



RAIN GARDENS AND NATIVE PLANTS

July 21, 2015
North Scituate Library
Scituate, RI

Funded by RIDEM with an EPA grant under
Section 319 of the Clean Water Act

TONIGHT'S AGENDA

- ◉ Rain gardens: what they do and how they work
- ◉ Native plants: how to find and care for them
- ◉ How rain garden plants are selected
- ◉ Neighborhood tour

NORTH SCITUATE VILLAGE STORMWATER PROJECT

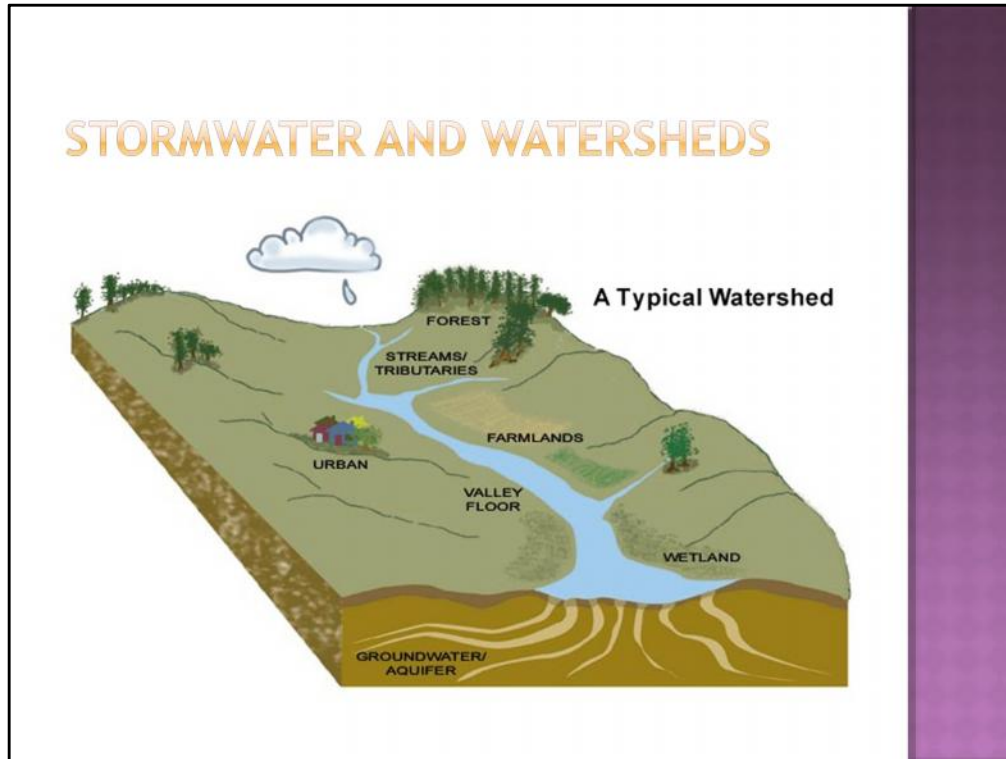
North Scituate Village Stormwater Project Eligible Area

Properties in the yellow area are eligible to apply for stormwater BMP installation through the Project. At least ten properties will be selected for installation.

The map shows an aerial view of a residential area in North Scituate, Rhode Island, outlined in yellow. The area is bounded by Danielson Pike to the west and south, and Westview Drive to the east. Key landmarks include Scituate Family Chiropractic and a building labeled 'SILVUS'. The map also shows roads 115 and 111. To the right of the map are logos for the following organizations: RIDEM (Rhode Island Department of Environmental Management), US EPA (United States Environmental Protection Agency), Northern RI Conservation District, and Providence Water.

We are here today as part of the North Scituate Village Stormwater Project, which is a partnership between the US EPA, RIDEM, The Town of Scituate, Providence Water, and Northern RI Conservation District. The goal of the project is to install various stormwater best management practices, which are devices that control runoff and keep it from becoming polluted as it runs over the landscape, in the area showcased in yellow here. A large effort made in this small area has the potential to both keep a lot of stormwater from reaching Regulating Reservoir nearby, and create a great showcase of the various types of stormwater management practices that are in use here in Rhode Island. So far seven stormwater practices have been installed in the area, with the potential for two additional practices this summer or early fall. The specific goal of the practices is to reduce the amount of phosphorus pollution, which can come from animal waste, septic systems, fertilizer, and several other sources, entering Regulating Reservoir.

