollution problems in NH.



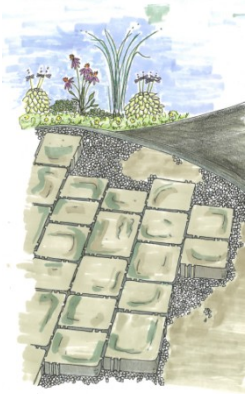
Aquatic Life Use

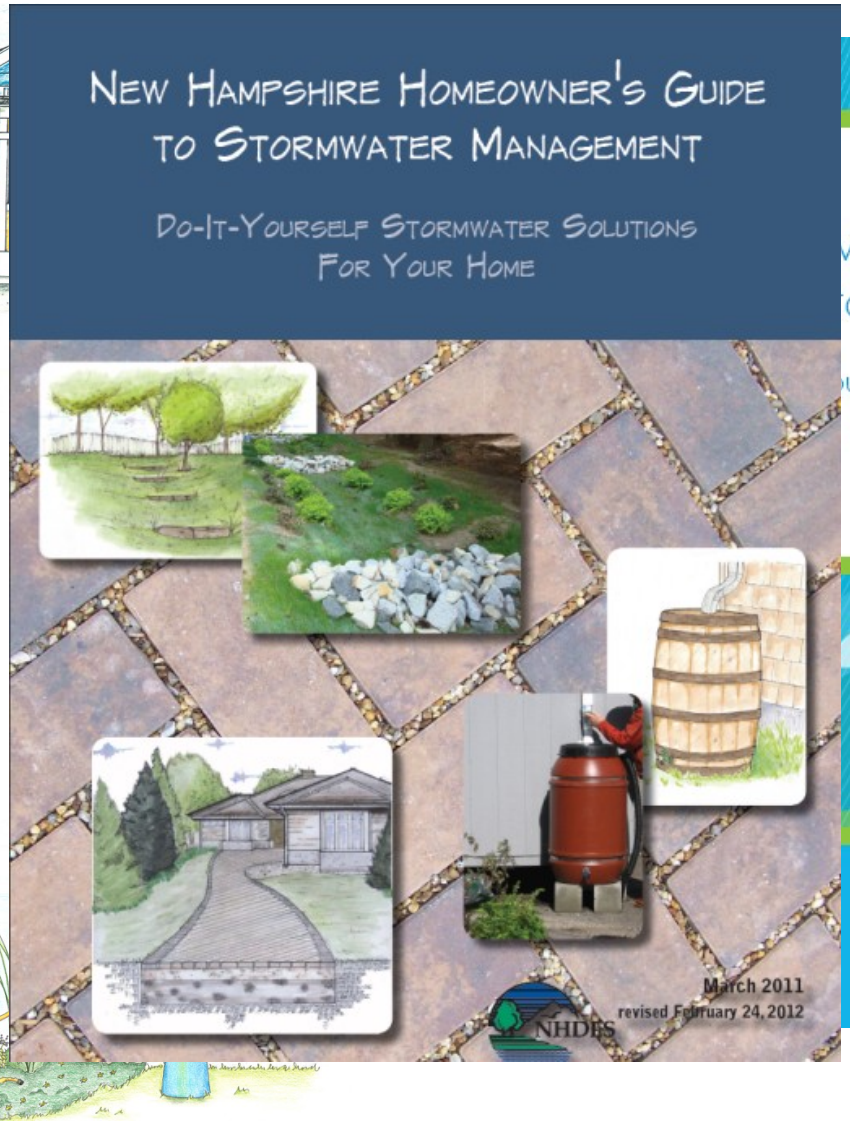
Primary Contact Recreation

Program Vision

NH residents understand the connection between their property management practices and the health of the watersheds in which they reside. NH surface waters are protected and restored through increased support for local water quality protection and in-the-ground practices that reduce stormwater pollution, such as rain gardens and rain barrels, that are as commonplace as recycling.

