Anacostia River Watershed Restoration Plan

Fort Dupont Subwatershed
Provisional Restoration Project Inventory











July 2009

Table of Contents

I. Background

The Fort Dupont tributary is a third order tributary to the Anacostia River and is 443 acres (0.69 square miles). Although the tributary lies entirely within the District of Columbia, the National Park Service (NPS) owns about 85-percent of the land (376 acres) drained by Fort Dupont and its three small tributaries. Approximately 80-percent of the NPS-owned land is forested by mature eastern hardwoods. The average impervious level in the watershed is 13.3-percent, located primarily in the watershed's headwaters. Despite this relatively low level of imperviousness, the impacts of uncontrolled stormwater runoff to the stream channel are clear.

Approximately 1.5 miles of the Fort Dupont's 1.9-mile main stem has unstable, eroding banks, caused by downcutting. These unstable banks contribute sediment to the Anacostia River. Since approximately 85-percent of the watershed is part of Fort Dupont National Park, which is used as recreational/preserved lands and is covered by eastern deciduous hardwoods, nutrient loading of the tributary is less of a concern. The upper portion of the watershed does, however, lie in residential areas, which contribute runoff pollution to the stream in the form of oil and other automobile fluids. Measurements taken during storm events also show that high stormwater flows may also move high levels of copper (Cu) and iron (Fe) from the stream banks into the stream.

Approximately 2,240 linear feet of the Fort Dupont tributary is piped, prohibiting all fish migration and decreasing the habitat area for macro-invertebrates. The longest piped sections are at the downstream end of the tributary and the section that passes under Fort Davis drive and the associated fill area.

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.

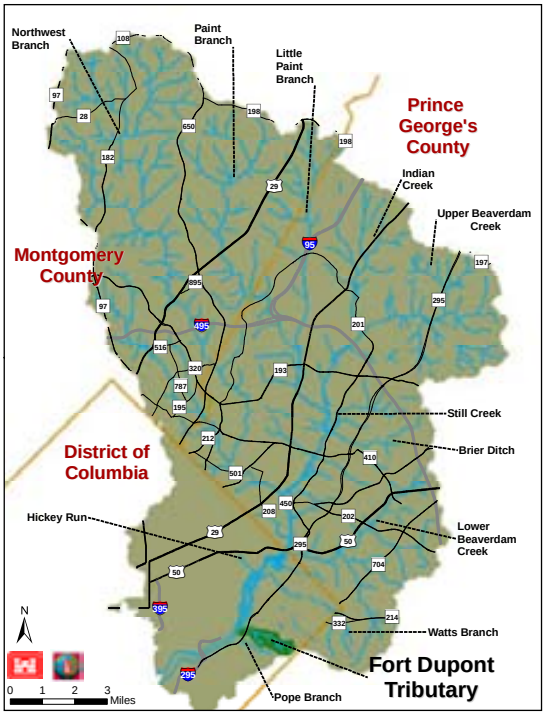

Figure 1- Fort Dupont Subwatershed

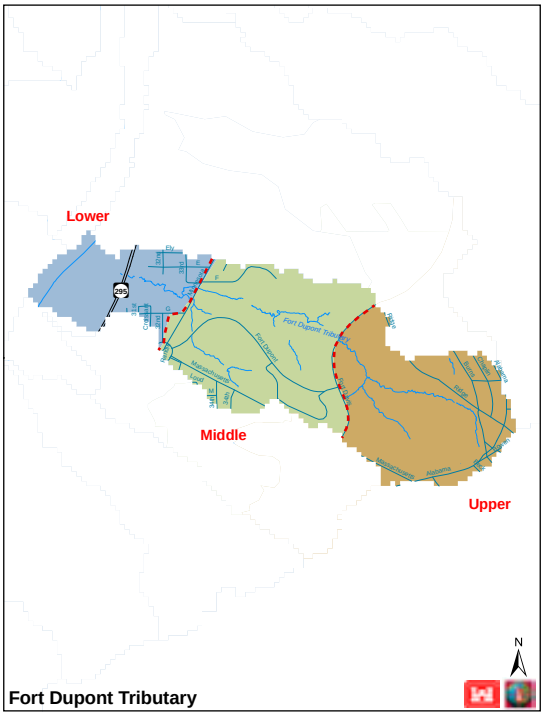

Figure 2- Fort Dupont Subwatershed Unit

II. Restoration Inventory

The following sections include stormwater retrofit, stream restoration, wetland restoration, fish blockage removal, and riparian restoration projects, 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 Fort Dupont 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 - Fort Dupont Candidate Restoration Projects

A. Impervious Features Summary

Figure 3 - Summary: Fort Dupont Impervious Features

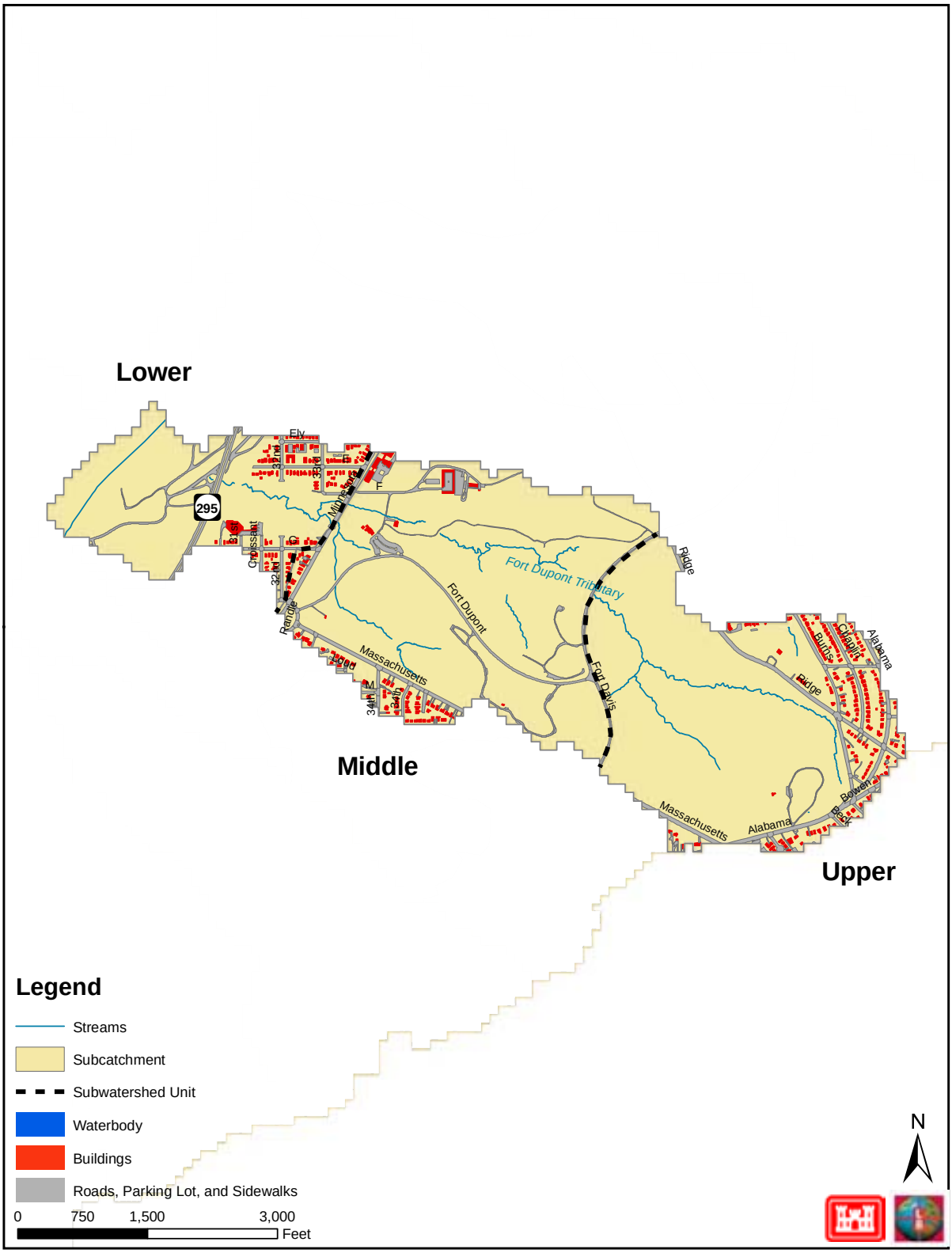

Table 1. Fort Dupont: Summary - Impervious Surfaces

Category	Acres	Miles
1. Roads	**26.1**	8.5
a. State/Fed	1.9	0.1
b. Local	24.2	8.4
2. Parking Lots	**10.6**	
a. Public/Institutional	9.9	
b. Private	0.7	
3.Roofs	**12.6**	
a. Public/Institutional	2.3	
b .Private	0.1	
c. Single Family	10.2	
3. Other		
a. Sidewalks *	3.0	
b. Single Family Driveways ^	5.3	
Total	**57.6**	
Avg. % Imperviousness	12%	
# of Single Family Homes	379	
Total Drainage area	**494**	
^ 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: Fort Dupont Existing Stormwater Management BMP Sites

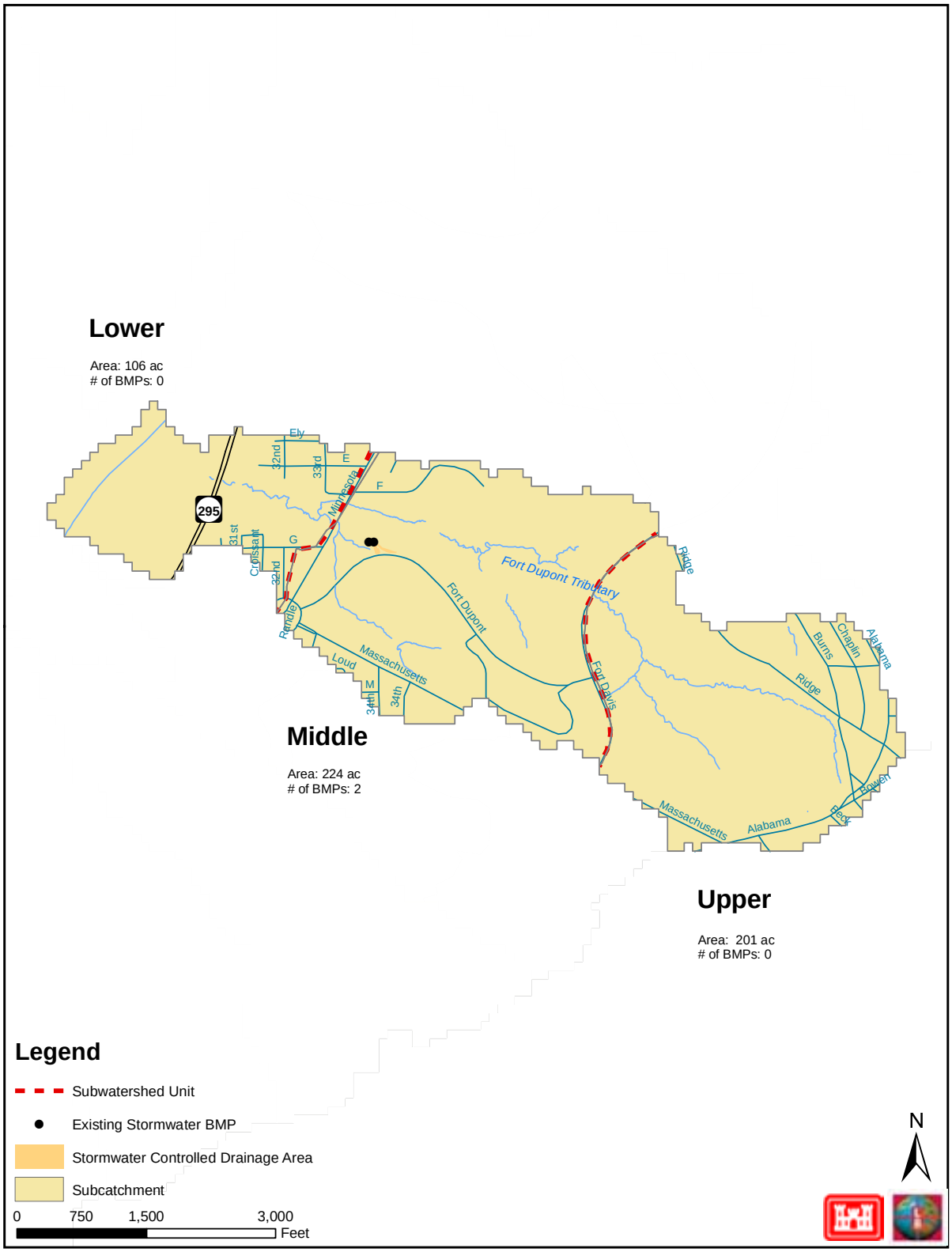

Table 2. Fort Dupont: Summary –Existing Stormwater Management BMPs

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			
8.	Water Quality Inlet (e.g. Stormreceptor, Bay Saver, etc)			
9.	Bioretention /Rain Garden	5	100.0	2.4
10.	'Green Street'*			
11.	Bioswale			
12.	Grass Swale w/ Check Dams			
13.	Porous Pavement			
14.	Sand Filter			
15.	Underground Pipe Storage			
16.	Cistern			
17.	Green Roof			
18.	Other			
	Total	**5**	**100.0**	**2.4**

* 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 (ft)	Acreage (ac)
1	Stormwater Retrofit	16	4,575,133	42.8	-	72.5
2	Stream Restoration	7	2,280,000	-	7,600	-
3	Wetland Creation/Restoration	2	30,000	-	-	0.6
4	Fish Blockage Removal/Modification	11	5,175,000	-	8,185	-
5	Riparian Reforestation, Meadow Creation, Street Tree and Invasive Management	1	14,000	-	-	1.0
6	Trash Reduction	0	-	-	-	-
7	Toxic Remediation	0	-	-	-	-
8	Parkland Acquisition	2	2,370,000	-	-	23.7
	Total	**39**	**14,444,000**	**42.8**	**15,785**	**97.8**

Table 4. Fort Dupont 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. Fort Dupont Candidate Restoration Projects