STORMWATER AND WATERSHEDS



Stormwater pollution can become a water quality problem because of the way watersheds work. Water will always move downhill. If it lands somewhere where it can be absorbed, or infiltrate, into the ground, it will stay relatively clean and have any pollution that it picks up filtered out by the soil. If, however, it runs downhill over streets or through storm drains, it can pick up pollution that will not have a chance to be filtered out before it reaches surface water, such as a river, a stream, or the Scituate Reservoir.

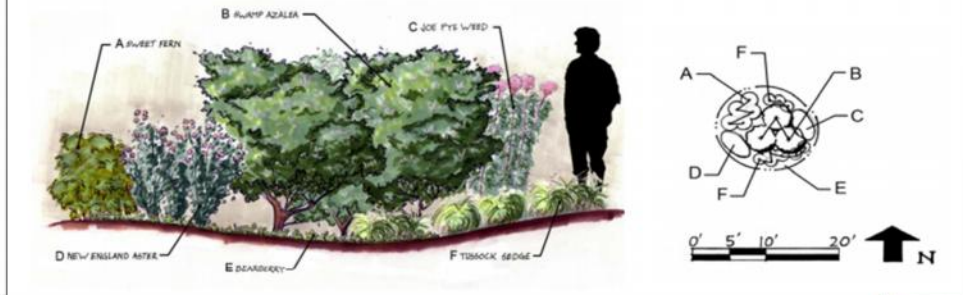
STORMWATER MANAGEMENT 101



In the 50s, 60s, and 70s, when much of our current infrastructure was designed and installed, the one goal of stormwater runoff management was preventing floods. This is certainly an important goal, but it was frequently addressed by using storm drains to bring water from roads to rivers and lakes as quickly as possible. Now that we understand more about the effect that polluted runoff can have on water quality, the goal has shifted to infiltration-mimicking natural systems by allowing as much water to absorb into the ground as possible. Large systems of basins, like the picture on the left from the 116/6 intersection in North Scituate, are one way to accomplish this. Large systems can often be found at newer commercial developments-you will start to notice them once you know what you are looking for. Rain gardens, like the one on the right, are a second way. Rain gardens can be a great fit for controlling stormwater at single family homes and small businesses.

RAIN GARDEN GUIDELINES

Figure 5. Rain Garden Example - Planting Plan 2



RIDEM has documents that give guidance for the design of rain gardens. Guidelines discuss the size that gardens need to be, how far they need to be from certain buildings and features, and how stormwater can be fed into them either by downspouts or by natural slopes. They also, however, contain guidance about what species of plants should be planted in the rain garden

PLANTING GUIDELINES

- ◉ Plants must tolerate both droughts and floods
- ◉ At least three different species
- ◉ Both woody (trees and shrubs) and herbaceous plants



The actual guidelines listed are basic-first, plants must be both flood tolerant and drought tolerant. Most rain gardens hold ponded water for up to 12 hours after a rainstorm, and not every plant is able to handle these inundated conditions. Second, rain garden gardens should hold at least three different plant species. This differentiates them from swales and other types of stormwater management devices that are planted with just grass. DEM also gives, in its documents, links to several suggested plant lists. On these lists you will begin to notice that, although it is not strictly **required** anywhere, most of the plants listed are native to Rhode Island.

NATIVE PLANT TERMINOLOGY

- ◉ *Native*=plants present when the Europeans arrived in the United States (ex. Red Maple, Joe Pye Weed)
- ◉ *Non-Native*=plants introduced with human help, accidentally or on purpose (ex. Norway Maple, hydrangea, forget-me-not)



It is important to note that the terminology related to native plants, and the ethical issues regarding planting native vs. nonnative plants, are all relatively controversial. Some people only consider a plant to be truly native if it grown from naturally-pollinated seed in the state of RI. Others consider cultivated versions of native plants grown at nurseries in the midwest to still be native plants. What I will aim to do here is give you a good sense of the issues and terminology involved so that you can be an informed consumer when choosing plants for your own home.

