

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

| Condition | Miles of Assessed Stream | % of Assessed Streams |
|------------------|---------------------------------|------------------------------|
| 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.

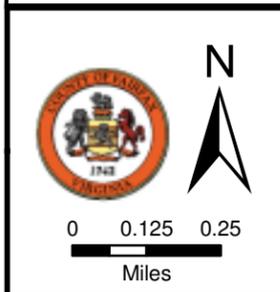
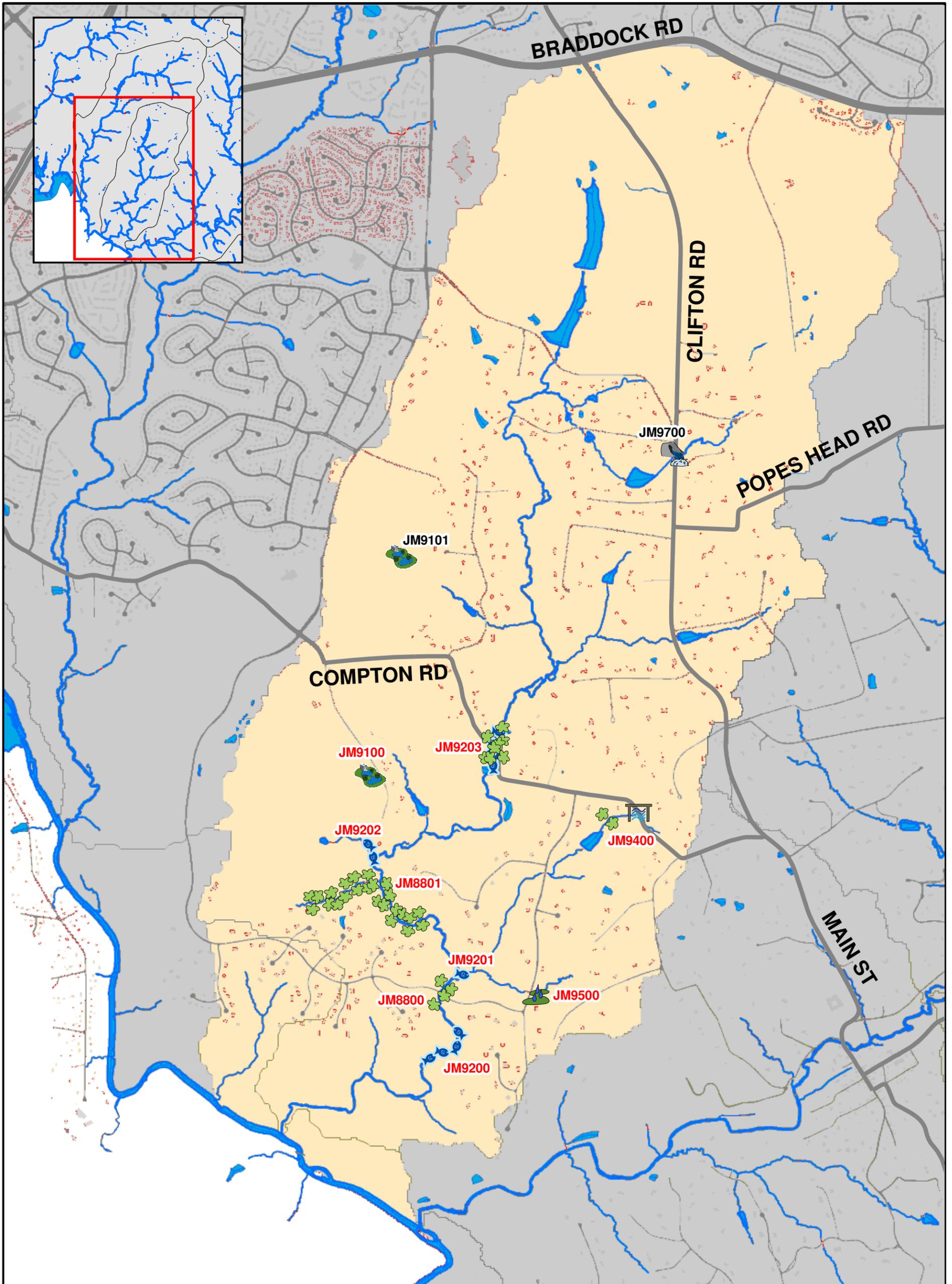
JM8801: This buffer restoration is located along Johnny Moore Creek and a tributary to Johnny Moore Creek south of the end of Union Ridge Road. Buffer restoration would improve the stream habitat and provide water quality benefits.

