

## 5. WMA Restoration Strategies

Strategies for restoration of the watershed for each of the three major WMAs (Johnny Moore Creek, Little Rocky Run – Upper and Little Rocky Run – Lower) are detailed in the following sections. The two smaller WMAs in the watersheds, Little Rocky Run – Bull Run and Johnny Moore Creek – Bull Run, are mostly protected, with only a small percentage of low-density residential development, and have no restoration strategies proposed in this watershed management plan.

### 5.1 Johnny Moore Creek WMA

The Johnny Moore Creek WMA is located entirely within the County’s R-C District for protection of the Occoquan Reservoir. The WMA consists primarily of estate residential development and open space. This WMA also includes most of the Twin Lakes and Westfields golf courses. Estate residential development in this WMA is expected to increase by 20% in the future. Existing stormwater treatment in the WMA covers approximately 10% of the area, due to the type and age of development. Several facilities in the WMA, such as golf course ponds and old farm ponds, provide some stormwater treatment although they were not designed for this purpose.

The County SPA completed in 2005 provided a categorization of the stream habitat summarized in Table 5-1. A map showing the results of the SPA in this WMA is located in Appendix A.

**Table 5-1 Johnny Moore Creek Stream Habitat Ratings**

<b>Condition</b>	<b>Miles of Assessed Stream</b>	<b>% of Assessed Streams</b>
Very Poor	0.1	1
Poor	1.8	15
Fair	7	60
Good	2.8	24
Excellent	0	0

The channels were characterized primarily as actively widening with unstable stream banks.

Based on the subwatershed characterization, the Johnny Moore Creek WMA contains mostly high-quality subwatersheds. The main stressors in this WMA come from the two golf courses, which tend to have higher pollutant loadings and a negative impact on natural stream buffers. In general, this WMA is of higher quality than the Little Rocky Run WMAs because of the significant land-use differences.

### 5.1.1 Johnny Moore Creek WMA Projects

The 10-year structural priority projects recommended for the Johnny Moore Creek WMA are described below. More detailed fact sheets for these projects are provided at the end of this section.

**JM9100:** Pond retrofit JM9100 addresses a pond that has fallen into disrepair and currently provides little to no detention or treatment. JM9100 calls for pond embankment repairs, new micropools and wetland plantings, and removal of debris downstream of the pond.

**JM9200:** Johnny Moore Creek suffers from severe bank erosion downstream of Balmoral Greens Avenue. Project JM9200 will restore the stream to a more stable, natural state to prevent future erosion and promote habitat health and diversity.

**JM9201:** Stream restoration project JM9201 addresses erosion in a tributary to Willow Spring Branch near the intersection of Balmoral Greens Avenue and Balmoral Forest Road. Project JM9201 will restore the stream to a more stable, natural state to prevent future erosion and promote habitat health and diversity.

**JM9202:** A tributary to Johnny Moore Creek that crosses Union Mill Road at its southern end suffers from erosion. Project JM9202 will restore the stream to a more stable, natural state to prevent future erosion and promote habitat health and diversity.

**JM9203:** Johnny Moore Creek suffers from moderate bank erosion at Compton Road Project JM9203 will restore the stream to a more stable, natural state to prevent future erosion and promote habitat health and diversity.

**JM9400:** Project JM9400 was based on comments regarding road flooding from the WAG. JM9400 will replace a culvert at Compton Road to alleviate the flooding issue.

**JM9500:** Project JM9500 is a culvert retrofit upstream of Balmoral Forest Road on Polecat Branch. The culvert retrofit will provide water quality treatment for an uncontrolled area.

Non-structural projects recommended in the WMA include two buffer restoration projects listed below:

**JM8800:** This buffer restoration is located along Johnny Moore Creek at the Balmoral Greens Avenue crossing. Buffer restoration would improve the stream habitat and provide water quality benefits.

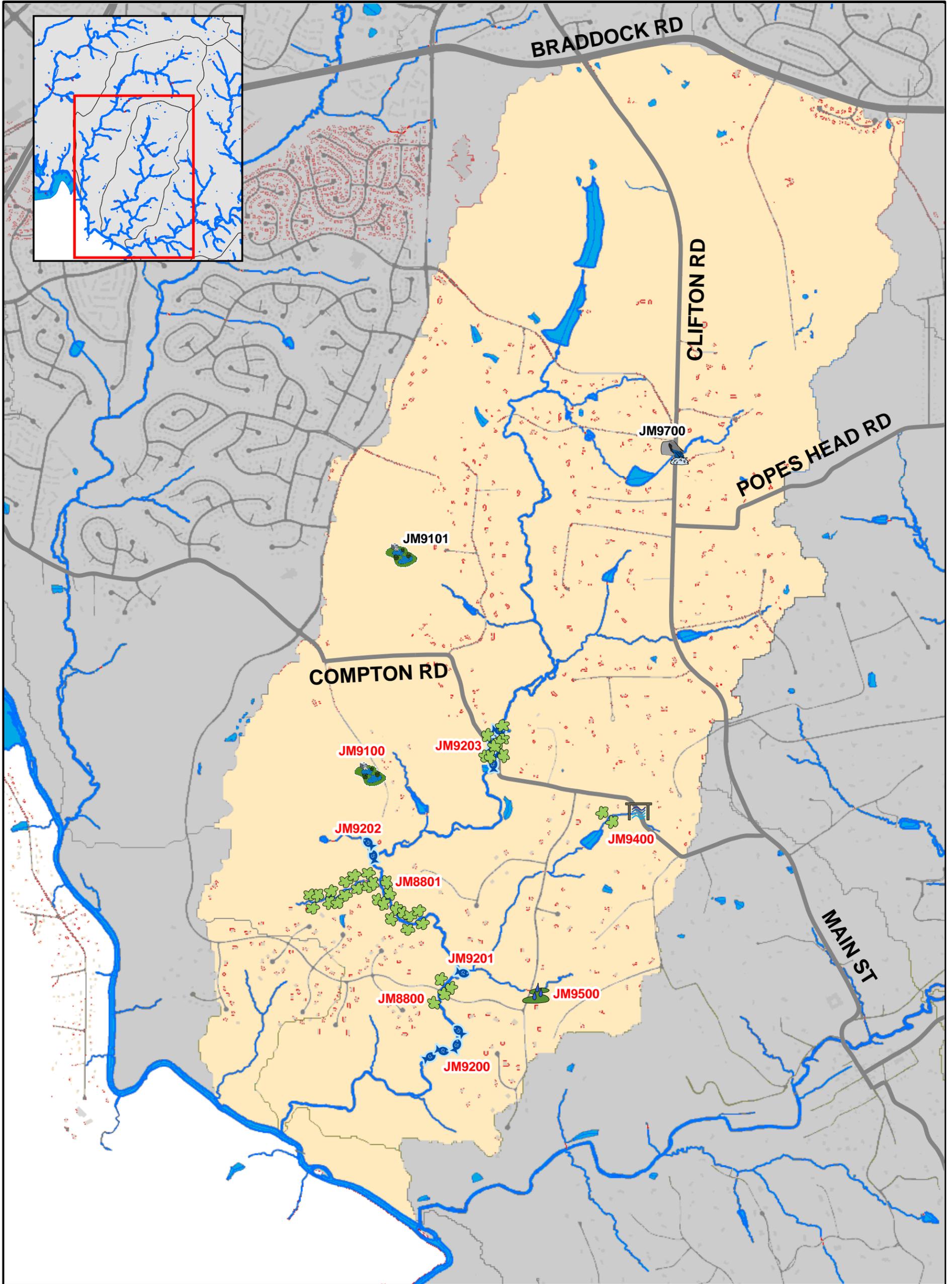
**JM8801:** This buffer restoration is located along Johnny Moore Creek and a tributary to Johnny Moore Creek south of the end of Union Ridge Road. Buffer restoration would improve the stream habitat and provide water quality benefits.

A list of all projects proposed for the WMA is shown in Table 5-2. Please note that only the 10-year priority projects have associated project fact sheets.

**Table 5-2 Johnny Moore Creek Restoration Strategies**

<b>Structural Projects</b>						
<b>Project #</b>	<b>Project Type</b>	<b>Subwatershed</b>	<b>Location</b>	<b>Watershed Benefit</b>	<b>Land Owner</b>	<b>Phase</b>
JM9100	Stormwater Pond Retrofit	JM-JM-0003	7005 Union Mill Rd Clifton, VA 20124	Quality/ Quantity	Private Commercial	0-10
JM9200	Stream Restoration	JM-JM-0001	13309 Balmoral Greens Av Clifton, VA 20124	Quality	FCPA	0-10
JM9201	Stream Restoration	JM-PC-0001	13309 Balmoral Greens Av Clifton, VA 20124	Quality	FCPA	0-10
JM9202	Stream Restoration	JM-JM-0003	7029 Union Mill Rd Clifton, VA 20124	Quality	FCPA, Private Residential	0-10
JM9203	Stream Restoration	JM-JM-0005	13400 Compton Rd Clifton, VA 20124	Quality	Private Residential	0-10
JM9400	Culvert Retrofit	JM-PC-0001	13165 Compton Rd Clifton, VA 20124	Flood	VDOT, Private Residential	0-10
JM9500	BMP/LID	JM-PC-0002	7051 Balmoral Forest Rd Clifton, VA 20124	Quality/ Quantity	FCPA	0-10
JM9101	Stormwater Pond Retrofit	JM-JM-0009	6801 Union Mill Rd Clifton, VA 20124	Quality	FCPS	11-25
JM9700	Outfall Improvement	JM-JM-0011	6301 Clifton Rd Clifton, VA 20124	Quality	VDOT	11-25
<b>Non-Structural Projects</b>						
<b>Project #</b>	<b>Project Type</b>	<b>Subwatershed</b>	<b>Location</b>	<b>Watershed Benefit</b>	<b>Land Owner</b>	
JM8800	Buffer Restoration	JM-JM-0001	13309 Balmoral Greens Av Clifton, VA 20124	Quality	FCPA	
JM8801	Buffer Restoration	JM-JM-0002	7404 Union Ridge Rd Clifton, VA 20124	Quality	FCPA, HOA	

Figure 5-1 provides an overview of project types and locations.