When we speak about native plants, we are talking about plants that were already present in RI when European settlers arrived. Two examples here are Red Maples and lady slippers. Non-native plants may have been introduced accidentally, when seeds were spread by settlers, or through commerce, or on purpose by people looking to either solve a biological problem or create a more attractive landscape. For example, Norway Maples were introduced because they are a hardy street tree. Red pines were introduced in this area, in part, because they are fast growing and absorb pollution well next to reservoirs. They are native to the US, but not New England. Most hydrangeas and forget-me-nots were introduced because they make good garden plants.

NATURALIZED PLANTS



Some plants that are introduced become naturalized to the point that they are seen as a natural part of the New England landscape. A classic example of that is the black-eyed susan. Although there is a native species of this plant in MA, it is rare, and is actually a species given conservation status by the state. The black-eyed susans that we see in our gardens and roadsides are native to North America, but introduced in RI. However they are often incorrectly considered native, even by garden and environmental professionals, and are not considered harmful to New England ecosystems. Landscapes and ecosystems do change and evolve over time, and many consider naturalized plants that serve ecosystem functions as a positive example of this change. It is possible that in coming years, for example, we will see increasing numbers of plants from southern states become naturalized in New England due to our warming climate.

INVASIVE PLANTS



“A species that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health”-National Invasive Species Management Plan

Some naturalized plants, however, take the next step and become invasive. A nonnative plant only is considered invasive if it has the potential to cause, or is causing, economic, environmental, or human health harm. The plant we see here, Asian bittersweet, is a classic example. It was introduced for ornamental reasons-its beautiful orange berries. However, it is very likely to spread, and grows so prolifically that it can choke and destroy trees. There are many places in New England where entire forests are being damaged by this plant. And yet, its beautiful orange berries still cause artisans to use it to make wreaths. Every time a bittersweet wreath is hung on a door where birds can reach it, it has the potential to spread to new locations. Asian bittersweet is such a harmful species that its use has been restricted in most New England states, although not yet in RI.

NON-NATIVES \neq INVASIVE



Hosta-Stays in place



Privet-Invades

Now, it should be noted that not ALL non-native species will automatically become invasive. Hostas are one example of a very popular garden plant that tends to stay in the garden, where it belongs. Our gardens are not natural landscapes-they have been highly impacted by human activity and sometimes cultivated plants like hostas or daylillies are a reasonable choice to plant in them. There are some plants, however, that are still commonly sold in nurseries and garden centers that will become very invasive and spread beyond the area where they are initially planted. One of these, shown here, is privet. Another is Japanese Barberry. Therefore, although planting nonnatives in your garden often makes sense, our landscapes benefit if you take time to do a quick google search and make sure the plant that you're purchasing does not have a history of becoming invasive.

Invasives specific to Scituate information goes here

NATIVE PLANT BENEFITS



With that said, there are many benefits that native plants hold both for gardeners and the environment. For one, native plants are hardy. If planted in suitable conditions, they will not require as much watering or fertilization as nonnative plants because they are adapted to our soil and our weather. Second, our native fauna evolved alongside native plants. They provide many important benefits for pollinating insect species, such as bees and butterflies. In addition to honeybees there are many important native bee species, such as bumblebees, that benefit greatly when there are large amounts of native plants nearby. Since native plants have evolved to have a natural resistance to many insect pests, you can generally avoid using harmful pesticides that could hurt beneficial insects accidentally. Finally, when choosing a native species, you are guaranteeing that you aren't purchasing a species that will later be determined to be invasive, as has happened with plants like butterfly bush.

CULTIVARS



Interest in using native plants is increasing among many gardeners, particularly in light of growing awareness about the plight of bees and the threat of invasive plant species. The landscaping industry is beginning to take note and create cultivars of many native species. Here is one example. On the right we have winterberry, *Ilex verticillata*, a beautiful native shrub with the appearance of a small tree that can grow to around 10 ft tall. On the left we have “red sprite,” a cultivated variety that grows to only about 4 ft tall and is therefore more appropriate for small spaces. In this case the red sprite serves the same basic ecological function as the native species-beautiful red berries that provide a great winter food source for birds (although this year, most red sprites would have been buried for most of the winter!)

