

# Anacostia River Watershed Restoration Plan

## Lower Beaverdam Subwatershed Provisional Restoration Project Inventory



December 2009

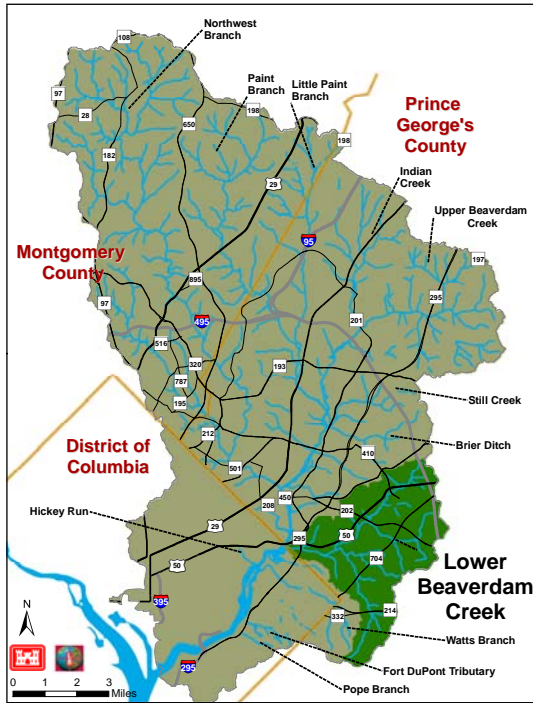
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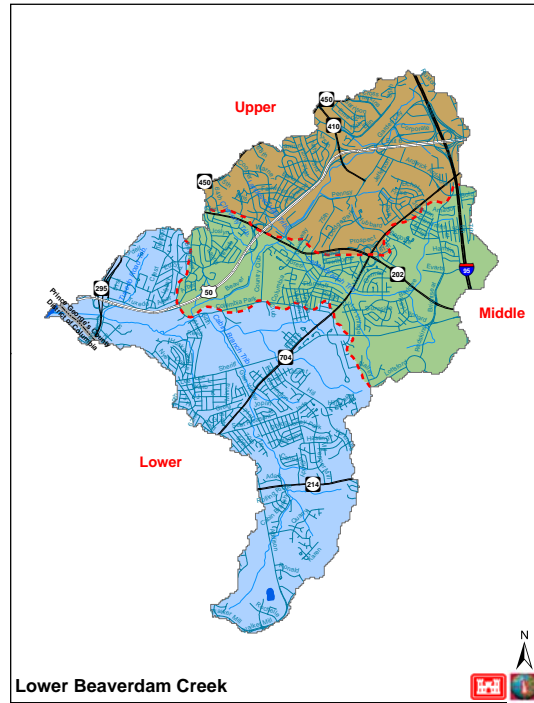
## **I. Background**

Lower Beaverdam Creek is the southeastern most major tributary of the Anacostia River. The stream drains approximately 14.9 mi<sup>2</sup> (9,561 acres) of which 32 percent is impervious. It joins the river just downstream of the District of Columbia-Maryland border at Kenilworth Marsh. The subwatershed is generally bound by the Capital Beltway (Interstate 495) and Central Avenue (MD Route 214) to the north and east, the Kenilworth Aquatic Gardens/Kenilworth Marsh to the south, and Annapolis Road (MD Route 450) to the west. Approximately 99.8 percent of the subwatershed is located within Prince George's County, with the remaining 0.2 percent located in the District of Columbia. Major Lower Beaverdam Creek tributaries include: Cattail Branch, Cabin Branch, Landover Hills tributary, Cheverly tributary and Tuxedo Road tributary. The dominant land uses are residential (41 percent), forest (26 percent) and industrial (17 percent). The sub-watershed is home to about 79,000 people. This is one of the most intensely developed areas in the Anacostia basin and much of the development occurred before stormwater controls were in effect.

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 sub-watersheds and the tidal river reach within the Anacostia River basin.