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Miles

-  Buffer Restoration
-  Stream Restoration
-  BMP/LID
-  Culvert Retrofit
-  Dumpsite/Obstruction Removal

-  New Stormwater Pond
-  Outfall Improvement
-  Stormwater Pond Retrofit
-  Other

-  Area-wide Drainage Improvement
-  Community Outreach/Public Education
-  Land Conservation Project
-  Flood Protection/Mitigation
-  Inspection/Enforcement Enhancement
-  Rain Barrel Program
-  Street Sweeping Program
-  Studies, Surveys and Assessments

Implementation timeframe denoted by project label color. Red = 0-10 years Black = 11-25 years.

# Map 5-1

WMA: Johnny Moore  
Proposed Projects

## 5.2 Little Rocky Run – Lower WMA

The land use in the Little Rocky Run - Lower WMA consists primarily of open space and medium density residential development. Approximately 25 percent of the WMA is located within the County's R-C District for protection of the Occoquan Reservoir. Estate residential development is expected to increase by 4% in the future. Existing stormwater treatment in the WMA covers approximately 44% of the area primarily serving the residential development in the north of the WMA.

The County SPA completed in 2005 provided a categorization of the stream habitat summarized in Table 5-3. A map showing the results of the SPA in this WMA is located in Appendix A.

**Table 5-3 Little Rocky Run – Lower Stream Habitat Ratings**

<b>Condition</b>	<b>Miles of Assessed Stream</b>	<b>% of Assessed Streams</b>
Very Poor	0	0
Poor	1.2	18
Fair	3	45
Good	1.8	27
Excellent	0.7	10

The channels were characterized primarily as deeply incised.

Based on the subwatershed characterization, the Little Rocky Run - Lower WMA is not homogeneous. The northern portion of the WMA has similar characteristics to Little Rocky Run – Upper. The southern portion of the WMA is much less developed and these subwatersheds are generally of high quality. Most of the development in this WMA occurred nearly 20 years ago; therefore, some of the stream systems have stabilized.

### 5.2.1 Little Rocky Run - Lower WMA Projects

The 10-year structural priority projects recommended for the Little Rocky Run - Lower WMA are described below. More detailed fact sheets for these projects are provided in Appendix A.

**LR9005A:** LR9005A is a proposed retrofit to existing facility 0829DP. The retrofit consists of removing the existing trickle ditches, adding micropools and wetland plantings and modifying internal pond geometry to extend the low flow path. Adding storage will depend on cooperation from HOA.

**LR9005C:** LR9005C is an alternative to Regional Pond R-05. This LID suite treats all of the area that drains to the proposed regional facility that is not treated by existing dry pond 0829DP. The HOA expressed opposition to the proposed regional pond during the WAG process, so LID measures are proposed throughout the subwatershed.

Treatment is still proposed at the outfall, but only consists of a bioretention area that can be constructed with minimal impact to mature trees.

- LR9013D:** This project is an alternative to Regional Pond R-13. This existing pond is downstream of the proposed regional pond site and controls additional drainage area than that proposed by the regional pond. This project proposes a retrofit to the pond to add capacity and modify plantings to provide additional water quality treatment.
- LR9100:** Project LR9100 is proposed to retrofit an existing pond to include wetland plantings. The retrofit would include removing the trickle ditch, adding micopools and altering pond geometry to extend the flow path.
- LR9102:** Project LR9102 is a retrofit of an existing stormwater pond. LR9102 will remove existing trickle ditches, increase storage capacity and lower peak flows, and will add micopools and wetland plantings.
- LR9103:** The LR9103 project area suffers from channel erosion and a clogged pond riser structure. LR9103 will restore the stream to a more stable, natural state to prevent future erosion and promote habitat health and diversity, clear the riser structure, and retrofit the pond with micopools and wetland plantings.
- LR9106:** Project LR9106 will retrofit an existing stormwater pond to provide improved water quality control. Existing concrete trickle ditches will be removed, and new micopools and wetland plantings will be added.
- LR9110:** Project LR9110 is to retrofit an existing facility to include wetland plantings and micopools, remove trickle ditches and extend the internal flow path.
- LR9111:** Project LR9111 will retrofit an existing stormwater pond to provide improved water quality control. Existing concrete trickle ditches will be removed, and new micopools and wetland plantings will be added.
- LR9201:** During the WAG process, participants from the Green Trails HOA noted that the tributary to Little Rocky Run downstream of Green Trails Boulevard suffers from erosion and poor flow. Subsequent field visits confirmed a stagnant system with little habitat support. Project LR9201 will restore the stream to a more stable, natural state to prevent future erosion and promote habitat health and diversity.
- LR9203:** Project LR9203 will restore the existing paved ditch upstream of Singletons Way with a natural channel system. This small stream restoration will use step pools to dissipate excess energy and prevent future erosion.
- LR9204:** Stream restoration LR9204 will restore a concrete ditch to a natural stream channel. This small stream restoration project will consist of linear bioretention basins.

- LR9504:** Proposed project LR9504 is to retrofit an existing culvert crossing to treat water quality using a gabion wall to create shallow marsh upstream.
- LR9508:** Project LR9508 proposes LID treatment of an uncontrolled area. The project includes a vegetated swale to collect runoff from the backside of townhouses and direct the flow to a small bioretention area. A new pipe from the facility to the stream will have to be placed under an existing paved trail. The project also includes one tree box filter in the cul-de-sac.
- LR9509:** Project LR9509 proposes to divert flow from an existing outlet into a created wetland detention system, designed for water quality and channel protection treatment. Approximately 24 acres of drainage will be diverted to the proposed facility. Relief is set by the culvert invert, but there is room to add storage because common area inside the easement averages 4 feet above the invert.
- LR9510:** Project LR9510 proposes BMP/LID projects at the Centreville Elementary School. The project includes constructing bioretention areas and a vegetated swale to treat runoff from roofs, parking lots, and all-purpose courts, and replacing three curb inlets with tree box filters.
- LR9514:** The Union Mill Elementary School site drains to existing dry pond 0612DP. Project LR9514 proposes construction of two bioretention areas to collect runoff from highly impervious areas. Two tree box filters will replace existing curb drop inlets.
- LR9516:** Project LR9516 is located on the Centreville High School site that drains to existing dry pond 0325DP. The project proposes replacement of five curb drop inlets with tree box filters and construction of a bioretention area near the parking lot. The proposed measures drain areas that are nearly 100% impervious.

Non-structural projects recommended in the WMA are listed below:

- LR9800:** This non-structural project is the result of information gathered from the WAG about litter problems in North Hart Run and Compton Valley Estates. This project is to provide targeted education about litter control in the neighborhood and organization of stream clean ups in the area.

A list of all projects proposed for the WMA is shown in Table 5-4. Please note that only the 10-year priority projects have associated project fact sheets.

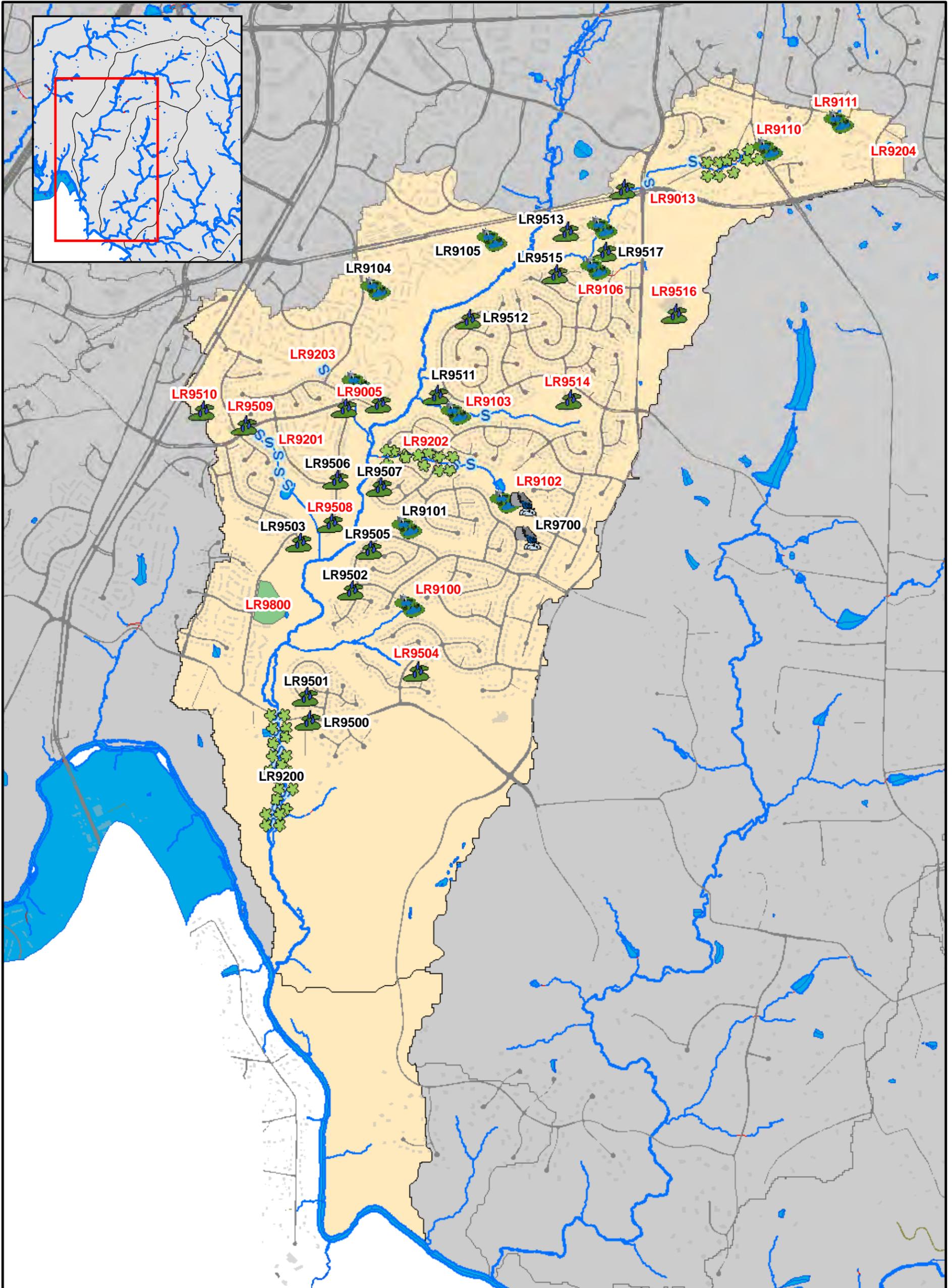
**Table 5-4 Little Rocky Run - Lower Restoration Strategies**

