Community-Based Green Infrastructure Training and Employment Initiative

GROUNDWORK Rhode Island

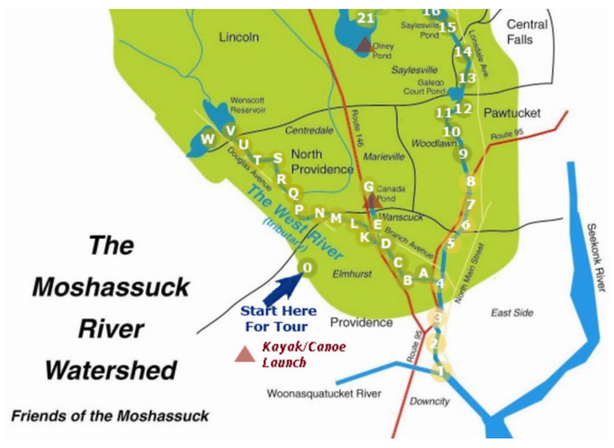
Project Overview

Time Period: September 1, 2019 – November 30, 2022
Grantee: Groundwork Rhode Island
Funding: $198,891 from EPA SNEP, $125,000 from private funding and in-kind support.
Objective: Install bioswales to manage stormwater and provide training opportunities for residents, especially in underserved communities.

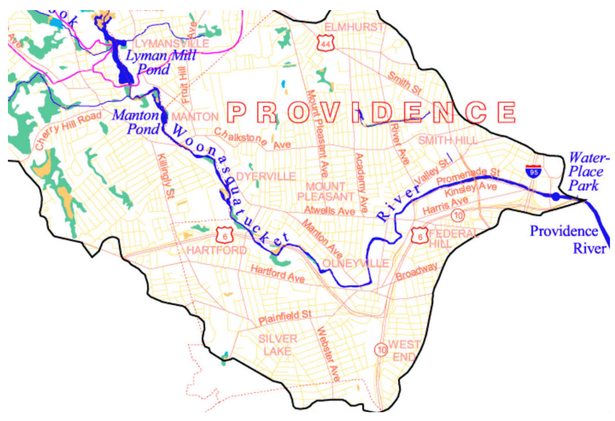
Project Achievements

- 57 bioswales installed across Providence
- 33 new bioswales directly funded by SNEP
- 12 reconstructed bioswales upgraded with SNEP funds
- 2 bioswales in Roger Williams Park funded with additional SNEP funding
- 10 bioswales funded by non-federal grants used as matching funds

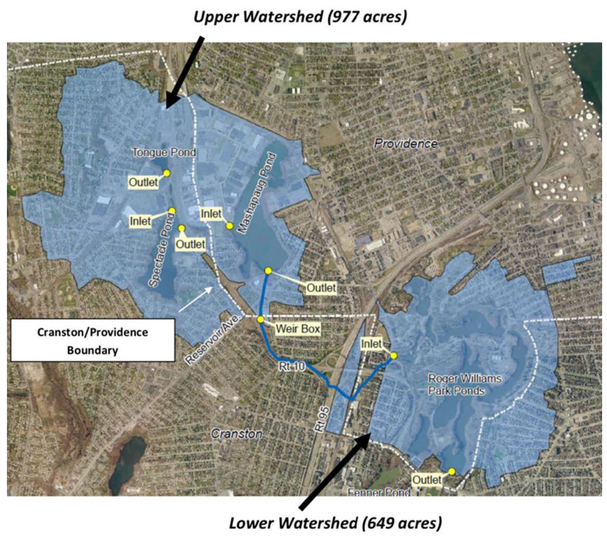
Four Focus Watersheds for ROW Bioswale Installations



The West River is a tributary of the Moshassuck River This image shows the lower portion of the Moshassuck River watershed where the West River connects. Our project focuses on this lower portion of the watershed. Image credit – Friends of the Moshassuck.