**Figure 1- Lower Beaverdam Creek Subwatershed**



**Figure 2- Lower Beaverdam Creek Subwatershed Unit**

## II. Restoration Inventory

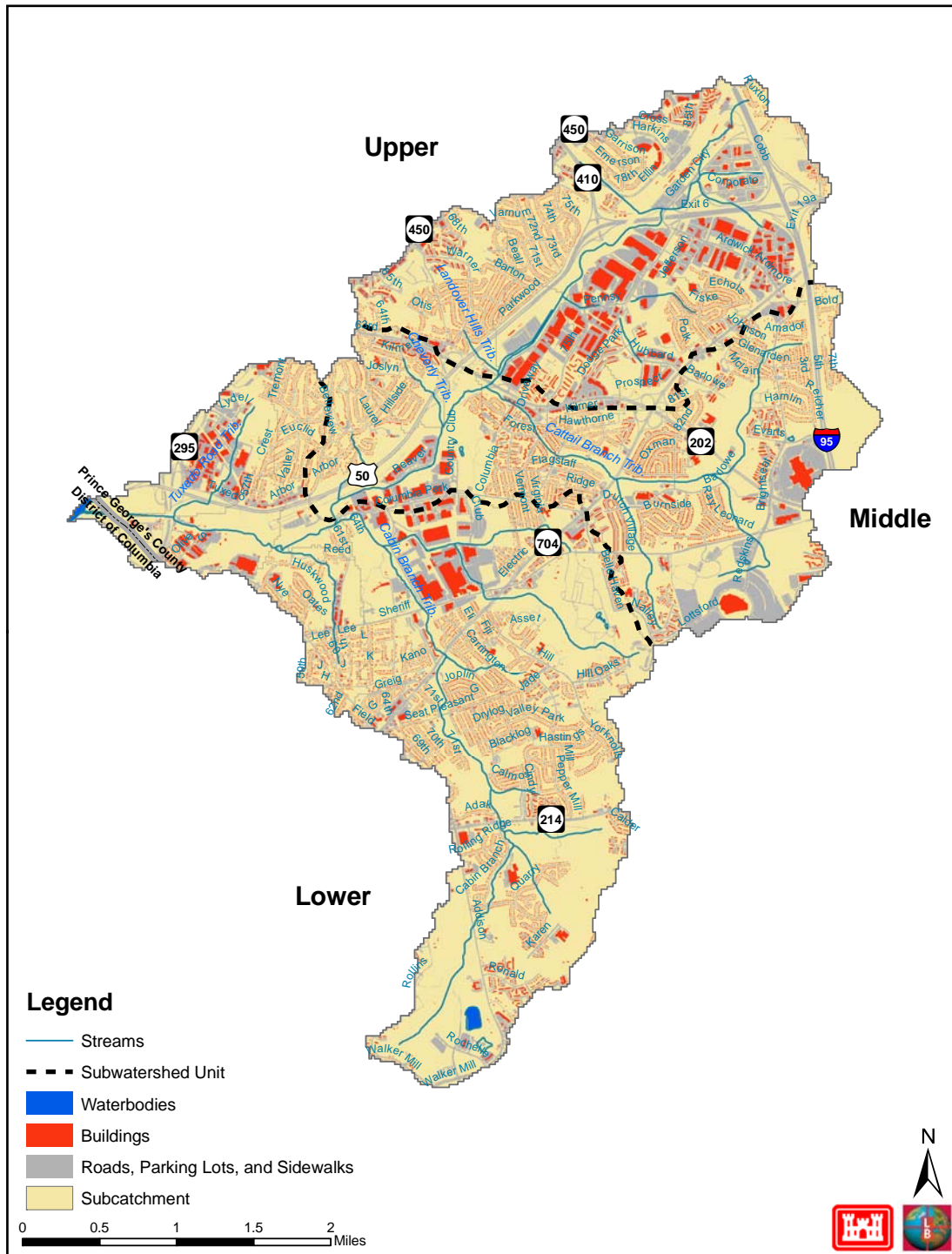
The following sections include stormwater retrofit, stream restoration, wetland restoration, and riparian restoration, and actions for further evaluation by others. As previously noted, the restoration projects presented herein are conceptual or planning level only. It is recognized that more detailed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

To facilitate reader understanding of the Lower Beaverdam Creek Subwatershed: Provisional Restoration Project Inventory, information has been organized into the following six sections:

- Section A - Impervious Features Summary
- Section B - Existing Stormwater Management Facilities Summary
- Section C - Candidate Restoration Project Summary
- Section D – Upper Lower Beaverdam Candidate Restoration Projects
- Section E – Middle Lower Beaverdam Candidate Restoration Projects
- Section F – Lower Lower Beaverdam Candidate Restoration Projects

