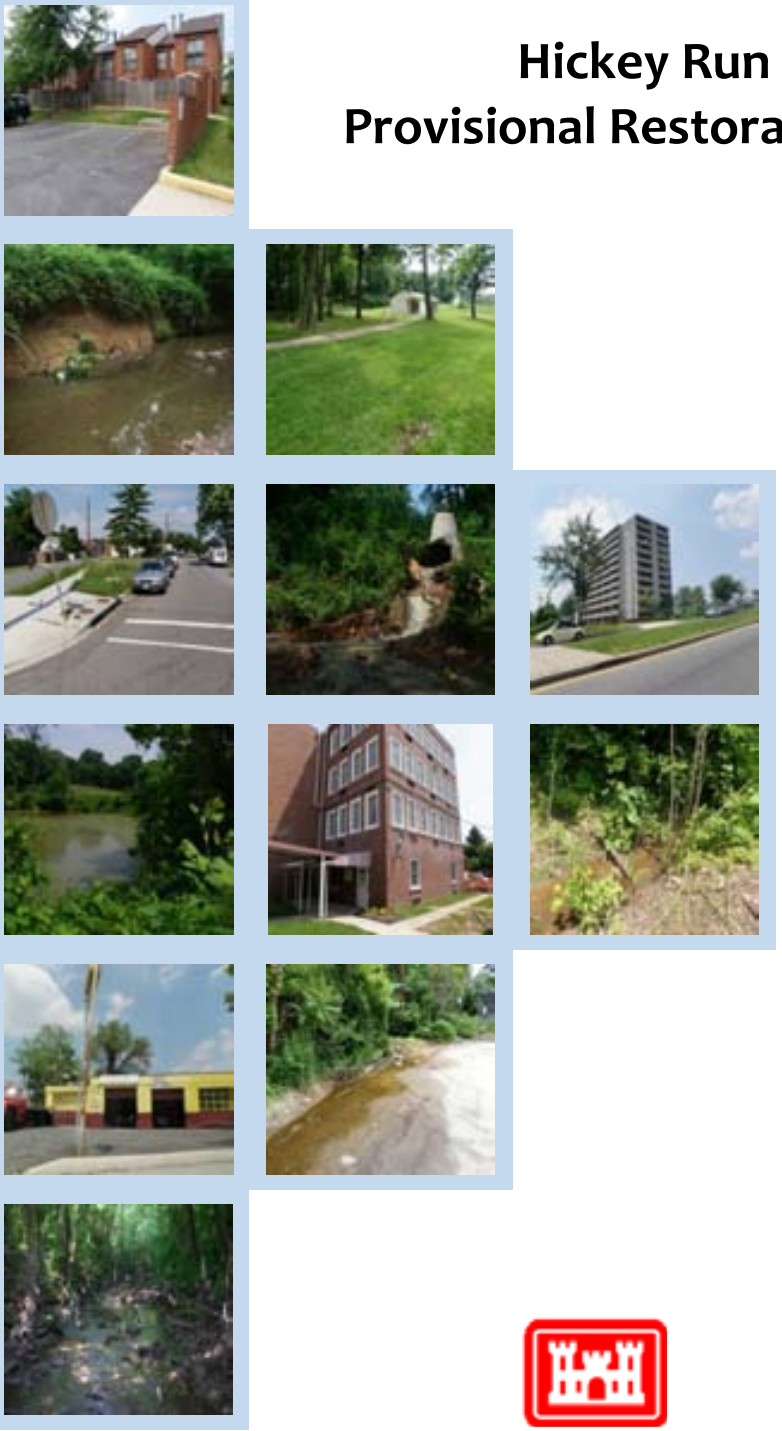
Anacostia River Watershed Restoration Plan



Hickey Run Subwatershed
Provisional Restoration Project Inventory

July 2009

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I. Background

The headwaters of Hickey Run, a free-flowing tributary of the Anacostia River, begin in the Langdon area in northeast Washington, D.C. This portion of the stream and its tributaries are currently enclosed in underground pipes and culverts. The stream crosses lands primarily owned by both the U.S. Department of Agriculture's National Arboretum and the National Park Service. Hickey Run joins the tidal Anacostia River upstream of Kingman Lake and approximately one mile downstream of the DC-Maryland border.

The daylight portion of the stream is located south of New York Avenue, in the National Arboretum, and the stream continues southeast about one mile to its confluence with the Anacostia River. The watershed area of Hickey Run is about 2.1 square miles (1,330 acres).

Hickey Run is in a highly urbanized area, and government agencies rate its water quality as poor. The watershed has a large amount of impervious surfaces, which along with the piped tributaries, has led to the stream's excessive urban stormwater runoff pollution. This pollution includes oil, grease, and bacteria, which comes from the watershed's large number of impervious surfaces and the piped tributaries. The D.C. Department of the Environment conducts ongoing monitoring of Hickey Run, provides public education activities for the stream, and has plans for stream improvement projects. Other agencies assisting in these Hickey Run improvements include the National Arboretum and the U.S. Fish and Wildlife Service.

Recognizing both the severity and extent of environmental and ecological problems affecting the Anacostia River watershed and the need to better coordinate restoration efforts and resources, the three jurisdictions and the Metropolitan Washington Council of Governments entered into a Federal cost-sharing agreement with the U.S. Army Corps of Engineers to prepare a 10-year watershed restoration plan. The Anacostia River Watershed Restoration Plan will identify opportunities and approaches for restoring and protecting the 14 major subwatersheds and the tidal river reach within the Anacostia River basin.

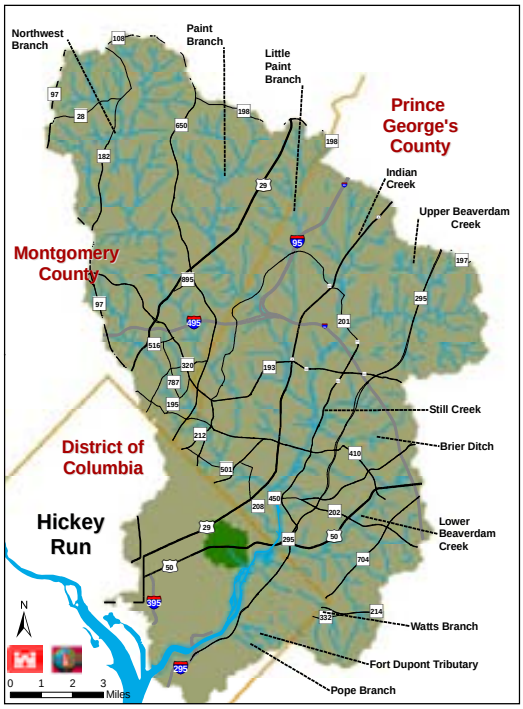

Figure 1- Hickey Run Subwatershed

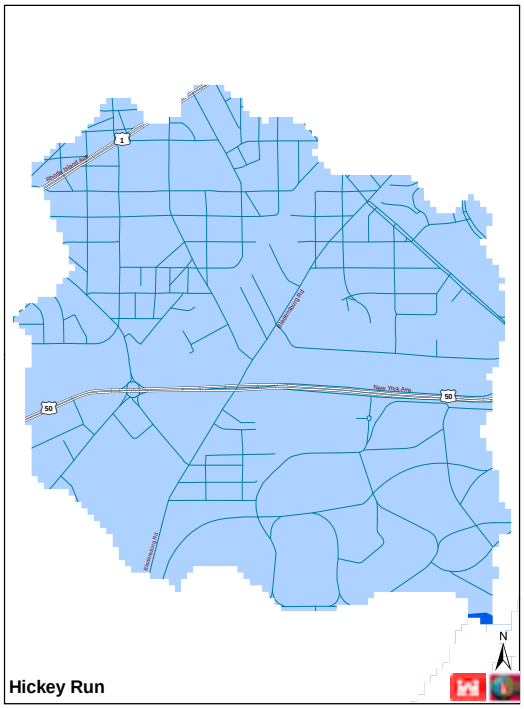

Figure 2- Hickey Run Subwatershed Unit

II. Restoration Inventory

The following sections include stormwater retrofit, stream restoration, wetland restoration, riparian restoration, and trash reduction, and actions for further evaluation by others. As previously noted, the restoration projects presented herein are conceptual or planning level only. It is recognized that more detailed drainage and site analyses are required, and that facility size and costs shown represent approximations.

To facilitate reader understanding of the Hickey Run Subwatershed: Provisional Restoration Project Inventory, information has been organized into the following four sections:

- Section A - Impervious Features Summary
- Section B - Existing Stormwater Management Facilities Summary
- Section C - Candidate Restoration Project Summary
- Section D - Hickey Run Candidate Restoration Projects

A. Impervious Features Summary

Figure 3 - Summary: Hickey Run Impervious Features

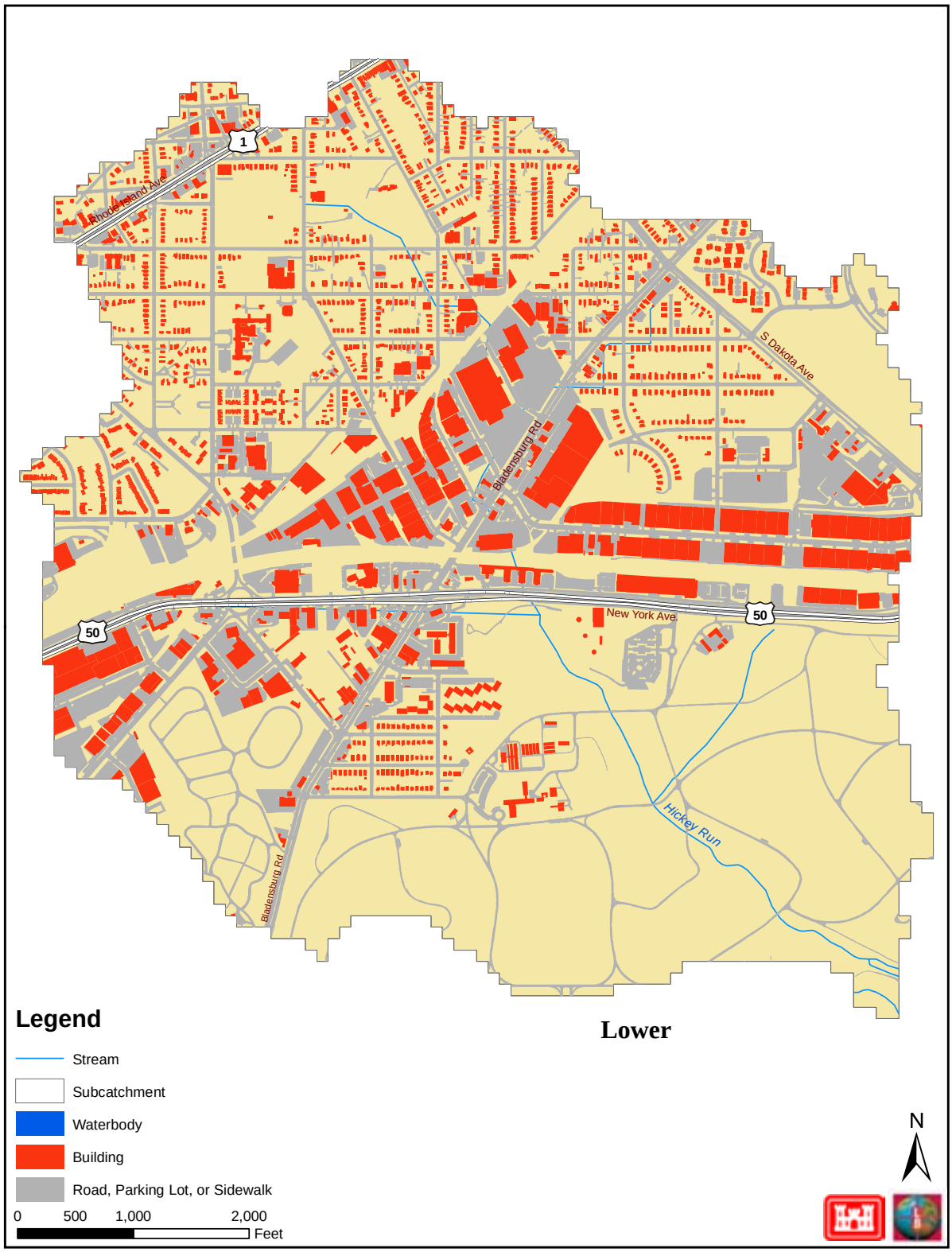

Table 1. Hickey Run: Summary - Impervious Surfaces

Category	Acres	Miles
1. Roads	**142.1**	21.2
a. State/Fed	36.3	3.9
b. Local	105.8	17.3
2. Parking Lots	**137.8**	
a. Public/Institutional	10.8	
b. Private	127.0	
3.Roofs	**143.5**	
a. Public/Institutional	4.7	
b .Private	106.9	
c. Single Family	31.9	
3. Other		
a. Sidewalks *	8.4	
b. Single Family Driveways ^	15.7	
Total	**447.5**	
Avg. % Imperviousness	41%	
# of Single Family Homes	1,122	
Total Drainage area	**1,102**	
^ Driveways assumptions	Average Driveway=0.014 Acres	
*** Sidewalks assumptions**	Width equal to 4 feet with a sidewalk running the length of one side of the road.	
Note: Drainage area and tributary area calculated using the USGS 30-meter digital elevation model (DEM)		