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

| Structural Projects | | | | | | |
|--------------------------------|--------------------------|---------------------|--|--------------------------|---------------------------------|--------------|
| Project # | Project Type | Subwatershed | Location | Watershed Benefit | Land Owner | Phase |
| 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 |
| Non-Structural Projects | | | | | | |
| Project # | Project Type | Subwatershed | Location | Watershed Benefit | Land Owner | |
| 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.



| | | |
|------------------------------|--------------------------|-------------------------------------|
| Buffer Restoration | New Stormwater Pond | Area-wide Drainage Improvement |
| Stream Restoration | Outfall Improvement | Community Outreach/Public Education |
| BMP/LID | Stormwater Pond Retrofit | Land Conservation Project |
| Culvert Retrofit | Other | Flood Protection/Mitigation |
| Dumpsite/Obstruction Removal | | 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

| Condition | Miles of Assessed Stream | % of Assessed Streams |
|-----------|--------------------------|-----------------------|
| 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 micropools 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 micropools 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 micropools 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 micropools and wetland plantings will be added.
- LR9110:** Project LR9110 is to retrofit an existing facility to include wetland plantings and micropools, 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 micropools 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.

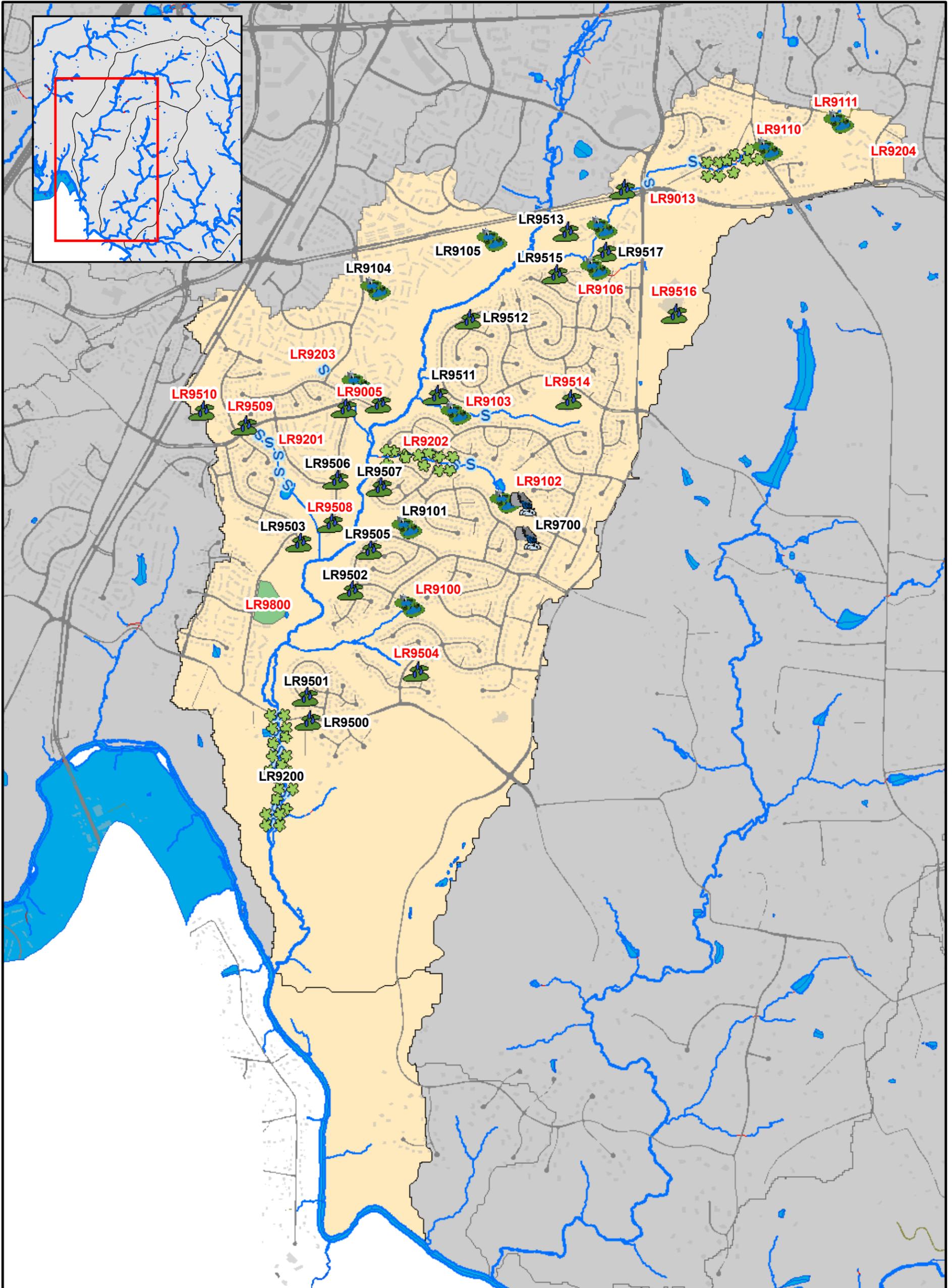
Table 5-4 Little Rocky Run - Lower Restoration Strategies