<b>Structural Projects</b>						
<b>Project #</b>	<b>Project Type</b>	<b>Subwatershed</b>	<b>Location</b>	<b>Watershed Benefit</b>	<b>Land Owner</b>	<b>Phase</b>
LR9005	Regional Pond Group	LR-LR-0010	6351 Littlefield Ct Centreville, VA 20121	Quality/ Quantity	HOA	0-10
LR9013	Regional Pond Group	LR-LR-0012	13600 Wildflower La Clifton, VA 20124	Quality/ Quantity	HOA	0-10
LR9100	Stormwater Pond Retrofit	LR-LR-0005	13943 Stonefield Dr Clifton, VA 20124	Quality	HOA	0-10
LR9102	Stormwater Pond Retrofit	LR-LR-0008	6579 Rockland Dr Clifton, VA 20124	Quality/ Quantity	HOA	0-10
LR9103	Stormwater Pond Retrofit Stream Restoration	LR-LR-0011	13815 Springstone Dr Clifton, VA 20124	Quality	HOA	0-10
LR9106	Stormwater Pond Retrofit	LR-LR-0012	13534 Union Village Ci Clifton, VA 20124	Quality	HOA	0-10
LR9110	Stormwater Pond Retrofit	LR-LR-0014	13214 Kilby Landing Ct Clifton, VA 20124	Quality	HOA	0-10
LR9111	Stormwater Pond Retrofit	LR-LR-0014	13022 Cobble La Clifton, VA 20124	Quality	HOA	0-10
LR9201	Stream Restoration	LR-LR-0007	14104 Sorrel Chase Ct Centreville, VA 20121	Quality	HOA	0-10
LR9202	Stream Restoration	LR-LR-0008	6419 Stonehaven Ct Clifton, VA 20124	Quality	HOA	0-10
LR9203	Stream Restoration	LR-LR-0010	14100 Wood Rock Wy Centreville, VA 20121	Quality	HOA	0-10
LR9204	Stream Restoration	LR-LR-0014	5587A Rockpointe Dr Clifton, VA 20124	Quality	HOA	0-10
LR9504	BMP/LID	LR-LR-0005	13916 Rock Brook Ct Clifton, VA 20124	Quality	HOA	0-10
LR9508	BMP/LID	LR-LR-0007	6612 Creek Run Dr Centreville, VA 20121	Quality	HOA, VDOT	0-10
LR9509	BMP/LID	LR-LR-0007	6600 La Petite Pl Centreville, VA 20121	Quality/ Quantity	HOA	0-10
LR9510	BMP/LID	LR-LR-0007	14330 Green Trails Bv Centreville, VA 20121	Quality	FCPS	0-10
LR9514	BMP/LID	LR-LR-0011	13611 Springstone Dr Clifton, VA 20124	Quality	FCPS	0-10

Structural Projects						
Project #	Project Type	Subwatershed	Location	Watershed Benefit	Land Owner	Phase
LR9516	BMP/LID	LR-LR-0012	6001 Union Mill Rd Clifton, VA 20124	Quality	FCPS	0-10
LR9101	Stormwater Pond Retrofit	LR-LR-0006	13909 Warm Spring Ct Clifton, VA 20124	Quality	HOA	11-25
LR9104	Stormwater Pond Retrofit	LR-LR-0009	13932 Preacher Chapman Pl Centreville, VA 20121	Quality	HOA	11-25
LR9105	Stormwater Pond Retrofit	LR-LR-0009	13801 Laura Ratcliff Ct Centreville, VA 20121	Quality	HOA	11-25
LR9200	Stream Restoration	LR-LR-0003	7014 Dalemar Dr Clifton, VA 20124	Quality	Private Residential	11-25
LR9500	BMP/LID	LR-LR-0003	6901 Newby Hall Ct Clifton, VA 20124	Quality	VDOT, Private Residential	11-25
LR9501	BMP/LID	LR-LR-0004	6818 Compton Heights Cr Clifton, VA 20124	Quality	HOA	11-25
LR9502	BMP/LID	LR-LR-0004	14024 Marblestone Dr Clifton, VA 20124	Quality	HOA, VDOT, Private Residential	11-25
LR9503	BMP/LID	LR-LR-0004	14100 Rock Canyon Dr Centreville, VA 20121	Quality	VDOT	11-25
LR9505	BMP/LID	LR-LR-0006	13933 Marblestone Dr Clifton, VA 20124	Quality	HOA, VDOT, Private Residential	11-25
LR9506	BMP/LID	LR-LR-0006	6596 Creek Run Dr Centreville, VA 20121	Quality	HOA, VDOT	11-25
LR9507	BMP/LID	LR-LR-0006	13930 South Springs Dr Clifton, VA 20124	Quality	HOA, VDOT	11-25
LR9512	BMP/LID	LR-LR-0009	13905 Springstone Dr Clifton, VA 20124	Quality	HOA, VDOT	11-25
LR9513	BMP/LID	LR-LR-0009	13671 Wildflower La Clifton, VA 20124	Quality	HOA, Private Residential	11-25
LR9515	BMP/LID	LR-LR-0012	13609 Bridgeland La Clifton, VA 20124	Quality	HOA, VDOT, Private Residential	11-25
LR9517	BMP/LID	LR-LR-0012	6021 Little Brook Ct Clifton, VA 20124	Quality	HOA	11-25

<b>Structural Projects</b>						
<b>Project #</b>	<b>Project Type</b>	<b>Subwatershed</b>	<b>Location</b>	<b>Watershed Benefit</b>	<b>Land Owner</b>	<b>Phase</b>
LR9700	Outfall Improvement	LR-LR-0008	6436 Battle Rock Dr Clifton, VA 20124	Quality	HOA	11-25
<b>Non-Structural Projects</b>						
<b>Project #</b>	<b>Project Type</b>	<b>Subwatershed</b>	<b>Location</b>	<b>Watershed Benefit</b>	<b>Land Owner</b>	
LR9800	Outreach/Education	LR-LR-0004	14123 Compton Valley Wy Centreville, VA 20121	Quality	HOA	

Figure 5-2 provides an overview of project types and locations.



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Miles

- Buffer Restoration
- Stream Restoration
- BMP/LID
- Culvert Retrofit
- Dumpsite/Obstruction Removal

- New Stormwater Pond
- Outfall Improvement
- Stormwater Pond Retrofit
- Other

- Area-wide Drainage Improvement
- Community Outreach/Public Education
- Land Conservation Project
- Flood Protection/Mitigation
- Inspection/Enforcement Enhancement
- Rain Barrel Program
- Street Sweeping Program
- Studies, Surveys and Assessments

Implementation timeframe denoted by project label color. Red = 0-10 years Black = 11-25 years.

## Map 5-2

WMA: Little Rocky - Lower  
Proposed Projects

### 5.3 Little Rocky Run – Upper WMA

The land use in the Little Rocky Run - Upper WMA consists primarily of medium density residential development and open space. Low-density residential development is expected to increase by 6% in the future. Existing stormwater treatment in the WMA covers approximately 34% of the area, primarily serving residential development in the WMA.

The County SPA completed in 2005 provided a categorization of the stream habitat summarized in Table 5-5. A map showing the results of the SPA in this WMA is located in Appendix A.

**Table 5-5 Little Rocky Run – Upper Stream Habitat Ratings**

<b>Condition</b>	<b>Miles of Assessed Stream</b>	<b>% of Assessed Streams</b>
Very Poor	0	0
Poor	1.3	20
Fair	5.2	80
Good	0	0
Excellent	0	0

The channels were characterized primarily as actively widening with unstable stream banks.

Based on the subwatershed characterization, the Little Rocky Run - Upper WMA contains most of the lower quality subwatersheds out of all three WMAs. This is due to the density of development and the ongoing disturbance occurring in the watershed that impacts sampling sites. Riparian, wetland and terrestrial forested habitat have been compromised, and pollutant loads are relatively high.

#### 5.3.1 Little Rocky Run - Upper WMA Projects

The 10-year structural priority projects recommended for the Little Rocky Run - Upper WMA are described below. More detailed fact sheets for these projects are provided at the end of this section.

**LR9010B:** Project LR9010B is an alternative to Regional Pond R-10. The project includes removal of trickle ditches, pond geometry alteration, and the addition of micropools and wetland plantings.

**LR9109:** Project LR9109 is a retrofit of an existing stormwater pond. The existing trickle ditch will be removed, and micropools and wetland plantings will be added.

