Pope Branch Post-Restoration

2018 Nonpoint Source Management Program

Annual Report

Reporting Period: October 1, 2017 - September 30, 2018

District of Columbia
Department of Energy and Environment

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Executive Summary

In accordance with Section 319 of the Federal Clean Water Act, this report documents the activities and accomplishments by the District of Columbia (District) 319 Nonpoint Source (NPS) Management Program. The Department of Energy and Environment (DOEE) is the lead agency for administering Section 319, including the 319(h) grant. In this responsibility, DOEE helps to protect and improve District water quality by promoting and funding best management practice (BMP) implementation and tracking, stream restoration efforts, education and outreach, and other measures to reduce NPS pollution loads.

In fiscal year (FY) 2018, the District received $1,034,000 through the Environmental Protection Agency (EPA) 319(h) grant and matched it with $689,334 to support the District's NPS pollution reduction activities. Over the course of its fiscal year 2018, which runs from October 1, 2017 through September 30, 2018, the District completed the installation of three RiverSmart Schools projects and audited 1,047 homes, installed 456 rain barrels, 876 trees, and 161 rain gardens through the RiverSmart Homes program.

Mission and Goals of the District of Columbia's NPS Management Program

The mission of the District's NPS Management Program is to prevent and control NPS pollution in its watersheds. Employing both regulatory and non-regulatory approaches, the NPS Management Program works to safeguard the District's water and soil resources as well as the health and welfare of citizens using those resources.

Long-term goals and short-term milestones to mark progress toward those goals are outlined in the *Non-Point Source Management Plan for the District of Columbia, 2014*. Note that the District is in the process of updating its management plan, which will be provided to EPA this fiscal year 2019. The format and goals in this annual report were organized to reflect the goals outlined in our previous management plan. The plan is aimed at reducing NPS pollution from urban runoff, construction, and hydrologic/habitat modification and includes:

- Supporting activities that reduce pollutant loads from urban runoff, litter prevention, and trash removal, for the purpose of attaining present designated uses by 2025 and future designated uses by 2035;
- Supporting and implementing activities that strive to restore and maintain healthy habitat, species diversity, and water flows to all of the tributaries of the Anacostia River by 2025, and to all surface waters of the District of Columbia by 2035, by restoring degraded systems and preserving healthy and threatened ones;
- Coordinating NPS Management Program efforts with other District, federal and private sector programs, and adjoining jurisdictions to provide the best delivery of services to prevent and control NPS pollution in the District of Columbia with the resources available;
- Supporting programs that aim to prevent NPS pollution from individual actions by carrying out effective information and education campaigns that reach at least 5,000 individuals each year to targeted audiences who live, work, teach, or visit in the District of Columbia and its watersheds; and

- Implementing programs that aim to increase NPS pollution prevention practices on private property reaching at least 1,000 properties per year.

Note that the format and goals of this report also reflect recent realignment within DOEE. The realigned Watershed Protection Division (WPD), which includes the Restoration Branch and the Partnering and Environmental Conservation Branch, contributed to the goals outlined in this report. The mission of the Watershed Protection Division is to protect and restore the environmental health of the District's watersheds by restoring streams and wetlands, providing incentives to control NPS pollution, and conducting outreach and education. The mission of the Restoration Branch is to conserve the soil and water resources of the District and protect watersheds from pollution. The mission of the Partnering and Environmental Conservation Branch is to cultivate partnerships through engagement, education, and financial, technical, and compliance assistance to enforce District laws that achieve clean water goals and support communities. Because of this realignment, some of the management plan's goals will be updated with, "N/A," for FY 2018. This represents tasks that are no longer conducted by the Division and therefore data is not available.

The District's NPS Management Program has also created four detailed watershed implementation plans (WIPs) for three major watersheds in the District and for the District as a whole. All of these plans, including the *Oxon Run WIP* (2010), *Rock Creek WIP* (2010), the *Anacostia River WIP* (2011), and the *Consolidated TMDL Implementation Plan* (2016) have been approved by EPA. Additionally, the District participated in the development of the Anacostia Watershed Restoration Plan, which was facilitated by the U.S. Army Corps of Engineers and released to the public in April 2010. These plans lay out waterbody impairments, technically appropriate implementation projects, and timelines that guide DOEE in its work.

DOEE assesses the health of all significant waterbodies in the District and prioritizes water quality improvement efforts based on data gathered from water quality monitoring. DOEE then characterizes waterbody impairments and threats that are included in the District's Section 305(b) reports as required by the federal Clean Water Act. The reports describe many of the District waterbodies as not supporting their swimmable (primary contact recreation) and fishable (fish consumption) designated uses.

Urban stormwater runoff is a prevalent source of pollutants to District waterbodies. Primary NPS pollutants of concern include nutrients, sediment, toxicants, pathogens and hydrocarbons. The few waterbodies that partially or fully support a designated use are also threatened by NPS pollutants. Processes to prioritize subwatersheds for NPS implementation in the District can be found in the WIPs referred to above. To properly address the water quality problems associated with the District's urban environment, DOEE has created a new NPS management plan. The new document outlines a comprehensive strategy for managing NPS pollution in an urban environment in an effort to restore beneficial uses, and sets new goals and objectives, including specific milestones for when the goals and objectives will be achieved.

This annual report is written in response to *Sections 319 (h)(8) and (11) of the Clean Water Act (33 USC 1329),* for the purpose of documenting progress made in FY 2018 by the District in implementing its *Non-Point Source Management Plan for the District of Columbia, 2014*.

Goal One: Support Activities that Reduce Pollutant Loads from Urban Runoff, Prevent Litter, and Help in Trash Removal Efforts

Anacostia Clean Up and Protection Act (Bag Law)

The District continues to implement the Anacostia Clean Up and Protection Act of 2009 (Bag Law), which requires any business that is selling food or beverages to charge five cents for every disposable bag distributed, with limited exemptions. The Bag Law is working to keep trash out of District waterbodies by incentivizing residents to use reusable bags and reduce consumption of disposable bags. Also, funds from the disposable bag fee are funding important projects, including maintenance of trash traps, stream restoration, reusable bag distribution, and environmental education. In FY 2018, 554 businesses throughout the District were inspected. 148 violations were issued, giving a 73 percent compliance rate.

Sustainable DC Omnibus Amendment Act (Foam Ban)

In 2008, The Anacostia Watershed Society (AWS) determined through their monitoring that expanded polystyrene (more commonly referred to as Styrofoam™) is one of the top-four-most common types of trash found in the Anacostia River. As part of the Sustainable DC Omnibus Act of 2014, the District passed a ban on disposable food service ware made of expanded polystyrene and other products that cannot be recycled or composted. The ban on foam became effective January 1, 2016 while the additional compostable/recyclable requirements became effective January 1, 2017. These bans affect all businesses and organizations in the District that serve food. The ban does not apply to prepackaged Styrofoam.

Figure 1 - DOEE Staff Celebrating the Reduction of Foam in District Waterways

For the first quarter of FY 2018, DOEE focused on outreach and education to communities affected by the new food service ware regulations. This was achieved by mailing postcards detailing the new requirements to over 3900 restaurants, food trucks, and other regulated entities. Additionally, DOEE conducted outreach in-

person to over 400 businesses throughout the District. Beginning on January 1, 2018, DOEE began inspecting businesses for compliance with the recyclable and compostable food service ware requirements. In FY 2018, DOEE inspectors determined that 97 percent of businesses were in compliance with the food service ware requirements and 92 percent of District businesses were in compliance with the foam ban.

Comprehensive Stormwater Management Enhancement Amendment Act (Coal Tar Ban)

The Comprehensive Stormwater Management Enhancement Amendment Act of 2008, effective July 1, 2009, prohibits the sale, use, and permitting of coal tar based pavement products in the District (Coal Tar Ban). The Coal Tar Ban helps to protect human health and the environment by reducing the amount of toxic polycyclic aromatic hydrocarbons (PAHs) in our communities and environment. Rainwater washes PAH-containing sealant particles and dust down storm drains and into local streams and rivers, threatening aquatic life in the Anacostia and Potomac Rivers and the Chesapeake Bay. No coal tar violations were found in District FY 2018.