Where it All Started





Program Structure

NH DES

Local Partners

Home Owners

Local Partners

Soak up the rain NH

Green Mountain Conservation Group

Phillips Exeter Academy

Neapolitan 900° Pizzeria

AWWA

Great Bay Stewards

Town of Hampton Conservation Commission

Rolling Green Nursery

Hodgson Brook Restoration Project
Portsmouth, NH

Silver Lake Land Trust
Harrisville and Nelson,NH

University of New Hampshire Cooperative Extension

Conservation Commerce Community
Lake Innipesaukee Watershed Association

NH Audubon
Protecting our environment since 1914

Partnership Spectrum

Everything in Between

Full Scale Program

Outreach & Education Only

Soak up the Rain BRENTWOOD

HELP OUR RIVER SAVE OUR BAY

A Program of

Partner Benefits

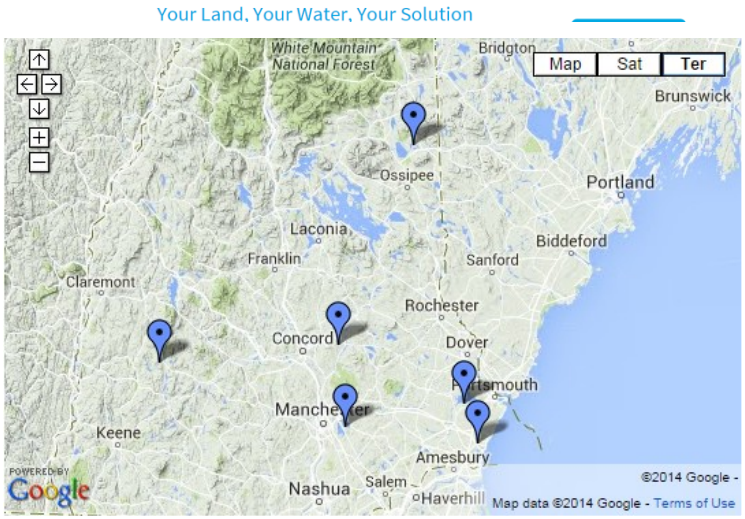
- Classroom
  - Project
  - Installati

Partner Benefits

A ready-made stormwater brand

Partner Benefits

- Exposure on the SOAK website and facebook page.
- Listed as a SOAK Partner
- SOAK story & project map



Soak Stories

DRY WELLS – SIMPLE AND EFFECTIVE FOR TREATING STORMWATER POLLUTION

In September 2014, the Soak Up the Rain (SOAK) Great Bay program installed a dry well at a property on the shore of Great Bay in Greenland. Before the installation, roof and driveway runoff from the property flowed through a pipe and into a pond that drains directly into the bay. Residents in the neighborhood reported increasing amounts of green algae in the pond in recent years – a sign that it's receiving too many nutrients.

The existing pipe drains to the pond and then to Great Bay.

The SOAK Great Bay team decided a simple and effective way to reduce pollution to the pond, including nutrients that make the algae grow, would be to capture the runoff in a dry well before flowing into the pipe. Now the dry well – basically a hole in the ground filled with crushed stone - collects the water and allows it so slowly soak into the ground.

THE NITTY GRITTY

To install the dry well, the crew began by removing an existing grate and disconnecting the drain pipe that led to the pond. Taking turns with shovels, a pick axe, post hole digger, and pry bar they dug the dry well to roughly 3' by 3' by 3' in size. The soil contained more clay than the crew anticipated and so it was decided in the field to increase the size of the dry well to accommodate a slower infiltration rate. The sides were lined with cloth filter fabric to prevent soil from migrating into the dry well.

Before filling the hole completely with ¾" drainage stone, an overflow pipe and a layer of the cloth filter were installed. If it rains enough to fill the dry well before all the water can soak in, the overflow pipe, attached to the existing drain pipe, allows the excess water flow to the

An overflow pipe is installed to drain excess flow during larger storms. Geotextile fabric prevents soil and sediment from migrating into the dry well.

understanding of community issues, as well as active relationships with the people who live there. Local SOAK Program managers should be enthusiastic, have the organizational

