

**National Fish and Wildlife Foundation
Closure Memo**

To: Jessica Lillquist
From: Claire Flynn
Date: November 29, 2018

Project: Green Infrastructure for Beardsley Zoo (CT)
Number: 1401.16.053527
Grantee: Connecticut Fund for the Environment

Project Description:

The project will install 6,000 square feet of green infrastructure to reduce 1,000,000 gallons of polluted stormwater runoff annually in Bridgeport, Connecticut. Green infrastructure uses a natural or engineered approach to mimic nature to manage stormwater runoff at the local level. Stormwater runoff is a major cause of water pollution in urban areas like Bridgeport. When rain falls, stormwater drains from streets and roofs through gutters, storm sewers, and into nearby water bodies. The grantee will address water quality problems in Pequonnock River whose waters flow into Long Island Sound. Currently, 80 percent of the river does not meet water quality standards because of pollution from urban runoff and other sources. The project will: 1) install 2,000 square feet of bioretention gardens (a combination of soil and plant material used to capture and treat stormwater) and up to two tree pits (collect rainwater by diverting runoff from the street into cuts in curbs); 2) replace 4,000 square feet of impervious pavement with pervious pavers (made of sustainable materials that trap and filter runoff); 3) install two signs to educate 275,000 annual visitors about the benefits of green infrastructure; and 4) conduct one volunteer planting and two educational workshops about green infrastructure. The project will improve water quality in the river and the Sound. Partners: Beardsley Zoo and Northeast Organic Farmers Association of Connecticut.

Final Products:

Install 2,000 square feet of bioretention gardens (a combination of soil and plant material used to capture and treat stormwater) and up to two tree pits (collect rainwater by diverting runoff from the street into cuts in curbs)

- 1,400 square feet of bioretention gardens
 - The overall goal of 6,000 square feet of green infrastructure installations was less than anticipated due to the presence of shallow bedrock in several areas, which limited the amount of suitable locations for installation

Commented [JL1]: 600 sq feet less than anticipated

Replace 4,000 square feet of impervious pavement with pervious pavers (made of sustainable materials that trap and filter runoff)

- 2,000 square feet of porous pavers installed, 700 square feet of grass pavers installed
 - This was less than anticipated due to the presence of shallow bedrock in several areas, which limited the amount of suitable locations for installation

Commented [JL2]: 1,300 sq. feet less than anticipated

- To reach the target volumetric storage the installations were constructed deeper than originally planned
- The combined installations manage runoff from more than one acre (43,840 square feet) of impervious parking lot, which correlates to the capture and treatment of more than one million gallons of runoff annually based on 80% capture of average rainfall of 48 inches per year. The diversion of the runoff will reduce combined sewer overflows into the Pequonnock River and ultimately Long Island Sound.

Install two signs to educate 275,000 annual visitors about the benefits of green infrastructure

- 1 sign developed demonstrating the function of the green infrastructure installations
 - Through consultation with the Zoo, CFE determined that one larger and more detailed sign was preferable to the two smaller signs originally anticipated in the application.
 - The sign associated with this grant describes the environmental issues associated with stormwater management, includes a graphic demonstrating how porous pavers manage stormwater runoff, and provides online resources for visitors interested in installing their own green infrastructure BMPs.
 - The sign was fabricated and installed using matching funds from the Metropolitan Council of Governments through CIRCA Municipal Funds.
 - This sign is at the entrance to the Zoo, ensuring that it will be visible to its 275,000 annual visitors.

Commented [JL3]: Photo of the sign is included with the report

Conduct one volunteer planting and two educational workshops about green infrastructure

- 2 workshops and 1 volunteer planting conducted
 - In partnership with Beardsley Zoo and Northeast Organic Farming Association of Connecticut, hosted a green infrastructure technology and stormwater management workshop for landscape professionals on October 18, 2017
 - This full-day workshop was developed to educate restoration practitioners and landscape professionals. It included presentations from Land Escapes Landscaping, CFE, and the Metropolitan Council of Governments as well as an afternoon hands-on component where participants learned how to install porous pavers
 - Hosted an educational workshop with Beardsley Zoo for local youths to introduce them to green infrastructure, which was paired with a volunteer planting event where members of the youth groups planted the two bioretention gardens on May 5, 2018.
 - The workshop was geared toward local youth and included attendance by more than 40 high school students from three local youth groups: Beardsley Zoo's Conservation Discovery Corps, Groundwork Bridgeport, and buildOn Bridgeport
 - Students learned about the importance of stormwater management, how green infrastructure improves water quality, and the potential for employment in the field

- The high school students completed the planting of the 300+ plants in bioretention gardens and Zoo staff began maintenance and upkeep by watering and weeding the gardens
- CFE engaged with more than 50 members of the public to educate them about stormwater management and encourage hands-on training in green infrastructure BMP installation

NFWF award: \$149,833.23
NFWF funds spent: \$149,833.23

Match requirement: \$75,880.00
Match spent: \$80,079.36

I recommend closing this grant.

