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*Final Report*

# **Fairfax County Stream Physical Assessment**

Prepared for  
**Department of Public Works and  
Environmental Services  
Fairfax County, Virginia**

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**CH2MHILL**  
Herndon, Virginia



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# Executive Summary

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Fairfax County is in the process of developing comprehensive management plans for the County's 30 designated watersheds. This report documents results from a data collection effort that involved a County-wide assessment of stream conditions. The purpose of the assessment was to collect information on and document the following:

- Habitat conditions (habitat assessment)
- Impacts on the stream from specific infrastructure and problem areas (infrastructure inventory)
- General stream characteristics
- Geomorphic classification of stream type

A baseline assessment was conducted on approximately 801 miles of streams throughout the County. The assessment results will be incorporated into the watershed planning process to determine appropriate management strategies.

The goals for the stream assessment were achieved through three main activities: data collection, data entry, and data analysis. Data were collected on approximately 801 miles of County streams. The data were entered into a database and digitized incorporation into a GIS-based Stream Assessment Tool. Data analysis placed stream reaches into one of five habitat assessment rating categories. Each stream reach was also placed in one of the five stages of geomorphic condition in the Channel Evolution Model (CEM).

The stream assessments comprised a habitat assessment and an inventory of physical stream features based on protocols developed specifically for this project. The habitat assessment (scoring of various habitat parameters) and the inventory (characterization of physical features such as pipelines, utilities, and buffers) together provide a baseline of overall stream conditions, from which watershed conditions can be inferred.

Habitat assessments were performed in combination with inventory assessments for 1,526 stream reaches totaling 716.8 miles. Inventory assessments alone were performed for an additional 311 reaches totaling 82.6 miles. For 14 additional miles, habitat and inventory assessments could not be performed owing to a number of reasons, including dangerous conditions, the presence of wetlands, and streams that were piped or channelized.

The stream habitat data were used to place each stream into one of five habitat assessment rating categories: excellent, good, fair, poor, or very poor. As shown in Table ES-1, most County streams were rated fair or good. Exhibit 1 (in map pocket) depicts the habitat rating for each reach. In addition, a length-weighted average total habitat score was calculated for each watershed and the corresponding total habitat rating was determined (see Table ES-2).

Table ES-3 summarizes, County-wide and for each watershed, the number of stream reaches in each of the five stages, or geomorphic types, from the CEM. Exhibit 2 (in map pocket) depicts the CEM stage for each stream reach. The large majority of streams are in CEM stage 3, indicating active evolution (i.e., deepening and widening) to a new geomorphic equilibrium and generally unstable channel morphology.

Table ES-4 summarizes the number of inventory points County-wide by impact score. Exhibits 3, 4, 5 and 6 (in map pocket) depict the inventory point locations for the entire County, as follows: Crossings (Exhibit 3), Buffer Deficiency (Exhibit 4), Pipes, Ditches, Dumps, and Utilities (Exhibit 5), and Erosion and Obstructions (Exhibit 6).

The Stream Assessment/Watershed Management Program is being implemented with the overall goal of providing a consistent basis for protecting and restoring the receiving water systems and other natural resources in the County. The stream physical assessment phase of Fairfax County's Watershed Management Program comprised habitat assessments and inventories of physical stream features (e.g., stream crossings, drainage pipes, utility crossings, stream bank erosion, deficient buffers, and stream obstructions); analysis of these data yielded baseline conditions for the streams.

The analysis characterized stream habitat conditions in 30 watersheds and indicated that many of the streams in Fairfax County have fair or good habitat. On the basis of the length-weighted average total habitat score, one watershed (Ryans Dam) was rated to have excellent habitat, six watersheds (Bull Neck Run, High Point, Kane Creek, Nichol Run, Occoquan, and Turkey Run) had good habitat, and two watersheds (Belle Haven and Little Hunting Creek) had poor habitat. The remaining watersheds were rated to have fair habitat.

TABLE ES-1  
 County-Wide Habitat Rating Summary, Linear Feet and Percent of Stream Length  
*Fairfax County Stream Physical Assessment*

<b>Watershed</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Fair</b>	<b>Good</b>	<b>Excellent</b>	<b>Total</b>					
Accotink Creek	16,826	3.73%	137,770	30.53%	168,024	37.23%	108,371	24.01%	20,335	4.51%	451,325
Belle Haven	2,664	28.44	4,306	45.98	2,396	25.58%	0	0.00%	0	0.00%	9,366
Bull Neck Run	0	0.00%	0	0.00%	6,394	25.25%	11,181	44.15%	7,748	30.60%	25,323
Bull Run	0	0.00%	6,443	9.34%	40,594	58.83%	21,970	31.84%	0	0.00%	69,007
Cameron Run	8,901	3.46%	102,149	39.71%	122,029	47.44%	22,247	8.65%	1,927	0.75%	257,252
Cub Run	6,849	1.74%	70,675	17.95%	124,669	31.66%	149,697	38.02%	41,882	10.64%	393,770
Dead Run	0	0.00%	3,740	11.83%	19,250	60.88%	6,436	20.36%	2,193	6.93%	31,618
Difficult Run	2,090	0.31%	75,778	11.07%	335,862	49.04%	222,963	32.56%	48,132	7.03%	684,825
Dogue Creek	304	0.35%	24,778	28.32%	46,199	52.80%	16,212	18.53%	0	0.00%	87,493
Four Mile Run	0	0.00%	0	0.00%	4,076	100.00%	0	0.00%	0	0.00%	4,076
High Point	0	0.00%	0	0.00%	638	4.02%	15,218	95.98%	0	0.00%	15,856
Horsepen Creek	6,028	6.75%	18,631	20.87%	30,938	34.66%	32,270	36.15%	1,395	1.56%	89,262
Johnny Moore Creek	677	1.09%	9,577	15.42%	37,204	59.92%	14,634	23.57%	0	0.00%	62,092
Kane Creek	0	0.00%	0	0.00%	2,072	5.38%	29,429	76.37%	7,034	18.25%	38,535
Little Hunting Creek	7,737	14.81%	20,433	39.10%	24,083	46.09%	0	0.00%	0	0.00%	52,253
Little Rocky Run	0	0.00%	12,911	18.57%	43,383	62.39%	9,659	13.89%	3,581	5.15%	69,534
Mill Branch	1,065	1.41%	30,518	40.54%	16,276	21.62%	13,480	17.91%	13,937	18.51%	75,276
Nichol Run	0	0.00%	6,683	9.23%	7,215	9.96%	41,175	56.86%	17,338	23.94%	72,412
Occoquan	0	0.00%	0	0.00%	16,876	52.85%	15,053	47.15%	0	0.00%	31,929
Old Mill Branch	0	0.00%	1,586	5.02%	28,116	88.89%	1,927	6.09%	0	0.00%	31,629

TABLE ES-1  
 County-Wide Habitat Rating Summary, Linear Feet and Percent of Stream Length  
*Fairfax County Stream Physical Assessment*

<b>Watershed</b>	<b>Very Poor</b>	<b>Poor</b>		<b>Fair</b>		<b>Good</b>		<b>Excellent</b>		<b>Total</b>
Pimmit Run 0	0.00%	5,554	5.82%	44,626	46.80%	43,547	45.67%	1,631	1.71%	95,357
Pohick Creek 12,514	3.41%	102,945	28.08%	197,539	53.88%	53,618	14.63%	0	0.00%	366,615
Pond Branch 6,513	7.25%	20,724	23.06%	42,138	46.88%	20,511	22.82%	0	0.00%	89,885
Popes Head 3,285 Creek	1.25%	43,647	16.66%	140,741	53.71%	69,486	26.52%	4,868	1.86%	262,027
Ryans Dam 0	0.00%	0	0.00%	0	0.00%	9,326	41.47%	13,164	58.53%	22,490
Sandy Run 0	0.00%	4,734	4.40%	88,280	82.07%	14,553	13.53%	0	0.00%	107,567
Scotts Run 0	0.00%	7,938	18.23%	20,840	47.86%	7,101	16.31%	7,664	17.60%	43,543
Sugarland Run 0	0.00%	21,925	16.13%	40,380	29.70%	73,637	54.17%	0	0.00%	135,942
Turkey Run 0	0.00%	1,487	10.07%	4,488	30.37%	0	0.00%	8,801	59.56%	14,777
Wolf Run 3,430	4.04%	8,042	9.46%	59,756	70.31%	13,761	16.19%	0	0.00%	84,989
<b>Grand Total</b> 78,882	2.09%	742,973	19.68%	1,715,080	45.42%	1,037,462	27.47%	201,628	5.34%	3,776,025

**TABLE ES-2**  
 Length-Weighted Total Habitat Scores and Habitat Rating by Watershed  
*Fairfax County Stream Physical Assessment*

<b>Watershed</b>	<b>Length-Weighted Total Habitat Score</b>	<b>Total Habitat Category</b>
Accotink Creek	100	Fair
Belle Haven	71	Poor
Bull Neck Run	128	Good
Bull Run	108	Fair
Cameron Run	92	Fair
Cub Run	110	Fair
Dead Run	103	Fair
Difficult Run	108	Fair
Dogue Creek	96	Fair
Four Mile Run	96	Fair
High Point	124	Good
Horsepen Creek	100	Fair
Johnny Moore Creek	104	Fair
Kane Creek	128	Good
Little Hunting Creek	82	Poor
Little Rocky Run	102	Fair
Mill Branch	106	Fair
Nichol Run	127	Good
Occoquan	117	Good
Old Mill Branch	99	Fair
Pimmit Run	112	Fair
Pohick Creek	95	Fair
Pond Branch	99	Fair
Popes Head Creek	103	Fair
Ryans Dam	145	Excellent
Sandy Run	104	Fair
Scotts Run	108	Fair
Sugarland Run	111	Fair
Turkey Run	124	Good
Wolf Run	99	Fair
County-wide	104	Fair

TABLE ES-3  
Channel Evolution Model Stage, County-Wide  
*Fairfax County Stream Physical Assessment*

Watershed	Evolution Stage										Total of Reach Length
	1		2		3		4		5		
	Length (ft)	%	Length (ft)	%	Length (ft)	%	Length (ft)	%	Length (ft)	%	
Accotink Creek		0%	16,057	4%	407,162	91%	23,916	5%	0	0%	447,135
Belle Haven		0%	0	0%	8,477	100%	0	0%	0	0%	8,477
Bull Neck Run		0%	0	0%	37,408	54%	31,599	46%	0	0%	69,007
Bull Run		0%	8,923	35%	16,399	65%	0	0%	0	0%	25,323
Cameron Run		0%	13,273	6%	180,167	75%	45,548	19%	0	0%	238,988
Cub Run		0%	32,274	8%	224,790	59%	118,313	31%	8,165	2%	383,541
Dead Run		0%	0	0%	31,618	100%	0	0%	0	0%	31,618
Difficult Run		0%	77,984	12%	487,764	73%	101,820	15%	4,973	1%	672,542
Dogue Creek		0%	13,335	15%	44,528	49%	32,215	36%	0	0%	90,078
Four Mile Run		0%	0	0%	1,654	41%	2,422	59%	0	0%	4,076
High Point		0%	15,856	100%	0	0%	0	0%	0	0%	15,856
Horsepen Creek		0%	6,163	7%	77,322	93%	0	0%	0	0%	83,485
Johnny Moore Creek		0%	0	0%	60,371	97%	1,720	3%	0	0%	62,092
Kane Creek		0%	24,118	64%	13,861	36%	0	0%	0	0%	37,979
Little Hunting Creek		0%	12,042	23%	22,037	42%	18,174	35%	0	0%	52,253
Little Rocky Run		0%	24,219	34%	34,826	49%	11,586	16%	0	0%	70,631
Mill Branch		0%	16,798	23%	55,675	77%	0	0%	0	0%	72,473
Nichol Run		0%	1,918	3%	64,682	91%	4,467	6%	0	0%	71,067
Occoquan		0%	1,679	6%	21,806	78%	4,368	16%	0	0%	27,853
Old Mill Branch		0%	0	0%	22,874	72%	8,755	28%	0	0%	31,629
Pimmit Run		0%	0	0%	92,439	97%	2,917	3%	0	0%	95,356
Pohick Creek		0%	16,965	5%	264,729	74%	76,533	21%	0	0%	358,226
Pond Branch		0%	0	0%	89,885	100%	0	0%	0	0%	89,885
Popes Head Creek		0%	18,297	7%	159,781	61%	82,003	32%	0	0%	260,081
Ryans Dam		0%	9,326	41%	13,164	59%	0	0%	0	0%	22,490
Sandy Run		0%	0	0%	66,114	65%	35,102	35%	0	0%	101,217
Scotts Run		0%	3,389	8%	38,775	89%	1,379	3%	0	0%	43,543
Sugarland Run		0%	0	0%	82,412	60%	54,492	40%	0	0%	136,904
Turkey Run		0%	0	0%	14,777	100%	0	0%	0	0%	14,777
Wolf Run		0%	1,665	2%	83,324	98%	0	0%	0	0%	84,989
<b>Total</b>		<b>0%</b>	<b>314,282</b>	<b>8%</b>	<b>2,718,822</b>	<b>73%</b>	<b>657,330</b>	<b>18%</b>	<b>13,138</b>	<b>0.4%</b>	<b>3,703,572</b>

TABLE ES-4  
Inventory Impact Scores, County-Wide  
*Fairfax County Stream Physical Assessment*

Inventory Type	Impact Score												Total
	0	1	2	3	4	5	6	7	8	9	10	>10	
Deficient Buffers	3	22	271	434	510	689	190	312	73	20	42		2566
Crossings	946	821	669	291	150	90	31	27	9	2	3		3039
Ditches and Pipes	1187	329	265	191	93	123	21	23	21	8	18		2279
Erosion		1	6	22	43	143	95	155	50	13	22		550
Head Cut			4	21	38	19	4	1	1	2	32		122
Obstruction	58	27	82	208	114	114	38	45	44	23	41		794
Utility	19	8	11	46	26	21	22	14	2	2	10	5	186
<b>Total</b>	<b>2213</b>	<b>1208</b>	<b>1308</b>	<b>1213</b>	<b>974</b>	<b>1199</b>	<b>401</b>	<b>577</b>	<b>200</b>	<b>70</b>	<b>168</b>	<b>5</b>	<b>9536</b>

N/A = Not applicable, impact score range was 0 to 10

# Introduction

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Fairfax County has recently completed a number of studies and projects related to watershed protection and restoration. These include the Stream Protection Strategy (SPS) program, a wetlands assessment and monitoring program, a perennial streams mapping project, and the development of comprehensive management plans for the County's watersheds. The SPS program is an ongoing biological monitoring effort with the overall goal of identifying and assessing trends in stream conditions County-wide. The baseline SPS study, completed in January 2001, documented current conditions throughout the County's streams on the basis of biological indicators and provided a foundation for prioritizing and implementing sound watershed management strategies.

The Stream Assessment/Watershed Management Program is being implemented with the overall goal of providing a consistent basis for protecting and restoring the receiving water systems and other natural resources in the County. The data collected from the first phase of this project, a comprehensive assessment of stream physical conditions County-wide, will allow the County a better understanding of each watershed and its stream network. The data from the stream physical assessment will be integrated with the County's land use goals to anticipate and mitigate stormwater impacts.

## 1.1 Background

Fairfax County is located in the northeastern part of the state of Virginia, bordering the Potomac River. The County is bordered to the east by Arlington County, and the Cities of Falls Church and Alexandria. The Potomac River borders the County to the northeast and southeast. To the northwest and southwest, lie Loudoun and Prince William County, respectively. Within the borders of Fairfax County are three incorporated towns (Vienna, Herndon, and Clifton) and one city (Fairfax City). A map of the County and neighboring jurisdictions is shown in Figure 1-1.

Fairfax County was completely rural until World War II, with dairy farming being the most important single industry. Today it is highly urbanized and approaching ultimate build-out conditions, as envisioned in the County's Comprehensive Plan. The total land area of Fairfax County, including incorporated towns is 395 mi<sup>2</sup>. It is the most populous jurisdiction in Virginia as well as the Washington D.C. metropolitan area. The current (2003) population is estimated to be 1,015,600 with 369,900 households. Most land in the county is devoted to residential, commercial, recreational, and open-land uses, with heavy industry essentially nonexistent.

There are two major physiographic provinces in the County, with the boundary between them generally approximated by Interstate 95. The Coastal Plain province lies to the east has relatively gentle topography and consists of unconsolidated strata deposited by ancient rivers and oceans. The Piedmont Upland province lies to the west, and consists of rolling hills underlain by metamorphic rocks. A sub-region of the Piedmont Upland province, the

Triassic Basin (also called the Piedmont Lowland) is located in the southwest corner of the county, and consists of areas of somewhat lower relief underlain by sedimentary rocks. The County has 30 designated watersheds (Figure 1-1). The southwestern part of the County drains into the Occoquan River. Except for two watersheds (Sugarland Run and Horsepen Creek) that drain into Loudoun County, the northern and southeastern parts of the county drain to the Potomac River.

During the early years of development in Fairfax County, the emphasis on storm water management was on conveyance and channelization. Major flood plains were delineated and flood control projects implemented. Starting in 1972, on-site detention control was required for all new development. In the early 1980's, water quality Best Management Practices (BMPs) were required for new development in the southern areas of the county draining to the Occoquan reservoir, a major source of drinking water for the County.<sup>1</sup> BMPs were required for new development throughout the county in 1993. The County generally encourages opportunities to retrofit existing older storm water devices that were designed for flood control.

In the late 1970s, master drainage plans were prepared for all watersheds in Fairfax County. This included the delineation of boundaries for 29 watersheds,<sup>2</sup> and the development of a masterplan for each watershed that consisted of an immediate action plan and a future plan. The immediate action plans described the physical improvements required to solve existing problems including flooding, erosion, sedimentation, and other environmental problems. These plans included various least-cost solutions to the problems identified. The future plans described improvements for problems that were predicted to occur through the year 2000. The cost of these improvements has been the basis for the pro-rata cost sharing system used by the County to allocate costs for watershed improvements to be borne by private developers. The County's Capital Improvement Program was also developed on the basis of these costs.

In 1989, the County adopted a Regional Stormwater Management Plan (RSMP), which proposed regional ponds in the most rapidly developing watersheds in the county. The adoption of this plan marked a shift in Fairfax County's approach to implementing stormwater management from onsite controls to regional controls. In general, facilities in the RSMP are designed to provide water quantity and quality control for areas of between 100 to 300 acres. Since the adoption of the RSMP, it has been the County's objective to implement regional stormwater management ponds wherever opportunities exist. In January, 2002, a multiagency committee recommended that regional ponds should not be considered the preferred alternative, but just one of many tools considered for stormwater management.<sup>3</sup>

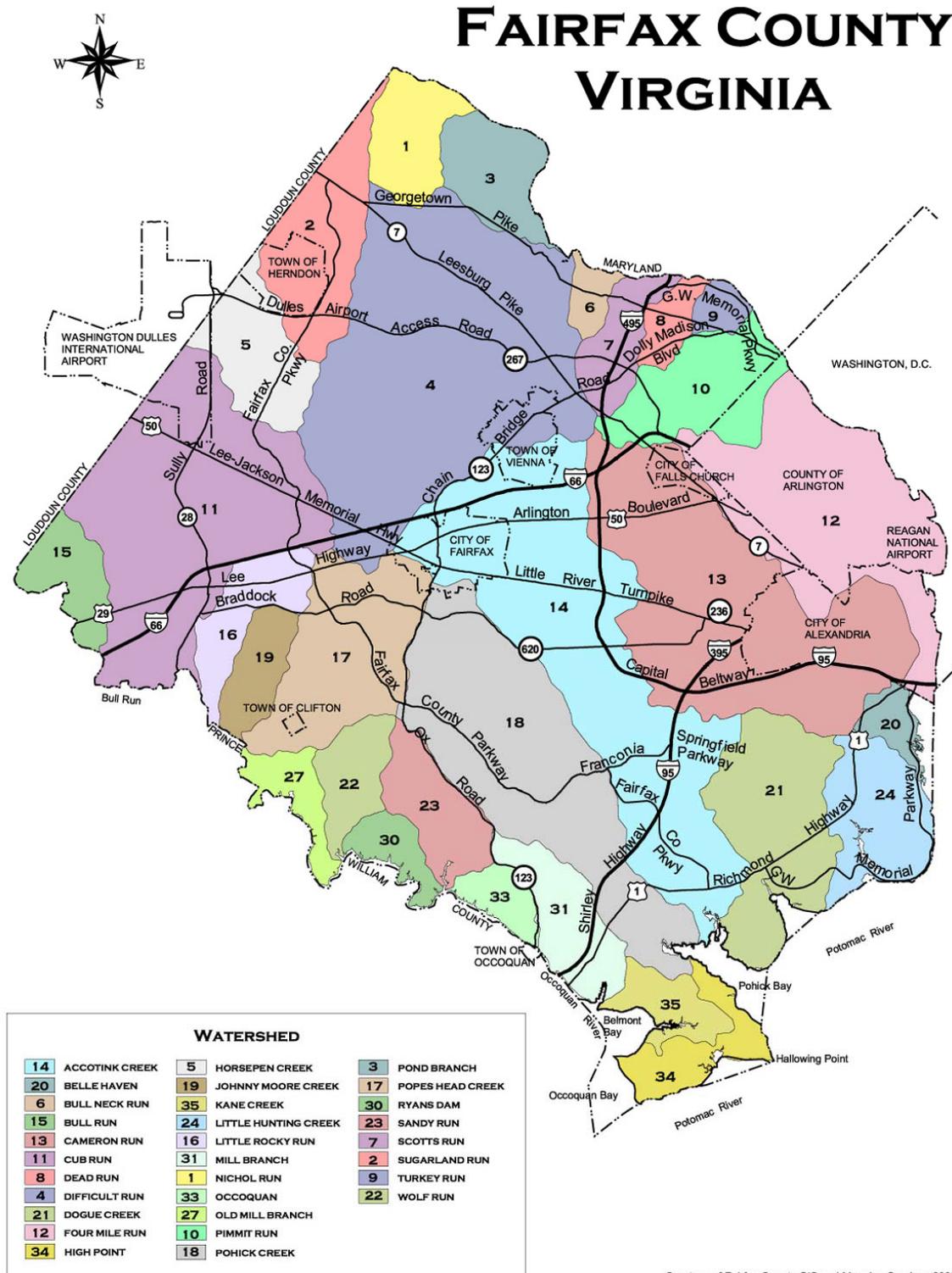
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<sup>1</sup> In 1982, the Fairfax County Board of Supervisors decided to downzone 41,000 acres of the Occoquan Watershed in the County, and limit development to 5-acre lots. The decision was upheld in a landmark court decision in 1985. As part of the downzoning, the entirety of the Occoquan watershed in Fairfax County (excluding the Town of Clifton) was designated as the Water Supply Overlay District (WSPOD) where BMPs were required for all development.

<sup>2</sup> Excluding the Four Mile Run watershed.

<sup>3</sup> The committee's report on regional ponds as a watershed management tool can be downloaded at: <http://www.fairfaxcounty.gov/dpwes/watersheds/ponds.htm>.