B. Existing Stormwater Management Facilities Summary

Figure 4 - Summary: Hickey Run Existing Stormwater Management BMP Sites

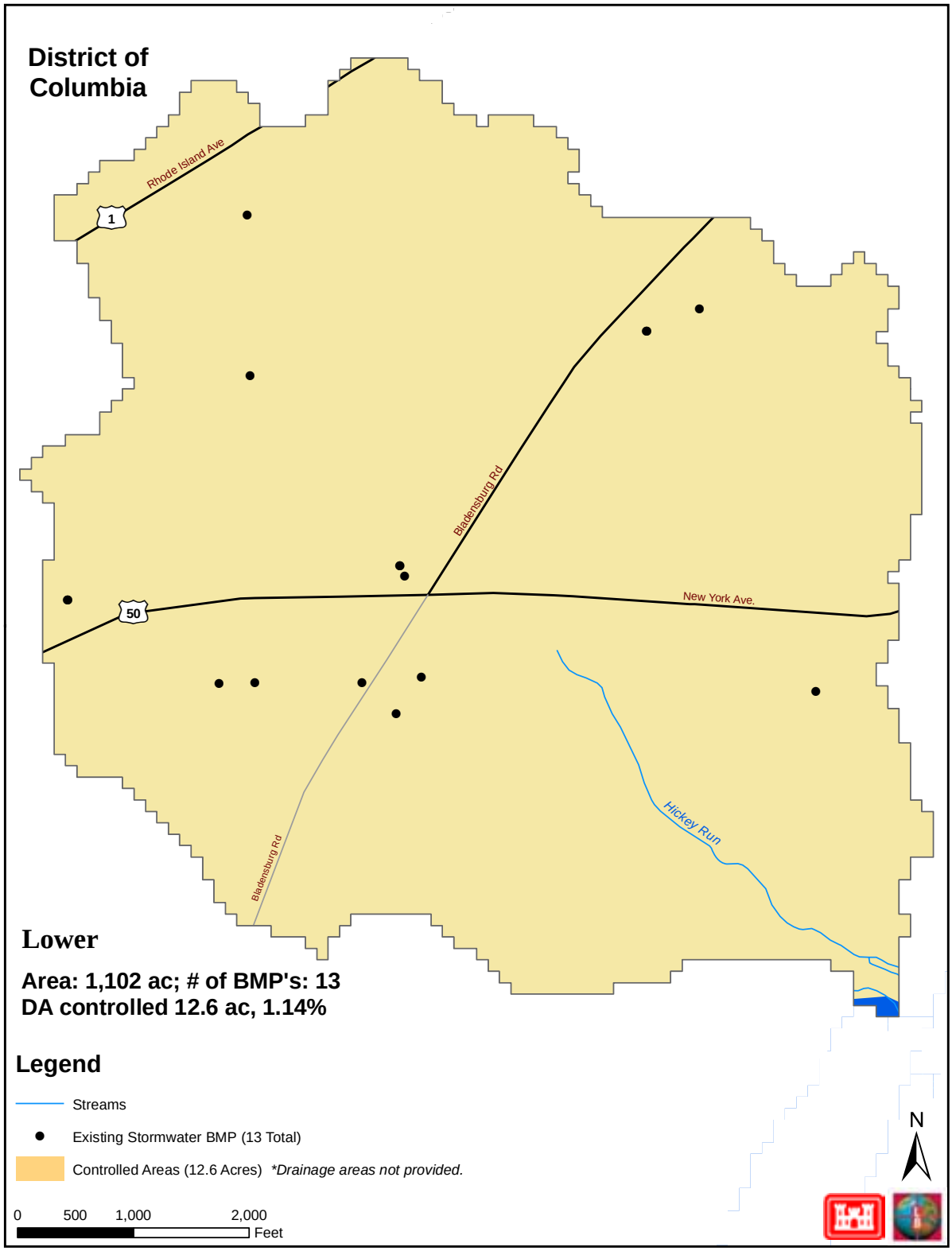

Table 2. Hickey Run: Summary – Hickey Run Existing Stormwater Management BMPs

	Type	No. of Facilities	Percent of Total BMP's	D.A. Controlled (ac.)
1.	**Dry Pond**			
2.	**ED Dry Pond**			
3.	**Wet Pond**			
4.	**ED Wet Pond**			
5.	**Wetland (non-ED and ED)**			
6.	**Infiltration (Trench or Basin)**			
7.	**Oil/Grit Separator**	3	23.1	4.1
8.	**Water Quality Inlet (e.g. Stormceptor, Bay Saver, etc)**	1	7.7	0.4
9.	**Bioretention /Rain Garden**			
10.	**'Green Street'***			
11.	**Bioswale**			
12.	**Grass Swale w/ Check Dams**			
13.	**Porous Pavement**			
14.	**Sand Filter**	8	61.5	7.8
15.	**Underground Pipe Storage**			
16.	**Cistern**			
17.	**Green Roof**			
18.	**Other**	1	7.7	0.2
	Total	**13**	100.0	**12.6**

*** May include a mix of LID techniques including, but not limited to: bioretention, rain garden, bioswale, soil amendment, etc.**

C. Candidate Restoration Project Summary

Table 3. Summary: Restoration Candidate Projects

	Candidate Project Type	Number of Projects	Estimated Cost ($)	Impervious Acreage Controlled (ac)	Length (feet)	Acreage (ac)
1	Stormwater Retrofit	47	7,357,000	187.1	-	204.2
2	Stream Restoration	1	414,000	-	1,380	-
3	Wetland Creation/Restoration	1	10,000	-	-	0.2
4	Fish Blockage Removal/Modification	-	-	-	-	-
5	Riparian Reforestation, Meadow Creation, Street Tree and Invasive Management	1	5,000			1.0
6	Trash Reduction	2	400	-	5,100	-
7	Toxic Remediation	-	-	-	-	-
8	Land Acquisition	6	1,933,000			19.3
	Total	**58**	**9,719,400**	**187.1**	**6480**	**225**

Table 4. Hickey Run Subwatershed: Provisional Restoration Project Inventory 'Unit Costs'*

No.	Practice	Approx. Unit Cost ($)
Stormwater Retrofit		
1	Existing Stormwater Management Pond/Wetland Retrofitting	~ $1,000-3,000/acre of drainage
2	New Stormwater Management Pond/Wetland Construction	~$3,000-5,000/acre of drainage
3	LID-Bioretention (w/Underdrain System)	~ $100,000/ impervious acre
4	LID-Curbside/Street Planter	~ $100,000/ impervious acre
5	LID-Tree Box Filter	~ $54,450 - $65,340/impervious acre
6	LID-Green Roof	~ $42/square foot
7	LID-Single Family Home Rain Garden	~ $5,000 per individual garden
8	LID-Single Family Home Rain Barrel	~ $200/barrel (Typically, two per house)
9	Sand Filter	~ $20,000 to $25,000 per impervious acre**
10	Underground Pipe Storage	~ $15,000 per impervious acre***
11	Permeable Pavement	~ $4.00 per square foot
12	LID Bioswale	~ $100,000/impervious acre
13	Storm Filter	~ $80,000/acre
Stream Restoration/Fish Passage/Wetland Creation		
14	Stream Restoration	~ $300/LF
15	Concrete Stream Channel Removal	~ $1,000/LF
16	Stream 'Day Lighting'	~ $2,000/LF
17	Regenerative Stormwater Conveyance System	~ $370/ft
18	Fish Passage/Riffle Grade Control Structure	~ $150,000 per one foot barrier height
19	Wetland Creation	~50,000/Acre
Riparian Reforestation/Meadow Creation/ Invasive Plant Management		
20	Riparian Reforestation	~ $9,000/acre
21	Wildflower Meadow Creation	~ $5,000/acre
22	Invasive Plant Management	~ $5,000/acre
Trash Reduction/Water Quality		
23	Manual Trash Pickup	~ $300/100 LF
24	Fresh Creek Trash Netting System	~ $1,000/acre of drainage
25	Signage	~ $1600
26	End–of-Pipe Trash Catching System	~ $4,000/ acre of drainage
27	Street Sweeping****	~ $50/curb mile/year
28	Storm Drain Trash Grate	~ $500/inlet
Land Acquisition		
29	Land Acquisition	~ $100,000/acre

*includes (where appropriate) design and construction/installation costs

** escalated to 2009 dollars from "*Schueler, T.R. 1994. Developments in Sand Filter Technology to Improve Stormwater Runoff Quality, Watershed Protection Techniques 1(2):47-54"*