Figure 5 – Upper Fort Dupont Candidate Stormwater Retrofit Sites

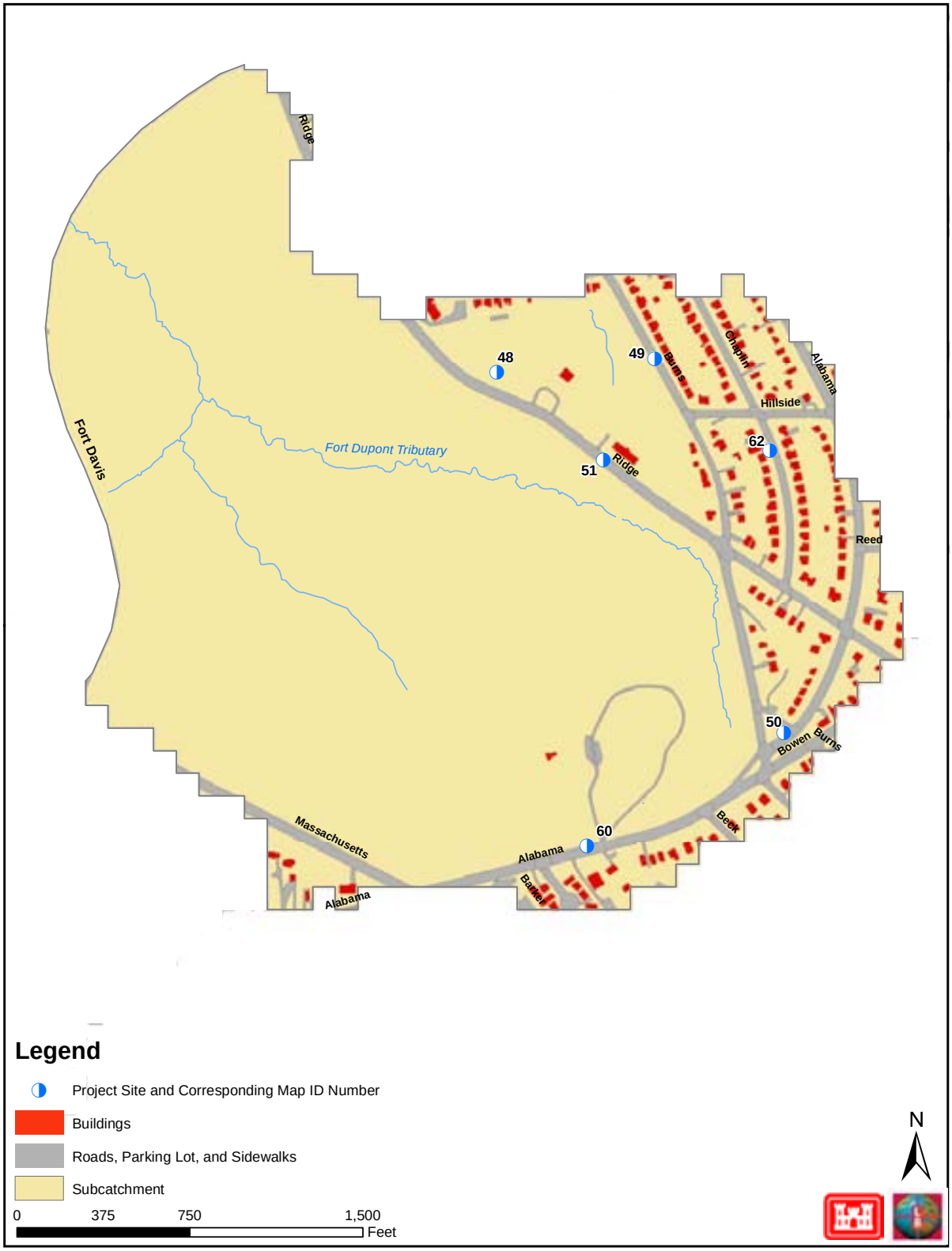

Figure 6 – Upper Fort Dupont Candidate Stormwater Retrofit Drainage Areas

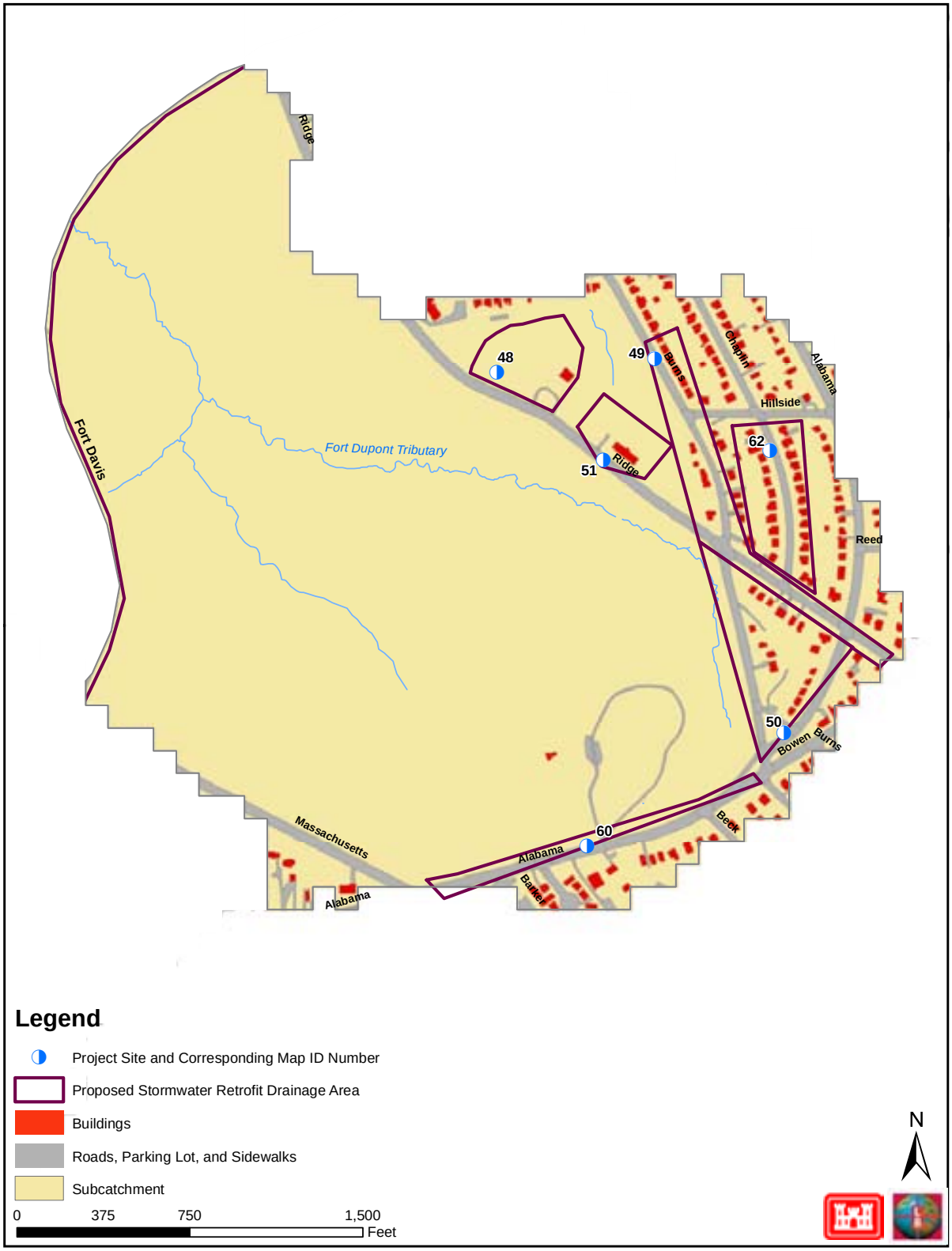

Figure 7 – Upper Fort Dupont Candidate Stormwater Retrofit and Existing Stormwater Retrofit Drainage Areas

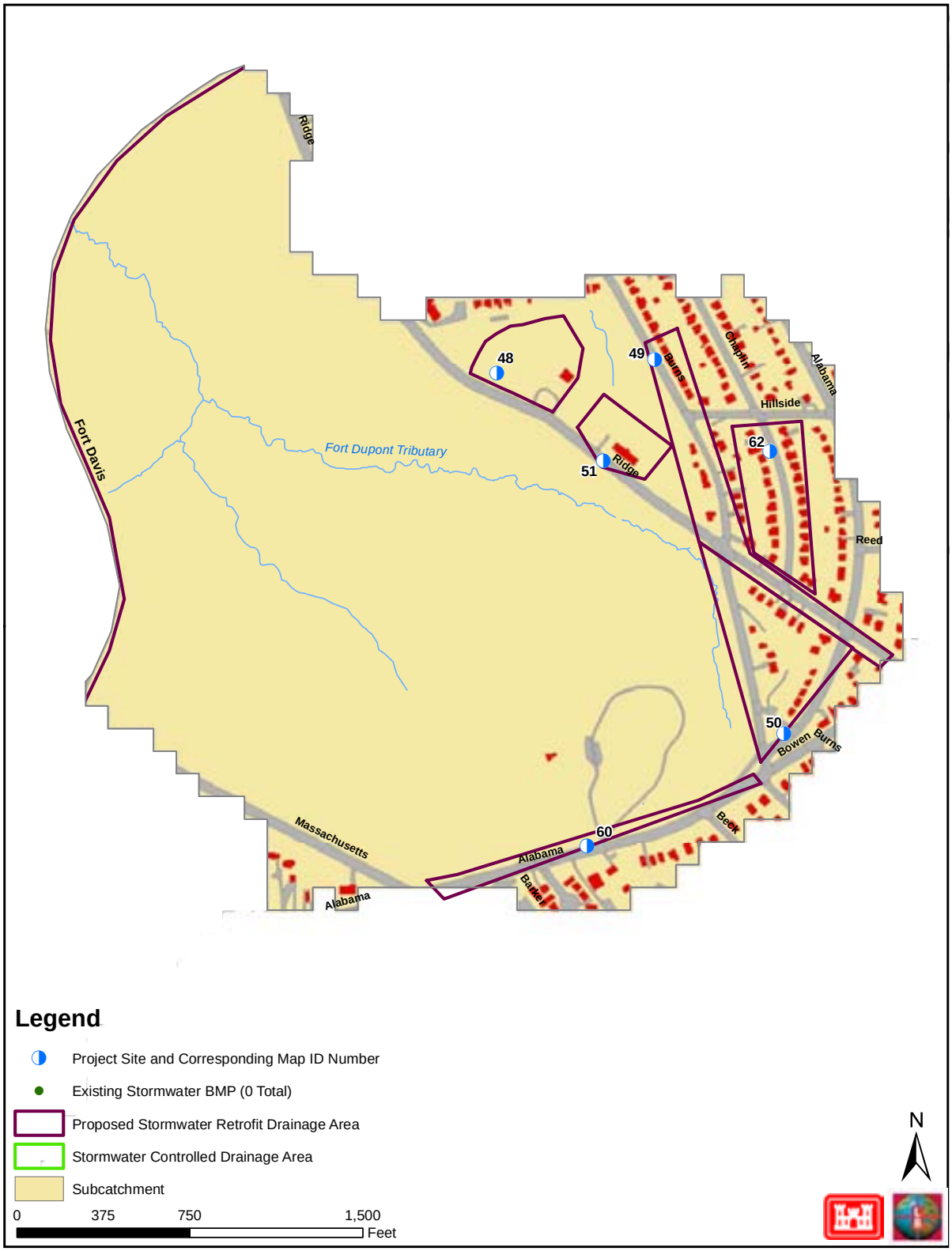

Table 5. Upper Fort Dupont – Candidate Stormwater Retrofit Projects

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)				
FD-U-01-S-1	48	DC	Ridge Road Recreation Center, 800 Ridge Road SE, Washington, DC	18 D 5	1c	Public	3.0	50	1.5	LID Rain Garden, LID Bioswale	155,000		
FD-U-01-S-2	49	DC	Burns Street SE between Bowen Road SE and 856 Burns Street SE, Washington, DC	18 D 5	1c	Public	5.4	80	4.3	LID Bioretention	430,000		
FD-U-01-S-3	50	DC	Residential neighborhood bounded by 856 Burns Street SE, Bowen Road SE, and Alabama Avenue SE, not including Chaplin Street SE, Washington, DC	18 D 6	1c	Public	5.9	35	2.1	Rainscape	120,000		
FD-U-01-S-4	51	DC	Ridge Road Outdoor Pool and Basketball Courts, Ridge Road SE and Burns Street SE, Washington, DC	18 D 5	1b	Public	1.9	70	1.3	LID Bioretention	130,000		
FD-U-01-S-5	60	DC	Alabama Avenue SE between Massachusetts Avenue SE and Burns Street SE, Washington, DC	18 D 6	1b	Public	1.8	80	1.4	LID Bioretention	140,000		
FD-U-01-S-6	62	DC	Chaplin Street SE between Hillside Road SE and Ridge Road SE, Washington, DC	18 D 5	1c	Public	4.1	40	1.6	Rainscape, LID Tree Box Filter	520,000		

DC = District of Columbia

[1] 1a= Water quantity, 1b= Water quantity and quality, 1c= Water quality

Figure 8a – Candidate Stormwater Retrofit Project		
Site Location:	Ridge Road Recreation Center, 800 Ridge Road SE, Washington, DC	
Project No.:	FD-U-01-S-1	
ADC Map Book Location:	18 D 5	Map ID: 48
Approximate Associated Drainage Area (acres):	3.0	
Approximate Imperviousness:	50%	1.5 acres
Description of Existing Conditions:	The site includes a synthetic turf athletic field and a surrounding grass area. Stormwater runoff drains south to a concrete drainage channel.	
Project Description:	**LID Rain Garden, LID Bioswale -** Disconnect downspouts and install rain gardens. Replace the concrete drainage channel with a bioswale.	

Figure 8b – Candidate Stormwater Retrofit Project		
Site Location:	Burns Street SE between Bowen Road SE and 856 Burns Street SE, Washington, DC	
Project No.:	FD-U-01-S-2	
ADC Map Book Location:	18 D 5	Map ID: 49
Approximate Associated Drainage Area (acres):	5.4	
Approximate Imperviousness:	80%	4.3 acres
Description of Existing Conditions:	Stormwater runoff from Burns Street SE drains to curb inlets at the Ridge Road SE intersection and along the west side. Burns Street SE is a two-lane street with parking on either side. There is no concrete curb between Hillside Road SE and Bowen Road SE.	
Project Description:	**LID Bioretention** – Construct a bioretention system at the southwest corner of Ridge Road SE and Burns Street SE and west of Burns Street SE north of Hillside Road SE.	

Figure 8c – Candidate Stormwater Retrofit Project		
Site Location:	Residential neighborhood bounded by 856 Burns Street SE, Bowen Road SE, and Alabama Avenue SE, not including Chaplin Street SE, Washington, DC	
Project No.:	FD-U-01-S-3	
ADC Map Book Location:	18 D 6	Map ID: 50
Approximate Associated Drainage Area (acres):	5.9	
Approximate Imperviousness:	35%	2.1 acres
Description of Existing Conditions:	This residential neighborhood has wide streets and one- and two-story homes. The downspouts drain into the lawns.	
Project Description:	**Rainscape** - Install rain barrels and rain gardens at downspouts.	

Figure 8d – Candidate Stormwater Retrofit Project		
Site Location:	Ridge Road Outdoor Pool and Basketball Courts, Ridge Road SE and Burns Street SE, Washington, DC	
Project No.:	FD-U-01-S-4	
ADC Map Book Location:	18 D 5	Map ID: 51
Approximate Associated Drainage Area (acres):	1.9	
Approximate Imperviousness:	70%	1.3 acres
Description of Existing Conditions:	The site consists of locker rooms, a pool, and basketball courts s part of Ridge Road Park.	
Project Description:	**LID Bioretention** – Construct a bioretention area in the green space between Ridge Road and the basketball courts.	

Figure 8e – Candidate Stormwater Retrofit Project		
Site Location:	Alabama Avenue SE between Massachusetts Avenue SE and Burns Street SE, Washington, DC	
Project No.:	FD-U-01-S-5	
ADC Map Book Location:	18 D 6	Map ID: 60
Approximate Associated Drainage Area (acres):	1.8	
Approximate Imperviousness:	80%	1.4 acres
Description of Existing Conditions:	A four-lane street is bordered on the south by commercial areas and residences and on the north by Fort DuPont Park. Stormwater runoff is drained by curb inlets at the intersections and on the north side of the road.	
Project Description:	**LID Bioretention** - Construct a bioretention system on the north side of the street.	

Figure 8f – Candidate Stormwater Retrofit Project		
Site Location:	Chaplin Street SE between Hillside Road SE and Ridge Road SE, Washington, DC	
Project No.:	FD-U-01-S-6	
ADC Map Book Location:	18 D 5	Map ID: 62
Approximate Associated Drainage Area (acres):	4.1	
Approximate Imperviousness:	40%	1.6 acres
Description of Existing Conditions:	Chaplin Street SE is a residential neighborhood primarily consisting of one-story, single-family homes. The road has two lanes and parking on either side. Stormwater runoff drains into curb inlet drains. There is a wide public sidewalk on either side of the street. Downspouts drain into lawns.	
Project Description:	**Rainscape, LID Tree Box Filter** - Install rain barrels and rain gardens at the downspouts. Install tree box filters at curb inlet drains.	

