

Acknowledgements

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Taya Abbott, Town of Clifton

Gary Anderson, Clifton Betterment Association

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Jeremy Epstein, Braddock District

Cliff Fairweather, Audubon Naturalist Society

George Jennings, III, RA, George Mason University, Facilities Planning

Jeannie Jirucha, Clifton Horse Society

Robert Jordan, Potomac River Greenways Coalition

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Dr. Donald Kelso, PhD, George Mason University, Environmental Science and Public Policy

Wilma Kime, Clifton Horse Society

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David Schnare, Occoquan Watershed Coalition

Charles Smith, Fairfax County Park Authority

Charlie Smith, Occoquan Watershed Coalition

Kevin Warhurst, Merrifield Garden Center

Bill Watts, Clifton Presbyterian Church

The Popes Head Creek Watershed Management Plan was initiated by the Fairfax County Stormwater Planning Division and the Project Team consists of:

Fairfax County Staff

Carl E. Bouchard, P.E., Director, Stormwater Planning Division

Fred Rose, P.E., Branch Chief, Watershed Planning and Assessment Branch

Paul Shirey, P.E., Project Manager, Watershed Planning and Assessment Branch

Kate Bennett, Assistant Project Manager, Watershed Planning and Assessment Branch

Shannon Curtis, Ecologist, Watershed Planning and Assessment Branch

AMEC Earth & Environmental, Inc.

Timothy Lormand, P.E., CDT, CFM, Project Manager

Douglas Moseley, AICP, CFM, Water Resources Planner

Lynne Mowery, P.E., Project Engineer

Joanne Reker, P.E., Project Engineer

Matt Breen, Project Engineer

Curt Ostrodka, Environmental Planner

Mark Preston, Technician

Limno-Tech, Inc.

Michael Sullivan, Associate Vice President

Heather Bourne, Project Scientist

Brian Hazelwood, Senior Project Engineer

Wetland Studies & Solutions, Inc.

Michael Rolband, P.E., P.W.S., President

Mark Headly, P.W.S., Vice President

William E. Nell, P.E., Vice President

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Executive Summary

The *Popes Head Creek Watershed Management Plan* is a strategic plan that will protect and improve the water quality within the watershed over the next 25 years. The planning process, initiated by Fairfax County, for development of this watershed management plan included the participation and recommendations of a watershed advisory committee. The Popes Head Creek Citizen's Advisory Committee developed the following guiding principles to aid in formulating the actions and strategies for implementing the objectives of this plan.

- Reduce or eliminate the adverse impacts of recreational activities in riparian areas.
- Actively support the enforcement of the RPA ordinance.
- Encourage small steps that residents can implement easily.
- Concentrate on solutions in the upstream areas first.
- Place an emphasis on protecting the existing high quality streams, including smaller tributaries.

The Popes Head Creek Watershed Management Plan provides strategies for protecting the watershed and mitigating adverse stream impacts that have occurred, such as stream bank erosion and poor water quality.

Background

The Popes Head Creek Watershed is one of the least developed watersheds in Fairfax County. On July 26, 1982, the Fairfax County Board of Supervisors approved a rezoning of more than 41,000 acres in the Occoquan Watershed in order to protect the Occoquan Reservoir, which supplies drinking water to the County. Land in the rezoned area is classified as Residential-Conservation (R-C) District, or one dwelling unit per 5 acres. Eighty-six percent of the Popes Head Creek Watershed is located in this rezoned area.

The history of the county's watershed management began in the 1940s with the conversion of primarily agricultural land use to residential and commercial land uses. Stormwater infrastructure was constructed to quickly carry runoff away from the developed areas to the creeks and streams that serve as the principal drainage system for the county. Starting in 1972, onsite detention was required for new development to minimize the effects of increased runoff from development. In the early 1980s, water quality best management practices (BMPs) were required for new development in the southern areas of the county that drained to the Occoquan drinking water reservoir. BMPs were required for all new development in the county starting in 1993.

Purpose

The primary reasons the *Popes Head Creek Watershed Management Plan* was developed can be summarized as follows:

1. To meet state and federal water quality standards by identifying strategies to prevent and remove pollution;
2. To support Virginia's commitment to the Chesapeake 2000 Agreement to restore the Chesapeake Bay;
3. To replace the currently out-dated watershed management plan through the use of new technologies; and,
4. To take a comprehensive approach in addressing multiple regulations, commitments, and community needs.