Project Period	1/02/2017 - 8/15/2018
Project Location	Beardsley Zoo, City of Bridgeport, in Fairfield County, Connecticut
Description (from Proposal)	
Project Summary (from Proposal)	Install green infrastructure including enhancing existing lawn areas with 2,000 square feet of bioretention gardens and tree pits; and replacing 4,000 square feet of impervious pavement with pervious pavers in Bridgeport, Connecticut. Project will capture and treat 1,000,000 gallons of urban stormwater runoff annually.
Project Status and Accomplishments	Construction of green infrastructure best management practices (GI BMPs) in the parking lot at Beardsley Zoo in Bridgeport, Connecticut kicked-off in October 2017. Connecticut Fund for the Environment (CFE), in partnership with the Zoo and the Northeast Organic Farming Association of Connecticut (CT NOFA), hosted a hands-on green infrastructure technology and stormwater management workshop for landscape professionals on October 18, 2017. In November of 2017, construction of the GI BMPs including porous pavers, grass pavers, and bioretention gardens was completed. To plant the bioretention gardens, CFE partnered with the Zoo to host a volunteer planting event and green infrastructure workshop for local youth groups. The suite of GI BMPs installed at the Zoo filters one million gallons of urban runoff annually and reduces pollution impacts from stormwater runoff and combined sewer overflows (CSOs) into the lower Pequonnock Watershed, which drains to Long Island Sound.
Lessons Learned	<p>Throughout this project CFE has learned valuable lessons regarding the planning, construction, maintenance, and outreach associated with green infrastructure. By performing detailed site assessments with the engineering contractor and Zoo staff, CFE accurately identified suitable locations for GI BMPs at the site. However, during construction we encountered shallow bedrock in some of the proposed locations, which required us to slightly alter the design of several GI BMPs in the field through coordination with the engineering contractor. This situation emphasized the importance of having professional partners who are flexible; in this case the engineer and the construction contractor were able to adapt the plans on short notice.</p> <p>Additionally, CFE discovered that one of the selected GI BMPs, the grass pavers, were less effective than the other GI BMPs (bioretention gardens and porous pavers). Several months following installation, the grass pavers did not contain any vegetation and began to erode. CFE suspects that this is due to the substrate that was used to plant the grass seed. The contractor followed the specifications detailed by the grass paver manufacturer but expressed reservations about its effectiveness at the time of installation. CFE is now working with the Zoo to repair the grass paver area and use different substrate where possible or modify the installation to mitigate erosion in other ways.</p> <p>The issue with the grass pavers emphasized another key lesson, the importance of maintenance and the value of a willing and capable project partner/site owner. It is well known that functional green infrastructure is dependent on frequent maintenance. The Zoo's maintenance and landscape crews are well equipped to reduce plant mortality and ensure that the GI BMPs continue to collect and manage runoff. Conservation organizations should identify a capable maintenance partner in coordination with the site owner early in the project process.</p>

Activities and Outcomes

Funding Strategy: Habitat Management

Metric: LISFF - Green Infrastructure - Sq ft of impervious surface treated for urban runoff

Required: Optional

Description: Other Metric

Starting Value	Other Metric
Value To Date	43840.00 Other Metric
Target value	Other Metric

Note: The Starting Value was 0 square feet.

The Target Value was 43,560 square feet.

Funding Strategy: Habitat Management

Metric: LISFF - Green Infrastructure - Sq ft of bioretention installed

Required: Recommended

Description: Enter the square footage of bioretention BMP installed. Provide # and specific type of green infrastructure to be installed.

Starting Value	0.00 Sq ft of bioretention installed
Value To Date	4100.00 Sq ft of bioretention installed
Target value	6000.00 Sq ft of bioretention installed

Note: Bioretention square footage is approximately 1,900 square feet less than anticipated due to the presence of shallow bedrock in some areas, which limited the suitable locations for installation. Target volumetric storage capacity was accomplished, however, by installing the GI BMPs deeper than originally planned.

Funding Strategy: Capacity, Outreach, Incentives

Metric: LISFF - Outreach/ Education/ Technical Assistance - # of edu signs installed

Required: Recommended

Description: Enter # and content of the signs.

Starting Value	0.00 # of edu signs installed
Value To Date	1.00 # of edu signs installed
Target value	2.00 # of edu signs installed

Note: Through consultation with the Zoo, CFE determined that one larger and more detailed sign was preferable to the two smaller signs originally anticipated in the application. CFE believes that this divergence from the application is acceptable given that another large educational sign was previously installed at an additional GI BMP at Beardsley Zoo as a component of a previously completed Section 319 grant from the Connecticut Department of Energy and Environmental Protection (CT DEEP).

Funding Strategy: Capacity, Outreach, Incentives

Metric: LISFF - Outreach/ Education/ Technical Assistance - # workshops, webinars, meetings

Required: Recommended

Description: Enter #, type and purpose of events.

Starting Value	0.00	# workshops, webinars, meetings
Value To Date	3.00	# workshops, webinars, meetings
Target value	3.00	# workshops, webinars, meetings

Note:



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

The following pages contain the uploaded documents, in the order shown below, as provided by the grantee:

Upload Type	File Name	Uploaded By	Uploaded Date
Final Report Narrative - Standard	CFE Beardsley Zoo NFWF 53527 Final Report.pdf	Garskof, Josh	11/08/2018
Photos - Jpeg	Bioretention 1 No Plants.JPG	Garskof, Josh	11/07/2018
Photos - Jpeg	Bioretention 1 Planted.JPG	Garskof, Josh	11/07/2018
Photos - Jpeg	Bioretention 2 No Plants.JPG	Garskof, Josh	11/07/2018
Photos - Jpeg	Bioretention 2 Planted.JPG	Garskof, Josh	11/07/2018
Photos - Jpeg	Entrance Pavers.JPG	Garskof, Josh	11/07/2018
Photos - Jpeg	Paver Construction.JPG	Garskof, Josh	11/07/2018
Photos - Jpeg	Youth GI Workshop.jpg	Garskof, Josh	11/07/2018
Photos - Jpeg	Youth Planting_1.jpg	Garskof, Josh	11/07/2018
Photos - Jpeg	Youth Planting_2.jpg	Garskof, Josh	11/07/2018
Photos - Jpeg	NOFA Paver Workshop.JPG	Garskof, Josh	11/07/2018
Other Documents	2017-03-10 Blog Post- Beardsley Phase 2 launch.pdf	Garskof, Josh	11/07/2018
Other Documents	2017-09-15 Release-ICC advisory.docx	Garskof, Josh	11/07/2018
Other Documents	2017-10-11 Release-Beardsley GI advisory.docx	Garskof, Josh	11/07/2018
Other Documents	2018-05-17 Release-Beardsley GI planting follow-up.docx	Garskof, Josh	11/07/2018
Other Documents	2011-7-1019 Press- Zoo breaks ground on new green infrastructure projects, Milford Mirror.pdf	Garskof, Josh	11/07/2018
Other Documents	2016-11-16 Press-Save the Sound receives Water Quality and Green Infrastructure grants, Milford Mirror.pdf	Garskof, Josh	11/07/2018
Other Documents	2017-10-19 Press- Zoo breaks ground on new green infrastructure projects, Milford Mirror.docx	Garskof, Josh	11/07/2018

The following uploads do not have the same headers and footers as the previous sections of this document in order to preserve the integrity of the actual files uploaded.