## **A. Impervious Features Summary**

**Figure 3 - Summary: Lower Beaverdam Creek Impervious Features**



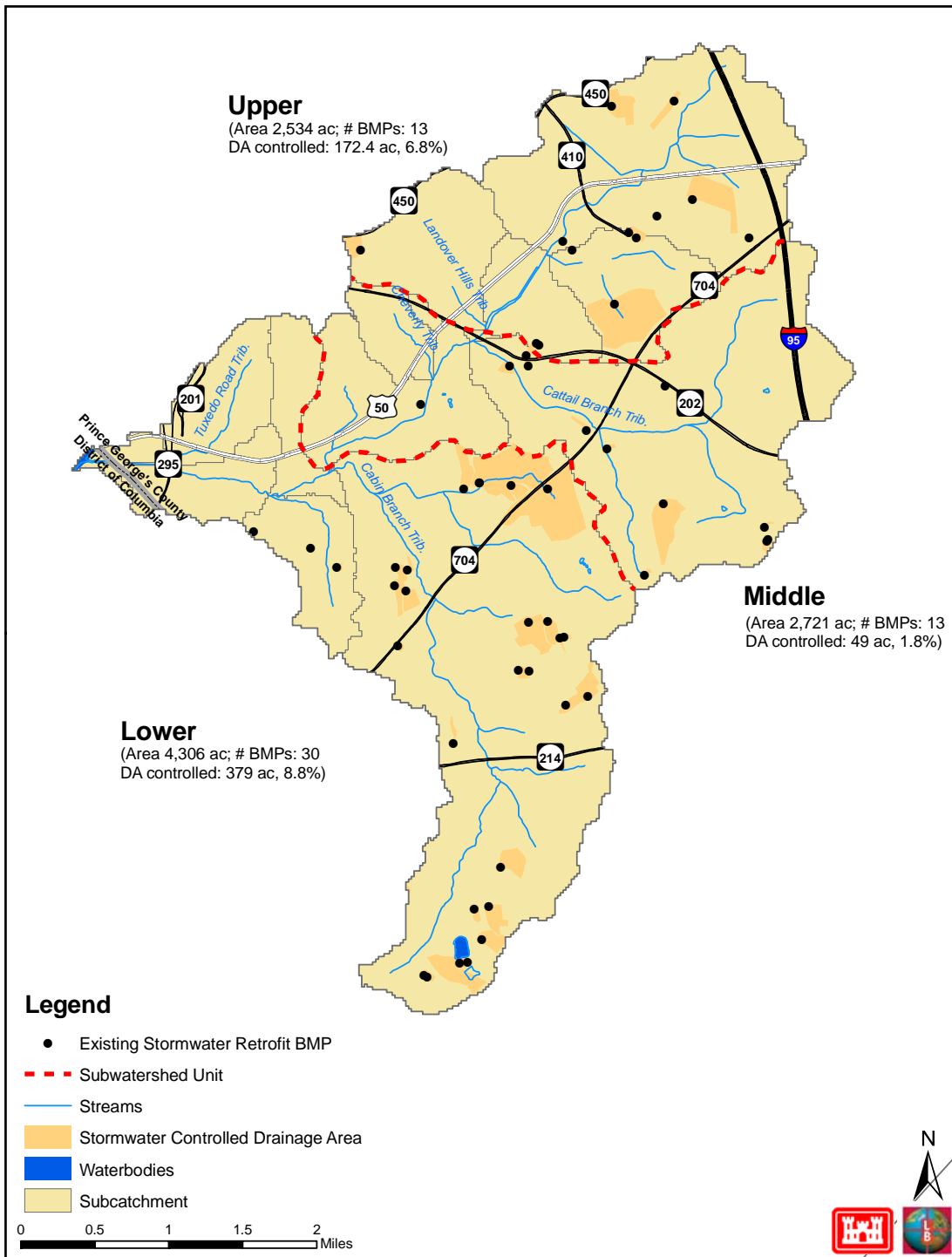
**Table 1. Lower Beaverdam Creek: Summary - Impervious Surfaces**