Figure 9 – Upper Fort Dupont Candidate Stream Restoration Sites

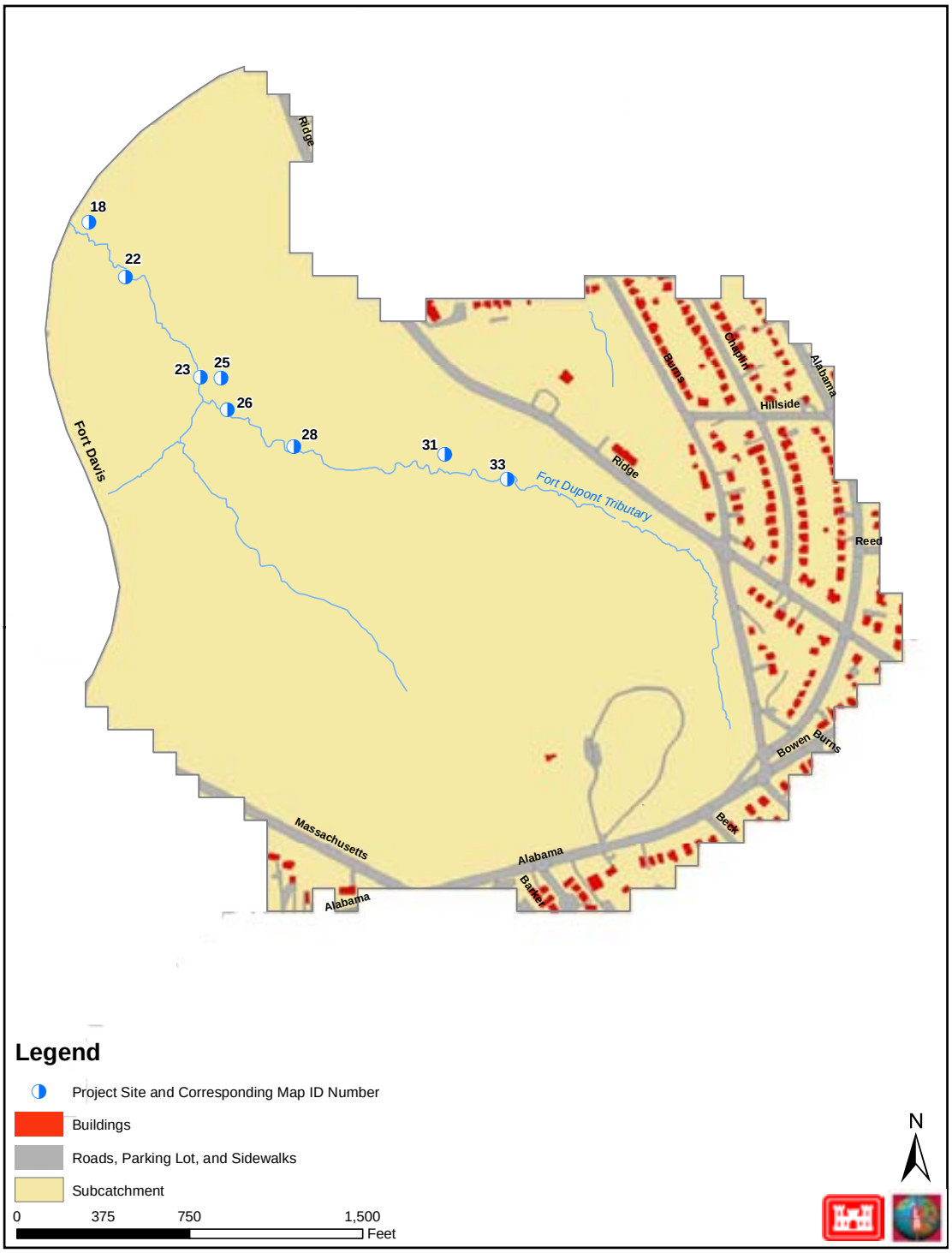

Table 6. Upper Fort Dupont - Candidate Stream Restoration Projects

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
FD-U-02-SR-1	18, 22, 23, 25, 26, 28, 31, 33	DC	Upper hydrological unit of Fort Dupont Tributary between Fort Davis Drive SE and Burns Street SE, Washington, DC	18 C 5, 18 D 5	1a, 1b	Public	3,600	Bank Stabilization, In-Stream Habitat Stabilization	1,080,000		

DC = District of Columbia

[1] 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:	Upper hydrological unit of Fort Dupont Tributary between Fort Davis Drive SE and Burns Street SE, Washington, DC	
Project No.:	FD-U-02-SR-1	
ADC Map Book Location:	18 C 5, 18 D 5	Map ID: 18, 22, 23, 25, 26, 28, 31, 33
Approximate Length (feet):	3,600	
Description of Existing Conditions:	The entire upper hydrological unit of the main stem of Fort Dupont Tributary is experiencing severe to moderate stream bank erosion. Both banks are adjacent to steep, forested slopes.	
Project Description:	**Bank Stabilization, In-Stream Habitat Stabilization –** Stabilize banks with tools such as live stakes or erosion mats. Recommend in-stream habitat stabilization by creating riffles and pools at base flow and directing thalweg flow away from banks during high flow events. Structures include rock vanes, cross vanes, log and stone deflectors, and/or boulders.	

Map ID: 18. Approximately 1,100 feet west of the intersection of G Street SE and Ridge Road SE, Washington, DC

Proposed Stream Restoration Projects in Upper Hydrological Unit of Fort Dupont Tributary


Map ID: 22. Approximately 1,500 feet upstream from the intersection of G Street SE and Ridge Road SE, Washington, DC

Map ID: 23. Approximately 2,150 feet upstream from the intersection of G Street SE and Ridge Road SE, Washington, DC


Map ID: 25. Approximately 2,300 feet upstream from the intersection of G Street SE and Ridge Road SE, Washington, DC

Proposed Stream Restoration Projects in Upper Hydrological Unit of Fort Dupont Tributary


Map ID: 26. Approximately 2,390 feet upstream from the intersection of G Street SE and Ridge Road SE, Washington, DC


Map ID: 28. Approximately 2,840 feet upstream from the intersection of G Street SE and Ridge Road SE, Washington, DC


Map ID: 31. Approximately 3,645 feet upstream from the intersection of G Street SE and Ridge Road SE, Washington, DC

Proposed Stream Restoration Projects in Upper Hydrological Unit of Fort Dupont Tributary

Map ID: 33. Approximately 4,015 feet upstream from the intersection of G Street SE and Ridge Road SE, Washington, DC. This location has the remnants of a dilapidated stormwater system which needs to be removed.

Figure 11 – Upper Fort Dupont Candidate Fish Blockage Removal Sites

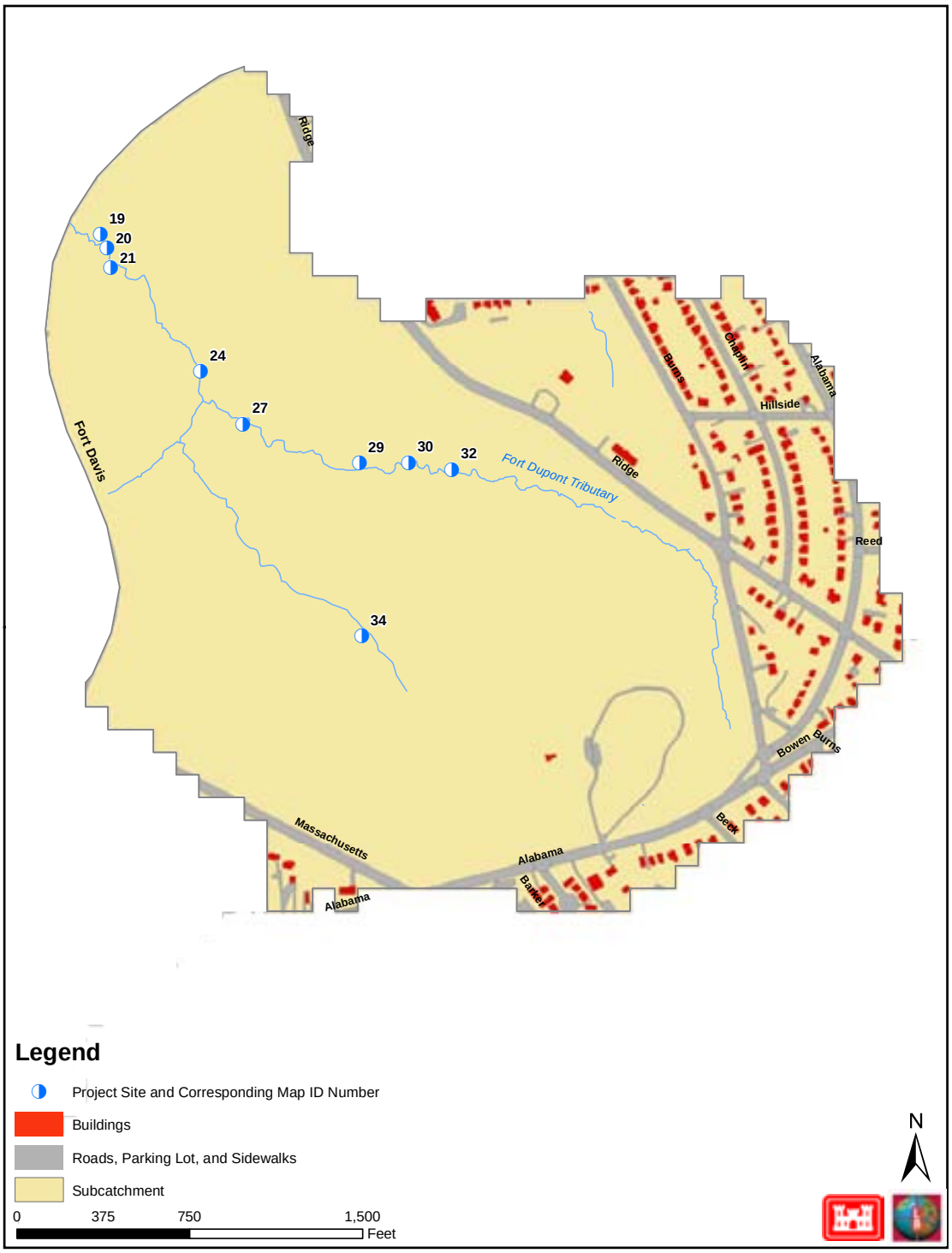

Table 7. Upper Fort Dupont Candidate Fish Blockage Removal Projects

Project ID	MAP ID	Jurisdiction	Site Location Name	ADC Map Book Location	Ownership	Approx Length (feet)	General Description of Proposed Actions	Estimated Cost ($)	Project Score (pts)	Project Ranking
FD-U-04-F-1	34	DC	Approximately 1,000 feet north of the intersection of Massachusetts Avenue SE and Alabama Avenue SE, Washington, DC	18 C 5	Public	350	Fish Blockage Removal	300,000		
FD-U-04-F-2	19, 20, 21, 24, 27, 29, 30, 32	DC	Upper hydrological unit of Fort Dupont Tributary main stem between Fort Davis Drive SE to the west, and Burns Street SE to the east, Washington, DC	18 C 5,18 D 5	Public	3,600	Fish Blockage Removal	900,000		

DC = District of Columbia

Figure 12a – Candidate Fish Blockage Removal Project		
Site Location:	Approximately 1,000 feet north of the intersection of Massachusetts Avenue SE and Alabama Avenue SE, Washington, DC	
Project No.:	FD-U-04-F-1	
ADC Map Book Location:	18 C 5	Map ID: 34
Approximate Upstream Length Open (feet):	350	
Description of Existing Conditions:	A complete fish blockage occurs at this site created by a fallen tree that has caused leaves, sediment, and debris to accumulate. The blockage is approximately six feet wide, fifteen feet long, and two feet high.	
Project Description:	**Fish Blockage Removal –** Remove the fish blockage and the sediment and debris that has accumulated. Create a riffle grade sequence in stream bed.	

Figure 12b – Candidate Fish Blockage Removal Project		
Site Location:	Upper hydrological unit of Fort Dupont Tributary main stem between Fort Davis Drive SE to the west, and Burns Street SE to the east, Washington, DC	
Project No.:	FD-U-04-F-2	
ADC Map Book Location:	18 C 5, 18 D 5	Map ID: 19, 20, 21, 24, 27, 29, 30, 32
Approximate Upstream Length Open (feet):	3,600	
Description of Existing Conditions:	Partial fish blockages have been created in the upper hydrological unit of the main stem of Fort Dupont Tributary primarily by fallen trees and accumulating debris and sediment.	
Project Description:	**Fish Blockage Removal –** Remove all fish blockages and create riffle grade sequences within stream bed. Recommend all fish blockage removal coincide with stormwater retrofits to attenuate rate at which sediment and debris enters the stream.	

Map ID: 19. Approximately 1,000 feet west of the intersection of G Street SE and Ridge Road SE, Washington, DC. Blockage is approximately six inches long, five feet wide, and one half-foot high

Fish Blockages in the Upper Hydrological Unit of the Main Stem of Fort Dupont Tributary

Map ID: 20. Approximately 1,100 feet upstream of the intersection of G Street SE and Ridge Road SE, Washington, DC. A series of three logs in the stream, within 20 feet of each other, created a partial fish blockage. Blockage is approximately six feet wide, twenty feet long, and one foot high

Map ID: 21. Approximately 1,200 feet upstream of the intersection of G Street SE and Ridge Road SE, Washington, DC. A log in the stream created a partial fish blockage. The blockage is approximately eight feet wide, one foot long, and one foot high

Map ID: 24. Approximately 1,925 feet upstream of the intersection of G Street SE and Ridge Road SE, Washington, DC. A log in the stream created a partial fish blockage. The blockage is approximately five feet wide, twenty feet long, and one half-foot high

Fish Blockages in the Upper Hydrological Unit of the Main Stem of Fort Dupont Tributary


Map ID: 27. Approximately 2,375 feet upstream from the intersection of G Street SE and Ridge Road SE, Washington, DC. A log in the stream created a partial fish blockage. The blockage is approximately seven feet wide, fifteen feet long, and one foot high


Map ID: 29. Approximately 3,175 feet upstream of the intersection of G Street SE and Ridge Road SE, Washington, DC. A log in the stream created a partial fish blockage. The blockage is approximately five feet wide, fifteen feet long, and one foot high


Map ID: 30. Approximately 3,475 feet upstream of the intersection of G Street SE and Ridge Road SE, Washington, DC. A log in the stream created a partial fish blockage. The blockage is approximately five feet wide, fifteen feet long, and one half-foot high

Fish Blockages in the Upper Hydrological Unit of the Main Stem of Fort Dupont Tributary

Map ID: 32. Approximately 3,775 feet upstream of the intersection of G Street SE and Ridge Road SE, Washington, DC. A log in the stream created a partial fish blockage. The blockage is approximately five feet wide, ten feet long, and one half-foot high

Figure 13 – Upper Fort Dupont Land Acquisition Sites

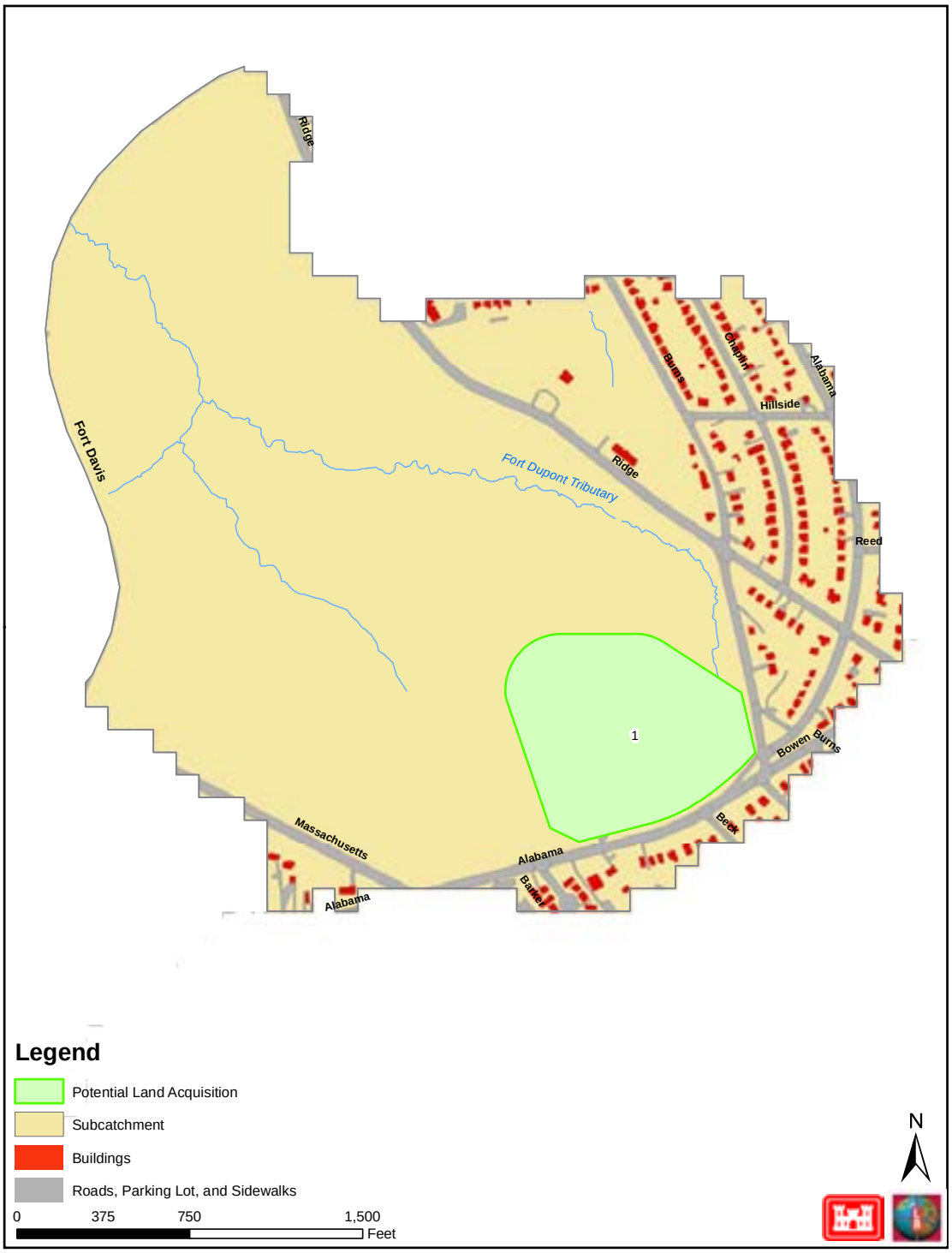

Table 8. Upper Fort Dupont Land Acquisition Projects

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]
FD-U-08-L-1	1	PG	4150 Alabama Ave, SE	18 D 5, 18 D 6	Robert Gonzales	Private	16.4	Land Acquisition	1,640,000		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 14 – Middle Fort Dupont Candidate Stormwater Retrofit Sites

