4. Watershed Restoration Strategies

Strategies for restoration of the watershed were presented to the Watershed Advisory Group (WAG) and were condensed into categories:

- Stream/Buffer Restoration
- Pond Retrofits
- New Stormwater Management (SWM) Facilities – includes Low Impact Development (LID) Techniques, Ponds, Culvert Retrofits, Outfall Treatment
- Flooding Mitigation

Table 4-1 shows the relationship between the County's goals and objectives and the restoration strategies.

Table 4-1 - Restoration Strategies

	Restoration Strategies			
County Goals & Objectives	**Stream/ Buffer Restoration**	**Pond Retrofits**	**New SWM Facilities**	**Flooding Mitigation**
Minimize impacts of stormwater runoff on stream hydrology to promote stable stream morphology, protect habitat, and support biota	■	■	■	
Minimize flooding to protect property, human health, and safety				■
Provide for healthy habitat through protecting, restoring, and maintaining riparian buffers, wetlands, and instream habitat	■			
Improve and maintain diversity of native plants and animals in the County	■			
Minimize impacts to stream water quality from pollutants in stormwater runoff		■	■	
Minimize impacts to drinking water sources from pathogens, nutrients, and toxics in stormwater runoff		■	■	
Minimize impacts to drinking water storage capacity from sediment in stormwater runoff	■	■	■	
Encourage the public to participate in watershed stewardship	■	■	■	■
Coordinate with regional jurisdictions on watershed management and restoration efforts such as Chesapeake Bay initiatives	■	■	■	■
Improve watershed aesthetics in Fairfax County	■	■	■	■

The restoration strategies encompass many different project types. Table 4-2 provides a summary of project types for each restoration strategy.

Table 4-2 - Project Types

Restoration Strategy	Project Type
Stream/Buffer Restoration	Stream/Bank Stabilization Stream Realignment Pipe Outfall Stabilization Buffer Reforestation
Pond Retrofits	Regrade pond to provide more storage Remove concrete trickle ditches Redesign pond to include micropools and wetland areas Redesign quantity-only ponds to provide water quality storage
New SWM Facilities	Bioretention areas Vegetated swales Green roofs Underground storage Manufactured BMPs Stormwater Ponds – extended detention dry ponds, wet ponds Constructed wetlands Tree box filters Rain barrel programs
Flooding Mitigation	Resize road crossing structures to convey design discharge Floodproof or purchase structures located in the floodplain

4.1 Watershed Project Descriptions

Many types of structural and non-structural projects are recommended in the watershed management plan. Structural projects involve some construction to implement. Non-structural projects include watershed approaches that do not involve construction, such as turf management programs, rain barrel programs, public education programs, stream cleanups and parking lot/street sweeping programs.

Descriptions of the various structural project types considered are provided below.

4.1.1 Structural Practices

Stormwater Pond Retrofit
Pond retrofit options that may be suitable for implementation include: • Increasing detention storage by means of additional excavation and grading or embankment modifications. • Providing water quality improvements to facilities that provide only water quantity control. These facilities could be retrofitted for water quality treatment by means of installing a micro-pool, sediment forebay, constructed stormwater wetlands, or by increasing the surrounding riparian buffer. • Modifying or replacing the existing riser structure and outlet controls to reduce the discharge rate from the stormwater management facility. A riser is a structure, typically made of concrete with a metal grate on top, which controls the level of water in the stormwater pond. • Adding other water quality features to enhance the existing pond such as wetland plantings, micropools and sediment forebays. The flow path through the pond can be increased to extend the opportunity for nutrient uptake.

Stormwater Pond Retrofit Project Example:

Braddock Forest Pond 0718DP   District: Braddock   Watershed: Popes Head Creek
A Maintenance and Stormwater Management Division Project

PRE-CONSTRUCTION
Problematic Conditions: Stormwater Pond was non-functional due to deterioration of control structures and depleted storage volume.

CONSTRUCTION
Key Project Elements: The height of the dam was increased, new control structures were installed, and a marsh was excavated in the pond floor.

POST-CONSTRUCTION
The pond has been seeded with an approved wetland seed mix and is currently stabilizing. Once it is stable the control devices (BMP plate and Trash Rack) will be installed.

