



Exeter Neighborhood Learns How to Soak Up the Rain

From a Soak Up the Rain (SOAK) perspective, the Westside Drive neighborhood in Exeter is a small area with a big problem. The wide roads and tightly packed homes generate a lot of stormwater runoff, but the high water table makes it difficult to find ways to allow that runoff to soak into the ground. Instead, when it rains all that water and its associated pollutants are collected by pipes and shot into the Little River which eventually leads to Great Bay.

Westside Drive Meet-Up

To generate interest among area residents, SOAK Great Bay (the local SOAK group headed by Laura Byergo of the Great Bay Stewards) partnered with the town of Exeter to host a neighborhood outreach event. Visitors learned how watersheds work, picked up flyers about Do-It-Yourself stormwater practices, and enjoyed displays and giveaway items. Neighbors were encouraged to share their stormwater stories, enter a rain barrel raffle, and sign up to have their properties evaluated.

Nora's "Oasis"

Through the meet-up, SOAK Great Bay found a really great opportunity to soak up some rain at Nora's neighborhood home off Westside Drive. Rain from Nora's roof was being directed onto the road and into the stormwater collection system. The idea was to direct the water into a rain garden instead. A "perc" test showed that water would soak in at the ideal spot for the rain garden, so Laura designed a rain garden based on the SOAK NH Do-It-Yourself Fact Sheets for rain gardens.

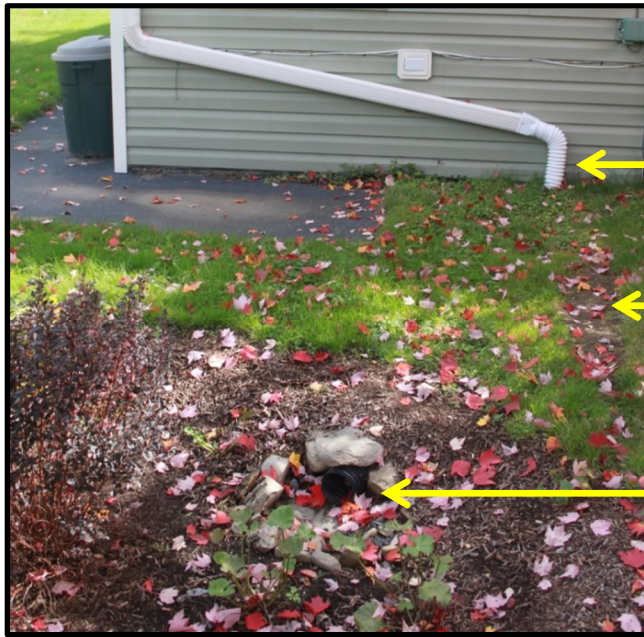
"It is an oasis....I am happy when it rains." Nora, speaking of her rain garden.



Although a hardy work crew was assembled, digging out the rain garden area by hand proved to be a challenge. A mini excavator was brought in to keep the work on schedule. Once the hole was dug, the crew was able to build the rain garden.

To determine the size of a rain garden, three pieces of information are needed: the size of the area being directed to

Each year, Nora's rain garden is expected to capture and soak in over 10,000 gallons of rain from her roof. A low growing Fragrant Sumac (*Rhus aromatic* "Gro Low") shrub can be seen on the left in the foreground. The dark-leaved shrub in the background is Ninebark (*Physocarpus opulifolius*).



The downspout extension was placed in a trench underground and connected to the inlet pipe

Former path of the downspout extension over lawn and out toward road

Inlet pipe bringing roof runoff into rain garden

the rain garden, the soil type, and the slope of the land where the garden will be built. According to SOAKNH's sizing directions, Nora's rain garden needed to be about 160 square feet. A rain garden this size is expected to hold one inch of rain falling on Nora's roof without overflowing. About 90% of rain storms in New Hampshire are one inch or less.

The rain garden contains a variety of perennials – such as asters and marsh marigolds – and shrubs – such as ninebark and red chokeberry. During a large storm a few months after it was built, Nora said that the rain garden worked perfectly. She called it an “oasis” and said she is now happy when it rains!

Based on the size of the roof and the expected annual rainfall in Exeter, it's estimated that Nora's rain garden will capture 10,016 gallons (1,339 cubic feet) of water, 1.8 pounds of sediment, 0.01 pounds of phosphorus, and 0.10 pounds of nitrogen each year.

Nelson's Infiltration Trench

As Nora's rain garden was being completed, a neighbor's property was being checked out for potential ways to reduce runoff to the road. At his property, Nelson had plans to bring in some soil to level his backyard, which would drive ponding water from roof runoff out toward the road in front of his house. SOAK Great Bay designed a slightly sloped infiltration trench along the side yard. Water directed into it from the roof can soak in as it moves along underground in the trench toward the front yard.

An infiltration trench is just a simple channel dug down about foot deep and filled to the top with $\frac{3}{4}$ " crushed stone. The sides are usually lined with landscape fabric. A layer of fabric is typically placed about 3" from the top before the trench is completely filled. The fabric is used to prevent soil from clogging up the pore spaces and to allow easier maintenance if the top layer becomes filled with soil. Decorative stone is often added as a very top layer. In Nelson's case, the end of the trench was widened to create a larger area of infiltration – resulting in a “lollipop” shape. Plants, a bird bath, or other decorative touches could be added in the future.



At the end of the trench (seen in the foreground of the photos), a “lollipop” shape was formed creating a large area for water to soak in. The trench was lined on all sides with black landscaping fabric (seen in the left photo) then filled to within three inches of the top with crushed stone. A layer of the fabric was installed over the stone. Three more inches of crushed stone were placed over the fabric to make the top of the trench flush with the surrounding lawn. The fabric prevents soil from moving into the pore spaces and clogging the trench, which allows water to move freely and soak into the ground. It also allows the homeowner to more easily clean the top layer of stone if it gets filled with soil and unwanted vegetation.

Based on the size of the roof and the expected annual rainfall in Exeter, it’s estimated that Nelson’s infiltration trench will capture 13,263 gallons (1,773 cubic feet) of water, 2.78 pounds of sediment, 0.02 pounds of phosphorus, and 0.14 pounds of nitrogen each year.

Congratulations!

These Westside Drive neighborhood projects were the final stormwater practices required by a grant agreement between SOAK Great Bay and NH Department of Environmental Services. Funding for the SOAK Great Bay program was provided in part by a Watershed Assistance Grant from the NH Department of Environmental Services with Clean Water Act Section 319 funds from the U.S. Environmental Protection Agency.

The practices were designed by Laura Byergo of the Great Bay Stewards and SOAK Great Bay using SOAK NH’s DIY Fact Sheets (available at SOAKNH.org). Along with the practices installed all over the Great Bay watershed – including in Dover, Durham, Exeter, Greenland, and Newmarket – SOAK Great Bay held multiple community events in the watershed. Congratulations and thank you to the Great Bay Stewards, especially Laura Byergo, for the commitment to showing homeowners how simple property management practices can help reduce water pollution in Great Bay!

In total, the Soak Up the Rain Stormwater Solutions installed by SOAK Great Bay capture up 103,149 gallons (13,789 cubic feet) of stormwater, 210 pounds of sediment, 1.3 pounds of phosphorus and 5.5 pounds of nitrogen each year.