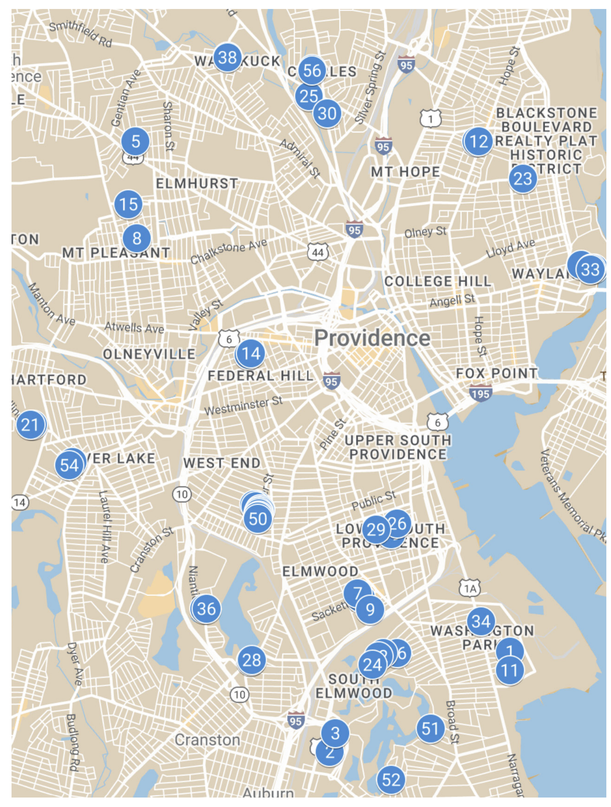


This image is of the lower portion of the Woonasquatucket River in Providence. Image credit – Woonasquatucket River Watershed Council.



Mashapaug Pond and connected ponds in Cranston feed into the Roger Williams Park ponds. The ponds are connected to the Pawtuxet River, which leads into Narragansett Bay. Image credit – Horsley Witten Group.

Installed Bioswale Locations



Outreach

Groundwork RI utilized flyers, social media, and word of mouth to spread awareness about and gain community support for this bioswale project. Our primary outreach methods to find bioswale locations were door-to-door outreach, direct mailings, email newsletter communications, and social media posts. Due to the limited nature of where we could install bioswales, our outreach was very targeted. Door to door outreach leaving flyers or talking directly with homeowners was one important method once we had already identified the home as a suitable bioswale installation site. **See example fliers below.** The three nonprofits we worked with, ReFocus Community Center, Anchor Recovery Center, and Southside Community Land Trust were all open and receptive from the moment we approached them about the project after having identified their properties as suitable locations.

Providence's ponds and rivers need your help!

Roger Williams Park Ponds | Mashapaug Pond | West River | Woonasquatucket River | York Pond

Groundwork Rhode Island is looking for **tenants or property owners** who would like to receive a **FREE bioswale** in front of their **home or business**, and are willing to **help look after them** after planting!

Bioswales are planted areas located in the right-of-way in front of your home or business. 5 feet of soil are dug out and backfilled with stone and soil. A curb cut allows stormwater from the street to enter. The bioswales are usually 12 ft x 4 ft.

This project will…

- **CLEAN**: Filter out pollution with plants, stone, and soil.
- **COOL**: Minimize concrete, heat-holding surfaces.
- **PROTECT**: Absorb & intercept rain to reduce flooding.
- **INCREASE WELLNESS**: Create welcoming spaces.
- **SUPPORT** our **ECONOMY**: Create local jobs & training opportunities.

Interested? Have questions?
Contact us at: info@groundworkri.org | (401) 559-2204

Project partners include:

¡Los lagos y ríos de Providence necesitan su ayuda!

Roger Williams Park Ponds | Mashapaug Pond | West River | Woonasquatucket River | York Pond

Groundwork Rhode Island está buscando **arrenditarios o propietarios** que deseen recibir un **bioswale GRATIS** en frente de su **casa o negocio**, y estén dispuestos a **ayudar a cuidarlos** después de plantar!

Los bioswales son áreas plantadas ubicadas en el derecho de paso frente a su hogar o negocio. Se excavan 5 pies de tierra y se rellenan con piedra y tierra. Un corte en la acera permite que entren las aguas pluviales de la calle. Los bioswales suelen ser de 12 pies x 4 pies.

Este proyecto…

- **LIMPIA**: Filtre la contaminación con plantas, piedras y tierra.
- **REFRESCA**: Minimice las superficies de concreto que retienen el calor.
- **PROTEJE**: Absorbe e intercepta la lluvia para reducir las inundaciones.
- **BIEN ESTAR**: Crea espacios de bienvenida.
- **APOYA** la **ECONOMÍA**: Crea trabajos locales y oportunidades de capacitación.