CULTIVARS



Hgtvgardens.com



Here, however, we see a different example. On the right we have purple coneflower, a naturalized species similar to blackeyed susan that has great benefits for bees and other pollinators. On the left is a cultivar that, because of its flower structure, does not provide a benefit to bees. They are not able to access the pollen in this flower. When choosing a cultivar, it is great to think about the ecological as well as aesthetic benefits of the cultivar and try to chose a variety that will be beneficial to the environment as well as your garden.

For our rain garden project, we made it our policy to purchase the pure species whenever it was available, which we found was around 50% of the time. When it was not available, we would chose a cultivar that was a close to the native species as possible.

PLANT SOURCING



Many native plant enthusiasts make it a priority to buy plants that are grown and sourced from the state they live in or an immediate neighbor. The logic here is that these plants are better adapted for the specific climate of the state they live in, and may also have specific benefits for local wildlife. A high bush blueberry plant in RI needs to survive very different climactic conditions than a highbush blueberry plant in Maine. Another consideration whether plants are not just grown locally, but “genetically native,” or grown from seed that has evolved locally over time. Finally, an additional consideration is whether plants are “open pollinated” by wind and insects or manually pollinated. Open pollinated plants have increased genetic diversity, but are difficult to obtain for the average gardener.

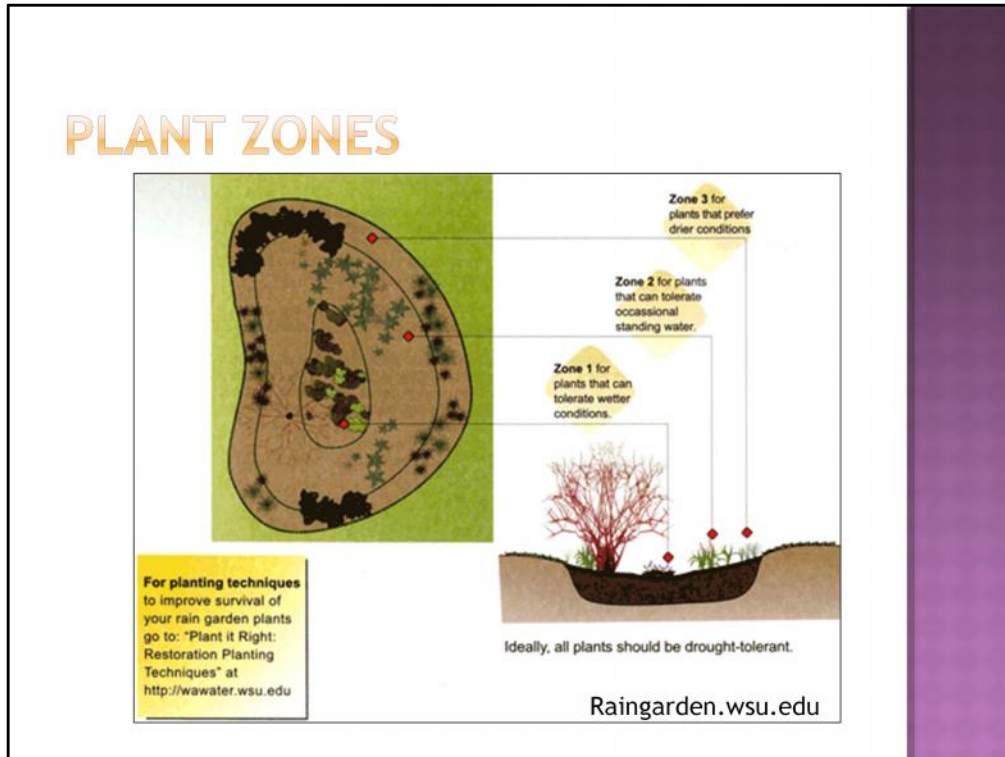
As you can see, there are many different “levels” of research you can do if you would like to add native plants to your garden. In your folder, you will find contact information for the URI Outreach Center and the RI Wild Plant Society. These organizations are not affiliated with us, but can help you locate nurseries that might have the specific native plants you are looking for, and can answer questions about sourcing, cultivars, etc. Overall, however, we encourage you to consider making native plants of some sort a part of your future gardening plans.

NATIVE PLANTS AND RAIN GARDENS



Across the country, including native plants in rain gardens is generally considered standard practice. They are a good fit for each other. Rain gardens shouldn't be fertilized, and native plants generally do not need to be fertilized. Rain gardens need plants that can tolerate weather extremes, and many native plants can do so. Finally, rain gardens are most successful long-term when they are low maintenance. From private homeowners to municipal employees, time is precious. When rain gardens require minimal maintenance, property owners are more likely to keep them around.