MS4 Benefits

Soak up the rain NH

Municipal Separate Storm Sewer System

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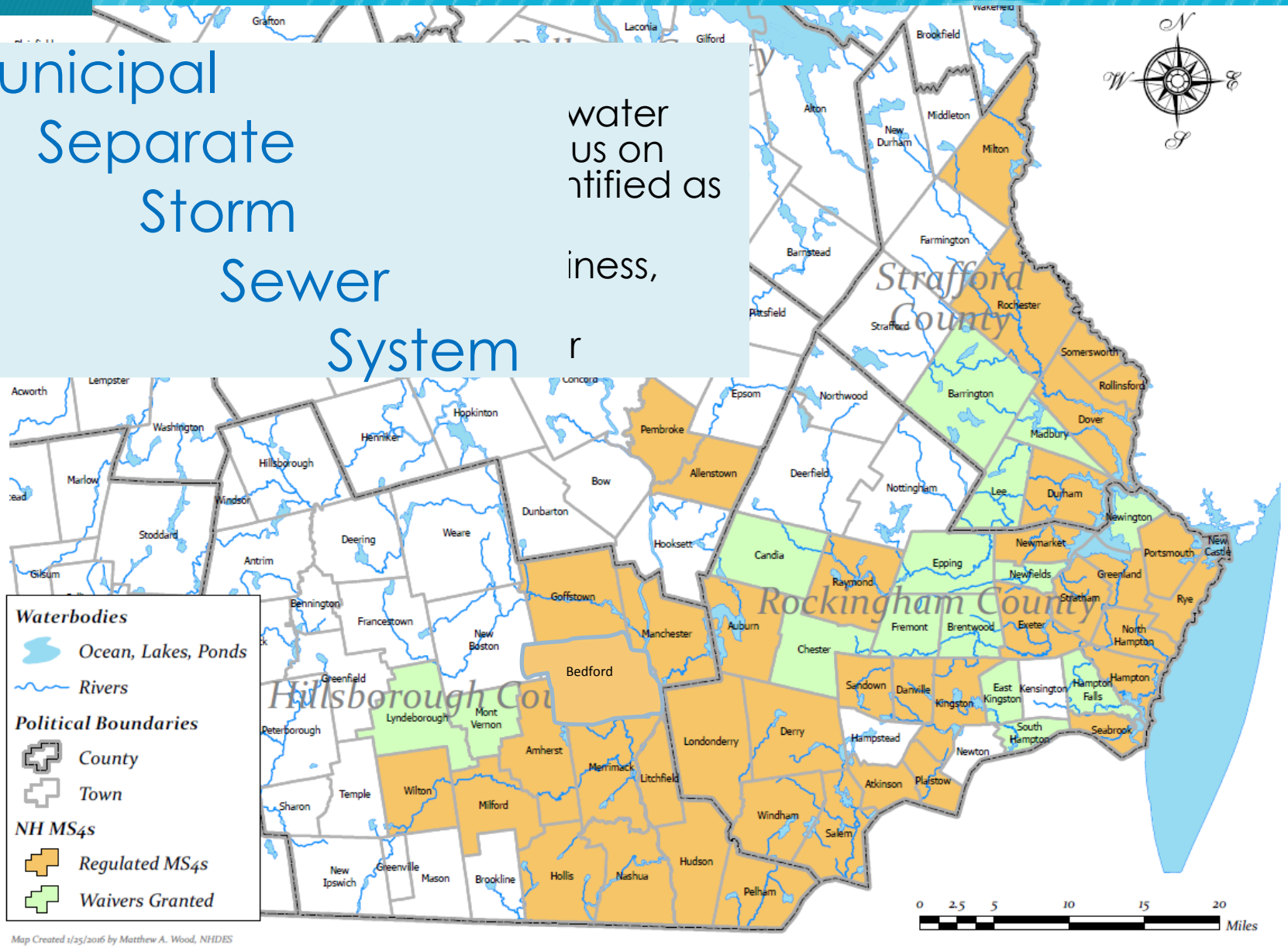


Working with MS4s

Resources

- Installations
- Presentations
- Training
- Site Assessments
- Flyers
- Website

Partnering

- Outreach Planning
- Installation Assistance
- Funding Assistance or Direction

Durham Rain Garden

Annual Pollutants Reduced:

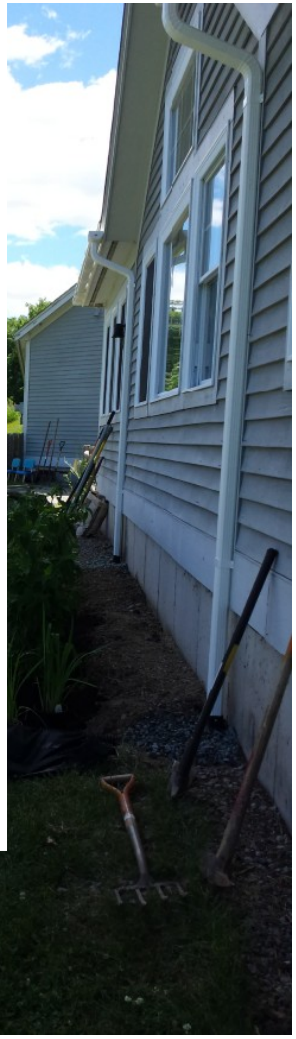
Runoff: 6785 gallons

Phosphorus: 0.03 lbs

Sediment: 8.64 lbs

Nitrogen: 0.1 lbs

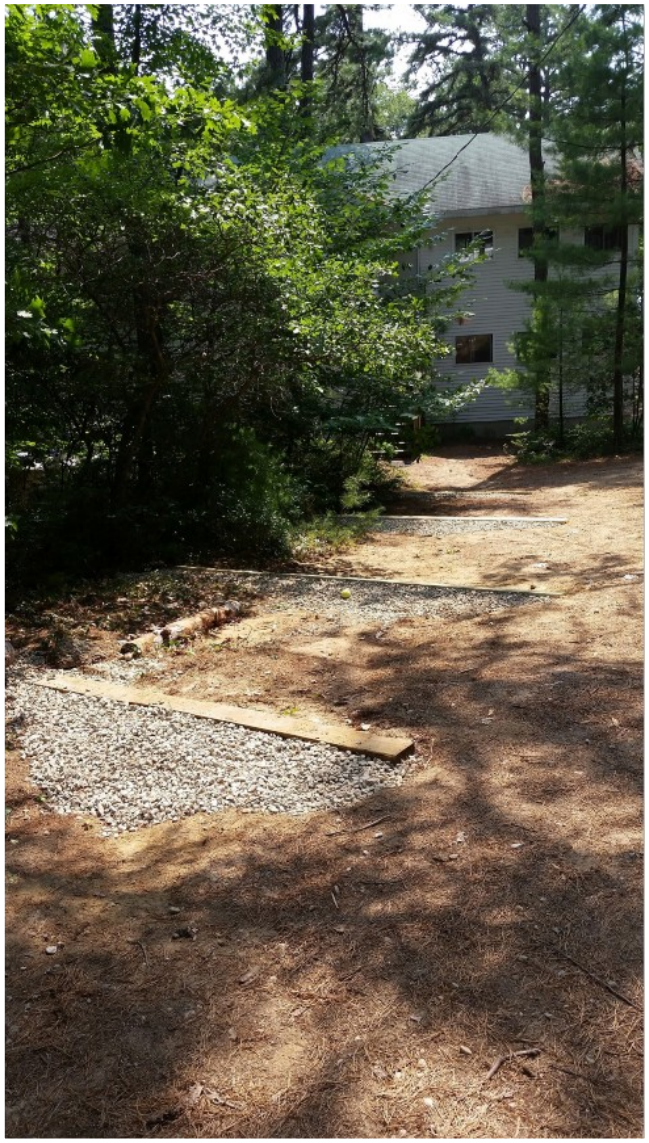
Auburn Rain Garden



Annual Pollutants Reduced:

Runoff: 17,340 gallons
Sediment: 2.34 lbs
Phosphorus: 0.01 lbs
Nitrogen: 0.13 lbs

Water Bars & Infiltration Steps



Annual Pollutants Reduced:

Runoff: 33,573 gal
Sediment: 11,600 lbs
Phosphorus: 3.1 lbs
Nitrogen: 5.4 lbs

Dover Rain Garden

Annual Pollutants Reduced:

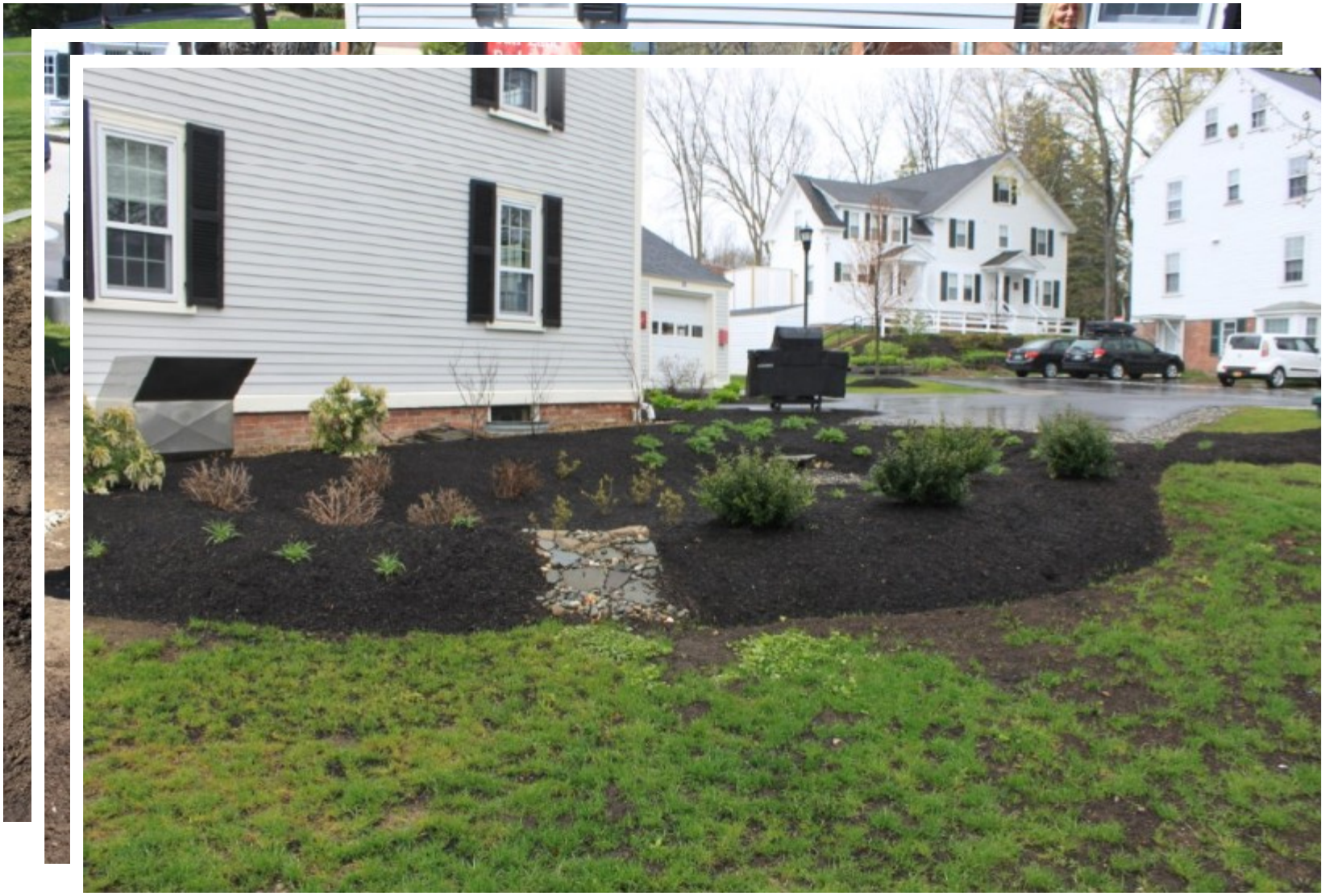
Runoff: 19,367 gallons

Sediment: 3.45 lbs

Phosphorus: 0.01 lbs

Nitrogen: 0.2 lbs

Exeter Rain Garden



Landscaping for Water Quality

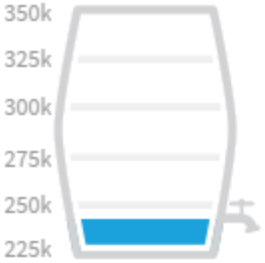
Measurable Results

www.soaknh.org

We're SOAKing up Pollution

We're soaking up runoff everywhere. See how much water pollution SOAK projects have prevented.

Goal: Soak up 350,000 gallons of stormwater by the end of 2016!
(or about 14 in-ground swimming pools)

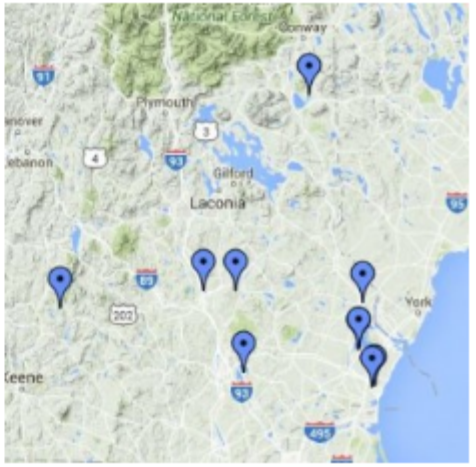


SOAKed to Date:
Runoff: 242,982 gals
Sediment: 11,696 lbs
Phosphorus: 4.06 lbs
Nitrogen: 7.82 lbs

You can help us reach our goal. See How.