- LR9114:** Project LR9114 will retrofit two existing stormwater ponds to provide improved water quality control. Existing concrete trickle ditches will be removed, and new micropools and wetland plantings will be added.
- LR9115:** Project LR9115 is a retrofit of an existing stormwater pond near Sandy Point Lane. Storage volume will be increased, existing trickle ditches will be removed, and micropools and wetland plantings will be added.
- LR9117:** Project LR9117 will retrofit an existing stormwater pond along Lee Highway to provide improved water quality control. Existing concrete trickle ditches will be removed, and new micropools and wetland plantings will be added.
- LR9205:** The pond outfalls near Whisper Willow Drive that drain to Little Rocky Run are causing scouring and erosion. Stream restoration project LR9205 will restore the stream to a more stable, natural state to prevent future erosion and promote habitat health and diversity.
- LR9207:** Stream restoration project LR9207 addresses erosion in the tributary to Willow Spring Branch along Ashleigh Road. Project LR9207 will restore the stream to a more stable, natural state to prevent future erosion and promote habitat health and diversity.
- LR9208:** The tributary to Willow Spring Branch at Kentstone Way is lined by a concrete trapezoidal channel (currently being undermined) with turf grass on either side. Stream restoration project LR9208 will remove the concrete channel and restore a natural stream system and riparian buffer area.
- LR9209:** The unnamed tributary to Willow Spring Branch at Ashleigh Road and Heatherford Place is lined by a concrete trapezoidal channel (currently being undermined) with turf grass on either side. Stream restoration project LR9209 will remove the concrete channel and recreate a natural stream system and riparian buffer area. A new channel with a plunge pool and several step pools will help dissipate erosive energy.
- LR9521:** LID stormwater treatment is proposed for Project LR9521 for this uncontrolled area near Canada Goose Court. The project includes collecting runoff from an existing grassed swale in a bioretention area and replacing two curb inlets with tree box filters.
- LR9522:** Project LR9522 provides stormwater retrofits at the Colin Powell Elementary School. Retrofits consist of cutting curbs and installing bioretention areas in grassed medians in five locations, and replacing one curb inlet with a tree box filter. This LID suite will treat most of the two parking lots on the property.
- LR9523:** Project LR9523 is located near Feldspar Court and includes constructing a wetland detention cell to treat for water quality only. This is a large untreated area where

more decentralized retrofits would be very difficult due to private property constraints.

**LR9524:** The stormwater system near Chalkstone Way has no existing water quality treatment and suffers from minor erosion. LR9524 will provide new water quality treatment with a constructed wetland area at the outfall of the system and will prevent future upstream and downstream erosion by dissipating excess energy.

**LR9526:** Project LR9526 will divert flow from an outfall downstream of Lee Highway into a wetland marsh area. The wetland marsh will treat the water quality volume only; channel protection treatment will require removal of trees or realigning the storm sewer/outfall. A trail and a workout station within the proposed footprint will need to be relocated.

**LR9527:** Project LR9527 provides stormwater retrofits at the Willow Springs Elementary School. Retrofits consist of altering the pond geometry and adding wetland plantings to three existing dry ponds, and adding a bioretention area to capture impervious runoff from the roof.

Non-structural projects recommended in the WMA are listed below:

**LR8800:** This buffer restoration is located on a tributary to Little Rocky Run at Westbrook Drive. Buffer restoration would improve the stream habitat and provide water quality benefits.

**LR9010A:** This buffer restoration is an alternative to Regional Pond R-10 and is located along Willow Springs Branch at Chronical Drive. Buffer restoration would improve the stream habitat and provide water quality benefits.

**LR9801:** This non-structural project is the result of information gathered from the WAG about trash and junk storage at the site. This project is to provide targeted education and enforcement of solid waste regulations.

**LR9802:** This non-structural project is the result of information gathered from the WAG about dumpster management and debris at this commercial site. This project is to provide targeted education and enforcement of solid waste regulations.

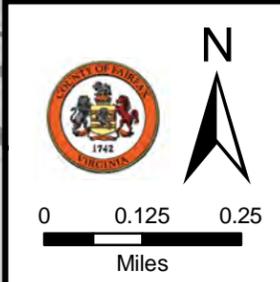
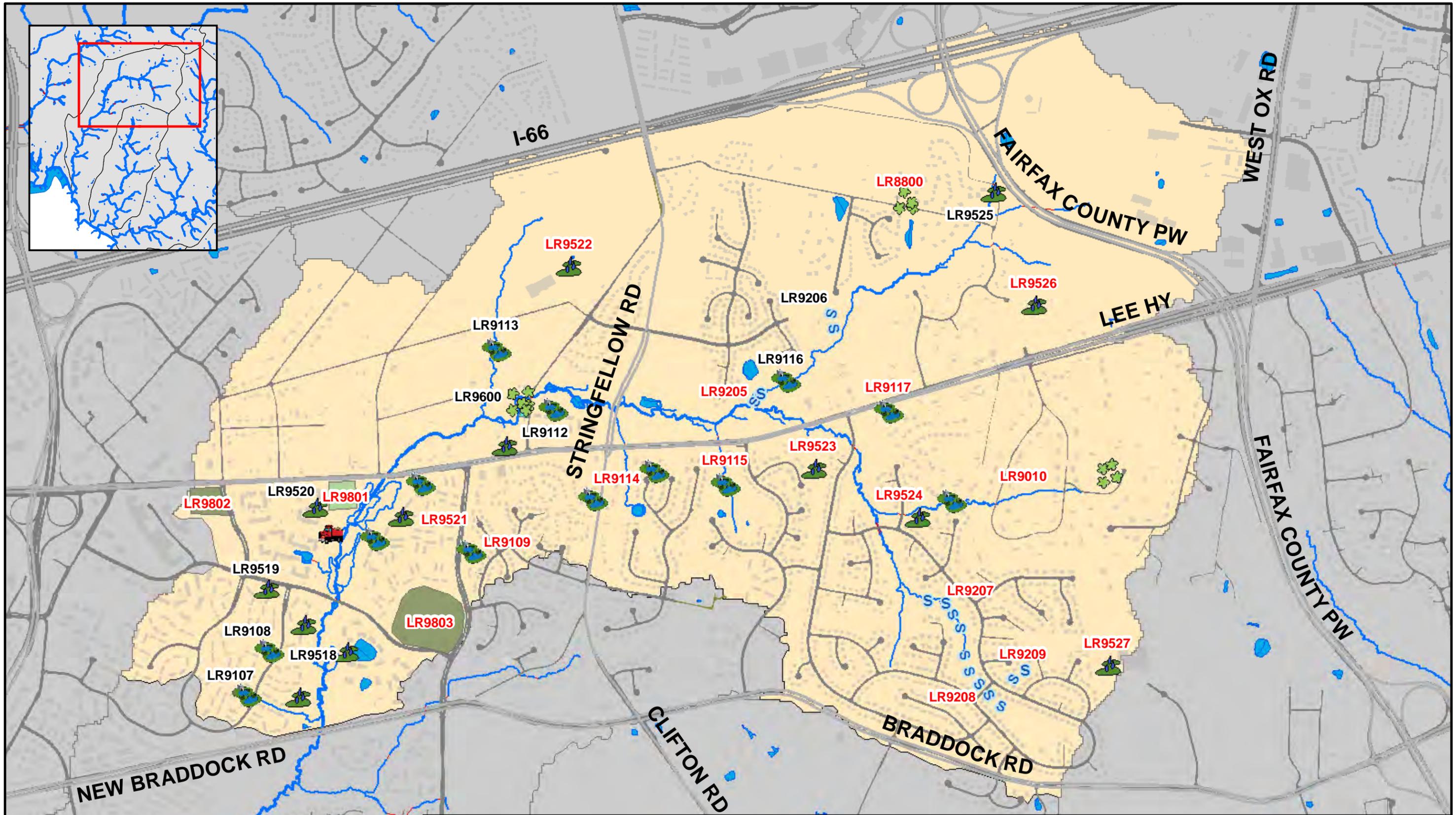
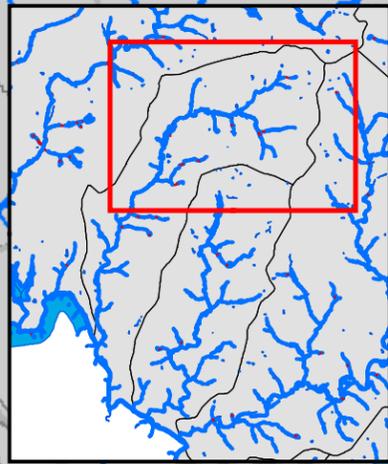
A list of all projects proposed for the WMA is shown in Table 5-6. Please note that only the 10-year priority projects have associated project fact sheets.

**Table 5-6 Little Rocky Run - Upper Restoration Strategies**

<b>Structural Projects</b>						
<b>Project #</b>	<b>Project Type</b>	<b>Subwatershed</b>	<b>Location</b>	<b>Watershed Benefit</b>	<b>Land Owner</b>	<b>Phase</b>
LR9010	Regional Pond Group	LR-WS-0004	5378 Harrow La Fairfax, VA 22030	Quality	HOA	0-10
LR9109	Stormwater Pond Retrofit	LR-LR-0016	5064 Cavalier Woods La Clifton, VA 20124	Quality	HOA	0-10
LR9114	Stormwater Pond Retrofit	LR-LR-0020	13114 Blue Willow PI Clifton, VA 20124	Quality/ Quantity	HOA	0-10
LR9115	Stormwater Pond Retrofit	LR-LR-0021	5403 Willow Valley Rd Clifton, VA 20124	Quality/ Quantity	HOA	0-10
LR9117	Stormwater Pond Retrofit	LR-WS-0002	12837 Lee Hy Fairfax, VA 22030	Quality	Private Residential	0-10
LR9205	Stream Restoration	LR-LR-0020	5217 Whisper Willow Dr Fairfax, VA 22030	Quality	FCPA	0-10
LR9207	Stream Restoration	LR-WS-0003	5378 Ashleigh Rd Fairfax, VA 22030	Quality	HOA	0-10
LR9208	Stream Restoration	LR-WS-0003	5418 Ashleigh Rd Fairfax, VA 22030	Quality	HOA	0-10
LR9209	Stream Restoration	LR-WS-0003	12753 Ashleigh Ct Fairfax, VA 22030	Quality	HOA	0-10
LR9521	BMP/LID	LR-LR-0016	13516 Canada Goose Ct Clifton, VA 20124	Quality	HOA	0-10
LR9522	BMP/LID	LR-LR-0019	13340 Leland Rd Centreville, VA 20121	Quality	FCPS	0-10
LR9523	BMP/LID	LR-WS-0002	13006 Feldspar Ct Clifton, VA 20124	Quality	HOA	0-10
LR9524	BMP/LID	LR-WS-0002	5355 Ashleigh Rd Fairfax, VA 22030	Quality	HOA	0-10
LR9526	BMP/LID	LR-LR-0025	4864 Muddler Way Fairfax, VA 22030	Quality	HOA	0-10
LR9527	BMP/LID	LR-WS-0003	5400 Willow Springs School Rd Fairfax, VA 22030	Quality	FCPS	0-10
LR9107	Stormwater Pond Retrofit	LR-LR-0015	5901 Spruce Run Ct Centreville, VA 20121	Quality	HOA	11-25
LR9108	Stormwater Pond Retrofit	LR-LR-0015	13660 Forest Pond Ct Centreville, VA 20121	Quality	HOA	11-25
LR9112	Stormwater Pond Retrofit	LR-LR-0018	13270 Maple Creek La Centreville, VA 20120	Quality	HOA	11-25