In spite of the benefits, however, a recent survey by one large residential stormwater program, Washington D.C.'s RiverSmart Homes program, found that the number one reservation that homeowners had about installing rain gardens was anxiety about caring for native plants. Working with these plants is less familiar to many gardeners since they are difficult to find at most big box nursery centers. Some people are concerned that they will all look like weeds, or will be hard to tell apart from weeds. When the right plant is chosen for the right spot, however, most native plants need far less maintenance than typical nursery plants and look just as nice.



In a rain garden, choosing the right plant for the right spot means thinking about hydrology, or how wet each part of the garden is going to be. The wettest part of a rain garden is the center, or deepest part, where standing water will pool for the longest after a storm. Plants in this part of the garden need to be tolerant of standing water, such as the blue flag iris. In Zone 2 plants may be in standing water occasionally after large storms, but not for as long as in the center. Plants that typically live on the edges of wetlands, such as highbush blueberries, can do well in this zone. Zone 3 plants can be plants that prefer dryer conditions, including many plants that do well in standard garden areas.

Here in North Scituate Village the soil drains water very quickly, so practically speaking some of our gardens don't really have a need for Zone 1 plants. Additionally, a few of our gardens have plants on their edges that would not normally be considered appropriate for a rain garden.

In addition to various levels of moisture tolerance, all plants placed in a rain garden in RI should be drought tolerant. We have had drought periods frequently in the last few years, and this is expected to continue. The goal is to select plants that will not need to be watered after the first year unless there are extreme drought conditions.



These next few slides will go over some of the great native plants that do well in each zone of a rain garden.

Here we have the swamp azalea, a lovely shrub that that does well in very wet soil. We initially had one of these in our Town Hall garden, but found it did not get wet enough there for the plant to do well so we ended up replacing it.



ZONE 1
PERENNIAL

Great Blue Lobelia
Lobelia siphilitica

"Lobelia siphilitica 0001" by H. Zell - Own work. Licensed under CC BY-SA 3.0 via Wikimedia Commons - https://commons.wikimedia.org/wiki/File:Lobelia_siphilitica_0001.JPG#/media/File:Lobelia_siphilitica_0001.JPG

One gorgeous perennial option for very wet soil is Great blue lobelia. These plants are in several of our rain gardens. They come back every year with brilliant blue flowers that bloom in the later summer and early fall. There is also a red version of this plant, cardinalflower, that does quite well.



Cinnamon fern is also a great option for wet spaces. You'll see one of these in our Town Hall rain garden. This is a large, dramatic fern with cinnamon-stick-like fertile frond in the center. We have found it to be very drought tolerant in the Town Hall garden.



ZONE 2 SHRUB

Sweet Pepperbush

Clethra alnifolia

www.wildflower.org

Moving up into Zone 2 we can find sweet pepperbush. This is one of the most common wild shrubs in RI, but it also makes a great garden plant. It tends to hold an attractive shape as it grows, and its white flowers in the late summer are a huge hit with pollinators. Even better, their seedheads persist into the winter and provide a source of food for overwintering birds. Many common cultivars of this plant have pink flowers, but we were able to source the native species for all of the gardens we used it in.



ZONE 2 SHRUB

Inkberry

Ilex verticillata

Inkberry is one of our native members of the holly family. It has delicate green leaves that persist all winter long, so it's a great choice to add some winter color to the garden. These are very hardy shrubs that regenerate quickly if they ever need to be pruned back.



Swamp milkweed is a great perennial that we added to one of our gardens as a replacement plant this year. We're excited to see how it does-milkweeds are the exclusive food source for monarch butterfly caterpillars, so it has a great ecological benefit. We did, unfortunately have a very difficult time finding this plant for purchase.

Whenever you are planting a milkweed species in your garden, it is important to do some research and make sure you are choosing a variety native to your area to get the biggest benefit for butterflies. Monarchs' migration habits MAY be altered when species from other regions flower at different times than the native milkweed species.



ZONE 2
PERENNIAL

Joe-Pye Weed
Eutrochium spp.