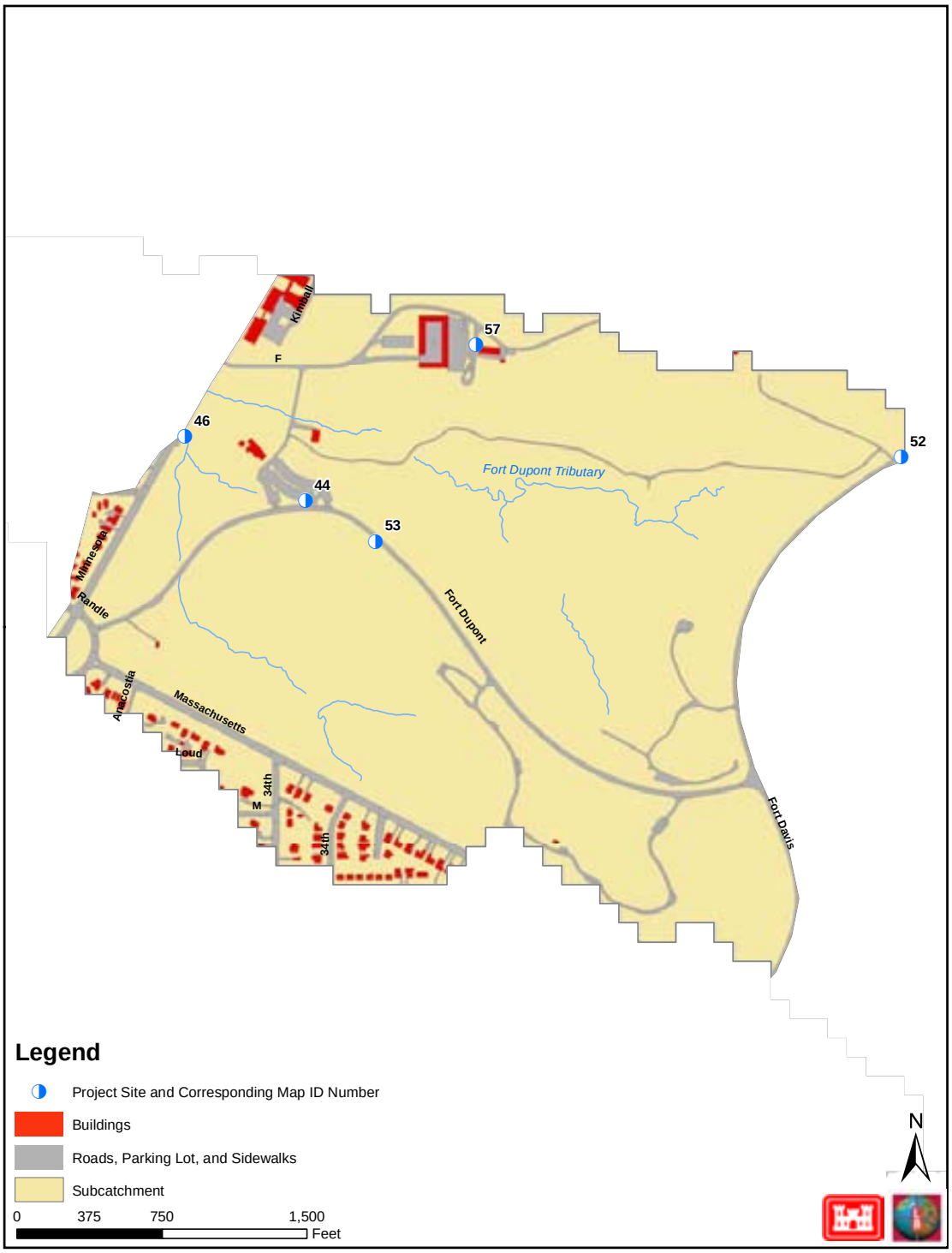

Figure 15 - Middle Fort Dupont Candidate Stormwater Retrofit Drainage Areas

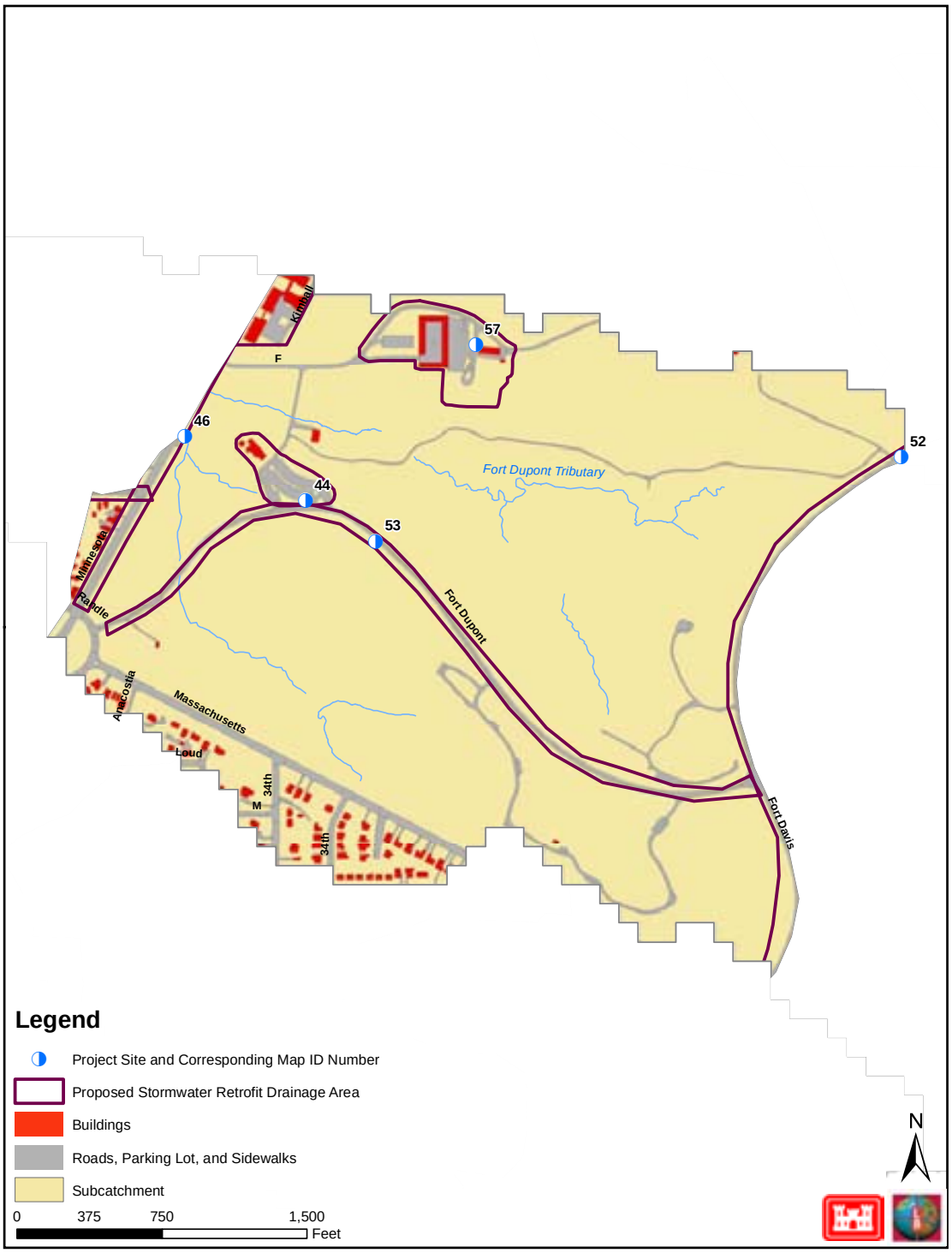

Figure 16 - Middle Fort Dupont Candidate Stormwater Retrofit and Existing Stormwater Retrofit Drainage Areas

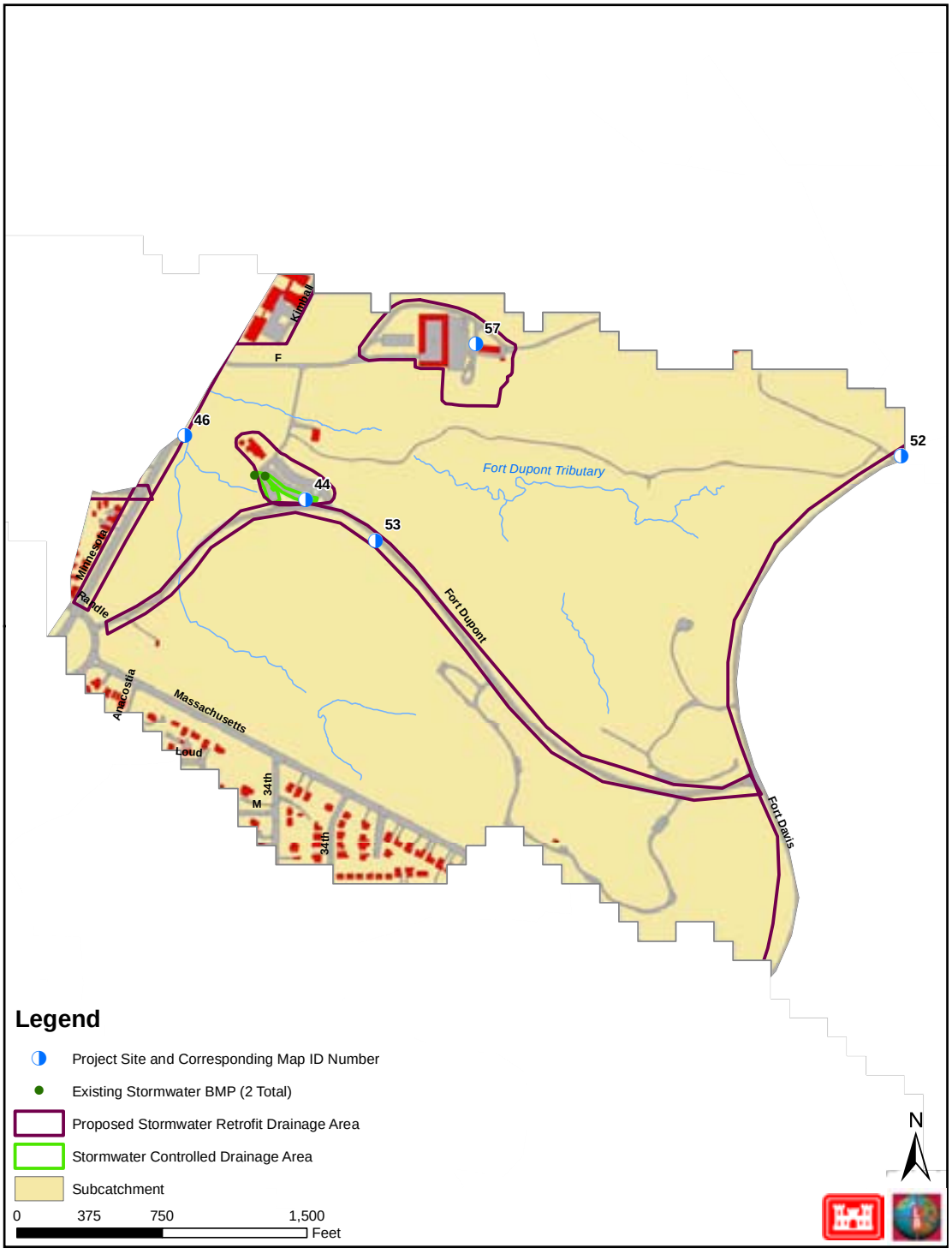

Table 9. Middle Fort Dupont - Candidate Stormwater Retrofit Projects

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)				
FD-M-01-S-1	46	DC	Minnesota Avenue SE between Randolph Circle SE and Ely Place SE, Washington, DC	18 A 4	1c	Public	4.2	80	3.4	LID Green Street	203,000		
FD-M-01-S-2	52	DC	Fort Davis Drive SE between Ridge Road SE and Massachusetts Avenue SE, Washington, DC	18 C 4	1c	Public	6.0	80	4.8	LID Bioswale	480,000		
FD-M-01-S-3	53	DC	Fort DuPont Drive SE, Washington, DC	18 B 4	1c	Public	6.4	80	5.1	LID Bioswale	510,000		
FD-M-01-S-4	57	DC	Fort DuPont maintenance depot and park police, Washington, DC	18 B 4	1b	Public	6.1	60	3.7	LID Bioretention	370,000		
FD-M-01-S-5	44	DC	Fort Dupont Recreation Activities Center, Fort Dupont Park, 1900 Anacostia Drive SE, Washington, DC	18 A 4	1b	Public	2.3	90	2.1	LID Bioretention	207,000		

DC = District of Columbia

[1] 1a= Water quantity, 1b= Water quantity and quality, 1c= Water quality

Figure 17a – Candidate Stormwater Retrofit Project		
Site Location:	Minnesota Avenue SE between Randolph Circle SE and Ely Place SE, Washington, DC	
Project No.:	FD-M-01-S-1	
ADC Map Book Location:	18 A 4	Map ID: 46
Approximate Associated Drainage Area (acres):	4.2	
Approximate Imperviousness:	80%	3.4 acres
Description of Existing Conditions:	Stormwater runoff from a four-lane street is drained by curb inlet drains. The area is residential, and is partially bordered by Fort Dupont Park. There are five-foot-wide sidewalks on either side of the road, restricting the green space.	
Project Description:	**LID Green Street -** Install tree box filters at the curb inlet drains.	

Figure 17b – Candidate Stormwater Retrofit Project		
Site Location:	Fort Davis Drive SE between Ridge Road SE and Massachusetts Avenue SE, Washington, DC	
Project No.:	FD-M-01-S-2	
ADC Map Book Location:	18 C 4	Map ID: 52
Approximate Associated Drainage Area (acres):	6.0	
Approximate Imperviousness:	80%	4.8 acres
Description of Existing Conditions:	Fort Davis Drive SE is a two-lane road with a grassy berm. Stormwater runoff drains towards the center, where it enters Fort DuPont Tributary mainstem. The crossing is the only outfall location. Debris and scour in the drainage ditches indicate that they convey a large amount of stormwater runoff.	
Project Description:	**LID Bioswale** – Install a bioswale in the existing drainage ditches.	

Figure 17c – Candidate Stormwater Retrofit Project		
Site Location:	Fort DuPont Drive SE, Washington, DC	
Project No.:	FD-M-01-S-3	
ADC Map Book Location:	18 B 4	Map ID: 53
Approximate Associated Drainage Area (acres):	6.4	
Approximate Imperviousness:	80%	5.1 acres
Description of Existing Conditions:	Stormwater runoff from Fort DuPont Drive SE drains towards the activity center. East of the activity center, the south side of the road has a concrete drainage ditch leading to a drop inlet drain. The picnic area near Randle Circle SE drains east by means of an asphalt drainage ditch on the north side.	
Project Description:	**LID Bioswale** - Remove pavement in the drainage ditches and install bioswales.	

Figure 17d – Candidate Stormwater Retrofit Project		
Site Location:	Fort DuPont maintenance depot and park police, Washington, DC	
Project No.:	FD-M-01-S-4	
ADC Map Book Location:	18 B 4	Map ID: 57
Approximate Associated Drainage Area (acres):	6.1	
Approximate Imperviousness:	60%	3.7 acres
Description of Existing Conditions:	The facility includes the mounted park police stables and office and the maintenance/storage garage for park services. Stormwater runoff drains to the southwest by means of pavement inlet drains. Downspouts are disconnected from the stormwater system.	
Project Description:	**LID Bioretention** - Construct bioretention areas in the green space of the parking area to treat stormwater runoff from the parking area and the northern access road. To treat stormwater runoff from the maintenance garage, construct a bioretention area in the park south of the garage.	