*** *USEPA 20001 Storm Water Technology Fact Sheet On-Site Underground Retention/Detention EPA 832-F-01-005*

**** EPA-certified as water quality BMP

D. Hickey Run Candidate Restoration Projects

Figure 5 – Hickey Run Candidate Stormwater Retrofit Sites

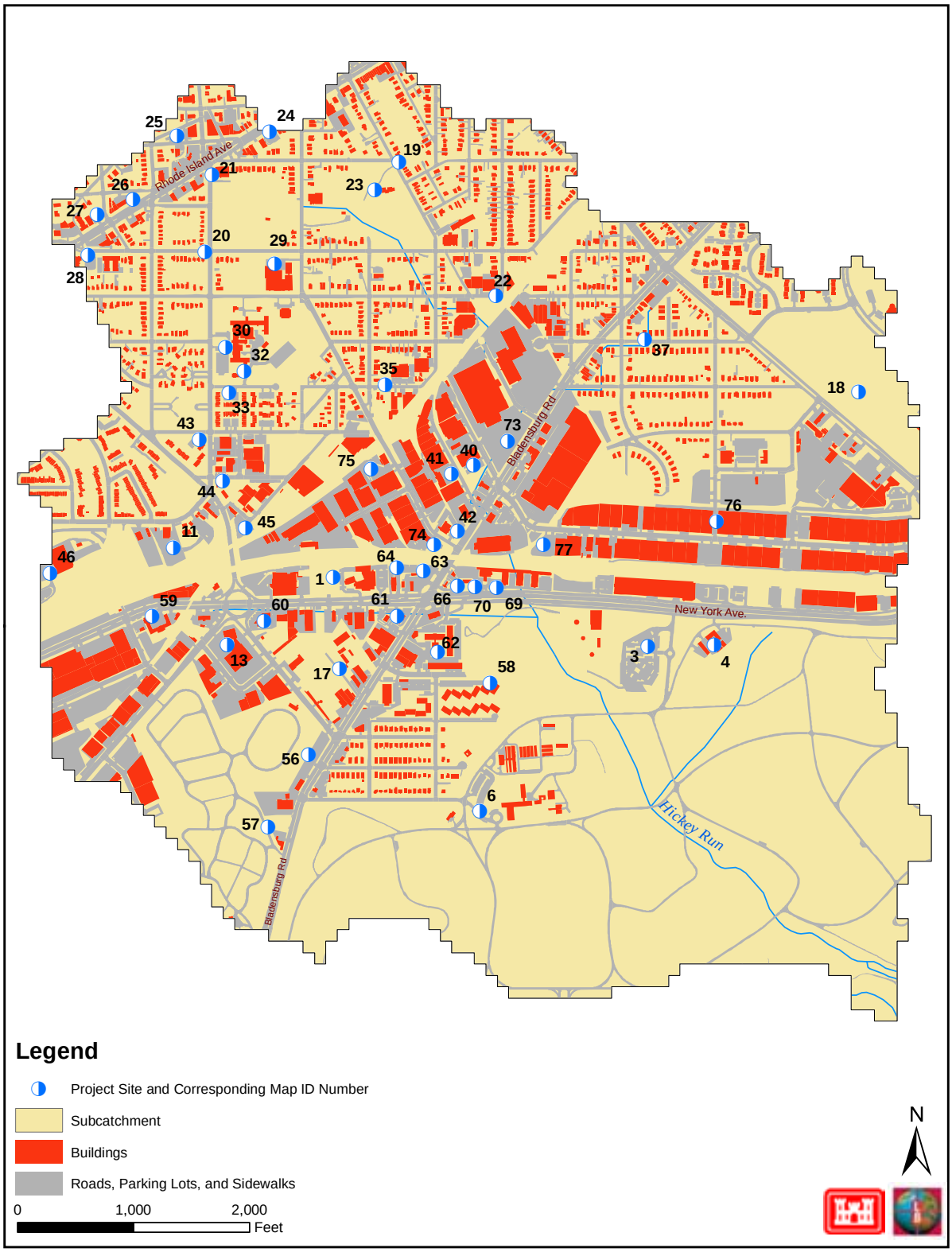

Figure 6 – Hickey Run Candidate Stormwater Retrofit Drainage Areas

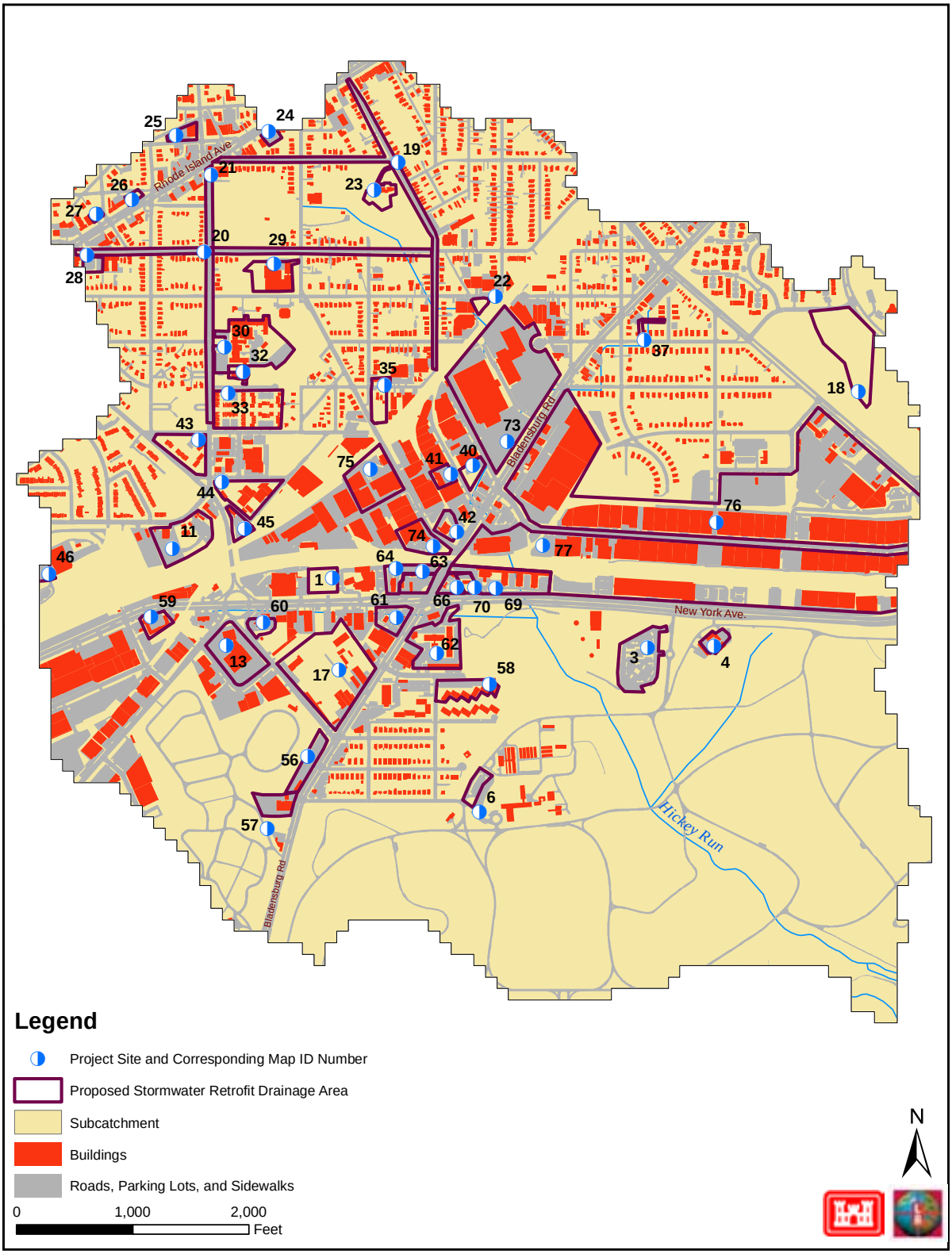

Figure 7 – Hickey Run Candidate Stormwater Retrofit and Existing Stormwater Retrofit Drainage Areas

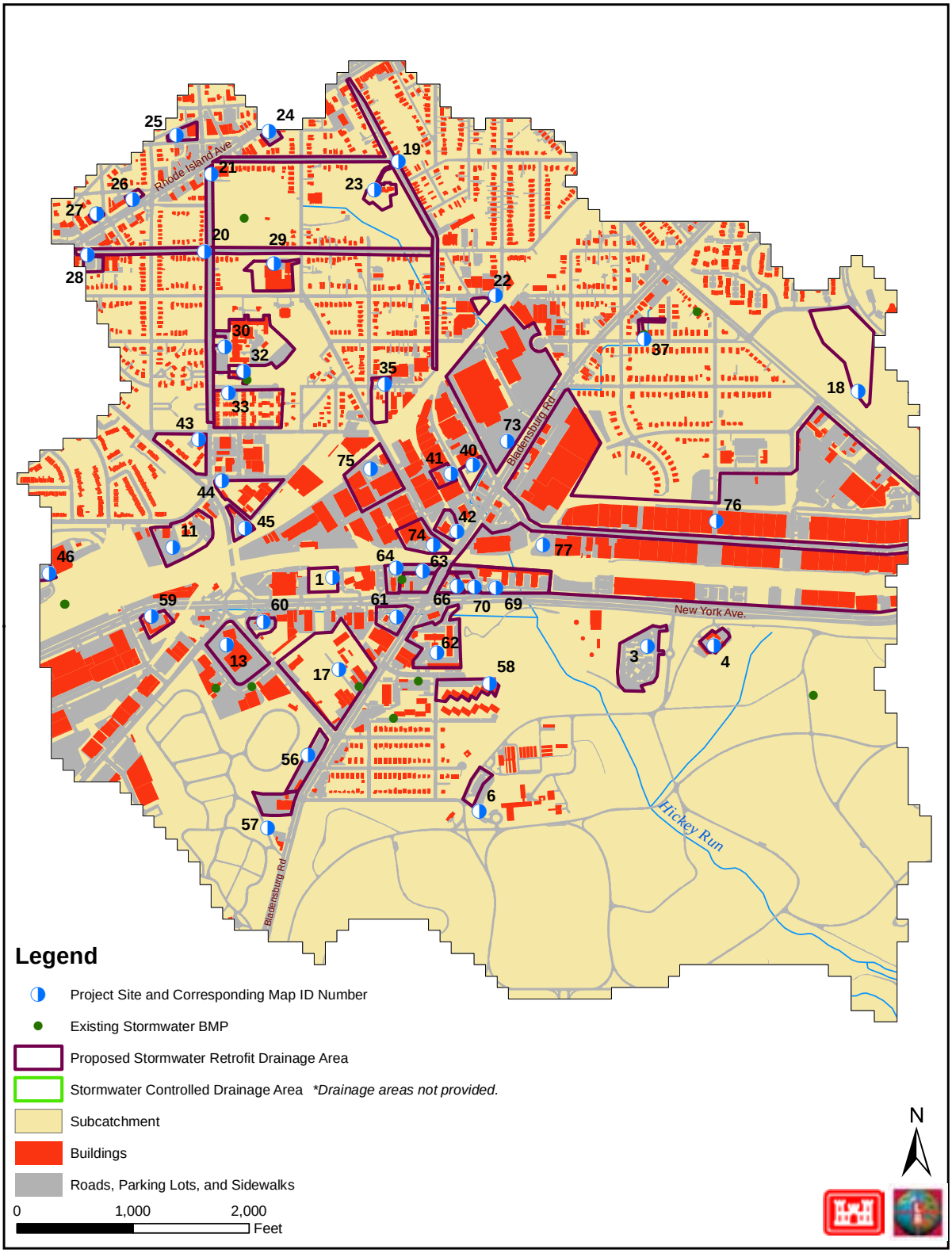

Table 5. Hickey Run – Candidate Stormwater Retrofit Projects

Project ID	MAP ID	Jurisdiction	Site Location Name	ADC Map Book Location	Project Type[1]	Ownership	Approx D.A. (acres)	Approx. Impervious		General Description of Proposed Actions	Estimated Cost ($)	Project Score (pts)	Project Ranking
								%	(acres)				
HR-L-01-S-1	1	DC	Auto repair/body shop triangle, Bladensburg Road/Montana Avenue/New York Avenue NE, Washington, DC	11 J 10	1c	Private	1.2	60	0.7	Sand Filter	16,000		
HR-L-01-S-2	3	DC	National Arboretum parking lot next to entrance off of Hickey Lane NE, Washington, DC	11 K 11	1b	Public	3.7	80	3.0	Permeable Pavement, LID Bioretention	410,000		
HR-L-01-S-3	4	DC	Maintenance yard in National Arboretum off of Azalea Lane NE, Washington, DC	11 K 11	1b	Public	0.7	90	0.6	LID Bioretention	60,000		
HR-L-01-S-4	6	DC	Visitors' center parking lot along Hickey Lane NE, northwest of visitors' center building and northeast of intersection of R Street NE and Hickey Lane NE, Washington, DC	11 J 11	1b	Public	0.8	60	0.5	LID Bioretention	50,000		
HR-L-01-S-5	76	DC	North of the intersection of V Street NE and Bladensburg Road NE, Washington, DC	11 K 10	1b	Private	51.5	95	48.9	Sand Filter, Underground Pipe Storage	930,000		
HR-L-01-S-6	18	DC	Pulte Homes, South Dakota Avenue NE and 31st Place NE, Washington, DC	12 A 10	1c	Private	5.1	45	2.3	Rainscape	405,000		
HR-L-01-S-7	19	DC	Mills Avenue NE and Hamlin Street NE intersection, Washington, DC	11 J 9	1b	Private	4.6	98	4.5	LID Bioretention, LID Tree Box Filters	300,000		
HR-L-01-S-8	20	DC	Franklin Street NE between Rhode Island Avenue NE and 27th Street NE, Washington, DC	11 H 9	1b	Private	3.8	98	3.7	LID Bioretention	210,000		
HR-L-01-S-9	21	DC	18th Street NE between Rhode Island Avenue and Montana Avenue NE, Washington, DC	11 H 9	1b	Private	3.1	98	3.0	LID Bioretention	180,000		
HR-L-01-S-10	22	DC	Junction of 26th Street NE and Evarts Street NE, Washington, DC	11 J 9	1b	Public	0.3	95	0.3	LID Bioretention	30,000		
HR-L-01-S-11	23	DC	Federal recreation facility, Hamlin Street NE and Mills Avenue NE, Washington, DC	11 J 9	1b	Public	1.0	90	0.9	LID Bioretention	90,000		
HR-L-01-S-12	24	DC	International House of Prayer for All People, 1913-17 Rhode Island Avenue NE, Washington, DC	11 H 9	1b	Private	0.3	96	0.3	LID Bioretention	30,000		
HR-L-01-S-13	25	DC	DC Merchange Market, 1730 Hamlin Street NE, Washington, DC	11 H 9	1b	Private	0.6	90	0.5	LID Bioretention	50,000		
HR-L-01-S-14	26	DC	Midas Express Service, 1620 Rhode Island Avenue NE, Washington, DC	11 H 9	1b	Private	0.2	92	0.2	LID Bioretention	20,000		
HR-L-01-S-15	27	DC	1544 Rhode Island Avenue NE, Washington, DC	11 H 9	1b	Private	0.2	95	0.2	LID Bioretention	20,000		
HR-L-01-S-16	28	DC	1613 Franklin Street NE, Washington, DC	11 H 9	1b	Private	0.5	96	0.5	LID Bioretention	50,000		

Project ID	MAP ID	Jurisdiction	Site Location Name	ADC Map Book Location	Project Type[1]	Ownership	Approx D.A. (acres)	Approx. Impervious		General Description of Proposed Actions	Estimated Cost ($)	Project Score (pts)	Project Ranking
								%	(acres)				
HR-L-01-S-17	29	DC	Langdon Elementary School, 1900 Evarts Street NE, Washington, DC	11 H 9	1b	Public	2.1	80	1.7	LID Bioretention	170,000		
HR-L-01-S-18	30	DC	Washington Center for Aging Services, 2601 18th Street NE, Washington, DC	11 H 9	1b	Private	5.1	70	3.6	LID Bioretention, LID Tree Box Filter	360,000		
HR-L-01-S-19	33	DC	Channing Court Condominiums, 2435 18th Street NE and 1835-1875 Channing Street NE, Washington, DC	11 H 10	1b	Private	4.4	96	4.2	LID Bioretention	420,000		
HR-L-01-S-20	35	DC	All Star Towing Inc. and Right Hour Auto Sales Inc., 2405 22nd Street NE and 2201 Channing Street NE, Washington, DC	11 J 10	1b	Private	1.2	95	1.1	LID Bioretention	110,000		
HR-L-01-S-21	37	DC	Alley between 3008 and 3010 Douglas Street NE, Washington, DC	11 K 9	1b	Public	0.2	70	0.1	LID Bioretention, Permeable Pavement	10,000		
HR-L-01-S-22	40	DC	Tomkins Builders, 2220 25th Place NE, Washington, DC	11 J 10	1b	Private	0.7	98	0.7	LID Bioretention, LID Tree Box Filter	60,000		
HR-L-01-S-23	41	DC	Christ Apostolic Church, 2130 24th Place NE, Washington, DC	11 J 10	1b	Private	0.6	98	0.6	LID Bioretention, LID Tree Box Filter	50,000		
HR-L-01-S-24	42	DC	Transit Employees Federal Credit Union, 2000 Bladensburg Road NE, Washington, DC	11 J 10	1b	Public	0.8	90	0.7	LID Bioretention, LID Rain Garden	90,000		
HR-L-01-S-25	43	DC	Bryant Street Townhome Condominiums, 2322 18th Street NE, Washington, DC	11 H 10	1b	Private	2.3	65	1.5	LID Bioretention, LID Tree Box Filter, LID Rain Garden	200,000		
HR-L-01-S-26	44	DC	1816 Adams Street NE, Washington, DC	11 H 10	1b	Private	2.5	95	2.4	Sand Filter, Underground Pipe Storage	46,000		
HR-L-01-S-27	45	DC	Edwin Street NE / Lawrence Avenue NE, Washington, DC	11 H 10	1b	Private	0.7	95	0.7	Sand Filter, Underground Pipe Storage	13,000		
HR-L-01-S-28	46	DC	1901 W Street NE, Washington, DC	11 G 10	1b	Private	3.1	98	3.0	LID Bioretention	30,000		
HR-L-01-S-29	77	DC	2850 V Street NE, Washington, DC	11 K 10	1b	Private	46.9	95	44.6	Sand Filter, Underground Pipe Storage	847,000		
HR-L-01-S-30	56	DC	U-Haul Moving Supplies, 1750 Bladensburg Road NE, Washington, DC	11 J 11	1b	Private	1.3	90	1.2	LID Bioretention	120,000		
HR-L-01-S-31	57	DC	Yellow Cab Company, 1636 Bladensburg Road NE, Washington, DC	11 H 12	1b	Private	1.3	70	0.9	LID Bioretention, LID Tree Box Filter	72,000		
HR-L-01-S-32	58	DC	Parkway Plaza Apartments, 1835-1855 22nd Street NE, Washington, DC	11 J 11	1b	Private	1.8	80	1.4	LID Bioretention, LID Tree Box Filter, LID Rain Garden	112,000		
HR-L-01-S-33	59	DC	Budget Motor Inn, 1615 New York Avenue NE, Washington, DC	11 H 11	1b	Private	0.9	90	0.8	LID Bioretention	80,000		