FIGURE 1-1 Fairfax County Jurisdictional Boundaries and Designated Watersheds



Courtesy of Fairfax County GIS and Mapping Services 2002

Recently, Fairfax County has embarked upon a number of significant studies and projects related to watershed protection and restoration. These include the Stream Protection Strategy (SPS) program, a wetlands assessment program, a perennial streams mapping project, and the development of comprehensive management plans for the County's watersheds.

Fairfax County's Stream Protection Strategy (SPS) program is an ongoing biological monitoring effort with the overall goal of identifying and assessing trends in stream conditions countywide. The baseline SPS study, completed in January 2001, documented current conditions throughout the county's streams based on biological indicators, and provided a foundation for prioritizing and implementing sound watershed management strategies.

A three-year study to inventory existing wetland resources and characterize wetland response to degrees of urbanization was initiated in August 2000 by the County in partnership with George Mason University. The study will also examine the function, usefulness, and sustainability of wetlands in stormwater management and provide critical information on wetland management in urban watersheds.

In September 2001, the County initiated a major effort to update its base stream map of all perennial and intermittent streams. In addition to the identification and mapping of perennial streams, this project inventoried physical and ecological conditions in headwater streams, and reevaluated the County's resource protection areas (RPAs) designated under the Chesapeake Bay Preservation Ordinance (CBPO), Chapter 118 of the Fairfax County Code. Updated RPA maps were adopted by the Fairfax County Board of Supervisors in November 2003.

In December 2001, the County embarked on a significant effort to develop watershed management plans for the 30 designated watersheds within the County over a proposed 5-7 year period. The overall goal for the development of watershed management plans is to provide a consistent basis for the evaluation and implementation of solutions for protecting and restoring the receiving water systems and other natural resources of the County. Under the first phase of this project, initiated in August 2002, an assessment of the physical condition of the County's estimated 800 stream miles was conducted. Habitat and geomorphic conditions were visually evaluated and scored. In addition, stormwater infrastructure such as road culverts and stormwater outfalls were inventoried and assessed. The data, including an extensive photo record, were integrated into a Geographic Information System (GIS) to allow watershed planners to visualize stream conditions and assist them in making sound management decisions for stream protection and restoration.

## 1.2 Purpose for a Stream Physical Assessment

The protocols presented in this document were followed to conduct the stream physical assessment. The purpose of the assessment was to collect information on and document the following:

- Habitat conditions (habitat assessment)
- Impacts on the stream from specific infrastructure and problem areas (infrastructure inventory)

- General stream characteristics
- Geomorphic classification of stream type

A baseline assessment was conducted on approximately 801 miles of streams throughout the county. The assessment results will be incorporated into the watershed planning process to determine appropriate management strategies. Although this project does not specifically address watershed management planning, its results will tie directly into the County's watershed planning process.



# Stream Assessment Methods

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This section summarizes the methods used to perform the stream assessments. The stream assessments were performed in all County watersheds for a total of approximately 801 stream miles.

In addition to following the protocols, the stream assessments were conducted with input from County staff and watershed consultants in August and September 2002. The protocols were presented and field tested on August 12 and 14 and subsequently revised on the basis of further County input and field tests in early October 2002. County-wide stream assessments and stream feature inventories were then conducted between October 2002 and February 2003. Supplemental stream assessments for the Pimmit Run and Accotink Creek watersheds were completed in February 2005. Through the field assessments, baseline conditions of the stream habitats were established. These habitat conditions are a measure of stream integrity from which watershed conditions can be inferred.

## 2.1 Protocols

### 2.1.1 Habitat Assessment

The habitat assessment protocols and metrics presented here were used on several watershed management projects in ecoregions of the Piedmont and Coastal Plain provinces for documenting the stream physical conditions. The protocols used on these projects were adapted from existing sources, tested and documented in the scientific literature, and recommended by the U.S. Environmental Protection Agency (USEPA). Appendix A contains a discussion summarizing how “visually based” stream habitat assessment protocols were selected and adapted for the watershedwide management programs.

#### 2.1.1.1 Habitat Assessment Metrics

An evaluation of habitat quality is critical to any assessment of ecological integrity. The habitat quality evaluation is accomplished by characterizing selected physical parameters that represent stream conditions. Metrics for the visual based approach depend on several conditions to accurately assess the quality of the physical habitat structure:

- The metrics selected to represent the various features of habitat structure need to be relevant and clearly defined
- The metrics must be sensitive to a continuum of conditions from the optimum to the poorest
- The judgement criteria for the attributes of each parameter should minimize subjectivity through quantitative measurements or specific categorical choices

Table 2-1 lists metrics cited in the literature and adopted by many states and environmental groups, including the USEPA, to conduct “visually based” stream and riparian zone

assessments for their biological and aquatic quality monitoring programs. Several of these metrics were tested and evaluated in the development of watershedwide assessment protocols for several municipalities in Virginia and the southeast. The table describes each metric and its relevance to instream aquatic integrity.

TABLE 2-1  
Habitat Assessment Metrics  
*Fairfax County Stream Physical Assessment*

Metric	Description	Comment
Epifaunal substrate/available cover	Includes the relative quantity and variety of natural structures in streams such as cobble, large rocks, fallen trees, logs and branches, feeding, or sites for spawning and nursery functions of aquatic macrofauna.	High- and low-gradient streams. Variability occurs when percent area coverage is misinterpreted.
Embeddedness	Extent to which rocks (gravel, cobbles, and boulders) are sunk into the silt, sand, or mud of the stream bottom.	High-gradient streams. It may also be useful to lift a few rocks in riffle areas and observe the extent of the dark area on their underside. Observations should be taken in the upstream and central portions of riffles (i.e., run).
Pool substrate characterization	Type and condition of bottom substrates found in pools. Firmer sediments and rooted aquatic plants support a wider variety of organisms than a pool substrate dominated by mud or bedrock and no plants.	Low-gradient streams. Requires visual inspection of pool substrate.
Velocity depth combinations	Patterns of velocity and depth combinations: <ul style="list-style-type: none"> <li>• slow-deep</li> <li>• slow-shallow</li> <li>• fast-deep</li> <li>• fast-shallow</li> </ul>	High-gradient streams. Guidelines are 0.5-m depth to separate shallow from deep and 0.3 m to separate fast from slow. Guidelines may not be sensitive enough to discriminate between large- and small-stream systems.
Pool variability	Rating of overall mixture of pool types according to size and depth. In rivers with low sinuosity (few bends) and monotonous pool characteristics, very little instream habitat variety exists to support a diverse community.  The four basic types of pools: <ul style="list-style-type: none"> <li>• large-shallow</li> <li>• large-deep</li> <li>• small-shallow</li> <li>• small-deep</li> </ul>	Low-gradient streams. Any pool dimension (e.g., length, width) greater than half the cross-section of the stream is a large pool. Small pools have lengths and widths less than half the width of the stream. Pools with depths greater than 1.0 m are deep. Shallow pools are less than 1.0 m deep. Guidelines may not be sensitive enough to discriminate between large- and small-stream systems.
Sediment deposition	Amount of sediment that has accumulated and the changes that have occurred to the stream bottom as a result of deposition. Sediment deposition may cause the formation of islands, point bars (areas of increased deposition usually at the beginning of a meander that increase in size as the channel is diverted toward the outer bank) or shoals, or result in the filling of pools.	High- and low-gradient streams. Estimation of growth of point bars requires visual determination of their stability (e.g., presence of vegetation).

TABLE 2-1  
Habitat Assessment Metrics  
*Fairfax County Stream Physical Assessment*

Metric	Description	Comment
Channel flow status	The degree to which the channel is filled with water during normal-flow periods. Flow status changes as the channel enlarges. Useful for interpreting biological condition during abnormal- or lowered-flow conditions.	High- and low-gradient streams. This is a seasonal parameter. A decrease in water will wet smaller portions of the streambed, thus decreasing available habitat for aquatic organisms. Observers use the toe of slope and vegetation line on the lower bank as reference point to estimate channel flow status. Variability occurs if stream is a C type or a C type forming in an F channel.
Channel alteration	Measurement of large-scale alteration of instream habitat, which affects stream biotic integrity and causes scouring. Channel alteration is present when, among other possible changes, <ul style="list-style-type: none"> <li>• artificial embankments, riprap, and other forms of artificial bank stabilization or structures are present</li> <li>• dredging has altered bank stability</li> <li>• dams and bridges are present</li> <li>• banks and channels have been disturbed by livestock or agricultural practices or hydrology</li> </ul>	High- and-low gradient streams. Variability occurs when discriminating between natural conditions and induced by development or other human use.
Frequency of riffles	Measure of sequence of riffles and the heterogeneity occurring in a stream. A riffle/run (i.e., distanced between riffles divided by width of stream) ratio is use to as a measure of heterogeneity.	High-gradient streams. Observers must estimate distance between riffles. For high gradient streams were riffles are uncommon, a run/bend rations is used.
Channel sinuosity	Evaluates the meandering or sinuosity of the stream.	Low-gradient streams. Run/bend ratio may not necessarily provide an accurate measurement. Stream length divided by valley length requires map measurements.
Bank stability	Measures the existence of or the potential for detachment of soil from the upper and lower stream banks and its movement into the stream. Steep banks are more likely to collapse and suffer from erosion than are gently sloping banks and are therefore considered to be unstable. Signs of erosion include crumbling, unvegetated banks, exposed tree roots, and exposed soil. Reinforcement of banks via rocks, artificial or natural, provides stability.	High- and low-gradient streams. Observers must evaluate bank soil condition, slope, shape, root mat density, etc.

TABLE 2-1  
Habitat Assessment Metrics  
*Fairfax County Stream Physical Assessment*

Metric	Description	Comment
Bank vegetative protection	Measures the amount of the stream bank that is covered by vegetation. This parameter supplies information on the ability of the bank to resist erosion. Banks that have full, natural plant growth are better for fish and macroinvertebrates than those without vegetation protection and those shored up with concrete or riprap.	High- and low-gradient streams. Observers must consider the following when scoring vegetative protection: <ul style="list-style-type: none"> <li>• Is the vegetation native and natural or planted and introduced?</li> <li>• Are the upper story, under story, and ground cover vegetation well balanced?</li> <li>• What is the standing crop biomass?</li> <li>• During which season is this assessment being conducted?</li> </ul>
Vegetation buffer zone width	Measures the width and conditions of the vegetation or land use from the edge of the upper stream bank through, and in some cases beyond, the flood plain and riparian zone. The vegetative zone is a buffer to pollutants entering a stream from runoff and minimizes erosion.	High- and low-gradient streams. Observers must walk in the buffer area, paying close attention to the amount of natural vegetation present and how deep it extends from the bank and to disturbances that may effect the transport of pollutants through the zone. Vegetated buffer zone assessment involves documenting three conditions: <ul style="list-style-type: none"> <li>• vegetation cover type</li> <li>• breaks</li> <li>• vegetated zone width</li> </ul>
Canopy cover	Measures the amount of cover overhead that provides shading and cooling of the water.	High- and low-gradient streams. Assessment involves vegetation cover type and density of leaf material. Metric is sensitive to season and size of stream.
Aesthetics	Measures the perception of what constitutes desirable surface water and aquatic integrity.	High- and low-gradient streams. Highly subjective and does not necessarily relate to the ability of a stream to support aquatic life.
Riffle/run depth	Measures conditions for fish habitat and refuge.	High- and low-gradient streams. Established pool or riffle depths may not be sensitive to discriminate between large and small stream systems.

The habitat assessment metrics were evaluated for their sensitivity to accurately measure and document the conditions and represent the stream and riparian features (see Appendix A). Overall, the metrics evaluated responded to the expected field conditions and support watershed-management decisions. The selected metrics are listed in Table 2-2 for glide/pool (low gradient) and riffle/run (high gradient) streams. A detailed discussion of the metrics can be found in Appendix A.

The County decided to apply only the riffle/run set of metrics to the Piedmont and Triassic physiographic provinces and the glide/pool (low-gradient) metrics to the coastal plain physiographic province. The watersheds located within each physiographic province are listed in Table 2-3. As shown in the table several watersheds extend into two physiographic provinces.

The stream assessments were performed with forms and instructions developed during the protocol development phase and updated on the basis of feedback from the accuracy and precision evaluation, which is summarized below. The updates involved mostly moving fields on the forms and adding additional explanations about scoring criteria. The field forms are in Attachments to Appendix A.

The field teams were also provided with field notebooks that included the forms, instructions, maps, and pictures representing scoring criteria. The instructions also included a Health and Safety Plan and a Quality Assurance Project Plan (QAPP).<sup>4</sup>

The protocol for stream assessments involved evaluating streams with contributory areas greater than 50 acres, as mapped by the County. Streams in the remainder of the watersheds were assessed for habitat and infrastructure. To assist in data collection, County-wide planimetric field maps were developed at a scale of 1 in. to 200 ft. Figure 2-1 shows the index to these maps as they overlay the county watersheds.

### 2.1.1.2 Watershed and Reach Naming Convention

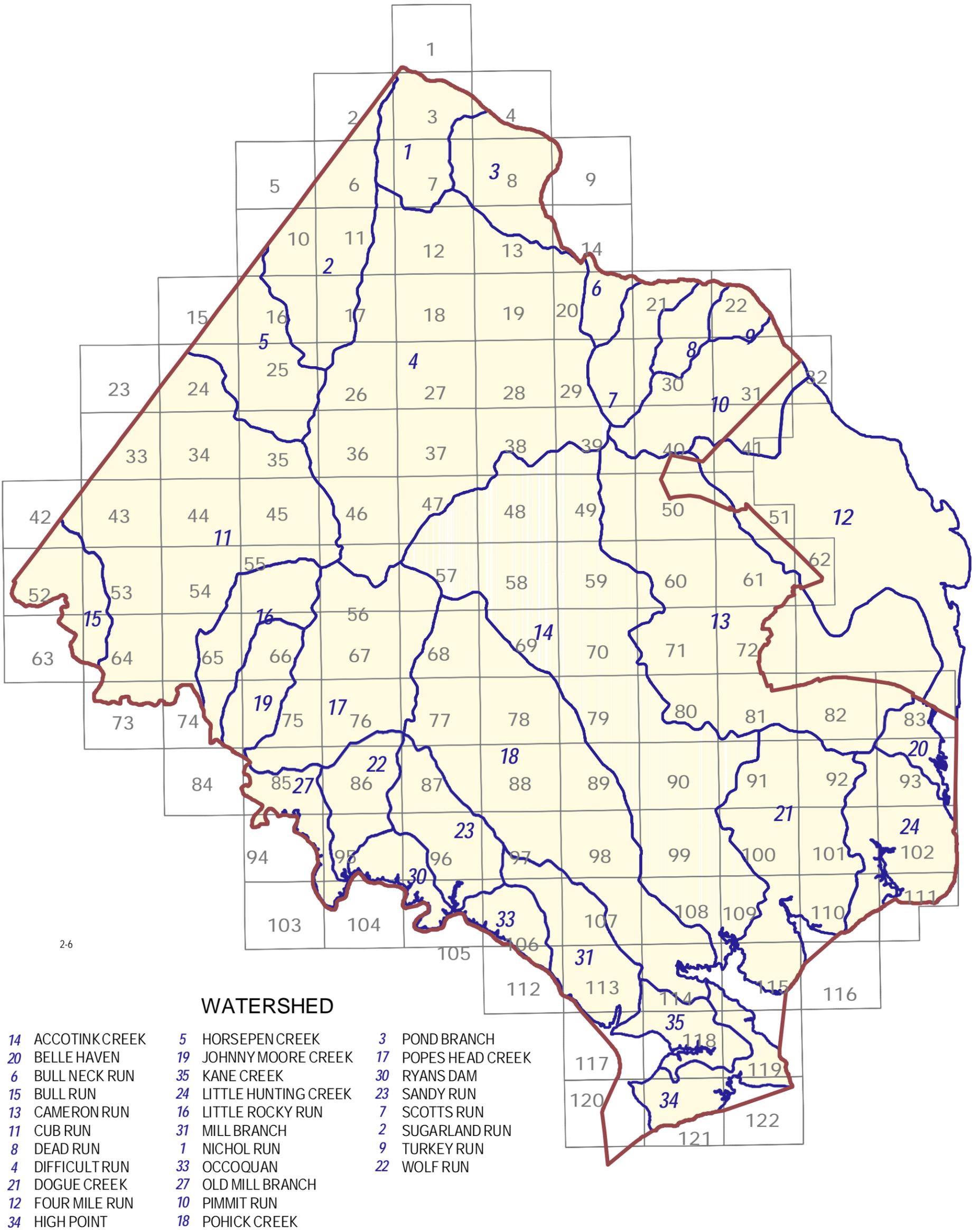
The habitat and geomorphic assessment protocols call for each reach defined in the field having a unique name. To facilitate reach naming, watersheds and reaches were each assigned a two-letter abbreviation. For example,

- **Watershed code**— Two letters, e.g., “LH” for Little Hunting Creek watershed, “AC” for Accotink Creek watershed
- **Reach code**— Two letters, e.g., “BB” for Bear Branch, “PS” for Paul Spring Branch

TABLE 2-2  
Selected Habitat Assessment Metrics  
*Fairfax County Stream Physical Assessment*

Glide/Pool	Riffle/Run
<b><i>Instream Habitat</i></b>	
Bottom substrate/available cover	Instream cover
Pool substrate characterization	Epifaunal substrate
Pool variability	Embeddedness in run areas
<b><i>Channel Morphology</i></b>	
Channel/bank alteration	Channel/bank alteration
Channel sinuosity	Frequency of riffles
Sediment deposition	Sediment deposition
Channel flow status	Channel flow status
<b><i>Riparian and Bank Structure</i></b>	
Bank vegetative protection	Bank vegetative protection
Bank stability	Bank stability
Vegetation buffer zone width	Vegetation buffer zone width

<sup>4</sup> Available as a separate document.



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- Fairfax County Boundary
- Fairfax County Map Index
- Watersheds

Figure 2-1  
Fairfax County Map Index  
Fairfax County Stream Physical Assessment





The watershed and reach codes can be found in Appendix B.

**TABLE 2-3**  
List of Watersheds in Each Physiographic Provinces  
*Fairfax County Stream Physical Assessment*

<b>Coastal Plain</b>	<b>Piedmont</b>	<b>Piedmont (Triassic)</b>
Accotink Creek Watershed	Accotink Creek Watershed	Bull Run Watershed
Belle Haven Watershed	Bull Neck Run Watershed	Cub Run Watershed
Cameron Run Watershed	Cameron Run Watershed	Horsepen Creek Watershed
Dogue Creek Watershed	Cub Run Watershed	Little Rocky Run Watershed
Four Mile Run Watershed	Dead Run Watershed	Sugarland Run Watershed
High Point Watershed	Difficult Run Watershed	
Kane Creek Watershed	Four Mile Run Watershed	
Little Hunting Creek Watershed	Horsepen Creek Watershed	
Mill Branch Watershed	Johnny Moore Creek Watershed	
Pimmit Run Watershed	Little Rocky Run Watershed	
Pohick Creek Watershed	Mill Branch Watershed	
	Nichol Run Watershed	
	Old Mill Branch Watershed	
	Occoquan Watershed	
	Pimmit Run Watershed	
	Pohick Creek Watershed	
	Pond Branch Watershed	
	Popes Head Creek Watershed	
	Ryans Dam Watershed	
	Sandy Run Watershed	
	Scotts Run Watershed	
	Turkey Run Watershed	
	Sugarland Run Watershed	
	Wolf Run Watershed	

## 2.1.2 Infrastructure Inventory

### 2.1.2.1 Infrastructure Items

The infrastructure inventory identified and characterized the following items:

- Deficient buffer vegetation
- Ditches
- Dump sites
- Erosion areas
- Head cuts
- Obstructions
- Pipes

- Road and other stream crossings
- Utility lines

Each infrastructure item identified in the field was noted on the appropriate inventory form with data recorded as explained in Appendix A and then located on a map with the inventory code (see below) and photographed if appropriate. Visual estimates of lengths and measurements were noted.

Each inventory item was assigned an impact score according to the criteria listed on the bottom of each inventory form. The field forms are provided in Attachments to Appendix A.

### 2.1.2.2 Infrastructure Item Naming Conventions

Each inventory item is assigned a unique one-letter infrastructure code:

- Buffer, B
- Crossing, C
- Ditch, D
- Dump, M
- Erosion, E
- Head cut, H
- Obstruction, T
- Pipe, P
- Utility, U

### 2.1.3 Inventory List Example

The list item “ACBB02.D04” designates the Accotink Creek Watershed (AC), Bear Branch (BB), Reach no. 2 (02), Ditch no. 4 (D04); or, the fourth ditch in the second reach of Bear Branch.

### 2.1.4 Stream Characteristics

Each stream reach was characterized in the field on the basis of one or more of the following factors:

- **Stream restoration candidate**—including a qualitative assessment of the need and potential for restoration.
- **Stream assessment**—Identifies if the habitat assessment was conducted. Some sites were eliminated from assessment for the following reasons:
  - **Wetland**—The forms are not responsive to wetlands.
  - **No access**—Property owner will not allow access to his or her property.
  - **Dangerous conditions**—Safety is always first.
  - **Pond/lake**—The forms are not responsive to impounded water.
  - **No flow**—Flow must be present for the habitat assessment.
  - **Too deep**—The majority of the stream must be wadable.
- **Infrastructure assessment**—Identifies if the infrastructure inventory was conducted, with some sites being eliminated for similar reasons to those for habitat assessment.

Note that some reaches that were not assessed for habitat were assessed for infrastructure inventory items, where possible.

- **Water appearance**
- **Water odor**
- **Sediment odors**
- **Fish** – Identifies qualitatively the presence or absence of fish.
- **Aquatic plants** – Identifies qualitatively the presence or absence of aquatic plants.
- **Algae** – Identifies qualitatively the presence or absence of algae.

Each stream characteristic item identified in the field was noted on the appropriate inventory form with data recorded as explained in Appendix A. The field forms are provided in Attachments to Appendix A.

### 2.1.5 Channel Evolution Model (Geomorphologic) Assessment

The channel evolution model (CEM)-based geomorphologic assessment entailed identifying the evolutionary stage of the system to each assessment reach. The CEM is used to identify stream successional stages from an early stable system with one terrace through an unstable changing environment (e.g., widening and downcutting) to a stable system with two terraces. The percent of the assessment reach represented by each evolutionary stage was determined by visual observations of the channel cross-section as well as other morphological observations within the study area. The various visual indicators utilized are summarized in Figure 2-2.

In addition to assigning CEM channel type(s), cross-sectional measurements were taken at one or more representative points (depending on the number of CEM types assigned) over the assessment reach.

Field forms for performing the CEM-based assessment are provided in Attachments to Appendix A.

## 2.2 Training

In order to maintain uniformity across field teams, a training class was prepared. The training class consisted of presentations, samples, and a field demonstration. The 2-day training workshop included a half-day overview in the office during which the presentations and samples were shown. The overview addressed the goals of the program, assessment performance, impact and habitat scoring criteria, logging of data on forms, and questions from the teams.

The second half of the workshop was conducted in the field. The workshop attendees were divided into four groups. Each group included an experienced person who led the teams through the forms and maps. At the end of each reach the groups compared their scores and evaluated scoring differences.