Joe Pye weed is a beautiful purple plant that you'll find in many of our gardens. It does fine in soil that is wet some of the time, but overall it did best in our dryer gardens. We had to replace it in some gardens where it was planted too close to the center and did not thrive. It also does very well at my house, which has dry soil. Pollinators of all shapes and sizes love this plant.

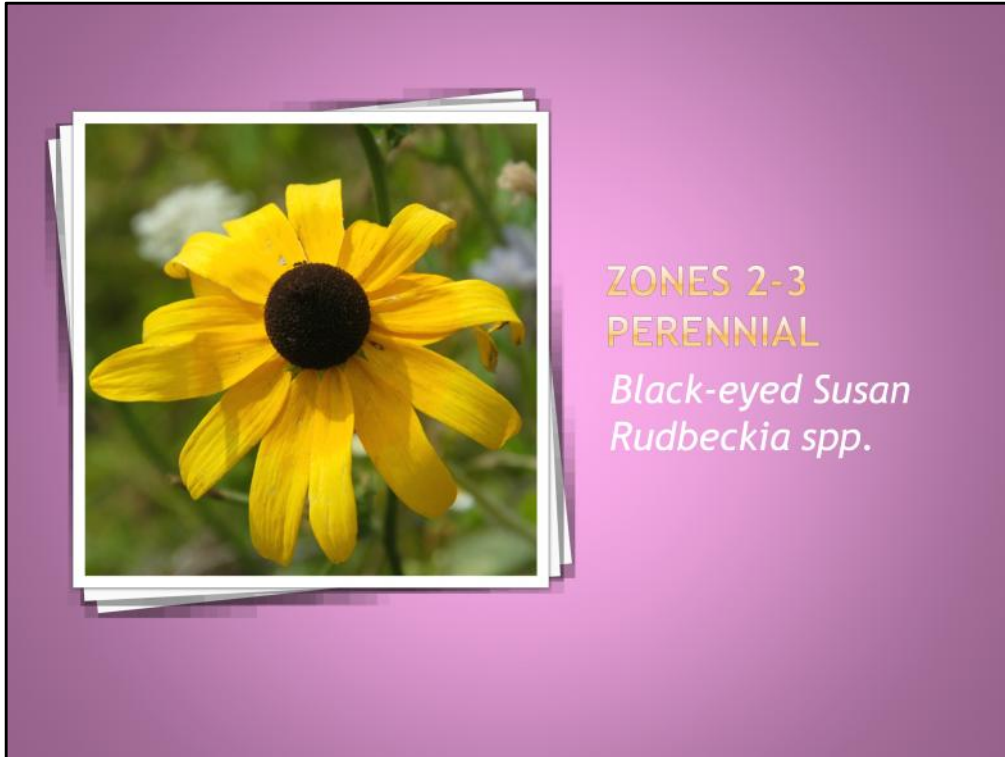


ZONES 2-3 GRASS

Switchgrass

Panicum virgatum

Switchgrass is a big, dramatic plant that you'll find in many of our gardens. It can grow very large when it matures, but it does need to be cut back every year. There are many ornamental cultivars of this plant, but we've never had any problem using or sourcing the native species. It is extremely hardy and drought resistant, as is the other grass we sometimes work with, little bluestem.

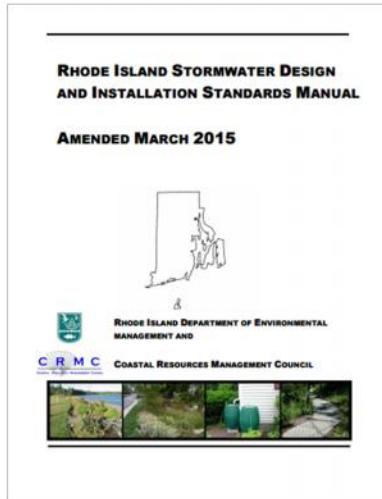


ZONES 2-3
PERENNIAL

Black-eyed Susan
Rudbeckia spp.

The black-eyed susan does great in the dryer areas of rain gardens, but this hardy plant can also survive periods of inundation. We are generally only able to source the “goldstrum” varietal of the plant.