Culvert Retrofit
There are two types of culvert retrofits: one to modify the culvert to address the culvert capacity and road flooding, and another to retrofit the upstream side of the culvert to provide stormwater management. This stormwater retrofit option is installed upstream from existing road culverts by constructing a control structure and excavating a micropool. These projects are designed for intermittent or ephemeral streams. The control structure will consist of a gabion weir that will detain and reduce stormwater flow; the micro-pool is a small pool that allows infiltration of stormwater runoff, improving water quality.

Culvert Retrofit Example:

Source: Center for Watershed Protection: Urban Stormwater Retrofit Practices Version 1.0, August 2007

Tree Box Filters
Tree box filters allow stormwater to flow through a specially designed filter mixture contained in a landscaped concrete container. The mixture immobilizes pollutants; those pollutants are then decomposed, volatilized and incorporated into the biomass of the tree box filter. Stormwater runoff flows through the media and into an underdrain system at the bottom of the container, where the treated water is discharged. They are useful on highly developed sites such as parking lots and streetscapes.

Tree Box Filter Example:

Low Impact Development (LID)
LID is an approach that duplicates the original hydrology of the watershed and is based on five basic principles: • Conservation and minimization • Storage • Conveyance • Landscaping • Infiltration LID is a lot-level approach to stormwater management with the goal of infiltrating the water on site. LID techniques include bioretention areas, vegetated swales, infiltration trenches, pervious pavement, green roofs, and rain barrels.

LID Project Example:

Rain Garden, Porous Pavement and Stormwater Storage System **Watershed: Accotink**
Providence Fire Station 30

PRE-CONSTRUCTION
Problematic Conditions:
Stormwater from impervious surfaces lacked quality and quantity treatment. Installation of a rain garden (bioretention basin) provides for water quality treatment and groundwater recharge through infiltration. The porous pavement provides for greater infiltration of runoff.

CONSTRUCTION
Key Project Elements:
Stormwater runoff is treated by rapid filtering through bioretention soil media, biological and biochemical reactions within the soil matrix and around the root zones of the plants, and infiltration into the underlying soil strata.

POST-CONSTRUCTION
The rain garden was planted with a combination of native trees, shrubs and herbaceous plants that provide nutrient uptake and an aesthetic benefit. The plantings also provide habitat for organisms like birds and butterflies.

Stream Restoration/Stabilization

Natural stream restoration utilizes bioengineering techniques to develop self-sustaining solutions that allow for adjustments over time. These projects incorporate living material into the solution and minimize the use of concrete or stone. Stream restoration is most applicable in a watershed with a stable land use so that the flow rate in the stream is unlikely to increase substantially. The stream restoration designs endeavor to encompass the entire stream reach, rather than apply a band-aid approach to a specific problem area.

Stream Restoration Project Example:

Stream Restoration/Outfall Improvement **District: Mount Vernon** **Watershed: Little Hunting Creek**

PRE-CONSTRUCTION
Problematic Conditions: Large quantities of uncontrolled stormwater caused bank erosion, tree loss and negative impacts to aquatic life.

CONSTRUCTION
Key Project Elements: The eroded stream was filled with suitable material to reconnect the channel to the natural floodplain. The project was designed using “natural stream restoration techniques” which aim at creating habitat for native wildlife.

POST-CONSTRUCTION
The stream was restored to a more natural design. A riparian seed mix and native trees were planted on impacted areas of the site. Continued monitoring of the vegetation and structures (cross veins, log jams, etc.) will occur. Ideally, aquatic organisms will re-inhabit the restored reach.

Buffer Restoration

Buffer restoration involves planting of trees and other riparian vegetation to improve the habitat and quality of the stream corridor. A robust stream buffer provides wildlife habitat, pollution control and protection from stream bank erosion. Riparian forests also provide shade cover that cools water temperatures. These projects can be performed by volunteers if needed.

Buffer Restoration Project Example:

Noman M. Cole Pollution Treatment Plant **Watershed: Pohick Creek**

PRE-CONSTRUCTION
Problematic Conditions:
Lack of a native riparian buffer decreases the amount of rain that infiltrates into the groundwater and increases the amount of pollutants that enter our waterways.

CONSTRUCTION
Key Project Elements:
Establishing a native riparian buffer will reduce the amount of stormwater entering streams and filter nonpoint source pollutants. Educating residents on the importance of riparian buffers is key to the success of the planting. This site had 1005 trees and shrubs planted by 180 volunteers over two days.