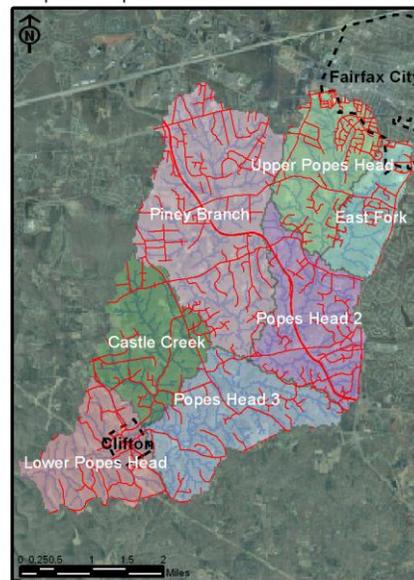
With input from the Popes Head Creek Citizen's Advisory Committee and other members of the community, this watershed management plan addresses these needs and requirements with a strategy for restoring and protecting the watershed. The Committee was composed of local community members from various interest groups, and represented environmental, business, and homeowner views and concerns. The Committee met with the Project Team regularly over 18 months to provide valuable local input and feedback. This public involvement process helped to ensure that the watershed plan will meet the specific needs and desires of the residents of the Popes Head Creek Watershed.

Watershed Condition

For the purposes of this watershed plan, the Popes Head Creek Watershed was divided into seven subwatersheds: Upper Popes Head, East Fork, Piney Branch, Popes Head 2, Castle Creek, Popes Head 3, and Lower Popes Head. Residential and commercial development in the northern portion of the Popes Head watershed began in the late 1950s. Commercial development in the upper Piney Branch watershed started in the mid-1980s. The central and southern portions of the watershed consist primarily of large lot residential development. The total impervious area in the watershed is approximately 1,142 acres, or 9% of the total area.

The predominant existing land use in the watershed is estate residential, with 45% of the watershed area consisting of this density of a minimum of 5 acres per dwelling unit. The next major land use consists of undeveloped areas in the watershed. For ultimate future buildout of the watershed, estate residential land use may increase to 59% and the future watershed imperviousness may increase to 11.4%.

Map E.1 Popes Head Creek Subwatersheds



The County initiated a stream physical assessment for all of its watersheds in August 2002. The stream physical assessment included a habitat assessment, infrastructure inventory, stream characterization, and stream geomorphologic assessment. The stream physical assessment data is described for each of the subwatersheds in the following sections. The stream habitat was rated as fair or good for approximately 73% of the watershed.

The Fairfax County Health Department formerly monitored stream water quality at three sampling sites in the watershed. The *Fairfax County 2002 Stream Water Quality Report* concluded that the overall water quality for Popes Head Creek is good for the chemical and physical parameters, including excellent dissolved oxygen levels. In 2002, an average of 9% of the samples in the watershed met the good water quality criteria for fecal coliform, as opposed to an average of 15% in 2001.

The *Fairfax County Stream Protection Strategy (SPS) Baseline Study* from January 2001 evaluated the quality of streams throughout the county. Popes Head Creek and its tributaries received “good” composite site condition ratings in the upper and lower watershed and a “fair” rating in the central portion of the watershed. Piney Branch received “fair” composite site condition ratings, while Castle Creek received “excellent” composite site condition ratings. These ratings were based on environmental parameters such as an index of biotic integrity, stream physical assessment, habitat assessment, fish taxa richness, and percent imperviousness.

Popes Head Creek is listed as an impaired waterbody in the 2004 305(b)/303(d) Water Quality Assessment Integrated Report prepared by the Virginia Department of Environmental Quality (DEQ). It was initially listed in 1998 after biological monitoring at Route 645 (Clifton Road) determined that the benthic community, composed of aquatic macroinvertebrates that live on the stream bottom, is moderately impaired. In 2004, Popes Head Creek was also listed as fecal coliform impaired based on water quality data collected at the same DEQ sampling location. The source of the fecal coliform and the benthic impairment are both unknown. As a result of the biological and bacteria listings, the segment was assessed as not supporting the Clean Water Act’s Recreation and Aquatic Life Use goals.