Following this initial 2-day training period, it was decided that two additional days should be devoted to on-the-job training prior to conducting the accuracy and precision evaluation (see below). During this additional training, each two-person field team conducted stream assessments at a slower pace while accompanied by a third, more experienced, lead person.

## 2.3 Accuracy and Precision Evaluation

Accuracy and precision were evaluated for stream physical assessment metrics according to the procedures documented in Appendix C. Seven two- or three-person teams participated in the assessment. The evaluations were conducted by having the teams assess two sites previously identified by the County and previously assessed as part of the County Stream Protection Strategy (SPS):

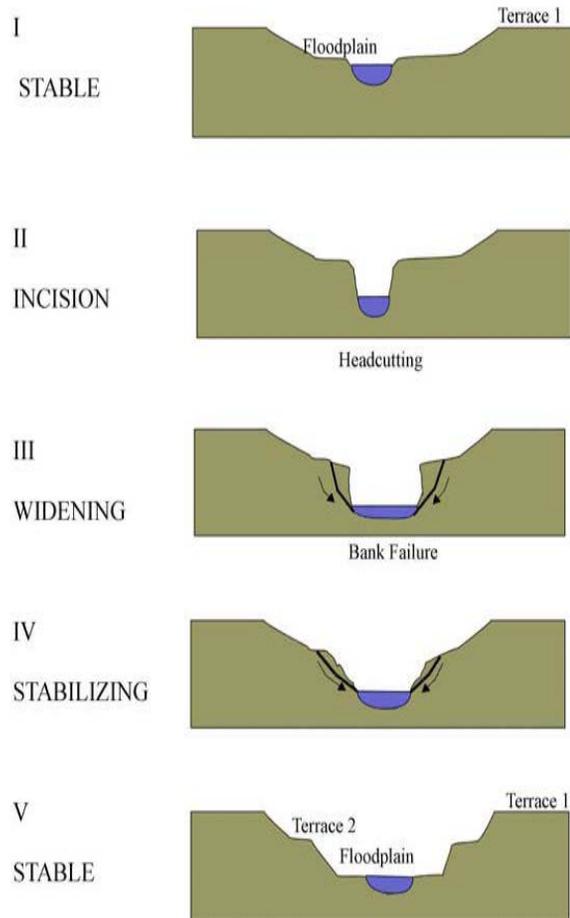
- Dogue Creek (DCDC01), a site located in the coastal plain physiographic region, in the Dogue Creek watershed
- Elk Horn Run (OCEH01), a site located in the Piedmont physiographic region, in the Occoquan watershed not far from the Occoquan River

Appendix C contains site location maps and upstream and downstream photographs from reaches identified by the field teams. Assessments for Elk Horn Run were not carried out consistently by the field teams because the lower segment was located in a wetland area. While dropping the site from the data analysis presented in this document was considered, it was determined that the results provided important information about wetland-upland interface field conditions and therefore the analysis of the pertinent data collected was included.

**FIGURE 2-2**  
 Indicators for Assigning Channel Type in the Incised Channel Evolution Model  
*Fairfax County Stream Physical Assessment*

**INCISED CHANNEL EVOLUTION MODEL**

(Schumm, Harvey, Watson 1984)



**Type I:** Well-developed base flow and bankfull channel; consistent floodplain features easily identified; one terrace apparent above active floodplain; predictable channel morphology; floodplain covered by diverse vegetation; streambanks  $\leq 45^\circ$ .

**Type II:** Head cuts; exposed cultural features (along channel bottom); sediment deposits absent or sparse; exposed bedrock (parts of reach); streambank slopes  $> 45^\circ$ .

**Type III:** Stream bank sloughing, sloughed material eroding; streambank slopes  $> 60^\circ$  or vertical/undercut; erosion on inside of bends; accelerated bend migration; exposed cultural features (along channel banks); exposed bedrock (majority of reach).

**Type IV:** Streambank aggrading; sloughed material not eroded; sloughed material colonized by vegetation; base flow, bankfull and floodplain channel developing; predictable channel morphology developing; streambank slopes  $\leq 45^\circ$ .

**Type V:** Well developed base flow and bankfull channel; consistent floodplain features easily identified; two terraces apparent above active floodplain; predictable channel morphology; streambanks  $\leq 45^\circ$ .

### 2.3.1 Precision Evaluation

Tables 2-4 and 2-5 present the standard deviation, mean, and coefficient of variation (COV) of the Dogue Creek and the Elk Horn Run sites for the individual habitat metrics and the total habitat scores. The statistics were calculated from the individual scores of each team member and the average score of each team.

TABLE 2-4  
Standard Deviation, Mean, and Coefficient of Variation for Dogue Creek, by Individual Score, and by Average Team Score  
*Fairfax County Stream Physical Assessment*

Glide/Pool Metrics	Statistics on Individual Basis				Statistics on Team Basis			
	Standard Deviation	Mean	Coefficient of Variation	Sample	Standard Deviation	Mean	Coefficient of Variation	Sample
Bottom substrate/available cover	2.9	11.9	25	16	2.4	12.3	20	7
Pool substrate characterization	3.4	10.4	33	16	3.1	10.7	29	7
Pool variability	2.1	12.4	17	16	1.8	12.4	15	7
Channel/bank alteration	4.1	12.4	33	16	3.8	12.7	30	7
Sediment deposition	2.5	8.6	29	16	2.1	8.9	24	7
Channel sinuosity	4.6	6.8	68	16	4.8	7.2	66	7
Channel flow status—drought	2.8	9.1	31	16	2.8	9.2	31	7
Channel flow status—normal	2.7	12.6	21	16	2.4	12.7	19	7
<b>Bank Vegetative Protection</b>								
LB	1.5	3.3	47	16	1.3	3.4	38	7
RB	1.7	3.5	49	16	1.6	3.6	43	7
<b>Bank Stability</b>								
LB	1.8	3.9	47	16	0.7	9.1	38	7
RB	1.7	4.1	41	16	2.2	7.5	35	7
<b>Vegetation Buffer Zone Width</b>								
LB	0.9	9.1	10	16	23.1	118.3	8	7
RB	2.0	7.6	27	16	21.3	109.0	29	7
Total without drought channel flow status	22.2	106.5	21	16	21.27	109.0	20	7

TABLE 2-5  
Standard Deviation, Mean and Coefficient of Variation for Elk Horn Run, by Individual Score, and by Average Team Score  
*Fairfax County Stream Physical Assessment*

Riffle/Run Metrics	Statistics on Individual Basis				Statistics on Team Basis			
	Standard Deviation	Mean	Coefficient of Variation (%)	Sample Size	Standard Deviation	Mean	Coefficient of Variation (%)	Sample Size
Instream cover	3.0	10.5	29	11	2.4	10.4	23	5
Epifaunal substrate	4.1	4.6	89	11	4.3	5.0	85	5
Embeddedness	5.0	9.4	54	11	5.3	9.8	54	5
Channel/bank alteration	1.9	15.7	12	11	1.7	15.6	11	5
Sediment deposition	2.5	14.0	18	11	2.5	13.7	18	5
Frequency of riffles	3.1	5.4	59	11	2.8	5.7	49	5
Channel flow status—drought	1.6	1.4	119	11	1.7	1.5	115	5
Channel flow status—normal	5.6	10.6	53	11	5.4	9.9	54	5
<b>Bank Vegetative Protection</b>								
LB	1.3	7.5	17	11	1.3	7.4	17	5
RB	1.4	7.6	18	11	1.4	7.5	19	5
<b>Bank Stability</b>								
LB	1.0	7.8	13	11	0.5	7.7	7	5
RB	1.0	7.9	13	11	0.7	7.8	9	5
<b>Vegetation Buffer Zone Width</b>								
LB	1.6	6.1	26	11	1.2	5.9	21	5
RB	1.6	7.1	23	11	1.7	7.0	24	5
Total without drought channel flow status	7.3	114.4	6	11	5.8	113.5	5	5

No set goals were established for the precision evaluation; however, in discussions with County staff a reasonable target was suggested: that the COV for the overall habitat score should not exceed 15 percent, while the COV for any one metric should not exceed 25 percent. The results shown in Tables 2-4 and 2-5 indicate that, in general, these targets have not been met for the glide/pool system, but they were more frequently met for the

riffle/run system. However, the overall COV for the glide/pool system of 20 percent is not unreasonable, and the overall COV for the riffle/run system of 5 percent is excellent (the latter for fewer teams, because of the problems assessing the wetlands area at the riffle/run site).

The glide/pool metrics with the most inconsistent results, based on the COV, are as follows, in declining order:

- **Channel sinuosity** – The discrepancies with sinuosity are a result of map wheel measurements of GIS coverage and observations of internal channel meandering through point bars.
- **Bank vegetative protection** – Bank vegetative protection differences are a result of misidentification of the demarcation between actual bank vegetation (that vegetative cover that occurs between the bank toe of slope and the top of bank) and riparian vegetative cover.
- **Bank stability** – The condition of the Dogue Creek system was such that bank stability could be easily misinterpreted. The creek did not have any active erosion with slumping, however, it was scoured and had little vegetative stability.
- **Channel flow status** – Given the drought conditions occurring at the time of evaluation, normal channel flow status was variable. The internal meandering within a larger established streambed increased the variability of this measurement.
- **Pool substrate characterization** – Pool substrate was easily determined by the dominant bed material, however, determining the “quality” of the pool in relation to habitat for fish and aquatic macroinvertebrates varied depending on experience of the assessor(s).
- **Sediment deposition** – Determining sediment deposition is a subjective estimation of the amount of point bars and unstable sediment within a stream. The variability of this measurement increased because the drought conditions increased the amount of exposed sediments resulting in an overestimate of the point bar depositions.

The conflicting riffle-run metrics are a direct result of the wetland system of Elk Horn Run. Applying stream protocols to a system with braided and overgrown wetland channels can produce a wide range of differing results. The metrics with the most inconsistent results, based on the COV, are as follows, in declining order:

- Channel flow status – drought
- Epifaunal substrate
- Embeddedness
- Frequency of riffles
- Vegetation buffer zone width
- Instream cover

### 2.3.2 Accuracy Evaluation

Table 2-6 presents the total habitat assessment score and condition rating for the two sites and the seven teams. Figure 2-3 shows the spread in the total habitat scores. Additional

graphical analyses are contained in Appendix C illustrating the scatter in the raw data and the average data by team, for each of the individual habitat metrics.

Team 2 was assumed to be made up of the most experienced team. No County assessment information for these sites was provided. All the habitat assessment scores fell within one rating category of the Team 2 category for the Elk Horn Run site, and all but one total habitat assessment score (Team 3) fell within one rating category of the Team 2 category for the Dogue Creek site. Note that the Team 2 score was the only one to rate Dogue Creek as “Poor” (by just three points), while all others rated it fair or good.

TABLE 2-6  
Total Habitat Assessment Score and Condition Rating for Elk Horn Run and  
Dogue Creek by Team  
*Fairfax County Stream Physical Assessment*

Team	OCEH001		DCDC001	
	Score	Condition	Score	Condition
1	110	Fair	111	Fair
2	123	Good	78	Poor
3	DNA	DNA	146	Good
4	108	Fair	94	Fair
5	DNA	DNA	115	Fair
6	116	Fair	101	Fair
7	112	Fair	120	Fair

Preliminary condition rating categories are as follows (these were later revised—see Section 3):

0–40	Very poor
41–80	Poor
81–120	Fair
121–160	Good
161–200	Excellent

OCEH001 data for Team 2 are obtained by combining the two Elk Horn Reaches.

DNA = Did not assess.

### 2.3.3 Channel Evolution Model Evaluation

Table 2-7 presents the channel evolution model rating for each team and assessment site. The Dogue Creek data show good consistency, with five of seven teams rating the site a 3, and the other two rating it a 3.5 or 4.

FIGURE 2-3  
Total Habitat Scores, by Team, by Site  
*Fairfax County Stream Physical Assessment*

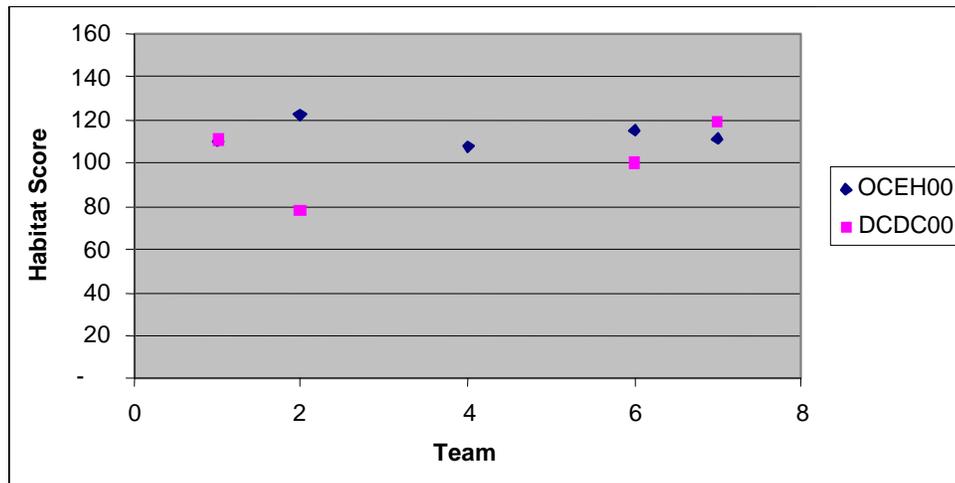


TABLE 2-7  
Channel Evolution Model (CEM) Rating for Elk Horn Run and Dogue Creek by Team  
*Fairfax County Stream Physical Assessment*

TEAM	OCEH001 (Points B to C)	OCEH002 (Points C to D)	DCDC001
	Wetland	Transitional Channel	
1	4.5, sand	DNA	4, sand
2	1, sand	1.5, gravel	3, sand
3	DNA	DNA	3, sand
4	4.5, Sand	DNA	3.5, sand
5	DNA	DNA	3, sand
6	DNA	3.5, gravel	3, sand
7	DNA	2.5, sand	3, sand

DNA = Did not assess.

## 2.4 Field Activities

### 2.4.1 Data Collection

In order to assess the 802 miles of streams in a reasonable timeframe, seven field teams of two to three persons each were organized. The field activities were performed almost continuously from October through mid-February. The teams collected the necessary data

and logged it on field forms and maps. For areas that could not be evaluated due to the following conditions, the teams still collected as much visual information as possible:

- Wetland with no defined channel
- Pond or a lake
- Flow was not present
- No access to the stream reach
- Conditions were too dangerous to walk the stream reach

In many instances when habitat assessments could not be performed, full or partial inventory assessments were still performed. The assessments resulted in 1851 reaches being assessed.

Figure 2-4 shows the stream reaches and their assessment status: habitat and inventory assessment, inventory assessment only, no assessment. Table 2-8 summarizes the miles of streams that were assessed County-wide and Table 2-9 summarizes this information by watershed. Approximately 88 percent of the streams had both habitat and inventory assessments performed. Another 10 percent had inventory assessments done. The remaining 2 percent were not assessed due to reasons mentioned above. Decisions to assess or not to assess a portion of the stream were made in the field based on information available at the sites.

TABLE 2-8  
Summary of Habitat and Inventory Assessments Performed, County-Wide  
*Fairfax County Stream Physical Assessment*

<b>Assessment</b>	<b>No. of Reaches</b>	<b>Total Length (ft)</b>	<b>Total Length (miles)</b>
Habitat and inventory assessment	1,526	3,784,958	716.8
Inventory assessment only—walked	311	436,096	82.6
Inventory assessment only—not walked	13	13,288	2.5
Subtotal—assessed	1,851	4,234,342	801.9
No assessment—walked	38	25,113	9.1
No assessment—not walked	31	47,892	4.8
<b>Total</b>	<b>1,9197</b>	<b>4,307,347</b>	<b>815.8</b>



-  Fairfax County Boundary
- Assessment Status**
-  Habitat and Inventory
-  Habitat Only
-  Inventory Only
-  No Assessment
-  Lakes and Ponds
-  Watersheds

Figure 2-4  
Stream Assessment Status  
Fairfax County Stream Physical Assessment



0                      3                      6                      9 Miles





TABLE 2-9  
Summary of Habitat and Inventory Assessments Performed, by Watershed  
*Fairfax County Stream Physical Assessment*

Watershed	Habitat and Inventory Assessment		Inventory Assessment Only		Total Assessed		Not Assessed*	
	No. of Reaches	Miles	No. of Reaches	Miles	No. of Reaches	Miles	No. of Reaches	Miles
Accotink Creek	147	85.5	36	6.1	183	91.6	3	0.8
Belle Haven	5	1.8	7	1.6	12	3.4	0	0.0
Bull Run	5	4.8	1	0.1	6	4.9	0	0.0
Bull Neck Run	14	13.1	0	0.0	14	13.1	0	0.0
Cameron Run	133	48.7	31	9.2	164	57.9	7	1.6
Cub Run	255	74.9	65	12.9	320	87.7	19	4.5
Dead Run	11	6.0	0	0.0	11	6.0	0	0.0
Difficult Run	267	129.7	52	14.2	319	143.9	10	1.4
Dogue Creek	39	16.6	41	15.5	80	32.0	0	0.0
Four Mile Run	2	0.8	1	1.0	3	1.8	0	0.0
High Point	6	3.0	0	0.0	6	3.0	1	0.2
Horsepen Creek	39	17.5	5	1.2	44	18.7	4	0.7
Johnny Moore Creek	26	11.3	8	2.0	34	13.3	3	0.2
Kane Creek	15	7.3	0	0.0	15	7.3	0	0.0
Little Hunting Creek	23	9.9	5	1.4	28	11.3	1	0.2
Little Rocky Run	22	13.2	9	2.8	31	16.0	2	0.1
Mill Branch	28	14.3	3	1.4	31	15.7	3	1.2
Nichol Run	24	13.7	0	0.0	24	13.7	3	0.4
Occoquan	13	6.0	1	0.5	14	6.6	0	0.0
Old Mill Branch	16	6.0	2	0.3	18	6.3	0	0.0
Pimmit Run	42	18.1	12	3.7	54	21.87	0	0.0
Pohick Creek	151	70.1	26	8.0	177	78.1	6	1.3
Pond Branch	29	17.0	1	0.2	30	17.3	5	0.9
Popes Head Creek	91	49.6	6	0.7	97	50.4	2	0.2
Ryans Dam	4	4.3	0	0.0	4	4.3	0	0.0
Sandy Run	35	20.4	2	0.2	37	20.6	0	0.0

**TABLE 2-9**  
Summary of Habitat and Inventory Assessments Performed, by Watershed  
*Fairfax County Stream Physical Assessment*

Watershed	Habitat and Inventory Assessment		Inventory Assessment Only		Total Assessed		Not Assessed*	
	No. of Reaches	Miles	No. of Reaches	Miles	No. of Reaches	Miles	No. of Reaches	Miles
Scotts Run	15	8.2	0	0.0	15	8.2	0	0.0
Sugarland Run	46	26.6	8	1.9	54	28.5	0	0.0
Turkey Run	5	2.8	0	0.0	5	2.8	0	0.0
Wolf Run	19	16.1	2	0.3	21	16.4	0	0.0
<b>Total</b>	<b>1,527</b>	<b>717.1</b>	<b>324</b>	<b>85.1</b>	<b>1,851</b>	<b>802.3</b>	<b>69</b>	<b>13.9</b>

\*Note: Only includes reaches for which field teams identified the reach end points and identified reasons it could not be assessed, such as reach is piped or not accessible. Does not include stream miles that were not assessed for other reasons, such as having drainage area less than 50 acres.

Appendix D tabulates the reasons that were listed by the field teams for areas where habitat assessments were not conducted. The presence of wetlands and the presence of ponds or lakes each contributed about 20 percent of the stream lengths that were not assessed.

The two other primary reasons for lack of habitat assessments were piped streams and streams channelized in concrete or ditches.

In addition to collecting data on forms and maps, the teams photographed the inventoried facilities per criteria listed on the forms and in the instructions. In instances where conditions were too dangerous or areas could not be accessed photographs may not have been taken. Overall, the teams took over 11,000 photographs.

The inventory assessments yielded approximately 9,536 inventory points. Exhibits 3, 4, 5 and 6 (in map pockets) depict the inventory point locations for the entire County, as follows: Crossings (Exhibit 3), Buffer Deficiency (Exhibit 4), Pipes, Ditches, Dumps, and Utilities (Exhibit 5), and Erosion and Obstructions (Exhibit 6). Table 2-10 summarizes the number of inventory items collected in each category.

**TABLE 2-10**  
Summary of Inventory Points by Category  
*Fairfax County Stream Physical Assessment*

Impact Score	Total
Deficient Buffers	2,566
Crossings	3,039
Ditches and Pipes	2,279
Erosion	550
Head Cut	122
Obstruction	7946
Utility	186

## 2.4.2 Quality Control

In order to ensure consistency between the different teams and quality of data, a number of quality control measures were enacted during the stream assessments. These quality control measures included:

- **Field Team Composition**—each field team was composed of two experienced field staff with a background in biology and/or engineering. During field assessments, habitat conditions and impact scores were compared and discussed to ensure an accurate assessment.
- **Field Team Coordination**—a field coordinator was assigned to manage staff and the field activities. This individual was responsible for field assignments and the review of field forms and maps that were completed by the field teams.
- **Daily Meetings**—each morning the teams met to discuss issues from the previous day and to answer questions from data reviews. The meetings also served as a means to provide updates or changes to the teams. If similar issues were noted in data received from several field teams, this was discussed during the meeting and summarized in writing for distribution.
- **Field Data Review**—the field teams turned in completed field forms, photo logs, and maps on a daily basis. This allowed for review of the data to verify that items entered on the field forms were entered correctly and had corresponding entries on the planimetric maps and photo logs.

These quality control processes performed during the field activities provided more consistent data for database entry and digitization into a Geographic Information System (GIS).<sup>5</sup> Separate quality control measures were undertaken for the data entry into the data management system, as follows.

### 2.4.2.1 Database

The data collected on the field forms were entered by a database entry clerk into the database. In order to ensure that the data was entered correctly these quality control measures were enacted:

- **Training**—The database entry clerk was briefed on the significance of each data field and the parameters that were expected for each field and was asked to flag any inconsistencies in the data to be entered.
- **Data check**—A comprehensive check on the data entered was performed by a second person.
- **GIS link**—The database was linked to the GIS to match information; mismatched information from the database and GIS was further investigated and resolved.

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<sup>5</sup>User and system documentation for the Stream Assessment Data Management Tool is provided separately (CH2M HILL, 2003).

### 2.4.2.2 GIS

The data collected by the field team on the field maps was digitized. Quality control of the digitization was accomplished through similar procedures as those for the database entry as follows:

- Training— The GIS technician was briefed on the map coding parameters.
- Check— Each digitized map was checked by a second person to ensure that all marked features were entered correctly.
- GIS link— The digitized points were linked to the database to identify and resolve inconsistencies.

# Summary of Stream Assessment Data

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This section summarizes the results of the stream assessment County-wide and by watershed. The data summaries provide a baseline for future data analysis to allow improved understanding of stream and watershed conditions. These summaries establish the framework for future assessments and development of targeted watershed management activities.

The data presented in this section include an initial countywide summary followed by watershed-specific summaries for stream habitat, infrastructure inventory, and CEM geomorphic condition.