Structural Projects						
Project #	Project Type	Subwatershed	Location	Watershed Benefit	Land Owner	Phase
LR9113	Stormwater Pond Retrofit	LR-LR-0019	5324 Sammie Kay La Centreville, VA 20120	Quality	HOA	11-25
LR9116	Stormwater Pond Retrofit	LR-LR-0022	5130 Myrtle Leaf Dr Fairfax, VA 22030	Quality	County	11-25
LR9206	Stream Restoration	LR-LR-0022	5112 Lincoln Dr Fairfax, VA 22030	Quality	FCPA	11-25
LR9518	BMP/LID	LR-LR-0015	13644 Barren Springs Ct Centreville, VA 20121	Quality	HOA	11-25
LR9519	BMP/LID	LR-LR-0015	5813 Rockdale Ct Centreville, VA 20121	Quality	HOA	11-25
LR9520	BMP/LID	LR-LR-0016	13660 Bayberry La Centreville, VA 20121	Quality	Private Residential	11-25
LR9525	BMP/LID	LR-LR-0024	4895 Annamohr Dr Fairfax, VA 22030	Quality	HOA, VDOT	11-25
LR9600	Buffer Restoration	LR-LR-0018	5416 Arrowhead Park Dr Centreville, VA 20120	Flood	Private Residential	11-25
Non-Structural Projects						
Project #	Project Type	Subwatershed	Location	Watershed Benefit	Land Owner	
LR8800	Buffer Restoration	LR-LR-0023	12810 Westbrook Dr Fairfax, VA 22030	Quality	FCPA, HOA	
LR9010A	Buffer Restoration	LR-WS-0005	12524 Chronical Dr Fairfax, VA 22030	Quality	Private Residential	
LR9801	Outreach/Education	LR-LR-0016	13617 Lee Hy Centreville, VA 20121	Quality	Private Commercial, HOA	
LR9802	Outreach/Education, Street Sweeping Program	LR-LR-0016	5702 Union Mill Rd Clifton, VA 20124	Quality	Private Commercial	

Figure 5-3 provides an overview of project types and locations.



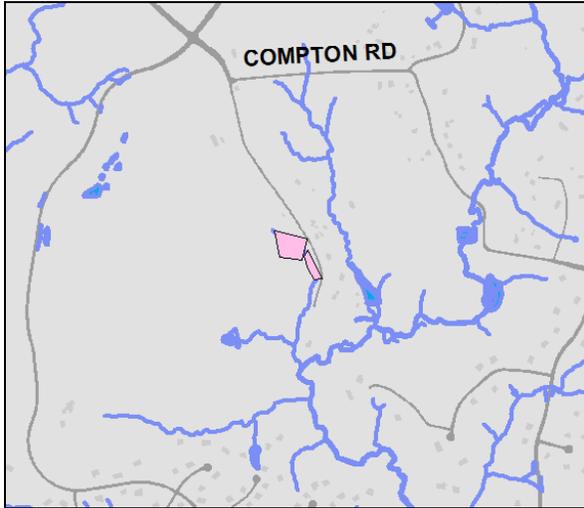
- |                    |                    |         |                  |                              |                     |                     |                          |       |                                |                                     |                           |                             |                                    |                     |                         |                                  |
|--------------------|--------------------|---------|------------------|------------------------------|---------------------|---------------------|--------------------------|-------|--------------------------------|-------------------------------------|---------------------------|-----------------------------|------------------------------------|---------------------|-------------------------|----------------------------------|
| Buffer Restoration | Stream Restoration | BMP/LID | Culvert Retrofit | Dumpsite/Obstruction Removal | New Stormwater Pond | Outfall Improvement | Stormwater Pond Retrofit | Other | Area-wide Drainage Improvement | Community Outreach/Public Education | Land Conservation Project | Flood Protection/Mitigation | Inspection/Enforcement Enhancement | Rain Barrel Program | Street Sweeping Program | Studies, Surveys and Assessments |
|--------------------|--------------------|---------|------------------|------------------------------|---------------------|---------------------|--------------------------|-------|--------------------------------|-------------------------------------|---------------------------|-----------------------------|------------------------------------|---------------------|-------------------------|----------------------------------|
- Implementation timeframe denoted by project label color. Red = 0-10 years Black = 11-25 years.

**Map 5-3**  
WMA: Little Rocky - Upper  
Proposed Projects

## **5.4 Project Fact Sheets**

The project fact sheets for the 10-year Implementation Plan provide more detailed information about each project and the project fact sheets. The project fact sheets follow in alphabetical order.

## JM9100 Pond Retrofit



Vicinity Map

<b>Address</b>	7005 Union Mill Rd
<b>Location</b>	Golf course
<b>Landowner</b>	Balmoral Golf Assoc LC Garfield Henry TR
<b>PIN</b>	0742 05 B1 0751 06 F
<b>Control Type</b>	Water quality and quantity control
<b>Drainage Area</b>	63 acres
<b>Receiving Waters</b>	Unnamed tributary to Johnny Moore Creek

**Description:** Pond retrofit JM9100 addresses a stormwater pond that has fallen into disrepair and currently provides little to no detention or treatment. JM9100 calls for pond embankment repairs, new micropools and wetland plantings, and removal of debris downstream of the pond.



Project Area Map

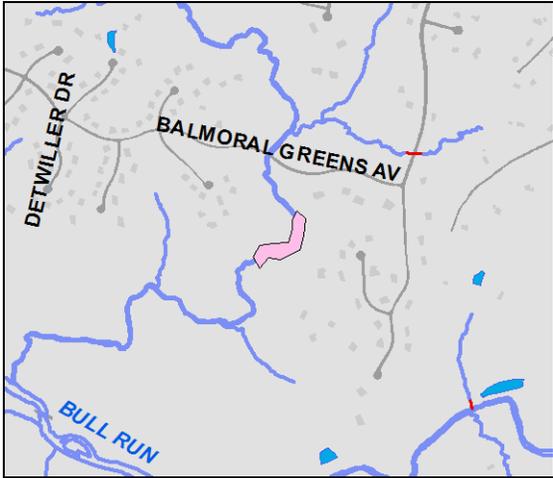
**Project Benefits:** JM9100 will eliminate approximately 3 lbs/yr of phosphorus pollution, and will improve wildlife habitat by restoring a wetland area.

**Project Design Considerations:** Stream restoration JM9202 is located approximately 1200 feet downstream of JM9100. Coordination and sequencing of these projects must be considered. The pond retrofit portion of JM9100 is located on Balmoral Golf Association property and is surrounded by conservation easements. The debris removal portion of JM9100 is located on private property, and is not within any easements.

**Costs:**

<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
Access Road	100	SY	\$25.00	\$2,500.00
Access Road Gate	1	EA	\$2,500.00	\$2,500.00
Clear and Grub	0.4	AC	\$8,500.00	\$3,400.00
Structural BMP and Incidentals	1	LS	\$10,000 - \$20,000	\$15,000.00
New Storm Pipe	30	LF	\$100 - \$300	\$6,000.00
Grading and Excavation	700	CY	\$35.00	\$24,500.00
Embankment	500	CY	\$50.00	\$25,000.00
Organic Compost Soil Amendment	175	CY	\$40.00	\$7,000.00
			<b>Base Construction Cost</b>	<b>\$85,900.00</b>
			Mobilization (5%)	\$4,295.00
			Plantings (5%)	\$4,295.00
			Ancillary Items (5%)	\$4,295.00
			Erosion & Sediment Control (10%)	\$8,590.00
			<b>Subtotal 1</b>	<b>\$107,375.00</b>
			Contingency (25%)	\$26,843.75
			<b>Subtotal 2</b>	<b>\$134,218.75</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	\$60,398.44
			<b>Total</b>	<b>\$194,617.19</b>
			<b>Estimated Project Cost</b>	<b>\$200,000.00</b>