Figure 17e – Candidate Stormwater Retrofit Project		
Site Location:	Fort Dupont Recreation Activities Center, Fort Dupont Park, 1900 Anacostia Drive SE, Washington, DC	
Project No.:	FD-M-01-S-5	
ADC Map Book Location:	18 A 4	Map ID: 44
Approximate Associated Drainage Area (acres):	2.3	
Approximate Imperviousness:	90%	2.1 acres
Description of Existing Conditions:	The site contains a parking area for the activities center and concert stage. Stormwater runoff is drained by a curb inlet drain. A large amount of sediment was observed at the curb inlet drain at the time of the visit.	
Project Description:	**LID Bioretention -** Construct bioretention systems at the northwest corner of the site and on the traffic islands.	

Figure 18 – Middle Fort Dupont Candidate Stream Restoration Sites

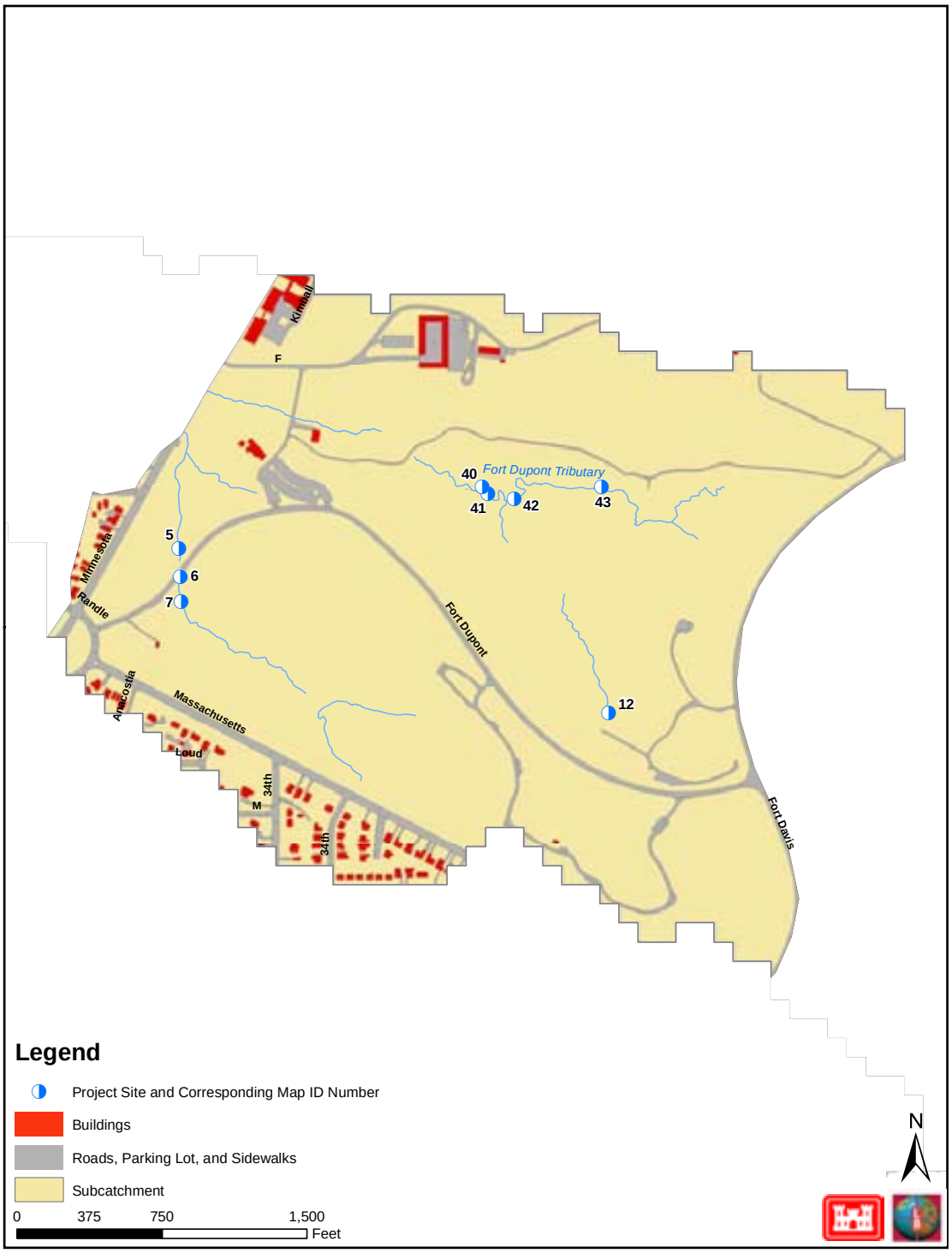

Table 9. Middle Fort Dupont Candidate Stream Restoration Projects

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
FD-M-02-SR-1	5	DC	Approximately 380 feet southeast of the intersection of Minnesota Avenue SE and G Street SE, Washington, DC	18 A 4	1a, 1b	Public	100	Bank Stabilization, In-Stream Habitat Stabilization	30,000		
FD-M-02-SR-2	6	DC	Located on southeastern side of Fort Dupont Drive SE, approximately 500 feet northeast of the intersection of Fort Dupont Drive SE and Randle Circle SE, Washington, DC	18 A 5	1c	Public	100	Debris Removal	30,000		
FD-M-02-SR-3	7	DC	Located approximately 500 feet northeast of the intersection of Fort Dupont Drive SE and Randle Circle SE, 100 feet south of Fort Dupont Drive SE, Washington, DC	18 A 5	1a, 1b	Public	1,000	Bank Stabilization, In-Stream Habitat Stabilization	300,000		
FD-M-02-SR-4	12	DC	Approximately 850 feet west-northwest of the intersection of Fort Dupont Drive SE and Fort Davis Drive SE, Washington, DC	18 B 5	1a	Public	600	Bank Stabilization, In-Stream Habitat Stabilization	180,000		
FD-M-02-SR-5	40,41 42, 43	DC	Middle hydrological unit of Fort Dupont Tributary between Minnesota Avenue SE to the west, and Fort Davis Drive SE to the east, Washington DC	18 A 4, 18 B 4	1a	Public, Private	2,000	Bank Stabilization, In-Stream Habitat Stabilization	600,000		

DC = District of Columbia

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

Figure 19a – Candidate Stream Restoration Project		
Site Location:	Approximately 380 feet southeast of the intersection of Minnesota Avenue SE and G Street SE, Washington, DC	
Project No.:	FD-M-02-SR-1	
ADC Map Book Location:	18 A 4	Map ID: 5
Approximate Length (feet):	100	
Description of Existing Conditions:	Stream bank is moderately eroded and stream bed is inundated with sediment from the road and the eroded banks. Area adjacent to both banks is very steep.	
Project Description:	**Bank Stabilization, In-Stream Habitat Stabilization –** Grade the slope adjacent to the banks and restore the banks with live stakes or another appropriate stabilization measure. Recommend in-stream habitat stabilization by creating riffles and pools at base flow and directing thalweg flow away from banks during high flow events.	

Figure 19b – Candidate Stream Restoration Project		
Site Location:	Located on southeastern side of Fort Dupont Drive SE, approximately 500 feet northeast of the intersection of Fort Dupont Drive SE and Randle Circle SE, Washington, DC	
Project No.:	FD-M-02-SR-2	
ADC Map Book Location:	18 A 5	Map ID: 6
Approximate Length (feet):	100	
Description of Existing Conditions:	The upstream faces of the two culverts are almost entirely blocked by trash, debris, and sediment. Flow through the culverts is highly attenuated and they will become completely blocked.	
Project Description:	**Debris Removal –** Remove the debris from culverts and monitor them so that debris does not accumulate in the future.	

Figure 19c – Candidate Stream Restoration Project		
Site Location:	Located approximately 500 feet northeast of the intersection of Fort Dupont Drive SE and Randle Circle SE, 100 feet south of Fort Dupont Drive SE, Washington, DC	
Project No.:	FD-M-02-SR-3	
ADC Map Book Location:	18 A 5	Map ID: 7
Approximate Length (feet):	1,000	
Description of Existing Conditions:	Stream bank is moderately eroded and stream bed is inundated with sediment from the road and the eroded banks. The area adjacent to both banks is very steep.	
Project Description:	**Bank Stabilization, In-Stream Habitat Stabilization –** Stabilize banks with tools such as live stakes or erosion mats. Recommend in-stream habitat stabilization by creating riffles and pools at base flow and directing thalweg flow away from banks during high flow events.	

Figure 19d – Candidate Stream Restoration Project		
Site Location:	Approximately 850 feet west-northwest of the intersection of Fort Dupont Drive SE and Fort Davis Drive SE, Washington, DC	
Project No.:	FD-M-02-SR-4	
ADC Map Book Location:	18 B 5	Map ID: 12
Approximate Length (feet):	600	
Description of Existing Conditions:	The stream banks at this location are severely eroded and continue until the stream is piped below the ground. Stormwater runoff emerges from several culverts in various states of disrepair as well as coming from an adjacent community garden.	
Project Description:	**Bank Stabilization, In-Stream Habitat Stabilization –** Stabilize banks with tools such as live stakes or erosion mats. Recommend in-stream habitat stabilization by creating riffles and pools at base flow and directing thalweg flow away from banks during high flow events. Recommend that stream restoration coincide with stormwater retrofit activity.	

Figure 19e – Candidate Stream Restoration Project		
Site Location:	Middle hydrological unit of Fort Dupont Tributary between Minnesota Avenue SE to the west, and Fort Davis Drive SE to the east, Washington DC	
Project No.:	FD-M-02-SR-5	
ADC Map Book Location:	18 A 4, 18 B 4	Map ID: 40, 41, 42, 43
Approximate Length (feet):	2,000	
Description of Existing Conditions:	Middle hydrological unit of the main stem of Fort Dupont Tributary is moderately eroded throughout the reach. The average bank height due to erosion is between four and five feet, but is as low as about one foot. This reach is piped underground twice. Base flow exhibited iron clouds throughout the reach.	
Project Description:	**Bank Stabilization, In-Stream Habitat Stabilization –** Stabilize banks with tools such as live stakes or erosion mats and other appropriate stabilization measures. Recommend in-stream habitat stabilization by creating riffles and pools at base flow and directing thalweg flow away from banks during high flow events.	

Map ID: 40. Approximately 1,050 feet north of the intersection of Fort Davis Drive SE and Fort Dupont Drive SE, Washington, DC

Proposed Stream Restoration Projects in the Middle Hydrological Unit of the Fort Dupont Tributary Main Stem
 **Map ID: 41.** Approximately 1,150 feet upstream of the intersection of Fort Davis Drive SE and Fort Dupont Drive SE, Washington, DC
 **Map ID: 42.** Approximately 1,400 feet upstream of the intersection of Fort Davis Drive SE and Fort Dupont Drive SE, Washington, DC
 **Map ID: 43.** Approximately 2,050 feet upstream of the intersection of Fort Davis Drive SE and Fort Dupont Drive SE, Washington, DC

Figure 20 – Middle Fort Dupont Candidate Wetland Restoration Sites

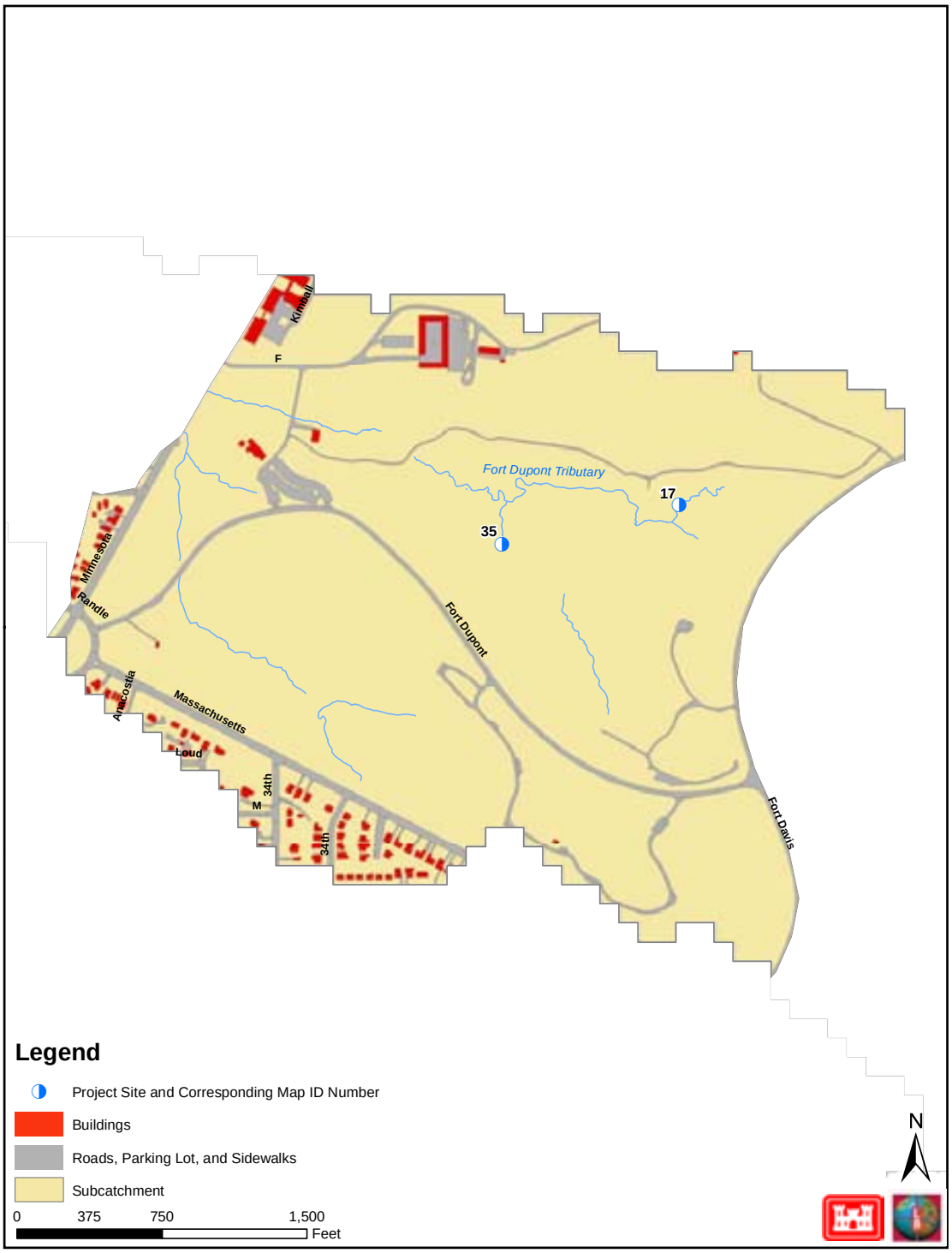

Table 10. Middle Fort Dupont - Candidate Wetland Restoration Projects

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
FD-M-03-W-1	17	DC	Approximately 1,300 feet west-northwest of the intersection of Ridge Road SE and Fort Davis Drive SE, Washington, DC	18 B 4	1e	Public	0.3	Wetland Enhancement	15,000		
FD-M-03-W-2	35	DC	Approximately 1,650 feet northeast of the intersection of 34th Street SE and Massachusetts Avenue SE, Washington, DC	18 B 4	1e	Public	0.3	Wetland Enhancement	15,000		

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 21a – Candidate Wetland Restoration Project		
Site Location:	Approximately 1,300 feet west-northwest of the intersection of Ridge Road SE and Fort Davis Drive SE, Washington, DC	
Project No.:	FD-M-03-W-1	
ADC Map Book Location:	18 B 4	Map ID: 17
Approximate Acreage (acres):	0.3	
Description of Existing Conditions:	A small tributary to the middle hydrological unit of the Fort Dupont Tributary main stem flows through a small depression area. Current vegetation consists of American beech (*Fagus grandifolia*) trees, red maple (*Acer rubrum*) trees, jewel weed (*Impatiens capensis*), and false nettle (*Boehmeria cylindrica*). Hydric sandy clay loam soil underlies the surface. This area occurs on the northern side of the main stem. Two small seepage wetlands occur on the southern side of the main stem.	
Project Description:	**Wetland Enhancement -** Place a notch weir within the unnamed tributary near the confluence of the unnamed tributary and the main stem to restrict flow from entering the main stem of Fort Dupont Tributary. Construct a berm in parts of this area so that water remains within the system, allowing sediment to settle.	