Final Programmatic Report Narrative - Green Infrastructure for Beardsley Zoo - 53527

Instructions: Save this document on your computer and complete the narrative in the format provided. The final narrative should not exceed ten (10) pages; do not delete the text provided below. Once complete, upload this document into the on-line final programmatic report task as instructed.

1. Summary of Accomplishments

In four to five sentences, provide a brief summary of the project's key accomplishments and outcomes that were observed or measured.

Construction of green infrastructure best management practices (GI BMPs) in the parking lot at Beardsley Zoo in Bridgeport, Connecticut kicked-off in October 2017. Connecticut Fund for the Environment (CFE), in partnership with the Zoo and the Northeast Organic Farming Association of Connecticut (CT NOFA), hosted a hands-on green infrastructure technology and stormwater management workshop for landscape professionals on October 18, 2017. In November of 2017, construction of the GI BMPs including porous pavers, grass pavers, and bioretention gardens was completed. To plant the bioretention gardens, CFE partnered with the Zoo to host a volunteer planting event and green infrastructure workshop for local youth groups. The suite of GI BMPs installed at the Zoo filters one million gallons of urban runoff annually and reduces pollution impacts from stormwater runoff and combined sewer overflows (CSOs) into the lower Pequonnock Watershed, which drains to Long Island Sound.

2. Project Activities & Outcomes

Activities

- **Describe and quantify (using the approved metrics referenced in your grant agreement) the primary activities conducted during this grant.**
 - The project's engineering contractor, Fuss & O'Neill, completed 100% engineering design drawings in October 2017.
 - CFE, in partnership with the Zoo and CT NOFA, developed educational programming for a green infrastructure workshop aimed at restoration practitioners and landscape professionals.
 - CFE secured the necessary permissions from the Zoo to begin site construction.
 - CFE entered into a contract with Schumack Engineered Construction, the project's construction contractor, in October 2017.
 - A construction kick-off meeting was held on site with the project team on October 6, 2017.
 - CFE, the Zoo, and CT NOFA hosted a one day workshop for restoration practitioners and landscape professionals that included a hands-on installation of porous pavers on October 18, 2017.
 - Schumack completed the installation of two porous paver areas, one grass paver demonstration, and two bioretention features (sans plants) at the Zoo in November 2017.
 - CFE, in coordination with the Zoo, prepared educational programming materials for a green infrastructure workshop aimed at high school aged youth.
 - CFE and the Zoo hosted an educational workshop for local youths to introduce them to green infrastructure, which was paired with a volunteer planting event where members of the youth groups planted the two bioretention gardens on May 5, 2018.
 - CFE, in coordination with the Zoo, developed educational signage to be installed in the Zoo parking lot to educate Zoo visitors about stormwater runoff and green infrastructure.

- Signage was designed and installed using matching funds from the Metropolitan Council of Governments (Metro COG), through a subaward of funding from the University of Connecticut's Connecticut Institute for Resilience and Climate Adaptation (CIRCA).
- **Briefly explain discrepancies between the activities conducted during the grant and the activities agreed upon in your grant agreement.**
 - Discrepancies are noted in the Outcomes section below.

Outcomes

- **Describe and quantify progress towards achieving the project outcomes described in your grant agreement. (Quantify using the approved metrics referenced in your grant agreement or by using more relevant metrics not included in the application.)**
 - Install 6,000 square feet of bioretention
Schumack completed the installation of 4,100 square feet of GI BMP features in November 2017. This includes 2,000 square feet of porous pavers, 700 square feet of grass pavers and 1,400 square feet of bioretention gardens—approximately 1,900 square feet less than anticipated due to the presence of shallow bedrock in some areas, which limited the suitable locations for installation. In order to accomplish the target volumetric storage capacity, the GI BMPs were constructed deeper than originally planned. Volunteers assisted with the porous paver installation during a professional workshop in October 2017, and youth volunteers planted the bioretention gardens in May 2018. The combined GI BMPs manage runoff from more than one acre of impervious parking lot, which correlates to the capture and treatment of more than one million gallons of runoff annually based on 80% capture of average rainfall of 48 inches per year. The diversion of this runoff will reduce combined sewer overflows (CSOs) into the Pequonnock River and ultimately Long Island Sound.
 - Install two educational signs
Educational signage demonstrating the function of the GI BMPs was developed by CFE and installed by the Zoo, however through consultation with the Zoo, CFE determined that one larger and more detailed sign was preferable to the two smaller signs originally anticipated in the application. CFE believes that this divergence from the application is acceptable given that another large educational sign was installed at an additional GI BMP at Beardsley Zoo as a component of a previously completed Section 319 grant from the Connecticut Department of Energy and Environmental Protection (CT DEEP). The sign associated with the Section 319 grant includes a graphic showing both bioretention and porous pavers. The new sign associated with this LISFF grant (see attached Project Documents) describes the environmental issues associated with stormwater management, includes a graphic demonstrating how porous pavers manage stormwater runoff (since it is installed where porous pavers are the only GI BMPs that are directly visible), and provides online resources for visitors interested in installing their own GI BMPs. The sign was fabricated and installed using matching funds from the Metropolitan Council of Governments through CIRCA Municipal Funds. This large and detailed sign is at the entrance to the Zoo, ensuring that it will be visible to its 275,000 annual visitors.
 - Develop 2 educational workshops and 1 volunteer planting
On October 18, 2017 CFE, the Zoo, and CT NOFA hosted an educational workshop on green infrastructure technology and stormwater management. This full-day workshop was developed to educate restoration practitioners and landscape professionals. It included presentations from Land Escapes Landscaping, CFE, and the Metropolitan Council of Governments as well as an afternoon hands-on component where participants learned how to install porous pavers. CFE and the Zoo hosted a second educational workshop on green infrastructure and stormwater management on May 5, 2018. This workshop was geared toward local youth and included attendance by more than 40 high school students from three local youth groups: Beardsley Zoo's Conservation Discovery Corps, Groundwork Bridgeport, and buildOn Bridgeport. Students learned about the importance of stormwater management, how green infrastructure improves water quality, and the potential for employment in the field. Following the workshop, CFE and the Zoo organized a volunteer planting event with the students, who planted the bioretention gardens that had been completed by Schumack in the fall of 2017. The high school students completed the planting of the 300+ plants in bioretention gardens and Zoo staff began maintenance and upkeep by watering and weeding the gardens. Through the two workshops and the volunteer planting

event, CFE engaged with more than 50 members of the public to educate them about stormwater management and encourage hands-on training in GI BMP installation.