Trash Removal

In 2010, the District and the State of Maryland established a total maximum daily load (TMDL) for trash for the Anacostia River. These loads were calculated based on stream and shoreline transect sampling performed by AWS through a grant from DOEE. NPS loads were attributed to illegal dumping. For the District's portion of watershed, an annual load allocation totaling 20,048 pounds of trash was assigned.

Some of the tools that the District is applying to meet the goals of the trash TMDL include education and outreach, stream and shoreline cleanups, new regulations, and enhanced enforcement. In 2018, the Alice Ferguson Foundation (AFF) continued work on a DOEE grant-funded project which included implementing of an education and outreach campaign throughout the District's portion of the Anacostia River watershed.

DOEE has supported the Annual AFF Potomac Watershed Clean-up and the Anacostia Watershed Society Earth Day Cleanup since their inception. AFF has developed an online GIS database to track cleanups that occur throughout the Potomac River watershed on an annual basis. Using this database, DOEE was able to determine the amount of trash removed from the District's watersheds by cleanup events in 2018. DOEE also gathered other trash cleanup data from other NGOs who conduct cleanups in the District. In 2018, DOEE estimates that 72,882 pounds of trash were removed District-wide through volunteer trash clean-ups. DOEE does not yet have data on trash collected through other BMPs in FY 2018.

This past year, DOEE continued to implement the DumpBusters program with the DC Metropolitan Police Department (MPD), the District Department of Public Works (DPW), and the National Park Service (Park Service). The program initially addressed illegal dumping at ten hotspots in the Anacostia River watershed and installing enforcement signage and cameras. In 2018, the program was expanded to address additional hotspots throughout the watershed. In 2018, MPD made 30 arrests related to illegal dumping

Stormwater Pollution Prevention Plans (SWPPPs)

In an effort to make all of District government compliant with reducing NPS, DOEE's stormwater pollution prevention team helps other District agencies in developing and implementing Stormwater Pollution Prevention Plans (SWPPPs). SWPPPs are facility-specific plans that aim to reduce or eliminate the creation of pollutants or wastes at the source through aggressive and practical pollution prevention methods. These SWPPPs are meant to address three primary objectives: 1) Assure facility compliance with the DC Municipal Separate Storm Sewer System (MS4) permit, 2) Identify potential sources of pollution associated with the activities at a facility that may affect the quality of stormwater discharges, and 3) Provide detailed commitments for daily practices and good housekeeping at each facility to ensure that pollution prevention goals are reached. In FY 2018, DOEE reviewed 13 SWPPPs for varying District facilities. Additionally, a template SWPPP was drafted to assist facilities that need to create a brand new SWPPP. The goal of reviewing 20 SWPPPs for varying District facilities in FY 2018 was not met because DOEE's main focus was to compile an inventory of municipal Critical Source facilities and to gauge the need for SWPPP assistance. However, DPW hired a contractor to revise all of their facility SWPPPs and DOEE provided feedback on the initial SWPPP to this contractor, which will affect 18 SWPPPs for DPW facilities.

Figure 2- DPW Fueling Station Employees Receive a Certificate of Completion after SWPPP Training

Snow and Ice Removal

DOEE works with the District snow team to address vehicle washing, snow disposal operations, and salt storage. These efforts include developing the first District plan to identify and prepare site maps for snow disposal sites and conducting salt dome and vehicle wash facility walk-throughs. In FY 2017 DOEE developed its first DOEE Snow Plan to clearly articulate DOEE's role in snow and ice removal operations and emergency response management during winter weather events. DOEE also helped a District salt dome devise a temporary vehicle wash station to divert wash water away from a sand filter into the sanitary sewer. In total, DOEE conducted five onsite visits to provide compliance assistance to snow operations (three salt domes and two vehicle washing operations).

DOEE develops and leads snow trainings for District employees, contractors and downtown Business Improvement Districts. These presentations teach District light- and heavy-plow operators and manual street and bridge teams about stormwater permitting, how to minimize stormwater pollution from snow and ice removal operations, good housekeeping practices, and how to respond to spills, leaks, and drips. In FY 2018, DOEE provided training to over 600 snow and ice removal staff during five different training events.

Pollution Prevention Workshops

DOEE's pollution prevention team also targets the automotive repair industry and commercial buildings by conducting workshops throughout the year to educate business owners and provide compliance assistance and stormwater pollution prevention strategies.

Figure 3 - First Edition of the GreenWrench Toolbox Newsletter

In FY 2018, DOEE held one workshop for the automotive repair industry addressing source reduction measures that save shops money and provided education on hazardous waste requirements, and underground storage tank and air quality regulations. DOEE provided additional educational resources to automotive repair shops through its GreenWrench Technical Assistance Program. This program aims to help businesses become compliant with local and federal environmental regulations and protect the environment by providing pollution prevention guidance and training to District mechanics and auto body shops, free of charge. DOEE also developed a quarterly newsletter in FY 2018 that is sent to 229 shops. This newsletter consists of case studies, articles on toxic materials, stormwater pollution, and air quality concerns.

DOEE also spent time in FY 2018 preparing two separate trainings for commercial building engineers and managers that took place in early January 2019.

Table 1 - Tracking Activities that Reduce Pollutant Loads from Urban Runoff, Prevent Litter, and Help in Trash Removal Efforts

OBJECTIVES	MILESTONES	2014	2015	2016	2017	2018	2020 Goal	% of 2020 Goal Achieved
Objective 1a: To reduce pollutant loads in targeted watershed	Milestone 1: Install LIDs in targeted watersheds	Number of BMPs Installed						
		3	117	42	21	44	N/A	N/A
		Area Treated (Acres)						
		19.1	38.0	11.8	2.58	20.73	N/A	N/A
	Milestone 2: Monitor water quality of all District streams	Number of Streams Monitored						
		3	4	4	4	4	N/A	N/A
		Number of Pollutants Monitored						
		30	30	30	30	30	N/A	N/A
	Milestone 3: Produce annual report of state of the District's waterways	Number of Reports						
		1	2	1	2	1	N/A	N/A
Objective 1b: To review, permit, and inspect all BMPs installed in the District	Milestone 1: Review all erosion and sediment and stormwater permit applications	Number of Permits Reviewed						
		3,264	3,597	4,796	5,158	2069	N/A	N/A
		Number of Permits Approved						
		2,882	1,684	1,475	1,559	1624	N/A	N/A
	Milestone 2: Inspect all permitted BMPs	Number of Sites Inspected						
		5,326	2,237	4,364	4,446	4926	N/A	N/A
		Number of Sites in Compliance						
		724	436	913	666	4700	N/A	N/A
	Milestone 3: Keep a tracking database of permitted BMPs	Total Number of BMPs Installed						
		3,893	4,065	3,757	1,984	1040	N/A	N/A
		Number of New Sites with BMPs						
		211	172	228	205	143	N/A	N/A
Objective 1c: To increase the number of waterbodies meeting water quality standards	Milestone 1: Install LIDs in watersheds with approved WIPs	Number of BMPs Installed						
		229	418	1,378	1,284	1,009	N/A	N/A
		Area Treated (Acres)						
		290	173	152	153	106	N/A	N/A
	Milestone 2: Monitor District streams for water quality improvements	Number of Streams Monitored						
		25	25	25	25	25	N/A	N/A
		Number of Pollutants Removed						
		30	30	30	30	30	N/A	N/A
	Milestone 3: One Water Quality Improvement	Measured or Calculated Water Quality Improvement						
		0	0	0	0	0	N/A	N/A

Goal Two: Support and Implement Activities that Restore and Maintain Healthy Habitat, Species Diversity, and Water Flows to all Tributaries

The WPD's Restoration Branch leads efforts to restore streams and wetlands in the District. The Restoration Branch supports and implement activities that strive to restore and maintain healthy habitat, species diversity, and water flows to all of the tributaries of the Anacostia River by 2025 and to all surface waters of the District of Columbia by 2035, by restoring degraded systems and preserving healthy and threatened ones.