## 3.1 County-Wide Summary

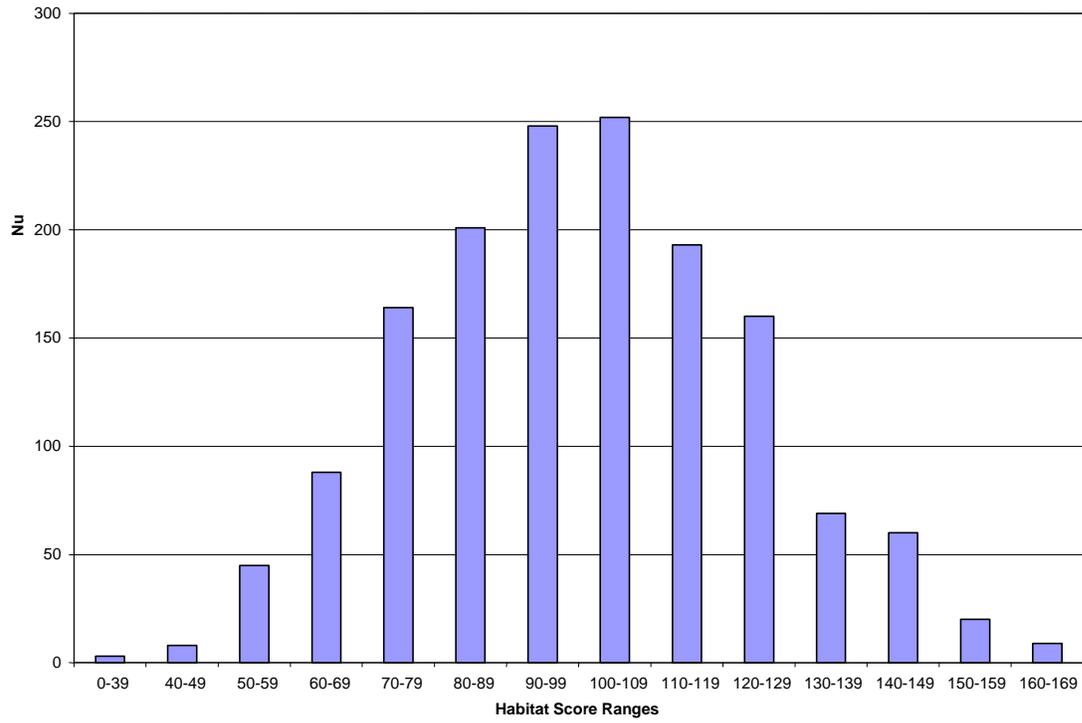
### 3.1.1 Habitat Assessment

The habitat assessment protocol used in this study assigned high scores to streams that have habitats with the greatest probability of supporting a diverse assemblage of aquatic species (i.e., diverse habitats). Low scores were assigned to areas that are degraded and have less-diverse habitats.

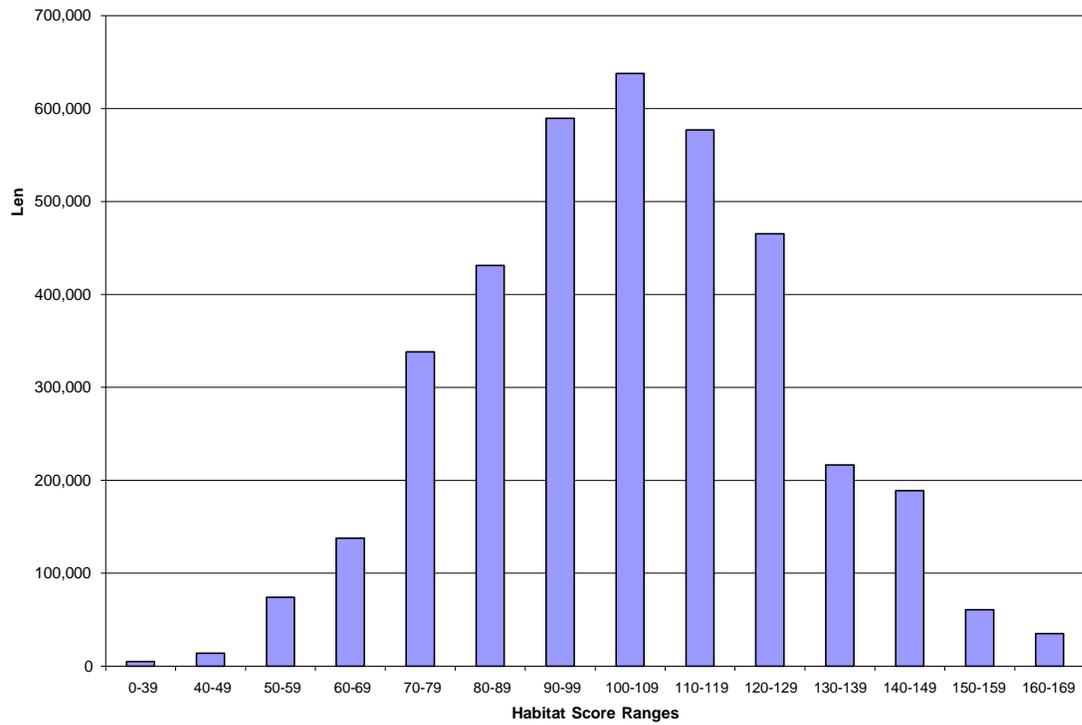
Habitat assessments were performed in combination with inventory assessments for 1,526 stream reaches totaling 716.8 miles. (See Section 2 for an explanation of why habitat scores were not assigned to some reaches.)

The habitat assessments yielded scores from 32 to 168, out of a maximum possible score of 200. The mean value of all the scores was 100, while the reach-length-weighted mean was 104. Figure 3-1 shows the distribution of the habitat scores based on score ranges for the reaches. Figure 3-2 shows the distribution of habitat scores based on stream lengths. The data indicate that the habitat and biotic integrity of many of the streams in Fairfax County have been somewhat degraded. There are a few stream reaches in very good condition and several in very poor condition.

**FIGURE 3-1**  
Distribution of Stream Habitat Scores by Number of Reaches



**FIGURE 3-2**  
Distribution of Stream Habitat Scores by Stream Length



In order to allow qualitative interpretations of the habitat assessment results, stream reaches were classified into one of five categories on the basis of total habitat score: excellent, good, fair, poor, and very poor. Three options were considered for categorizing the total habitat score into these categories. Equal partitioning of the data was considered (1) over the theoretical range of 0 to 200, (2) on the basis of USEPA-recommended ranges, and (3) over the range of observed scores. Following discussions with County staff, it was agreed that for consistency with the approach used in the SPS baseline, the third option would be used. The resulting rating category names and score ranges are

- Excellent (142–168)
- Good (114–141)
- Fair (87–113)
- Poor (59–86)
- Very Poor (32–58)

### 3.1.1.1 Habitat Definitions

The following definitions of the habitat condition rating categories provide narrative descriptions of the field conditions expected to be observed when a site is scored within the range of scores in each rating category. The definitions are based on the USEPA RBP (Barbour et al., 1999) guidelines but also account for the numerical range of observed scores (32–168) used in this study and the addition of a fifth condition category.

**Excellent.** A minimally impaired aquatic system with a relatively high potential for supporting a diverse biological community. The watershed is generally undeveloped, there are few water quality issues, and the channels are undisturbed and uninterrupted. Instream habitat is generally undisturbed.

Those streams whose habitat includes greater than 70 percent favorable instream cover (50 percent in slower gradient streams) for benthos and fish with little to no effects from sediments and anthropogenic alterations, stable banks with less than 10 percent bank failure covered by more than 90 percent with native vegetation, and a riparian zone width of greater than 18 m with no negative impacts by encroachment. (Range: 142–168.)

**Good.** Habitat integrity is slightly degraded with a moderate potential for supporting a diverse biological community. The watershed may include low-density development. Channels are moderately disturbed due to road crossings and natural obstructions. Primary habitat for fish and benthos is moderately degraded due to siltation and embeddedness.

Those streams whose habitat includes 55–70 percent favorable instream cover (45–50 percent in slower gradient streams) for benthos and fish with only minor effects from sediments and anthropogenic alterations, moderately stable banks with only 10–30 percent evident bank failure covered 70–90 percent by native vegetation, and a riparian zone width of 14–18 m with some minimal encroachment. (Range: 114–141.)

**Fair.** Habitat integrity is moderately degraded with a fair potential for supporting a diverse biological community. The watershed may include low- to high-density development, with noticeable channel disturbance due to encroachment and other factors. Primary habitat for fish and benthos is significantly degraded due to bank erosion, siltation, and embeddedness.

Those streams whose habitat includes 35–55 percent instream cover (25–45 percent in slower gradient streams) for benthos and fish with noticeable effects from sediments and anthropogenic alterations, moderately stable banks with 30–40 percent evident bank failure covered 50–70 percent by native vegetation, and a riparian zone width of 10–14 m with apparent encroachment. (Range: 87–113.)

**Poor.** Habitat integrity is significantly degraded with a low potential for supporting a diverse biological community. The watershed may include a range of low- to high-density development. Much of the natural forested vegetation in the watershed was replaced with alternative land uses. Channels are highly disturbed, and primary habitat for fish and benthos is highly degraded due to some bank erosion, siltation, and embeddedness.

Those streams whose habitat includes only moderate 20–35 percent instream cover (10–25 percent in slower gradient streams) for benthos and fish with significant effects from sediments and anthropogenic alterations, moderately unstable banks with 40–60 percent evident bank failure covered by only 30–50 percent by native vegetation, and a riparian zone width of 6–10 m with significant encroachment. (Range: 59–86.)

**Very Poor.** Habitat integrity is severely degraded with little potential for supporting a diverse biological community. The watershed includes extensive development and the riparian zone is severely altered. Channels are substantially disturbed. The hydrology is severely altered and flows are erosive. Primary habitat for fish and benthos is severely degraded due to extensive bank erosion, siltation, and embeddedness.

Those streams whose habitat includes significantly impacted less than 20 percent instream cover (less than 10 percent in low gradient streams) for benthos and fish with major effects from sediments and anthropogenic alterations, severely unstable banks with 60–100 percent evident bank failure covered by less than 30 percent with native vegetation, and a riparian zone width of less than 6 m with encroachment causing a substantial loss of riparian vegetation. (Range: 32–58.)

### 3.1.1.2 Habitat Results

Table 3-1 summarizes the lengths of stream reaches falling in each of the five rating categories. Exhibit 1 (in map pocket) depicts the habitat rating for each reach.

**TABLE 3-1**  
Stream Length in Each Habitat Rating  
*Fairfax County Stream Physical Assessment*

Category	Score Range	Length of Stream (ft)	% of Total Stream Length
Excellent	142–168	201,628	5%
Good	114–141	1,037,462	25%
Fair	87–113	1,715,080	45%
Poor	59–86	742,973	20%
Very Poor	32–58	78,882	2%

**TABLE 3-2**  
Length-Weighted Total Habitat Scores and Total Habitat Category by Watershed  
*Fairfax County Stream Physical Assessment*

Watershed	Length-Weighted Total Habitat Score	Total Habitat Category
Accotink Creek	100	Fair
Belle Haven	71	Poor
Bull Neck Run	128	Good
Bull Run	108	Fair
Cameron Run	92	Fair
Cub Run	110	Fair
Dead Run	103	Fair
Difficult Run	108	Fair
Dogue Creek	96	Fair
Four Mile Run	96	Fair
High Point	124	Good
Horsepen Creek	100	Fair
Johnny Moore Creek	104	Fair
Kane Creek	128	Good
Little Hunting Creek	82	Poor
Little Rocky Run	102	Fair
Mill Branch	106	Fair
Nichol Run	127	Good
Occoquan	117	Good
Old Mill Branch	99	Fair
Pimmit Run	112	Fair
Pohick Creek	95	Fair
Pond Branch	99	Fair
Popes Head Creek	103	Fair
Ryans Dam	145	Excellent

**TABLE 3-2**  
Length-Weighted Total Habitat Scores and Total Habitat Category by Watershed  
*Fairfax County Stream Physical Assessment*

<b>Watershed</b>	<b>Length-Weighted Total Habitat Score</b>	<b>Total Habitat Category</b>
Sandy Run	104	Fair
Scotts Run	108	Fair
Sugarland Run	111	Fair
Turkey Run	124	Good
Wolf Run	99	Fair
County-wide	104	Fair

In addition, a length-weighted average total habitat score was calculated for each watershed and the corresponding total habitat rating was determined (see Table 3-2).

### 3.1.2 Channel Evolution Model

Table 3-3 summarizes the length of stream reach in each of the five CEM stages, countywide. Exhibit 2 (in map pocket) depicts the CEM stage for each stream reach. The large majority of streams are in CEM stage 3, indicating active evolution to a new geomorphic equilibrium and generally unstable channel morphology. These results are discussed in more detail for each watershed below.

### 3.1.3 Infrastructure Inventory

Table 3-4 summarizes the number of inventory points countywide by impact score. Exhibits 3, 4, 5 and 6 (in map pocket) depict the inventory point locations for the entire County, as follows: Crossings (Exhibit 3), Buffer Deficiency (Exhibit 4), Pipes, Ditches, Dumps, and Utilities (Exhibit 5), and Erosion and Obstructions (Exhibit 6).

## 3.2 Watershed Summaries

The watershed summaries are arranged into 12 groups, to be consistent with the groupings presented in the Stream Protection Strategy Report (Fairfax County, 2001). The original groups were created based on characteristics of area, geography and, in most cases, physiographic province and proximity of watersheds to each other. Text and tables are provided in each section, summarizing the results from individual watersheds. A single set of maps is provided at the end of each section, depicting assessment results for all of the watersheds summarized within that section. Watersheds included within each section are listed below:

Watershed Group	Watershed(s)
Sugarland Run	Sugarland Run, Horsepen Creek
Upper Potomac	Nichol Run, Pond Branch
Difficult Run	Difficult Run
Middle Potomac	Bull Neck Run, Scotts Run, Dead Run, Turkey Run, Pimmit Run
Cameron Run	Cameron Run, Four Mile Run
Lower Potomac	Dogue Creek, Little Hunting Creek, Belle Haven
Accotink Creek	Accotink Creek
Pohick Creek	Pohick Creek
Upper Bull Run	Cub Run, Bull Run
Lower Bull Run	Little Rocky Run, Johnny Moore Creek, Popes Head Creek
Upper Occoquan	Old Mill Branch, Wolf Run, Sandy Run, Ryans Dam, Occoquan
Lower Occoquan	Mill Branch, Kane Creek, High Point

**TABLE 3-3**  
Channel Evolution Model Stage, County-Wide  
Fairfax County Stream Physical Assessment

Watershed	Evolution Stage										Total of Reach Length
	1		2		3		4		5		
	Length (ft)	%	Length (ft)	%	Length (ft)	%	Length (ft)	%	Length (ft)	%	
Accotink Creek	0%	16,057	4%	407,162	91%	23,916	5%	0	0%	447,135	
Belle Haven	0%	0	0%	8,477	100%	0	0%	0	0%	8,477	
Bull Neck Run	0%	0	0%	37,408	54%	31,599	46%	0	0%	69,007	
Bull Run	0%	8,923	35%	16,399	65%	0	0%	0	0%	25,323	
Cameron Run	0%	13,273	6%	180,167	75%	45,548	19%	0	0%	238,988	
Cub Run	0%	32,274	8%	224,790	59%	118,313	31%	8,165	2%	383,541	
Dead Run	0%	0	0%	31,618	100%	0	0%	0	0%	31,618	
Difficult Run	0%	77,984	12%	487,764	73%	101,820	15%	4,973	1%	672,542	
Dogue Creek	0%	13,335	15%	44,528	49%	32,215	36%	0	0%	90,078	
Four Mile Run	0%	0	0%	1,654	41%	2,422	59%	0	0%	4,076	
High Point	0%	15,856	100%	0	0%	0	0%	0	0%	15,856	
Horsepen Creek	0%	6,163	7%	77,322	93%	0	0%	0	0%	83,485	
Johnny Moore Creek	0%	0	0%	60,371	97%	1,720	3%	0	0%	62,092	
Kane Creek	0%	24,118	64%	13,861	36%	0	0%	0	0%	37,979	
Little Hunting Creek	0%	12,042	23%	22,037	42%	18,174	35%	0	0%	52,253	
Little Rocky Run	0%	24,219	34%	34,826	49%	11,586	16%	0	0%	70,631	
Mill Branch	0%	16,798	23%	55,675	77%	0	0%	0	0%	72,473	
Nichol Run	0%	1,918	3%	64,682	91%	4,467	6%	0	0%	71,067	
Occoquan	0%	1,679	6%	21,806	78%	4,368	16%	0	0%	27,853	
Old Mill Branch	0%	0	0%	22,874	72%	8,755	28%	0	0%	31,629	
Pimmit Run	0%	0	0%	92,439	97%	2,917	3%	0	0%	95,356	

**TABLE 3-3**  
Channel Evolution Model Stage, County-Wide  
*Fairfax County Stream Physical Assessment*

Watershed	Evolution Stage										Total of Reach Length
	1		2		3		4		5		
	Length (ft)	%	Length (ft)	%	Length (ft)	%	Length (ft)	%	Length (ft)	%	
Pohick Creek		0%	16,965	5%	264,729	74%	76,533	21%	0	0%	358,226
Pond Branch		0%	0	0%	89,885	100%	0	0%	0	0%	89,885
Popes Head Creek		0%	18,297	7%	159,781	61%	82,003	32%	0	0%	260,081
Ryans Dam		0%	9,326	41%	13,164	59%	0	0%	0	0%	22,490
Sandy Run		0%	0	0%	66,114	65%	35,102	35%	0	0%	101,217
Scotts Run		0%	3,389	8%	38,775	89%	1,379	3%	0	0%	43,543
Sugarland Run		0%	0	0%	82,412	60%	54,492	40%	0	0%	136,904
Turkey Run		0%	0	0%	14,777	100%	0	0%	0	0%	14,777
Wolf Run		0%	1,665	2%	83,324	98%	0	0%	0	0%	84,989
<b>Total</b>		<b>0%</b>	<b>314,282</b>	<b>8%</b>	<b>2,718,822</b>	<b>73%</b>	<b>657,330</b>	<b>18%</b>	<b>13,138</b>	<b>0.4%</b>	<b>3,703,572</b>

**TABLE 3-4**  
Inventory Impact Scores, County-Wide  
*Fairfax County Stream Physical Assessment*

Inventory Type	Impact Score												Total
	0	1	2	3	4	5	6	7	8	9	10	>10	
Deficient Buffers	3	22	271	434	510	689	190	312	73	20	42		2566
Crossings	946	821	669	291	150	90	31	27	9	2	3		3039
Ditches and Pipes	1187	329	265	191	93	123	21	23	21	8	18		2279
Erosion		1	6	22	43	143	95	155	50	13	22		550
Head Cut			4	21	38	19	4	1	1	2	32		122
Obstruction	58	27	82	208	114	114	38	45	44	23	41		794
Utility	19	8	11	46	26	21	22	14	2	2	10	5	186
<b>Total</b>	<b>2213</b>	<b>1208</b>	<b>1308</b>	<b>1213</b>	<b>974</b>	<b>1199</b>	<b>401</b>	<b>577</b>	<b>200</b>	<b>70</b>	<b>168</b>	<b>5</b>	<b>9536</b>

N/A = Not applicable, impact score range was 0 to 10

## 3.2.1 Sugarland Run Group Summary

### 3.2.1.1 Sugarland Run Watershed

**Description.** Sugarland Run Watershed is a medium sized watershed, with approximately 26 miles of stream assessed. It is located along the northwestern boundary of the County. The County contains most of the headwaters of the stream. Sugarland Run continues through Loudoun County before it discharges into the Potomac River.

**Habitat.** The habitat assessment results for Sugarland Run Watershed are summarized by stream in Table 3-5. Habitat scores for each reach are depicted in Figure 3-3. Based on a length weighted habitat score of 111 (Table 3-2), Sugarland Run Watershed is in the upper middle range of quality, compared to the rest of the County. Approximately 4.2 miles of stream were categorized as having “poor” habitat conditions, 7.6 miles as “fair,” and 13.9 miles as “good.”

**CEM.** On the basis of the CEM evaluations approximately 60 percent of the channels in Sugarland Run Watershed are in Evolutionary Stage 3 (Table 3-3) and the remainder are in Stage 4. Figure 3-4 summarizes the CEM results.

**Infrastructure.** The infrastructure inventory resulted in 281 inventory points. The most significant problems were related to two deficient buffers, two head cuts, a crossing, a pipe, and an erosional area, which were given an impact scores of 10. The infrastructure inventory results are summarized in Table 3-6. Figures 3-5, 3-6, 3-7, 3-8, and 3-9 summarize impact scores for the erosion problems; deficient buffers; pipes/ditches; crossings; and dumps, obstructions, and utilities, respectively.

### 3.2.1.2 Horsepen Creek Watershed

**Description.** Horsepen Creek Watershed is a medium-sized watershed, with approximately 17 miles of stream assessed. It is located along the middle of the northwestern boundary of the County. The lower portion of the watershed is located in Loudoun County, before the Creek discharges into Broad Run and eventually into the Potomac River.

**Habitat.** The habitat assessment results for Horsepen Creek Watershed are summarized by stream in Table 3-7. Habitat scores for each reach are depicted in Figure 3-3. Based on a length weighted habitat score of 100 (Table 3-2), Horsepen Creek Watershed is in the lower middle range of quality, compared to the rest of the County. Approximately 1.1 mile of stream was categorized as having “very poor” habitat conditions, 3.5 miles as “poor,” 6.1 miles as “fair,” 6.1 miles as “good,” and 0.3 miles as “excellent.”

**CEM.** Based on the CEM evaluations, nearly all of the channels assessed in Horsepen Creek Watershed are in Evolutionary Stage 3 (Table 3-3), with all of the remainder in Stage 2. Figure 3-4 summarizes the CEM results.

**Infrastructure.** The infrastructure inventory resulted in 322 inventory points. The most significant problems were related to two head cuts, which were given impact scores of 9 and 10. The infrastructure inventory results are summarized in Table 3-8. Figures 3-5, 3-6, 3-7, 3-8, and 3-9 summarize impact scores for the erosion problems; deficient buffers; pipes/ditches; crossings; and dumps, obstructions, and utilities, respectively.