POST-CONSTRUCTION
Future monitoring and maintenance is required to ensure survivorship of the plants. When mature, this area will provide a balanced ecosystem that will help reduce stormwater impacts and create habitat for wildlife.

4.1.2 Non-Structural Practices

Non-structural projects are a group of projects that do not require traditional construction measures to be implemented and may be programmatic in nature. These projects include but are not limited to the following practices:

- Buffer restorations
- Rain barrel programs
- Dumpsite and obstruction removals
- Community outreach and public education
- Land conservation coordination projects
- Inspection and enforcement projects
- Street sweeping programs
- Recommendation of additional studies, surveys and assessments

These projects, in concert with the structural projects, represent a holistic approach to watershed management. Since much of the land area in Fairfax County is privately owned, there is a strong need to work with local communities to promote environmental awareness and recommend projects that can be implemented by residents and other groups.

The fundamental difference between structural and non-structural projects is the ability to predict the result of the project implementation through models. For example, the nitrogen removal of a wet pond may be calculated; however, there is no way to predict the reduction in nitrogen from an outreach campaign on proper fertilizer use. Additionally, these projects and programs should not be confined to any single watershed but could be implemented throughout the County as opportunities occur. Because of these differences, non-structural projects were evaluated and will be implemented using a different process than the structural projects.

There are many advantages of non-structural projects. Some of the key advantages to this projects type are:

- Less costly
- Less disruptive
- Promotes public and community awareness

In general, non-structural projects represent opportunities to proactively pursue stormwater issues that more traditional structural practices cannot address. The use of non-structural practices fulfills Fairfax County's MS4 permit requirements and environmental initiatives. The full potential of these projects will be realized through partnerships with County agencies, residents and other interested parties.

4.2 Candidate Project Selection Procedure

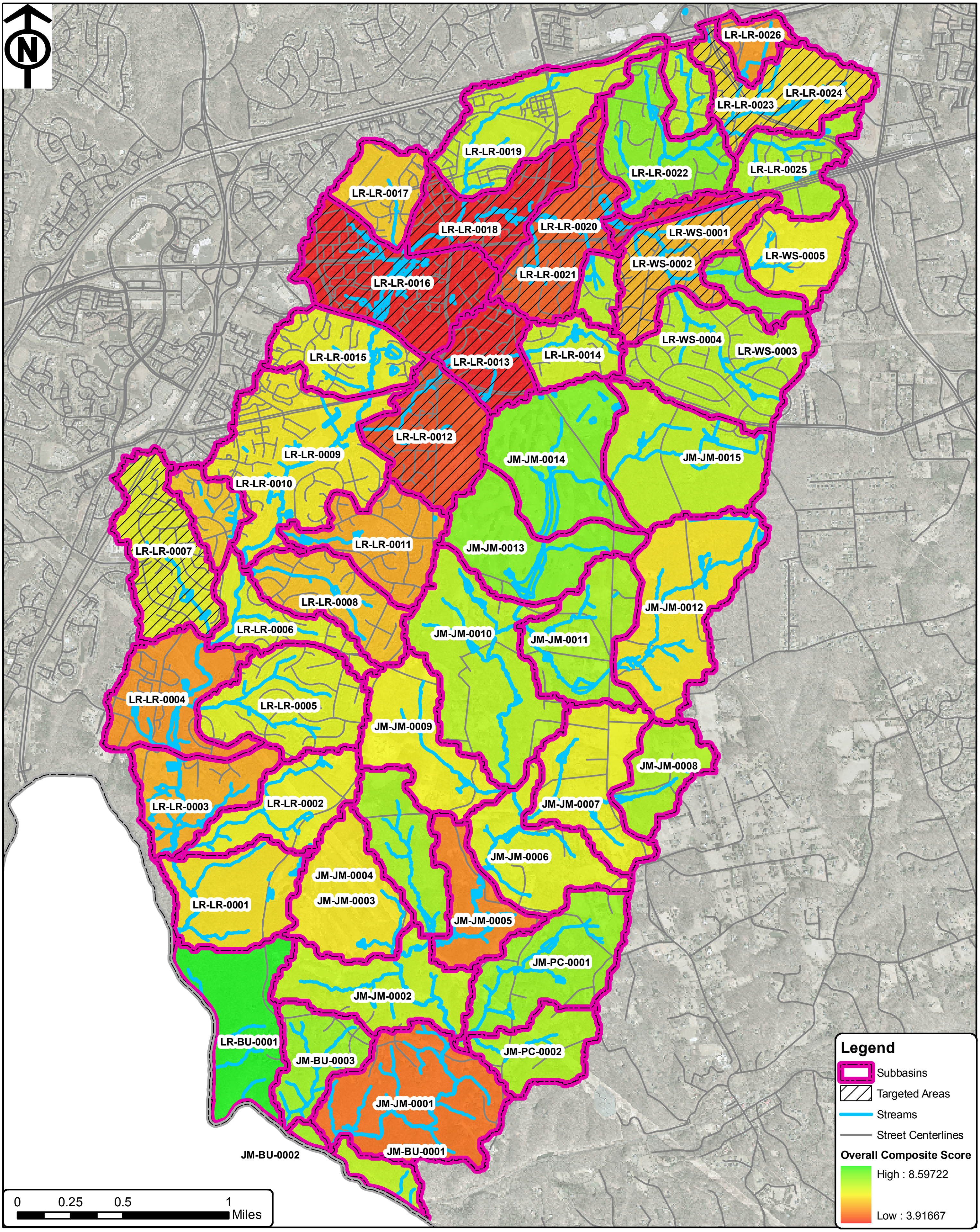
The watersheds were analyzed using the subwatershed ranking results. Subwatersheds with a poor overall composite score are likely to be deficient for at least one, if not more, County-defined objectives. The individual objectives were analyzed more closely to determine those which were not being achieved. Each objective score is comprised of a combination of individual metrics. Those metrics contributing to a poor objective score helped define the strategy for that particular subwatershed, as well as bringing to light potential project sites. A similar technique was used when evaluating potential stressors. Initially, the overall source composite score was considered in order to address subwatersheds clearly contributing to watershed degradation, but individual source metrics also were analyzed to ensure that any specific stressors were identified.