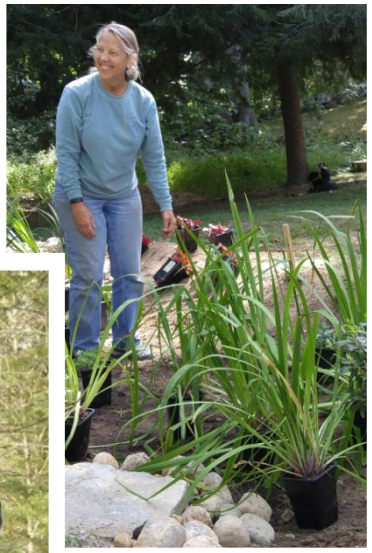
See where we're SOAKing up the Rain

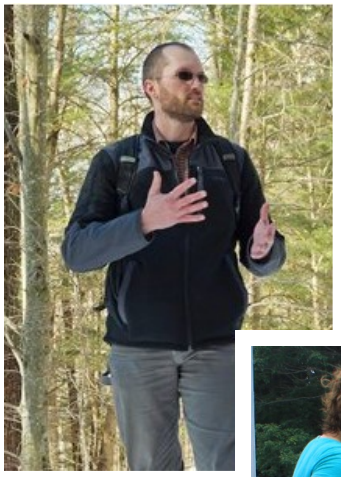
Click on the map to see where the SOAK program and its partners are reducing stormwater pollution.



Lessons Learned

1. A successful program needs an energetic, local champion.





Challenge:

- Competing priorities
- Volunteer burnout

Recommendation:

- Paid volunteer coordinators – through professional employment or grants
- Multiple volunteers split coordination tasks

Lessons Learned

2. Build a diverse volunteer network.

Challenge:

- Not enough people sign up for project
- People who signed up do not show up

Recommendation:

- Diversify – master gardener's, local clubs, local schools and summer camps, local businesses, neighbors
- Recruit for each installation
- Incentives – food, raffle
- Event-based – national day of caring, earth day, old home day, market day

Lessons Learned

3. Tap in to local partners to locate project sites.

Challenge:

- Difficult and time consuming to find optimum project sites

Recommendation:

- Engage and build partnerships within the community to identify target areas: environmental groups, municipalities, regional planning commissions, and other organization
- Partner with local businesses for demonstration sites

Lessons Learned

4. Slow and steady wins the race.

Challenge:

- Underestimate time and resource needs
- Overcommit and can't meet goals – seen as failure

Recommendation:

- Be realistic about organizational capacity in the first years
  - Set realistic goals to achieve success – even if small
  - Better to be able to scale-up than have to scale-down

Lessons Learned

5. Plan for maintenance.

Challenge:

- Maintenance? What maintenance?

Recommendation:

- Put together a simple maintenance plan for the property owner:
  - Design and planting plan (if vegetated)
  - Photo of finished project
  - Leave tags or markers on plants
  - Schedule of maintenance activities
  - Agree on person responsible for maintenance before project is done

Next Steps

- Promote update to NH Homeowner's Guide to Stormwater Management
- Newfound Lake Region Association local program
- Landscaping for Water Quality training in NH Lakes Region
- Continue to build local partnerships
  - Project installations
  - Outreach and presentations

soaknh.org Resources

Resources

- Outreach Materials
- Property Owner Documents
- SOAK Project Planning
- Do-It-Yourself Fact Sheets
- Publications and Related Links

Like us on Facebook

SOAK Project Planning

SOAK Field Tools and Guides

Used to assess properties and gather information for potential projects.

Pre-Screening Survey
Helps determine whether a property would be a good project site – based on potential water quality benefit and property owner interest.

Site Screening Field Sheet
Used to determine if the property is suitable for a SOAK project.

Site Design Field Sheet
Used to gather information needed to design a project.