Stream and Wetland Restoration

Stream and Wetland Restoration is the act of modifying a waterway or marsh to improve its environmental health and habitat. All District streams face similar threats from urbanization due to high stormwater flows from impervious surface runoff. Erosion of the banks and beds of an urban stream is the stream's way of adjusting to accommodate the new geomorphological flow regime it is experiencing. Stream restoration attempts to create a new channel that is in stasis with the flows it conveys. The District's stream restoration efforts have focused on restoring tributary streams to prevent excessive sediment loads and associated pollutants from reaching downstream receiving waterbodies such as the Anacostia and Potomac Rivers as well as the Chesapeake Bay.

Watts Branch Stream Restoration

The Watts Branch project was completed in 2012. DOEE used natural channel design techniques to restore over 8,976 feet of stream in Ward 7. Since 2012, DOEE has monitored the stream to ensure that it is functioning as designed and constructed. Restoration monitoring is achieved through photographic and vegetative surveys and geomorphic assessments. DOEE has watched as both muskrats and beavers have come back to and made their homes along Watts Branch after the restoration was completed. Beaver dams are now a constant presence on Watts Branch. Monitoring along Watts Branch during FY 2018 has shown macroinvertebrate taxa ranging in the fair to good categories for stream health and the fish scores are in the good range.

Broad Branch

In 2014, a 1,600-foot tributary of Broad Branch was day-lighted as part of a 1,600-foot reach of stream of an unnamed tributary to Broad Branch. This project also included Low Impact Development (LID) work and installation of several regenerative stormwater conveyances (RSCs). Post restoration monitoring has found macroinvertebrate taxa ranging in the fair category. Due to downstream fish blockages no fish were found in this project area.

Nash Run Stream Restoration

In 2016, DOEE completed a 1,408-foot stream restoration project in the Kenilworth neighborhood of the District by using floodplain reconnection design techniques. The project removed legacy sediments along the stream corridor and created a low floodplain bench which will allow the stream to access its floodplain in small and large storm events. In FY 2018, DOEE monitored this stream for geomorphic stability, vegetation, water quality, fish, and macroinvertebrates. Early post-restoration monitoring show that fish populations have returned to pre-restoration levels, total macroinvertebrate taxa range in numbers for streams with fair to good health, and stream bank stability is in excellent condition.

Figure 4 - Fish Count at Nash Run

Linnean Park

In 2014, DOEE completed the installation of a RSC system in Linnean Park that restored 1,000 linear feet of in-stream habitat. The Linnean Park tributary is a perennial stream that was degraded by stormwater runoff from a 24.5-acre watershed dominated by single family homes and wide suburban streets.

This project, partially funded by a National Fish and Wildlife Foundation grant, was monitored to better understand the efficacy of the RSC restoration approach. The University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory performed pre-installation monitoring for concentrations of nutrients, sediment, metals, bacteria, flow volume and velocity, water temperature, and habitat health. In 2016, the researchers continued post-restoration monitoring of the project area and a final report was submitted to DOEE in 2017. The project used a paired monitoring approach, studying the same set of parameters in Spring Valley, a stream and watershed of similar character that will be restored in the near future. DOEE is also performing photo monitoring of the project area to document the stability of RSC over time.

The data shows that the RSC restoration project reduced phosphorous, nitrogen, and sediment loading in both baseflow and especially stormflow levels of the Linnean Park stream. The construction, which took place in early summer of 2014, raised the average groundwater table depth substantially, especially as compared with the control site, Spring Valley, which fluctuated more but remained lower on average. A higher groundwater table indicates a closer connection between a stream and its floodplain. Post-restoration monitoring has also found macroinvertebrate taxa ranging in the fair category. Due to downstream fish blockages, no fish were found in the project areas.

Pope Branch Stream Restoration

In 2016, DOEE and its partner, DC Water, completed the 4,780-foot-long Pope Branch Stream Restoration Project. The restoration project used regenerative stream channel design techniques that connected the stream to its historic floodplain by filling in the incised channel and brought the stream bed elevation up so that it can access its floodplain during storm events.

Figure 5 - Pope Branch Restored

Because the downstream end of Pope Branch has a significant fish blockage, DOEE staff has coordinated work efforts with two grantees to relocate fish from Nash Run to Pope Branch. The two grantees working on this project are the Metropolitan Washington Council of Governments (MWCOG) and the Latin American Youth Center's River Corps. In FY 2018, River Corps members worked with MWCOG on this effort.

Springhouse Run Stream Restoration

Springhouse Run is a remnant of one of the original tributaries to Hickey Run, a tributary of the Anacostia River, with a drainage area of 152 acres. The majority of the tributary was stable, although highly altered and armored in most areas. The armoring has resulted in a stream with poor habitat value and very limited ability to trap sediment and uptake nutrients.

DOEE coordinated the design of a stream and habitat restoration for Springhouse Run, which was delivered in late 2014. A construction contract was awarded in July 2016 and construction was completed in summer 2017. This project reach measures approximately 1,800 feet in length and lies entirely within the U.S. National Arboretum. A total of 44,120 square feet of non-tidal wetlands were created in three sections of the stream. In addition to stream restoration work, the project also converted two ponds into valuable wetland areas and added several bioretention cells to the parking area at the Visitor Center for the National Arboretum. This project was funded in part with EPA 319 funds and was completed in 2017. Post-restoration monitoring during FY 2018 has shown excellent stream bank stability, macroinvertebrate taxa ranging in the fair category, and shown new fish species diversity compared to pre-restoration conditions.

Branch Avenue Park Stream Restoration

In FY 2018, DOEE issued a design-build contract for a 500-foot stream restoration project of an incised stream gully in southeast DC which drains into the Oxon Run watershed. This project will be in the design and permitting phase in FY 2019 and will be constructed in FY 2020. In addition to restoring over 500 feet of stream, the project will also stabilize and restore two degraded stormwater outfalls.

Fort Dupont

The Fort Dupont watershed is included in the District's Anacostia River WIP approved in 2012 by the EPA. DOEE commenced a comprehensive project in FY 2017 to restore the Fort Dupont watershed with five main components: 1) community outreach and education activities focused on watershed restoration; 2) upland LID work on private property within the watershed through voluntary implementation efforts; 3) installation of LID on Park Service or public right of way areas; 4) stream restoration work; and 5) wetland restoration work. In FY 2017, DOEE contracted an environmental assessment to explore the impacts of stream and wetland restoration work in the park, which would allow for the restoration of over 10,000 linear feet of stream and five acres of wetlands.

Figure 6 - Roadway BioSwale at Fort Dupont

During FY 2018, DOEE worked to move the environmental assessment towards completion with the Park Service. DOEE expects the environmental assessment to be finalized in FY 2019, and then designs will be contracted for the restoration of the entire approved project area.

In addition to the stream work proposed for Fort Dupont, over 2,500 feet of bioswales were installed along the roadways that transect Fort Dupont. The design and construction of these bioswales was through a partnership with DOEE, Park Service, and the Eastern Federal Lands Division of the Federal Highways Administration. The bioswales will catch and filter roadway run-off before it enters the stream network thus lowering the volume and velocity of water entering the stream as well as improving the quality of water entering it.

Alger Park Stream Restoration

In 2017, DOEE completed a 1,541-foot stream restoration project at Alger Park in the Hillcrest neighborhood in southeast Washington, D.C. The project used both regenerative stream channel design and floodplain reconnection techniques that added over half of an acre of wetlands to the stream corridor. In addition to extensive stream restoration work at this site, DOEE has partnered with the D.C. Department of Transportation (DDOT) to install LID projects in the upper watershed to catch, capture, and filter run-off before it gets into the stream. DDOT has completed half of the proposed LID installations in the public space that drains into Alger Park and should complete all LID work in FY 2019.