Figure 21b – Candidate Wetland Restoration Project		
Site Location:	Approximately 1,650 feet northeast of the intersection of 34th Street SE and Massachusetts Avenue SE, Washington, DC	
Project No.:	FD-M-03-W-2	
ADC Map Book Location:	18 B 4	Map ID: 35
Approximate Acreage (acres):	0.3	
Description of Existing Conditions:	A small tributary of the middle hydrological unit of the Fort Dupont Tributary main stem flows through a small depression area, from the south towards the main stem. Current vegetation consists of red maple (*Acer rubrum*) trees, tulip poplar trees (*Liriodendron tulipfera*), fowl meadow grass (*Poa palustris*), jewel weed (*Impatiens capensis*), poison ivy (*Toxicodendron radicans*), rice cut-grass (*Leersia oryzoides*), and false nettle (*Boehmeria cylindrica*). Hydric sandy clay loam soil underlies the surface. This area has several small drainage ways that flow through the existing wetland towards the tributary. The tributary flows towards several dilapidated drainage pipes to the main stem.	
Project Description:	**Wetland Enhancement -** Place a notch weir within the unnamed tributary near the confluence of the unnamed tributary and the main stem to restrict flow from entering the main stem of Fort Dupont Tributary. Construct a berm in parts of this area so that water remains within the system, allowing sediment to settle.	

Figure 22 – Middle Fort Dupont Candidate Fish Blockage Removal Sites

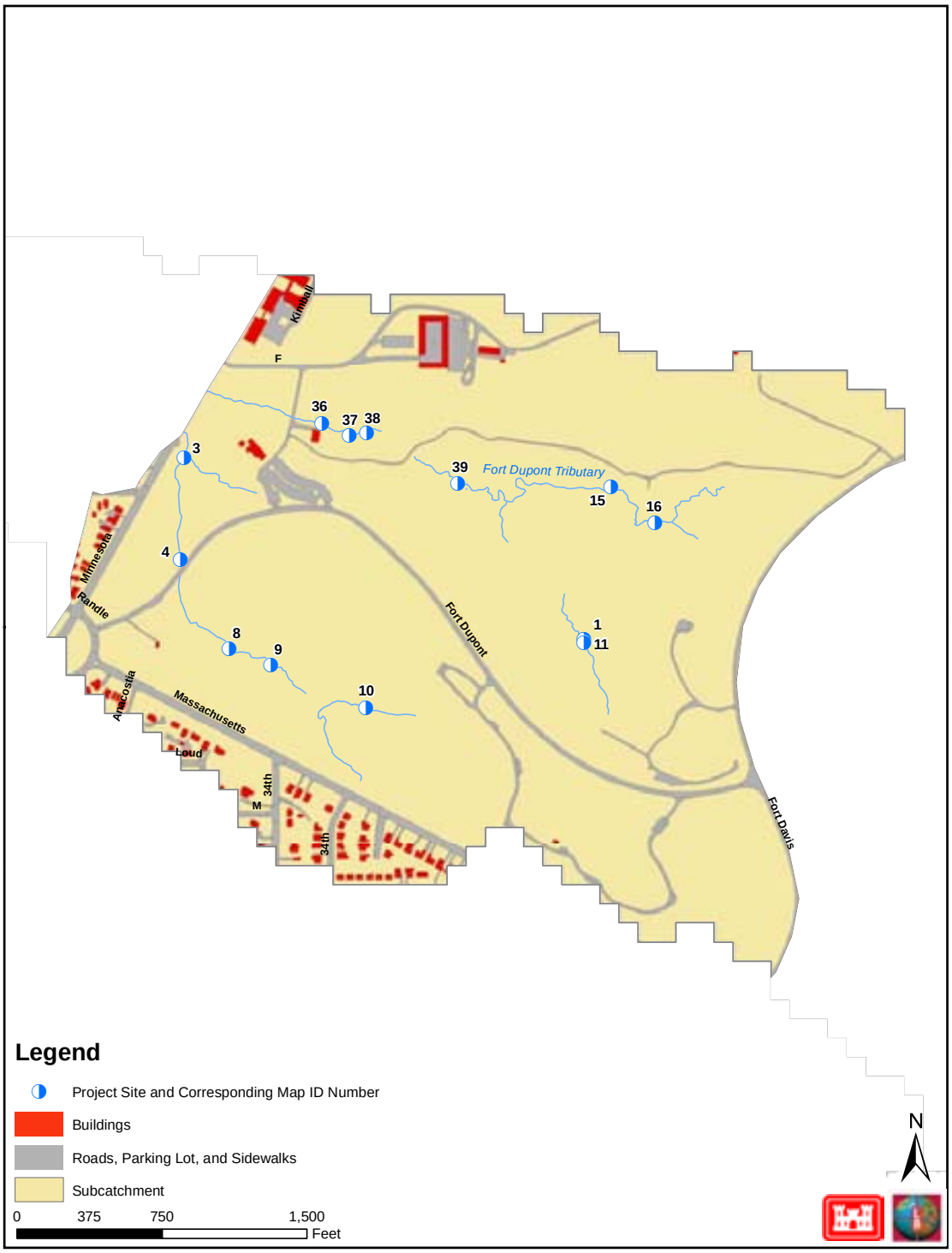

Table 11. Middle Fort Dupont Candidate Fish Blockage Removal Projects

Project ID	MAP ID	Jurisdiction	Site Location Name	ADC Map Book Location	Ownership	Approx Length (feet)	General Description of Proposed Actions	Estimated Cost ($)	Project Score (pts)	Project Ranking
FD-M-04-F-1	15, 39, 16, 37, 38, 36	DC	Middle hydrological unit of Fort Dupont Tributary main stem between Minnesota Avenue SE to the west, and Fort Davis Drive SE to the east, Washington, DC	18 A 4,18 B 4	Public, Private	2,000	Fish Blockage Removal	2,250,000		
FD-M-04-F-2	3	DC	Approximately 220 feet northeast of the intersection of Minnesota Avenue SE and G Street SE, Washington, DC	18 A 4	Public	450	Fish Blockage Removal	150,000		
FD-M-04-F-3	4	DC	Approximately 380 feet southeast of the intersection of Minnesota Avenue SE and G Street SE, Washington, DC	18 A 4	Public	100	Fish Ladder Installation	300,000		
FD-M-04-F-4	8	DC	Located approximately 940 feet upstream the intersection of Fort Dupont Drive SE and Randle Circle SE, Washington, DC	18 A 5	Public	220	Fish Blockage Removal	150,000		
FD-M-04-F-5	9	DC	Located approximately 1,160 feet upstream from the intersection of Fort Dupont Drive SE and Randle Circle SE, Washington, DC	18 A 5	Public	200	Fish Blockage Removal	300,000		
FD-M-04-F-6	10	DC	Approximately 450 feet northeast of the intersection of Massachusetts Avenue SE and 34th Street SE, Washington, DC	18 B 5	Public	265	Fish Blockage Removal	300,000		
FD-M-04-F-7	11	DC	Approximately 850 feet west-northwest of the intersection of Fort DuPont Drive SE and Fort Davis Drive SE, Washington, DC	18 B 5	Public	400	Fish Blockage Removal	150,000		
FD-M-04-F-8	1	DC	Approximately 450 feet west-northwest of the intersection of Fort Dupont Drive SE and Fort Davis Drive SE, Washington, DC	18 B 5	Public	400	Fish Blockage Removal	300,000		

DC = District of Columbia

Figure 23a – Candidate Fish Blockage Removal Project		
Site Location:	Middle hydrological unit of Fort Dupont Tributary main stem between Minnesota Avenue SE to the west, and Fort Davis Drive SE to the east, Washington, DC	
Project No.:	FD-M-04-F-1	
ADC Map Book Location:	18 A 4, 18 B 4	Map ID: 15, 39, 16, 37, 38, 36
Approximate Upstream Length Open (feet):	2,000	
Description of Existing Conditions:	Complete and partial fish blockages have been created in the middle hydrological unit of Fort Dupont Tributary main stem primarily by trees and accumulating debris and sediment.	
Project Description:	**Fish Blockage Removal –** Remove all partial and complete fish blockages and create riffle grade sequences within the stream bed. Recommend all fish blockage removal coincide with stormwater retrofits to attenuate rate at which sediment and debris enters the stream. Any fish blockage activities should coincide with stream restoration activities.	

Map ID 36: Approximately 650 feet southeast from the intersection of F Street SE and Minnesota Avenue SE, Washington, DC. Blockage is approximately three feet long, eight feet wide, and one foot high

Fish Blockages in the Middle Hydrological Unit of the Main Stem of Fort Dupont Tributary

Map ID: 37. Approximately 815 feet upstream of the intersection of F Street SE and Minnesota Avenue SE, Washington, DC. Fifteen feet wide, fifteen feet long, two feet high

Map ID: 38. Approximately 925 feet upstream of the intersection of F Street SE and Minnesota Avenue SE, Washington, DC. Twenty feet long, ten feet wide, four feet high

Map ID: 39. Approximately 1,100 feet north-northwest of Fort Dupont Drive SE and Fort Davis Drive SE, Washington, DC. Fifteen feet wide, fifteen feet long, two feet high

Map ID: 15. Approximately 1,160 feet north-northwest of Fort Dupont Drive SE and Fort Davis Drive SE, Washington, DC. Ten feet wide, fifteen feet long, and three feet high

Map ID: 16. Approximately1,810 feet north-northwest of Fort Dupont Drive SE and Fort Davis Drive SE, Washington, DC. Eight feet wide, five feet long, and three feet high

Figure 23b – Candidate Fish Blockage Removal Project		
Site Location:	Approximately 220 feet northeast of the intersection of Minnesota Avenue SE and G Street SE, Washington, DC	
Project No.:	FD-M-04-F-2	
ADC Map Book Location:	18 A 4	Map ID: 3
Approximate Upstream Length Open (feet):	450	
Description of Existing Conditions:	A series of complete fish blockages are located within the reach. The blockages were created by fallen and accumulating debris and sediment. Blockages are approximately three feet wide, six feet long, and one foot high.	
Project Description:	**Fish Blockage Removal –** Remove all of the blockages and create riffle grade sequences.	

Figure 23c – Candidate Fish Blockage Removal Project		
Site Location:	Approximately 380 feet southeast of the intersection of Minnesota Avenue SE and G Street SE, Washington, DC	
Project No.:	FD-M-04-F-3	
ADC Map Book Location:	18 A 4	Map ID: 4
Approximate Upstream Length Open (feet):	100	
Description of Existing Conditions:	The culvert that runs beneath Fort Dupont Drive SE was constructed such that a two-foot ledge creates a complete fish blockage. The blockage is approximately 50 feet long and ten feet wide.	
Project Description:	**Fish Ladder Installation –** Install a fish ladder to address the blockage.	

Figure 23d– Candidate Fish Blockage Removal Project		
Site Location:	Located approximately 940 feet upstream the intersection of Fort Dupont Drive SE and Randle Circle SE, Washington, DC	
Project No.:	FD-M-04-F-4	
ADC Map Book Location:	18 A 5	Map ID: 8
Approximate Upstream Length Open (feet):	220	
Description of Existing Conditions:	A partial blockage was created by fallen trees and accumulating debris and sediment. The blockage is approximately three feet long, five feet wide, and one foot high.	
Project Description:	**Fish Blockage Removal** - Remove the blockage and debris.	

Figure 23e – Candidate Fish Blockage Removal Project		
Site Location:	Located approximately 1,160 feet upstream from the intersection of Fort Dupont Drive SE and Randle Circle SE, Washington, DC	
Project No.:	FD-M-04-F-5	
ADC Map Book Location:	18 A 5	Map ID: 9
Approximate Upstream Length Open (feet):	200	
Description of Existing Conditions:	A partial blockage was created by fallen trees and accumulating debris and sediment. The blockage is approximately two feet long, five feet wide, and two feet high.	
Project Description:	**Fish Blockage Removal** - Remove the blockage and debris.	

Figure 23f – Candidate Fish Blockage Removal Project		
Site Location:	Approximately 450 feet northeast of the intersection of Massachusetts Avenue SE and 34th Street SE, Washington, DC	
Project No.:	FD-M-04-F-6	
ADC Map Book Location:	18 B 5	Map ID: 10
Approximate Upstream Length Open (feet):	265	
Description of Existing Conditions:	A partial blockage was created by fallen trees and accumulating debris and sediment. The blockage is approximately two feet long, five feet wide, and two feet high.	
Project Description:	**Fish Blockage Removal** – Remove the blockage and debris.	

Figure 23g – Candidate Fish Blockage Removal Project		
Site Location:	Approximately 850 feet west-northwest of the intersection of Fort DuPont Drive SE and Fort Davis Drive SE, Washington, DC	
Project No.:	FD-M-04-F-7	
ADC Map Book Location:	18 B 5	Map ID: 11
Approximate Upstream Length Open (feet):	400	
Description of Existing Conditions:	A partial blockage was created by fallen trees and accumulating debris and sediment. The blockage is approximately three feet wide, six feet long, and one foot high.	
Project Description:	**Fish Blockage Removal** – Remove all of the blockage and debris, and create riffle grade sequences.	

Figure 23h – Candidate Fish Blockage Removal Project		
Site Location:	Approximately 450 feet west-northwest of the intersection of Fort Dupont Drive SE and Fort Davis Drive SE, Washington, DC	
Project No.:	FD-M-04-F-8	
ADC Map Book Location:	18 B 5	Map ID: 1
Approximate Upstream Length Open (feet):	400	
Description of Existing Conditions:	A partial fish blockage is formed by a fallen tree where debris and sediment have accumulated. The blockage is approximately two feet long, six feet wide, and two feet high.	
Project Description:	**Fish Blockage Removal** – Remove the blockage and debris.	

Figure 24 – Middle Fort Dupont Candidate Riparian Restoration Sites

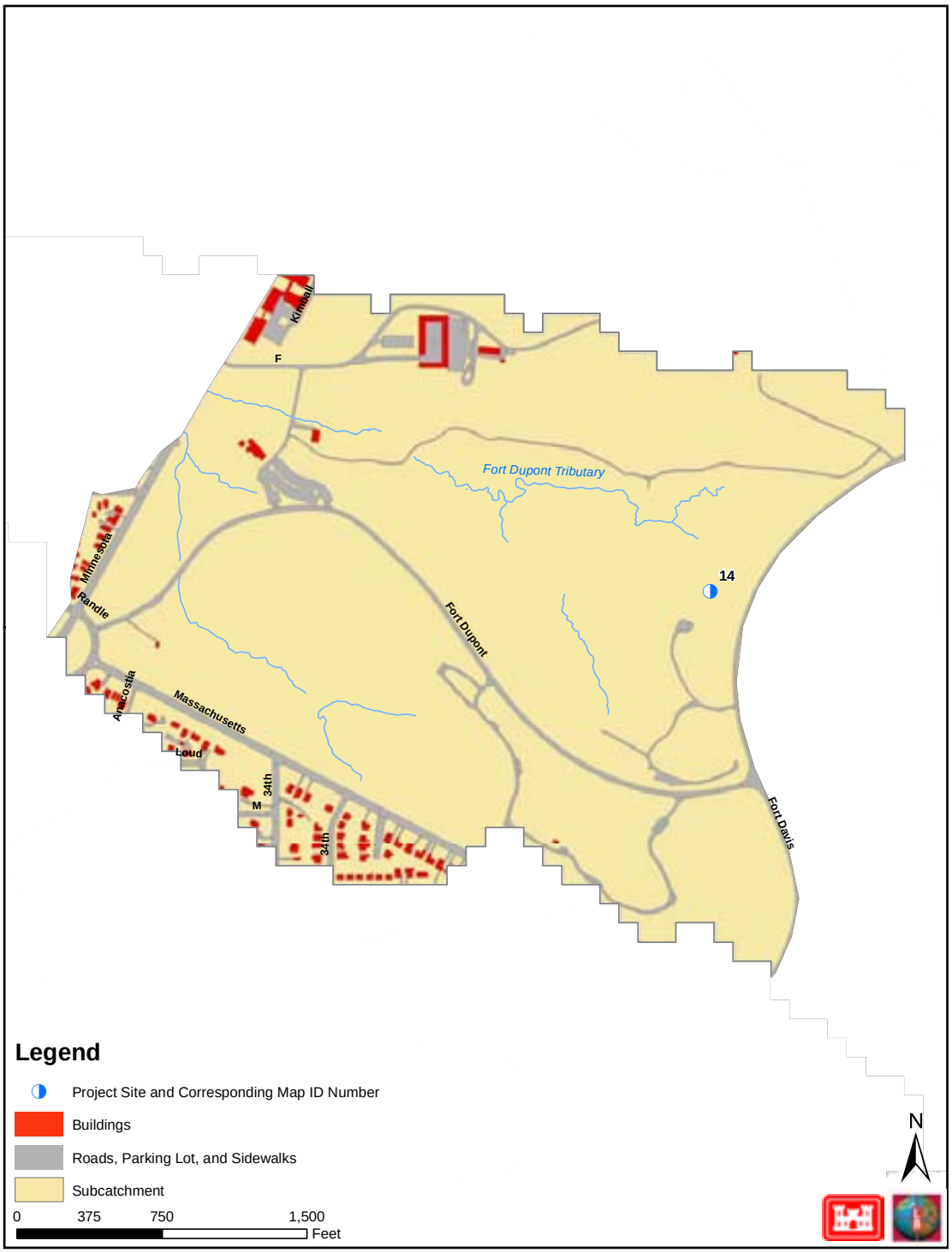

Table 12. Middle Fort Dupont - Candidate Riparian Restoration Projects

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
FD-M-05-R-1	14	DC	Approximately 1,350 feet southwest of the intersection of Fort Davis Drive SE and Ridge Road SE, Washington, DC	18 B 5	1a, 1d	Public	1.0	Upland Restoration, Invasive Species Removal	14,000		