- Treat approximately one acre (43,560 square feet) of impervious surface with GI BMPs
One acre of impervious surface is successfully being managed and treated through the completed installation of 4,100 square feet of GI BMPs. This is less than the 6,000 square feet of GI BMPs that had been planned, due to field conditions, however the designs were modified to maintain the same storage capacity. By managing more than one acre of impervious area, the GI BMPs will divert and filter more than one million gallons of stormwater runoff annually, which will reduce water pollution associated with direct stormwater discharge and CSOs in the Pequonnock River.
- **Briefly explain discrepancies between what actually happened compared to what was anticipated to happen.**
 - We had proposed 6,000 square feet of GI BMPs, but due to shallow bedrock, about 1,900 fewer square feet were installed than originally planned; the GI BMPs were installed deeper in order to handle the target of one million gallons of runoff per year.
 - We had proposed two educational signs, however given that another sign explaining both bioretention and porous pavers was already installed under a previous Section 319 grant, the Zoo and CFE determined that one larger and more detailed sign was preferable to two smaller signs. The new sign highlights porous pavers and is installed at the entrance to the Zoo, where it is visible to the Zoo's 275,000 annual visitors.
 - In our application we stated that the installation of the bioretention features would include "up to two strategically planted trees and/or tree pits," however due to the presence of shallow bedrock, planting trees was not viable. Therefore in coordination with the Zoo, CFE planted 10 shallow-rooted shrubs in the locations that were previously designated for trees. This divergence from the plan proposed in the application for up to two trees was necessary given the site conditions and through discussion with the Zoo, CFE is confident that the goal of increasing vegetative cover and reducing impervious surface was achieved through the implemented features. Overall, CFE and volunteers planted more than 300 plants in the bioretention areas.
- **Provide any further information (such as unexpected outcomes) important for understanding project activities and outcome results.**
 - An unexpected outcome of this LISFF grant is a new relationship that was formed between CFE and other project partners who provided additional funding, MetroCOG and CIRCA. CFE is excited about the opportunity to continue this partnership for future projects.

3. Lessons Learned

Describe the key lessons learned from this project, such as the least and most effective conservation practices or notable aspects of the project's methods, monitoring, or results. How could other conservation organizations adapt their projects to build upon some of these key lessons about what worked best and what did not?

Throughout this project CFE has learned valuable lessons regarding the planning, construction, maintenance, and outreach associated with green infrastructure. By performing detailed site assessments with the engineering contractor and Zoo staff, CFE accurately identified suitable locations for GI BMPs at the site. However, during construction we encountered shallow bedrock in some of the proposed locations, which required us to slightly alter the design of several GI BMPs in the field through coordination with the engineering contractor. This situation emphasized the importance of having professional partners who are flexible; in this case the engineer and the construction contractor were able to adapt the plans on short notice.

Additionally, CFE discovered that one of the selected GI BMPs, the grass pavers, was less effective than the other GI BMPs (bioretention gardens and porous pavers). Several months following installation, the grass pavers did not contain any vegetation and began to erode. CFE suspects that this is due to the substrate that was used to plant the grass seed. The contractor followed the specifications detailed by the grass paver manufacturer but expressed reservations about its effectiveness at the time of installation. CFE is now working with the Zoo to repair the grass paver area and use different substrate where possible or modify the installation to mitigate erosion in other ways.

The issue with the grass pavers emphasized another key lesson, the importance of maintenance and the value of a willing and capable project partner/site owner. It is well known that functional green infrastructure is dependent on frequent maintenance. The Zoo's maintenance and landscape crews are well equipped to reduce plant mortality and ensure that the

GI BMPs continue to collect and manage runoff. Conservation organizations should identify a capable maintenance partner in coordination with the site owner early in the project process.

4. Dissemination

Briefly identify any dissemination of lessons learned or other project results to external audiences, such as the public or other conservation organizations.

CFE presented project results and the lessons learned to regional conservation organizations, annual Zoo visitors, and CFE funders through presentations, workshops, and signage. In order to educate conservation leaders about green infrastructure, CFE presented on the project process and results at two Conservation Technical Advisory Committee (CTAC) meetings, which are organized by the regionally focused Metropolitan Council of Governments. By presenting the project once during the planning and design phase and subsequently after the completion of construction, CFE communicated the most effective strategies and potential pitfalls when implementing GI BMPs on private property, so that CTAC members could take the information back to their organizations. CFE also engaged with CT NOFA for a hands-on workshop to introduce their members to the function, installation, and maintenance of GI BMPs. During informal information sharing meetings, CFE relayed lessons learned during the planning, design, and construction phases to the Nature Conservancy, which is also implementing similar GI BMPs in the Bridgeport area. This transfer of knowledge is valuable to both organizations as we refine, which strategies and processes are most efficient.

Through the installation of signage that demonstrates the function of the GI BMPs, CFE has engaged with the more than 275,000 annual Zoo visitors. During the workshop with local high school youth, CFE presented the results of the project (i.e. the completion of GI BMPs at the site including those from previous Section 319 grants) to the public. Given the educational nature of this project's setting at the Zoo, CFE is excited to continue presenting this project and is actively engaging with Zoo staff to identify additional GI BMP projects at the Zoo.

