5 WMA Restoration Strategies

In an area as built-out and diverse as Fairfax County, it is important to understand the specific issues in a watershed in order to determine the best strategy to restore and protect it. To facilitate data management and promote local awareness of the streams, the watershed was subdivided into 16 Watershed Management Areas (WMAs) each approximately four square miles in size. These include seven major tributaries: Bear Branch, Crook Branch, Daniels Run, Hunters Branch, Long Branch Central, Long Branch North and Long Branch South. Because of long, narrow shape of the watershed, the remaining areas that drain directly to Accotink Creek mainstem were subdivided into eight WMAs: Mainstem 1 through 8. Finally, the area of land draining to tidewater was designated as the Potomac WMA.

Approximately 11.7 square miles (23 percent) of the watershed are located in areas outside of the County jurisdiction and are not included in this plan. Because of this, the planning effort focused on only 14 of the 16 WMAs identified since the Potomac WMA is entirely within Fort Belvoir Military Reservation and the Daniels Run WMA is within the City of Fairfax.

The following section provides a discussion of the impairments affecting each WMA in the plan and the proposed solutions to those impairments. Impairments were identified through field assessment, modeling and the results of subwatershed ranking analysis. Additional information may be found in Appendix B, Technical Documents.

5.1 Bear Branch

Roughly half of the Bear Branch WMA is within the boundaries of the Town of Vienna, which still falls under the jurisdiction of Fairfax County. Two subwatersheds were identified among the highest priority areas in need for restoration in the entire Accotink Creek watershed.

5.1.1 Structural Projects

5.1.1.1 10-Year Projects

<u>AC9182 Stormwater Pond Retrofit</u>

A retrofit is proposed for the existing pond 0043DP in Mantua Park that treats the stormwater runoff from a high-density residential area in Chesterfield Meadows Section 1 neighborhood. Recommendations include a new control structure, extending the flow path and creating a new outfall, which would be reconnected to the wetland.

<u>AC9183 New Stormwater Pond</u>

This is a proposed new pond to treat runoff from the parking lot at Kena Shriners Temple. The facility would be located in the grassy area on the southwest portion of the site. The existing storm drain pipe will be cut so that it discharges into the pond for treatment and a riser structure will be designed to provide detention for water quality.

Bear Branch Stream Restoration Projects -- Three stream restoration projects and a series of culvert retrofits have been proposed to restore a substantial length of Bear Branch and its tributaries. Ideally, they would be implemented from upstream to downstream, in the following order: AC9225 and AC9240 first, with design of the confluence coordinated, followed by AC9239 downstream. If the 25-year culvert retrofit project, AC9408, is included, it should be designed simultaneously with AC9240.

AC9225 Stream Restoration

This project would retrofit the stream channel on the upstream side of I-66 at South Side Park in the Town of Vienna. The channel is over-widened with moderate to severe erosion along the stream banks. Restoration would include reducing the channel dimensions, raising the bed elevation and installing grade controls.

AC9239 Stream Restoration

This project would restore an eroded section of Bear Branch that originates north of Hunter Road and extends approximately 600 feet downstream of Route 50. Restoration would include stabilizing the stormwater outfall structures, regrading and stabilizing eroded stream banks with armor-in-place and bioengineering techniques, installing grade controls and removing the metal beams currently in the stream.

AC9240 Stream Restoration

This project is located at the downstream end of a road culvert under Yeonas Drive and extends through South Side Park approximately 2,500 feet downstream to a road culvert under Route 66. Restoration would include repairing broken stormwater outfall structures, regrading and stabilizing the eroded banks with armor-in-place and bioengineering techniques, installing grade controls and removing invasive plant species.

AC9315 Area-Wide Drainage Improvements

Some medium and low-density residential areas in the Hideaway Park subdivision between Elsmore Street and Glenvale Drive that lack stormwater management controls would be retrofitted to treat stormwater runoff by installing tree box filters at existing stormwater inlets and rain gardens at yard inlets.

5.1.1.2 25-Year Projects

AC9184 Stormwater Pond Retrofit

This project involves the retrofit of two existing ponds. The first (1204DP) is located along Barkley Gate Lane and Royal Doulton Lane. The second pond treats stormwater runoff from the Armistead Park neighborhood. Both projects would include some excavation of the existing ponds for additional storage. Tree removal along the embankment and riparian plantings downstream are also recommended with this project.

AC9185 New Stormwater Pond

This is a potential site for new pond behind Silent Valley Drive that would treat the stormwater runoff from high-density residential homes in the Covington neighborhood. A riser structure and embankment will be used to provide the water quality and water quantity treatment.