To develop projects, the subwatershed ranking results were used in combination with ‘severe’ SPA inventory points, concerns identified by both the WAG and the public forum, and sites discovered during the field reconnaissance. Considering the relatively small size of the watersheds being analyzed, threshold values were not established for strategy development. In other words, candidate projects were considered in all subwatersheds to address identified deficiencies, not just in the subwatersheds that ranked poorly. With only three fairly homogenous WMAs and a majority of subwatersheds classified as headwaters, all 52 subwatersheds were analyzed for their restoration/protection potential using this procedure. A handful of subwatersheds failed to meet several County objectives in the existing or future ‘without project’ conditions and were slated as target subwatersheds. Figure 4-1 shows a map of the target subwatersheds.

A ‘project universe’ of nearly 150 candidate projects was compiled as a result of this analysis. The procedure for this analysis is described in greater detail in Appendix B.

Field investigation of the candidate projects was conducted in June 2009 to evaluate feasibility and to gather other data such as site conditions, site constraints and potential construction considerations. Field staff noted any recommendations for the project and evaluated the feasibility of the project. Factors affecting feasibility included construction access, permitting issues, land ownership, utility conflicts, the topography of the site and other impacts on the stream, wetlands, trees or floodplain. Following the field investigation, 82 projects were selected for further prioritization and ranking (Section 4.3). Some of the projects were combined into one project based on their cost and proximity.

Figure 4-1 Targeted Subwatersheds Map



4.3 Project Ranking and Prioritization

Seventy-five structural projects and seven non-structural projects were prioritized according to the criteria in the following section. The top 40 structural projects are categorized as part of the 10-year implementation plan and are supported with Project Fact Sheets in Section 5. The remaining 35 structural projects complete the project proposals for the 25-year implementation period.

4.3.1 Initial Project Ranking (0 to 25-Year Timeframe)

The baseline ranking process consisted of setting values in five categories that, when scored according to the County's weighting system, resulted in a preliminary project score. The five categories are described as:

1. Effect on Watershed Impact Indicators (30%)
2. Effect on Source Indicators (30%)
3. Location within Priority Subwatersheds (10%)
4. Sequencing (20%)
5. Implementability (10%)

A brief synopsis of how scores were developed for each category is provided below. More detail about the ranking process can be found in technical memorandum 3.4/3.5 located in Appendix B.