Once a waterbody has been listed as impaired, a Total Maximum Daily Load (TMDL) report identifying the sources causing the water quality problem and the reductions needed to resolve it must be developed and submitted to the United States Environmental Protection Agency (EPA) for approval. Upon approval, DEQ must develop a TMDL Implementation Plan to restore water quality. Because the impaired segment begins at the mouth of Popes Head Creek, the TMDL will include the creek’s entire watershed. DEQ has scheduled TMDLs for both listings to be submitted to EPA in May 2006 and began TMDL development in March 2005.

Plan Goals, Objectives, and Actions

The goals of the Popes Head Creek Watershed Plan were derived from the issues identified by the community and the project team, based on their analysis of the watershed condition.

Goal A: Protect and improve the ecological health of Popes Head Creek and its tributaries.

According to the 2003 Stream Physical Assessment study, Popes Head Creek Watershed is in good condition. Approximately 73% of the stream reaches were assessed as fair or good, with the remaining reaches assessed as poor or very poor. The project team and the community have agreed that it is important to protect this high quality habitat. It provides protection to the Occoquan Reservoir, as well an aesthetically pleasing character that adds to the quality of life for residents of the watershed. This goal will primarily be accomplished by reducing stormwater runoff via retrofitting old stormwater facilities or installing new Best Management Practices (BMPs) in certain areas that currently lack stormwater controls, and by protecting and restoring riparian buffers in stream corridors.

Objective A1: Increase the effectiveness of and use of existing BMPs to reduce impacts from stormwater runoff.

Action A1.1 Retrofit suitable existing stormwater management facilities and BMPs to make them more effective. Retrofitting these facilities is intended to exceed the performance criteria or standards that were used to design the facility. The increased performance and/or coverage area will improve water quality in the watershed.

Action A1.2: Install new BMP and LID facilities in areas that do not have existing stormwater management facilities, or in areas where retrofitting existing facilities is not feasible.

Action A1.3: Install new stormwater management ponds in areas that lack stormwater controls.

Objective A2: Reduce and mitigate the impacts of impervious surface.

Action A2.1: Program to facilitate and encourage homeowners and developers to disconnect impervious areas.

Action A2.2: Monthly street sweeping program for parking lots in the watershed and residential streets in the Fairfax Villa subdivision.

Objective A3: Preserve, maintain, and restore streams to benefit stream health and habitat.

Action A3.1: The county and community groups will perform stream restoration projects in the areas identified as good candidates.

Action A3.2: Retrofit existing road culverts to reduce stormwater runoff into streams.

Action A3.3: Replace road crossings that overtop and flood.

Action A3.4: Remove dump sites and obstructions from stream corridors.

Objective A4: Preserve, maintain, and restore riparian buffers to protect stream health and water quality.

Action A4.1: Plant native vegetation next to streams in areas that are identified as good candidates for buffer restoration.

Action A4.2: Monitor the condition of restored and existing riparian buffer with annual stream walks to evaluate the condition and areas needing improvement.

Objective A5: Maintain the open space and pastoral quality of the watershed and preserve the aesthetic quality in both urban and rural areas.

Action A5.1: Facilitate the acquisition and donation of conservation easements by community groups for riparian buffer and stream protection, and public/private open space for the environmental quality corridors described in the *Fairfax County Comprehensive Plan*.

Objective A6: Develop water quality sensitive recreational opportunities.

Action A6.1: Post official County signage that publicizes the existence of the Resource Protection Areas (RPAs) and states that ATV and other usages that destroy vegetation and cause erosion are not permitted in the RPA.

Action A6.2: Coordinate with the Fairfax County Police to target areas with significant ATV impacts for enforcement of existing laws and ordinances (e.g. trespassing and environmental regulations).

Objective A7: Maintain the diversity of wildlife in the watershed.

Action A7.1: Conserve land and water ecosystems to provide high quality habitat for wildlife.

Action A7.2: Preserve large blocks of forest to prevent further fragmentation.