Oxon Run Stream Restoration

DOEE plans to undertake the restoration of the main stem of Oxon Run in the District which would restore over 16,000 feet of degraded urban stream. In FY 2018, DOEE completed the first phase of the restoration work, which involved a detailed floodplain study undertaken between the District and the U.S. Army Corps of Engineers. In order to continue the restoration work, DOEE needs to obtain consent to move forward on designs and regulatory compliance from all property owners in and along the stream corridor.

Pinehurst Branch

Pinehurst Branch originates at the District/Maryland border and flows approximately 1.3 miles east-southeast on Park Service property to its confluence with Rock Creek. The 619-acre Pinehurst Branch watershed land use is approximately 70 percent residential and commercial development and 30 percent parkland. Approximately 70 percent of the watershed lies within the District, with the remaining in Montgomery County, Maryland. The large amount of imperviousness in the watershed has caused significant erosion in Pinehurst Branch, resulting in sediment transport to Rock Creek and exposed sanitary sewer lines in the stream. DC Water abandoned/removed existing sanitary sewer lines in Pinehurst Branch in early 2018. DOEE will coordinate with DC Water to restore the stream following completion of the sanitary sewer line work.

Figure 7 - An LID installed at Alger Park

The Pinehurst Branch stream restoration project will be a comprehensive restoration project that addresses current degraded conditions in the stream, including eroding banks, exposed sewer lines, and invasive vegetation. In FY 2018, DOEE worked on an environmental assessment for the restoration of this degraded tributary. DOEE plans to continue work on the environmental assessment and designs in FY 2019 until the project is ready for the construction phase.

Spring Valley Stream Restoration

In FYs 2014 and 2015 DOEE collected pre-restoration monitoring data for the 1,100 linear-foot-long Spring Valley Park stream, a tributary of the Potomac River. The basis of design for the stream channel is to replace the existing incised stream channel with a stable stream channel located just below the top of bank elevation for the majority of the approximately 1,100 linear feet of channel. The proposed channel cross section has been sized to convey stormflows within a proposed channel with increased flow width and shallower flow depth to reduce channel shear

stress and minimize potential bank erosion. In FY 2017, DOEE awarded a design-build contract for the restoration of the Spring Valley stream.

In spring of 2019, DOEE will restore a 900-foot reach of degraded stream within the Spring Valley project area that has a sanitary sewer line. DOEE is using local funds for this restoration project.

Stickfoot Branch

In 2017, DOEE entered into an agreement with DC Water to restore a headwater tributary of Stickfoot Branch in the southeast part of the District that drains into the Anacostia River. The work will include the restoration of 850 feet of highly incised stream channel, protection of a sanitary sewer line, and the improvement of three storm sewer outfalls in the restoration area.

Figure 8 - Highly Incised Stream Channel of Stickfoot Branch

In 2018, DOEE worked with the Park Service to finalize an agreement for putting out a Request for Proposals (RFP) for an environmental assessment and 100 percent design contract for this stream restoration project. In the lead up to the design and environmental assessment work, DOEE had our River Corps Green Infrastructure Job Training Program commence photo monitoring of the site and MWCOG executed stream monitoring on the site so that we have solid baseline pre-restoration information on the site prior to restoration work taking place.

Rock Creek, Park Drive, and Fort Stanton Outfall Gullies

In FY 2018, DOEE worked with Park Service to get approval to move forward the repair of several eroded gully channels. These projects will restore highly incised and rapidly eroding channels while also repairing the collapsed or degrading outfall structures.

Table 2 - Tracking Activities That Strive to Restore the Habitat, Species Diversity, and Water Flows to all Tributaries

OBJECTIVES	MILESTONES	2014	2015	2016	2017	2018	2020 Goal	% of 2020 Goal Achieved
Objective 2a: To restore five miles of stream by 2025	Milestone 1: Restore two miles of stream by 2020	Miles of Stream Restored						
		0.55	0	1.17	1.27	0	2	149.5%
	Milestone 2: Restore an additional three miles of stream by 2025	Miles of Stream Restored						
		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Objective 2b: To add 100 wetland acres by 2035, bringing the total acres of wetlands in the District from 280 acres to 380 acres	Milestone 1: Increase wetland acres by 50 acres by 2025	Acres of Wetland Created						
		0.68	0	4.38	2.01	0	70	10.1%
	Milestone 2: Increase wetlands by an additional 50 acres by 2035	Acres of Wetland Created						
		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Objective 2c: To protect all the District's wetlands by 2035	Milestone 1: Identify and document all District waterbodies	Number of Wetlands Identified						
		48	48	48	48	48	N/A	N/A
		Total Wetland Acres						
		280	280	280	280	280	N/A	N/A
	Milestone 2: Update wetland regulations	Number of Updated Regulations						
		0	0	0	0	0	N/A	N/A
	Milestone 3: Protect District wetlands from degradation, encroachment, or destruction	Acres of Wetlands Protected						
		280	280	280	280	280	N/A	N/A

Goal Three: Coordinate NPS Management Program Efforts with Other District, Federal, and Private Sector Programs and Adjoining Jurisdictions

Partnerships and Coordination

The District of Columbia represents only a small portion of the watersheds that it is within: it represents 17 percent of the Anacostia River watershed, 0.5 percent of the Potomac River watershed, and 0.1 percent of the Chesapeake Bay watershed. Further, DOEE is not a landowning or landholding agency. Strategic regional partnerships and collaboration with both governmental and private entities are vitally important to make the agency's watershed protection and restoration work a success.

Local and Regional Partners

Almost 30 percent of the District is federal land, so coordinating with federal agencies is a critical component of efforts to reduce urban runoff. Starting in 2018, DOEE began convening major federal landholding agencies within the District to develop nitrogen and phosphorus reduction strategies as part of the process for developing the District's Phase III WIP for the Chesapeake Bay. These federal agencies are:

- Department of Agriculture (USDA)
- Department of Defense (DOD)
- General Services Administration (GSA)
- Park Service
- Smithsonian Institution (SI)

In coordination with EPA's Chesapeake Bay Program (CBP) Office, DOEE led a webinar on May 24, 2018 to provide an overview of the Chesapeake Bay Program and the Phase III WIP development process. On May 31, 2018, DOEE hosted an in-person, all-day training to teach federal agencies how to use the Chesapeake Bay Programs Chesapeake Assessment Scenario Tool and the District's Stormwater Database for planning and reporting pollution control efforts. On September 14, 2018, the District provided the federal agencies with local planning goals for nitrogen and phosphorus management. These trainings, as well as interim deadlines for submitting information to the District for inclusion in the Phase III WIP, are continuing in FY 2019 as part of the WIP development process. Additional information on DOEE's collaboration with federal agencies is available at https://doee.dc.gov/service/watershed-implementation-plans-chesapeake-bay.

Partnership and Planning Meetings

In June 2006, the MWCOG adopted a resolution that established a new Anacostia Watershed Restoration Partnership (AWRP). The AWRP is comprised of a Steering Committee, Management Committee, and Citizens Advisory Committee that provide a cooperative

framework to support restoration of the Anacostia River and its tributaries. In FY 2018, DOEE participated in:

- Three Steering Committee meetings;
- Four Management Committee meetings; and
- One Restoration Roundtable convened by the AWRP.

Chesapeake Bay Program

The Chesapeake Bay Program is a unique regional partnership that has led and directed the restoration of the Chesapeake Bay since 1983. The District of Columbia has been a partner since its inception, and other partners include the states of Delaware, Maryland, New York, Pennsylvania, Virginia, and West Virginia; the EPA representing the federal government; the Chesapeake Bay Commission, a tri-state legislative body; and participating advisory groups. The partners have committed to work together through a series of Chesapeake Agreements. The 2014 Chesapeake Watershed Agreement includes ten goals to advance a vision of clean water, abundant life, conserved lands, public access to water, a vibrant cultural heritage, and a diversity of engaged citizens and stakeholders. DOEE is the D.C. agency responsible for carrying out program activities related to the Chesapeake Bay.

In FY 2018, the District participated in:

- One Executive Council meeting;
- Five Principals Staff Committee meetings and conference calls; and
- Eleven Management Board meetings and conference calls.