4.3.2 Watershed Impact Indicators

Each project type was associated with specific watershed impact indicators (described in Section 2). Using modeling results where applicable, a project received a score of five for the greatest positive change in a particular indicator. The individual indicator scores were averaged to determine a project score for 'effect on watershed impact indicators'. Some indicators were based on the County's monitoring information and were not part of any model output, allowing for only a 'snapshot' evaluation. Best professional judgment was employed to determine whether a particular project type would address the nutrient or indicator of concern.

4.3.3 Source Indicators

A methodology similar to that used in evaluating impact indicators was used to determine a score for a project's effect on source indicators (also described in Section 2). Where modeling results were available, they were used to assign higher scores for projects with the greater positive influence on a particular indicator. Source indicator analysis helps to focus in on the cause of watershed degradation, but the source (or cause) may not be located in the same subwatershed as the impact (or effect). Areas that appear stable may be exacerbating conditions further downstream, commonly seen in streambank erosion along Little Rocky Run and Johnny Moore Creek. While the location of the downcutting/widening channel may be in the middle of an undeveloped subwatershed, the development in headwater areas is a likely culprit. Projects tend to be more expensive and complex further downstream; therefore, if an impact is addressed without paying attention to the cause, it may result in a costly temporary solution. Individual source indicator scores were averaged to determine a final score.

4.3.4 Location within Priority Subwatersheds

Priority subwatersheds were based on the impact indicator composite scores of the Future 'without project' scenario. Impact indicator composite scores represent an average score for every impact indicator in a subwatershed. Quintiles were developed and scores were assessed based on need. In other words, the subwatersheds with the lowest impact composite score received the highest priority (five) score. A map of the priority subwatersheds is in Appendix B.

4.3.5 Sequencing

Sequencing scores were developed by first recording the upstream-downstream order of the subwatersheds. Headwaters subwatersheds (any subwatershed where a stream originates) were given an order of one. Subwatersheds just downstream of headwater subwatersheds were given an order of two. This process continued until all subwatersheds are assigned an order, with the most downstream subwatersheds receiving the highest value. Where subwatersheds of different orders were upstream of a single subwatershed, that subwatershed received the next sequentially highest order.

Once the subwatershed order was established, quintiles were used to assign a project score to each subwatershed order. Those with the lowest subwatershed order were given the highest project score (five). This provides priority to headwater projects and simulates a more natural watershed hydrology. A map of the sequencing scores is included in Appendix B.

4.3.6 Implementability

Scores were assigned according to the following criteria:

- High Implementability (5 points)
    - Tree buffer restoration
    - Debris/trash removal
    - SWM retrofits in County-maintained facilities where no additional land rights are required
    - Stream restorations that do not require upstream runoff quantity reductions and are proposed on sites with significant land owner support
    - LID retrofits at schools and other County facilities
    - Other priority projects that have significant land owner support
- Moderate Implementability (3 points)
    - Pond and LID retrofits and other stream restorations that do not require upstream runoff quantity reductions
- Low Implementability (1 point)
    - Projects that do not fit into the above categories and are likely to be less feasible than the majority of recommended projects

Project scores were developed based on the previously described weighting system. Using these scores, the 75 structural projects were prioritized from 1-75. Some slight adjustments were made based on input from the WAG. The scores also were adjusted based on completed hydrologic and hydraulic modeling of selected projects. The top 40 projects are part of the 10-year implementation timeframe, while the remaining projects fall to the 25-year implementation period. Project fact sheets for the top 40 projects are located in Section 5.

4.4 Project List

Once the structural candidate projects were prioritized based on the ranking process, the final set of recommended projects and final ranking was adjusted utilizing a cost/benefit analysis. Table 4-3 presents a summary of the Priority (10-Year) Structural, Long-Term (25-Year) Structural, and Non-Structural projects for the Johnny Moore Creek, Little Rocky Run – Lower, and Little Rocky Run – Upper WMAs.