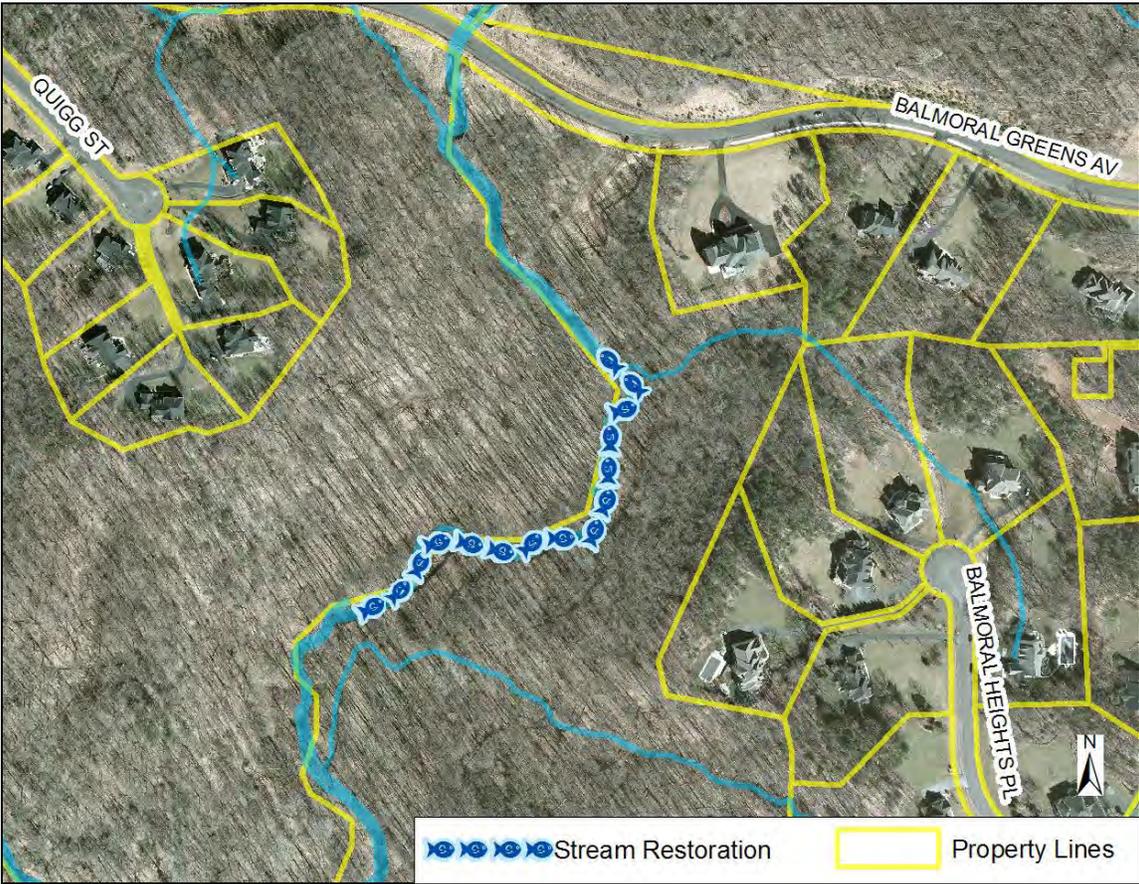
# JM9200 Stream Restoration



Vicinity Map

<b>Address</b>	13309 Balmoral Greens Ave
<b>Location</b>	Stream valley park
<b>Landowner</b>	Fairfax County Park Authority
<b>PIN</b>	0744 03 V 0851 07 G
<b>Control Type</b>	Water quality control
<b>Drainage Area</b>	2984 acres
<b>Receiving Waters</b>	Johnny Moore Creek

**Description:** Johnny Moore Creek suffers from severe bank erosion in the area shown below. Project JM9200 will restore the stream to a more stable, natural state to prevent future erosion and promote habitat health and diversity.



Project Area Map

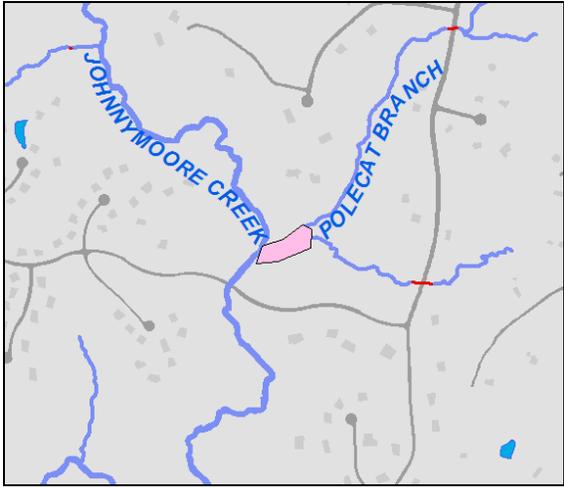
**Project Benefits:** JM9200 will remove approximately 116 lbs/yr of phosphorus and 187 tons/yr of sediment by restoring about 1000 linear feet of stream channel. Higher quality habitat for fish and wildlife will also be provided.

**Project Design Considerations:** Buffer restoration JM8800 is located just upstream of the project site, where Balmoral Greens Avenue crosses Johnny Moore Creek. Stream restoration JM9201 is also located further upstream. Coordination of these three projects should be considered. The project site can be accessed from Balmoral Greens Avenue, and is located within floodplain/stormwater and conservation easements. Significant construction issues exist – especially site access – such that it may be worthwhile to extend the restoration project even further upstream to where Balmoral Greens Avenue crosses Johnny Moore Creek. As with any stream restoration, there are significant environmental permitting requirements for this project. Impacts to trees will be inevitable, but the long-term environmental benefits of the Johnny Moore Creek Stream Restoration will outweigh its short-term environmental costs.

**Costs:**

<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
Clear and Grub	1.5	AC	\$10,000.00	\$15,000.00
Construct New Channel	1000	LF	\$200.00	\$200,000.00
Add'l Cost, first 500 LF	500	LF	\$200.00	\$100,000.00
Plantings	1.5	AC	\$25,000.00	\$37,500.00
			<b>Base Construction Cost</b>	<b>\$352,500.00</b>
			Mobilization (5%)	\$17,625.00
			Ancillary Items (5%)	\$17,625.00
			Erosion & Sediment Control (10%)	\$35,250.00
			<b>Subtotal 1</b>	<b>\$423,000.00</b>
			Contingency (25%)	\$105,750.00
			<b>Subtotal 2</b>	<b>\$528,750.00</b>
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$237,937.50
			<b>Total</b>	<b>\$766,687.50</b>
			<b>Estimated Project Cost</b>	<b>\$770,000.00</b>

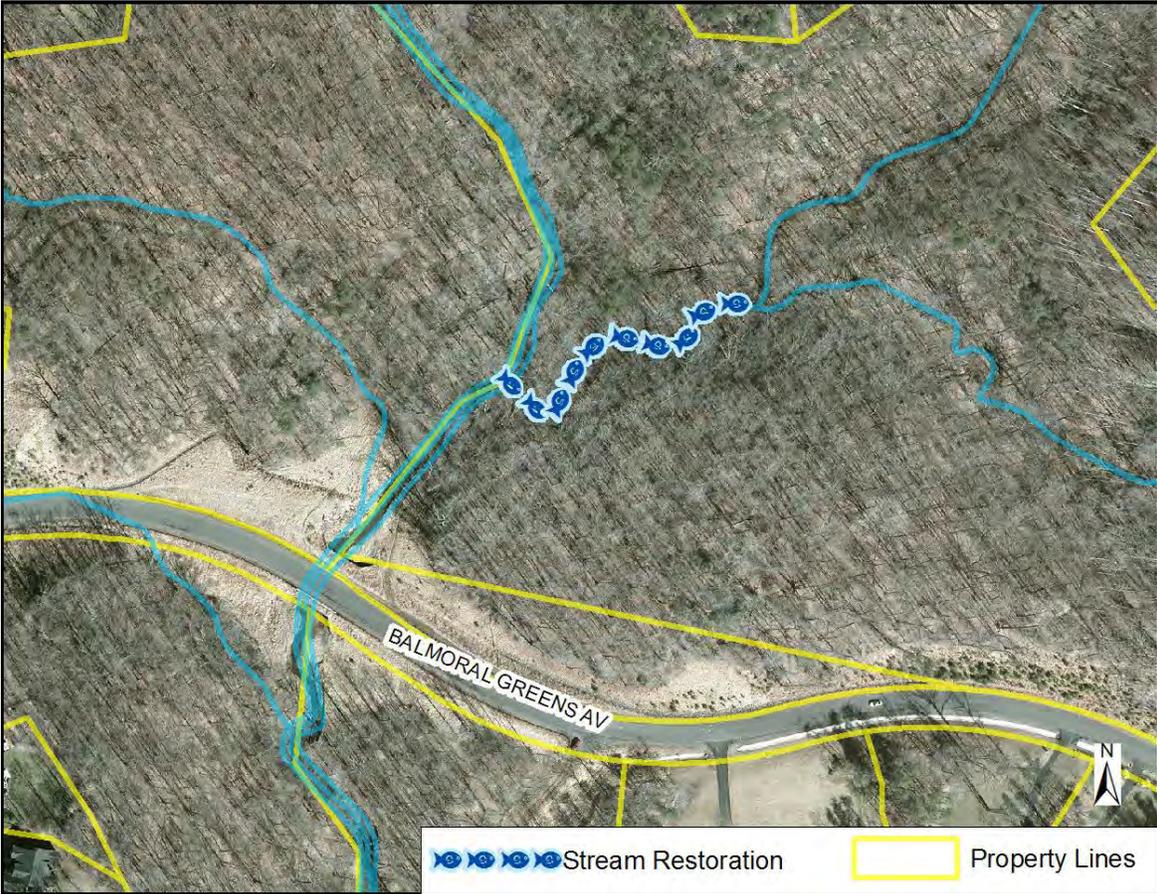
# JM9201 Stream Restoration



Vicinity Map

<b>Address</b>	13309 Balmoral Greens Ave
<b>Location</b>	Wooded area
<b>Landowner</b>	Fairfax County Park Authority
<b>PIN</b>	0753 08 A
<b>Control Type</b>	Water quality control
<b>Drainage Area</b>	310 acres
<b>Receiving Waters</b>	Johnny Moore Creek

**Description:** Stream restoration project JM9201 addresses erosion in the downstream portion of Polecat Branch. Project JM9201 will restore the stream to a more stable, natural state to prevent future erosion and promote habitat health and diversity.



Project Area Map

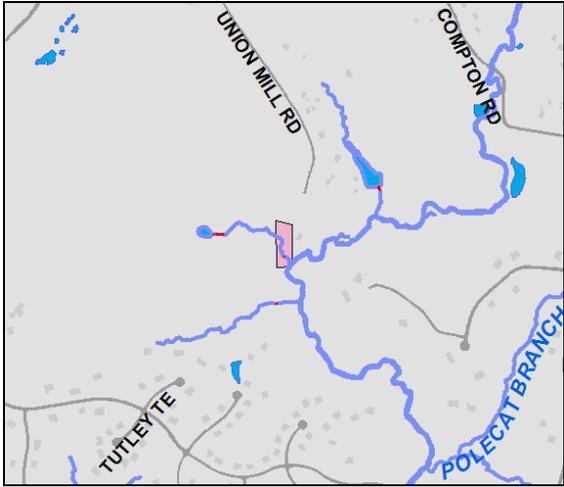
**Project Benefits:** Project JM9201 will reduce phosphorus and nitrogen loading in the Polecat Branch. Higher quality habitat for wildlife will also be provided.