DC = District of Columbia

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

Figure 25a – Candidate Riparian Restoration Project		
Site Location:	Approximately 1,350 feet southwest of the intersection of Fort Davis Drive SE and Ridge Road SE, Washington, DC	
Project No.:	FD-M-05-R-1	
ADC Map Book Location:	18 B 5	Map ID: 14
Approximate Acreage (acres):	1.0	
Description of Existing Conditions:	Non-forested area is overgrown with Japanese honeysuckle (*Lonicera japonica*), multiflora rose (*Rosa multiflora*), common green brier (*Smilax royundifolia*), and poison ivy (*Toxicodendron radicans*). Although this data point represents the 1.0-acre area at which it was taken, these conditions generally apply throughout the unmaintained non-forested areas of the park.	
Project Description:	**Upland Restoration, Invasive Species Removal –** Remove invasive species (Japanese honeysuckle and multiflora rose) as well as other species (poison ivy and common green brier) that are choking shrubs and saplings. Replant the area with seed and fruit bearing herbaceous and shrubby plants to create a more viable habitat for birds and mammals.	

Figure 26 – Lower Fort Dupont Candidate Stormwater Retrofit Sites

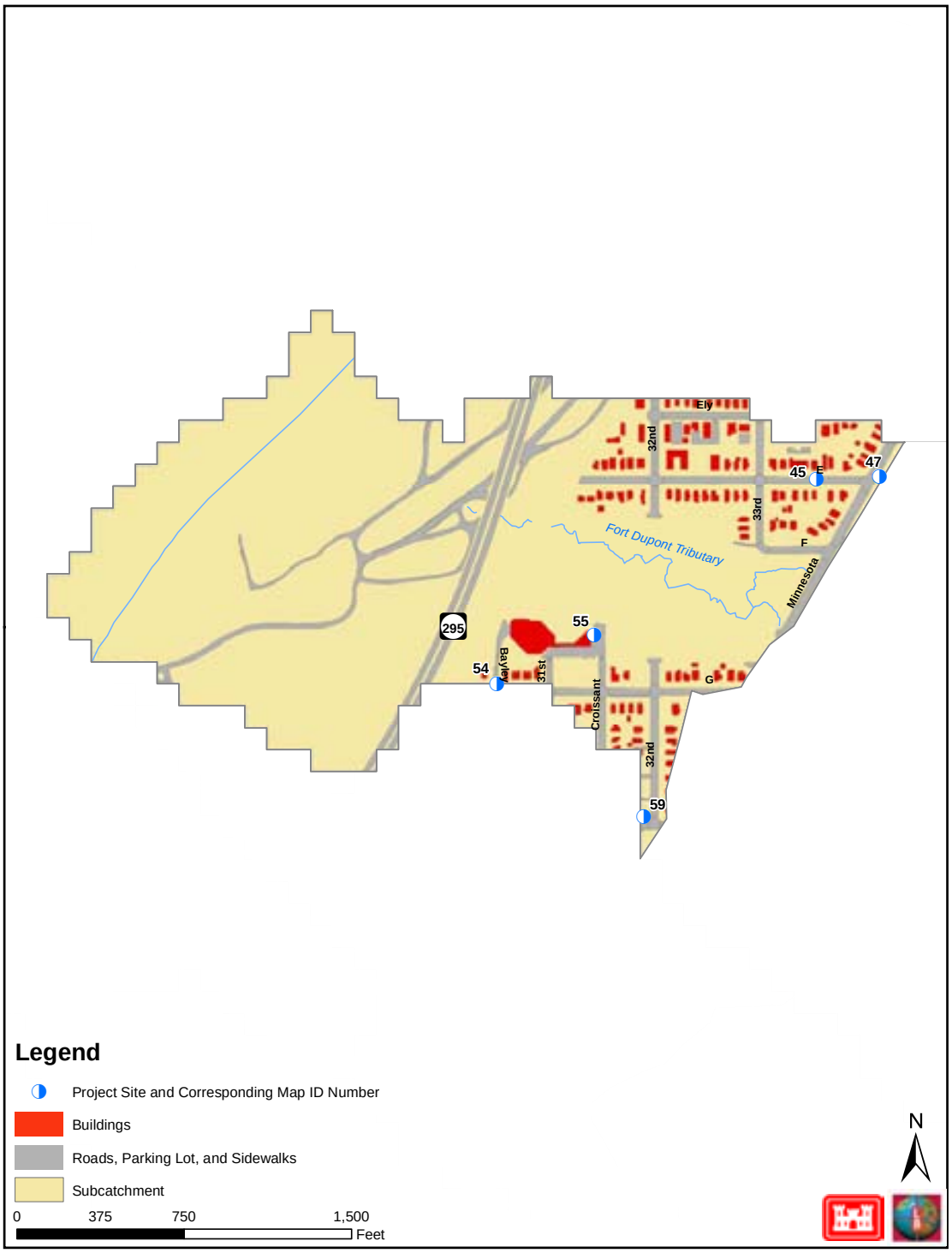

Figure 27 – Lower Fort Dupont Candidate Stormwater Retrofit Drainage Areas

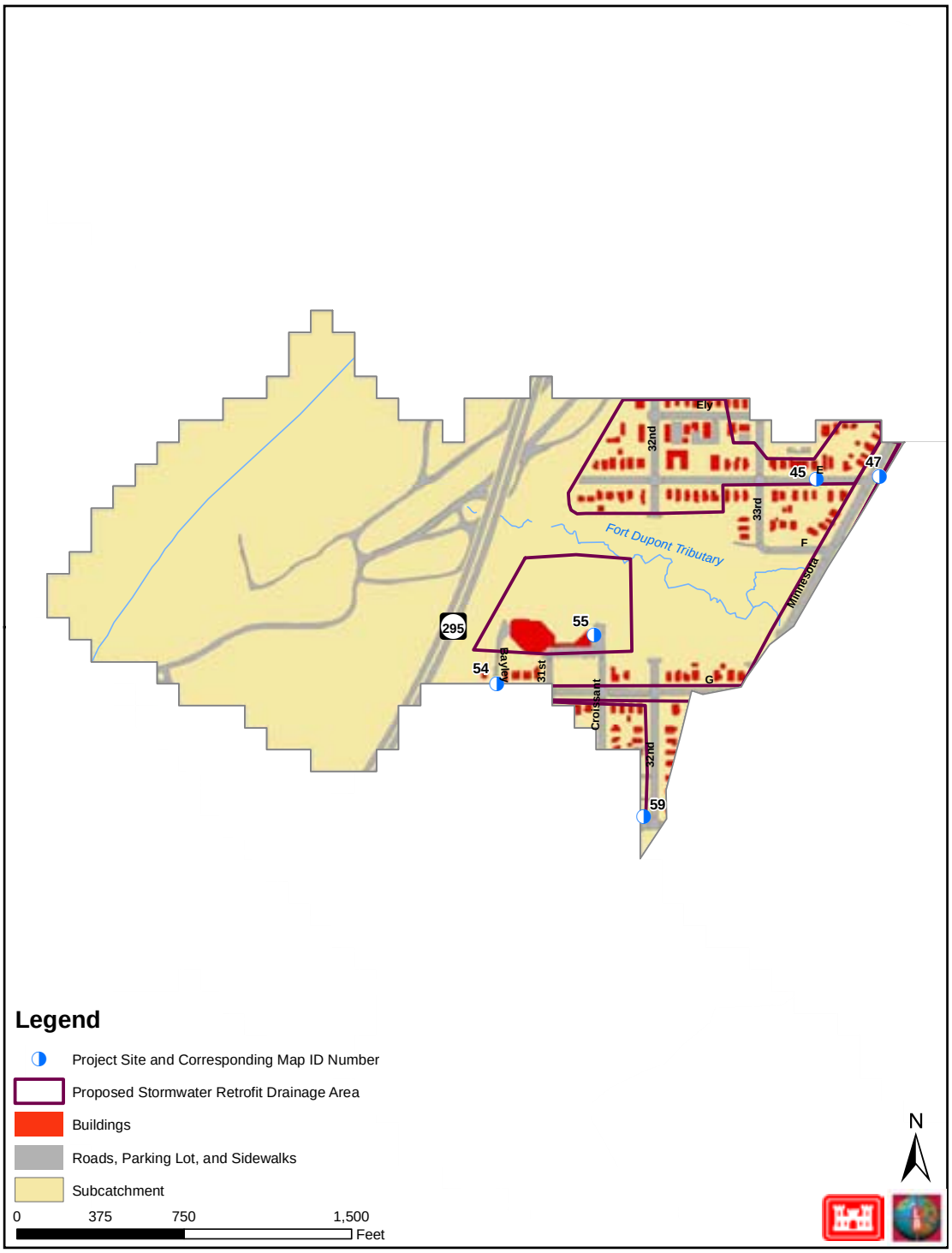

Figure 28 – Lower Fort Dupont Candidate Stormwater Retrofit and Existing Stormwater Retrofit Drainage Areas

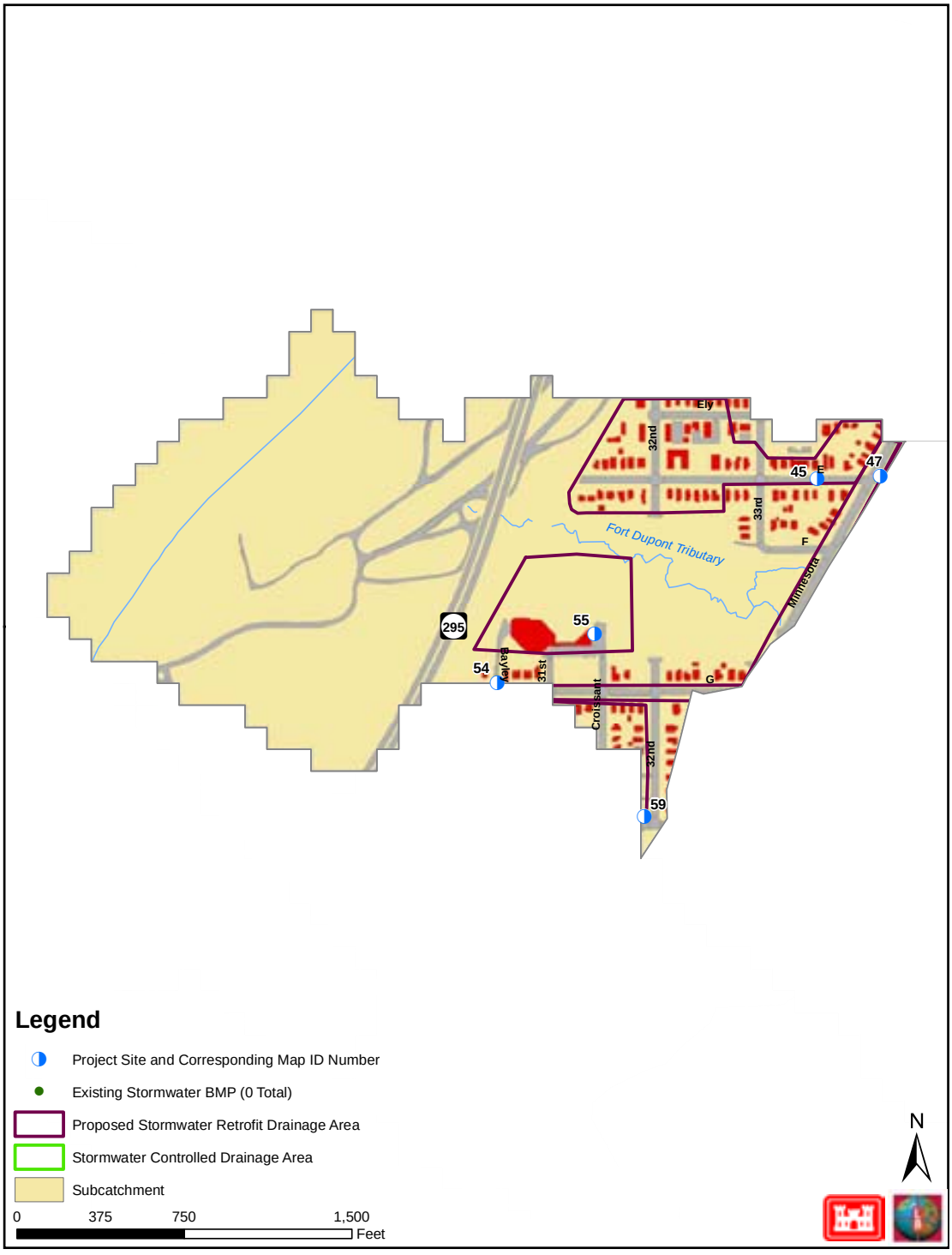

Table 13. Lower Fort Dupont - Candidate Stormwater Retrofit Projects

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)				
FD-L-01-S-1	47	DC	Ephraim Kimball Elementary School, 3300 Minnesota Avenue SE, Washington, DC	18 A 4	1b	Public	2.7	65	1.8	LID Bioswale, LID Bioretention	180,000		
FD-L-01-S-2	45	DC	E Street SE west of Minnesota Avenue SE, Washington, DC	18 A 4	1c	Mixed	9.8	45	4.4	LID Bioretention, Rainscape	656,000		
FD-L-01-S-3	54	DC	G Street SE between Minnesota Avenue SE and the railroad, Washington, DC	17 K 4	1c	Public	2.0	80	1.6	LID Tree Box Filter	104,000		
FD-L-01-S-4	55	DC	Department of Parks and Recreation Therapeutic Recreation Center, 3030 G Street SE, Washington, DC	18 A 4	1b	Public	5.8	30	1.7	LID Bioretention	170,000		
FD-L-01-S-5	59	DC	Randle Circle SE and 32nd Street SE, Washington, DC	18 A 5	1b	Public	5.1	40	2.0	LID Bioretention	200,000		

DC = District of Columbia

[1] 1a= Water quantity, 1b= Water quantity and quality, 1c= Water quality

Figure 29a – Candidate Stormwater Retrofit Project		
Site Location:	Ephraim Kimball Elementary School, 3300 Minnesota Avenue SE, Washington, DC	
Project No.:	FD-L-01-S-1	
ADC Map Book Location:	18 A 4	Map ID: 47
Approximate Associated Drainage Area (acres):	2.7	
Approximate Imperviousness:	65%	1.8 acres
Description of Existing Conditions:	The site includes a multi-building school campus with internal downspouts. Stormwater runoff drains along the east side of the property by means of a concrete drainage ditch around the perimeter.	
Project Description:	**LID Bioswale, LID Bioretention -** Replace the concrete drainage ditch with a bioswale and construct a bioretention system in the south lawn. Disconnect downspouts and direct to the bioretention system.	