In addition, DOEE participated on the Chesapeake Bay Program's Advisory Committees, Goal Implementation Teams, Working Groups and Action Teams.

Community Stormwater Solutions Grants

In FY 2018, DOEE continued the Community Stormwater Solutions Grant program, which provides start-up funding for community-oriented projects that raise awareness about urban watershed issues, in particular those associated with stormwater runoff. All projects must fall into one or more of the following project areas:

- Install green infrastructure;
- Maintain existing green infrastructure;
- Provide pathways to green jobs focused on stormwater solutions;
- Restore natural habitat;
- Clean up areas affected by high volumes of litter and address littering sources;
- Reduce sources of pollution to District water bodies; and
- Engage communities, raise awareness, and bring about behavior change on issues impacting water quality, including stormwater management, trash, pollution prevention, and watershed restoration.

In 2018, DOEE included a special project area to support the Year of the Anacostia, which commemorated the 100th year anniversary of Anacostia Park.

In FY 2018, DOEE closed out 11 grants that were awarded during the 2017 funding cycle. Eight projects wrapped up on April 30, 2018 and three additional finished on September 30, 2018. In

addition, DOEE awarded ten grants totaling $181,985 through the 2018 funding cycle. These projects were awarded in April and May of 2018 and will be completed by June 30, 2019.

Accomplishments of the 2018 Community Stormwater Solutions:

Activity	**Results**
Community members engaged in project activities	663
Stakeholder organizations consulted	21
Students reached	219
Clean ups and other events	128
Educational lessons, including field trips and trash audits	40
Site assessments	6
Educational signs	9
Field manual for GI maintenance	1
"River of Resilience"/Anacostia Watershed Story Map created	1
Anacostia Watershed Photo Database created (includes 200 photos)	1
"Inspector Green" Smart Phone app created	1
Pounds of leaves removed from storm drain inlets	356
Pounds of recycling collected	25
Pounds of trash collected	5,402
Rain garden installed (square feet)	500
Native plants planted	1,379
Stormwater-focused public artwork installed	29
Storm drain murals installed	27
Student-created native species mosaics	8

Stormwater Retrofits

District Department of Parks and Recreation (DPR) Projects

The District Department of Parks and Recreation (DPR) provides quality urban recreation and leisure services for residents of and visitors to the District. DPR supervises and maintains area parks, community facilities, swimming pools and spray parks, and neighborhood recreation centers. In FY 2018 DOEE and DPR worked together on the installation of LIDs on several other DPR parcels. DOEE worked with the Office of Contracting and Procurement in FY 2018 to contract for the design and construction of three different LID retrofits at the Congress Heights Recreation Center, Benning Park Community Center, and Amidon Field. Additional contracting and construction of LID retrofits will occur in FY 2020.

Table 3 - Tracking the Coordination of NPS Management Efforts with Other District, Federal, and Private Sector Programs and Adjoining Jurisdictions

OBJECTIVES	MILESTONES	2014	2015	2016	2017	2018	2020 Goal	% of 2020 Goal Achieved
Objective 3a: To work with local and regional partners on NPS management issues	Milestone 1: Partner with District agencies for NPS projects	Number of Partnership Projects Annually						
		4	8	8	8	37	N/A	N/A
Objective 3b: To participate in partnership and planning meetings	Milestone 1: Participate on regional committees or planning meetings	Number of Meetings						
		50	60	55	80	95	N/A	N/A
		Number of Joint Committees Annually						
		25	25	25	43	45	N/A	N/A
	Milestone 2: Demonstrate two programmatic partnership successes annually	Number of Successful Partnerships						
		4	2	4	2	3	14	107%
Objective 3c: To participate on Region 3 and Bay Program Technical Advisory Committees	Milestone 1: Join technical committees	Number of Committees Participating On Annually						
		16	25	17	25	25	N/A	N/A

Goal Four: Support Programs that Aim to Prevent NPS Pollution from Individual Actions by Carrying Out Effective Information and Education Campaigns

Education and Outreach

Almost 650,000 people currently reside in the District. Additionally, the city hosts millions of visitors each year, including tourists and those that work in the District but live outside its border. Without educated and engaged residents and visitors, the District will not be able to achieve its pollution reduction goals. A citizenry educated about NPS pollution reduction techniques is important for the following reason, among others:

- Modify their behavior and adopt environmentally sensitive practices;
- Advocate for stronger laws and regulations and for funds to enforce them; and
- Help care for practices installed by the District.

Because education is critical to the District's efforts, DOEE sponsors and conducts environmental education and outreach activities targeted at teachers, environmental educators, and students throughout the District. These programs and resources include the following efforts.

Figure 9 - Student Feeding a Calf during a MWEE

Meaningful Watershed Educational Experiences (MWEEs)

As part of DOEE's sub-grant program, several initiatives were funded for nonprofit partners to create Meaningful Watershed Educational Experiences (MWEEs) for hundreds of District youth. In FY 2014, AFF partnered with Living Classrooms of the National Capital Region and Nature Bridge, began a pilot project in which fifth-grade students spend three days and two nights in a natural setting learning about the environment. AFF continues to administer this program in partnership with NatureBridge and Living Classrooms. In FY 2018, 2,242 fifth-grade students who were enrolled in District Public Schools and Public Charter Schools participated in the overnight MWEE program (2,309 students participated during school year 2017-2018).

In addition to the overnight MWEE program, DOEE funds a trash-focused MWEE awarded a nonprofit partner, Live It Learn It, to offer day programming to students in Wards 7 and 8. This program reached 120 students in FY 2018.

Project Learning Tree (PLT)

Project Learning Tree (PLT) is an internationally recognized program that trains educators in innovative techniques for exploring a wide range of environmental concepts with students, and teaches critical thinking skills that lead to environmental stewardship (grades K-12). DOEE offers PLT training workshops free to those that request them. In FY 2018, DOEE staff conducted one educator workshop for twelve informal environmental educators.

RiverSmart Schools

Figure 10 - Covered Classroom Space at Janney Elementary

RiverSmart Schools works with applicant schools to install LID practices to control stormwater. These practices are specially designed to be functional as well as educational in order to fit with the school environment. Additionally, schools that participate in the RiverSmart Schools program receive teacher training on how to use the sites to teach to curriculum standards and how to properly maintain the sites.

In addition to providing LID retrofits for schools throughout the District, RiverSmart Schools provides training workshops in environmental education to teachers and informal educators with environmental curricula that support the District's teaching and learning standards. In FY 2018, 25 teachers participated in these training workshops.

In FY 2018, RiverSmart Schools accomplished the following:

- Provided 25 teachers with a four-day workshop on RiverSmart schools site usage and programming;
- Conducted 17 classroom visits and provided seven boat trips to support integration of watershed lessons for the RiverSmart Schools project at each participating school; and
- Engaged students, teachers, and volunteers in community work days to construct and maintain designed schoolyard conservation sites. Two hundred students from two schools participated in eight community work days.

DOEE also completed the design and construction of the following three RiverSmart Schools LID projects:

- The Janney Elementary project included the installation of a 2,000 square foot bioretention cell, two 265 gallon rainwater harvesting systems with a foot-powered pump that allows students to water the new pollinator garden, and an enhanced covered classroom space with new storage benches and seating;
- The IDEA School project had 3,900 square feet if impervious surface removed and replaced with three enhanced rain gardens with an outdoor classroom integrated into a coastal plain wet meadow conservation landscaped area;
- The Lee Montessori School project consisted of installing a 265 gallon cistern to capture water from three downspouts, two modified step pools, an outdoor classroom, and ample permeable paths.

Anacostia River Explorers

Anacostia River Explorers are boat tours that educate the public about the Anacostia River through one and two-hour motorized and canoe tours. Participants learn about the Anacostia River's human and natural history, the threats it faces, and what solutions are being undertaken to help the River realize its full potential as an invaluable asset for the District and its residents. There are two grantees undertaking this work for the District and in FY 2018 they held 343 tours that reached 5,257 District residents and participants.