**Project Design Considerations:** Buffer restoration JM8800 is located about 250 feet downstream of the project site, where Balmoral Greens Avenue crosses Johnny Moore Creek. Stream restoration JM9200 is also located further downstream on Johnny Moore Creek. Coordination and sequencing of these three projects should be considered, especially due to site access issues for JM9201 and JM9200 – both are densely wooded and somewhat remote. As with any stream restoration, there are significant environmental permitting requirements for this project. Impacts to mature trees will be inevitable, but the long-term environmental benefits of the Polecat Creek Stream Restoration will outweigh its short-term environmental costs.

**Costs:**

<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
Clear and Grub	0.57	AC	\$10,000.00	\$5,700.00
Construct New Channel	425	LF	\$200.00	\$85,000.00
Add'l Cost, first 500 LF	425	LF	\$200.00	\$85,000.00
Plantings	0.57	AC	\$25,000.00	\$14,250.00
		<b>Base Construction Cost</b>		<b>\$189,950.00</b>
		Mobilization (5%)		\$9,497.50
		Ancillary Items (5%)		\$9,497.50
		Erosion & Sediment Control (10%)		\$18,995.00
		<b>Subtotal 1</b>		<b>\$227,940.00</b>
		Contingency (25%)		\$56,985.00
		<b>Subtotal 2</b>		<b>\$284,925.00</b>
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$128,216.25
		<b>Total</b>		<b>\$413,141.25</b>
		<b>Estimated Project Cost</b>		<b>\$420,000.00</b>

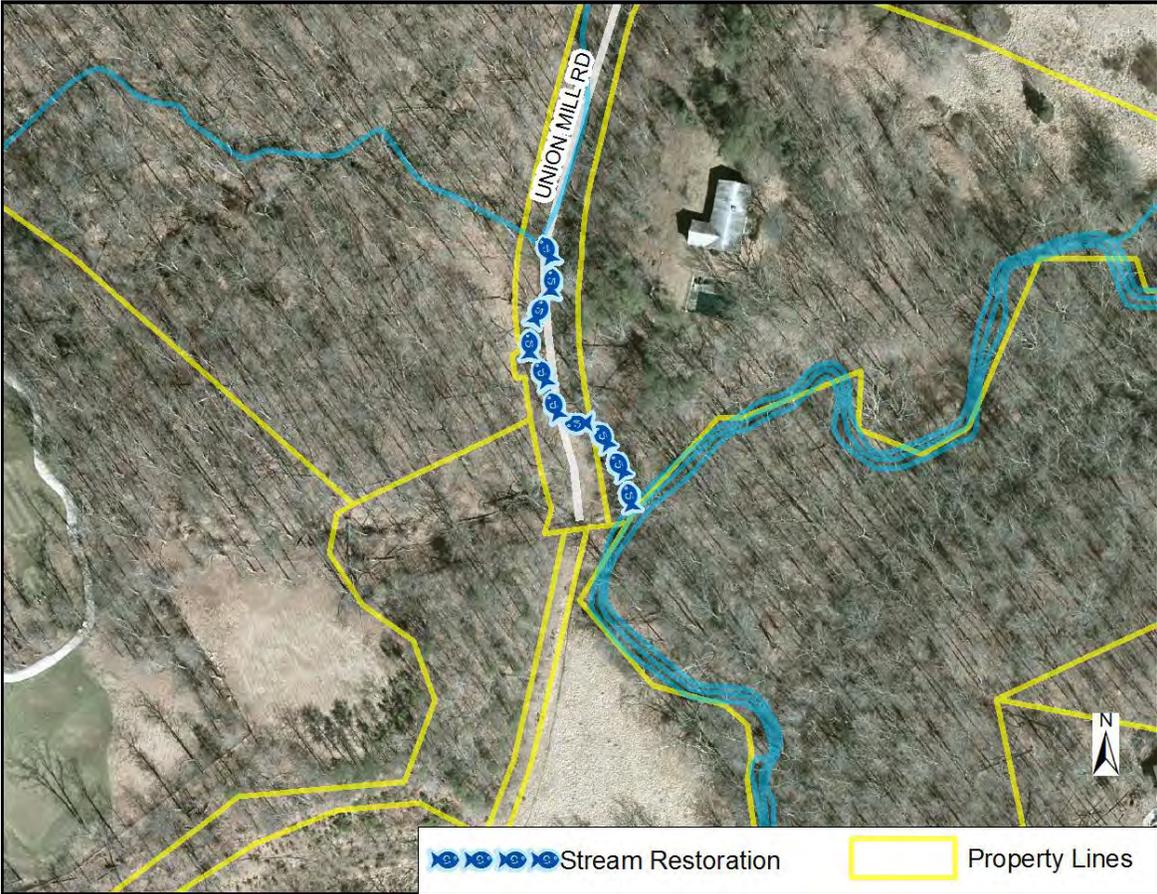
# JM9202 Stream Restoration



Vicinity Map

<b>Address</b>	7029 Union Mill Rd
<b>Location</b>	Stream valley park
<b>Landowner</b>	Fairfax County Park Authority Garfield Henry TR
<b>PIN</b>	0744 03 S 0751 06 E
<b>Control Type</b>	Water quality control
<b>Drainage Area</b>	174 acres
<b>Receiving Waters</b>	Johnny Moore Creek

**Description:** The tributary to Johnny Moore Creek that crosses Union Mill Rd (as shown below) suffers from erosion. Project JM9202 will restore the stream to a more stable, natural state to prevent future erosion and promote habitat health and diversity.



Project Area Map

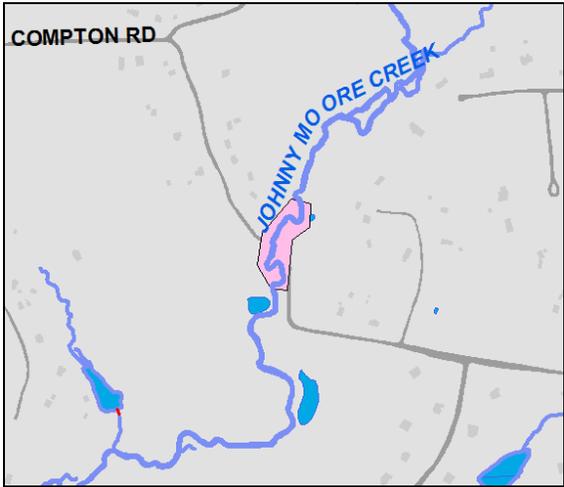
**Project Benefits:** The Tributary to Johnny Moore Creek Stream Restoration (JM9202) will reduce phosphorus, nitrogen and sediment loading, and restore approximately 325 linear feet of degraded stream channel. Higher quality habitat for fish and wildlife will also be provided.

**Project Design Considerations:** Buffer restoration JM8801 is located approximately 500' downstream of JM9202 – coordination of these two projects should be considered. JM9202 is located partially within floodplain/stormwater and conservation easements, and is also partially located on private property. The project site can be accessed from Union Mill Rd. Significant construction issues exist – especially site access. As with any stream restoration, there are significant environmental permitting requirements for this project. Impacts to trees will be inevitable, but the long-term environmental benefits of the Johnny Moore Creek Stream Restoration will outweigh its short-term environmental costs.

**Costs:**

<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
Clear and Grub	0.45	AC	\$10,000.00	\$4,500.00
Construct New Channel	325	LF	\$200.00	\$65,000.00
Add'l Cost, first 500 LF	325	LF	\$200.00	\$65,000.00
Plantings	0.45	AC	\$25,000.00	\$11,250.00
		<b>Base Construction Cost</b>		<b>\$145,750.00</b>
		Mobilization (5%)		\$7,287.50
		Ancillary Items (5%)		\$7,287.50
		Erosion & Sediment Control (10%)		\$14,575.00
		<b>Subtotal 1</b>		<b>\$174,900.00</b>
		Contingency (25%)		\$43,725.00
		<b>Subtotal 2</b>		<b>\$218,625.00</b>
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$98,381.25
		<b>Total</b>		<b>\$317,006.25</b>
		<b>Estimated Project Cost</b>		<b>\$320,000.00</b>