Complete SOAK Field Packet
Contains the Site Screening Field Sheet and the Site Design Field Sheet.

SOAK Planning & Design Tools and Guides

Used to help plan and design a SOAK project installation once a site has been selected.

Project Worksheet
Used to organize project information and to determine the type and amount of materials needed.

Planting Plan
Used for planning the plant type, amount, and placement for vegetated practices.

soaknh.org Resources

Vegetated Swale

A vegetated swale is a shallow channel that slows runoff and directs it to an area where it can infiltrate. Swales use plants to stabilize the soil, reduce erosion, slow the flow and absorb runoff.

EQUIPMENT & MATERIALS

- Measuring tape
- Shovels
- Rakes
- Plants - native grasses, sedges, and seedlings
- Mulch
- Wheel Barrow(s)
- Stakes
- String & string level

Sizing and Design

STEP 1: **Location.** Swales are often located close to roads or driveways. They are usually built in naturally sloping areas to convey runoff safely and slowly to a vegetated area where it can infiltrate. If a vegetated area doesn't exist, consider building a rain garden, dry well, or other practice at the end of the swale to encourage the runoff to soak into the ground. A slope of 1" for every foot in length is enough to slowly move the runoff through the swale. Consider the source of the runoff, the slope of the land, and where you want the runoff to ultimately end up when selecting the location of your swale. Swales should not be used to direct water off of your property, or into a road or waterbody.

STEP 2: **Length and width.** Consider the natural contour of the land when deciding on the shape and dimension of the swale. A swale that meanders down a slope will convey runoff more slowly than a straight swale. The distance from the source of the runoff to the desired outlet location will dictate the length. A swale can be any width. Constraints on the site, such as buildings and property setbacks, can influence the width and how the swale fits into other landscaped features.

STEP 3: **Berms or check dams.** If a swale needs to be oriented straight down a hill or on a steep slope, consider adding berms or check dams to the swale design. Berms or check dams are built across a swale, similar to speed bumps in a road. They are used to slow down the speed of runoff as it flows through the swale.

STEP 4: **Plant selection.** Refer to *Native Plants for New England Rain Gardens* in Appendix A for plant suggestions. While this guide was developed for rain gardens, many of the species would do well in vegetated buffers. Hardy ground covers and

New Hampshire Homeowner's Guide to Stormwater Management Do-It-Yourself Stormwater Solutions

grasses that produce uniform, dense cover, and can withstand flood and drought conditions are best. If the swale is to be located close to a road or in an area where snow will be stored, salt-tolerant plants should be considered.

STEP 4. **Identify staging and material disposal area(s).** Identify an area on the site where delivered materials, such as stone, compost, and mulch, can be stored temporarily while the vegetated swale is being built. Also determine where excess materials, like sod and soil that is excavated from the swale, will be disposed.

Installation

STEP 1: **Mark out location.** Using stakes and string or spray paint, mark out the boundary of the swale according to the design. Be sure to identify the placement of any berms or check dams. These are areas that you will likely not need to dig as deeply, if at all.

STEP 2: **Dig.** Dig out the shape of the swale. The deepest part of the swale should be about 3' deep. The width of the swale will depend on how much space you have on your site. A swale can be any size or length, but most are shaped like a trapezoid with the sides being three times wider than the width of the base. The slope of the sides should be between 1% and 4% (Figure 1).

TIP: Be careful not to compact the soil when digging because it will reduce the ability of the swale to infiltrate runoff. For clay soils or other poorly infiltrating soils, you may want to dig down an additional 1 1/2' below the bottom of the swale and create a sandy loam by mixing sand in with the existing soil, then refill the hole. This will improve infiltration.

STEP 3: **Berms and check dams.** For swales on steep slopes (5% or steeper), berms or check dams can be used to slow down the flow of runoff and reduce the potential for erosion. These can be made of compacted earth and reinforced with plantings and stone, or can be made of larger stones. Be creative. Berms made with large stones can become beautiful landscape features.

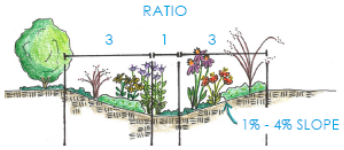


Figure 1. Profile of vegetated swale.

STEP 4: **Secure swale inlet.** Depending on how runoff enters the swale, consider stabilizing the inlet with a splash guard, crushed stone, or hardy plants to reduce erosion from fast moving water.