Project ID	MAP ID	Jurisdiction	Site Location Name	ADC Map Book Location	Project Type[1]	Ownership	Approx D.A. (acres)	Approx. Impervious		General Description of Proposed Actions	Estimated Cost ($)	Project Score (pts)	Project Ranking
								%	(acres)				
HR-L-01-S-34	60	DC	Hess Gas Station, 1801 New York Avenue NE, Washington, DC	11 H 11	1b	Public	0.7	90	0.6	LID Bioretention	60,000		
HR-L-01-S-35	61	DC	1844 Bladensburg Road NE, Washington, DC	11 J 11	1b	Public	1.2	90	1.1	LID Bioretention	110,000		
HR-L-01-S-36	62	DC	Holiday Inn Express and Suites and Fairfield Inn, 1917 Bladensburg Road NE and 2305 New York Avenue NE, Washington, DC	11 J 11	1b	Private	3.8	80	3.0	LID Bioretention, LID Tree Box Filter	240,000		
HR-L-01-S-37	63	DC	Exxon Gas Station, 2230 New York Avenue NE, Washington, DC	11 J 10	1b	Private	0.9	80	0.7	LID Bioretention	70,000		
HR-L-01-S-38	64	DC	McDonald's Restaurant, 2228 New York Avenue NE, Washington, DC	11 J 10	1b	Private	1.3	90	1.2	LID Bioretention, LID Tree Box Filter	120,000		
HR-L-01-S-39	66	DC	Checkers, 2300 New York Avenue NE, Washington, DC	11 J 10	1b	Private	0.6	90	0.5	LID Bioretention	50,000		
HR-L-01-S-40	69	DC	Days Inn, 2600 New York Avenue NE, Washington, DC	11 J 10	1b	Private	3.4	90	3.1	LID Bioretention, LID Tree Box Filter	310,000		
HR-L-01-S-41	70	DC	CITGO Service Station, 2500 New York Avenue NE, Washington, DC	11 J 10	1b	Private	0.5	98	0.5	LID Bioretention	50,000		
HR-L-01-S-42	17	DC	1940 Montana Avenue NE, Washington, DC	11 J 11	1b	Private	9.4	95	8.9	Sand Filter, Underground Pipe Storage	170,000		
HR-L-01-S-43	11	DC	1734 W Street NE, Washington, DC	11 H 10	1b	Private	3.4	98	3.3	Sand Filter, Underground Pipe Storage	63,000		
HR-L-01-S-44	13	DC	1716 17th Street NE, Washington, DC	11 H 11	1b	Private	3.5	98	3.4	Sand Filter, Underground Pipe Storage	65,000		
HR-L-01-S-45	73	DC	2382 Bladensburg Road NE, Washington, DC	11 J 10	1b	Private	16.5	98	16.2	Sand Filter, Underground Pipe Storage	308,000		
HR-L-01-S-46	74	DC	2122 Queens Chapel Road NE, Washington, DC	11 J 10	1b	Private	1.8	95	1.7	Sand Filter, Underground Pipe Storage	32,000		
HR-L-01-S-47	75	DC	Waste Management, 2220 Queens Chapel Road NE, Washington, DC	11 J 10	1b	Private	3.7	98	3.6	Sand Filter, Underground Pipe Storage	68,000		

DC = District of Columbia [1] 1a= Water quantity, 1b= Water quantity and quality, 1c= Water quality

Figure 8a – Candidate Stormwater Retrofit Project		
Site Location:	Auto repair/body shop triangle, Bladensburg Road/Montana Avenue/New York Avenue NE, Washington, DC	
Project No.:	HR-L-01-S-1	
ADC Map Book Location:	11 J 10	Map ID: 1
Approximate Associated Drainage Area (acres):	1.2	
Approximate Imperviousness:	60%	0.7 acres
Description of Existing Conditions:	This area consists of several auto body repair/service/junkyard type of activities with limited access. There is a large vacant lot belonging to DC Housing authority on Montana Avenue NE, which forms the rear of many of the Bladensburg Road NE facilities. There is an available green space behind the Bladensburg auto facilities. Most of the facilities along New York Avenue NE between Montana Avenue NE and Bladensburg Road NE are commercial facilities with limited access.	
Project Description:	**Sand Filter** – Install underground sand filters at inlet drains along New York Avenue NE.	

Figure 8b – Candidate Stormwater Retrofit Project		
Site Location:	National Arboretum parking lot next to entrance off of Hickey Lane NE, Washington, DC	
Project No.:	HR-L-01-S-2	
ADC Map Book Location:	11 K 11	Map ID: 3
Approximate Associated Drainage Area (acres):	3.7	
Approximate Imperviousness:	80%	3.0 acres
Description of Existing Conditions:	The site includes the Arboretum parking lot, mostly paved with several green islands. At the center, it is layed with pervious brick pattern. The stormwater runoff drains to the green area around the paved lot. There is a main stormwater inlet drain on the east side of lot. The stormwater inlet drain appeared to be clogged. There is a swale on the southeast corner of the lot, sloping to the south.	
Project Description:	**Permeable Pavement, LID Bioretention** - Cover the entire lot with the pervious brick pattern during its next scheduled maintenance. Clean/retrofit the inlet drain. Construct bioretention systems in the grassy area surrounding the parking lot.	

Figure 8c – Candidate Stormwater Retrofit Project		
Site Location:	Maintenance yard in National Arboretum off of Azalea Lane NE, Washington, DC	
Project No.:	HR-L-01-S-3	
ADC Map Book Location:	11 K 11	Map ID: 4
Approximate Associated Drainage Area (acres):	0.7	
Approximate Imperviousness:	90%	0.6 acres
Description of Existing Conditions:	The Arboretum maintenance yard is paved and slopes to the west and northwest. A small pervious area north of the lot is covered with crushed stone with an above ground storage facility on the east side. Stormwater runoff drains primarily into a stormwater inlet located in center of lot on the west side. The inlet drain seems to be clogged and silted. Additionally, stormwater runoff drains outside into a swale that connects to the stormwater receptor.	
Project Description:	**LID Bioretention** - Construct bioretention systems in the green space just outside the entrance of the yard. Clean stormwater inlet drain and redirect stormwater runoff to the bioretention systems.	

Figure 8d – Candidate Stormwater Retrofit Project		
Site Location:	Visitors' center parking lot along Hickey Lane NE, northwest of visitors' center building and northeast of intersection of R Street NE and Hickey Lane NE, Washington, DC	
Project No.:	HR-L-01-S-4	
ADC Map Book Location:	11 J 11	Map ID: 6
Approximate Associated Drainage Area (acres):	0.8	
Approximate Imperviousness:	60%	0.5 acres
Description of Existing Conditions:	The arboretum visitors' parking lot is paved and has a green strip divider and islands. Stormwater runoff drains towards the north into the curb inlet drains. A total of five inlet drains were observed.	
Project Description:	**LID Bioretention** - Construct bioretention systems in the green space adjacent to the storm inlet drains.	

Figure 8e – Candidate Stormwater Retrofit Project		
Site Location:	North of the intersection of V Street NE and Bladensburg Road NE, Washington, DC	
Project No.:	HR-L-01-S-5	
ADC Map Book Location:	11 K 10	Map ID: 76
Approximate Associated Drainage Area (acres):	51.5	
Approximate Imperviousness:	95%	48.9 acres
Description of Existing Conditions:	This site includes industrial/commercial facilities with large flat roof buildings (red dashed line in aerial photograph).	
Project Description:	**Sand Filter, Underground Pipe Storage** – Install underground sand filters combined with underground pipe storage along the ditch which runs immediately north of V Street NE (blue dotted line on aerial photograph) and redirect stormwater runoff to the existing storm inlets within the targeted facilities.	

Figure 8f – Candidate Stormwater Retrofit Project		
Site Location:	Pulte Homes, South Dakota Avenue NE and 31st Place NE, Washington, DC	
Project No.:	HR-L-01-S-6	
ADC Map Book Location:	12 A 10	Map ID: 18
Approximate Associated Drainage Area (acres):	5.1	
Approximate Imperviousness:	45%	2.3 acres
Description of Existing Conditions:	The site consists of mostly new homes, built along north/south lines. Stormwater runoff drains to the south. There is green space between the rows of housing.	
Project Description:	**Rainscape** - Install rain barrels and rain gardens at downspouts.	

Figure 8g – Candidate Stormwater Retrofit Project		
Site Location:	Mills Avenue NE and Hamlin Street NE intersection, Washington, DC	
Project No.:	HR-L-01-S-7	
ADC Map Book Location:	11 J 9	Map ID: 19
Approximate Associated Drainage Area (acres):	4.6	
Approximate Imperviousness:	98%	4.5 acres
Description of Existing Conditions:	The site includes Mills Avenue NE between Rhode Island Avenue NE and Franklin Street NE, where stormwater runoff is collected by curb inlet drains. Hamlin Street crosses Mills Avenue and slopes toward it. Mills Avenue slopes in the direction of Franklin Street. A green strip is located along the curb on both sides of Mills Avenue.	
Project Description:	**LID Bioretention, LID Tree Box Filters -** Construct bioretention systems in the green space along Mills Avenue NE. Install tree box filters at curb inlets.	

Figure 8h – Candidate Stormwater Retrofit Project		
Site Location:	Franklin Street NE between Rhode Island Avenue NE and 27th Street NE, Washington, DC	
Project No.:	HR-L-01-S-8	
ADC Map Book Location:	11 H 9	Map ID: 20
Approximate Associated Drainage Area (acres):	3.8	
Approximate Imperviousness:	98%	3.7 acres
Description of Existing Conditions:	Franklin Street NE slopes down from Rhode Island Avenue NE towards 18th Street NE and then upslopes to 20th Street NE. From 20th Street NE, Franklin Street NE slopes down all the way to 24th Street NE, gently sloping upwards toward 27th Street NE. There is a buried fireline on the north curbline of Franklin Street NE. There is available green spaces on either curbing of Franklin Street NE. There is also a large available green space at Franklin Street NE's intersection with 18th Street NE and 24th Street NE.	
Project Description:	**LID Bioretention** - Construct bioretention systems at the intersection of Franklin Street with 18th Street NE and 24th Street NE.	

Figure 8i – Candidate Stormwater Retrofit Project		
Site Location:	18th Street NE between Rhode Island Avenue NE and Montana Avenue NE, Washington, DC	
Project No.:	HR-L-01-S-9	
ADC Map Book Location:	11 H 9	Map ID: 21
Approximate Associated Drainage Area (acres):	3.1	
Approximate Imperviousness:	98%	3.0 acres
Description of Existing Conditions:	18th Street NE slopes down from Rhode Island Avenue NE to Franklin Street NE, slopes up to Douglas Street NE, and then down to Montana Avenue NE. There is available green space adjacent to Franklin Street NE along the curb on both sides of 18th Street NE. There are no curbs on the southbound side of 18th Street NE, south of Channing Street NE, with green space that extends into residential yards.	
Project Description:	**LID Bioretention** - Construct bioretention systems along 18th Street NE.	

Figure 8j – Candidate Stormwater Retrofit Project		
Site Location:	Junction of 26th Street NE and Evarts Street NE, Washington, DC	
Project No.:	HR-L-01-S-10	
ADC Map Book Location:	11 J 9	Map ID: 22
Approximate Associated Drainage Area (acres):	0.3	
Approximate Imperviousness:	95%	0.3 acres
Description of Existing Conditions:	Stormwater runoff from 26th Street NE and Evarts Street NE, and from commercial operations (United Ventures Consortium, towing service, junkyard, etc.) is directed into the principal stormwater inlet drain at the bottom of the street intersection. Two additional stormwater inlet drains are located across from the principal stormwater inlet drain. One of the inlet drains is damaged and silted. The principal inlet drain is located in dense vegetation and covered with debris and silt.	
Project Description:	**LID Biorentention** - Regrade the 26th and Evart Streets NE intersection to direct stormwater runoff into the principal inlet drain location. Construct a bioretention system at the principal inlet drain location.	

Figure 8k – Candidate Stormwater Retrofit Project		
Site Location:	Federal recreation facility, Hamlin Street NE and Mills Avenue NE, Washington, DC	
Project No.:	HR-L-01-S-11	
ADC Map Book Location:	11 J 9	Map ID: 23
Approximate Associated Drainage Area (acres):	1.0	
Approximate Imperviousness:	90%	0.9 acres
Description of Existing Conditions:	The facility is located in a valley and includes a swimming pool and an open field that is used as a ballpark. Excessive signs of erosion were observed at the bottom of the approach road from Mills Avenue NE to the swimming pool. According to the property manager, the existing curbing along the access way into the swimming pool causes soil erosion that clogs the drain and overflows into the pool. The facility and the landscaped areas are served by a series of drop inlets that drain stormwater runoff southeast to Mills Avenue NE and Franklin Street NE. The inlet drains were covered with grass cuttings and soil runoff.	
Project Description:	**LID Bioretention** – Construct bioretention systems at the drop inlets within the grassy areas. Modify existing curbing along the access way into the swimming pool with an appropriate drain system.	