**TABLE 3-5**  
Habitat Assessment Summary for Sugarland Run Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Folly Lick Branch	0 (0.00)	3,996 (18.56)	8,770 (40.72)	8,771 (40.72)	0 (0.00)	21,537
Hughes Branch	0 (0.00)	0 (0.00)	1,257 (100.00)	0 (0.00)	0 (0.00)	1,257
Muddy Branch	0 (0.00)	0 (0.00)	0 (0.00)	2,034 (100.00)	0 (0.00)	2,034
Offuts Branch	0 (0.00)	0 (0.00)	3,437 (33.59)	6,796 (66.41)	0 (0.00)	10,233
Rosiers Branch	0 (0.00)	0 (0.00)	413 (4.67)	8,439 (95.33)	0 (0.00)	8,853
Sugarland Run	0 (0.00)	17,928 (23.67)	24,069 (31.78)	33,747 (44.55)	0 (0.00)	75,744
Sugarland Run Tributary	0 (0.00)	0 (0.00)	2,434 (14.95)	13,850 (85.05)	0 (0.00)	16,283
<b>Watershed Total</b>	0 (0.00)	21,925 (16.13)	40,380 (29.70)	73,637 (54.17)	0 (0.00)	135,942

**TABLE 3-6**  
Infrastructure Assessment Summary for Sugarland Run Watershed  
*Fairfax County Stream Physical Assessment*

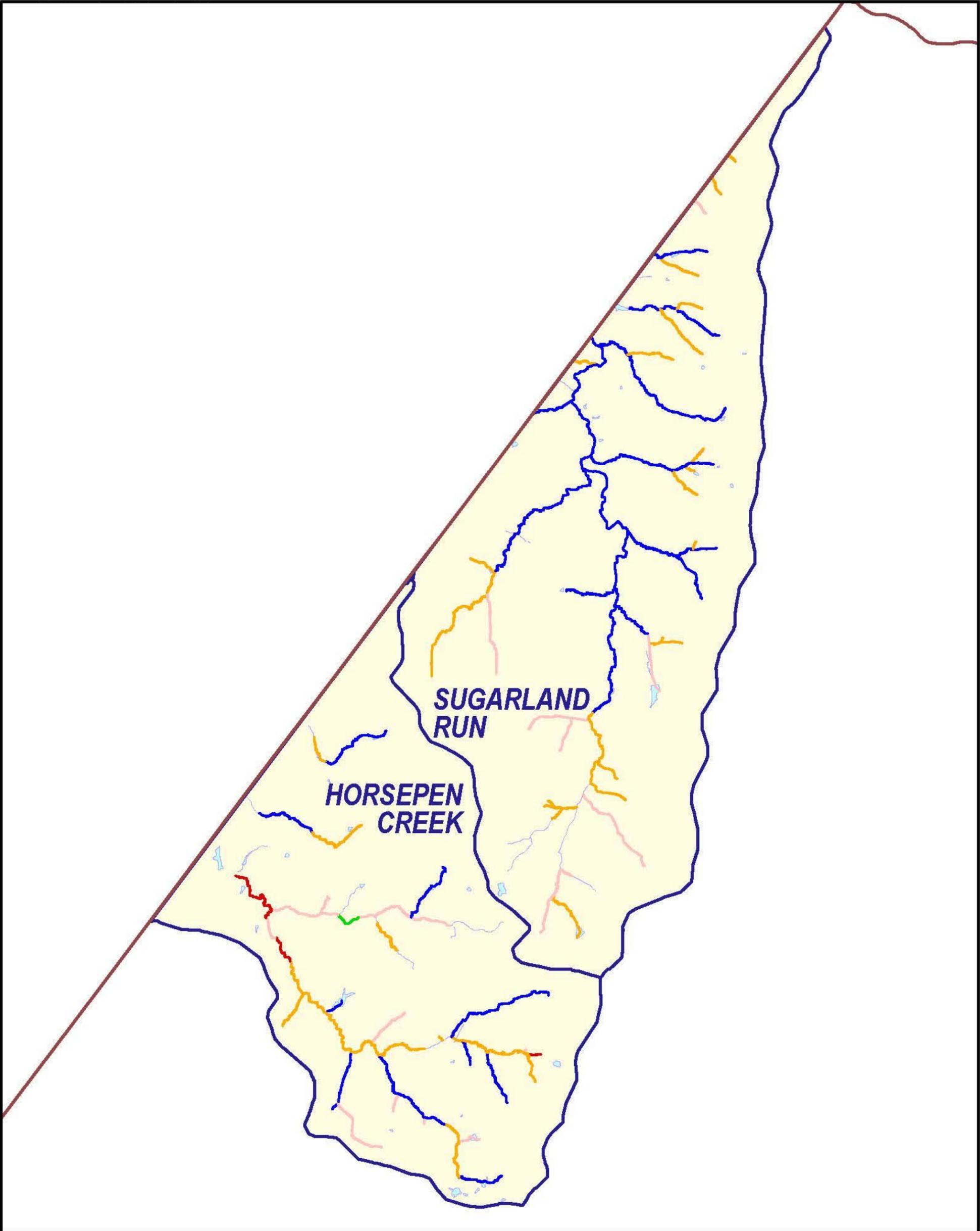
Impact Score	0	1	2	3	4	5	6	7	8	9	10	> 10	Total
Buffers	0	0	8	15	14	23	1	8	1	1	2	N/A	73
Crossings	0	88	34	11	3	4	0	0	0	0	1	N/A	141
Ditches and Pipes	1	30	7	2	0	2	0	0	0	0	1	N/A	43
Erosion	0	0	0	0	1	3	0	1	0	0	1	N/A	6
Head Cut	0	0	0	0	0	0	0	0	0	0	2	N/A	2
Obstruction	1	0	4	6	1	1	0	0	0	0	0	N/A	13
Utility	0	0	0	3	0	0	0	0	0	0	0	0	3
<b>Total</b>	<b>2</b>	<b>118</b>	<b>53</b>	<b>37</b>	<b>19</b>	<b>33</b>	<b>1</b>	<b>9</b>	<b>1</b>	<b>1</b>	<b>7</b>	<b>0</b>	<b>281</b>

**TABLE 3-7**  
Habitat Assessment Summary for Horsepen Creek Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Cedar Run	0 (0.00)	2,317 (17.17)	3,513 (26.04)	7,662 (56.79)	0 (0.00)	13,493
Frying Pan Branch	0 (0.00)	9,321 (57.87)	2,057 (12.77)	3,334 (20.70)	1,395 (8.66)	16,108
Horsepen Creek	0 (0.00)	0 (0.00)	3,442 (100.00)	0 (0.00)	0 (0.00)	3,442
Horsepen Run	6,028 (14.30)	4,703 (11.16)	18,514 (43.93)	12,901 (30.61)	0 (0.00)	42,146
Merrybrook Run	0 (0.00)	0 (0.00)	3,413 (51.90)	3,163 (48.10)	0 (0.00)	6,575
Tributary To Horsepen Run	0 (0.00)	2,289 (30.53)	0 (0.00)	5,210 (69.47)	0 (0.00)	7,499
<b>Watershed Total</b>	<b>6,028 (6.75)</b>	<b>18,631 (20.87)</b>	<b>30,938 (34.66)</b>	<b>32,270 (36.15)</b>	<b>1,395 (1.56)</b>	<b>89,262</b>

**TABLE 3-8**  
Infrastructure Assessment Summary for Horsepen Creek Watershed  
*Fairfax County Stream Physical Assessment*

Impact Score	0	1	2	3	4	5	6	7	8	9	10	> 10	Total
Buffers	0	0	26	12	4	34	3	16	1	0	0	N/A	96
Crossings	31	11	14	3	0	4	2	1	0	0	0	N/A	66
Ditches and Pipes	31	6	16	6	6	9	0	2	1	0	0	N/A	77
Erosion	0	0	0	0	2	6	4	2	0	0	0	N/A	14
Head Cut	0	0	0	5	6	1	0	0	0	1	1	N/A	14
Obstruction	1	0	9	21	4	7	1	3	3	0	0	N/A	49
Utility	0	3	1	0	0	2	0	0	0	0	0	0	6
<b>Total</b>	<b>63</b>	<b>20</b>	<b>66</b>	<b>47</b>	<b>22</b>	<b>63</b>	<b>10</b>	<b>24</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>322</b>



-  Fairfax County Boundary
- Habitat Rating**
-  Excellent
-  Good
-  Fair
-  Poor
-  Very Poor
-  No Habitat Assessment
-  Lakes and Ponds
-  Watersheds