Table 4-3 Project List

Priority Structural Projects (10-Year Implementation Plan)						
Project #	**Project Type**	**WMA**	**Location**	**Watershed Benefit**	**Land Owner**	**Cost**
JM9100	Stormwater Pond Retrofit	Johnny Moore Creek	7005 Union Mill Rd Clifton, VA 20124	Quality/ Quantity	Private Commercia l	$ 200,000
JM9200	Stream Restoration	Johnny Moore Creek	13309 Balmoral Greens Av Clifton, VA 20124	Quality	FCPA	$ 770,000
JM9201	Stream Restoration	Johnny Moore Creek	13309 Balmoral Greens Av Clifton, VA 20124	Quality	FCPA	$ 420,000
JM9202	Stream Restoration	Johnny Moore Creek	7029 Union Mill Rd Clifton, VA 20124	Quality	FCPA, Private Residential	$ 320,000
JM9203	Stream Restoration	Johnny Moore Creek	13400 Compton Rd Clifton, VA 20124	Quality	Private Residential	$ 770,000
JM9400	Culvert Retrofit	Johnny Moore Creek	13165 Compton Rd Clifton, VA 20124	Flood	VDOT, Private Residential	$ 120,000
JM9500	BMP/LID	Johnny Moore Creek	7051 Balmoral Forest Rd Clifton, VA 20124	Quality/ Quantity	FCPA	$ 120,000
LR9005	Regional Pond Group	Little Rocky Run - Lower	6351 Littlefield Ct Centreville, VA 20121	Quality/ Quantity	HOA	$ 650,000
LR9010	Regional Pond Group	Little Rocky Run - Upper	5378 Harrow La Fairfax, VA 22030	Quality	HOA	$ 350,000
LR9013	Regional Pond Group	Little Rocky Run - Lower	13600 Wildflower La Clifton, VA 20124	Quality/ Quantity	HOA	$ 740,000
LR9100	Stormwater Pond Retrofit	Little Rocky Run - Lower	13943 Stonefield Dr Clifton, VA 20124	Quality	HOA	$ 100,000
LR9102	Stormwater Pond Retrofit	Little Rocky Run - Lower	6579 Rockland Dr Clifton, VA 20124	Quality/ Quantity	HOA	$ 220,000
LR9103	Stormwater Pond Retrofit Stream Restoration	Little Rocky Run - Lower	13815 Springstone Dr Clifton, VA 20124	Quality	HOA	$ 490,000

Priority Structural Projects (10-Year Implementation Plan)						
Project #	**Project Type**	**WMA**	**Location**	**Watershed Benefit**	**Land Owner**	**Cost**
LR9106	Stormwater Pond Retrofit	Little Rocky Run - Lower	13534 Union Village Ci Clifton, VA 20124	Quality	HOA	$ 190,000
LR9109	Stormwater Pond Retrofit	Little Rocky Run - Upper	5064 Cavalier Woods La Clifton, VA 20124	Quality	HOA	$ 40,000
LR9110	Stormwater Pond Retrofit	Little Rocky Run - Lower	13214 Kilby Landing Ct Clifton, VA 20124	Quality	HOA	$ 120,000
LR9111	Stormwater Pond Retrofit	Little Rocky Run - Lower	13022 Cobble La Clifton, VA 20124	Quality	HOA	$ 100,000
LR9114	Stormwater Pond Retrofit	Little Rocky Run - Upper	13114 Blue Willow Pl Clifton, VA 20124	Quality/ Quantity	HOA	$ 60,000
LR9115	Stormwater Pond Retrofit	Little Rocky Run - Upper	5403 Willow Valley Rd Clifton, VA 20124	Quality/ Quantity	HOA	$ 290,000
LR9117	Stormwater Pond Retrofit	Little Rocky Run - Upper	12837 Lee Hy Fairfax, VA 22030	Quality	Private Residential	$ 40,000
LR9201	Stream Restoration	Little Rocky Run - Lower	14104 Sorrel Chase Ct Centreville, VA 20121	Quality	HOA	$ 830,000
LR9202	Stream Restoration	Little Rocky Run - Lower	6419 Stonehaven Ct Clifton, VA 20124	Quality	HOA	$ 820,000
LR9203	Stream Restoration	Little Rocky Run - Lower	14100 Wood Rock Wy Centreville, VA 20121	Quality	HOA	$ 310,000
LR9204	Stream Restoration	Little Rocky Run - Lower	5587A Rockpointe Dr Clifton, VA 20124	Quality	HOA	$ 110,000
LR9205	Stream Restoration	Little Rocky Run - Upper	5217 Whisper Willow Dr Fairfax, VA 22030	Quality	FCPA	$ 510,000
LR9207	Stream Restoration	Little Rocky Run - Upper	5378 Ashleigh Rd Fairfax, VA 22030	Quality	HOA	$ 650,000
LR9208	Stream Restoration	Little Rocky Run - Upper	5418 Ashleigh Rd Fairfax, VA 22030	Quality	HOA	$ 800,000
LR9209	Stream Restoration	Little Rocky Run - Upper	12753 Ashleigh Ct Fairfax, VA 22030	Quality	HOA	$ 380,000
LR9504	BMP/LID	Little Rocky Run - Lower	13916 Rock Brook Ct Clifton, VA 20124	Quality	HOA	$ 80,000
LR9508	BMP/LID	Little Rocky Run - Lower	6612 Creek Run Dr Centreville, VA 20121	Quality	HOA, VDOT	$ 90,000
LR9509	BMP/LID	Little Rocky Run - Lower	6600 La Petite Pl Centreville, VA 20121	Quality/ Quantity	HOA	$ 140,000
LR9510	BMP/LID	Little Rocky Run - Lower	14330 Green Trails Bv Centreville, VA 20121	Quality	FCPS	$ 260,000
LR9514	BMP/LID	Little Rocky Run - Lower	13611 Springstone Dr Clifton, VA 20124	Quality	FCPS	$ 100,000
LR9516	BMP/LID	Little Rocky Run - Lower	6001 Union Mill Rd Clifton, VA 20124	Quality	FCPS	$ 330,000
LR9521	BMP/LID	Little Rocky Run - Upper	13516 Canada Goose Ct Clifton, VA 20124	Quality	HOA	$ 180,000