¿Tiene interés? ¿Preguntas?
Contactanos: info@groundworkri.org | (401) 559-2204

Los socios del proyecto incluyen:

Community Engagement and Project Partners

- Craig Hochman, the City Engineer, and other staff in the Providence Department of Public Works (DPW) were very supportive of this project and helped us through the permitting and site selection and approval process.
- The Providence Parks Department was also a great partner in our efforts to install bioswales inside Roger Williams Park.
- The Providence Neighborhood Planting Program (PNPP) and the Woonasquatucket River Watershed Council (WRWC) helped us identify locations for bioswales that complemented planned street tree plantings and find project locations in the Woonasquatucket River watershed, respectively.
- The resident-led Blackstone Parks Conservancy (BPC) was a key partner as well in the final stretch of the project period when we still needed to find many bioswale locations after scouring the four primary watersheds where we started the project.
- At the beginning of our project, the RI Department of Transportation (DOT) reviewed the final project design, added comments, and tried to identify locations for our bioswales on state roads within their jurisdiction and within our priority watersheds. In the end, we were unable to install any bioswales on state roads as part of this project, but it was good to have their support.
- The RI Green Infrastructure Coalition (GIC) helped promote our bioswale project through its email newsletter and at regular coalition meetings. Groundwork RI staff also presented our project plans and revised bioswale designs at two separate public events hosted by the GIC.
- The resident-led Blackstone Parks Conservancy (BPC) was a key partner as well in the final stretch of the project period when we still needed to find many bioswale locations after scouring the four primary watersheds where we started the project.

Workforce Development

- One of the goals of our project was to use the bioswale installations as both an employment and training opportunity. A few of our own job training cohorts participated in various aspects of the bioswale project – primarily in depaving and excavation, cutting out the curb cut, then filling and planting the feature.
- In 2022, we worked with two young adult cohorts from Building Futures who were trained by GroundCorp to mix concrete, set the stone paver borders, and install the concrete splash pads on a few bioswales as well. See photos of these cohorts to the right*
- WRWC's River Rangers, a paid landscaping team similar to our GroundCorp program, joined GroundCorp for bioswale installations at a number of locations as a training exercise.
- Our job training partners included Children's Friend, Open Doors, Garden Time, and Building Futures, all of whom provided student referrals to Groundwork's own training program or contracted with us to run classroom and field-based training programs for their client base.
- Approximately 31 students particiapted over the course of the project.

Site Selection

- DPW staff were invaluable in brainstorming during the very iterative design process, which was ongoing throughout the project period, helping us make decisions about design features that were the most practical, followed ADA requirements, and fit within the context of Providence's streetscape. DPW was game for trying and testing out new ideas out and were not afraid to go back to the drawing board with us when something failed or could be improved We were also permitted to use the City of Providence's Sewer and Stormwater GIS Database for identifying suitable sites.
- The Providence Neighborhood Planting Program (PNPP) and the Woonasquatucket River Watershed Council (WRWC) helped us identify locations for bioswales that complemented planned street tree plantings and find project locations in the Woonasquatucket River watershed, respectively
- Some bioswales were also planted in front of public parks owned by the City. The Providence Parks Department was also a great partner in our efforts to install bioswales inside Roger Williams Park, as well as install bioswales outside other city parks such as Paul Grande Park in Silver Lake and Sessions Street Park on the East Side.
- In order to maximize water quality benefits to Providence ponds and rivers, as well as utilize our bioswales for the City's stormwater credits (as part of their consent order with RIDEM), the DPW required us to only install bioswales in separated sewer areas of the city.
- We had to accommodate mnimum distances from corners, retaining walls, buildings, utility poles, and drainage basins, building entrances, loading zones, fire zones, curb cuts, and avoid areas with steep slopes and heavy traffic. Compliance with ADA requirements and local regulations and adequate sidewalk space and no underground utility conflicts were also required.
- Property owner permission of the corresponding home or business was also required.

Design and Construction

Design #1

- Our original design, developed with the Providence DPW in 2017, resulted in a bioswale that looked like **photo number 1**, 12 of which are located along Dexter Street.
- Design features included a unique steel fence fabricated by the Steel Yard, a local nonprofit, which was set in concrete around the border, perennials as well as a tree in the center of the feature, and two curb cuts with steel plates across the opening that were bolted or glued onto the granite curb.
- Maintenance of these design features proved to be difficult: the fences were prone to car damage and were not easy to fix, the steel plates were difficult to bolt into the granite and popped off occasionally due to contact with cars or plows, and we are unsure how the stormwater capture system will work as the tree matures and the roots take up more space within the bioswale.