Goal B: *Have a well informed community that is actively involved in watershed stewardship.*

Public participation and outreach is a vital component of the watershed plan. An educated and active citizen base can promote environmental stewardship to neighbors, co-workers, friends and family members. They can identify new problem areas in the watershed and report them to the proper officials. A well informed and active community can also leverage political or financial support for watershed management projects. This goal will be accomplished through the coordination of volunteer watershed stewardship activities and a public education campaign.

Objective B1: Achieve community sponsorship of the watershed.

Action B1.1: Support the formation of a “Friends of Popes Head Creek” group composed of local citizens.

Action B1.2: Establish a group of volunteer stream monitors and monitoring sites.

Objective B2: Develop and consolidate educational materials that describe the value of the watershed.

Action B2.1: Develop and distribute educational materials that describe beneficial landscaping techniques for homeowners.

Action B2.2: Develop and distribute educational materials that describe beneficial landscaping techniques to landscaping companies and suppliers.

Action B2.3: Develop and distribute educational materials about appropriate horse care and grazing management in the Resource Protection Area.

Action B2.4: Distribute educational materials to private pond owners that describe proper maintenance.

Action B2.5: Develop and distribute educational materials for proper ATV usage in the watershed.

Goal C: Continue to maintain the Occoquan Reservoir as a clean and sustainable source of potable water for Fairfax County.

The Occoquan Reservoir is the major source of potable water for the residents of Fairfax County. It is a 2,100 acre impoundment that is managed by the Fairfax County Water Authority, forming the boundary between Fairfax and Prince William Counties. This goal will be accomplished by installing BMPs in certain areas that currently lack water quality controls or enhancing the performance of existing stormwater management facilities to reduce nitrogen and phosphorus loading in stormwater runoff.

Objective C.1: Reduce the amount of pollutants, such as fecal coliform, nitrogen, phosphorus, and sediment that enters the Occoquan Reservoir.

Action C1.1: Install BMPs or enhance the performance of existing stormwater management facilities to reduce sediment and phosphorus loading in stormwater runoff.

Action C1.2: Manage large existing areas of lawn at institutional and commercial properties to minimize nutrient loading in streams.

Benefits of Plan Actions

Future conditions and future conditions with proposed BMPs were modeled to compare the condition of the watershed when development is continued without any changes to the watershed, and when projects identified above are completed. Unlike other watersheds within Fairfax County, the Popes Head Creek watershed is currently in good condition, with a future imperviousness of only 11.4%, due to the 1982 rezoning for the Occoquan reservoir. Even though it is not a highly developed watershed, it is still important to implement the proposed actions to preserve the watershed and because Popes Head Creek is a major tributary to the Occoquan Reservoir, which serves as the primary drinking water source for Fairfax County. With this in mind, most of the proposed BMP projects and watershed wide actions are for water quality control, not water quantity control.

The proposed actions in the Popes Head Creek Watershed Management Plan will reduce pollutant loadings throughout the watershed. The future conditions with proposed BMPs model shows a 8.93% decrease in total suspended solids (TSS), a 3.15% decrease in total phosphorus (TP), and a 2.85% decrease in total nitrogen (TN) pollutant loads for the entire Popes Head Creek watershed. It is important to note that the Popes Head Creek watershed will not show significant decreases in pollutant loading due to the relatively pristine existing condition of the watershed. The Piney Branch and Popes Head 2 subwatersheds both show above average improvements. This is important because both subwatersheds were given “fair” Stream Protection Strategy site condition ratings, as shown on Map 2.11. All other subwatersheds have “good” or “excellent” site condition ratings. Table 4.9 shows pollutant reductions by subwatershed if the proposed BMP projects are implemented.