Priority Structural Projects (10-Year Implementation Plan)						
Project #	**Project Type**	**WMA**	**Location**	**Watershed Benefit**	**Land Owner**	**Cost**
LR9522	BMP/LID	Little Rocky Run - Upper	13340 Leland Rd Centreville, VA 20121	Quality	FCPS	$ 220,000
LR9523	BMP/LID	Little Rocky Run - Upper	13006 Feldspar Ct Clifton, VA 20124	Quality	HOA	$ 510,000
LR9524	BMP/LID	Little Rocky Run - Upper	5355 Ashleigh Rd Fairfax, VA 22030	Quality	HOA	$ 210,000
LR9526	BMP/LID	Little Rocky Run - Upper	4864 Muddler Way Fairfax, VA 22030	Quality	HOA	$ 130,000
LR9527	BMP/LID	Little Rocky Run - Upper	5400 Willow Springs School Rd Fairfax, VA 22030	Quality	FCPS	$ 130,000
						$12,900,000

Long Term Structural Projects (25 Year Implementation Plan)					
Project #	**Project Type**	**WMA**	**Location**	**Watershed Benefit**	**Land Owner**
JM9101	Stormwater Pond Retrofit	Johnny Moore Creek	6801 Union Mill Rd Clifton, VA 20124	Quality	FCPS
JM9700	Outfall Improvement	Johnny Moore Creek	6301 Clifton Rd Clifton, VA 20124	Quality	VDOT
LR9101	Stormwater Pond Retrofit	Little Rocky Run - Lower	13909 Warm Spring Ct Clifton, VA 20124	Quality	HOA
LR9104	Stormwater Pond Retrofit	Little Rocky Run - Lower	13932 Preacher Chapman Pl Centreville, VA 20121	Quality	HOA
LR9105	Stormwater Pond Retrofit	Little Rocky Run - Lower	13801 Laura Ratcliff Ct Centreville, VA 20121	Quality	HOA
LR9107	Stormwater Pond Retrofit	Little Rocky Run - Upper	5901 Spruce Run Ct Centreville, VA 20121	Quality	HOA
LR9108	Stormwater Pond Retrofit	Little Rocky Run - Upper	13660 Forest Pond Ct Centreville, VA 20121	Quality	HOA
LR9112	Stormwater Pond Retrofit	Little Rocky Run - Upper	13270 Maple Creek La Centreville, VA 20120	Quality	HOA
LR9113	Stormwater Pond Retrofit	Little Rocky Run - Upper	5324 Sammie Kay La Centreville, VA 20120	Quality	HOA
LR9116	Stormwater Pond Retrofit	Little Rocky Run - Upper	5130 Myrtle Leaf Dr Fairfax, VA 22030	Quality	County
LR9200	Stream Restoration	Little Rocky Run - Lower	7014 Dalemar Dr Clifton, VA 20124	Quality	Private Residential
LR9206	Stream Restoration	Little Rocky Run - Upper	5112 Lincoln Dr Fairfax, VA 22030	Quality	FCPA
LR9500	BMP/LID	Little Rocky Run - Lower	6901 Newby Hall Ct Clifton, VA 20124	Quality	VDOT, Private Residential
LR9501	BMP/LID	Little Rocky Run - Lower	6818 Compton Heights Cr Clifton, VA 20124	Quality	HOA

