

Rain Gardens

Rain Gardens are typically a shallow depressional area designed to use the natural capacities of soil and vegetation to retain, cleanse, and infiltrate storm water. In other words rain gardens capitalize on low lying areas to capture runoff from driveways, and roofs, and use plants to filter out pollutants and reduce the erosive effects of runoff. The reason that rain gardens are so effective is that these gardens capture runoff before it gains enough volume to have any damaging properties and allow it to seep slowly into the ground.

According to the USEPA, nonpoint sources such as storm water runoff from an urbanized landscape, are the leading causes of urban stream water quality problems. Rain gardens are able to reduce this pollution because they create an ideal location where small, isolated amounts of runoff can be absorbed into the ground.

For those of you who are still skeptical about building a rain garden, here are some of the pros of the system. When properly built, a rain garden will reduce pollutant discharges and minimize stream bank erosion by reducing the amount of water entering streams and rivers. The mulch layer can remove heavy metals such as copper, zinc, and lead, and replenish groundwater slowly and steadily. You don't have to worry about mosquitoes either because the rain garden is designed to hold water for less than 48 hours so that mosquitoes can't breed.

If you are considering building a rain garden you can visit the Department of Environmental Conservation's website for information and design plans. <http://www.dec.ny.gov/public/44330.html>

Materials: Geotextile Fabric, mulch mix, of bioretention soil mix, and native drought tolerant plants. Now once you have all of your materials, your basin should be at least 7' x 10' with a minimum depth of 6 feet. After all of the earth has been removed, line the walls of your basin with a geotextile or filter fabric and then start by filling the bottom of the basin with 1 foot of ¾" crushed stone. Install an additional 4 inches of pea gravel, followed by the mulch mix and finish by covering the gravel with 30 inches of bioretention soil mix. When choosing plants for the surface of the rain garden, look for young plants that are native to the area and are drought tolerant as they will adapt better to the environment.

How Can Green Infrastructure Benefit the Environment?

The benefits of green infrastructure are particularly accentuated in urban and suburban areas where green space is limited and environmental damage is more extensive. Green infrastructure benefits include:

Reduced and Delayed Storm Water Runoff Volumes - By increasing the amount of pervious ground cover, green infrastructure techniques increase storm water infiltration rates, thereby reducing the volume of runoff entering our storm water systems, and ultimately our lakes, rivers, and streams.

Storm Water Pollutant Reductions - Green infrastructure techniques infiltrate runoff close to its source and help prevent pollutants from being transported to nearby soils.

Reduced Sewer Overflow Events - Utilizing the natural retention and infiltration capabilities of plants and soils, green infrastructure limits the frequency of storm sewer overflow events by reducing runoff volumes and by delaying storm water discharges.

Improved Air Quality - Green infrastructure facilitates the incorporation of trees and vegetation in urban landscapes, which can contribute to improved air quality.

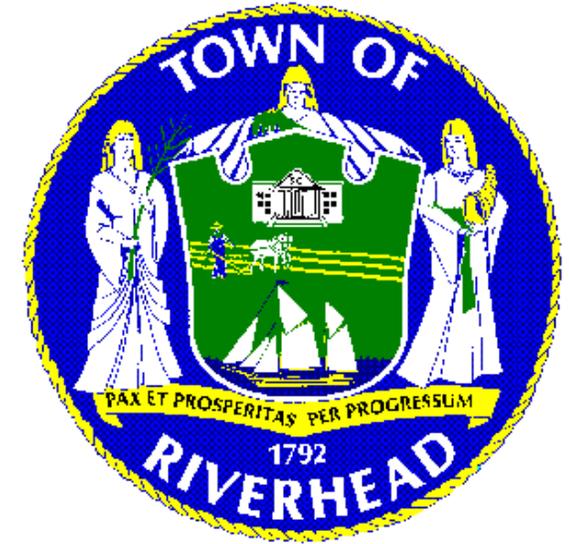
Heat Island Effect - Green infrastructure reduces warm water discharge to streams which can harm fish. By collecting water in rain gardens and catch basins, the runoff can cool by up to 11 degrees Celsius before it returns to streams and rivers, thus preventing damage to the ecosystem.

Sources

<http://www.fallschurcheenvironment.org/usingrainbarrels.html>

<http://cfpub.epa.gov/npdes/greeninfrastructure/technology.cfm#greenparking>

<http://www.stormh2o.com/october-2008/dry-rain-gardens.aspx>



How Green Infrastructure Can Mitigate Storm Water Pollution and Reduce Storm Water Runoff

Riverhead Department of Engineering

Drew Dillingham, P.E.

(631) 727-3200 ext. 604

Green Infrastructure



The Town of Riverhead is home to some of the most beautiful landscapes and wildlife in Suffolk County. In order to preserve this natural resource we must try to help mother nature by trying to reduce our impact on the ecosystem.

In this pamphlet we will be focusing on ways to improve your home and community in order to alleviate some of the stress placed on the environment and your wallet. Green infrastructure can contribute to health and quality of life, such as forests that clean the air and filter and absorb storm water.



Why Storm Water Runoff is a Problem

Storm Water Runoff is the technical term for rain water that falls to earth and travels across roadways, parking lots and any other non permeable surfaces and enters the drain and exits in a collection basin, storm drain, or is diverted into a body of water.



Many problems arise when runoff is not properly drained. First, the water can gather pollutants as it travels and those pollutants are

carried into locations such as our lakes and rivers. These pollutants can harm the ecosystem and even humans if they swim in contaminated water.

Secondly, with the amount of paved surfaces that exist today, runoff tends to pool up as a result of backed up storm drains that are having to work overtime. Backed up storm drains can cause road and property flooding/damage and are also a hazard to motorists.



What You Can Do To Help

There are an increasing number of ways that you can help alleviate the effects of storm water runoff in your neighborhood. One approach is utilizing green alternatives when designing or remodeling your home site.

Green Roofs are one of the best alternatives for your home. Green Roofs are generally flat and designed for the additional load of vegetation and a growing medium, planted on top of a waterproof membrane. Green Roofs absorb rain water and reduce the amount of runoff that runs off the house and enters the street. Green Roofs are also excellent insulators and when used in large numbers can greatly reduce urban temperatures by reducing the heat island effect. The heat island effect results from the high concentrations of buildings in a city absorbing solar energy causing higher temperatures in that particular area.

If home owners are considering retrofits, a Rain Barrel can help alleviate stress placed on the storm system by diverting roof runoff into a container that can be used to water existing landscape. For every 1,000 square feet of roof area served by a downspout, a one inch rain storm will produce 600 gallons of rain water. That just shows how much water a rain barrel can keep off the streets! Rain Barrels should be designed with an overflow valve so that winter ice does not build up and damage the system.