**WATERSHED GROUP:  
SUGARLAND RUN**

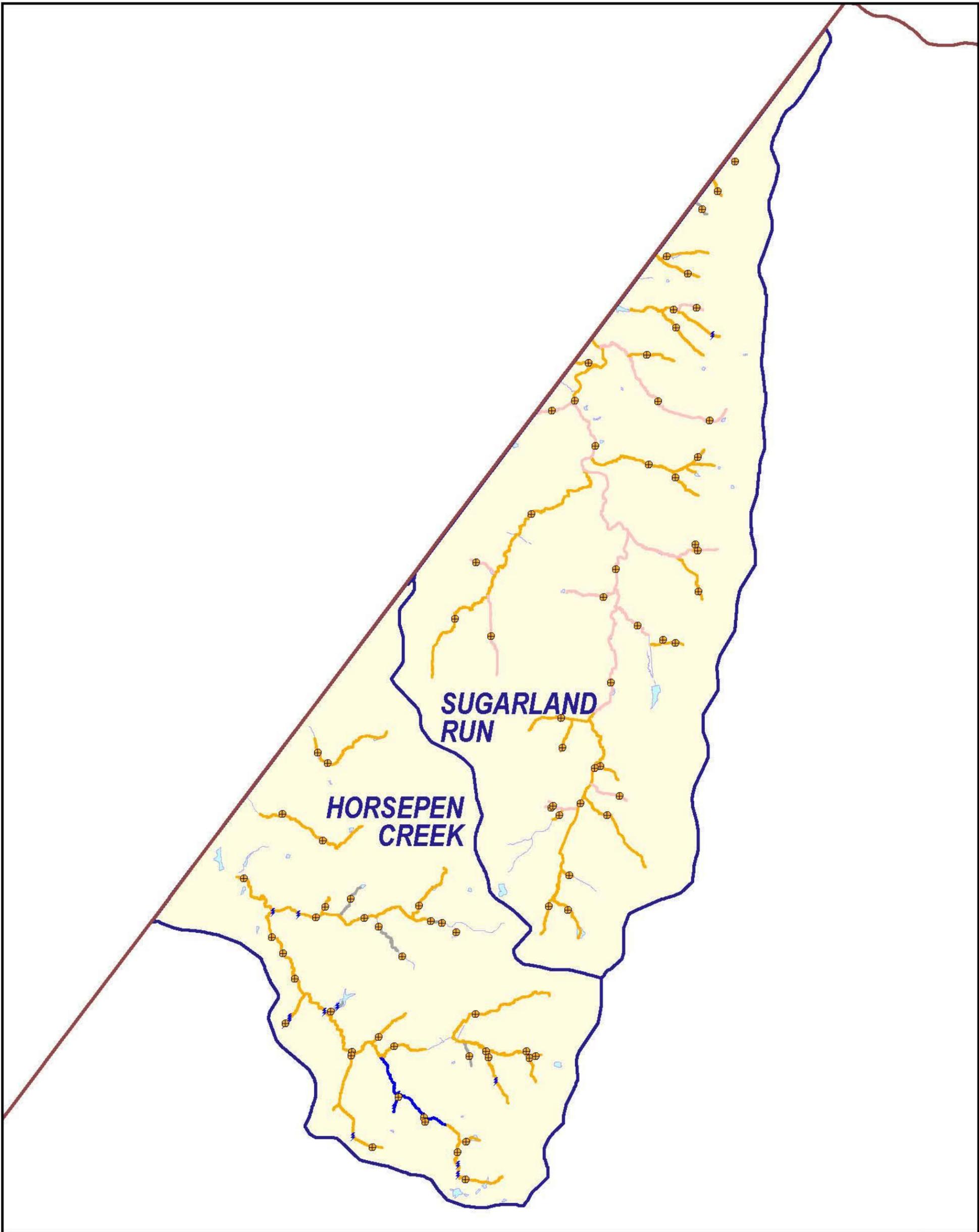


**Figure 3-3**  
**Habitat Assessment**  
**Sugarland Run Group**  
**Fairfax County Stream Physical Assessment**



0 3000 6000 9000 12000 Feet





Inventory Types

- Cross Section
- Head Cut

CEM Stage

- Not Assigned
- 1
- 2
- 3
- 4
- 5

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

WATERSHED GROUP:  
SUGARLAND RUN

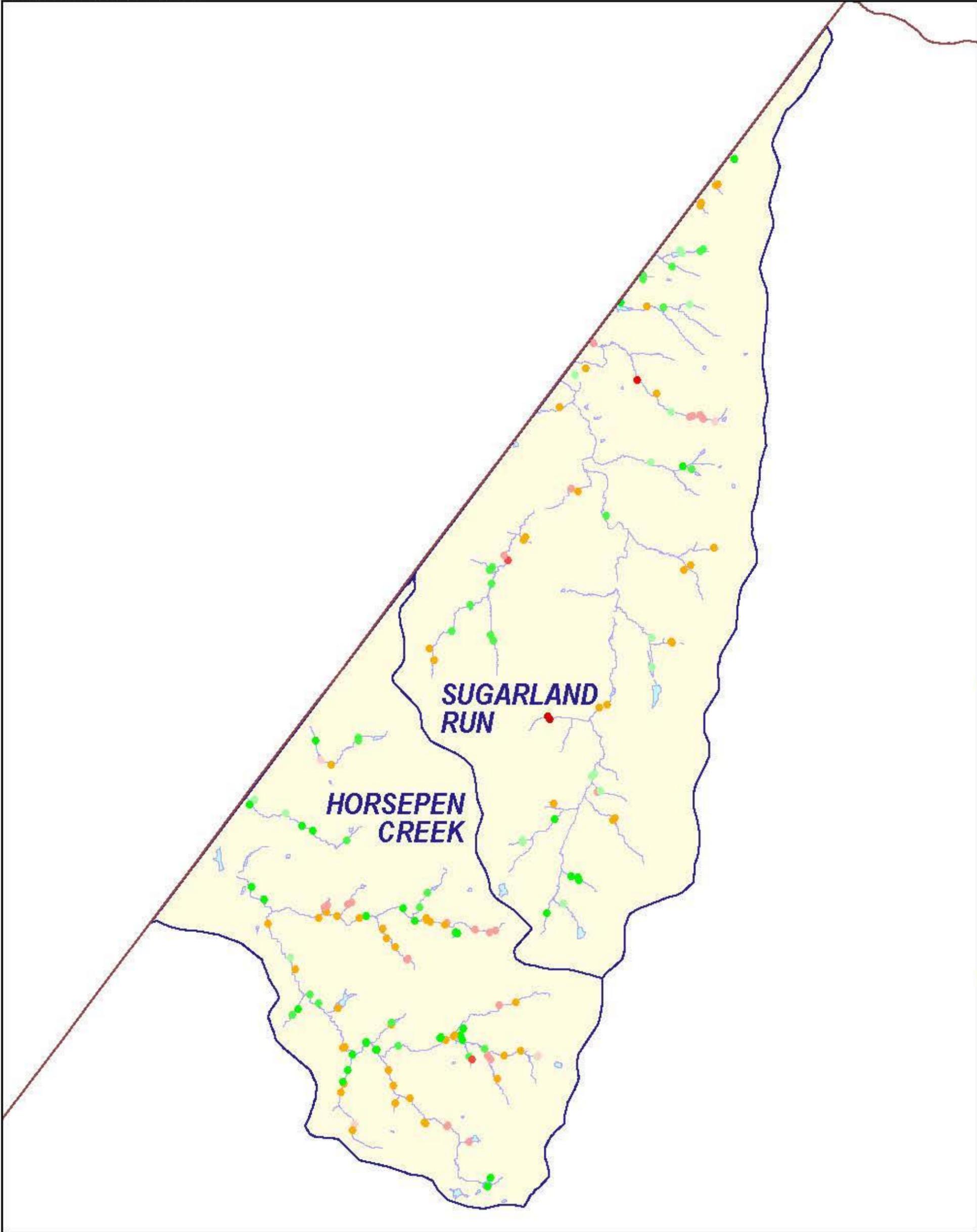


0 3000 6000 9000 12000 Feet

**Figure 3-4**  
**CEM Stages**  
**Sugarland Run Group**  
**Fairfax County Stream Physical Assessment**







Deficient Buffer by Impact Score

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

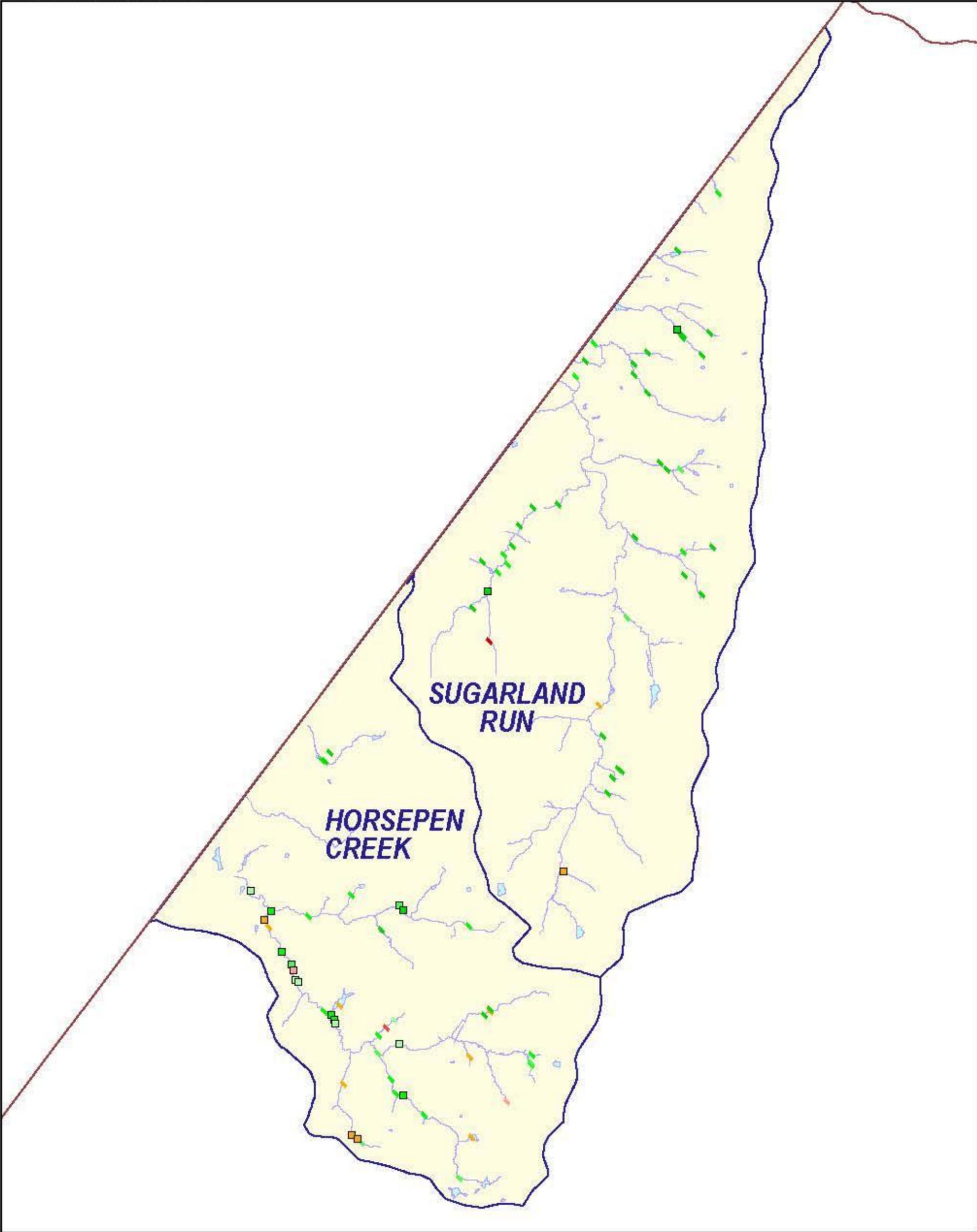
WATERSHED GROUP:  
SUGARLAND RUN



0 3000 6000 9000 12000 Feet

**Figure 3-6**  
**Deficient Buffer Impacts**  
**Sugarland Run Group**  
**Fairfax County Stream Physical Assessment**





Pipe / Ditch by Impact Score

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

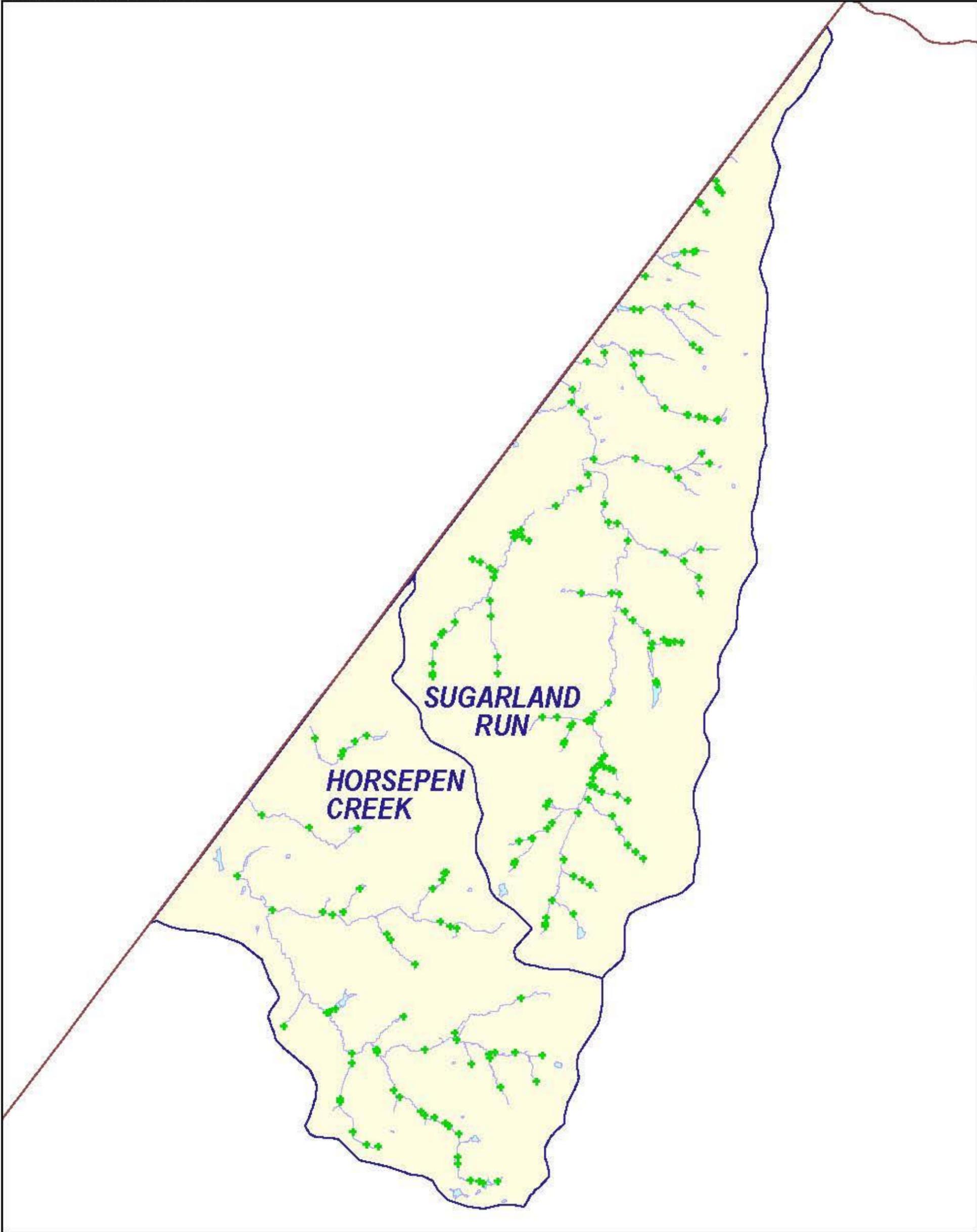
WATERSHED GROUP:  
SUGARLAND RUN



0 3000 6000 9000 12000 Feet

**Figure 3-7**  
**Pipe and Ditch Impacts**  
**Sugarland Run Group**  
**Fairfax County Stream Physical Assessment**

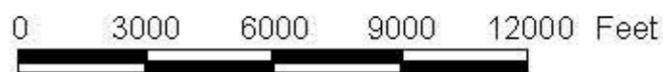




**Inventory Type**

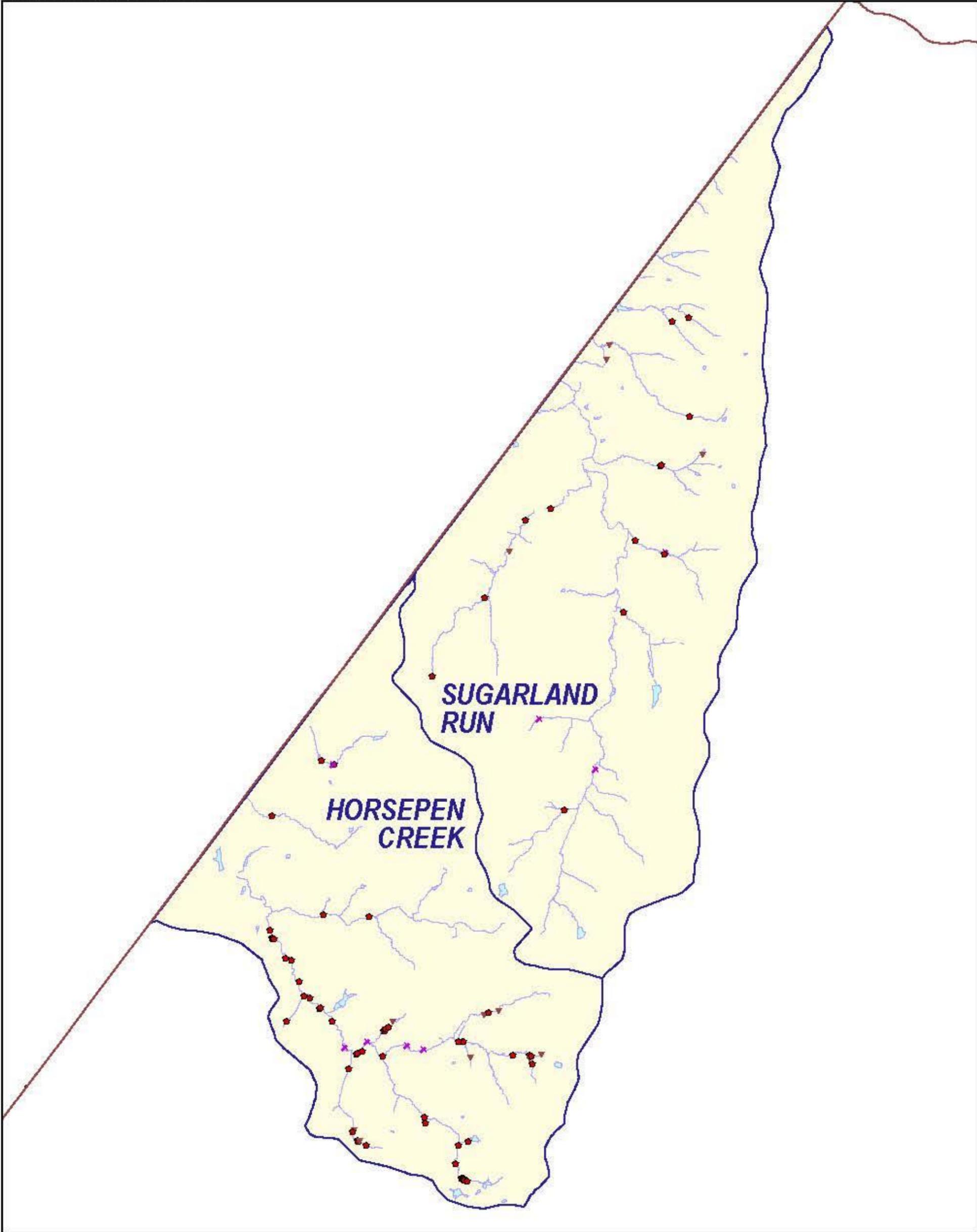
- + Crossing
- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

**WATERSHED GROUP:  
SUGARLAND RUN**



**Figure 3-8  
Crossings  
Sugarland Run Group  
Fairfax County Stream Physical Assessment**





**Inventory Types**

- ▼ Dump
- ◆ Obstruction
- ✕ Utility

- ▭ Fairfax County Boundary
- ▭ Lakes and Ponds
- ▭ Streams
- ▭ Watersheds

**WATERSHED GROUP:  
SUGARLAND RUN**



0 3000 6000 9000 12000 Feet

**Figure 3-9  
Dumps, Obstructions, and Utilities  
Sugarland Run Group  
Fairfax County Stream Physical Assessment**



## 3.2.2 Upper Potomac Group Summary

### 3.2.2.1 Nichol Run Watershed

**Description.** Nichol Run Watershed is a medium-sized watershed, with just under 14 miles of stream assessed. It is located in the very northern end of the County. The watershed is contained entirely within the county boundaries, and drains directly to the Potomac River.

**Habitat.** The habitat assessment results for Nichol Run Watershed are summarized by stream in Table 3-9. Habitat scores for each reach are depicted in Figure 3-10. Based on a length-weighted habitat score of 127 (Table 3-2), Nichol Run Watershed is one of the highest-quality watersheds in the County. Approximately 1 mile of stream was categorized as having “poor” habitat conditions, 1 mile as “fair,” and 8 miles as “good,” and 3 miles as “excellent.”

**CEM.** Based on the CEM evaluations, 91 percent of the channels in Nichol Run Watershed are in Evolutionary Stage 3 (Table 3-3). Figure 3-11 summarizes the CEM results for Nichol Run Watershed.

**Infrastructure.** The infrastructure inventory resulted in 113 inventory points. The most significant problems were related to two head cuts and one obstruction which were each given an impact score of 10. The infrastructure inventory results are summarized in Table 3-10. Figures 3-12, 3-13, 3-14, 3-15, and 3-16 summarize impact scores for the erosion problems; deficient buffers; pipes/ditches; crossings; and dumps, obstructions, and utilities, respectively.

### 3.2.2.2 Pond Branch Watershed

**Description.** Pond Branch Watershed is a medium sized watershed, with approximately 17 miles of stream assessed. It consists of several small stream networks that drain directly to the Potomac at the northern end of the County.

**Habitat.** The habitat assessment results for Pond Branch Watershed are summarized by stream in Table 3-11. Habitat scores for each reach are depicted in Figure 3-10. Based on a length weighted habitat score of 99 (Table 3-2), Pond Branch Watershed is in the lower middle range of quality, compared to the rest of the County. Approximately 1 mile of stream was categorized as having “very poor” habitat conditions, 4 miles were categorized as “poor,” 8 miles as “fair,” and 4 miles as “good.” No miles were “excellent.”

**CEM.** On the basis of the CEM evaluations all of the channels in Pond Branch Watershed are in Evolutionary Stage 3 (Table 3-3). Figure 3-11 summarizes the CEM results for Pond Branch Watershed.

**Infrastructure.** The infrastructure inventory resulted in 143 inventory points. The most significant problems were related to a head cut that was given an impact score of 10 and a deficient buffer and obstruction, which were given impact scores of 9. The infrastructure inventory results are summarized in Table 3-12. Figures 3-12, 3-13, 3-14, 3-15, and 3-16 summarize impact scores for the erosion problems; deficient buffers; pipes/ditches; crossings; and dumps, obstructions, and utilities, respectively.

**TABLE 3-9**  
Habitat Assessment Summary for Nichol Run Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Harkney Branch	0 (0.00)	0 (0.00)	0 (0.00)	5,316 (100.00)	0 (0.00)	5,316
Jefferson Branch	0 (0.00)	0 (0.00)	0 (0.00)	13,077 (58.70)	9,199 (41.30)	22,275
Nichols Run	0 (0.00)	0 (0.00)	0 (0.00)	18,381 (69.31)	8,139 (30.69)	26,520
Tributary to Jefferson Branch	0 (0.00)	0 (0.00)	1,648 (100.00)	0 (0.00)	0 (0.00)	1,648
Tributary to Nichols Run	0 (0.00)	6,683 (40.14)	5,567 (33.43)	4,401 (26.43)	0 (0.00)	16,652
<b>Watershed Total</b>	<b>0 (0.00)</b>	<b>6,683 (9.23)</b>	<b>7,215 (9.96)</b>	<b>41,175 (56.86)</b>	<b>17,338 (23.94)</b>	<b>72,412</b>

**TABLE 3-10**  
Infrastructure Assessment Summary for Nichol Run Watershed  
*Fairfax County Stream Physical Assessment*

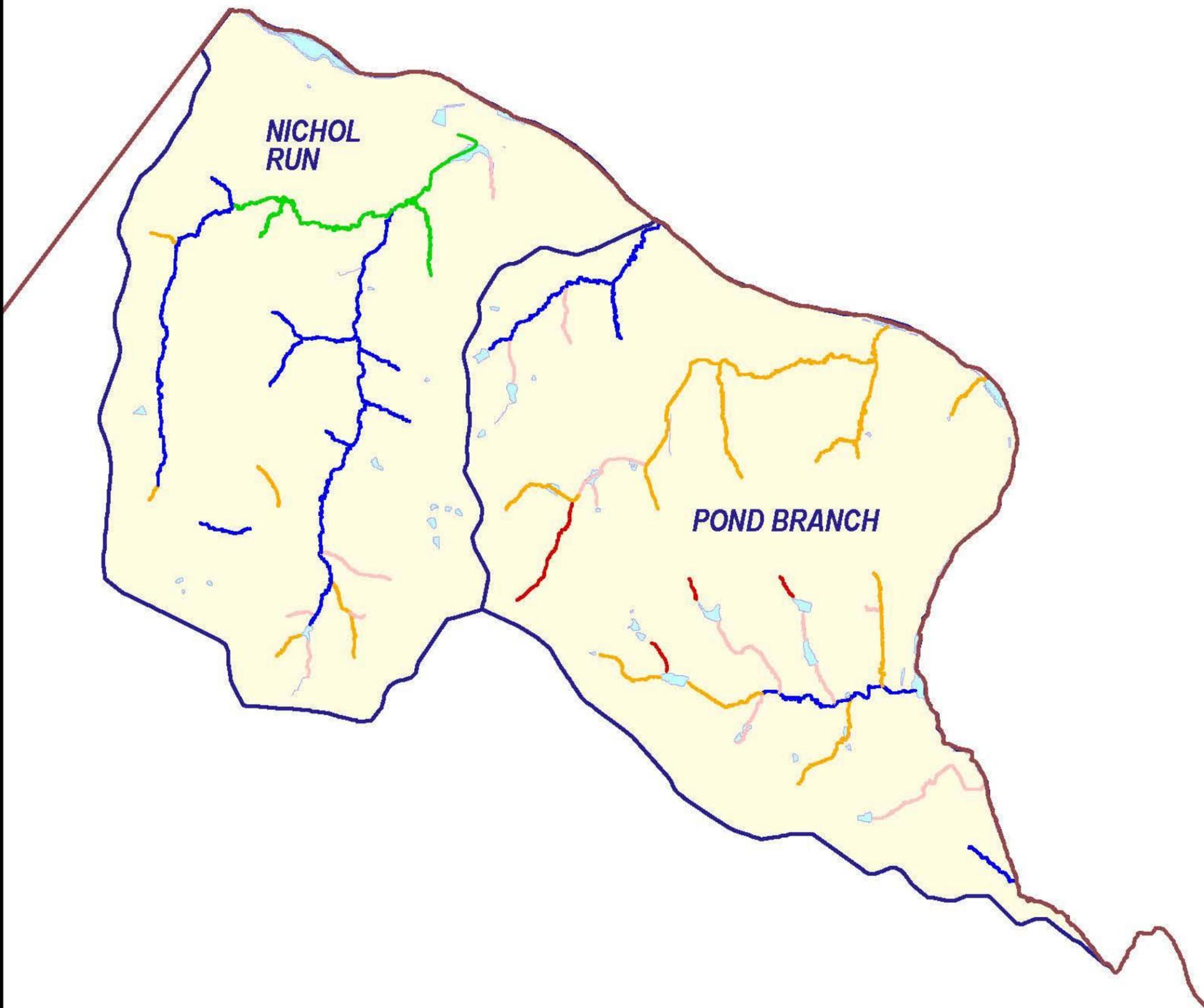
Impact Score	0	1	2	3	4	5	6	7	8	9	10	>10	Total
Deficient Buffers	0	0	8	2	1	19	0	7	0	0	0	N/A	37
Crossings	16	5	15	0	0	4	1	1	0	0	0	N/A	42
Ditches and Pipes	4	0	3	0	0	1	0	0	0	0	0	N/A	8
Erosion	0	0	0	0	0	1	1	3	0	0	0	N/A	5
Head Cut	0	0	0	0	0	2	0	0	0	0	2	N/A	4
Obstruction	1	0	3	7	1	2	0	0	1	0	1	N/A	16
Utility	0	0	1	0	0	0	0	0	0	0	0	0	1
<b>Total</b>	<b>21</b>	<b>5</b>	<b>30</b>	<b>9</b>	<b>2</b>	<b>29</b>	<b>2</b>	<b>11</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>113</b>

**TABLE 3-11**  
Habitat Assessment Summary for Pond Branch Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Clarks Branch	3,918 (12.05)	3,308 (10.18)	25,286 (77.77)	0 (0.00)	0 (0.00)	32,513
Mine Run Branch	1,829 (7.65)	8,925 (37.35)	6,529 (27.33)	6,612 (27.67)	0 (0.00)	23,895
Tributary to Clarks Branch	0 (0.00)	0 (0.00)	1,722 (100.00)	0 (0.00)	0 (0.00)	1,722
Tributary to Mine Branch	766 (10.37)	0 (0.00)	6,621 (89.63)	0 (0.00)	0 (0.00)	7,387
Tributary to Pond Branch	0 (0.00)	3,528 (22.96)	0 (0.00)	11,839 (77.04)	0 (0.00)	15,368
Tributary to Potomac River	0 (0.00)	4,962 (55.12)	1,979 (21.99)	2,060 (22.89)	0 (0.00)	9,001
<b>Watershed Total</b>	<b>6,513 (7.25)</b>	<b>20,724 (23.06)</b>	<b>42,138 (46.88)</b>	<b>20,511 (22.82)</b>	<b>0 (0.00)</b>	<b>89,885</b>

**TABLE 3-12**  
Infrastructure Assessment Summary for Pond Branch Watershed  
*Fairfax County Stream Physical Assessment*

Impact Score	0	1	2	3	4	5	6	7	8	9	10	>10	Total
Deficient Buffers	0	0	2	18	11	10	1	5	0	1	0	N/A	48
Crossings	67	1	0	4	0	0	2	2	0	0	0	N/A	76
Ditches and Pipes	8	0	0	0	0	1	0	0	0	0	0	N/A	9
Erosion	0	0	0	0	0	1	1	0	0	0	0	N/A	2
Head Cut	0	0	0	0	0	1	0	0	0	0	1	N/A	2
Obstruction	0	0	2	2	0	0	0	0	0	1	0	N/A	5
Utility	0	0	0	0	1	0	0	0	0	0	0	0	1
<b>Total</b>	<b>75</b>	<b>1</b>	<b>4</b>	<b>24</b>	<b>12</b>	<b>13</b>	<b>4</b>	<b>7</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>143</b>



-  Fairfax County Boundary
- Habitat Rating**
-  Excellent
-  Good
-  Fair
-  Poor
-  Very Poor
-  No Habitat Assessment
-  Lakes and Ponds
-  Watersheds

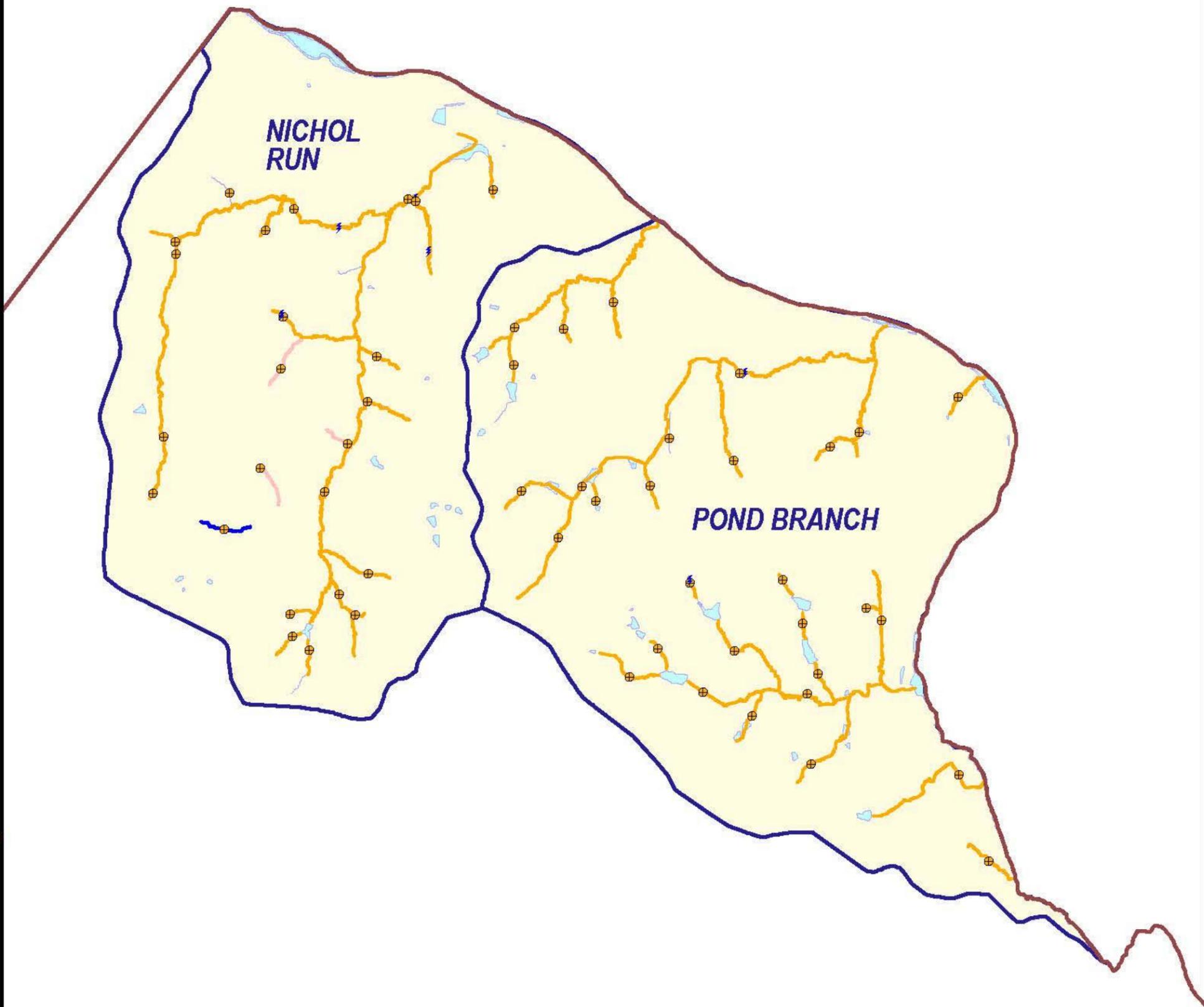
**WATERSHED GROUP:  
UPPER POTOMAC**



0 2000 4000 6000 8000 Feet

**Figure 3-10**  
**Habitat Assessment**  
**Upper Potomac Group**  
**Fairfax County Stream Physical Assessment**





Inventory Types

⊕ Cross Section

⚡ Head Cut

CEM Stage

⚡ Not Assigned

1

2

3

4

5

▭ Fairfax County Boundary

▭ Lakes and Ponds

▭ Streams

▭ Watersheds

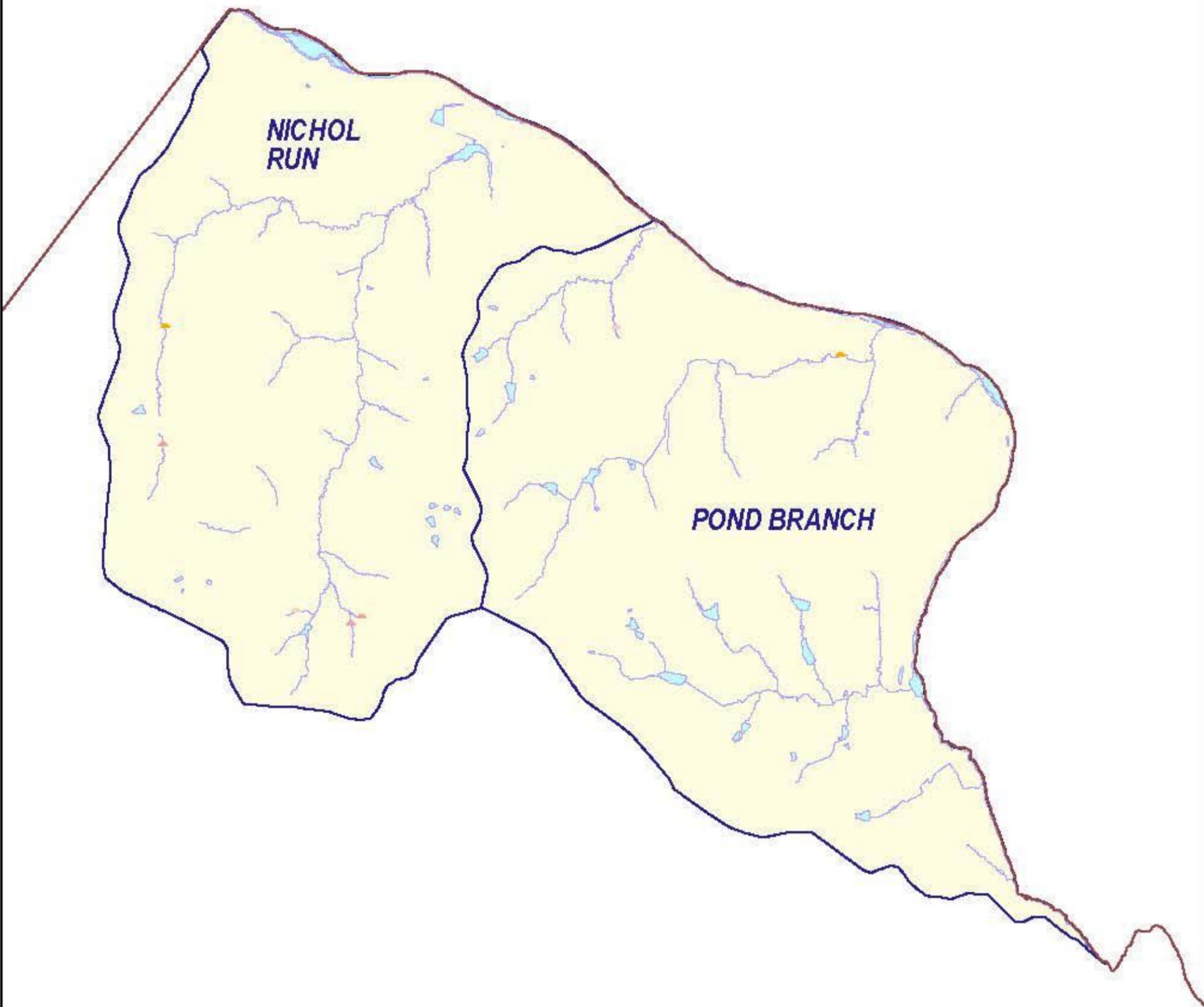
WATERSHED GROUP:  
UPPER POTOMAC



0 2000 4000 6000 8000 Feet

Figure 3-11  
CEM Stages  
Upper Potomac Group  
Fairfax County Stream Physical Assessment