Design #2

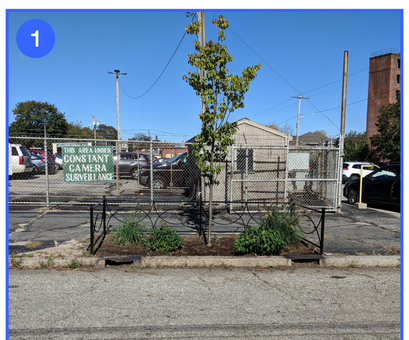
- Based on a design from New Haven, we made changes to the design.
- In the design in **photo number 2** we added a single angled curb cut instead of the double, steel-plated straight curb cut. The angle served the same purpose as the steel plates of allowing snow plows to pass by the bioswale without damaging the open edge of the curb cut.
- We added a concrete splash pad as well; the splash pad has some texture and grooves to slow water down as it enters the bioswale. The stone border and stone gabion help absorb more stormwater and infiltrate the water faster. Our gabion uses a corrugated drainpipe filled with rock instead of wire or wire mesh, in order to add more structure and stability.
- The fencing is shorter than our original design and is made from easier-to repair materials.

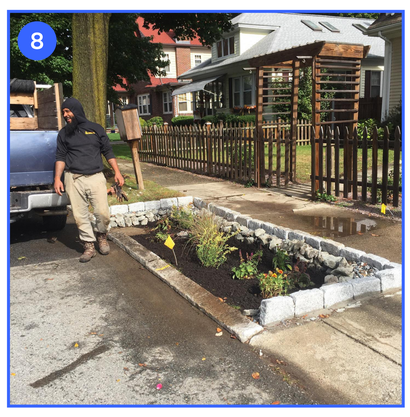
Design #3

- After retrofitting the original 12 bioswales on Dexter Street with the new design, we found there were still some sites where the aluminum fencing became damaged so often that it was impossible to keep up with proper maintenance.
- The fencing is necessary in order to comply with ADA requirements to alert blind pedestrians that the bioswale feature is there. The bioswale sits at a slightly lower grade than the sidewalk so we want to avoid pedestrians tripping and hurting themselves, and we want to prevent pedestrians and bicycles from causing damage to the feature, compacting the soil, etc.
- After a few iterations, we landed on this fencing border below made out of stone pavers **(seen in photo 3)**. So far, we have been pleased with the results in terms of ease to repair and maintain the border, and we have received positive feedback from residents.

Site Specific Designs

- The bioswales on Opper Street look more like traditional rain gardens situated on either side of a driveway opening for a privately-owned property, but are built at the curb edge and feature a gabion and curb cut like all the other bioswales.
- The two projects we installed in Roger Williams Park **(photos 4-5)** are located along the roadside as well but do not conform to the same "look" as right-of-way bioswales along a city street. This design choice was intentional to ensure the features fit into the natural surroundings and historic feel of the park.
- On Killingly Street outside a Little League field next to Neutaconkanut Park in Silver Lake, we installed two bioswales in quick succession due to the volume and velocity of water coming down the slope of that road. The first bioswale **(photo 6)** acts as a stone forebay without any plants (which would otherwise get washed out in a rainstorm) to capture as much water as possible before reaching the second bioswale, which has the typical planted style.





Long Term Sustainability and Future Projects

- We will continue to perform ongoing maintenance of all bioswales.
- RIDOT contracted Groundwork RI to reconstruct, replan, then maintain 18 linear bioswales.
- We will continue applying for grant funding to run workforce development programs.
- We will develop educational products and use the bioswales as education and training sites for our job training and youth programs. GWRI staff have been certified as instructors by the Center for Watershed Protection for its Clean Water Certificate program.

Key Outcomes and Impacts

- The project engaged residents in meaningful employment and provided hands-on training in green infrastructure construction and maintenance.
- Enhanced skill sets of participants, improving future employment prospects.
- Created training opportunities for Groundwork RI crew opened up new opportunities.
- Fostered relationships with local departments, including Providence Parks and Public Works.
- Raised awareness about green infrastructure and climate resilience.
- Design iterations led to more effective bioswales.

Project Credits

- Amelia Rose, GWRI Executive Director
- Steve Ricci, GWRI Director of Field Operations
- George Brice, Javon Threats, Chris Barboza, Ricardo Tillman, and Teddy Ramos, GWRI GroundCorp employees