Table 4.9 Pollutant Loading by Subwatershed

Subwatershed	Future TSS with				Future TP with				Future TN with			
	Future TSS (lb/ac/yr)	proposed BMPs (lb/ac/yr)	Reduction in TSS (lb/ac/yr)	% Decrease TSS	Future TP (lb/ac/yr)	proposed BMPs (lb/ac/yr)	Reduction in TP (lb/ac/yr)	% Decrease TP	Future TN (lb/ac/yr)	proposed BMPs (lb/ac/yr)	Reduction in TN (lb/ac/yr)	% Decrease TN
Castle Creek	31.78	31.03	0.75	2.37	0.39	0.39	0.00	0.76	2.98	2.96	0.02	0.50
Piney Branch	58.84	46.51	12.33	20.95	0.56	0.52	0.04	6.82	4.20	3.97	0.23	5.54
East Fork	152.52	145.63	6.89	4.52	0.88	0.86	0.02	1.71	7.52	7.35	0.17	2.29
Upper Popes Head	91.34	89.37	1.97	2.16	0.85	0.84	0.01	1.29	6.18	6.10	0.08	1.21
Popes Head 2	67.70	60.29	7.40	10.93	0.59	0.57	0.02	4.05	4.91	4.70	0.21	4.30
Popes Head 3	37.75	36.48	1.27	3.36	0.44	0.44	0.01	1.58	3.47	3.45	0.02	0.58
Lower Popes Head	56.32	54.69	1.63	2.89	0.47	0.46	0.01	1.71	4.33	4.26	0.06	1.50
Popes Head Creek Total	63.64	57.96	5.69	8.93	0.57	0.55	0.02	3.15	4.52	4.39	0.13	2.85

Stream Habitat Improvements

The proposed stream restoration projects will also improve the stream habitat and improve water quality. To quantify the benefits of the proposed stream restoration projects, the Army Corps of Engineers (COE) stream condition index (SCI) rating was applied to the stream reaches to determine the increase in stream habitat and reduction in erosion and sediment loss. Briefly, the SCI is determined by looking at 5 variables within the stream and rating them from 1.0 to 5.0. The stream was then ranked from 1.0 (worst) to 5.0 (best) as to its condition. The potential stream restoration areas have a

SCI ranging from 2.8 to 4.15. Please see table 4.10 below showing the overall rating for the existing and proposed conditions. The table demonstrates that there is an increase in the SCI, showing that the stream restoration projects will improve the stream habitat and water quality of the watershed.

Table 4.10: Stream Condition Index Scores

Project ID	Stream Reach	Existing SCI	Proposed SCI	Increase SCI (%)
PH9201	Clifton Creek #1	4.15	4.50	8
PH9200	Clifton Creek #2	4.15	4.5	8
PH9202	Clifton Road	2.95	3.95	34
PH9210	Wycklow Drive	3.2	4.2	31
PH9204	Young Branch Road - Part 1	3.85	4.35	13
PH9204	Young Branch Road – Part 2	2.8	3.85	38
PH9270	Brookline Drive	2.95	4.55	54
PH9271	Fox Chapel Road	4.05	4.50	11
PH9272	Berwynd Drive	4.05	4.50	11

Again, the watershed plan focuses more on the water quality improvements because of the watershed land usage. The watershed is primarily zoned for 5 acres lots, therefore water quantity control is not as necessary as in a more developed area. The nature of the future development in this watershed is for minimal impervious area and a large increase in water volume is not anticipated. Future development located in the upper watershed outside of the resource conservation district will be required to provide water quantity and quality controls. Additionally, most of the existing development in the upper watershed is relatively new and the SWM ponds that do exist already have stringent water quantity controls in place. This is why the plan projects and watershed wide actions focus on water quality improvements.

Plan Implementation

The recommended plan actions described in Section 4.4 will be implemented over the 25-year life of the Popes Head Creek Watershed Management Plan. This plan will serve as guidance for all County agencies and officials to protect and maintain the health of the Popes Head Creek watershed. The plan will be considered as an active, or “living,” document that is revisited every five years.

Structural and non-structural projects will typically require additional design work, possible land rights acquisition, agreements, or other coordination during the implementation phase. The “policy” recommendations will need to be evaluated further in light of greater County-wide implications. The current planned approach for processing of the policy recommendations from the Popes Head Creek Watershed Plan is to compare these with similar recommendations that will be developed with the Little Hunting Creek, Cameron Run, Cub Run, and Difficult Run Watershed Management Plans within the next few years.

A weighted set of five categories was used to prioritize each plan action. The following prioritization categories were used:

1. Board Adopted Categories (40%)
2. Direct Regulatory Contribution (10%)
3. Public Support (10%)
4. Effectiveness/Location (25%)
5. Ease of Implementation (15%)

Each project was then placed into one of five implementation groups, based on relative priority, as listed below:

- Group A: Fiscal Year 2006 – 2010
- Group B: Fiscal Year 2011 – 2015
- Group C: Fiscal Year 2016 – 2020
- Group D: Fiscal Year 2021 – 2025
- Group E: Fiscal Year 2026 – 2030

The dates for implementation are target dates, subject to County funding approval and ongoing updates to the plan.