Figure 29b – Candidate Stormwater Retrofit Project		
Site Location:	E Street SE west of Minnesota Avenue SE, Washington, DC	
Project No.:	FD-L-01-S-2	
ADC Map Book Location:	18 A 4	Map ID: 45
Approximate Associated Drainage Area (acres):	9.8	
Approximate Imperviousness:	45%	4.4 acres
Description of Existing Conditions:	Stormwater runoff drains from a residential street into curb inlets to the west toward the E Street SE dead end. The community consists of single-family residences and small, garden-style apartments with parking on either side of the street.	
Project Description:	**LID Bioretention, Rainscape** – Construct a bioretention system at the E Street SE dead end and install rain barrels and rain gardens at the downspouts.	

Figure 29c – Candidate Stormwater Retrofit Project		
Site Location:	G Street SE between Minnesota Avenue SE and the railroad, Washington, DC	
Project No.:	FD-L-01-S-3	
ADC Map Book Location:	17 K 4	Map ID: 54
Approximate Associated Drainage Area (acres):	2.0	
Approximate Imperviousness:	80%	1.6 acres
Description of Existing Conditions:	G Street SE is a two-lane street with parking on both sides. Stormwater runoff from the street drains to the west into curb inlets.	
Project Description:	**LID Tree Box Filter** - Install tree box filters at curb inlet drains.	

Figure 29d – Candidate Stormwater Retrofit Project		
Site Location:	Department of Parks and Recreation Therapeutic Recreation Center, 3030 G Street SE, Washington, DC	
Project No.:	FD-L-01-S-4	
ADC Map Book Location:	18 A 4	Map ID: 55
Approximate Associated Drainage Area (acres):	5.8	
Approximate Imperviousness:	30%	1.7 acres
Description of Existing Conditions:	The recreation center is a single-story complex with a parking area and a large green space park. Stormwater runoff from the parking area is drained by pavement inlets. The building does not have downspouts.	
Project Description:	**LID Bioretention** - Construct bioretention areas in the southwest corner of the lot.	

Figure 29e – Candidate Stormwater Retrofit Project		
Site Location:	Randle Circle SE and 32nd Street SE, Washington, DC	
Project No.:	FD-L-01-S-5	
ADC Map Book Location:	18 A 5	Map ID:59
Approximate Associated Drainage Area (acres):	5.1	
Approximate Imperviousness:	40%	2.0 acres
Description of Existing Conditions:	Stormwater runoff from Randle Circle SE drains west into curb inlets around the perimeter.	
Project Description:	**LID Bioretention** – Construct bioretention areas in the grassy landscape in the center of the circle.	

Figure 30 – Lower Fort Dupont Candidate Stream Restoration Sites

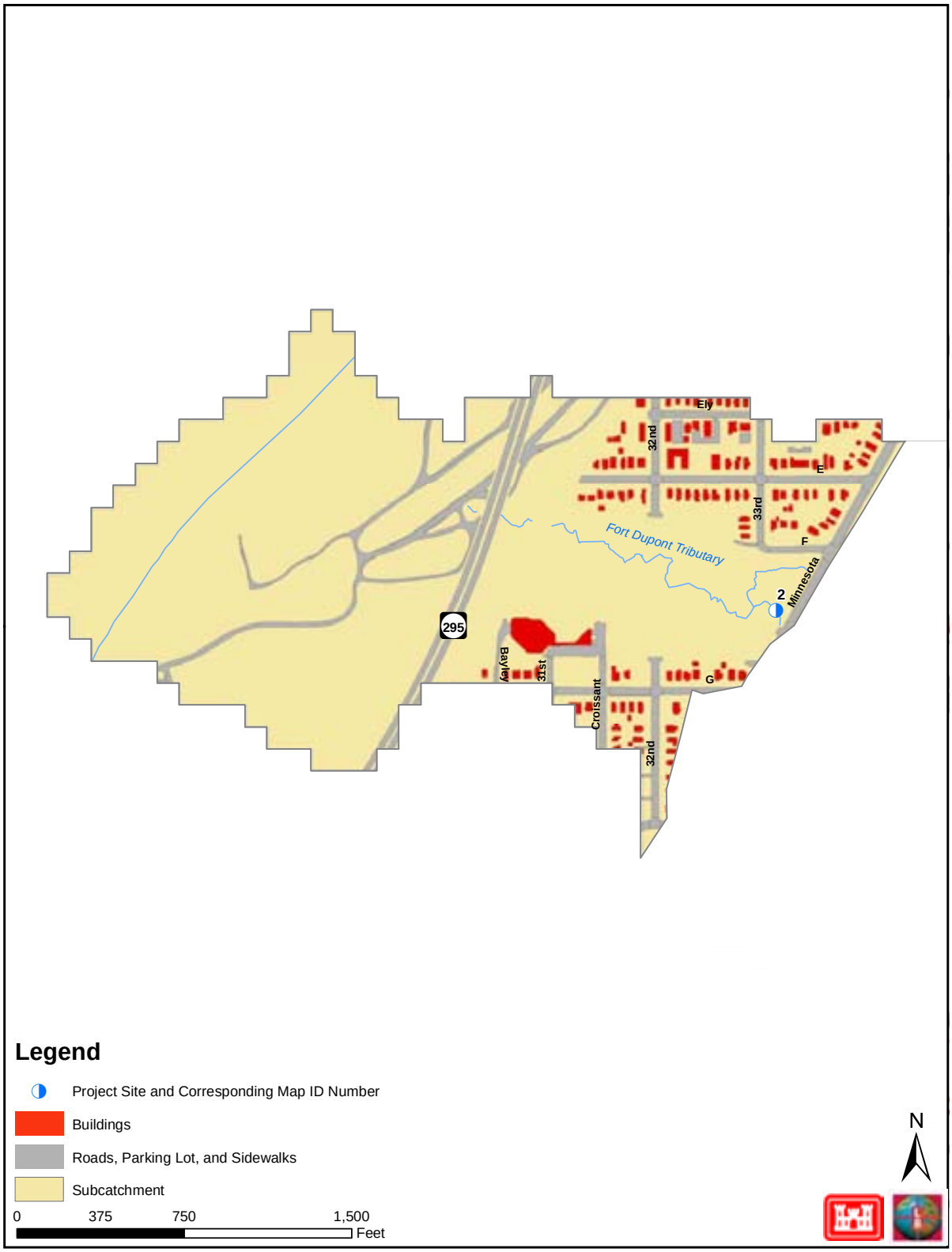

Table 14. Lower Fort Dupont – Candidate Stream Restoration Projects

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
FD-L-02-SR-1	2	DC	Approximately 380 feet southwest of the intersection of Minnesota Avenue SE and F Street SE, Washington, DC	18 A 4	1a, 1b	Public	200	Bank Stabilization, In-Stream Habitat Stabilization	60,000		

DC = District of Columbia

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

Figure 31a – Candidate Stream Restoration Project		
Site Location:	Approximately 380 feet southwest of the intersection of Minnesota Avenue SE and F Street SE, Washington, DC	
Project No.:	FD-L-02-SR-1	
ADC Map Book Location:	18 A 4	Map ID: 2
Approximate Length (feet):	200	
Description of Existing Conditions:	Moderate bank erosion is occurring where a concrete embankment is deteriorating. Currently, English ivy (*Hedera helix*) is clinging to the bank, providing little stabilization.	
Project Description:	**Bank Stabilization, In-Stream Habitat Stabilization –** Stabilize banks with tools such as live stakes, erosion mats, or appropriate bank stabilization measures. Recommend in-stream habitat stabilization by creating riffles and pools at base flow and directing thalweg flow away from banks during high flow events.	

Figure 32 – Lower Fort Dupont Candidate Fish Blockage Removal Sites

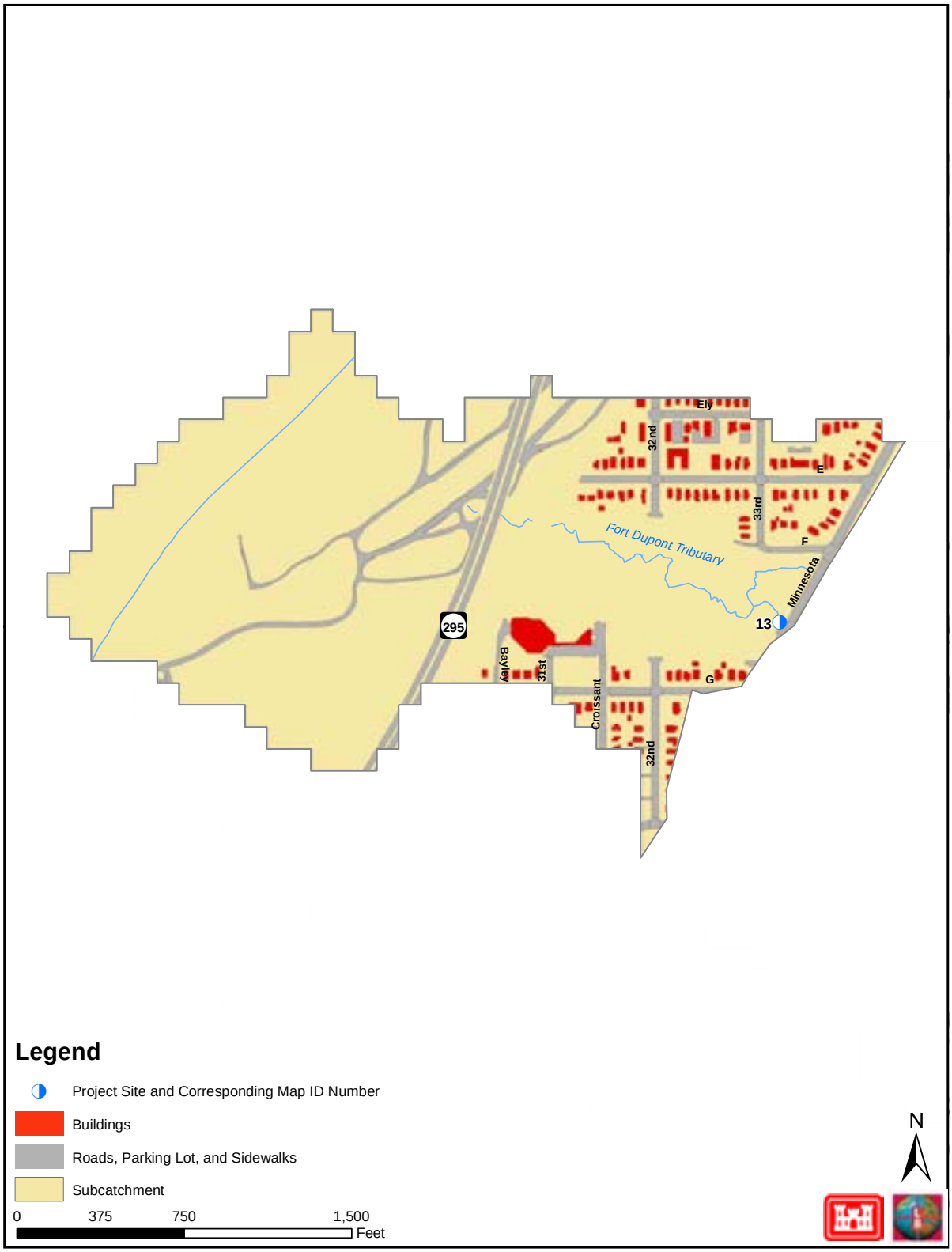

Table 15. Lower Fort Dupont – Fish Blockage Removal Projects

Project ID	MAP ID	Jurisdiction	Site Location Name	ADC Map Book Location	Ownership	Approx Length (feet)	General Description of Proposed Actions	Estimated Cost ($)	Project Score (pts)	Project Ranking
FD-L-04-F-1	13	DC	Approximately 380 feet southeast of the intersection of Minnesota Avenue SE and F Street SE, Washington, DC	18 A 4	Private	200	Fish Blockage Removal	75,000		

DC = District of Columbia

Figure 33a – Candidate Fish Blockage Removal Project		
Site Location:	Approximately 380 feet southeast of the intersection of Minnesota Avenue SE and F Street SE, Washington, DC	
Project No.:	FD-L-04-F-1	
ADC Map Book Location:	18 A 4	Map ID: 13
Approximate Upstream Length Open (feet):	200	
Description of Existing Conditions:	Two fish blockages occur within 50 feet of each other. One is a natural, partial blockage. The second blockage occurs where a culvert runs beneath the road. Combined blockages are approximately 30 feet long, six feet wide, and 0.5 feet high.	
Project Description:	**Fish Blockage Removal -** Remove the partial blockage and implement a small ladder for the complete blockage.	

Figure 34 – Lower Fort Dupont Land Acquisition

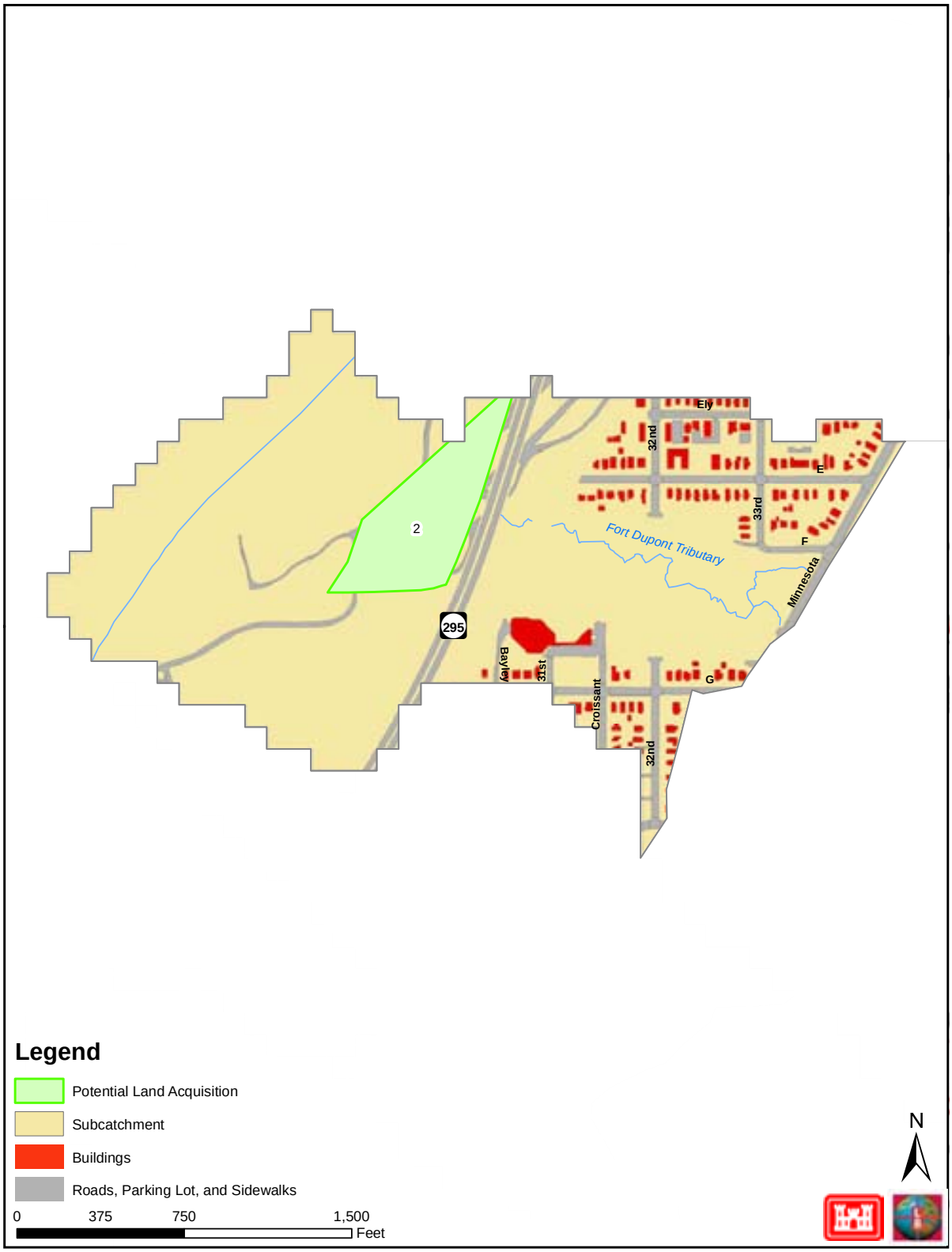

Table 16. Fort Dupont Land Acquisition

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]
FD-L-08-L-1	2	PG	Route 295 and Massachusetts Avenue, SE, DC	17 K 4	Philadelphia Baltimore & Washington RailRoad	Public	7.3	Land Acquisition	730,000		Medium

[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.