NONPOINT SOURCE SUCCESS STORY

District of Columbia

Stream Restoration and Trash Removal Efforts Improve Nash Run

Waterbody Improved

Nash Run, a first-order tributary of the Anacostia River, is impaired by stormwater runoff from a highly impervious watershed. Stormwater runoff has led to severe bed and bank erosion, contributing to diminished water quality and degradation of instream habitat conditions. Nash Run was added to the 1996 Clean Water Act (CWA) section 303(d) list of impaired waters for multiple pollutants. The Washington, D.C. (District) Department of Energy and Environment (DOEE) used a legacy-sediment-removal stream design technique to reduce bank erosion by creating a low and wide floodplain bench along the stream corridor. As a result, Nash Run water quality has improved and is closer to attaining water quality standards.

Problem

The headwaters of Nash Run are in Prince George's County, Maryland, but 75 percent of the watershed is within the borders of the District. The stream remains piped from Prince George's County until it discharges through an outfall west of Kenilworth Avenue in northeast Washington, D.C. Once released from the pipe, Nash Run flows through Kenilworth Marsh before discharging into the Anacostia River.

The Nash Run sewer shed encompasses a 229-acre area in the District, 112 acres (49 percent) of which is impervious. The heavily urbanized character of the watershed produces conditions for flashy and intense stream channel flows even during moderate storms. Large amounts of trash and debris wash out of the storm sewer system during rain events, choking portions of the stream and creating ponded areas that support breeding mosquito populations. The hydrologic alterations to the stream degraded the water quality of Nash Run and its natural habitat downstream of the outfall. DOEE estimated that 33 tons of sediment per year were eroding from the stream banks of Nash Run and washing downstream into the Anacostia River. A 2008 study on trash estimated that Nash Run produces approximately 3 percent of the total trash from the District that washes into the Anacostia River.

Nash Run was first added to the CWA section 303(d) list of impaired waters in 1996. The stream remained listed as impaired as of 2016 for turbidity, flow alternations, organic enrichment/oxygen depletion, pathogens and other reasons.

Story Highlights

The Nash Run Stream Restoration Project restored 1,400 feet of urban stream, turning a degraded stream into both a community and environmental asset. DOEE excavated over 9,000 cubic yards of soil along the stream corridor and created a floodplain bench that is 55 feet wide along the stream (Figures 1 and 2). The floodplain bench is one acre in size on both sides of the stream and is planted with over 1,000 native grasses and herbaceous plants. It serves as a grassy wetland complex adjacent to the stream and allows the stream to spread out in storm events, thus dissipating energy and reducing the stream's erosive forces. Designs for the project began in 2011 and were completed in 2015.

The project also included the installation of a floatable trash trap, and two new culvert pipes underneath a parking lot to help reduce the stream's 100-year floodplain footprint, thus reducing the risk of flooding affecting surrounding homes. In total, over 1,000 herbaceous plants, 50 shrubs, and 99 trees were planted along the restored stream corridor during restoration work in 2016.

The restoration project was a community-based effort. More than 20 private property owners signed temporary easements allowing DOEE to conduct stream restoration work on their property. Through community meetings, door-knocking, and being a constant presence in the neighborhood DOEE built up a level of trust with residents that fostered their continued support for the project.

Figure 1. Nash Run mid-stream in 2010 (before restoration).

Figure 2. Nash Run mid-stream in 2018 (after restoration).

Results

Initial post-restoration data (2017) shows that the stream restoration work and trash trap installation is a success. In 2017 the trash trap collected over 3,600 pounds of predominantly floatable trash. The increased floodplain connectivity throughout the project area reduced stream bank erosion and created a 1.08-acre grassy floodplain wetland next to the stream.

Table 1. Fish count survey data in Nash Run before (2014–2015) and after (2016–2018) restoration.

Species	2014	2015	2016	2017	2018
American eel	12	40	-	2	-
Banded killifish	279	386	527	151	34
Blacknose dace	-	1	-	-	124
Creek chubsucker	1	2	-	-	12
E. mosquitofish	134	90	2,234	930	62
Green sunfish	48	29	-	3	-
Largemouth bass	-	-	1	-	1,029
Mummichog	158	341	59	280	41
N. creek chub	-	2	-	-	12
N. snakehead	1	-	-	-	366
Spottail shiner	-	-	-	-	36
Sunfish (other)*	7	-	-	-	17
White sucker	-	11	-	-	-
Total fish counts	**640**	**902**	**2,821**	**1,366**	**1,733**

**Sunfish (other) includes pumpkinseed, redbreast, bluegill and hybrid species*

Thanks to the project's success and the dedication of DOEE and the local community, the Nash Run Stream Restoration and Trash Trap Project was recognized as a winner in the Chesapeake Stormwater Network's 2017 BUBBA [Best Urban BMP in the Bay Award] contest.

Since the completion of the restoration project, the fish quantities and diversity have continued to increase (Table 1). Although monitoring conducted immediately post-restoration identified 2,821 individual fish, these were limited to only four species of fish—the vast majority of which were eastern mosquito fish. In the summer of 2018, there were 10 species of fish found with a good distribution of fish per species. Overall, the aquatic community index of biological integrity for fish is now in the 'fair' range and is showing steady improvements each year since restoration.

Partners and Funding

The partners involved in this project include the National Fish and Wildlife Foundation (NFWF); Johnson, Mirimam, and Thompson (the designer); Environmental Quality Resources (the construction contractor); the Environmental Protection Agency (EPA) CWA Section 319 Program; the EPA Chesapeake Bay Program; the Clean Water State Revolving Fund; and DOEE. The total project cost (including design, construction and monitoring) was over $3.5 million. Funding included $400,000 from a NFWF grant, $1.025 million from the District's Bag Law, $1.1 million from both the federal and local Clean Water State Revolving Fund, $357,773 from the Chesapeake Bay Program, and $337,221 from EPA's CWA Section 319 Program.

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