Table 4.12: Implementation of Proposed Projects

Project Number	Project Location	Description	Implementation Timeframe	Total Cost
Action A2.1	Non-structural Practice	Disconnect Imperviousness	A	\$200,000 (over 25 years)
Action A2.2	Non-structural Practice	Monthly Street Sweeping in Fairfax Villa	A	\$1,000,000 (over 25 years)
Action A5.1	Non-structural Practice	Conservation Easement Acquisition	A	\$250,000 (over 25 years)
Action B1.1	Non-structural Practice	Formation of Friends of Popes Head Creek group	A	\$120,000 (over 25 years)
Action B1.2	Non-structural Practice	Volunteer Stream Monitoring	A	\$200,000 (over 25 years)
Action B1.3	Non-structural Practice	Watershed Stewardship program for schools	A	\$200,000 (over 25 years)
Action B2.1	Non-structural Practice	Landowner Education	A	\$200,000 (over 25 years)
Action B2.2	Non-structural Practice	Landscape Company Education	A	\$120,000 (over 25 years)
Action B2.3	Non-structural Practice	Horse Care Education	A	\$120,000 (over 25 years)
Action B2.4	Non-structural Practice	Private Pond Owner Education	A	\$120,000 (over 25 years)

Project Number	Project Location	Description	Implementation Timeframe	Total Cost
Action B2.6	Non-structural Practice	Wildlife Education	A	\$200,000 (over 25 years)
Action C1.2	Non-structural Practice	Institutional/Commercial Property Nutrient Management	A	\$200,000 (over 25 years)
PH9900	Kincheloe Road	Debris Removal	A	\$4,000
PH9961	Hope Park Road	Remove fill from stream and restore stream.	A	\$1,400,000
PH9960	Hope Park Road	Debris Removal	A	\$3,000
PH9970	Washington Street	Automobile/Debris Removal	A	\$5,000
PH9962	Popes Head Road	Debris Removal	A	\$5,000
PH9981	Crescent Drive	Automobile Removal	A	\$5,000
PH9973	Bentonbrook	Obstruction Removal/ collapsed footbridge removal	A	\$6,000
PH9190	Marymead Pond	SWM Pond Retrofit	A	\$560,000
PH9170	Braddock Road Pond	SWM Pond Retrofit	A	\$70,000
PH9192	FCPA-Piney Branch Park Pond	SWM Pond Retrofit	A	\$720,000
PH9180	Brentwood Pond	SWM Pond Retrofit	A	\$140,000
PH9210	Wycklow Drive	Stream Restoration	A	\$60,000
PH9201	Clifton Creek #1	Stream Restoration	A	\$90,000
PH9200	Clifton Creek #2	Stream Restoration	A	\$120,000
PH9202	Clifton Road	Stream Restoration	A	\$360,000
PH9204	Young Branch Drive	Stream Restoration	A	\$1,080,000
PH9885	Fairfax Villa Elementary School	2 Bioretention facilities.	B	\$60,000
Action A4.2	Non-structural Practice	Monitor Riparian Buffers	B	\$250,000 (over 25 years)
Action A6.1	Non-structural Practice	RPA Signage Installation	B	\$80,000 (over 25 years)
Action A6.2	Non-structural Practice	ATV Usage Violation Enforcement	B	\$250,000 (over 25 years)
Action B2.5	Non-structural Practice	ATV Usage Education	B	\$120,000 (over 25 years)
PH9195	Costco East Pond	SWM Pond Retrofit	B	\$120,000
PH9194	Piney Branch Road Extention Pond	SWM Pond Retrofit	B	\$120,000
PH9193	Sports Authority Pond	SWM Pond Retrofit	B	\$120,000
PH9130	Colchester Hunt	SWM Pond Retrofit	B	\$140,000
PH9191	Merrifield Gardens Pond	SWM Pond Retrofit	B	\$70,000
PH9196	Waples Mobile Home Park Pond	SWM Pond Retrofit	B	\$930,000