AC9408 Culvert Retrofit

This project is proposed at three different road crossings within the Town of Vienna's South Side Park: Kingsley Road, Yeonas Drive and Cottage Street. Recommendations include creating a micropool followed by a pool with wetland plantings upstream of each road crossing to provide water quality control.

5.1.2 Non Structural Projects

AC9900 Community Outreach/Public Education - Stenciling

This community-wide project involves marking the storm drain inlets within the Armistead Park neighborhood. The program can educate the public, reduce dumping and reduce the amount of litter and pollutants that enter the storm drain system.

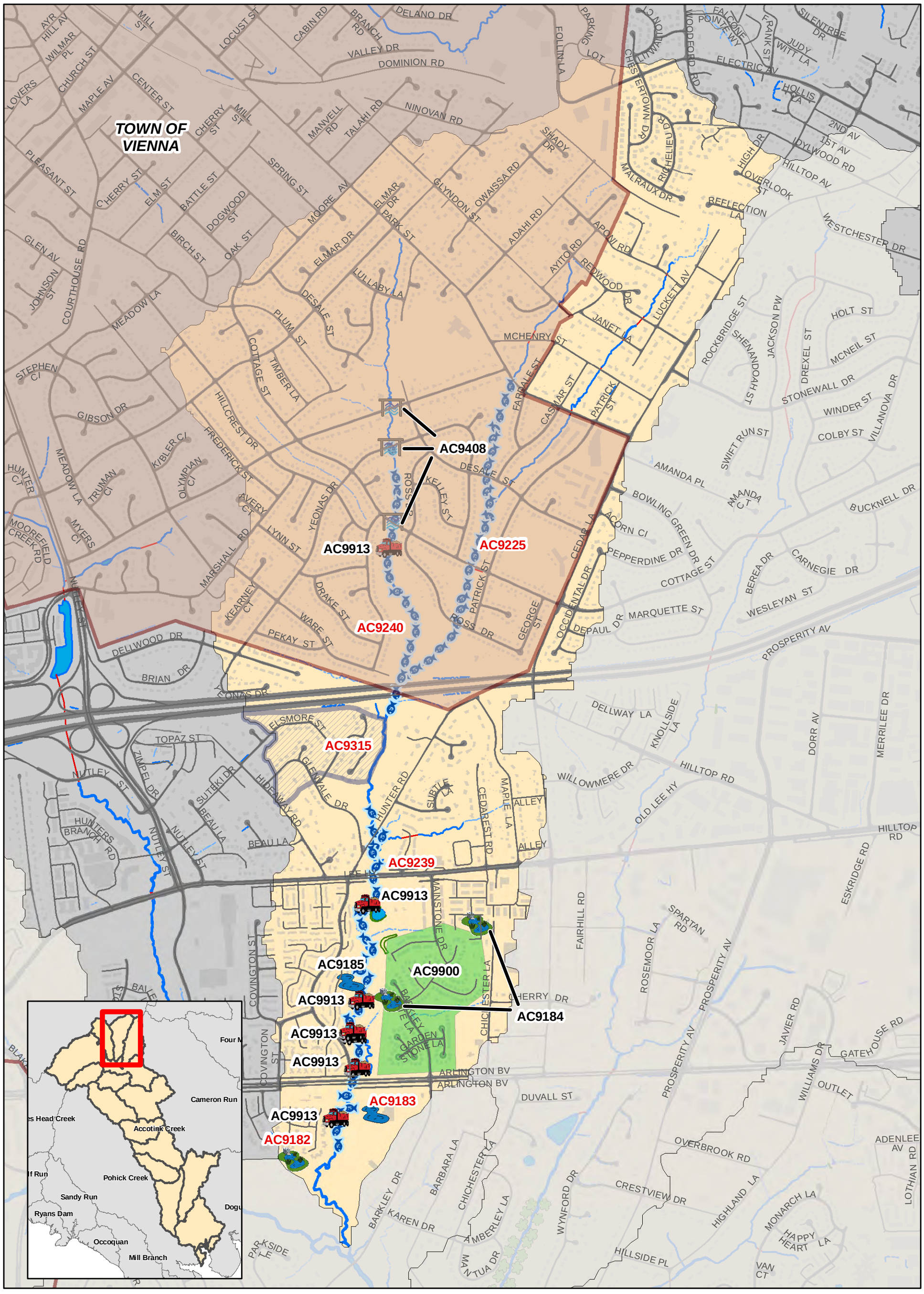
AC9913 Dumpsite/Obstruction Removal - Dumpsite/Obstruction

Six sites were identified as areas of significant obstructions during the physical stream assessment. This project would be a community-wide program to remove trees and debris blocking fish passage, trees and yard waste within the stream.