STEP 5: **Plant the swale.** Use good planting practices, such as those listed below. Place plants while still in their pots into the buffer according to the planting plan. Make adjustments for spacing as needed. When you are ready to plant, remove one plant at a time from its pot.

- Dig a hole twice as wide as the plant's rootball and no deeper than the rootball.
- Loosen and rough up the rootball before planting, especially those rootbound in

Soak up the rain NH

www.soaknh.org

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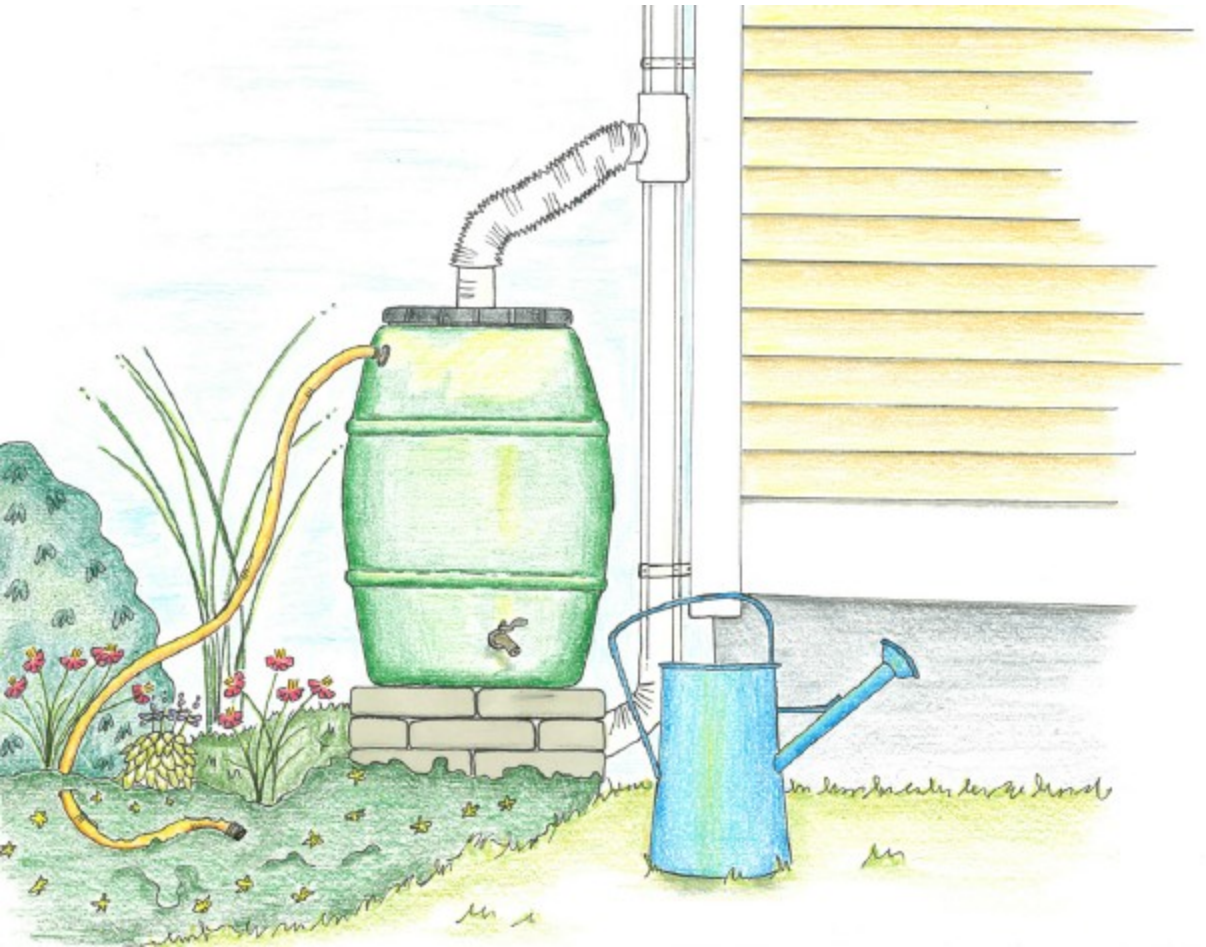

Soak up the Rain New Hampshire

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