5. Project Documents

Include in your final programmatic report, via the Uploads section of this task, the following:

- **2-10 representative photos from the project. Photos need to have a minimum resolution of 300 dpi and must be accompanied with a legend or caption describing the file name and content of the photos;**
- Photos
 1. "Bioretention 1 No Plants.jpg"
 - i. Date Taken: November 14, 2017
 - ii. Location: Beardsley Zoo, Bridgeport, CT
 - iii. Caption: Bioretention Garden #1 after excavation and backfilling before being planted
 - iv. Photo Credit: Anna Marshall, CFE/Save the Sound
 2. "Bioretention 2 No Plants.jpg"
 - i. Date Taken: November 14, 2017
 - ii. Location: Beardsley Zoo, Bridgeport, CT
 - iii. Caption: Bioretention Garden #2 after excavation and backfilling before being planted
 - iv. Photo Credit: Anna Marshall, CFE/Save the Sound
 3. "Youth Planting_1.jpg"
 - i. Date Taken: May 5, 2018
 - ii. Location: Beardsley Zoo, Bridgeport, CT
 - iii. Caption: Youth from the local organization, Groundwork Bridgeport, plant native species in Bioretention Garden #1
 - iv. Photo Credit: Anna Marshall, CFE/Save the Sound
 4. "Youth Planting_2.jpg"
 - i. Date Taken: May 5, 2018
 - ii. Location: Beardsley Zoo, Bridgeport, CT

- iii. Caption: Youth from Beardsley Zoo's Conservation Discovery Corps and Bridgeport's buildOn plant native species in Bioretention Garden #2
 - iv. Photo Credit: Kevin Dahms, CFE/Save the Sound
- 5. "Bioretention 1 Planted.jpg"
 - i. Date Taken: August 9, 2018
 - ii. Location: Beardsley Zoo, Bridgeport, CT
 - iii. Caption: Bioretention Garden #1 three months after planting
 - iv. Photo Credit: Kevin Dahms, CFE/Save the Sound
- 6. "Bioretention 2 Planted.jpg"
 - i. Date Taken: August 9, 2018
 - ii. Location: Beardsley Zoo, Bridgeport, CT
 - iii. Caption: Bioretention Garden #2 three months after planting
 - iv. Photo Credit: Kevin Dahms, CFE/Save the Sound
- 7. "Paver Construction.jpg"
 - i. Date Taken: October 16, 2017
 - ii. Location: Beardsley Zoo, Bridgeport, CT
 - iii. Caption: Schumack Engineered Construction excavates parking lot and installs coarse stone subgrade and leveling course for installation of porous pavers
 - iv. Photo Credit: Gwen Macdonald, CFE/Save the Sound
- 8. "NOFA Paver Workshop.jpg"
 - i. Date Taken: November 14, 2017
 - ii. Location: Beardsley Zoo, Bridgeport, CT
 - iii. Caption: CFE/Save the Sound partnered with Beardsley Zoo staff and the Northeast Organic Farming Association (NOFA) to host a porous paver installation workshop with Land Escapes Landscaping and NOFA members
 - iv. Photo Credit: Gwen Macdonald, CFE/Save the Sound
- 9. "Entrance Pavers.jpg"
 - i. Date Taken: November 14, 2017
 - ii. Location: Beardsley Zoo, Bridgeport, CT
 - iii. Caption: Completed porous paver installation at the entrance to Beardsley Zoo
 - iv. Photo Credit: Gwen Macdonald, CFE/Save the Sound
- 10. "Youth GI Workshop.jpg"
 - i. Date Taken: May 5, 2018
 - ii. Location: Beardsley Zoo, Bridgeport, CT
 - iii. Caption: Anna Marshall of CFE/Save the Sound leads an educational workshop on stormwater management and green infrastructure for more than 40 high school students during an event at Beardsley Zoo
 - iv. Photo Credit: Kevin Dahms, CFE/Save the Sound
- **report publications, GIS data, brochures, videos, outreach tools, press releases, media coverage;**
 - Article on Oct 2017 groundbreaking for Phase II; it ran in five local Fairfield papers.
 - Release on Oct 2017 groundbreaking

- Release on May 2018 workshop & planting
- Release on 2017 ICC that mentions our Beardsley GI work in the context of a cleanup happening nearby. Your call whether you'd like to include it—minor but shows that we try to highlight the GI work whenever there's an opportunity.
- Here's the groundbreaking on our blog: <http://www.ctenvironment.org/2017/03/10/launching-phase-two-of-the-beardsley-zoo-green-infrastructure-project/>, and we shared news of these milestones and events on social media, as well.
- **any project deliverables per the terms of your grant agreement.**

POSTING OF FINAL REPORT: *This report and attached project documents may be shared by the Foundation and any Funding Source for the Project via their respective websites. In the event that the Recipient intends to claim that its final report or project documents contains material that does not have to be posted on such websites because it is protected from disclosure by statutory or regulatory provisions, the Recipient shall clearly mark all such potentially protected materials as “PROTECTED” and provide an explanation and complete citation to the statutory or regulatory source for such protection.*





















Launching phase two of the Beardsley Zoo green infrastructure project

March 10, 2017

Save the Sound is thrilled to launch phase two of green infrastructure retrofits at Connecticut's Beardsley Zoo!

In 2015 we partnered with the Beardsley Zoo to bring to life [phase one](#) of their Green Infrastructure Long-Range Plan, which identifies opportunities for managing stormwater runoff produced by the zoo's parking lots. As a part of this effort, we worked with the zoo and other project partners to design and build a rain garden and porous walkway that filter and absorb stormwater runoff from one quarter of an acre of impervious asphalt, and help prevent pollution to the Pequonnock River and Long Island Sound. In addition to reducing stormwater runoff, the project created an opportunity to teach local youth and Save the Sound members about green infrastructure.





Beardsley Zoo green infrastructure workshop, May 2016.