Figure 8l – Candidate Stormwater Retrofit Project		
Site Location:	International House of Prayer for All People, 1913-17 Rhode Island Avenue NE, Washington, DC	
Project No.:	HR-L-01-S-12	
ADC Map Book Location:	11 H 9	Map ID: 24
Approximate Associated Drainage Area (acres):	0.3	
Approximate Imperviousness:	96%	0.3 acres
Description of Existing Conditions:	The site has a paved parking area associated with the International House of Prayer. The paved area slopes towards Rhode Island Avenue NE and stormwater runoff is collected by drop inlet drains at the entrances to the site. The drains are currently clogged with debris. There are green spaces between the drains and along the northeast part of the facility. Areas of the parking lot are cracked and in disrepair.	
Project Description:	**LID Bioretention -** Construct bioretention systems within the existing green space along the northeast part of the property and within the landscaped area between the drop inlet drains.	

Figure 8m – Candidate Stormwater Retrofit Project		
Site Location:	DC Merchange Market, 1730 Hamlin Street NE, Washington, DC	
Project No.:	HR-L-01-S-13	
ADC Map Book Location:	11 H 9	Map ID: 25
Approximate Associated Drainage Area (acres):	0.6	
Approximate Imperviousness:	90%	0.5 acres
Description of Existing Conditions:	The site consists of a parking lot area with uncut grass at the curbs. A large green space exists at the intersection of Hamlin Street NE, Brentwrood Road NE and 17th Street NE including a large curb inlet drain at Hamlin Street NE.	
Project Description:	**LID Bioretention** - Construct a bioretention system within the existing green space adjacent to the large curb inlet drain at Hamlin Street NE. Direct stormwater runoff originating from Brentwood Road NE and Hamlin Street NE to the bioretention system.	

Figure 8n – Candidate Stormwater Retrofit Project		
Site Location:	Midas Express Service, 1620 Rhode Island Avenue NE, Washington, DC	
Project No.:	HR-L-01-S-14	
ADC Map Book Location:	11 H 9	Map ID: 26
Approximate Associated Drainage Area (acres):	0.2	
Approximate Imperviousness:	92%	0.2 acres
Description of Existing Conditions:	The site consists of an auto service shop with a paved parking area along Girard Street NE. The drop inlet drains located at the entrance from Rhode Island Avenue NE are clogged with debris. There is a large green space between Girard Street NE and Rhode Island Avenue NE.	
Project Description:	**LID Bioretention -** Construct a bioretention system at the northeast entrance within the large green space. Clear the drop inlet drain at the entrance from Rhode Island Avenue NE of debris and redirect stormwater runoff to the bioretention system.	

Figure 8o – Candidate Stormwater Retrofit Project		
Site Location:	1544 Rhode Island Avenue NE, Washington, DC	
Project No.:	HR-L-01-S-15	
ADC Map Book Location:	11 H 9	Map ID: 27
Approximate Associated Drainage Area (acres):	0.2	
Approximate Imperviousness:	95%	0.2 acres
Description of Existing Conditions:	The site consists of a closed restaurant and parking lot. The stormwater runoff from the lot drains directly to the street. The drop inlet drain along the entrance from Rhode Island Avenue NE is damaged and clogged. There is a large green space at the intersection of Rhode Island Avenue NE and 16th Street NE.	
Project Description:	**LID Bioretention** - Construct a bioretention system in the existing green space along Rhode Island Avenue NE. Repair the drop inlet drain and redirect stormwater runoff to the bioretention system.	

Figure 8p – Candidate Stormwater Retrofit Project		
Site Location:	1613 Franklin Street NE, Washington, DC	
Project No.:	HR-L-01-S-16	
ADC Map Book Location:	11 H 9	Map ID: 28
Approximate Associated Drainage Area (acres):	0.5	
Approximate Imperviousness:	96%	0.5 acres
Description of Existing Conditions:	The site consists of an aparment building with a large, paved, fenced parking area. Downspouts are connected to the stormwater system. Stormwater runoff drains into Franklin Street NE.	
Project Description:	**LID Bioretention** - Construct bioretention islands and strips within the parking lot. Disconnect the downspouts from the stormwater system and connect them to the bioretention systems.	

Figure 8q – Candidate Stormwater Retrofit Project		
Site Location:	Langdon Elementary School, 1900 Evarts Street NE, Washington, DC	
Project No.:	HR-L-01-S-17	
ADC Map Book Location:	11 H 9	Map ID: 29
Approximate Associated Drainage Area (acres):	2.1	
Approximate Imperviousness:	80%	1.7 acres
Description of Existing Conditions:	The site includes an elementary school, playground, and a fenced parking lot located at the rear of the school building. The parking lot is paved and slopes towards Franklin Street NE. Stormwater runoff from the parking lot drains into a series drop inlets drains along the fence. The inlet drains were covered with leaves and silt at the time of the visit. There is a large green space at the entrance from 20th Street NE into the fenced area. The playground slopes toward Franklin Street NE, draining into a large inlet at the northeast corner of the site.	
Project Description:	**LID Bioretention** - Restore the series of drains around the parking lot and construct a bioretention system in the large fenced area at the 20th Street NE entrance. Also construct a bioretention system at the northeast corner in the green space near the playground.	

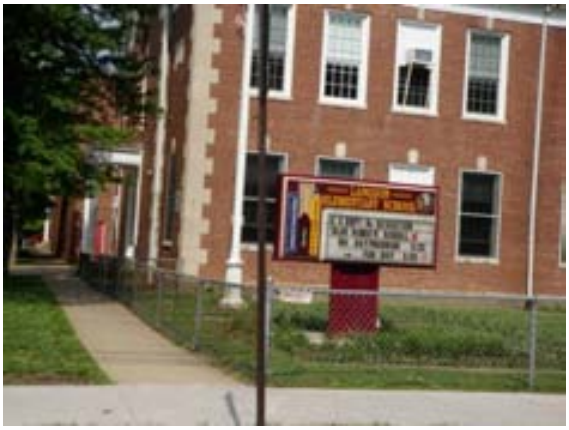

Figure 8r – Candidate Stormwater Retrofit Project		
Site Location:	Washington Center for Aging Services, 2601 18th Street NE, Washington, DC	
Project No.:	HR-L-01-S-18	
ADC Map Book Location:	11 H 9	Map ID: 30
Approximate Associated Drainage Area (acres):	5.1	
Approximate Imperviousness:	70%	3.6 acres
Description of Existing Conditions:	The site contains several buildings and six associated paved parking areas, some of which are fenced. Stormwater runoff drains into drop inlet drains in the parking los, to the green space surrounding the parking lots, or directly into Channing Street NE. A stormwater drain retrofit is currently underway at the rear of the main building. Combined drainage is directed into the main stormwater receptor located on the northeast corner of the property.	
Project Description:	**LID Bioretention, LID Tree Box Filter** - Construct bioretention systems in the available green space surrounding the parking lots. Install tree box filters at drop inlet drains.	

Figure 8s – Candidate Stormwater Retrofit Project		
Site Location:	Channing Court Condominiums, 2435 18th Street NE and 1835-1875 Channing Street NE, Washington, DC	
Project No.:	HR-L-01-S-19	
ADC Map Book Location:	11 H 10	Map ID: 33
Approximate Associated Drainage Area (acres):	4.4	
Approximate Imperviousness:	96%	4.2 acres
Description of Existing Conditions:	The site includes two condominium complexes and associated paved paved parking areas for residents. Stormwater runoff drains into curb inlet drains. There are green islands in the parking lot and green space surrounding the condominiums themselves.	
Project Description:	**LID Bioretention** - Construct bioretention systems within the green islands in the parking lot and in the green space adjacent to the curb inlet drains.	

Figure 8t – Candidate Stormwater Retrofit Project		
Site Location:	All Star Towing Inc. and Right Hour Auto Sales Inc., 2405 22nd Street NE and 2201 Channing Street NE, Washington, DC	
Project No.:	HR-L-01-S-20	
ADC Map Book Location:	11 J 10	Map ID: 35
Approximate Associated Drainage Area (acres):	1.2	
Approximate Imperviousness:	95%	1.1 acres
Description of Existing Conditions:	The site includes a fenced, paved impound lot associated with towing services and an auto service facility. The rectangular strips of pavement slope to the southeast corner of the lot and stormwater runoff drains directly onto Channing Street NE. Green space exists along the Channing Street NE curb.	
Project Description:	**LID Bioretention** - Construct a bioretention system along the green space on Channing Street NE.	

Figure 8u – Candidate Stormwater Retrofit Project		
Site Location:	Alley between 3008 and 3010 Douglas Street NE, Washington, DC	
Project No.:	HR-L-01-S-21	
ADC Map Book Location:	11 K 9	Map ID: 37
Approximate Associated Drainage Area (acres):	0.2	
Approximate Imperviousness:	70%	0.1 acres
Description of Existing Conditions:	An asphalt alley extends from Douglas Street NE between private residences to 31st Place NE. Stormwater runoff drains into Douglas Street. The alley is in disrepair, with standing water observed in pot holes. Downspouts from residences drain directly into alley.	
Project Description:	**LID Bioretention, Permeable Pavement** - Construct a bioretention system within the green space on Douglas Street NE. Install permeable pavement during the next maintenance cycle.	

Figure 8v – Candidate Stormwater Retrofit Project		
Site Location:	Tomkins Builders, 2220 25th Place NE, Washington, DC	
Project No.:	HR-L-01-S-22	
ADC Map Book Location:	11 J 10	Map ID: 40
Approximate Associated Drainage Area (acres):	0.7	
Approximate Imperviousness:	98%	0.7 acres
Description of Existing Conditions:	The site consists of a concrete parking lot and storage for construction material. The concrete is exposed and cracked and covered with gravel and crushed stone. Existing green space is located along the street curb. Stormwater runoff drains directly on to 25th Place NE.	
Project Description:	**LID Bioretention, LID Tree Box Filter** - Construct a bioretention system along the curb at the existing green area on 25th Place NE. Install tree box filters at the curb inlets on 25th Place NE.	

Figure 8w – Candidate Stormwater Retrofit Project		
Site Location:	Christ Apolistic Church, 2130 24th Place NE, Washington, DC	
Project No.:	HR-L-01-S-23	
ADC Map Book Location:	11 J 10	Map ID: 41
Approximate Associated Drainage Area (acres):	0.6	
Approximate Imperviousness:	98%	0.6 acres
Description of Existing Conditions:	The site consists of a church building and a fenced, paved parking lot that slopes towards 24th Place NE. Stormwater runoff drains directly onto 24th Place NE.	
Project Description:	**LID Bioretention, LID Tree Box Filter** - Construct a bioretention system and install tree box filters along the curb on 24th Place NE. Construct additional bioretention strips within the parking lot.	

Figure 8x – Candidate Stormwater Retrofit Project		
Site Location:	Transit Employees Federal Credit Union, 2000 Bladensburg Road NE, Washington, DC	
Project No.:	HR-L-01-S-24	
ADC Map Book Location:	11 J 10	Map ID: 42
Approximate Associated Drainage Area (acres):	0.8	
Approximate Imperviousness:	90%	0.7 acres
Description of Existing Conditions:	The site includes a building with surrounding paved parking. Existing green spaces are located in the northeast corner of the site and at the southwest entrance to the lot. The parking lot slopes around the building towards the southern entrance. Stormwater runoff is collected at the southern entrance by trench inlet drains.	
Project Description:	**LID Bioretention, LID Rain Garden** - Construct a bioretention system in the existing green space in the southwestern entrance to the lot and redirect drain inlets into the system. Construct an additional bioretention unit in the green space on the northeast corner of building. Install rain gardens at downspouts.	

Figure 8y – Candidate Stormwater Retrofit Project		
Site Location:	Bryant Street Townhome Condominiums, 2322 18th Street NE, Washington, DC	
Project No.:	HR-L-01-S-25	
ADC Map Book Location:	11 H 10	Map ID: 43
Approximate Associated Drainage Area (acres):	2.3	
Approximate Imperviousness:	65%	1.5 acres
Description of Existing Conditions:	The site consists of a residential community with a paved parking area that slopes to the south directing stormwater runoff into a single drain. A recreational green space is located to the west of the inlet. Another green space is located to the west of the parking area and drains into the lot.	
Project Description:	**LID Bioretention, LID Tree Box Filter, LID Rain Garden** - Construct a bioretention unit within the recreational green space. Install a tree box filter at the inlet drain. Install rain gardens at downspouts.	

Figure 8z – Candidate Stormwater Retrofit Project		
Site Location:	1816 Adams Street NE, Washington, DC	
Project No.:	HR-L-01-S-26	
ADC Map Book Location:	11 H 10	Map ID: 44
Approximate Associated Drainage Area (acres):	2.5	
Approximate Imperviousness:	95%	2.4 acres
Description of Existing Conditions:	The site includes automotive industrial/commercial facilities between Adams and Edwin Streets, and Montana and Lawrence Avenues. Stormwater runoff drains into the streets and into storm inlets on site.	
Project Description:	**Sand Filter, Underground Pipe Storage** – Install underground sand filters combined with underground pipe storage.	

Figure 8aa – Candidate Stormwater Retrofit Project		
Site Location:	Edwin Street NE / Lawrence Avenue NE, Washington, DC	
Project No.:	HR-L-01-S-27	
ADC Map Book Location:	11 H 10	Map ID: 45
Approximate Associated Drainage Area (acres):	0.7	
Approximate Imperviousness:	95%	0.7 acres
Description of Existing Conditions:	The site includes automotive industrial/commercial facilities between Edwin Street, and Montana and Lawrence Avenues (red dot on the aerial photograph). Stormwater runoff drains into the streets and into storm inlets on site.	
Project Description:	**Sand Filter, Underground Pipe Storage** – Install underground sand filters combined with underground pipe storage and redirect stormwater runoff to the existing storm inlets on site.	