Table 5-1: Bear Branch Projects

Structural Projects						
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
AC9182	Stormwater Pond Retrofit	AC-BB-0000	Mantua Park	Water Quality	County - FCPA	1 - 10
AC9183	New Stormwater Pond	AC-BB-0000	Kena Shriners Temple	Water Quality and Quantity	Private	1 - 10
AC9225	Stream Restoration	AC-BB-0030	South Side Park	Water Quality	Private / Town of Vienna	1 - 10
AC9239	Stream Restoration	AC-BB-0000, -0005, -0010	Covington / Villa Lee Park, Arrowhead Park	Water Quality	Private / County - FCPA	1 - 10
AC9240	Stream Restoration	AC-BB-0015, -0020	South Side Park Neighborhood	Water Quality	Town of Vienna	1 - 10
AC9315	Area-Wide Drainage Improvements	AC-BB-0010	Hideaway Park neighborhood	Water Quality	Private	1 - 10
AC9184	Stormwater Pond Retrofit	AC-BB-0005	Behind Barkley Gate Ln and Armistead Park neighborhood	Water Quality and Quantity	Private - Residential	11 - 25
AC9185	New Stormwater Pond	AC-BB-0005	Covington neighborhood	Water Quality and Quantity	Private - Residential	11 - 25
AC9408	Culvert Retrofit	AC-BB-0020	South Side Park	Water Quality	Town of Vienna	11 - 25

Non-Structural Projects					
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**
AC9900	Community Outreach/Public Education	Multiple	Armistead Park	Water Quality	Multiple
AC9913	Dumpsite/Obstruction Removal	Multiple	Multiple	Water Quality	Multiple



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Buffer Restoration
Stream Restoration
BMP/LID
Culvert Retrofit
Dumpsite/Obstruction Removal
New Stormwater Pond
Outfall Improvement
Stormwater Pond Retrofit
Other
Community Outreach/Public Education
Area-wide Drainage Improvement
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: Bear Branch
Proposed Projects

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5.2 Crook Branch

The results of the subwatershed ranking analysis showed that all except one subwatershed in Crook Branch WMA appeared to be impaired in one form or another. One subwatershed located in the eastern portion of the WMA was in good condition primarily due to the influence of good forest and wetland coverage. In terms of overall ranking, the Crook Branch WMA had five of the highest priority subwatersheds in the entire Accotink Creek watershed.

5.2.1 Structural Projects

5.2.1.1 10-Year Projects

AC9175 Stormwater Pond Retrofit

Three local pond retrofits are proposed for this project. The first pond (0137DP) treats stormwater runoff from Hunters Glen neighborhood. The second pond (0045DP) treats stormwater runoff from the Ridgelea Hills neighborhood. The third pond (DP0133) treats the Bethlehem Lutheran Church. Proposed project recommendations include a new riser/control structure, excavating for additional storage and adding a plunge pool at each inflow point where stormwater enters the pond.

AC9220 Stream Restoration

There is severe erosion for approximately 100 feet in the stream channel behind Glade Hill Road. The project will include stabilizing the eroded stream through raising the bed elevation to meet the confluence elevation with Project AC9221, and installing grade controls or step pools to dissipate energy and prevent further bed incision.

AC9221 Stream Restoration

This project is a stream restoration of an incised and over-widened stream behind Colesbury Place in the Ridgelea Hills neighborhood. Restoration of this channel will focus on creating a nested channel, in which the floodplain and banks of the current channel will be regraded to allow for a new floodplain at an elevation lower than the original floodplain, and restoring the riparian buffer.

AC9222 Stream Restoration

There are areas of significant erosion along the length of the stream bank along Tovito Drive. This stream restoration project would involve regrading and stabilizing the eroded stream banks, grade controls to dissipate energy and installation of stone toe protection to ensure future bank stability.

AC9312 Area-Wide Drainage Improvements

Area-wide drainage improvements are recommended for the low and medium-density residential areas of the Westchester and Briars of Westchester neighborhoods to provide water quality control. Tree box filters will be installed at curb inlets, rain gardens will be installed at yard inlets and vegetated swales will be installed in place of paved ditches.

AC9313 Area-Wide Drainage Improvements

The Langhorne Acres neighborhood has no stormwater management facilities and would benefit by implementing area wide drainage improvements. Proposed treatment systems include tree box filters installed at various street inlets and rain gardens installed at yard inlets.