Following construction of the walkway and excavation of the rain garden, we led an educational workshop and hands-on planting for young adults from the Beardsley Zoo Explorers and Conservation Discovery Corps, the Mayor's Conservation Corps, and Groundwork Bridgeport. Our members participated in a [second planting](#) in September 2016 to further enhance the rain garden with hearty perennial plants that birds and butterflies love.



Rain garden planting, September 2016. Photo by Kendall Barbery.

For phase two, we've set a goal of capturing stormwater runoff from an additional acre of the zoo's impervious parking lot, and filtering it through porous pavements, rain gardens, and other green infrastructure features. That means more than fifty percent of the zoo's parking lot will be sustainably managed by the time of the project's completion. We'll spend this summer working with the zoo to develop design plans and workshop materials, with plans to break ground in late summer 2017. As a part of the construction of this project, we are also launching a new collaboration with the Connecticut Chapter of the Northeast Organic Farmers Association—who will co-lead a hands-on professional development workshop for landscapers and construction contractors interested in gaining experience in green infrastructure installation techniques.

Before long, you'll head to the zoo to see the peacocks as well as the porous pavement, and learn all about what you can do to prevent pollution and manage rainwater where it falls.

Phase two of the Beardsley Zoo project is made possible thanks to grant funding from the National Fish and Wildlife Foundation's Long Island Sound Futures Fund, which is partially funded through the Environmental Protection Agency (EPA). Phase one of the project was also made possible by EPA funding through a Clean Water Act Section 319 grant, administered by the Connecticut Department of Energy and Environmental Protection. With the future of the EPA yet to be determined, we're thinking about all the amazing green infrastructure work the agency has made possible – and hoping to continue this work for years to come.

To learn more about the Beardsley Zoo green infrastructure project, contact Green Infrastructure Program Manager [Kendall Barbery](#).

Posted in [Rain Gardens & GI](#), [Sewage & Stormwater](#)

Tagged [Beardsley Zoo](#), [Bridgeport](#), [Green Infrastructure](#)

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Save the Sound®

FOR IMMEDIATE RELEASE
September 15, 2017

Contact:
Laura McMillan 540-292-8429
Ariel Shearer 774-487-2088

THIS WEEKEND: 23 Beach Cleanups Across Connecticut

International Coastal Cleanup Day will bring together volunteers worldwide

New Haven, Conn.—This Saturday, September 16, is the 32nd annual International Coastal Cleanup Day. Across Connecticut, many hundreds of volunteers will come out to remove bottles, plastic bags, cans, cigarette butts, and more exotic finds from their favorite beaches.

“International Coastal Cleanup Day embodies the spirit of stewardship,” **said Long Island Soundkeeper Bill Lucey**, a veteran of two decades of cleanups in Alaska. “This weekend about 900 volunteers are planning to give up part of their own Saturday or Sunday to put on gloves and pick up trash, because they know that only their hard work can keep the beaches they love clean and the wildlife in our Sound safe. On average, each cleanup volunteer collects about 22 pounds of trash—so every single participant is making a big difference.”

Save the Sound, a bi-state program of Connecticut Fund for the Environment, has been coordinating the Connecticut cleanups for 15 years as part of the worldwide volunteer event founded by Ocean Conservancy. The organization expects well over a thousand volunteers at 50 coastal cleanups across Long Island Sound’s Connecticut shoreline throughout September and October. About two dozen public and private cleanups are slated for this weekend alone.

“We’re proud to be working with some great partners this year including the National Charity League, Builders Beyond Borders, Yale University School of Public Health, Cub Scout Pack #288, and Mystic Aquarium,” **Lucey said**. “And we’re grateful to the corps of cleanup captains and volunteers who sign up year after year. Their dedication keeps beaches clean for their neighbors.”

Ocean trash threatens the health of beachgoers; can kill birds, sea turtles, fish, and marine mammals; and damages economic activity such as tourism and the fishing industry. Every piece of trash volunteers find is tracked, reported to Save the Sound, and included in Ocean Conservancy’s [annual index of global marine debris](#). Last year, the worldwide effort collected over 18,000,000 pounds of trash.

For a complete list of public coastal cleanups happening in Connecticut throughout September and October or to register as a volunteer, please visit [Save the Sound’s registration form](#).

###

Selected cleanups recommended to press:

FAIRFIELD CO

- National Charity League (Canaan Parish Chapter) at Sasco Hill Beach, Fairfield. Saturday, Sept. 16, 9:00 – 11:00am. *Featuring approximately 100 mothers and daughters.*

- Builders Beyond Borders at Beardsley Park/Bunnells Pond, Bridgeport. Saturday, Sept. 16, 9:00am – 3:00pm. *Site of Save the Sound fish passage and green infrastructure projects.*

NEW HAVEN CO

- Sandy Point, West Haven. Saturday, Sept. 16, 9:00am – 12:00pm. *Featuring Soundkeeper Bill Lucey, college students, and local residents.*
- Patagonia at Mill River - Criscuolo Park, New Haven. Saturday, Sept. 16, 8:00 – 9:30am. *Bonus: followed by community event honoring 200th birthday of Frederick Douglass.*

MIDDLESEX CO

- Westbrook Land Conservation Trust at Menunketesuk and Duck Islands, Westbrook. Saturday, Sept. 16, 9:00am – 12:00pm. *Boat-based cleanup of islands.*

NEW LONDON CO

- SECONN Divers at State Pier, New London. Saturday, Sept. 16, 9:30am – 12:00pm. *SCUBA underwater cleanup!*
- Mystic Aquarium at Bluff Point State Park, Groton. Sunday, Sept. 17, 10:00am – 2:00pm. *About 100 volunteers expected! Sunday cleanup.*



Global Totals



Total global trash weight is equivalent to the weight of

437 whale sharks.



The total global straws collected, when laid end to end could extend down to the deepest point on Earth, the Mariana Trench, and back to sea level

3 times.

Total distance cleaned is equal to nearly

6 times the length of the Amazon River.