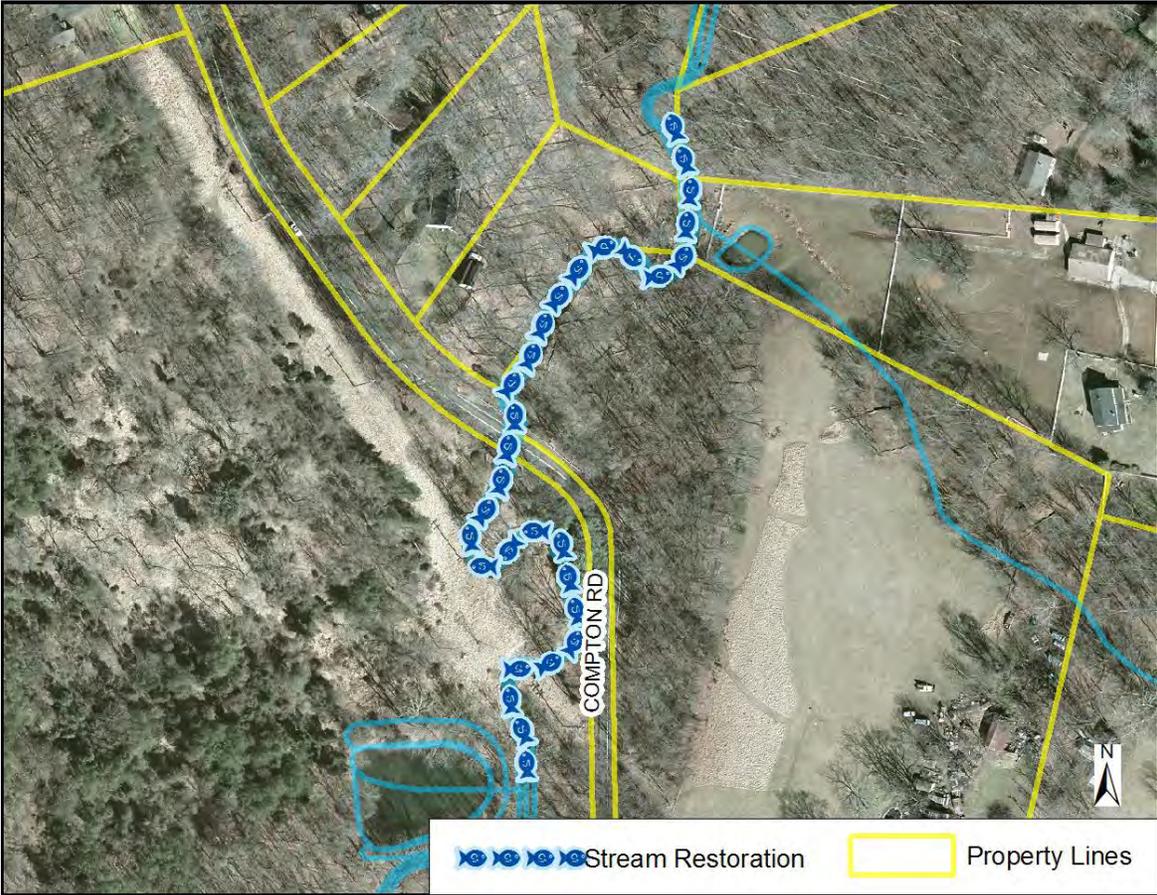
### JM9203 Stream Restoration



Vicinity Map

<b>Address</b>	13400 Compton Rd
<b>Location</b>	Private property
<b>Landowner</b>	Boyd, Donald E. TR MA Properties
<b>PIN</b>	0751 01 0026 0751 01 0011Z
<b>Control Type</b>	Water quality control
<b>Drainage Area</b>	2022 acres
<b>Receiving Waters</b>	Bull Run

**Description:** Johnny Moore Creek suffers from moderate bank erosion in this area. Project JM9203 will restore the stream to a more stable, natural state to prevent future erosion and promote habitat health and diversity.



Project Area Map

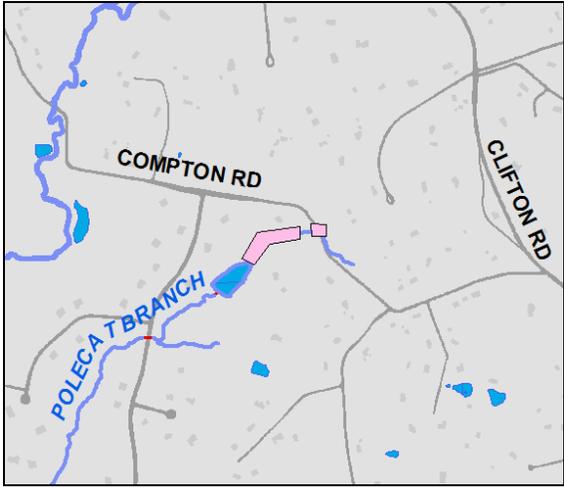
**Project Benefits:** Stream restoration JM9203 will remove approximately 6 lbs/yr of phosphorus and 10 tons/yr of sediment by restoring about 1070 linear feet of stream channel. Higher quality habitat for fish and wildlife will also be provided.

**Project Design Considerations:** Culvert retrofit JM9400 is located approximately 0.6 miles east of JM9203 on Compton Rd. Although these projects are located in separate sub-watersheds, their proximity to each other along Compton Rd. warrants consideration of coordination and sequencing. JM9203 is located on private property. As with any stream restoration, there are significant environmental permitting requirements for this project. Impacts to trees will be inevitable, but the long-term environmental benefits of the Johnny Moore Creek Stream Restoration will outweigh its short-term environmental costs.

**Costs:**

<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
Clear and Grub	1.1	AC	\$10,000.00	\$11,000.00
Construct New Channel	1070	LF	\$200.00	\$214,000.00
Add'l Cost, first 500 LF	500	LF	\$200.00	\$100,000.00
Plantings	1.1	AC	\$25,000.00	\$27,500.00
		<b>Base Construction Cost</b>		<b>\$352,500.00</b>
		Mobilization (5%)		\$17,625.00
		Ancillary Items (5%)		\$17,625.00
		Erosion & Sediment Control (10%)		\$35,250.00
		<b>Subtotal 1</b>		<b>\$423,000.00</b>
		Contingency (25%)		\$105,750.00
		<b>Subtotal 2</b>		<b>\$528,750.00</b>
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$237,937.50
		<b>Total</b>		<b>\$766,687.50</b>
		<b>Estimated Project Cost</b>		<b>\$770,000.00</b>

**JM9400 Culvert Retrofit**



Vicinity Map

<b>Address</b>	13165 Compton Rd
<b>Location</b>	Open space
<b>Landowner</b>	Feriozi, Dan J and Anne T Gallotta, Mark A and Pamela Deal, Bruce C and Ilysia D Witschey, John F and Robyn N
<b>PIN</b>	0751 01 0021 0751 01 0034B 0751 01 0033B 0753 01 0018A
<b>Control Type</b>	Water quality control
<b>Drainage Area</b>	75 acres
<b>Receiving Waters</b>	Polecat Branch

**Description:** Project JM9400 consists of a culvert retrofit where a tributary of Polecat Branch crosses Compton Rd. A small buffer restoration downstream of the culvert retrofit site is also included.



Project Area Map

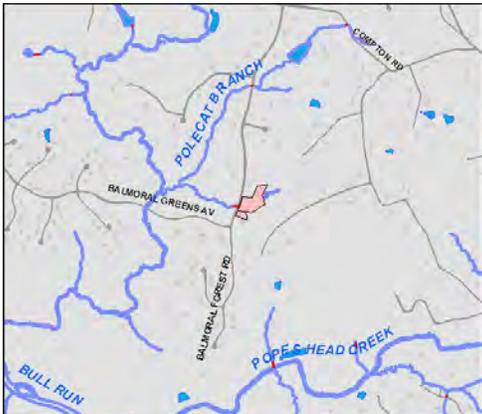
**Project Benefits:** JM9400 will address flooding issues along Compton Rd by providing more efficient stormwater conveyance at the culvert retrofit site. The buffer restoration portion of the project will reduce erosion and pollutant loading and will provide higher quality habitat for native wildlife. Increased shade will also decrease water temperatures, which will better maintain dissolved oxygen, providing better conditions for aquatic life.

**Project Design Considerations:** As the buffer restoration portion of JM9400 is located partially on private property, the County will need to coordinate with landowners. The County may also need to coordinate with adjacent landowners and VDOT regarding the culvert retrofit, depending on topological and access constraints. Permitting requirements for both the culvert retrofit and buffer restoration should be minimal.

**Costs:**

<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
Clear and Grub	0.05	AC	\$8,500.00	\$425.00
Grading and Excavation	100	CY	\$35.00	\$3,500.00
New Storm Pipe	40	LF	\$100 - \$300	\$8,000.00
Organic Compost Soil Amendment	122	CY	\$40.00	\$4,880.00
Plantings	0.3	AC	\$114,030.00	\$34,209.00
			<b>Base Construction Cost</b>	<b>\$51,014.00</b>
			Mobilization (5%)	\$2,550.70
			Plantings (5%)	\$2,550.70
			Ancillary Items (5%)	\$2,550.70
			Erosion & Sediment Control (10%)	\$5,101.40
			<b>Subtotal 1</b>	<b>\$63,767.50</b>
			Contingency (25%)	\$15,941.88
			<b>Subtotal 2</b>	<b>\$79,709.38</b>
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$35,869.22
			<b>Total</b>	<b>\$115,578.59</b>
			<b>Estimated Project Cost</b>	<b>\$120,000.00</b>

**JM9500 BMP/LID**



Vicinity Map

<b>Address</b>	7051 Balmoral Forest Road
<b>Location</b>	Open Space
<b>Landowner</b>	Fairfax County Park Authority
<b>PIN</b>	0753 08 C
<b>Control Type</b>	Water quality control
<b>Drainage Area</b>	78 Acres
<b>Receiving Waters</b>	Unnamed Tributary to Polecat branch

**Description:** Project JM9500 is a culvert retrofit upstream of Balmoral Forest Road on Polecat Branch. The culvert retrofit will provide water quality treatment for an uncontrolled area. Road drainage infrastructure may need to be realigned to allow for berm construction.



Project Area Map

**Project Benefits:** An estimated 12.5 lbs/yr of phosphorus will be removed. Project takes advantage of 'free' storage on upstream side of culvert. The project may allow for continued estate residential development upstream, which is often exempt from stormwater regulations, knowing that the water quality volume was treated.

**Project Design Considerations:** There are access issues owing to steep slopes off the road. The stream valley is also very steep and in a forested area, requiring a clearing/grading effort of the access route as well as for construction of the berm. Consider gabion wall over earthen embankment to reduce footprint. Although it is zoned as Estate residential, the models show a large pollutant removal capacity at this site. There are no sequencing issues. By nature with any culvert retrofit, the project is in-line and more permitting requirements are likely. This is a perennial stream at this location.

**Costs:**

<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
Access Road	1000	SY	\$25.00	\$25,000.00
Access Road Gate	1	EA	\$2,500.00	\$2,500.00
Clear and Grub	0.3	AC	\$8,500.00	\$2,550.00
Structural BMP and Incidentals	1	LS	\$10,000 - \$20,000	\$10,000.00
New Storm Pipe		LF	\$100 - \$300	\$0.00
Grading and Excavation		CY	\$35.00	\$0.00
Embankment	200	CY	\$50.00	\$10,000.00
Organic Compost Soil Amendment		CY	\$40.00	\$0.00
			<b>Base Construction Cost</b>	<b>\$50,050.00</b>
			Mobilization (5%)	\$2,502.50
			Plantings (5%)	\$2,502.50
			Ancillary Items (5%)	\$2,502.50
			Erosion & Sediment Control (10%)	\$5,005.00
			<b>Subtotal 1</b>	<b>\$62,562.50</b>
			Contingency (25%)	\$15,640.63
			<b>Subtotal 2</b>	<b>\$78,203.13</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	\$35,191.41
			<b>Total</b>	<b>\$113,394.53</b>
			<b>Estimated Project Cost</b>	<b>\$120,000.00</b>