Project Number	Project Location	Description	Implementation Timeframe	Total Cost
PH9884	Fairfax Villa Subdivision	8 Filterra Manufactured LIDs, 3 bioretention areas, Rain barrel program	B	\$400,000
PH9890	University Square Subdivision	2 Filterra Manufactured BMPs.	B	\$80,000
PH9131	Innisvale Pond	SWM Pond Retrofit	B	\$190,000
PH9872	Willow Springs Elementary School.	1 Bioretention area and 1 Filterra manufactured LID	B	\$80,000
PH9880	Brentwood Subdivision	4 grassed swales, 3 bioretention areas	B	\$160,000
PH9850	Vannoy Park Subdivision.	2 Grassed swales	B	\$100,000
PH9882	Braddox Subdivision.	1 Bioretention area in abandoned road right-of-way.	B	\$30,000
PH9883	Buckner Forest Subdivision.	1 Bioretention area.	B	\$30,000
PH9891	Glen Alden Subdivision.	1 grassed swale	B	\$20,000
PH9821	Fairfax Station Subdivision	3 Grassed Swales, 5 bioretention areas	B	\$220,000
PH9800	Clifton Elementary School.	Bioretention area, 1 Filterra manufactured LID	B	\$90,000
PH9271	Berwynd Road	Stream Restoration	B	\$330,000
PH9270	Brookline Drive	Stream Restoration	B	\$30,000
PH9272	Fox Chapel Road	Stream Restoration	B	\$310,000
PH9820	Clifton Green Subdivision	Bioretention area and Grassed swale	B	\$50,000
PH9860	West Hill Subdivision	2 Grassed swales and 2 Filterra manufactured LIDs	B	\$140,000
PH9801	Intersection of Compton and Clifton Roads	Grassed swale	B	\$50,000
PH9831	Smoke Rise Subdivision	1 Bioretention area.	B	\$40,000
PH9841	Barton Place Subdivision	Grassed swale and 2 bioretention areas.	B	\$230,000
PH9870	Brecon Ridge Subdivision	6 grassed swales, 1 bioretention area	B	\$160,000
PH9871	Ridges of Glendilough Subdivision.	2 Bioretention areas, 2 Filterra manufactured LIDs	B	\$200,000

Project Number	Project Location	Description	Implementation Timeframe	Total Cost
PH9877	Brecon Ridge Woods Subdivision.	1 Grassed swale and bioretention at pipe outfall	B	\$110,000
PH9830	Pickwick Woods Subdivision	3 Bioretention areas	B	\$90,000
PH9851	Lewis Park	2 Grassed swales	B	\$60,000
PH9842	Fairfax Hunt	1 Bioretention Area	B	\$50,000
PH9530	Saddle Horn Road	Culvert Retrofit	C	\$60,000
PH9580	Fairfax County Parkway	Culvert Retrofit	C	\$90,000
PH9540	Smoke Rise Road	Culvert Retrofit	C	\$60,000
PH9512	Fairfax Station Road	Culvert Retrofit	C	\$70,000
PH9502	Tepper Drive	Culvert Retrofit	C	\$40,000
PH9505	Balls Ford Road	Culvert Retrofit	C	\$70,000
PH9504	Private Drive near Yates Ford Road	Culvert Retrofit	C	\$50,000
PH9403	Newman Road and Castle Creek	Bridge Project	C	\$390,000
PH9401	Clifton Road #2 and #3 and Popes Head Creek	Culvert Replacements	C	\$260,000
PH9414	Fairfax Station Road and Piney Branch, Popes Head Creek, Trib to Popes Head	Culvert Replacements	C	\$4,190,000
PH9452	Popes Head Road and Piney Branch	Bridge Project	C	\$10,000
PH9450	Colchester Road and Castle Creek	Drainage Improvements	C	\$1,020,000
PH9412	Newman Road and Castle Creek Trib 1	Culvert Replacement	D	\$430,000
PH9400	Clifton Road and Popes Head Creek	Bridge Project	D	\$1,850,000
PH9461	Popes Head Road and Popes Head Creek	Bridge Project	E	\$1,050,000
PH9435	Newman Road and Castle Creek	Culvert Replacement	E	\$130,000
PH9470	Brookline Drive and East Fork	Culvert Replacement	E	\$300,000
PH9404	Colchester Road and Popes Head Creek	Bridge Project	E	\$1,240,000
PH9462	Walcott Avenue and Piney Branch unnamed Trib	Culvert Replacement	E	\$100,000