Connecticut Fund
for the Environment

Save the Sound®

FOR IMMEDIATE RELEASE

October 11, 2017

Contact: Ariel Shearer, 203-787-0646 x130

MONDAY: Save the Sound to break ground, start construction on new green infrastructure projects at Beardsley Zoo

New rain-loving gardens and porous pavement will filter stormwater before it pollutes the Pequonnock River, Long Island Sound

Bridgeport, Conn. – Save the Sound, a bi-state program of Connecticut Fund for the Environment, will break ground on Monday for the construction of two new bioretention gardens and the installation of new porous pavement at Connecticut's Beardsley Zoo. The rain-loving gardens and porous walkway will help capture and filter polluted stormwater runoff from the zoo's parking lot to prevent it from flowing into the nearby Pequonnock River and Long Island Sound.

The Beardsley Zoo green infrastructure project, a partnership between CFE/Save the Sound and Connecticut's Beardsley Zoo, was launched in April 2016 with the installation of one rain garden and a small segment of a porous walkway. This latest phase of the project will increase the amount of stormwater that can be captured from the parking lot and allowed to percolate in the soil before releasing clean water into the Pequonnock River. The rain garden and walkway's prominent location in a highly-trafficked Connecticut tourism destination serves as a learning laboratory and public education site for visitors to the zoo.

On Wednesday, October 18, Save the Sound will co-host a green stormwater infrastructure workshop with the Northeast Organic Farming Association (NOFA) at the Beardsley Zoo as part of the new construction phase. Participants will learn the fundamentals of green stormwater infrastructure from an in-depth presentation with NOFA accredited professional Trevor Smith and gain hands-on experience working with porous pavers at the green infrastructure construction site.

Phase two of the Beardsley Zoo green infrastructure project is generously supported by the National Fish and Wildlife Foundation Long Island Sound Futures Fund, Connecticut Institute for Resilience and Climate Adaptation, Jeniam Foundation, and Newman's Own Foundation.

What: Construction of rain gardens and porous walkway

Where: Beardsley Zoo
1875 Noble Ave.
Bridgeport, CT 06610

When: Monday, October 16, 2017
8:30 a.m. groundbreaking

Wednesday, October 18, 2017
9:00 a.m. – 3:00 p.m. workshop

Who: Anna Marshall, Save the Sound green projects associate
Connecticut's Beardsley Zoo
Northeast Organic Farming Association

###



Connecticut Fund
for the Environment

Save the Sound®

FOR IMMEDIATE RELEASE

May 17, 2018

Contact: Laura McMillan, 540-292-8429

Youth build green infrastructure skills at Beardsley Zoo planting

Hands-on rain garden planting workshop teaches benefits of green infrastructure while combatting river pollution

Bridgeport, Conn. – Bridgeport youth volunteers gained green infrastructure skills recently at a hands-on rain garden planting workshop led by Save the Sound, a bi-state program of Connecticut Fund for the Environment. Saturday's workshop at Beardsley Zoo is part of Save the Sound's ongoing efforts to spread the word about the benefits of green infrastructure, and builds upon rain gardens previously installed at the zoo by Save the Sound and volunteers.

Green infrastructure uses natural principles and landscaping to manage stormwater, reduce flooding, and filter pollutants. The rain gardens built at the Beardsley Zoo slow the flow of rain water runoff and helps filter polluted rainwater before it reaches the Pequonnock River and Long Island Sound.

"The beauty of rain gardens and other green infrastructure is that they are mostly above ground, so they're visible. And because rain gardens are visible, they both have value in beautifying neighborhoods and serve as great tools for educating people about sustainable water management," **said Kevin Dahms, Save the Sound's Green Infrastructure project manager.** "The new rain gardens combined with installations of porous pavement in the Zoo's parking lot filters 1,000,000 gallons of urban runoff annually. With the completion of the rain gardens, more than fifty percent of the Zoo's parking lot is now sustainably managed."

The Beardsley Zoo green infrastructure project, a partnership between Save the Sound and Connecticut's Beardsley Zoo, first broke ground in spring 2016. Save the Sound and partners installed a rain garden and a porous walkway that allows stormwater runoff from the Zoo's parking lot to percolate into the soil. Area youth and Save the Sound have since followed up with multiple rounds of plantings to reinforce the garden.

About 40 volunteers, including local young people from Beardsley Zoo Youth Conservation Discovery Corps, Groundwork Bridgeport, and BuildOn Bridgeport participated in the Saturday morning workshop. They learned about the harmful effects of stormwater runoff and how green infrastructure prevents flooding and water pollution, then gained hands-on experience by planting native perennials to filter runoff from the zoo's parking lot. Species included joe-pye weed, coreopsis, bee balm, and switchgrass, among others. All are tolerant of both wet soil and periods of drought—critical as climate change is expected to generate less-frequent, but higher-intensity storms that drop a great deal of rain in a short amount of time.

Together, the porous pavement and rain gardens provide a two-step process for capturing and filtering stormwater runoff, and releasing clean water into the Pequonnock River. In addition, the

rain gardens and porous pavement's prominent location in a highly-trafficked Connecticut tourism destination function as a public education site.

The Beardsley Zoo green infrastructure project is generously supported by a sub-award from the Connecticut Metropolitan Council of Governments (MetroCOG) through an agreement from the Connecticut Institute for Resilience and Climate Adaptation, the University of Connecticut with funds provided by Grant No, PS#43280, PS#2014-14249 from CT Department of Energy and Environmental Protection. Additional project funding was received from the National Fish and Wildlife Foundation, Jeniam Foundation, and Newman's Own Foundation.

###





Additional photographs of rain garden planting workshop are available upon request.


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Zoo breaks ground on new green infrastructure projects

By [HAN Network](#) on October 19, 2017 in [Business, Clubs & Organizations](#), [Community](#), [News](#), [Regional](#) ·



More permeable pavers were installed in the Zoo's parking lot.