Figure 8ab – Candidate Stormwater Retrofit Project		
Site Location:	1901 W Street NE, Washington, DC	
Project No.:	HR-L-01-S-28	
ADC Map Book Location:	11 G 10	Map ID: 46
Approximate Associated Drainage Area (acres):	3.1	
Approximate Imperviousness:	98%	3.0 acres
Description of Existing Conditions:	The site includes a large building and paved parking lot. Stormwater runoff drains directly into the Amtrak railroad tracks to the south.	
Project Description:	**LID Bioretention** - Construct bioretention green strips in the parking lot at the existing islands and restricted parking areas.	

Figure 8ac – Candidate Stormwater Retrofit Project		
Site Location:	2850 V Street NE, Washington, DC	
Project No.:	HR-L-01-S-29	
ADC Map Book Location:	11 K 10	Map ID: 77
Approximate Associated Drainage Area (acres):	46.9	
Approximate Imperviousness:	95%	44.6 acres
Description of Existing Conditions:	The site contains industrial/commercial facilities south of V Street NE and north of Route 50 Westbound lanes, located on either side of an existing railroad lines (red dashed line in aerial photograph).	
Project Description:	**Sand Filter, Underground Pipe Storage** – Install underground sand filters combined with underground pipe storage along a green strip next to the railroad (green dotted line on aerial photograph) and redirect stormwater runoff to the existing storm inlets within the targeted facilities.	

Figure 8ad – Candidate Stormwater Retrofit Project		
Site Location:	U-Haul Moving Supplies, 1750 Bladensburg Road NE, Washington, DC	
Project No.:	HR-L-01-S-30	
ADC Map Book Location:	11 J 11	Map ID: 56
Approximate Associated Drainage Area (acres):	1.3	
Approximate Imperviousness:	90%	1.2 acres
Description of Existing Conditions:	The site consists of a building and a paved parking lot. Stormwater runoff drains toward Montana Avenue NE.	
Project Description:	**LID Bioretention** - Construct bioretention systems in the asphalt-covered area adjacent to the entrance at Montana Avenue NE.	

Figure 8ae – Candidate Stormwater Retrofit Project		
Site Location:	Yellow Cab Company, 1636 Bladensburg Road NE, Washington, DC	
Project No.:	HR-L-01-S-31	
ADC Map Book Location:	11 H 12	Map ID: 57
Approximate Associated Drainage Area (acres):	1.3	
Approximate Imperviousness:	70%	0.9 acres
Description of Existing Conditions:	The site includes a building and paved lot that slopes to the northwest. Part of the lot north of the building slopes towards Bladensburg Road NE. Stormwater runoff drains towards the northeast corner of the site and into Mount Olivet Cemetery.	
Project Description:	**LID Bioretention, LID Tree Box Filter** - Construct a bioretention system at the northwest corner of the site. Addtionally, install tree box filters along Bladensburg Road NE at the curb inlets.	

Figure 8af – Candidate Stormwater Retrofit Project		
Site Location:	Parkway Plaza Apartments, 1835-1855 22nd Street NE, Washington, DC	
Project No.:	HR-L-01-S-32	
ADC Map Book Location:	11 J 11	Map ID: 58
Approximate Associated Drainage Area (acres):	1.8	
Approximate Imperviousness:	80%	1.4 acres
Description of Existing Conditions:	The site consists of a residential community with a paved parking lot that slopes toward the west. Stormwater runoff drains onto 24th Street NE and primarily towards the west into an existing green space at the northwestern end of the lot. There is an existing rip-rap lined inlet at west end of lot.	
Project Description:	**LID Bioretention, LID Tree Box Filter, LID Rain Garden -** Construct a bioretention system at the west end of the lot and in the green space along 24th Street NE. Install a tree box filter at the inlet drain. Install rain gardens at downspouts.	

Figure 8ag – Candidate Stormwater Retrofit Project		
Site Location:	Budget Motor Inn, 1615 New York Avenue NE, Washington, DC	
Project No.:	HR-L-01-S-33	
ADC Map Book Location:	11 H 11	Map ID: 59
Approximate Associated Drainage Area (acres):	0.9	
Approximate Imperviousness:	90%	0.8 acres
Description of Existing Conditions:	The site consists of a motel and a paved parking lot slopes northwest towards New York Avenue NE. Downspouts drain onto the lot. There is an existing strip of green space along the length of the curb of New York Avenue NE and an existing trench inlet drain along the two entrances from New York Avenue NE.	
Project Description:	**LID Bioretention** - Construct a bioretention system in the green spaces on the western edge of the property. Redirect the trench inlet drain to the bioretention system. Construct additional bioretention systems in the green space adjacent to the curb.	

Figure 8ah – Candidate Stormwater Retrofit Project		
Site Location:	Hess Gas Station, 1801 New York Avenue NE, Washington, DC	
Project No.:	HR-L-01-S-34	
ADC Map Book Location:	11 H 11	Map ID: 60
Approximate Associated Drainage Area (acres):	0.7	
Approximate Imperviousness:	90%	0.6 acres
Description of Existing Conditions:	The site consists of a gas station and car wash with paved lot that slopes toward New York Avenue NE. Existing green islands are present along New York Avenue NE.	
Project Description:	**LID Bioretention** - Construct bioretention systems within the green islands along New York Avenue NE.	

Figure 8ai – Candidate Stormwater Retrofit Project		
Site Location:	1844 Bladensburg Road NE, Washington, DC	
Project No.:	HR-L-01-S-35	
ADC Map Book Location:	11 J 11	Map ID: 61
Approximate Associated Drainage Area (acres):	1.2	
Approximate Imperviousness:	90%	1.1 acres
Description of Existing Conditions:	The site consists of a building and an asphalt parking lot that slopes in the direction of Route 50/New York Avenue NE. An existing trench inlet drain is located at the entrance from New York Avenue NE. Inlet drains are located along the curb on New York Avenue NE. Green spaces and islands are present in the parking lot around the building. Stormwater runoff drains either directly onto New York Avenue NE or to an inlet drain located at the northeast corner of the parking lot.	
Project Description:	**LID Bioretention** - Construct a bioretention system in the green space along New York Avenue NE and adjacent to the KFC/Taco Bell drive-through entrance. Redirect the trench inlet drain to the bioretention system.	

Figure 8aj – Candidate Stormwater Retrofit Project		
Site Location:	Holiday Inn Express and Suites and Fairfield Inn, 1917 Bladensburg Road NE and 2305 New York Avenue NE, Washington, DC	
Project No.:	HR-L-01-S-36	
ADC Map Book Location:	11 J 11	Map ID: 62
Approximate Associated Drainage Area (acres):	3.8	
Approximate Imperviousness:	80%	3.0 acres
Description of Existing Conditions:	Holiday Inn Express and Fairfield Inn facilities occupy the site. Stormwater runoff drains towards the north and to curb inlet drains. Several green islands on the site are located adjacent to the inlet drains. Trench inlet drains are located at the New York Avenue NE entrance to the Fairfield Inn.	
Project Description:	**LID Bioretention, LID Tree Box Filters** - Construct bioretention systems in the green spaces within the parking lot. Install tree box filters at the two curb inlet drains in the parking lot.	

Figure 8ak – Candidate Stormwater Retrofit Project		
Site Location:	Exxon Gas Station, 2230 New York Avenue NE, Washington, DC	
Project No.:	HR-L-01-S-37	
ADC Map Book Location:	11 J 10	Map ID: 63
Approximate Associated Drainage Area (acres):	0.9	
Approximate Imperviousness:	80%	0.7 acres
Description of Existing Conditions:	The site consists of a gas station and paved parking lot. Stormwater runoff drains towards New York Avenue NE and Bladensburg Road NE. Existing trench inlet drains are located along street entrances into the station. Green islands are located along the streets.	
Project Description:	**LID Bioretention** - Construct bioretention systems in the the green space and redirect the trench inlet drains into the system.	

Figure 8al – Candidate Stormwater Retrofit Project		
Site Location:	McDonald's Restaurant, 2228 New York Avenue NE, Washington, DC	
Project No.:	HR-L-01-S-38	
ADC Map Book Location:	11 J 10	Map ID: 64
Approximate Associated Drainage Area (acres):	1.3	
Approximate Imperviousness:	90%	1.2 acres
Description of Existing Conditions:	The site includes an 'L' shaped paved parking area for a retail food outlet with drive-through lanes. Existing green islands and strips are located around the retail food building and the parking lot. Stormwater runoff drains towards the south into New York Avenue NE and Bladensburg Road NE. Trench inlet drains are located at the entrances along New York Avenue NE.	
Project Description:	**LID Bioretention, LID Tree Box Filters** - Construct bioretention systems in front of the building and in the green space on the western side of the property. Install tree box filters at the curb inlet drains along the rear parking lot. Redirect the trench inlet drains into the bioretention system.	

Figure 8am – Candidate Stormwater Retrofit Project		
Site Location:	Checkers, 2300 New York Avenue NE, Washington, DC	
Project No.:	HR-L-01-S-39	
ADC Map Book Location:	11 J 10	Map ID: 66
Approximate Associated Drainage Area (acres):	0.6	
Approximate Imperviousness:	90%	0.5 acres
Description of Existing Conditions:	The site consists of a retail food outlet and a paved parking lot. Stormwater runoff drains primarily towards New York Avenue NE and into an inlet drain at the southeast corner of the parking lot. There are existing trench inlet drains along the street entrances. Existing green spaces are located at southeast corner of the paved area and at the entrance along Bladensburg Road NE.	
Project Description:	**LID Bioretention** - Construct bioretention systems in the green space along the street entrances, and at the southeastern corner of the paved area. Redirect trench inlet drains to the bioretention system.	

Figure 8an – Candidate Stormwater Retrofit Project		
Site Location:	Days Inn, 2600 New York Avenue NE, Washington, DC	
Project No.:	HR-L-01-S-40	
ADC Map Book Location:	11 J 10	Map ID: 69
Approximate Associated Drainage Area (acres):	3.4	
Approximate Imperviousness:	90%	3.1 acres
Description of Existing Conditions:	The site contains a strip hotel facility with paved parking lot and entrances from New York Avenue NE and Bladensburg Road NE. Stormwater runoff drains to New York Avenue NE. A clogged trench inlet drain is located at the entrance from New York Avenue NE.	
Project Description:	**LID Bioretention, LID Tree Box Filter** - Construct a bioretention system at the entrance from New York Avenue NE. Construct a bioretention system at the southeast corner of the site beside the locked entrance. Redirect trench inlet drains to the bioretention system. Install tree box filters at inlet drains along New York Avenue NE.	

Figure 8ao – Candidate Stormwater Retrofit Project		
Site Location:	CITGO Service Station, 2500 New York Avenue NE, Washington, DC	
Project No.:	HR-L-01-S-41	
ADC Map Book Location:	11 J 10	Map ID: 70
Approximate Associated Drainage Area (acres):	0.5	
Approximate Imperviousness:	98%	0.5 acres
Description of Existing Conditions:	The site consists of a gas station and paved parking lot. Stormwater runoff drains towards New York Avenue NE into the existing trench inlet drains along the street entrances into station. Green islands are located along the southeastern and southwestern corner of the lot.	
Project Description:	**LID Bioretention** - Construct bioretention systems in the green space along the southeastern and southwestern corner of the lot. Redirect trench inlet drains to the bioretention system.	

Figure 8ap – Candidate Stormwater Retrofit Project		
Site Location:	1940 Montana Avenue NE, Washington, DC	
Project No.:	HR-L-01-S-42	
ADC Map Book Location:	11 J 11	Map ID: 17
Approximate Associated Drainage Area (acres):	9.4	
Approximate Imperviousness:	95%	8.9 acres
Description of Existing Conditions:	The site includes automotive industrial/commercial facilities north of the intersection between Montana Avenue NE and Bladensburg Road NE (red dot on the aerial photograph). Stormwater runoff drains onto the streets, unpaved areas, green spaces and storm inlets on site.	
Project Description:	**Sand Filter, Underground Pipe Storage** – Install underground sand filters combined with underground pipe storage and redirect stormwater runoff to the existing and new storm inlets.	

Figure 8aq – Candidate Stormwater Retrofit Project		
Site Location:	1734 W Street NE, Washington, DC	
Project No.:	HR-L-01-S-43	
ADC Map Book Location:	11 H 10	Map ID: 11
Approximate Associated Drainage Area (acres):	3.4	
Approximate Imperviousness:	98%	3.3 acres
Description of Existing Conditions:	The site includes industrial/commercial facilities dealing with oversized construction equipment staging/maintenance along W Street NE. Stormwater runoff drains to the south into storm inlets on site and towards the railroad.	
Project Description:	**Sand Filter, Underground Pipe Storage** – Install underground sand filters combined with underground pipe storage and redirect stormwater runoff to the existing and new storm inlets.	

Figure 8ar – Candidate Stormwater Retrofit Project		
Site Location:	1716 17th Street NE, Washington, DC	
Project No.:	HR-L-01-S-44	
ADC Map Book Location:	11 H 11	Map ID: 13
Approximate Associated Drainage Area (acres):	3.5	
Approximate Imperviousness:	98%	3.4 acres
Description of Existing Conditions:	The site includes the D.C. Metro Police facility with buildings and surrounding paved areas (red dot on the aerial photograph). Stormwater runoff drains into storm inlets on site and onto the surrounding streets.	
Project Description:	**Sand Filter, Underground Pipe Storage** – Install underground sand filters combined with underground pipe storage and redirect stormwater runoff to the existing storm inlets within the site and to new trench drains.	

