

**National Fish and Wildlife Foundation
Closure Memo**

Date: 10/18/2016

Project: Implementing Green Infrastructure to Manage Stormwater in
New Haven (CT)
Number: 1401.14.045203
Grantee: New Haven Urban Resources Initiative

Project Description:

The New Haven Urban Resources Initiative will install 8 bioretention swales and a 1,000 sq. ft. rain garden treating 2,810,000 gallons of stormwater; and providing 5 acres of habitat for birds, pollinators, and other wildlife in a subwatershed of the West River, New Haven, CT. Long Island Sound's environment is degraded by pollution delivered from its watersheds. Large areas of impervious surface and compacted soils lead to flow of contaminated stormwater and combined sewer overflows (CSOs) into waterways from urban neighborhoods. The project will create a model to decrease the CSO impact of storms, and increase community resilience to storms by testing green infrastructure (GI). The GI will detain and infiltrate 70% of runoff from local annual rainfall event; capture 100% of the first flush of 1" of rainfall in all storms; and reduce the flow amount and concentration of contaminants into the Sound. Major activities include: engaging 60 high school students, ex-offenders and community members to install and monitor the GI; conducting community education with 6 workshops about green yard maintenance and using rain barrels, and to recruit 220 volunteers to maintain projects; installing 4 interpretative signs; and seeking community input into project design reaching 15,252 people. Partners include: New Haven Urban Resources Initiative, New Haven Ecology Project, Yale School of Forestry and Environmental Studies, City of New Haven, Greater New Haven Water Pollution Control Authority.

Final Products:

- **8 Bioswales built**

Bioswales were adapted from the City of New York's standard bioswales. Located in Westville residential neighborhood along the West River. 5 bioswales were "adopted" by West Park Avenue homeowners and 3 bioswales were placed in a park with approval from the Parks Department. Bioswales were filled with native plants and shrubs. Homeowners who adopted bioswales were encouraged to water plants, clean the bioswales, and help maintain them. The bioswales placed in parks will be maintained by the Engineering Department, and will likely create contracts to carry out the maintenance. Greenskills crew members installed bioswales in November 2014 and March 2015, and community volunteers helped fill the bioswales with native plants. These bioswales reduce pollution associated with stormwater runoff by reducing the overland flow and stormwater runoff that

enters the West River. There were significant problems in maintaining bioswales, mostly due to the buildup of leaves and exacerbated by failure of the city to regularly perform street sweeping. As a result of bioswale installment, a 91% reduction of stormwater from the treatment sewer was observed.

- **1,000 foot rain garden built**

A large rain garden was installed outside the front entrance of New Haven Ecology Project's (NHEP) school on the Common Ground Campus, completed through planting by 10 Ground's Green Jobs Corps members. Instrumentation was installed to measure the change in stormwater flow as a result of the rain garden and other green infrastructure projects.

- **1,400 square feet of bioretention installed**

Together, the rain garden and the 8 bioswales cover 1,400 square feet of new green infrastructure.

- **15 acres of habitat placed under BMP implementation for nutrient or sediment reduction**

It is estimated that the installed bioswales and rain garden reduce contamination load by 2,480 pounds.

- **7 monitoring programs were established**

Monitoring programs were established for 4 bioswales, 2 subwatersheds, and 1 watershed, totaling 15 acres of land being monitored. This includes 5 acres intensively used by the New Haven Ecology Project and two 5 acre sewersheds draining to the West River. 150,000 measurements were made of hydrological conditions, sewer and storm water temperature and total dissolved solids over a 6 month period to establish baseline hydrologic conditions in two watersheds that confirmed the two watersheds were hydrologically identical, allowing the unmodified watershed to serve as a control for the watershed where bioswales were installed. 500 storm samples were collected and analyzed for conductivity, temperature, nitrate, total nitrogen orthophosphate, cadmium, copper, and total suspended solids.

- **220 volunteers participated in the project**

Volunteers were recruited by New Haven Urban Resources Initiative (URI), NHEP, and the West River Watershed Coalition. Volunteers help create the NHEP rain garden, Greenskills crew members installed bioswales in November 2014 and March 2015, volunteers helped maintain the 8 bioswales by planting perennials, and improved home lawn maintenance practices, which focused on recommending that the downspouts on households are redirected to water lawns rather than going into the storm system. The Greenskills crew consisted of 22 high school students, 4 Yale graduate students, and 12 ex-offenders. The high school students came from a partnership with Common Ground High School, from the Common Ground Green Job Corps. These students focused on planting the bioswale, bioswale maintenance, and community outreach. The ex-offenders came from a partnership with Emerge (a Transitional Workforce Development Program)

- **220 community members educated that demonstrate a minimum level of knowledge or skills**

This includes the 220 volunteers that participated in the project, learning about green infrastructure, bioswales, and stormwater management. These volunteers

include student interns from Common Grounds high school and ex-offenders who received on-the-job training through URI's GreenSkills job training program.

- **15,252 community members targeted by outreach and training**
Four educational signs were placed at the 8 bioswale locations to educate the public on green infrastructure and serve as demonstration sights.
- **10 community members educated on bioswale maintenance**
A training was led on bioswale maintenance for the public in May 2016. The invitation e-mail was sent to 2,022 community members, opened by 514 members, however the event was only attended by 10 community members.
- **24 workshops, webinars, and meetings with partners and the public were hosted**
Workshops were hosted by URI for community members and high school students. There were 4 workshops in total; one educated homeowners on downspout disconnection, another focused on overall stormwater in New Haven, one on rain barrel installation, and the final one on bioswale and yard maintenance practices. In total, 130 community members participated in the workshops. 60 attendees came from West Park Avenue, and 70 attendees were from Common Ground H.S.
- **2 local government departments participated in the project**
The City of New Haven's Department of Engineering and the Greater New Haven Water Pollution Control Authority partnered with URI for the project.

NFWF award:	\$	149,971.20	
NFWF funds spent:	\$	144,296.47	
Match requirement:	\$	278,371.00	
Match spent:	\$	278,371.00	(NonFed)

I recommend closing this grant.