Project Number	Project Location	Description	Implementation Timeframe	Total Cost
PH9453	Popes Head Road and Piney Branch unnamed Trib	Culvert Replacement	E	\$180,000
PH9420	Fairfax Station Road and Popes Head unnamed Trib	Culvert Replacement	E	\$160,000
			Total Capital Cost	\$24.6 million

Policy Recommendations are listed in Chapter 5 and summarized in Table 5.1 below.

Table 5.1: Summary of Policy Recommendations

Policy Recommendation	Description	Benefit
A1.1	Increase the frequency of inspection for private BMPs with maintenance agreements	Ensures that BMPs perform as intended. Will help to maintain existing conditions and aid in preventing the further degradation of the watershed
A1.2	Evaluate and revise the current list of recommended BMPs	Will allow developers to utilize innovative BMPs and submit their site plans for review
A1.3	Expand the allowed placement of integrated LID on individual residential lots	More flexibility in the selection and siting of BMPs for developers. The implementation of LID management practices, will treat stormwater runoff more directly at the source
A2.1	Adopt a policy of implementing natural landscaping and green building approaches at County facilities	The implementation of more suitable landscaping materials and techniques for the watershed increase water quality and quantity benefits
A2.2	More frequent assessment and inspection of VDOT drainage systems	Identification of existing and potential future drainage problems and development of a prioritized approach to correcting any existing inadequacies and schedule future maintenance projects
A2.3	Encourage use of porous pavement	A reduction in impervious areas will decrease the amount of stormwater runoff within the watershed.
A4.1	Encourage replanting efforts within degraded RPA buffer areas of sites undergoing redevelopment.	Restoration of riparian buffers will increase the amount of habitat area, protect the stream bank areas from erosion, and provide filtering of pollutants from runoff

Policy Recommendation	Description	Benefit
A5.1	Enforce the solid waste ordinance and the erosion and sedimentation control ordinance prohibition against illegal dumping	Reduced pollution as a result of illegal dumping. This action would help to improve the health and reduce the amount of pollutants in streams within the watershed.
A6.1	Regulate the use of All Terrain Vehicles (ATVs)	Reduction of illegal ATV use in the RPA. It will reduce erosion, sedimentation, and the destruction of vegetation caused by ATVs.
B1.1	Develop a watershed stewardship message specifically for Fairfax County Public Schools and George Mason University	The children can take the environmental lessons they learn home to their families and discuss environmental issues
C1.1	Encourage all lawn management companies to participate in DCRs Virginia Water Quality Improvement Program	Nutrient management in the watershed. Increased awareness and education of watershed residents and lawn care companies who perform services within the watershed.
D1.1	Establish a dedicated funding mechanism	Proposed projects will not have to compete for funding from the Fairfax County General Fund. Evaluation of a dedicated funding source is being addressed as a countywide initiative

Plan Total Cost

The total cost of the proposed structural and non-structural actions in Table 4.13, as presented in Chapter 4, is approximately \$24.6 million. Over the plan's lifespan of 25 years, this will require approximately 1.8 Fairfax County Staff Year Equivalents (SYE) for project management, land acquisition, and construction management, which are factored into the project costs. Actual costs may be reduced by using volunteer organizations to help implement non-structural projects, such as educational campaigns and environmental monitoring.

The total cost of the policy recommendations in Table 5.1, as presented in Chapter 5, is \$1.3 million. Over the plan's lifespan of 25 years, this will require approximately 0.9 Fairfax County Staff Year Equivalents (SYE) for project management. These recommendations are not specific to only Popes Head Creek, but are intended to be implemented County-wide where applicable. The recommendations will be evaluated along with the recommendations from the other watershed management plans to determine their applicability in the County.

The total cost for implementing the entire watershed plan is approximately \$25.9 million. This includes all structural and non-structural projects and policy recommendations, over the plan's lifespan of 25 years.