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About author



HAN Network

The second stage of an ongoing green infrastructure project began this week at Connecticut's Beardsley Zoo, designed to filter stormwater before it reaches the nearby Pequonnock River, and ultimately, Long Island Sound. Runoff from rainwater can wash pollutants into the river, including oil and chemicals from automobiles, bacteria, and other debris and sediment, potentially harming aquatic life. By installing two new rain gardens and more permeable pavers in the parking lot, the intent is to allow stormwater to migrate through the soil and be biologically treated.

The project is a partnership between Connecticut's Beardsley Zoo and Connecticut Fund for the Environment (CFE)/Save the Sound. The project was launched in April 2016 with the installation of one rain garden and a small segment of porous walkway. This second phase will increase the amount of stormwater that can be captured from the parking lot and allowed to percolate in the soil before releasing clean water into the Pequonnock River. The rain gardens' and walkways prominent locations also serve as a learning laboratory and public education site for Zoo guests.



Permeable pavers at the Zoo.

"We have rain gardens all around the Zoo grounds," said Zoo Director Gregg Dancho. "Those gardens also become habitats, which we like. The gardens and permeable pavers are part of our focus on environmental conservation, caring about anything that affects plant, animal and human life."

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Phase Two of the Connecticut's Beardsley Zoo project is supported by the National Fish and Wildlife Foundation's Long Island Sound Futures Fund, Connecticut Institute for Resilience and Climate Adaptation, Jeniam Foundation, and Newman's Own Foundation.

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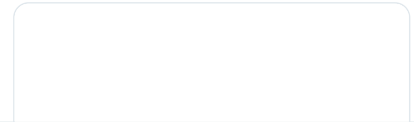
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Save the Sound receives Water Quality and Green Infrastructure grants

By [HAN Network](#) on November 16, 2016 in [Business](#), [Clubs & Organizations](#), [Community](#), [News](#), [Regional](#)



Peter Linderth, Save the Sound Water Quality Program Manager; Mark Tedesco of the EPA's Long Island Sound Study; Tracy Brown, Director of Save the Sound's Western Long Island Sound programs; Kendall Barbery, Save the Sound Green Infrastructure Program Manager.

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About author



HAN Network

Save the Sound has received three grants to monitor and prevent water pollution around the western Long Island Sound region. Grants from the Long Island Sound Futures Fund will make possible green infrastructure in Fairfield County and water quality program development in Westchester and Nassau counties, and a grant from the Westchester Community Foundation will support water quality monitoring.

“The western Sound faces special water pollution challenges: dense population, deteriorating pipes, and water flow patterns that mean pollution can stick around for a long time,” said Tracy Brown, director of Save the Sound’s Western Long Island Sound programs. “Support from the Westchester Community Foundation will let us continue tracking down sewage leaks in Westchester County’s streams, rivers, and harbors. And thanks to the Long Island Sound Futures Fund, we’ll be able to pilot common standards for citizen scientists doing similar work on Sound bays and harbors across the New York and Connecticut shores.”

The Long Island Sound Futures Fund (LISFF) pools funds from the U.S. Environmental Protection Agency, National Fish and Wildlife Foundation, and the U.S. Fish and Wildlife Service. The LISFF has granted Save the Sound \$58,937 to operate the pilot program at Mamaroneck Harbor and Manhasset Bay, New York — one of [25 grants announced Monday](#) with federal, Connecticut, and New York environmental officials. The Westchester Community Foundation will continue its strong support of Save the Sound’s water quality monitoring program with a grant of \$15,000, the [foundation announced](#) late last week.

A second major grant from the LISFF provides \$149,833 for Phase II of a green infrastructure project at Connecticut’s Beardsley Zoo in Bridgeport.

“This project will capture and filter nearly one million gallons of urban stormwater each year,” said Save the Sound Green Infrastructure Program Manager Kendall Barbary. “Thanks to the Long Island Sound Futures Fund, the Pequonnock River and Long Island Sound will be cleaner. We’re looking forward to providing zoo visitors with beautiful landscaping and giving local teens and landscape practitioners the opportunity to learn new planting and green infrastructure construction skills.”

Save the Sound and the zoo have been [partnering since April](#) on permeable pavement and rain gardens that filter rain flowing across the zoo’s parking lot and walkways. This grant will support installation of 2,000 square feet of bioretention gardens and tree pits in lawn areas, and replacement of up to 4,000 square feet of impervious pavement with pervious pavers that allow water to soak into the ground.

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Save the Sound is a bi-state program of Connecticut Fund for the Environment with an established 40-year track record of restoring and protecting the waters and shorelines of the Sound. From its offices in New Haven and Mamaroneck, Save the Sound works for a cleaner, healthier, and more vibrant Long Island Sound where humans and marine life can prosper year-round. Our success is based on scientific knowledge, legal expertise, and thousands of ordinary people teaming up achieve results that benefit our environment for current and future generations.

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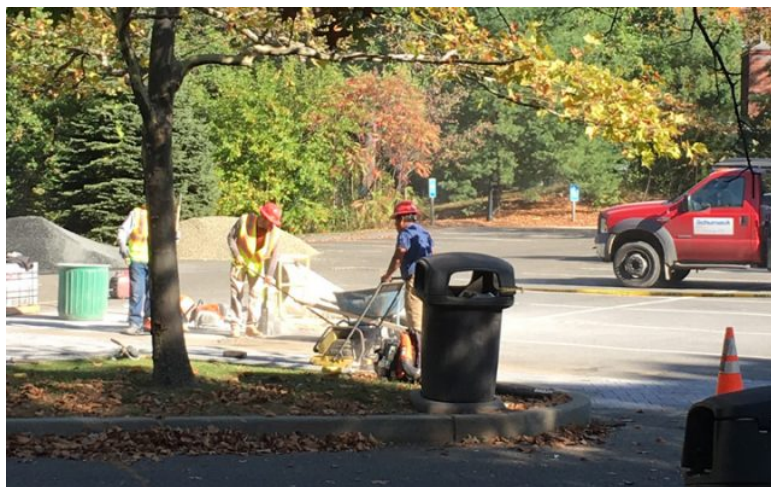


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NOTE: This story also ran in the Wilton Bulletin, The Ridgefield Press, The Weston Forum, and the Easton Courier.