ADDITIONAL PLANT RESOURCES



This, of course, is only a small sampling of the plants that can do well in rain gardens. I've included in your educational materials lists of other suggested plants from a few different sources, including both state recommendations and recommendations compiled by my own internet research. Note that not all lists limit themselves strictly to native plants, but a simple internet search can help you identify which plants are native if utilizing natives is important to you



GARDEN MAINTENANCE

The fun part!

Now let's wrap up with a couple of minutes about the maintenance required for rain garden plants

YEARS 1-3: MULCHING



Initially, rain gardens are mulched with 4 inches of mulch, and additional layers of 2-4 inches, depending on the rate of mulch decay, need to be added every year for the first three years. The important functions of the mulch include holding in moisture and preventing weed growth. We used soft wood mulch for our gardens, as prescribed by our landscape architect, but some gardens find that hardwood mulch works better since it will not float when ponding occurs. We also make an effort to avoid mulches that are heavily dyed, although completely undyed mulches are challenging to find.

YEARLY: WEEDING



When rain gardens are young, such as in this second-year photo of the Town Hall rain garden, weed growth can be a challenging issue. This is particularly true for gardens near or under taller trees, especially maples. Although mulching late in the fall or early in the spring helps a lot, weeding will be a part of the annual maintenance routine. If you are concerned about differentiating weeds from young plants, leaving the plant markers in place is a good idea. As plants grow and expand throughout the garden area in later years, weeding will be a less of a concern.

AS NEEDED-MONITOR HEALTH



Just as with any garden plant, you need to monitor the health of your rain garden plants and do a little research to determine the problem if anything seems off. Here we have an actual example from one of our rain gardens, an inkberry that developed many spots after the winter snowmelt. Internet research determined that the problem could easily be fixed by pruning the affected branches, and the plant responded very well.

AS NEEDED-THIN/DIVIDE/MOVE PLANTS



Here is a photo of our garden at the Village Tavern, taken a couple of years ago. This garden has been in the ground for over 6 years, and as you can see the plants have spread to encompass most of the space in the garden basin. Weeding is less of a problem here, but this garden has gotten to the point where splitting and removal some plants may occasionally become required. Sometimes, plants that do not seem to be thriving in the rain garden could be moved to another spot in your yard and replaced with a new plant from one of the recommended planting lists

YEAR 2-EVALUATE PLANT SELECTIONS AND MOVE IF NEEDED



We are now in our 2nd year with most of the North Scituate rain gardens, and we took some time this year to evaluate our plant selections and see what was working well and what wasn't. This blueberry plant, for example, did surprisingly poorly in one garden at a private residence. The biggest problem seemed to be that it was being munched on by deer, and the stress caused the plant to fail to produce any berries. Another possible issue is that it was in a very shady spot that ended up a big drier than expected. We removed this plant and moved it to a new spot on the homeowners' property to give it a better chance, and replaced it with lupine and swamp milkweed. We did not have to replace many plants this year, but did replace 1-2 in each garden.

AS NEEDED-PRUNE



Rain garden shrubs can be pruned as desired or for optimal plant health just like any other shrubs that you have on your property

NO FERTILIZER REQUIRED



Fertilizer is not required for rain garden plants, with the exception of some compost when you first install the garden. In fact, DEM guidelines caution against the use of fertilizer. Native plants typically do not require it for health, and since the goal of rain gardens is to minimize the introduction of pollution adding fertilizer, particularly commercial fertilizer, to the system is somewhat counterproductive.

NO PESTICIDE ALLOWED



By the same token, no pesticide is used on rain garden plants. Some pesticides are harmful to the water supply, and many are harmful to helpful pollinating insects. The good news about using native plants, however, is that they have evolved to deal with the types of pests that we have here in RI. Yes, there will sometimes be signs of insects munching on plant leaves, or laying eggs on a plant. However, this generally will not inhibit plant growth on a plant well adapted for a particular spot. Another matter of concern is deer predation. Although there is no such thing as a truly deer-proof plant, we have noticed that certain plants are more susceptible to deer grazing than others. Therefore, we are now avoiding using red twig dogwood or highbush blueberry on plants that are located in deer-heavy areas. Deer predation on low herbaceous plants used in our project has been minimal.

THE BOTTOM LINE? NATIVE PLANTS

- ◉ Are easy to care for
- ◉ Are affordable to care for
- ◉ Support native ecosystems
- ◉ Can help to get water clean as part of a rain garden





QUESTIONS?
Neighborhood Tour