Figure 8as – Candidate Stormwater Retrofit Project		
Site Location:	2382 Bladensburg Road NE, Washington, DC	
Project No.:	HR-L-01-S-45	
ADC Map Book Location:	11 J 10	Map ID: 73
Approximate Associated Drainage Area (acres):	16.5	
Approximate Imperviousness:	98%	16.2 acres
Description of Existing Conditions:	The site is a Metro bus depot on Bladensburg Road (red mark on aerial photograph). The facility consists of buildings and bus lanes. It is almost entirely paved and stormwater runoff drains into storm inlets on site or directly onto the street.	
Project Description:	**LID Sand Filter, Underground Pipe Storage** – Install an underground sand filter unit combined with underground pipe storage and redirect stormwater runoff to the existing storm inlets within the depot and new trench drains.	

Figure 8at – Candidate Stormwater Retrofit Project		
Site Location:	2122 Queens Chapel Road NE, Washington, DC	
Project No.:	HR-L-01-S-46	
ADC Map Book Location:	11 J 10	Map ID: 74
Approximate Associated Drainage Area (acres):	1.8	
Approximate Imperviousness:	95%	1.7 acres
Description of Existing Conditions:	The site includes industrial/commercial facility with buildings and paved areas. Stormwater runoff drains towards the southwest of the site, the railroad/street, and into existing storm inlets on site.	
Project Description:	**Sand Filter, Underground Pipe Storage** – Install underground sand filters combined with underground pipe storage and redirect stormwater runoff to the existing storm inlets within the facility and new trench drains.	

Figure 8au – Candidate Stormwater Retrofit Project		
Site Location:	Waste Management, 2220 Queens Chapel Road NE, Washington, DC	
Project No.:	HR-L-01-S-47	
ADC Map Book Location:	11 J 10	Map ID: 75
Approximate Associated Drainage Area (acres):	3.7	
Approximate Imperviousness:	98%	3.6 acres
Description of Existing Conditions:	The site includes an industrial/commercial facility with buildings and paved areas (red dot on the aerial photograph). Stormwater runoff drains towards the north-northwest of the site into existing storm inlets on site and towards the railroad.	
Project Description:	**Sand Filter, Underground Pipe Storage** – Install underground sand filters combined with underground pipe storage and redirect stormwater runoff to the existing storm inlets and new trench drains.	

Figure 9 – Hickey Run Candidate Stream Restoration Sites

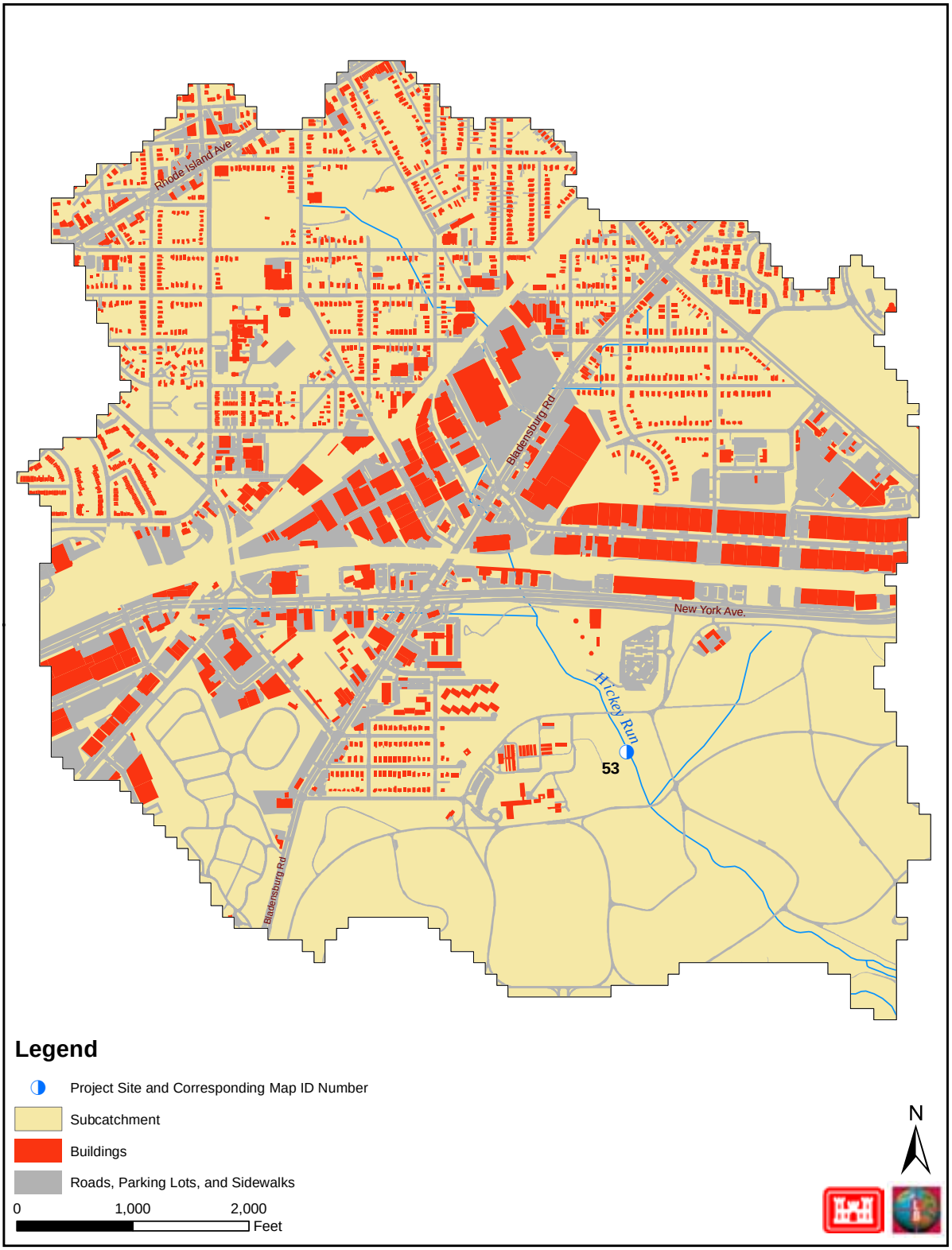

Table 6. Hickey Run – Candidate Stream Restoration Projects

Project ID	MAP ID	Jurisdiction	Site Location Name	ADC Map Book Location	Project Type[1]	Ownership	Approx Length (feet)	General Description of Proposed Actions	Estimated Cost ($)	Project Score (pts)	Project Ranking
HR-L-02-SR-1	53	DC	Along stream channel south of the bridge on Hickey Lane NE, west of the intersection of Hickey Lane NE, Azalea Road NE, and Beechwood Road NE within the National Arboretum, Washington, DC	11 K 11	1a, 1b	Public	1,380	Stream Channel Morphology Restoration	414,000		

DC = District of Columbia

1a= Channel Morphology, 1b= In-Stream Habitat/Bank Stabilization, 1c= Fish Blockage, 1d= Vernal Pool Creation Enhancement

Figure 10a – Candidate Stream Restoration Project		
Site Location:	Along stream channel south of the bridge on Hickey Lane NE, west of the intersection of Hickey Lane NE, Azalea Road NE, and Beechwood Road NE within the National Arboretum, Washington, DC	
Project No.:	HR-L-02-SR-1	
ADC Map Book Location:	11 K 11	Map ID: 53
Approximate Length (feet):	1,380	
Description of Existing Conditions:	The upper portion of the stream has been channelized with concrete. The concrete channel is cracked and broken in several places along this 75- to 100-foot stretch. The banks are eroded and undercut from the transition of concrete to natural streambed. The banks are approximately four feet tall with exposed roots and continued erosion along most of the stream from this point to the National Arboretum property boundary.	
Project Description:	**Stream Channel Morphology Restoration** – Implement stream bank and channel stabilization to reduce erosion and downcutting. Remove the concrete channel and restore to a natural streambed. Bank stabilization measures may include erosion control mat, live stakes or more intense vegetative/structural measures.	

Figure 11 – Hickey Run Candidate Wetland Restoration Sites

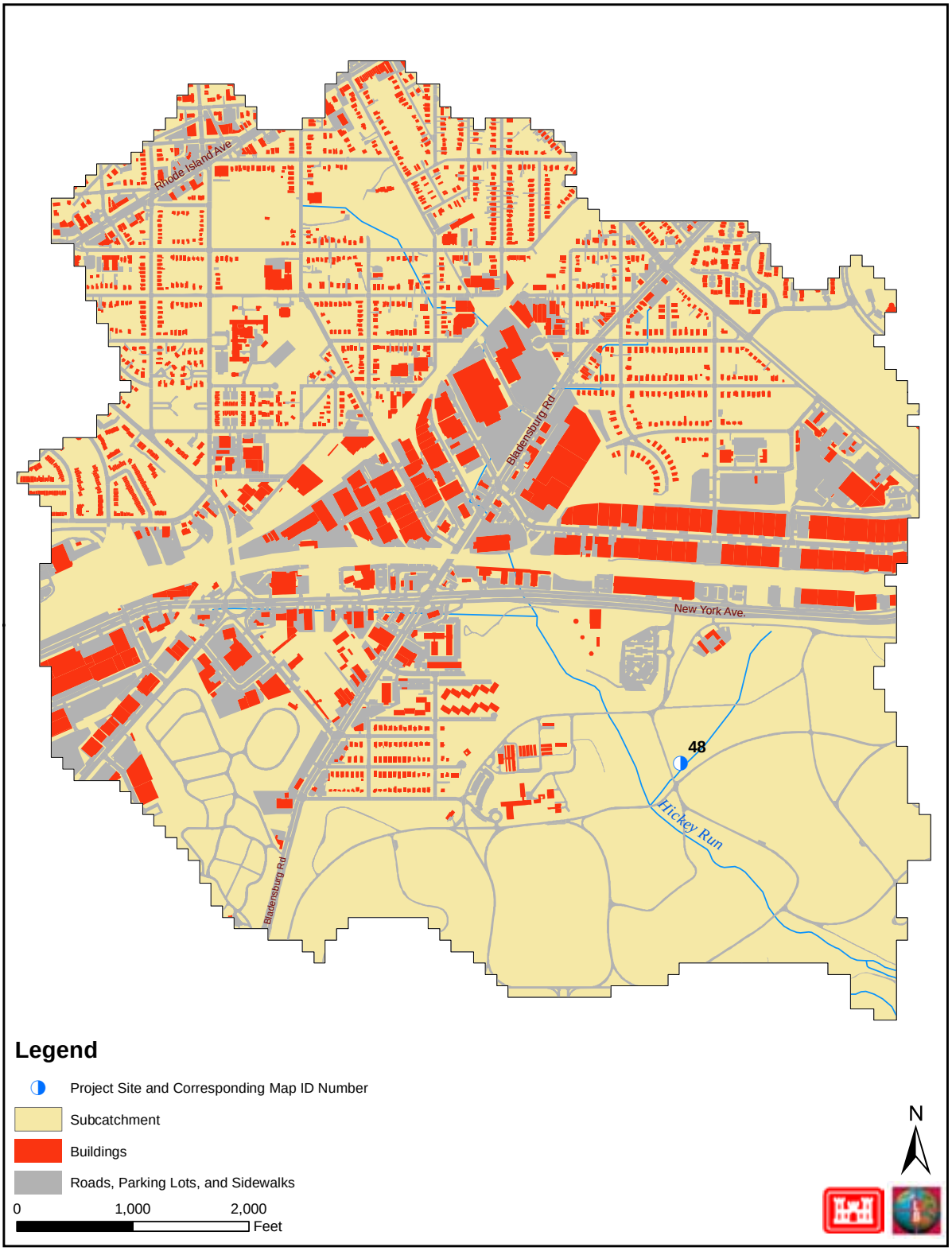

Table 7. Hickey Run – Candidate Wetland Restoration Projects

Project ID	Map ID	Jurisdiction	Site Location Name	ADC Map Book Location	Project Type[1]	Ownership	Approx Acreage	General Description of Proposed Actions	Estimated Cost ($)	Project Score (pts)	Project Ranking
HR-L-03-W-1	48	DC	Northeast of the intersection of Beechwood Road NE and Meadow Road NE in the National Arboretum, Washington, DC	11 K 11	1e	Public	0.2	Wetland Creation	10,000		

DC = District of Columbia

[1] 1a= Channel Morphology, 1b= In-Stream Habitat/Bank Stabilization, 1c= Fish Blockage, 1d= Vernal pool Creation Enhancement, 1e= Wetland Creation/Restoration, 1f = Invasive Species Control

Figure 12a – Candidate Wetland Restoration Project		
Site Location:	Northeast of the intersection of Beechwood Road NE and Meadow Road NE in the National Arboretum, Washington, DC	
Project No.:	HR-L-03-W-1	
ADC Map Book Location:	11 K 11	Map ID: 48
Approximate Acreage (acres):	0.2	
Description of Existing Conditions:	The site includes low, depressional area adjacent to a small tributary that collects runoff from surrounding uplands with mostly herbaceous vegetation, native grasses, and forbs. The stream channel is narrow, approximately two to three feet wide. The riparian buffer consists mostly of grapevines, blackberries, and forbs with minimal tree and shrub cover.	
Project Description:	**Wetland Creation -** This area is an ideal candidate for wetland creation in the depressional area. Using check dams and directing hydrology into this area would create a wetland.	