Figure 11 - Anacostia River Explorers Boat Tour

Adopt-Your-District Program

Adopt-Your-District is a program that allows volunteers to adopt parks, blocks, or segments of streams throughout the District. This program is a collaboration effort between DOEE, District DPR, Parks Service, and Office of the Clean City.

In FY 2018, AFF launched a pilot Adopt-A-Stream program with funding from DOEE's Trash Free Communities grant. With training provided by the AFF and Rock Creek Conservancy, this program allows Adopt-A-Stream volunteers to adopt a segment of District stream, collect data on the types of trash found in the area, and organize cleanups to help protect the stream and beautify the area. A total of 16 volunteers were trained for the Adopt-A-Stream program in FY 2018. DOEE also assisted in identifying parks of interest and establishing correct government contacts

for at least 13 District residents and organizations interested in adopting a park through the Adopt-A-Park program.

Watershed Stewards Academy

The Watershed Stewards Academy is an eight-week certification course taught by DOEE and AWS staff for District residents who want to address local pollution problems in their local watersheds. The program is funded by a DOEE grant to AWS and is part of the National Capital Region Watershed Stewards Academy, which is a coalition of watershed protection groups in the Potomac, Rock Creek, Anacostia, and East Patuxent watersheds. Once they've completed the course, these residents are considered to be Master Watershed Stewards in their local watershed. These alumni serve as resource people and community leaders in the effort to clean up local waterways, to coordinate efforts to infiltrate and reduce stormwater runoff. In FY 2018, 30 District residents became Watershed Stewards.

Storm Drain Marking Program

In FY 2018, DOEE installed 250 storm drain markers throughout the District. DOEE has maintained its geolocated database of marked storm drains. WPD worked with five different volunteer groups to achieve this goal, including: the Green Zone Environmental Program (GZEP); a high school; a neighborhood association; and citizen volunteers.

Job Training Programs

Green Zone Environmental Programs (GZEP)

Every summer, Green Zone Environmental Programs (GZEP) partners with the Marion Barry Summer Youth Employment Program to provide youth and young adults, ages 14-24, with an opportunity to learn about energy and environmental issues, complete community-based environmental projects, and prepare for careers.

In the summer of 2018, WPD staff worked with over 275 D.C. youth to educate them about the importance of watershed stewardship. On five separate occasions, WPD staff worked with the GZEP participants to teach them about DOEE's watershed protection work happening throughout the District. Afterwards, WPD staff had the participants execute an activity where they performed a stormwater audit for the facility they were located at and then had the participants make recommendations for how the facility could better manage stormwater. WPD staff also worked with GZEP participants on education and outreach efforts throughout the summer via storm drain marking.

River Corps

In 2017, DOEE commenced a green infrastructure and job training program, the River Corps, run by the Latin American Youth Center. Each year two cohorts, comprised of ten youth each, will participate in a five-month long green infrastructure job training program. In this program, young people learn how to maintain LID sites, inspect RiverSmart Homes installations, perform trash cleanups, remove invasive plant species, and photo monitor upcoming and existing stream restoration projects. In FY 2018, the River Corps monitored the following streams: Bingham Run, Milkhouse Ford, Nash Run, Alger Park, and Pope Branch.

Table 4 - Tracking Programs That Aim to Prevent NPS Pollution through Informative and Educational Campaigns

OBJECTIVES	MILESTONES	2014	2015	2016	2017	2018	2020 Goal	% of 2020 Goal Achieved
Objective 4a: To reach 1,000 school students annually with hands-on environmental education activities (DOEE, DCPS)	Milestone 1: Reach 1,000 school students in the first year	Number of Students Participating in Hands-On Environmental Education						
		1,297	1.241	2,100	1,943	3,307	7,000	141%
Objective 4b: To support 2,100 school students annually through an overnight meaningful watershed education experience	Milestone 1: Reach 2,100 school students in the first year	Number of Students Participating in Overnight Meaningful Watershed Education Experiences						
		696	821	1,776	1,603	2,242	14,700	48.6%
Objective 4c: To install BMPs on three schoolyards per year	Milestone 1: Install BMPs at three schoolyards annually	Number of BMPs Installed						
		3	5	5	5	6	21	114%
		Square Feet Treated						
		183,607	127,278	28,371	25,348	26,222	N/A	N/A
		Volume Captured (cubic feet)						
		12,713	8,839	2,310	1,813	3,412	N/A	N/A
		Estimated Load Reductions						
							N/A	N/A
Objective 4d: To train 10 teachers annually through training that integrates hands-on watershed education with system-wide standards of learning	Milestone 1: Train 10 teachers annually	Number of Teachers Trained						
		107	27	44	40	25	70	347%
	Milestone 2: Have watershed education fully immersed in standards of learning so that sponsor trainings are no longer necessary by 2025	Incorporation of Watershed Education Into Curriculum						
		1 Learning Standards Complete	1 Learning Standards Complete	1 Learning Standards Complete	1 Learning Standards Complete	1 Learning Standards Complete	N/A	N/A

Goal Five: Implement Programs That Aim to Increase NPS Pollution Runoff Prevention Practices on Private Property

RiverSmart Rooftops

Historically, the District has offered a rebate for installation of a green roof on a new building or the retrofit of an existing roof. Programs offered through DOEE provided varying rebate amounts with varying constraints. In 2012, DOEE restructured this rebate program to offer a single application process with a set rebate of $5 per square foot regardless of the roof size. In early 2013, the rebate program continued to offer a single application process with a rebate of $5 per square foot. Participation in the program was less than predicted, so DOEE has increased the rebate amount to $7 per square foot.

DOEE awarded a new grant for administration of the RiverSmart Rooftops program in November 2017. The current program offers a $10 per-square-foot rebate for green roofs voluntarily installed in the combined sewer system service area and $15 per-square-foot for the MS4 service area.

In FY 2018, the District added 481,039 square feet of green roofing to its portfolio. This includes 5,864 square feet through the RiverSmart Rooftops program and an additional 475,175 square feet of green installed outside of the DOEE incentive programs. The RiverSmart Rooftops program installations amounts to 1 percent of the total green roofing installed in FY 2018.

RiverSmart Communities

In FY 2018, RiverSmart Communities continued our focus aimed solely at installing retrofits on nonprofit and religious institutional properties. Typical practices include permeable paving systems, bioretention, rain gardens, BayScaping, and tree planting. The program provided full funding for designs and construction costs to participants. In exchange the nonprofit partner will perform outreach and education to the audience they serve about relevant District environmental programs.

DOEE selected five religious institutions using our competitive grant review process in FY 2018: Dumbarton United Methodist, Foundry United Methodist, Grace Evangelical Lutheran, Shepherd Park Christian, and St. Gabriel's Catholic Church. These sites will have LID retrofits installed in FY 2019. Once completed, they will collectively treat 0.2 acres of stormwater runoff. Furthermore, our four selected application from our 2017 cohort completed their installations in FY 2018, Peace Lutheran Church, SB Works, St. Theresa of Avila Catholic Church, and Luther Place Memorial Church.

RiverSmart Homes

The District has recognized the importance of targeting homeowners for pollution reduction measures because residential property is among the largest single land uses in the city and, because of the relatively small lot sizes, is the least likely to be required to install storm water management practices. In 2008, DOEE developed RiverSmart Homes, an LID retrofit program aimed at District single-family homes. The program started with eight demonstration sites, one in

each of the District's wards. It then expanded to a pilot program in the Pope Branch watershed and has been open to all District residents since the summer of 2009.

Through this program, DOEE performs audits of homeowners' properties and provides feedback to the homeowners on what LID technologies can be safely installed on the property. DOEE also offers homeowners subsidized installations of any LID recommended at the audit, which can include rain barrels, shade trees, rain gardens, native landscaping to replace grass, and permeable pavement.