AC9546 New BMP/LID

There are four existing bioretention filters on the Mantua Elementary School property which are not functioning as optimally as they could due to a lack of vegetative cover. These sites are candidates for additional amendments to bring them to demonstration quality in this public location. As part of the overall project, one additional location for a bioretention filter was identified at an outfall on the southeast portion of the property.

AC9547 New BMP/LID

Two bioretention projects would treat the rooftop runoff from the Providence Presbyterian Church and the roadway runoff from Pixie Court. The downspouts at the rear of the church could be disconnected and routed to one of the bioretention facilities, while curb extensions on Pixie Court could route the roadway runoff into the other bioretention facility for treatment before it enters Crook Branch.

AC9548 New BMP/LID

Because of the large drainage area, this proposed project will use a flow splitter to direct the first flush of stormwater to a proposed bioretention filter, which is sited in open space adjacent to the intersection of Little River Turnpike and Ridgelea Drive in the Ridgelea Hills neighborhood. This will provide water quality treatment for a combination of residential, commercial and roadway runoff.

5.2.1.2 25-Year Projects

AC9174 Stormwater Pond Retrofit

This project is a retrofit of the existing dry pond (DP0378) at the Greater Washington Jewish Community Foundation. The retrofit would modify the riser structure, remove the concrete low-flow channels and replace them with meandering natural channels.

AC9176 Stormwater Pond Retrofit

This project is a proposed dry pond retrofit (0200DP) to treat stormwater runoff from the Briars at Westchester neighborhood. Recommendations include excavating to increase storage volume, removing the concrete channel and modifying the riser.

5.2.2 Non Structural Projects

AC9803 Buffer Restoration

This project, located downstream of Prosperity Avenue, involves the restoration of the impaired stream buffer.

AC9804 Buffer Restoration

This project, located upstream of Prosperity Avenue, involves the restoration of the impaired stream buffer.

AC9900 Community Outreach/Public Education - Stenciling

This community-wide project involves marking the storm drains within the Mantua Hills, Brian Acres, Skybrook, Sunnyhill Hill and Westchester communities. The stencil marking can educate

the public, reduce dumping and reduce the amount of litter and pollutants that enter the storm drain system.

AC9907 Community Outreach/Public Education - Lawn Care

This project would provide community-wide education and guidance to homeowners on lawn care practices that would potentially reduce pollutants in stormwater runoff. The upland reconnaissance identified one neighborhood, Ridgelea Hills, which could be targeted with this effort.

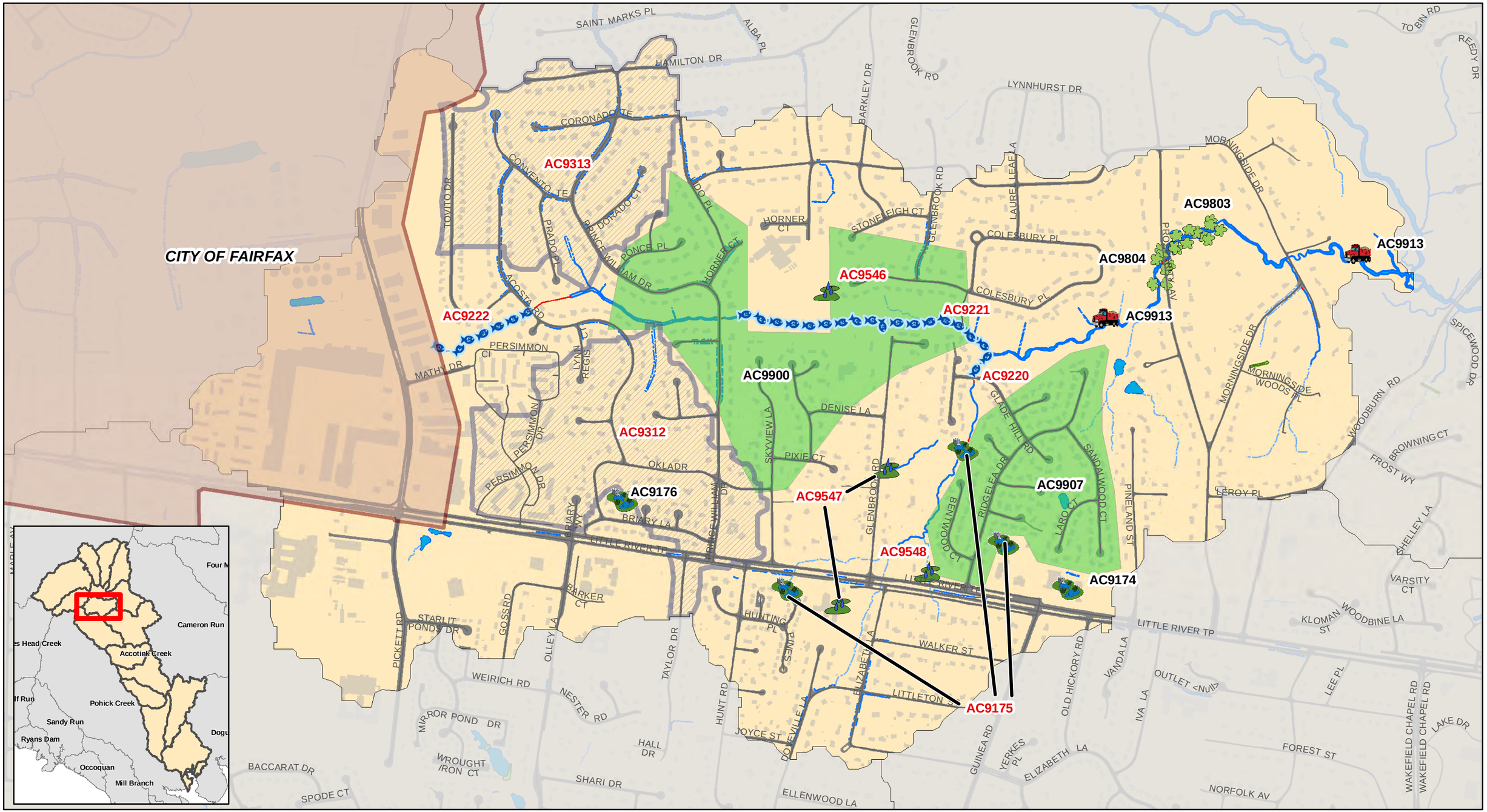
AC9913 Dumpsite/Obstruction Removal - Dumpsite/Obstruction