Erosion by Impact Score

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

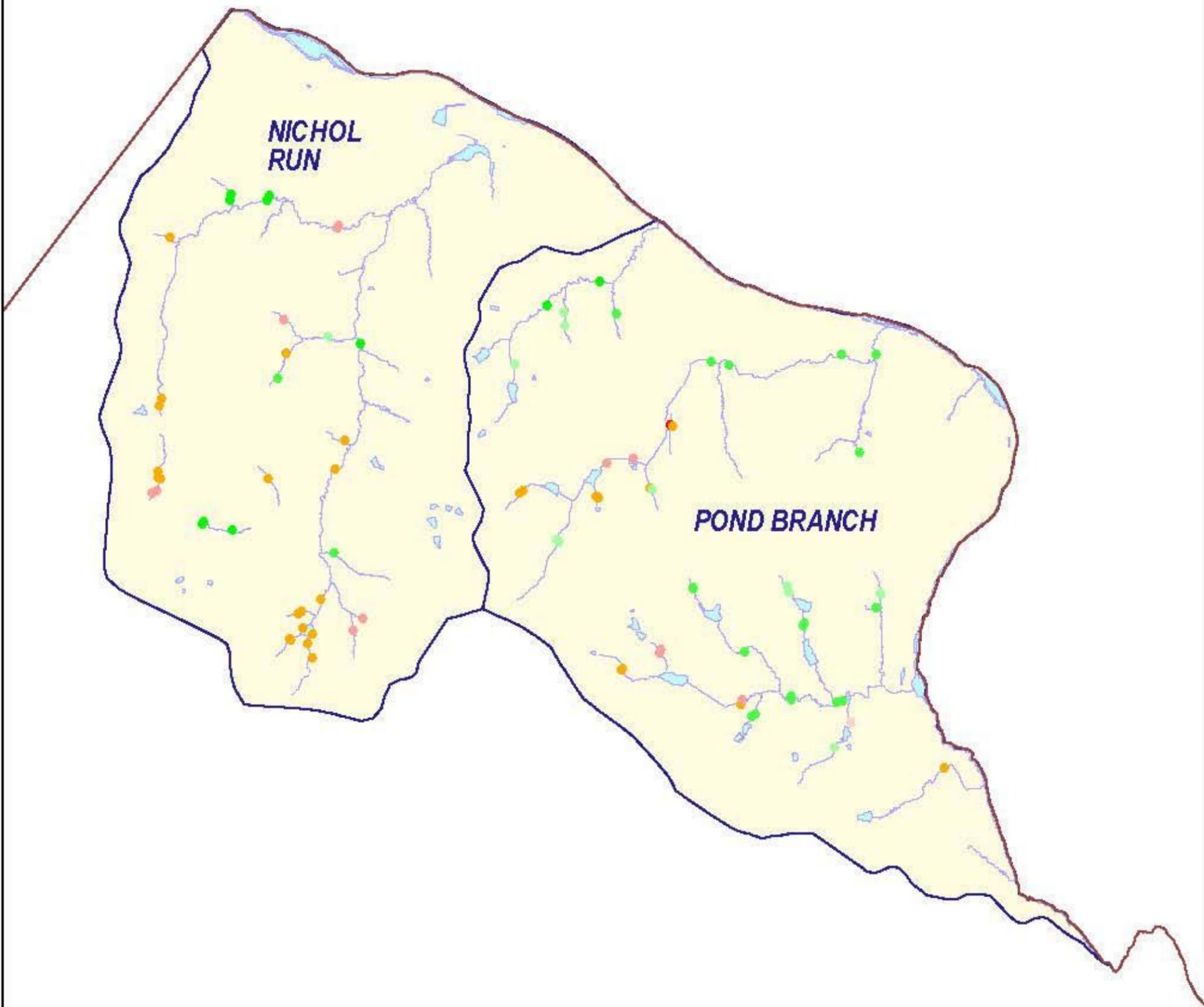
WATERSHED GROUP:  
UPPER POTOMAC



0 2000 4000 6000 8000 Feet

**Figure 3-12**  
**Erosion Impacts**  
**Upper Potomac Group**  
**Fairfax County Stream Physical Assessment**





Deficient Buffer by Impact Score

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- ▭ Fairfax County Boundary
- ▭ Lakes and Ponds
- ▭ Streams
- ▭ Watersheds

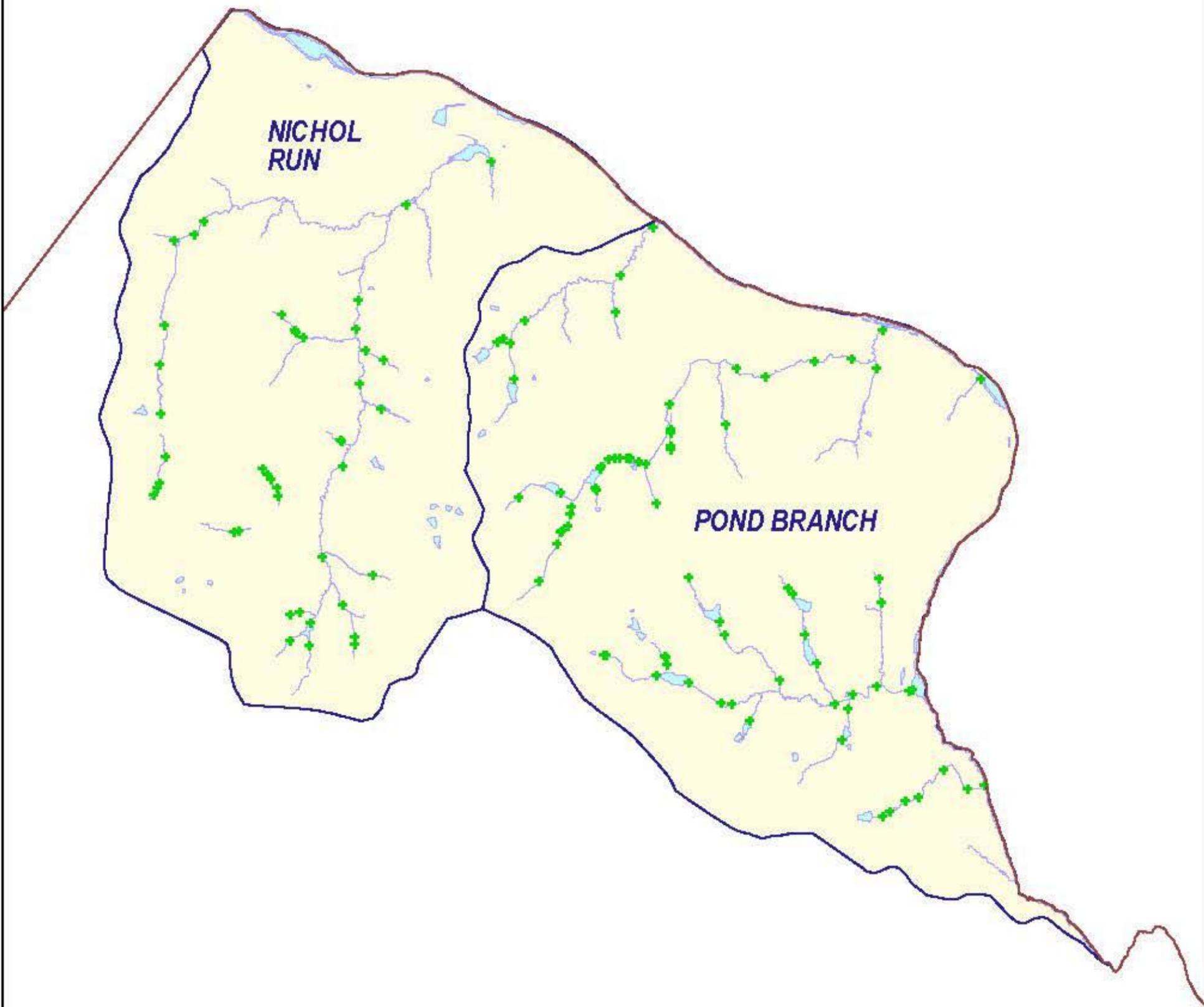
WATERSHED GROUP:  
UPPER POTOMAC



0 2000 4000 6000 8000 Feet

**Figure 3-13**  
**Deficient Buffer Impacts**  
**Upper Potomac Group**  
**Fairfax County Stream Physical Assessment**





**Inventory Type**

-  Crossing
-  Fairfax County Boundary
-  Lakes and Ponds
-  Streams
-  Watersheds

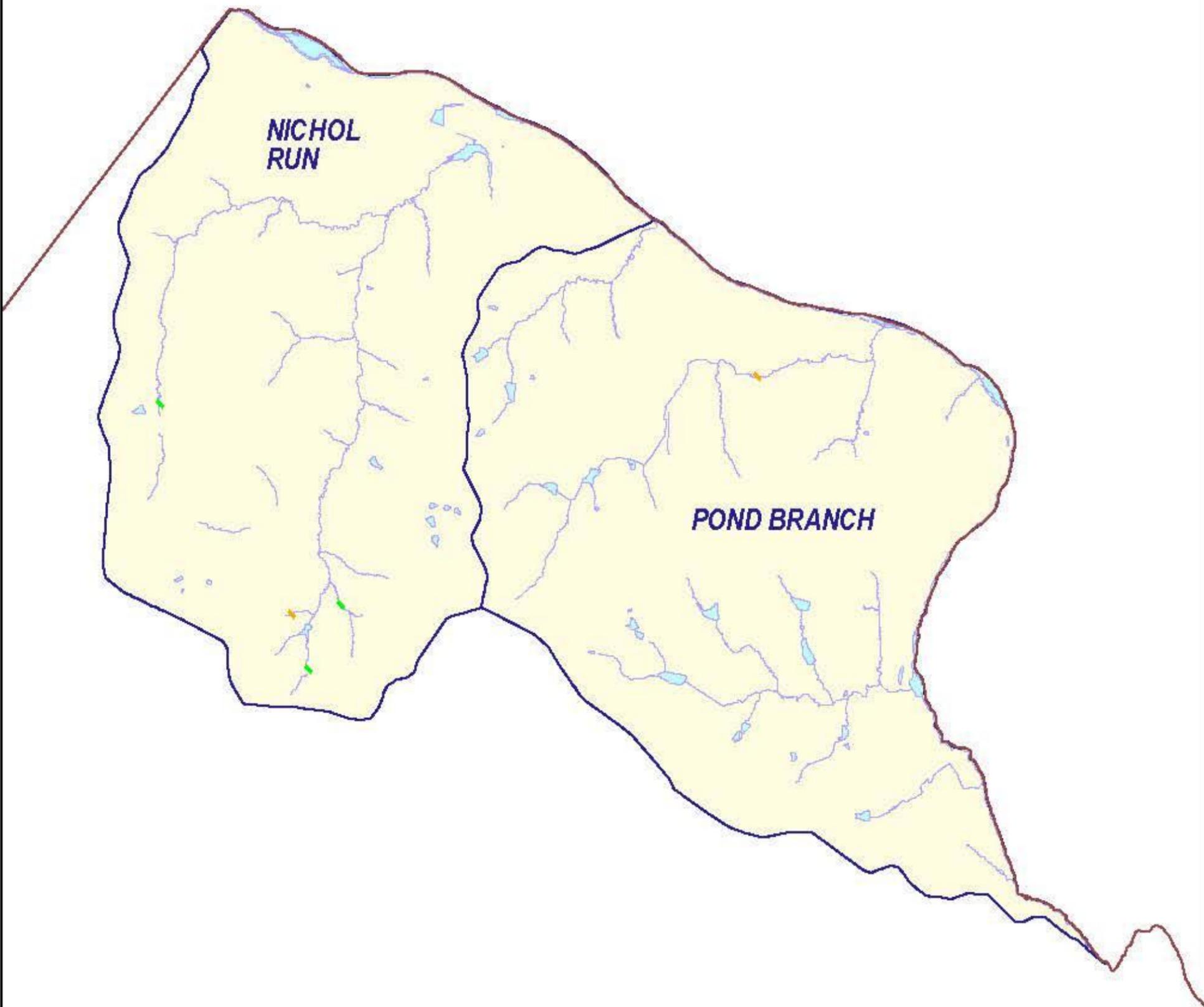
**WATERSHED GROUP:  
UPPER POTOMAC**



0 2000 4000 6000 8000 Feet

**Figure 3-14**  
**Crossings**  
**Upper Potomac Group**  
**Fairfax County Stream Physical Assessment**





Pipe / Ditch by Impact Score

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

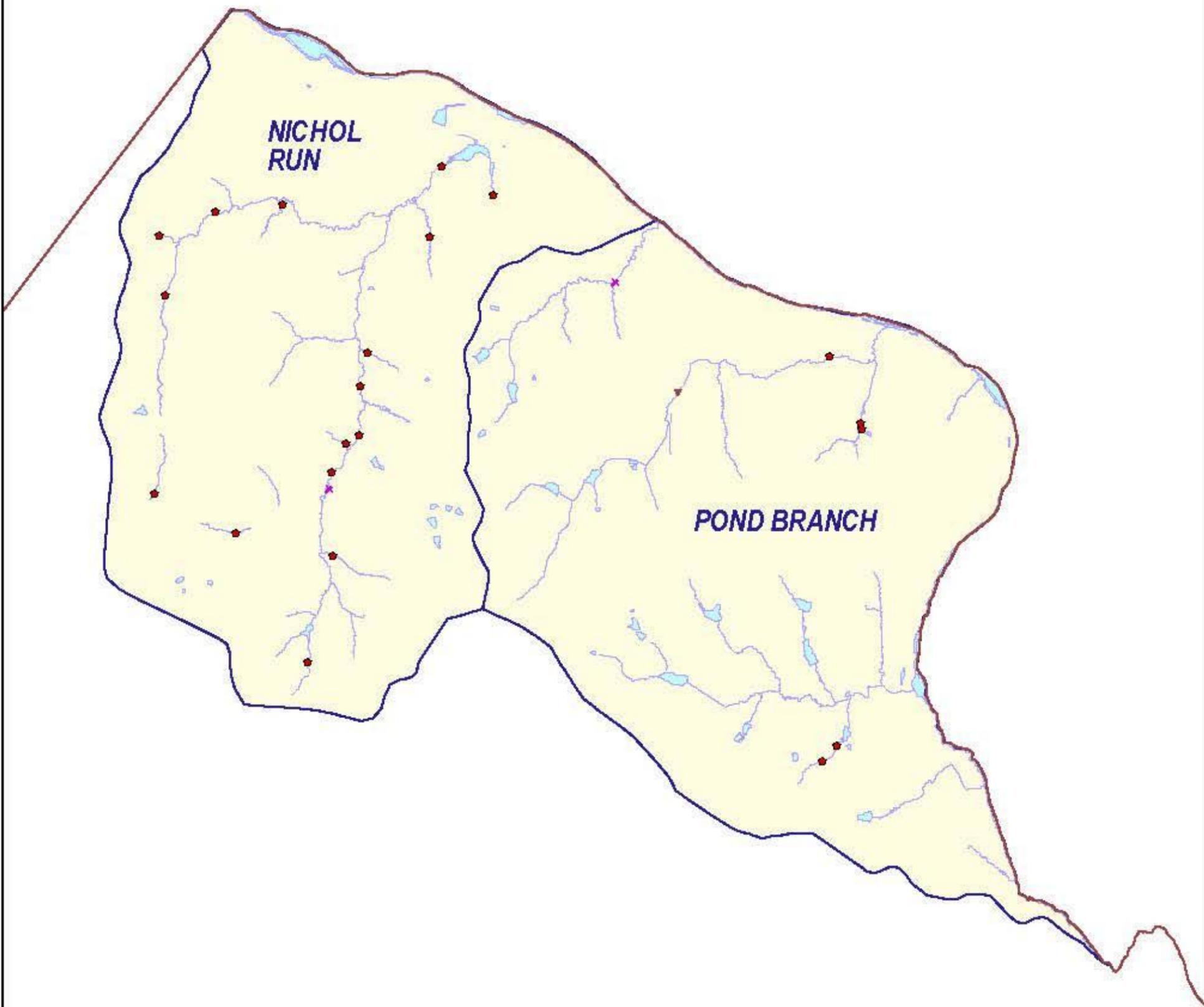
WATERSHED GROUP:  
UPPER POTOMAC



0 2000 4000 6000 8000 Feet

**Figure 3-15**  
**Pipe and Ditch Impacts**  
**Upper Potomac Group**  
**Fairfax County Stream Physical Assessment**





**Inventory Types**

- ▼ Dump
- ◆ Obstruction
- ✕ Utility

- ▭ Fairfax County Boundary
- ▭ Lakes and Ponds
- ▭ Streams
- ▭ Watersheds

**WATERSHED GROUP:  
UPPER POTOMAC**



0 2000 4000 6000 8000 Feet

**Figure 3-16**  
**Dumps, Obstructions, and Utilities**  
**Upper Potomac Group**  
**Fairfax County Stream Physical Assessment**



### 3.2.3 Difficult Run Summary

#### 3.2.3.1 Difficult Run Watershed

**Description.** Difficult Run Watershed is the largest watershed in Fairfax County, with just over 131 miles of stream assessed. It encompasses most of the northern portion of the County. The watershed is contained entirely within the county boundaries, and drains directly to the Potomac River.

**Habitat.** The habitat assessment results for Difficult Run Watershed are summarized by stream in Table 3-13. Habitat scores for each reach are depicted in Figure 3-17. Based on a length-weighted habitat score of 108 (Table 3-2), Difficult Run Watershed is in the middle to upper range of quality, compared to the rest of the County. Less than 1 mile of stream was categorized as having “very poor” habitat conditions; approximately 14 miles were categorized as “poor,” 64 miles as “fair,” 42 miles as “good,” and 9 miles as “excellent.”

**CEM.** On the basis of the CEM evaluations, approximately 73 percent of Difficult Run Watershed is in Evolutionary Stage 3 (Table 3-3). Figure 3-18 summarizes the CEM results for Difficult Run Watershed.

**Infrastructure.** The infrastructure inventory resulted in 1814 inventory points. The most significant problems were related to three exposed utility lines that were given an impact score over 10 and many obstructions, and erosion points which were each given an impact score of 10. The infrastructure inventory results are summarized in Table 3-14. Figures 3-19, 3-20, 3-21, 3-22, and 3-23 summarize impact scores for the erosion problems; deficient buffers; pipes/ditches; crossings; and dumps, obstructions, and utilities, respectively.

**TABLE 3-13**  
Habitat Assessment Summary for Difficult Run Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Angelico Branch	0 (0.00)	0 (0.00)	10,672 (100.00)	0 (0.00)	0 (0.00)	10,672
Bridge Branch	0 (0.00)	0 (0.00)	0 (0.00)	1,524 (100.00)	0 (0.00)	1,524
Captain Hickory Run	0 (0.00)	5,118 (24.54)	13,298 (63.75)	977 (4.68)	1,468 (7.04)	20,861
Colvin Run	0 (0.00)	1,412 (2.86)	28,799 (58.36)	18,062 (36.60)	1,075 (2.18)	49,348
Difficult Run	0 (0.00)	23,261 (14.26)	110,245 (67.58)	29,629 (18.16)	0 (0.00)	163,134
Dog Run	0 (0.00)	0 (0.00)	7,339 (100.00)	0 (0.00)	0 (0.00)	7,339
Little Difficult Run	0 (0.00)	0 (0.00)	19,225 (35.91)	30,580 (57.12)	3,732 (6.97)	53,536

**TABLE 3-13**  
Habitat Assessment Summary for Difficult Run Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Moonac Creek	0 (0.00)	0 (0.00)	2,977 (100.00)	0 (0.00)	0 (0.00)	2,977
Old Courthouse Spring Branch	0 (0.00)	0 (0.00)	0 (0.00)	10,750 (80.46)	2,611 (19.54)	13,361
Piney Branch	0 (0.00)	0 (0.00)	7,294 (20.29)	27,124 (75.44)	1,536 (4.27)	35,953
Piney Run	0 (0.00)	10,098 (24.22)	25,508 (61.19)	6,083 (14.59)	0 (0.00)	41,689
Rocky Branch	0 (0.00)	6,997 (15.34)	32,034 (70.24)	6,574 (14.42)	0 (0.00)	45,606
Rocky Run	0 (0.00)	2,962 (9.56)	6,525 (21.06)	14,373 (46.38)	7,127 (23.00)	30,987
Sharpers Run	0 (0.00)	0 (0.00)	0 (0.00)	8,224 (100.00)	0 (0.00)	8,224
Snakeden Branch	2,090 (6.03)	3,681 (10.63)	16,550 (47.78)	12,313 (35.55)	0 (0.00)	34,634
South Fork Run	0 (0.00)	0 (0.00)	8,819 (24.46)	27,233 (75.54)	0 (0.00)	36,052
The Glade	0 (0.00)	0 (0.00)	10,534 (54.20)	7,285 (37.49)	1,616 (8.31)	19,434
Tributary To Captain Hickory Run	0 (0.00)	2,732 (20.78)	10,419 (79.22)	0 (0.00)	0 (0.00)	13,151
Tributary To Colvin Run	0 (0.00)	6,313 (32.84)	11,583 (60.26)	1,326 (6.90)	0 (0.00)	19,222
Tributary To Difficult Run	0 (0.00)	7,264 (66.87)	3,599 (33.13)	0 (0.00)	0 (0.00)	10,863
Tributary To Dog Run	0 (0.00)	3,979 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)	3,979
Tributary To Piney Branch	0 (0.00)	0 (0.00)	515 (26.37)	1,438 (73.63)	0 (0.00)	1,954
Tributary To Rock Branch	0 (0.00)	1,657 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)	1,657
Wolftrap Creek	0 (0.00)	303 (0.52)	9,928 (16.92)	19,468 (33.18)	28,968 (49.38)	58,666
<b>Watershed Total</b>	<b>2,090 (0.31)</b>	<b>75,778 (11.07)</b>	<b>335,862 (49.04)</b>	<b>222,963 (32.56)</b>	<b>48,132 (7.03)</b>	<b>684,825</b>

**TABLE 3-14**  
 Infrastructure Assessment Summary for Difficult Run Watershed  
*Fairfax County Stream Physical Assessment*