Accomplishments for the RiverSmart Homes program during FY 2018 include the following:

- Conducted 1,047 audits of District residential properties
- 456 rain barrel installations on residential homes
- 161 rain garden installations on residential homes
- 74 permeable pavers projects, treating 1.8 acres of runoff

Rain Barrel Installation and Rebate Program

The Rain Barrel Installation and Rebate program is a sub-program of RiverSmart Homes that allows District residents to have up to two rain barrels installed on their property for a small copayment with DOEE subsidizing the rest of the cost. Alternatively, homeowners are able to purchase and install their own rain barrel and receive a rebate of $2 for every gallon captured by the rain barrel of cistern, with a maximum rebate of $1,000. This grant is awarded to and administered by the Alliance for the Chesapeake Bay. In FY 2018, the Rain Barrel Installation and Rebate program installed 456 rain barrels on District properties and administered $10,792 to District residents in rain barrel rebates.

Figure 12 - DOEE Staff Demonstrate How to Properly Maintain RiverSmart Rain Barrels

The District notes that the number of rain barrel installations was below its goal of 600, as noted in Table 3 below. This was primarily due to the inability to install rain barrels during severe weather events, which the District frequently experienced in FY 2018, as well as trouble with retaining rain barrel installers for the program. The RiverSmart homes team anticipates reaching

this goal in FY 2019 by increasing payments to installers per barrel, therefore improving contractor retention.

Landscaping Installation and Rebate Program

The Landscaping Installation and Rebate Program is a sub-program of RiverSmart Homes that allows District residents to have up to two conservation landscaping projects installed on their property for a small copayment with DOEE subsidizing the rest of the cost. These practices consist of rain gardens and BayScaping. Rain gardens are areas landscaped with native plants that are connected to a downspout in order to collect and absorb stormwater from a rooftop. BayScaping is native plant gardening with the goal of replacing sloped areas (or areas causing high stormwater runoff) with plants native to the Chesapeake Bay. Alternatively, homeowners are welcome to install their own rain gardens and apply for a rebate of $3 for every square foot of treatment area, with a maximum rebate of $2,200. There is no rebate available for BayScaping.

In FY 2018, the Landscaping Installation and Rebate Program installed 161 rain gardens, 357 BayScape gardens, and administered $10,528 to District residents in rain garden rebates.

Permeable Surface Rebate Program

The RiverSmart Permeable Surface Rebate Program is a sub-program of RiverSmart Homes that allows District residents to receive a rebate of $5 for every square foot of an existing impervious area removed and replaced with vegetation. We also offer a rebate of $10 per square foot of an existing impervious area removed and replaced with permeable paver systems.

Figure 13 - Permeable Paver Patio Installed Through the RiverSmart Homes Permeable Surface Rebate Program

In FY 2018, RiverSmart Permeable Surface Rebate Program rebated a total of 74 projects (which will collectively treat about 1.8 acres), and administered $332,512 to District residents in permeable surface rebates. In addition to the rebate amount, District residents contributed $589,000 out of pocket. This program experienced a 20 percent growth in participation from FY 2017 to FY 2018 and we anticipate this growth to continue into FY 2019.

Tree Planting

The District has been called "The City of Trees." It has a tree canopy cover of 38 percent, which is high for a dense urban environment, but lower than what the canopy cover has been historically, even when the city had a higher population density. In an effort to improve air and water quality, reduce the urban heat island effect, and offset greenhouse gas emissions, the District has adopted a 40-percent tree canopy goal. Mayor Bowser has adopted a Sustainability Plan that calls for achieving the canopy goal by 2032. To achieve that goal the District will need to plant an average of 10,800 trees annually.

In FY 2018, the annual planting goal was exceeded, with 12,895 trees planted across the District collectively by multiple stakeholders. Urban Forestry Division, the agency that maintains the District's street trees, planted 8,800 trees. DOEE funded 2,832 trees on private, federal, and other District lands including the following:

- 867 trees on private land as part of the RiverSmart Homes and Tree Rebate Program
- 949 trees on District school yards and parklands
- 1,016 trees across District, Federal and private lands through the first year of a new large parcel tree planting program

An additional 1,262 trees were planted District-wide through assorted other efforts, including Trees for Georgetown; PEPCO's Right Tree, Right Place; and the National Cherry Blossom Festival, as well as individual efforts of National Parks Service, GSA and other partners and facilities.

Table 5 - Tracking Programs that Aim to Increase NPS Pollution Runoff Prevention Practices on Private Property

OBJECTIVES	MILESTONES	2014	2015	2016	2017	2018	2020 Goal	% of 2020 Goal Achieved
Objective 5a: To audit 1,000 residential properties per year	Milestone 1: 1,000 audits annually	Number of Residential Homes Audited						
		1,117	1,071	1,032	939	1,047	7,000	74.4%
Objective 5b: To audit 150 multi-family and commercial properties	Milestone 1: 30 audits annually	Number of Multi-family and Commercial Properties Audited						
		31	34	30	10	20	150	83.3%
Objective 5c: To plant 750 trees per year on private property	Milestone 1: 750 trees planted annually	Number of Trees Planted on Residential Properties						
		972	943	962	974	867	5,250	89.9%
		Estimated Canopy Expansion/Acreage of Canopy						
		9.72	9.43	9.62	9.74	8.67	N/A	N/A
Objective 5d: To plant 8,600 trees per year in public space	Milestone 1: 8,600 trees planted annually	Number of Trees Planted in Public Space						
		9,560	14,700	9,893	8,204	12,028	51,600	105.4%
		Estimated Canopy Expansion/Acreage of Canopy						
		95.6	147.0	98.93	82.04	120.28	N/A	N/A
Objective 5e: To install 900 rain barrels per year on residential properties	Milestone 1: 900 rain barrels installed annually	Number of Rain Barrels Installed						
		475	595	354	360	456	6,300	33%
		Estimated Volume of Rainwater Captured (gallons)						
		1,934,695	2,423,435	1,442,842	1,466,280	1,205,608	N/A	N/A
Objective 5f: To install 100 rain gardens per year on residential properties	Milestone 1: Install 100 rain gardens annually (DOEE, Nonprofits)	Number of Rain Gardens Installed						
		138	133	76	118	161	700	89.4%
		Area Treated (square feet)						
		61,392	59,850	29,700	82,470	86,940	N/A	N/A
		Volume Captured (gallons)						
		760,033	740,943	367,686	1,020,979	1,076,317	N/A	N/A

Table 6 - Annual Runoff Volume and Load Reductions for the FY 2018 BMP Inventory for the District of Columbia

