



**National Wildlife University
Reston, Virginia
Habitat Restoration
George Mason University
Grounds Shop
Fairfax, Virginia 22030**

Using Rain Gardens as a Storm Water Runoff Bioretention Technique in Established Landscapes

SCHOOL

George Mason University, in Fairfax County, is a four year institution within the Commonwealth of Virginia public system, with an enrollment of over 25,000 students.

ABSTRACT

The GMU Grounds Shop is using biomediation techniques to improve the water quality of storm runoff through the use of filtration, sedimentation and biological processes. The first of the biomediation techniques in use on campus are rain gardens; low lying areas where water can be allowed to accumulate during heavy rains. Each rain garden consists of one or more...



...excavated depression(s), where the soil has been amended by tilling in sand (for improved infiltration) and organic material (for improved absorption). As part of the design, most rain gardens have a one or two tier rip-rap stone wall, (with the excavated soil used to form shallow berms behind the stones) to help stabilize the sides of the depression, yet allow water to infiltrate between the stone into the banks. Rain gardens protect drainage systems by slowing down the flow of runoff, allowing sedimentation to

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occur, and increasing infiltration into the surrounding soil. At present ten rain gardens have been retrofitted into the existing landscapes around campus, with more planned.

GOALS AND OUTCOMES

a) Goals

The basic goal was to demonstrate the viability of retrofitting existing landscapes with biomediation techniques in an effort to improve water quality on. Hopefully the success of these demonstration areas will justify including biomediation techniques into the design of new buildings, parking lots and roadways.

b) Accomplishments / Outcomes

Although there are no statistics available to quantify the success of the rain gardens, observation has shown that, during a normal rainfall event, water initially accumulates in the depressions and begins to infiltrate before flowing into nearby storm drains. During short duration rainfalls, storm water may not even flow into the nearby drains, but be intercepted, retained for two or three days and absorbed by the rain gardens. Typically, the native mosquito life cycle requires two weeks of standing water; after rainfalls, infiltration areas are monitored and amended as necessary with sand and organic material, to ensure collected water infiltrates within three days. This is long enough for the ponding water to also be available to beneficial insects, birds, and other small wildlife, but not long enough to act as a viable breeding area for mosquitoes.

c) Challenges and Responses

The labor spent on installing the rain gardens was the major challenge; time spent on biomediation projects was time not spent on standard grounds maintenance operations, such as turf maintenance and horticultural activities. But the increased interest and acceptance of environmental and sustainability issues has increased the acceptance of time spent employing biomediation techniques. The program has also demonstrated to the Virginia Soil Conservation Service, that the University is a responsible partner in mediating storm water runoff issues.

d) Campus Climate Action: Your School's Carbon Footprint

No effect on global climate change was evident or intended.

e) Commentary/Reflection

Installing rain gardens into existing landscapes shows the viability of using simple biomediation techniques to improve water quality, and control storm water runoff from flowing directly into the Chesapeake Bay watershed. Projects do not have to be large in scale, and can become....

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....an aesthetic features in the landscape. Rain gardens are just the first technique the GMU Grounds shop is considering to improve water quality. Other biomediation and retention techniques under consideration, dependent on the situation where the techniques may be employed, include but are not limited, to bioretention islands in parking lots, bioretention benches, and drip line plantings along buildings.

ENGAGEMENT AND SUPPORT

a) Leaders and Supporters

The projects were not done in conjunction with any academic program on campus, but as an in-house initiative of the Grounds Shop. However, the projects do serve to educate the University community of the value in using small scale biomediation and retention techniques as a part of landscape maintenance programs.

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b) Funding and Resources

The materials for the rain gardens were taken from the normal stockpiles of stone and organic amendments used in normal landscaping operations. Note, most of the organic material was created by shredding leaves collected during the previous fall. The cost of each rain garden installation, sans labor, was minimal, and was not recorded.

c) Education and Community Outreach

Mention of the rain gardens on campus was included in the most recent University Earth Day program, and the rain gardens are examples of small scale biomediation and retention techniques that property owners within the University community can consider using as a part of their landscape maintenance activities.

d) National Wildlife Federation's Campus Ecology Program

The developing use of biomediation and retention is an in-house initiative. Consultations were held, and the projects examined by, the native plants curator from the State of Virginia arboretum, who supplied input on a developing a list of native plants which may be suitable for installation in the rain gardens.

CONTACT INFORMATION

a) Contacts

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MORE ABOUT YOUR SCHOOL

Campus Sustainability History

Insert your information here:

In one paragraph, please describe other campus greening efforts prior to or occurring at the same time as this project. Mention if you have a sustainability office or program, and provide its website.

THANK YOU!

End of case study narrative =====
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v. May 2009