| Structural Projects | | | | | | |
|----------------------------|--|---------------------|---|--------------------------|-------------------|--------------|
| Project # | Project Type | Subwatershed | Location | Watershed Benefit | Land Owner | Phase |
| 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 |

| Structural Projects | | | | | | |
|--------------------------------|---------------------|---------------------|--|--------------------------|-------------------|--------------|
| Project # | Project Type | Subwatershed | Location | Watershed Benefit | Land Owner | Phase |
| LR9700 | Outfall Improvement | LR-LR-0008 | 6436 Battle Rock Dr Clifton, VA 20124 | Quality | HOA | 11-25 |
| Non-Structural Projects | | | | | | |
| Project # | Project Type | Subwatershed | Location | Watershed Benefit | Land Owner | |
| 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.



-  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

| Condition | Miles of Assessed Stream | % of Assessed Streams |
|------------------|---------------------------------|------------------------------|
| 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.

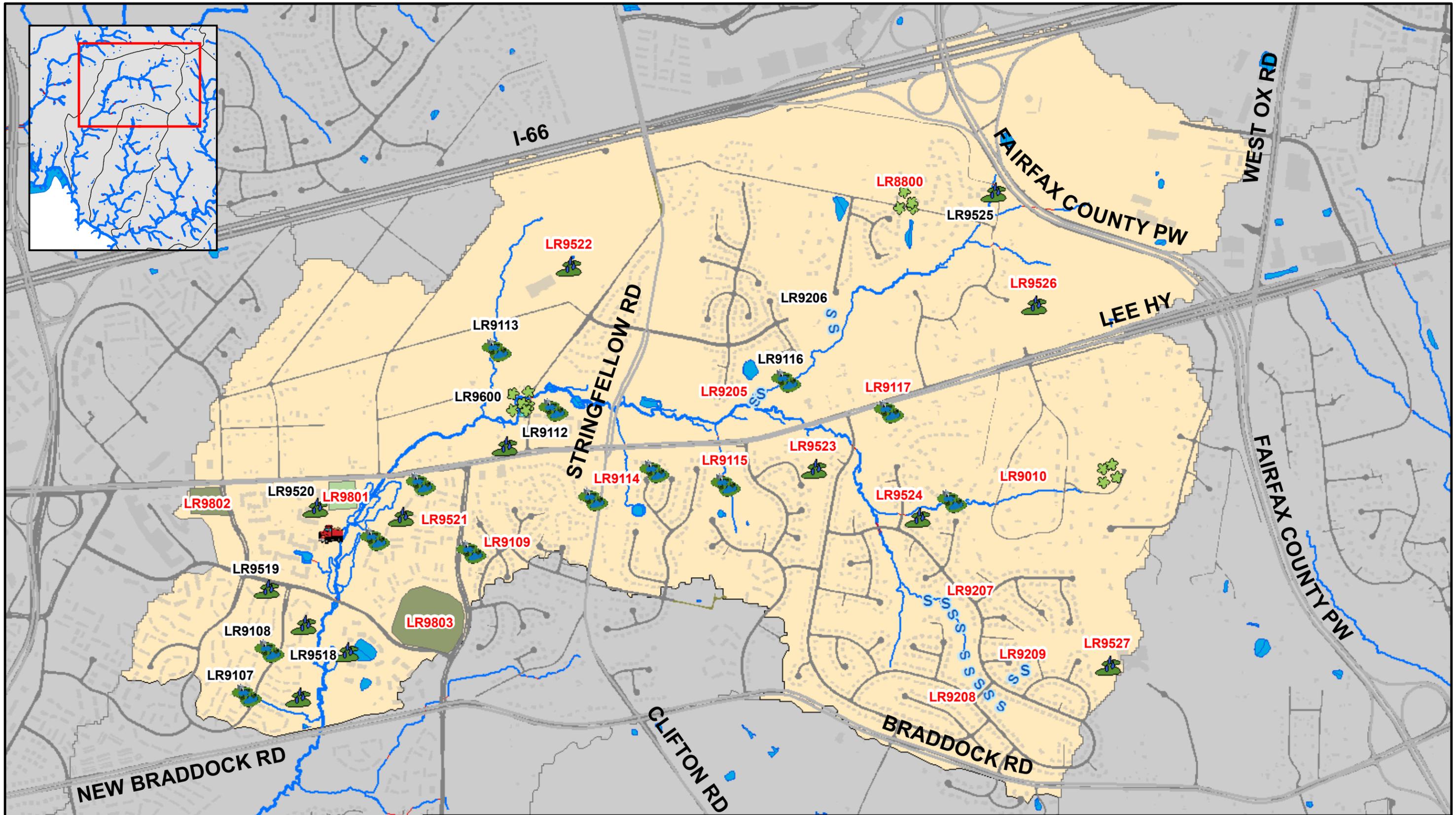
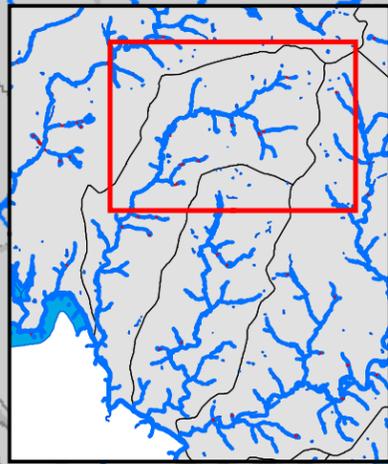
A list of all projects proposed for the WMA is shown in Table 5-6. Please note that only the 10-year priority projects have associated project fact sheets.

Table 5-6 Little Rocky Run - Upper Restoration Strategies

| Structural Projects | | | | | | |
|----------------------------|--------------------------|---------------------|---|--------------------------|------------------------|--------------|
| Project # | Project Type | Subwatershed | Location | Watershed Benefit | Land Owner | Phase |
| 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.



0 0.125 0.25
Miles

- | | | |
|------------------------------|--------------------------|-------------------------------------|
| Buffer Restoration | New Stormwater Pond | Area-wide Drainage Improvement |
| Stream Restoration | Outfall Improvement | Community Outreach/Public Education |
| BMP/LID | Stormwater Pond Retrofit | Land Conservation Project |
| Culvert Retrofit | Other | Flood Protection/Mitigation |
| Dumpsite/Obstruction Removal | | 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.