Watershed	Area Treated (acres)	Number of Practices	TN (lbs)	TP (lbs)	TSS (lbs)	Fecal Coliform (billion MPN)	BOD (lbs)	Oil and Grease (lbs)	Arsenic (lbs)	Copper (lbs)	Lead (lbs)	Mercury (lbs)	Zinc (lbs)	Chlordane (lbs)	DDD (lbs)	DDE (lbs)	DDT (lbs)	Dieldrin (lbs)	Heptachlor Epoxide (lbs)	PAH1 (lbs)	PAH2 (lbs)	PAH3 (lbs)	TPCB (lbs)	E. *coli* (Billion MPN)
Anacostia	90.73034022	2869	1157.032979	135.236629	27755.5384	22471.4598	11233.1033	1261.21114	5.36E-01	1.88E+01	5.90E+00	6.62E-02	4.38E+01	3.14E-03	1.07E-03	4.86E-03	1.23E-02	8.79E-05	2.90E-04	2.01E-01	1.37E+00	1.01E+00	2.82E-02	9.02E+03
Broad Branch	0.688158861	178	16.9139763	1.94311435	310.993687	317.877301	114.329513	20.0450985	7.77E-03	2.69E-01	8.24E-02	9.59E-04	5.21E-01	4.81E-05	1.53E-05	6.84E-05	1.75E-04	1.40E-06	4.62E-06	3.18E-03	2.06E-02	1.40E-02	4.08E-04	1.28E+02
Dumbarton Oaks	--	16	0.70319364	0.08048602	12.6024161	13.1377252	5.01343174	0.87899204	3.26E-04	1.12E-02	3.38E-03	4.02E-05	2.15E-02	2.08E-06	6.35E-07	2.82E-06	7.24E-06	6.14E-08	2.03E-07	1.39E-04	8.81E-04	5.68E-04	1.71E-05	5.27E+00
Fenwick Branch	0.052823691	51	2.56	0.30	49.07	48.53	15.63	2.74	1.15E-03	4.05E-02	1.28E-02	1.42E-04	7.96E-02	6.77E-06	2.30E-06	1.05E-05	2.67E-05	1.91E-07	6.32E-07	4.36E-04	2.95E-03	2.19E-03	6.08E-05	1.95E+01
Fort Chaplin	--	49	1.98	0.23	43.65	36.92	21.39	2.17	9.17E-04	3.15E-02	9.49E-03	1.13E-04	7.20E-02	5.85E-06	1.79E-06	7.92E-06	2.04E-05	1.73E-07	5.70E-07	3.92E-04	2.48E-03	1.60E-03	4.80E-05	1.48E+01
Fort Davis	0.285996327	21	6.49	0.74	143.28	121.19	70.20	7.13	3.01E-03	1.03E-01	3.11E-02	3.71E-04	2.36E-01	1.92E-05	5.86E-06	2.60E-05	6.68E-05	5.67E-07	1.87E-06	1.29E-03	8.13E-03	5.24E-03	1.57E-04	4.86E+01
Fort Dupont	--	74	3.25	0.37	71.83	60.76	35.20	3.58	1.51E-03	5.18E-02	1.56E-02	1.86E-04	1.18E-01	9.63E-06	2.94E-06	1.30E-05	3.35E-05	2.84E-07	9.37E-07	6.45E-04	4.07E-03	2.63E-03	7.90E-05	2.44E+01
Fort Stanton	0.82573416	34	13.81	1.58	304.98	257.97	149.43	15.18	6.40E-03	2.20E-01	6.63E-02	7.90E-04	5.03E-01	4.09E-05	1.25E-05	5.53E-05	1.42E-04	1.21E-06	3.98E-06	2.74E-03	1.73E-02	1.12E-02	3.35E-04	1.04E+02
Hickey Run	24.13120914	286	156.68	18.29	3845.62	3106.55	1638.88	168.04	7.42E-02	2.60E+00	8.17E-01	9.15E-03	6.06E+00	4.32E-04	1.47E-04	6.73E-04	1.71E-03	1.21E-05	3.99E-05	2.77E-02	1.89E-01	1.39E-01	3.90E-03	1.25E+03
Klingle Valley	--	23	1.01	0.12	18.12	18.89	7.21	1.26	4.69E-04	1.61E-02	4.85E-03	5.78E-05	3.10E-02	2.99E-06	9.13E-07	4.05E-06	1.04E-05	8.83E-08	2.91E-07	2.00E-04	1.27E-03	8.17E-04	2.45E-05	7.58E+00
Luzon Branch	2.143801653	127	33.84	3.90	649.32	646.78	232.16	37.95	1.54E-02	5.41E-01	1.69E-01	1.91E-03	1.06E+00	9.19E-05	3.08E-05	1.40E-04	3.55E-04	2.61E-06	8.62E-06	5.95E-03	3.99E-02	2.90E-02	8.13E-04	2.60E+02
Melvin Hazen	--	22	0.85	0.1	15.21	6.05	1.06		3.94E-04	1.35E-02	4.08E-03	4.86E-05	2.60E-02	2.51E-06	7.67E-07	3.40E-06	8.74E-06	7.41E-08	2.45E-07	1.68E-04	1.06E-03	6.86E-04	2.06E-05	6.36E+00
Nash Run	0.344467401	78	7.41	0.85	163.67	138.44	80.19	8.15	3.44E-03	1.18E-01	3.56E-02	4.24E-04	2.70E-01	2.19E-05	6.70E-06	2.97E-05	7.63E-05	6.47E-07	2.14E-06	1.47E-03	9.28E-03	5.99E-03	1.80E-04	5.56E+01
Normanstone	0.17805326	22	3.93	0.45	70.51	73.50	28.05	4.92	1.82E-03	6.27E-02	1.89E-02	2.25E-04	1.21E-01	1.16E-05	3.56E-06	1.58E-05	4.05E-05	3.44E-07	1.13E-06	7.80E-04	4.93E-03	3.18E-03	9.55E-05	2.95E+01
Oxon Run	13.18394835	453	116.58	13.79	1607.84	2197.02	830.20	135.39	5.17E-02	1.82E+00	5.83E-01	6.37E-03	3.57E+00	3.00E-04	1.04E-04	4.76E-04	1.20E-03	8.55E-06	2.82E-05	1.95E-02	1.31E-01	1.01E-01	2.72E-03	8.82E+02
Pinehurst	0.497107438	75	10.06	1.17	199.79	192.54	56.12	9.84	4.48E-03	1.59E-01	5.13E-02	5.52E-04	3.16E-01	2.50E-05	9.06E-06	4.18E-05	1.06E-04	6.88E-07	2.27E-06	1.57E-03	1.11E-02	8.85E-03	2.37E-04	7.73E+01
Piney Branch	2.394406107	426	52.23	6.00	691.71	983.60	414.49	49.73	2.40E-02	8.30E-01	2.56E-01	2.95E-03	1.60E+00	1.47E-04	4.72E-05	2.12E-04	5.41E-04	4.27E-06	1.41E-05	9.71E-03	6.32E-02	4.33E-02	1.26E-03	3.95E+02
Pope Branch	0.022497704	44	2.38	0.27	52.57	44.46	25.76	2.62	1.10E-03	3.79E-02	1.14E-02	1.36E-04	8.67E-02	7.05E-06	2.15E-06	9.53E-06	2.45E-05	2.08E-07	6.86E-07	4.72E-04	2.98E-03	1.92E-03	5.78E-05	1.78E+01
Portal Branch	0.111685032	18	1.61	0.18	28.93	30.16	11.51	2.02	7.49E-04	2.57E-02	7.75E-03	9.24E-05	4.95E-02	4.78E-06	1.46E-06	6.47E-06	1.66E-05	1.41E-07	4.65E-07	3.20E-04	2.02E-03	1.30E-03	3.92E-05	1.21E+01
Rock Creek	12.73130119	1458	272.53	31.31	4150.83	5132.66	2057.91	283.69	1.25E-01	4.34E+00	1.33E+00	1.54E-02	8.38E+00	7.72E-04	2.46E-04	1.10E-03	2.83E-03	2.24E-05	7.39E-05	5.10E-02	3.31E-01	2.26E-01	6.57E-03	2.06E+03
Soapstone	0.698278237	59	10.64	1.22	192.66	199.32	74.38	13.04	4.92E-03	1.69E-01	5.14E-02	6.07E-04	3.27E-01	3.11E-05	9.62E-06	4.28E-05	1.10E-04	9.11E-07	3.01E-06	2.07E-03	1.32E-02	8.67E-03	2.58E-04	8.00E+01
Texas Avenue Tributary	--	25	0.95	0.11	21.01	17.77	10.29	1.05	4.41E-04	1.51E-02	4.57E-03	5.44E-05	3.46E-02	2.82E-06	8.59E-07	3.81E-06	9.80E-06	8.31E-08	2.74E-07	1.89E-04	1.19E-03	7.68E-04	2.31E-05	7.13E+00
Watts Branch	1.655463728	247	28.67	3.37	758.46	573.46	187.54	19.05	1.28E-02	4.62E-01	1.56E-01	1.58E-03	1.12E+00	6.21E-05	2.64E-05	1.26E-04	3.11E-04	1.51E-06	5.00E-06	3.53E-03	2.93E-02	2.72E-02	6.80E-04	2.30E+02

Summary

The District's NPS Management Program meets the challenges of the highly urbanized setting within the District by seeking and employing innovative solutions for reducing NPS pollution. With the help of creative partnerships and cutting-edge technologies, the District will continue to make significant progress toward achieving its goals. In FY 2019 the District will work to strengthen its existing programs for regulation and enforcement, stream and wetland restoration, education and outreach, and pollution prevention. The NPS Management Program will continue to provide technical assistance and resources that will improve the quality of the District's waterways.