Category	Acres	Miles
<b>1. Roads</b>	<b>921.3</b>	<b>185.3</b>
a. State/Fed	223.3	24.2
b. Local	697.9	161.1
<b>2. Parking Lots</b>	<b>1,041.9</b>	
a. Public/Institutional	52.4	
b. Private	989.5	
<b>3. Roofs</b>	<b>905.4</b>	
a. Public/Institutional	35.3	
b. Private	560.5	
c. Single Family	309.6	
<b>3. Other</b>		
a. Sidewalks *	78.1	
b. Single Family Driveways ^	149.8	
<b>Total</b>	<b>3,096.5</b>	
<b>Avg. % Imperviousness</b>	<b>32%</b>	
<b># of Single Family Homes</b>	<b>10,697</b>	
<b>Total Drainage area</b>	<b>9,561</b>	
<b>^ Driveways assumptions</b>	Average Driveway=0.014 Acres	
<b>* Sidewalks assumptions</b>	Width equal to 4 feet with a sidewalk running the length of one side of the road.	
<b>Note: Drainage area and tributary area calculated using the USGS 30-meter digital elevation model (DEM)</b>		

## **B. Existing Stormwater Management Facilities Summary**



**Figure 4 - Summary: Lower Beaverdam Creek Existing Stormwater Management BMP Sites**



**Table 2. Lower Beaverdam Creek: Summary – Lower Beaverdam Creek Existing Stormwater Management BMPs**

Type	No. of Facilities	Percent of Total BMP's	D.A. Controlled (ac.)
1. Dry Pond	8	14.3%	64.8
2. ED Dry Pond	6	10.7%	51.1
3. Wet Pond	13	23.2%	179.4
4. ED Wet Pond	5	8.9%	250.0
5. Wetland (non-ED and ED)	4	7.1%	4.6
6. Infiltration (Trench or Basin)	5	8.9%	0.6
7. Oil/Grit Separator	2	3.6%	3.0
8. Water Quality Inlet (e.g. Stormceptor, Bay Saver, etc)	11	19.6%	44.5
9. Bioretention /Rain Garden	-	0.0%	-
10. 'Green Street'*	-	0.0%	-
11. Biofiltration Swale	-	0.0%	-
12. Grass Swale w/ Check Dams	-	0.0%	-
13. Porous Pavement	-	0.0%	-
14. Sand Filter	1	1.8%	1.6
15. Underground Pipe Storage	1	1.8%	1.0
16. Cistern	-	0.0%	-
17. Green Roof	-	0.0%	-
18. Other	-	0.0%	-
<b>Total</b>	<b>56</b>	<b>100%</b>	<b>600.6</b>

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

## **C. Candidate Restoration Project Summary**

**Table 3. Summary: Restoration Candidate Projects**

	<b>Candidate Project Type</b>	<b>Number of Projects</b>	<b>Estimated Cost (\$)</b>	<b>Impervious Acreage Controlled (ac)</b>	<b>Length (mi)</b>	<b>Acreage (ac)</b>
1	Stormwater Retrofit	327	426,257,000	1,902.8		
2	Stream Restoration	43	35,925,000		9.7	
3	Wetland Creation/Restoration	8	767,000			11.4
4	Fish Blockage Removal/Modification	10	1,981,000		1.4	
5	Riparian Reforestation, Meadow Creation, Street Tree and Invasive Management	18	437,000			49.3
6	Trash Reduction	18	89,000		9.8	
7	Toxic Remediation					
8	Parkland Acquisition	14	39,210,000			392.1
	<b>Total</b>	<b>438</b>	<b>504,666,000</b>	<b>1,902.8</b>	<b>20.9</b>	<b>452.8</b>

**Table 4. Lower Beaverdam Creek Subwatershed: Provisional Restoration Project Inventory ‘Unit Costs’\***

<b>N</b>	<b>Practice</b>	<b>Approx. Unit Cost (\$)</b>
<b>Stormwater Retrofit</b>		
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
<b>Stream Restoration/Fish Passage/Wetland Creation</b>		
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
<b>Riparian Reforestation/Meadow Creation/ Invasive Plant Management</b>		
20	Riparian Reforestation	~ \$9,000/acre
21	Wildflower Meadow Creation	~ \$5,000/acre
22	Invasive Plant Management	~ \$5,000/acre
<b>Trash Reduction/Water Quality</b>		
23	Manual Trash Pickup	~ \$300/100 LF
24	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
<b>Parkland Acquisition</b>		
29	Parkland 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