Two sites were identified as areas of significant obstructions or dumpsites during the physical stream assessment. This project would be a community-wide program to remove debris blocking fish passage and trees within the stream.

Table 5-2: Crook Branch Projects

Structural Projects						
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
AC9175	Stormwater Pond Retrofit	AC-CR-0010	Hunters Glen and Ridgelea Hills neighborhoods and Bethlehem Lutheran Church	Water Quality	Private	1 - 10
AC9220	Stream Restoration	AC-CR-0010	Ridgelea Hills neighborhood	Water Quality	Private	1 - 10
AC9221	Stream Restoration	AC-CR-0015	Mantua and Ridgelea Hills neighborhoods	Water Quality	Private	1 - 10
AC9222	Stream Restoration	AC-CR-0025	Mantua Hills and Stockbridge neighborhoods	Water Quality	Private - Residential	1 - 10
AC9312	Area-Wide Drainage Improvements	AC-CR-0020	Westchester and Briars of Westchester neighborhoods	Water Quality	Private - Residential	1 - 10
AC9313	Area-Wide Drainage Improvements	AC-CR-0030	Langhorne Acres neighborhood	Water Quality	Private - Residential	1 - 10
AC9546	BMP/LID	AC-CR-0015	Mantua Elementary School	Water Quality	County - FCPS	1 - 10
AC9547	BMP/LID	AC-CR-0010	Providence Presbyterian Church and Pixie Ct	Water Quality	Private / State - VDOT	1 - 10
AC9548	BMP/LID	AC-CR-0010	Ridgelea Hills neighborhood	Water Quality	Private	1 - 10
AC9174	Stormwater Pond Retrofit	AC-CR-0005	Greater Washington Jewish Community Foundation	Water Quality and Quantity	Private - Church	11 - 25
AC9176	Stormwater Pond Retrofit	AC-CR-0020	Briars at Westchester neighborhood	Water Quality and Quantity	Private - Residential	11 - 25

Non-Structural Projects					
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**
AC9803	Buffer Restoration	AC-CR-0000	Upstream of Prosperity Ave	Water Quality	Private, County
AC9804	Buffer Restoration	AC-CR-0005	Downstream of Prosperity Ave	Water Quality	Private
AC9900	Community Outreach/Public Education	Multiple	Multiple	Water Quality	Multiple
AC9907	Community Outreach/Public Education	Multiple	Multiple	Water Quality	Multiple
AC9913	Dumpsite/Obstruction Removal	Multiple	Multiple	Water Quality	Multiple



Map 5.2

WMA: Crook Branch
Proposed Projects

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