Long Term Structural Projects (25 Year Implementation Plan)					
Project #	**Project Type**	**WMA**	**Location**	**Watershed Benefit**	**Land Owner**
LR9502	BMP/LID	Little Rocky Run - Lower	14024 Marblestone Dr Clifton, VA 20124	Quality	HOA, VDOT, Private Residential
LR9503	BMP/LID	Little Rocky Run - Lower	14100 Rock Canyon Dr Centreville, VA 20121	Quality	VDOT
LR9505	BMP/LID	Little Rocky Run - Lower	13933 Marblestone Dr Clifton, VA 20124	Quality	HOA, VDOT, Private Residential
LR9506	BMP/LID	Little Rocky Run - Lower	6596 Creek Run Dr Centreville, VA 20121	Quality	HOA, VDOT
LR9507	BMP/LID	Little Rocky Run - Lower	13930 South Springs Dr Clifton, VA 20124	Quality	HOA, VDOT
LR9512	BMP/LID	Little Rocky Run - Lower	13905 Springstone Dr Clifton, VA 20124	Quality	HOA, VDOT
LR9513	BMP/LID	Little Rocky Run - Lower	13671 Wildflower La Clifton, VA 20124	Quality	HOA, Private Residential
LR9515	BMP/LID	Little Rocky Run - Lower	13609 Bridgeland La Clifton, VA 20124	Quality	HOA, VDOT, Private Residential
LR9517	BMP/LID	Little Rocky Run - Lower	6021 Little Brook Ct Clifton, VA 20124	Quality	HOA
LR9518	BMP/LID	Little Rocky Run - Upper	13644 Barren Springs Ct Centreville, VA 20121	Quality	HOA
LR9519	BMP/LID	Little Rocky Run - Upper	5813 Rockdale Ct Centreville, VA 20121	Quality	HOA
LR9520	BMP/LID	Little Rocky Run - Upper	13660 Bayberry La Centreville, VA 20121	Quality	Private Residential
LR9525	BMP/LID	Little Rocky Run - Upper	4895 Annamohr Dr Fairfax, VA 22030	Quality	HOA, VDOT
LR9600	Flood Protection/Mitigation	Little Rocky Run - Upper	5416 Arrowhead Park Dr Centreville, VA 20120	Flood	Private Residential
LR9700	Outfall Improvement	Little Rocky Run - Lower	6436 Battle Rock Dr Clifton, VA 20124	Quality	HOA

Non-Structural Projects					
Project #	**Project Type**	**WMA**	**Location**	**Watershed Benefit**	**Land Owner**
JM8800	Buffer Restoration	Johnny Moore Creek	13309 Balmoral Greens Av Clifton, VA 20124	Quality	FCPA
JM8801	Buffer Restoration	Johnny Moore Creek	7404 Union Ridge Rd Clifton, VA 20124	Quality	FCPA, HOA
LR8800	Buffer Restoration	Little Rocky Run - Upper	12810 Westbrook Dr Fairfax, VA 22030	Quality	FCPA, HOA
LR9010A	Buffer Restoration	Little Rocky Run - Upper	12524 Chronical Dr Fairfax, VA 22030	Quality	Private Residential
LR9800	Outreach/Education	Little Rocky Run - Lower	14123 Compton Valley Wy Centreville, VA 20121	Quality	HOA
LR9801	Outreach/Education	Little Rocky Run - Upper	13617 Lee Hy Centreville, VA 20121	Quality	Private Commercial, HOA
LR9802	Outreach/Education, Street Sweeping Program	Little Rocky Run - Upper	5702 Union Mill Rd Clifton, VA 20124	Quality	Private Commercial