

LEARNING LESSONS AT A DURHAM RAIN GARDEN



Along Durham’s Mill Pond Road, there are numerous properties that abut the Oyster River with potential to negatively impact the water quality in the river and eventually in Great Bay. When one such property owner contacted the Soak Up the Rain program, a connection was made and a rain garden installation was planned.

PLANNING & INSTALLING THE RAIN GARDEN

Based on the topography and flow of water along the property, the rain garden was located in the side yard. This area was selected because it receives runoff from the yard itself as well as from a neighboring property’s driveway. The runoff continued down the side yard, into a small brook, then into the Oyster River. Locating a rain garden to capture this runoff before it enters the river provides the greatest water quality benefit.

The slope of the yard was factored into the rain garden size and berm height. Rain gardens are not recommended on slopes greater than 12% because it is difficult to prevent water from flowing too quickly through the garden and causing damage to the berm. Rain gardens built on slopes require that a berm – or low wall – be built along the low side to give the rain garden its characteristic bowl shape.

A fantastic group of volunteers helped to build the rain garden. The garden has an 8” ponding depth – the depth of the finished garden which allows water to pond up and slowly sink in. Plants were chosen from a list of rain garden appropriate plants, considering the homeowner’s preferences. A mix of shrubs, ferns, and flowering perennials provide the garden with interest and texture. Among others, Common witch-hazel (*Hamamelis peregrina*), Cardinal flower (*Lobelia cardinalis*), and Royal fern (*Osmunda regalis*) were planted.



This Mill Pond Road neighborhood rain garden captures runoff from paved and grassed areas potentially reducing pollutants and excess flow to the Oyster River.



Blueflag (*Iris versicolor*), seen above and left being planted by the homeowner, helps disperse flow as it enters the rain garden at the inlet. Northern spicebush (*Lindera benzoin*) can be seen on the bottom right of the photo.

FINE-TUNING AFTER THE FIRST RAIN

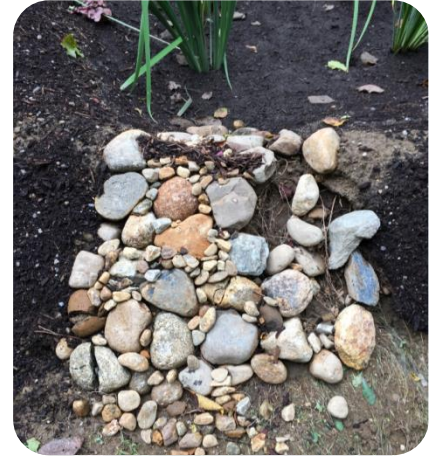
Like most rain gardens, the Mill Pond Road garden needed fine-tuning after the first big rain storm. It is recommended that rain gardens be inspected after each rain storm, especially if the storm brings more than an inch of rain – the amount of rainfall rain gardens are typically designed to absorb. The week after this rain garden was installed, Durham experienced a storm that brought over three inches of rain.



The upper bank experienced erosion during a large storm. Additional plantings on the bank helped address this issue.



The inlet was widened and stone was added to help guide water into the rain garden.



At the height of the storm, water overwhelmed the outlet, which was reinforced with additional stone.

This large storm caused small rivulets in the garden's sloped embankment as well as the inlet and outlet. A number of Spotted crane's bill geraniums (*Geranium maculatum*) were added along the embankment to help stabilize it. The inlet was reinforced by widening it slightly and adding additional stone. Similar reinforcement was made to the outlet. These types of adjustments after large storms are to be expected.

LEARNING LESSONS

The berm height is not always carefully calculated or designed in great detail in the planning process. Rather, it takes shape as the rain garden is built. For this project, the slope of the yard in conjunction with the length of the rain garden downhill was such that the berm needed to be quite high in order for the rain garden to have level edges all the way around. The installation team felt that, while it functioned well, the tall height of the berm appeared oversized and wasn't as visually appealing as it could be.

As a result of this observation, the SOAK NH program developed the following recommendations and sizing guide for rain garden berms:

- Berms should be no taller than about 12" high in order to blend with the surrounding landscape and to be easier to maintain. This may require reducing the length of the garden in the uphill/downhill direction.
- If the rain garden length in the uphill/downhill direction cannot be reduced, dig the garden deeper and decrease the berm height. The "bowl" shape of the rain garden will be sunken into the sloped landscape.

BERM SIZING GUIDE:

| Suggested Rain Garden Length for a 12" Berm Height | | | | | | | | | | | | | |
|--|------|-----|-----|-----|-------|-------|-------|-----|-----|-------|-----|------|----------|
| Slope | 12% | 11% | 10% | 9% | 8% | 7% | 6% | 5% | 4% | 3% | 2% | 1% | 0% |
| Rain Garden no Longer Than: | 8.5' | 9' | 10' | 11' | 12.5' | 14.5' | 16.5' | 20' | 25' | 33.5' | 50' | 100' | No limit |

REDUCING POLLUTANTS

It is estimated that this rain garden captures over 6,700 gallons (900 cubic feet) of runoff every year preventing 8.64 pounds of sediment, 0.03 pounds of phosphorus, and 0.1 pounds of nitrogen from reaching the bay each year.

Soak up the Rain (SOAK) Great Bay is a pilot, residential stormwater management program under NHDES's voluntary SOAK NH program. SOAK Great Bay is focused on providing assistance to property owners in the Great Bay watershed to reduce stormwater runoff and pollution to the bay. In August 2013, the Great Bay Stewards partnered with NHDES to expand their knowledge of residential stormwater management, receive hands on training to identify potential stormwater issues, and assist homeowners with installing solutions.

The Stewards are currently searching for additional homeowners willing to have their property considered for a SOAK project.

Contact them at:
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