Figure 13 – Hickey Run Candidate Riparian Restoration Sites

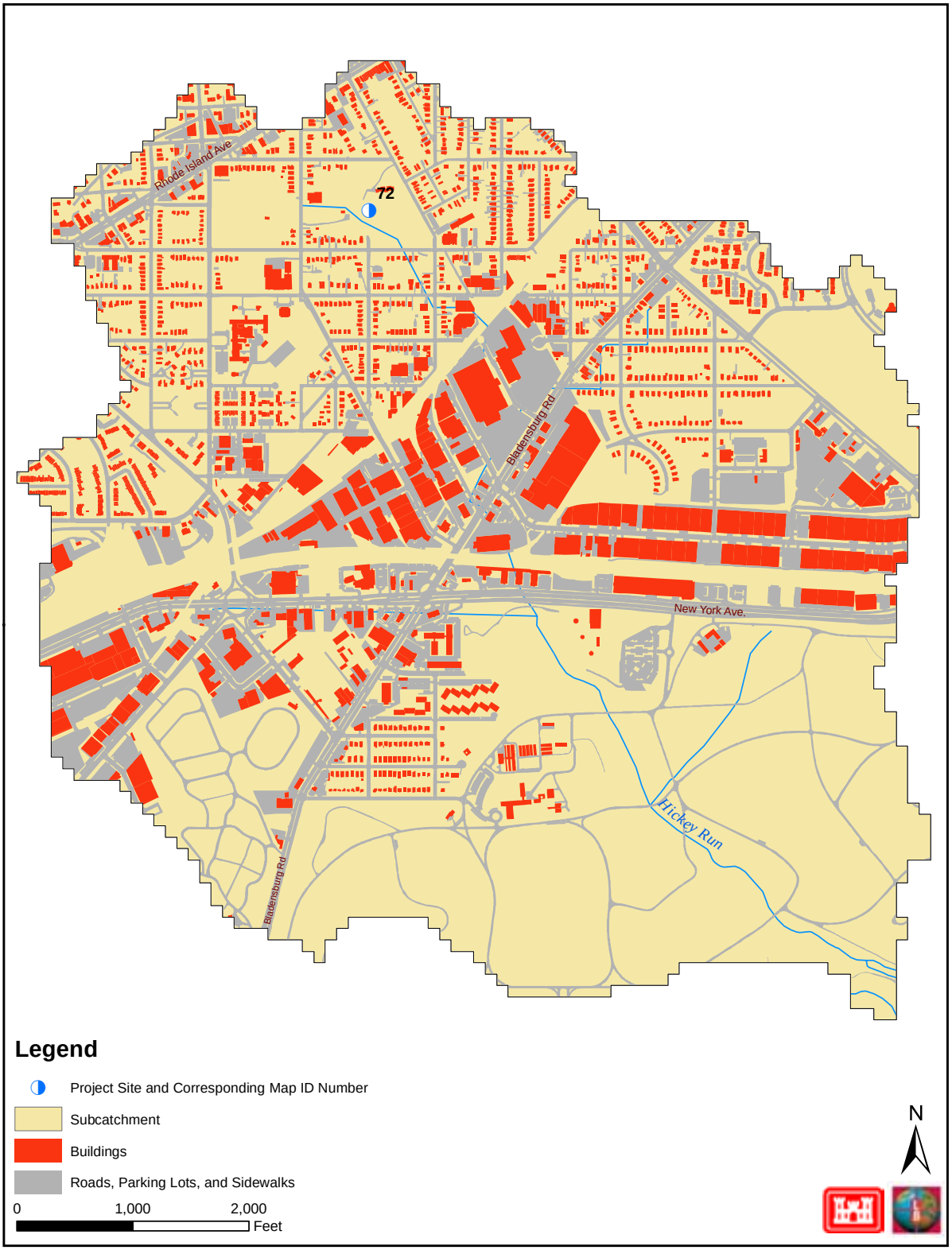

Table 8. Hickey Run – Candidate Riparian Restoration Projects

Project ID	MAP ID	Jurisdiction	Site Location Name	ADC Map Book Location	Project Type[1]	Ownership	Approx Acreage	General Description of Proposed Actions	Estimated Cost ($)	Project Score (pts)	Project Ranking
HR-L-05-R-1	72	DC	Forested area by the swimming pool in Langdon Park, at the intersection of 20th Street NE and Franklin Street NE, Washington, DC	11 J 9	1d	Public	1.0	Forested Riparian Preservation Area, Invasive Species Removal	5,000		

DC = District of Columbia

[1] 1a= Upland Reforestation, 1b= Riparian Reforestation, 1c= Meadow Creation, 1d= Invasive Plant Management

Figure 14a – Candidate Riparian Restoration Project		
Site Location:	Forested area by the swimming pool in Langdon Park, at the intersection of 20th Street NE and Franklin Street NE, Washington, DC	
Project No.:	HR-L-05-R-1	
ADC Map Book Location:	11 J 9	Map ID: 72
Approximate Acreage (acres):	1.0	
Description of Existing Conditions:	There is a forested area approximately 128,500 square feet adjacent to Langdon Park and a residential community. The forest is overgrown with invasives, including Japanese honeysuckle (*Lonicera japonica*), English ivy (*Hedera helix*), poison ivy (*Toxicodendron radicans*), and multiflora rose (*Rosa multiflora*).	
Project Description:	**Forested Riparian Preservation Area, Invasive Species Removal** - Recommend to set aside this area for preservation since there are few natural forested areas in this watershed. Remove invasives and plant with endemic shrubs and plants.	

Figure 15 – Hickey Run Candidate Trash Reduction Sites

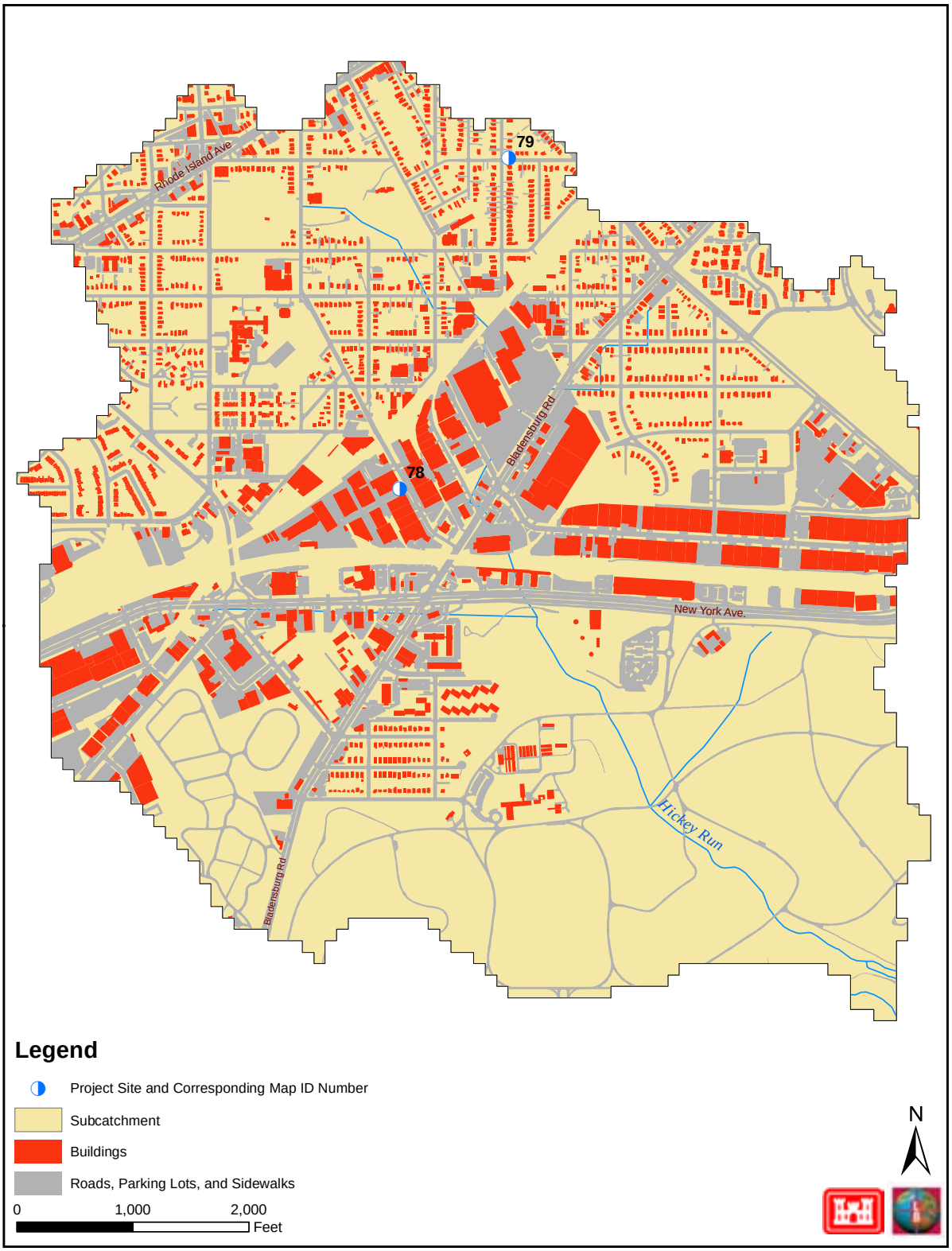

Table 9. Hickey Run – Candidate Trash Reduction Projects

Project ID	MAP ID	Jurisdiction	Site Location Name	ADC Map Book Location	Project Type	Ownership	Approx Length (ft)	General Description of Proposed Actions	Estimated Cost ($)	Project Score (pts)	Project Ranking
H-L-06-T-1	78	DC	Queens Chapel Road NE between Bladensburg Road NE and Evarts Street NE, Washington, DC	11 J 9	1a	Public	2500	Street Sweeping	200		
H-L-06-T-2	79	DC	Hamlin Street NE between South Dakota Avenue NE and Rhode Island Avenue NE, Washington, DC	11 J 10	1a	Public	2600	Street Sweeping	200		

DC= Washington D.C.

[1] 1a = Street Sweeping, 1b = Manual/Mechanical removal, 1c= Structural, 1d=Outreach/education

Figure 16a – Candidate Trash Reduction Project		
Site Location:	Queens Chapel Road NE between Bladensburg Road NE and Evarts Street NE, Washington, DC	
Project No.:	HR-L-06-T-1	
ADC Map Book Location:	11 J 9	Map ID: 78
Approximate Length (feet):	2,500	
Description of Existing Conditions:	The road is bordered by commercial and industrial sites and shows moderate sediment and trash buildup around the curb inlet drains and in the middle of the street.	
Project Description:	**Street Sweeping** – Conduct street sweeping on both curbs on a quarterly basis.	

Figure 16b – Candidate Trash Reduction Project		
Site Location:	Hamlin Street NE between South Dakota Avenue NE and Rhode Island Avenue NE, Washington, DC	
Project No.:	HR-L-06-T-2	
ADC Map Book Location:	11 J 10	Map ID: 79
Approximate Length (feet):	2,600	
Description of Existing Conditions:	Hamlin Street NE is split into two sections in a residential area. The sections show accumulation of trash (plastic bottles, cups, cans) and wood debris.	
Project Description:	**Street Sweeping** – Conduct street sweeping on both curbs on a quarterly basis.	

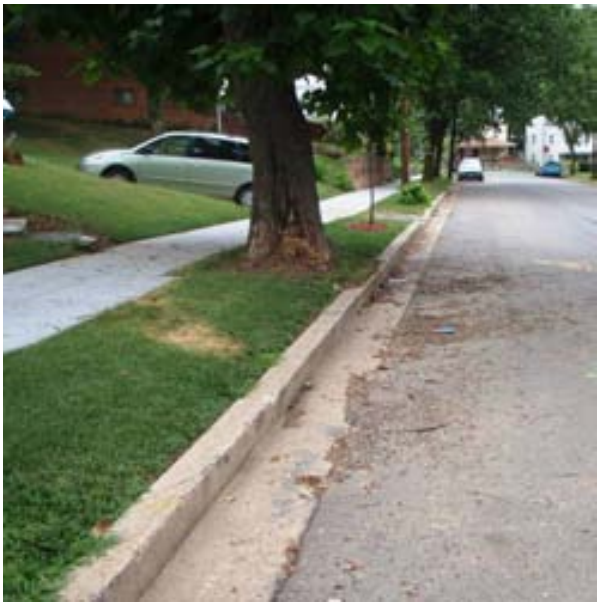

Table 10. Hickey Run – Land Acquisition

Project ID	MAP ID	Jurisdiction	Site Location Name	ADC Map Book Location	Owner	Ownership	Approx. Acreage	General Description of Proposed Actions	Estimated Cost ($)	Project Score (pts)	Project Ranking[1]
H-L-08-L-1	1	PG	V Street NE, Washington DC	11 K 10	2800 V Street LP	Private	3	Land Acquisition	300,000		Medium
H-L-08-L-2	2	PG	Lawrence Avenue NE, Washington DC	11 H 10, 11 J 10	District of Columbia	Public	2.36	Land Acquisition	236,000		Medium
H-L-08-L-3	3	PG	1701 Adams Street NE, Washington DC	11 H 10	District of Columbia	Public	2.43	Land Acquisition	243,000		Medium
H-L-08-L-4	4	PG	20th Street NE, Washington DC	11 H 9, 11 J 9, 11 H 10, 11 J 10	District of Columbia	Public	5.3	Land Acquisition	530,000		High
H-L-08-L-5	5	PG	3165 Adams Street NE, Washington DC	12 A 10	Teamsters Local 639 Trust Fund	Private	0.89	Land Acquisition	89,000		Low
H-L-08-L-6	6	PG	W Street NE, Washington DC	11 H 10, 11 H11, 11 G 11	District of Columbia	Public	5.35	Land Acquisition	535,000		High

[1] Potential land acquisition projects were identified by the following criteria: adjacency to streams/stream channel erosion, forested riparian corridors, NWI wetlands, private parcels forming a gap between a contiguous riparian corridors, forest, NWI wetland or parkland, adjacency to existing forest or mature forest, adjacency to or within a FEMA 1-percent-annual-chance floodplain, size of private parcel.

Figure 17. Hickey Run Land Acquisition