<b>Impact Score</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>12</b>	<b>15</b>	<b>18</b>	<b>20</b>	<b>Total</b>
Deficient Buffers	0	0	14	38	90	165	58	70	31	5	3	N/A	N/A	N/A	N/A	474
Crossings	114	172	148	61	47	25	8	6	2	0	1	N/A	N/A	N/A	N/A	584
Ditches and Pipes	197	65	23	26	17	27	4	5	6	0	6	N/A	N/A	N/A	N/A	376
Erosion	0	0	0	0	5	25	24	47	26	5	12	N/A	N/A	N/A	N/A	144
Head Cut	0	0	0	0	4	0	1	0	0	0	1	N/A	N/A	N/A	N/A	6
Obstruction	12	5	9	27	16	32	15	16	17	10	32	N/A	N/A	N/A	N/A	191
Utility	2	1	4	9	10	3	0	4	0	0	3	1	1	1	0	39
<b>Total</b>	<b>325</b>	<b>243</b>	<b>198</b>	<b>161</b>	<b>189</b>	<b>277</b>	<b>110</b>	<b>148</b>	<b>82</b>	<b>20</b>	<b>58</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1814</b>



-  Fairfax County Boundary
- Habitat Rating**
-  Excellent
-  Good
-  Fair
-  Poor
-  Very Poor
-  No Habitat Assessment
-  Lakes and Ponds
-  Watersheds

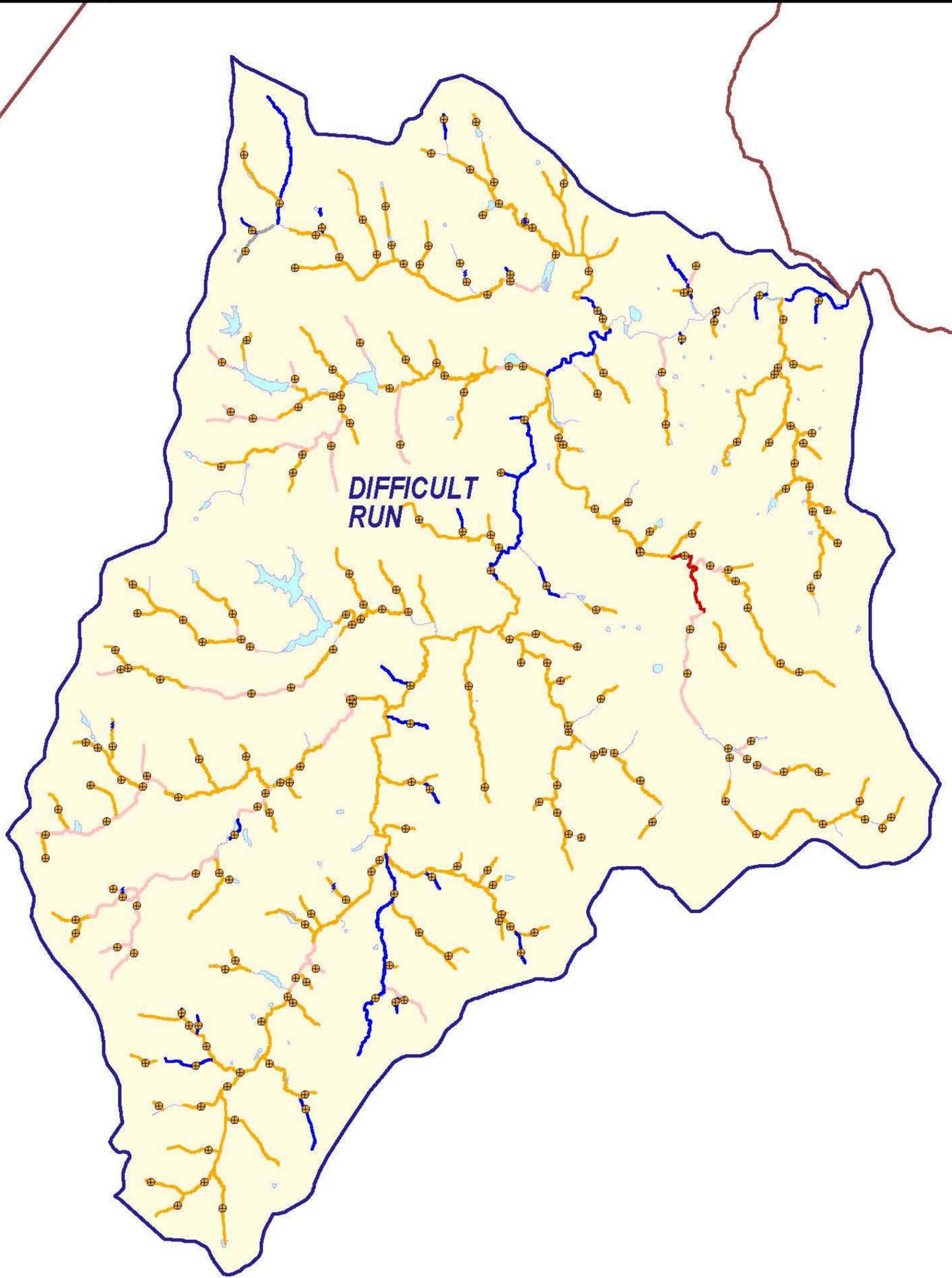
**WATERSHED GROUP:  
DIFFICULT RUN**



0 3000 6000 9000 12000 Feet

**Figure 3-17**  
**Habitat Assessment**  
**Difficult Run**  
**Fairfax County Stream Physical Assessment**





**DIFFICULT  
RUN**

**Inventory Types**

● Cross Section

⚡ Head Cut

**CEM Stage**

— Not Assigned

1

2

3

4

5

— Fairfax County Boundary

— Lakes and Ponds

— Streams

— Watersheds

**WATERSHED GROUP:  
DIFFICULT RUN**



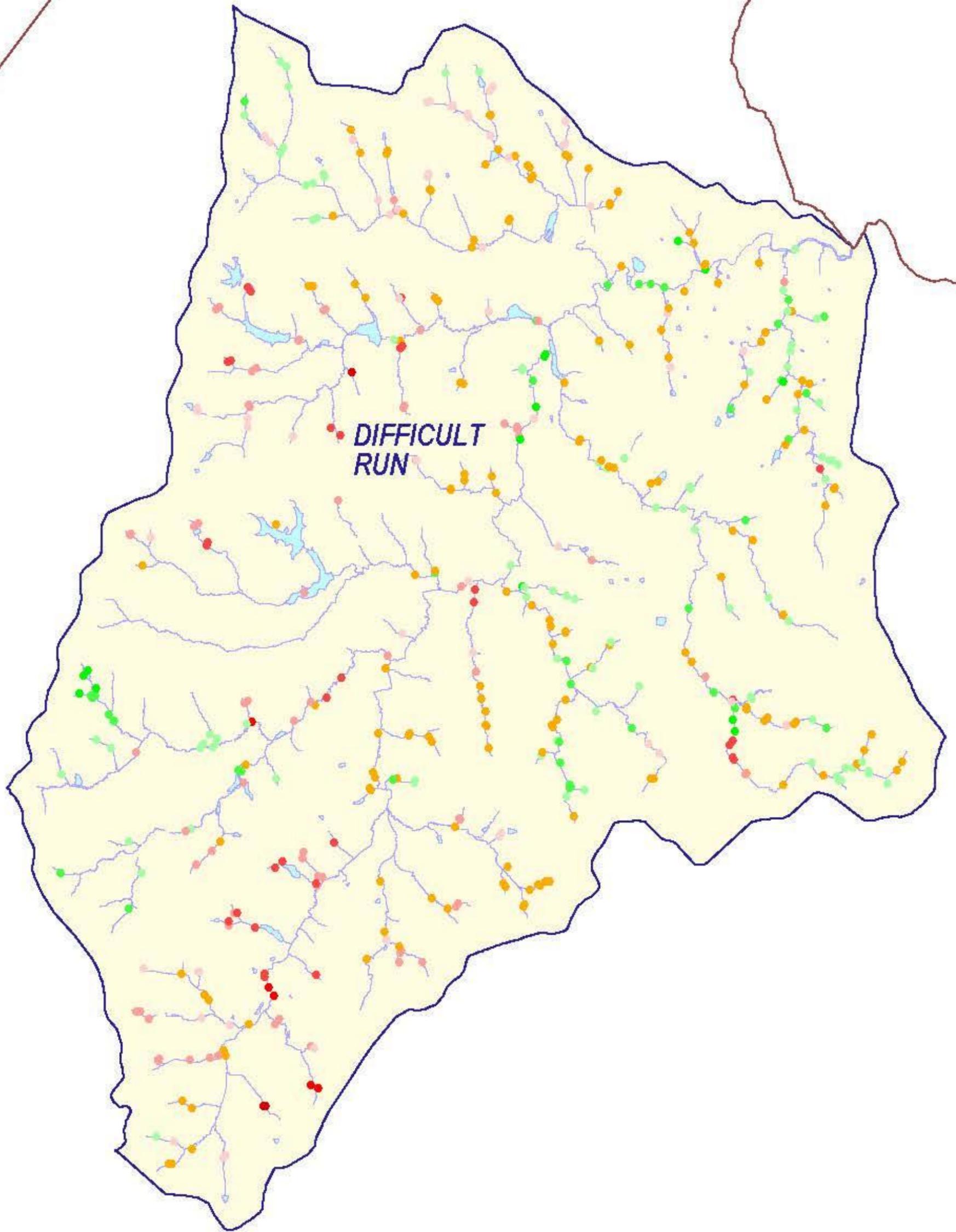
**Figure 3-18  
CEM Stages  
Difficult Run  
Fairfax County Stream Physical Assessment**



0 3000 6000 9000 12000 Feet







Deficient Buffer by Impact Score

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- ▭ Fairfax County Boundary
- ▭ Lakes and Ponds
- ▭ Streams
- ▭ Watersheds

WATERSHED GROUP:  
DIFFICULT RUN

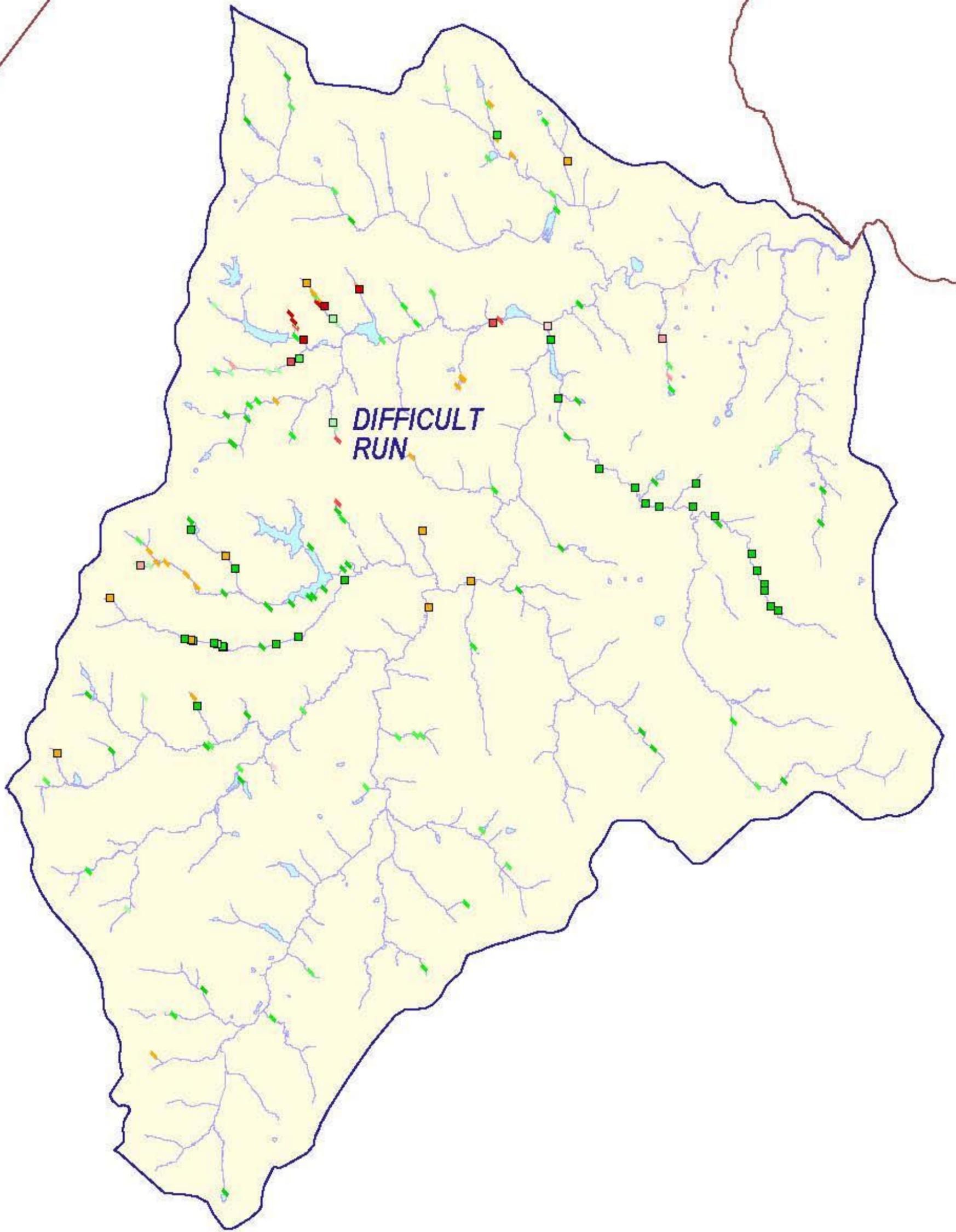


0 3000 6000 9000 12000 Feet

**Figure 3-20**  
**Deficient Buffer Impacts**  
**Difficult Run**  
**Fairfax County Stream Physical Assessment**







Pipe / Ditch by Impact Score

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

WATERSHED GROUP:  
DIFFICULT RUN



0 3000 6000 9000 12000 Feet

**Figure 3-22**  
**Pipe and Ditch Impacts**  
**Difficult Run**  
**Fairfax County Stream Physical Assessment**





## 3.2.4 Middle Potomac Group Summary

### 3.2.4.1 Bull Neck Run Watershed

**Description.** Bull Neck Run Watershed is one of the smaller watersheds in Fairfax County, with just under 5 miles of stream assessed. It consists of a small stream network that drains directly to the Potomac River.

**Habitat.** The habitat assessment results for Bull Neck Run Watershed are summarized by stream in Table 3-15. Habitat scores for each reach are depicted in Figure 3-24. Based on a length weighted habitat score of 128 (Table 3-2), Bull Neck Run Watershed is one of the highest quality streams, compared to the rest of the County. Just over 1 mile of stream was categorized as having “fair” habitat conditions; 2 miles were categorized as “good,” and 1 mile as “excellent.”

**CEM.** Based on the CEM evaluations the channels in Bull Neck Run Watershed are divided nearly equally between Stage 3 and Stage 4 (Table 3-3). Figure 3-25 summarizes the CEM results for Bull Neck Run Watershed.

**Infrastructure.** The infrastructure inventory resulted in 25 inventory points. The most significant problems were related to two erosional areas that were each given an impact score of 7. The infrastructure inventory results are summarized in Table 3-16. Figures 3-26, 3-27, 3-28, 3-29, and 3-30 summarize impact scores for the erosion problems; deficient buffers; pipes/ditches; crossings; and dumps, obstructions, and utilities, respectively.

### 3.2.4.2 Scotts Run Watershed

**Description.** Scotts Run Watershed is a small watershed, with approximately 8 miles of stream assessed. It is located in the middle of the northeastern boundary of the County. The watershed is contained entirely within the county boundaries, and drains directly to the Potomac River.

**Habitat.** The habitat assessment results for Scotts Run Watershed are summarized by stream in Table 3-17. Habitat scores for each reach are depicted in Figure 3-24. Based on a length weighted habitat score of 108 (Table 3-2), Scotts Run Watershed is in the middle range of quality, compared to the rest of the County. Approximately 1.5 miles of stream were categorized as having “poor” habitat conditions, 4 miles as “fair,” and 1 mile as “good,” and 1.5 miles as “excellent.”

**CEM.** On the basis of the CEM evaluations 89 percent of the channels in Scotts Run Watershed are in Evolutionary Stage 3 (Table 3-3). Figure 3-25 summarizes the CEM results for Scotts Run Watershed.

**Infrastructure.** The infrastructure inventory resulted in 78 inventory points. The most significant problem was related to a crossing that was given an impact score of 8. The infrastructure inventory results are summarized in Table 3-18. Figures 3-26, 3-27, 3-28, 3-29, and 3-30 summarize impact scores for the erosion problems; deficient buffers; pipes/ditches; crossings; and dumps, obstructions, and utilities, respectively.

### 3.2.4.3 Dead Run Watershed

**Description.** Dead Run Watershed is one of the smaller watersheds in Fairfax County, with approximately 6 miles of stream assessed. It consists of a small stream network that drains directly to the Potomac River at the north end of the County.

**Habitat.** The habitat assessment results for Dead Run Watershed are summarized by stream in Table 3-19. Habitat scores for each reach are depicted in Figure 3-24. Based on a length weighted habitat score of 103 (Table 3-2), Dead Run Watershed is in the middle range of quality, compared to the rest of the County. Less than 1 mile of stream was categorized as having “poor” habitat conditions, approximately 4 miles of stream were categorized as having “fair,” and 1 mile as having “good.”

**CEM.** On the basis of CEM evaluations, all of the channels in Dead Run Watershed are in Stage 3 (Table 3-3). Figure 3-25 summarizes the CEM results for Dead Run Watershed.

**Infrastructure.** The infrastructure inventory resulted in 49 inventory points. The most significant problems were related to two deficient buffers that were each given an impact score of 7. The infrastructure inventory results are summarized in Table 3-20. Figures 3-26, 3-27, 3-28, 3-29, and 3-30 summarize impact scores for the erosion problems; deficient buffers; pipes/ditches; crossings; and dumps, obstructions, and utilities, respectively.

### 3.2.4.4 Turkey Run Watershed

**Description.** Turkey Run Watershed is a small watershed, with approximately 3 miles of stream assessed. It is located along the middle of the northeastern boundary of the County. The watershed consists of a couple small tributaries that drain directly to the Potomac River.

**Habitat.** The habitat assessment results for Turkey Run Watershed are summarized by stream in Table 3-21. Habitat scores for each reach are depicted in Figure 3-24. Based on a length weighted habitat score of 124 (Table 3-2), Turkey Run Watershed is one of the highest quality watersheds in the County. Approximately 1 mile of stream was categorized as having “fair” habitat conditions and 2 miles as “excellent.”

**CEM.** On the basis of the CEM evaluations all of the channels assessed in Turkey Run Watershed are in Evolutionary Stage 3 (Table 3-3). Figure 3-25 summarizes the CEM results for Turkey Run Watershed.

**Infrastructure.** The infrastructure inventory resulted in 21 inventory points. The most significant problem was related to an erosional area that was given an impact score of 7. The infrastructure inventory results are summarized in Table 3-22. Figures 3-26, 3-27, 3-28, 3-29, and 3-30 summarize impact scores for the erosion problems; deficient buffers; pipes/ditches; crossings; and dumps, obstructions, and utilities, respectively.

### 3.2.4.5 Pimmit Run Watershed

**Description.** Pimmit Run Watershed is a medium sized watershed, with approximately 19 miles of stream assessed. It is located in the middle of the northeastern boundary of the County. The watershed is contained entirely within the county boundaries, and drains directly to the Potomac River.

**Habitat.** The habitat assessment results for Pimmit Run Watershed are summarized by stream in Table 3-23. Habitat scores for each reach are depicted in Figure 3-24. Based on a length weighted habitat score of 112 (Table 3-2), Pimmit Run Watershed is in the upper middle range, compared to the rest of the County. Just over 1 mile of stream was categorized as having “poor” habitat conditions, approximately 8 miles as “fair,” 8 miles as “good,” and nearly 0.5 mile as “excellent.”

**CEM.** Based on the CEM evaluations approximately 97 percent of the channels in Pimmit Run Watershed are in Evolutionary Stage 3 with the remainder in Stage 4 (Table 3-3). Figure 3-25 summarizes the CEM results for Pimmit Run Watershed.

**Infrastructure.** The infrastructure inventory resulted in 311 inventory points. The most significant problems were related to 1 deficient buffer and 1 erosional point that were given impact scores of 9 and 10 respectively. The infrastructure inventory results are summarized in Table 3-24. Figures 3-26, 3-27, 3-28, 3-29, and 3-30 summarize impact scores for the erosion problems; deficient buffers; pipes/ditches; crossings; and dumps, obstructions, and utilities, respectively.

**TABLE 3-15**  
Habitat Assessment Summary for Bull Neck Run Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Bull Neck Run	0 (0.00)	0 (0.00)	0 (0.00)	10,005 (100.00)	0 (0.00)	10,005
Tributary to Bull Neck Run	0 (0.00)	0 (0.00)	6,394 (55.51)	0 (0.00)	5,125 (44.49)	11,519
Tributary to Potomac River	0 (0.00)	0 (0.00)	0 (0.00)	1,175 (30.95)	2,623 (69.05)	3,798
<b>Watershed Total</b>	<b>0 (0.00)</b>	<b>0 (0.00)</b>	<b>6,394 (25.25)</b>	<b>11,181 (44.15)</b>	<b>7,748 (30.60)</b>	<b>25,323</b>

**TABLE 3-16**  
Infrastructure Assessment Summary for Bull Neck Run Watershed  
*Fairfax County Stream Physical Assessment*

Impact Score	0	1	2	3	4	5	6	7	8	9	10	>10	Total
Deficient Buffers	0	0	0	4	1	0	0	0	0	0	0	N/A	5
Crossings	0	8	2	2	1	0	0	0	0	0	0	N/A	13
Ditches and Pipes	0	0	0	0	1	0	0	0	0	0	0	N/A	1
Erosion	0	0	0	0	0	1	0	2	0	0	0	N/A	3
Head Cut	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Obstruction	0	0	0	2	1	0	0	0	0	0	0	N/A	3
Utility	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>8</b>	<b>2</b>	<b>8</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>25</b>

**TABLE 3-17**  
Habitat Assessment Summary for Scotts Run Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Bradley Branch	0 (0.00)	0 (0.00)	3,647 (100.00)	0 (0.00)	0 (0.00)	3,647
Scott Run	0 (0.00)	0 (0.00)	12,458 (54.53)	2,726 (11.93)	7,664 (33.54)	22,848
Tributary to Scott Run	0 (0.00)	7,938 (46.56)	4,735 (27.77)	4,375 (25.66)	0 (0.00)	17,049
<b>Watershed Total</b>	<b>0 (0.00)</b>	<b>7,938 (18.23)</b>	<b>20,840 (47.86)</b>	<b>7,101 (16.31)</b>	<b>7,664 (17.60)</b>	<b>43,543</b>

**TABLE 3-18**  
Infrastructure Assessment Summary for Scotts Run Watershed  
*Fairfax County Stream Physical Assessment*

Impact Score	0	1	2	3	4	5	6	7	8	9	10	>10	Total
Deficient Buffers	0	0	1	4	5	3	1	0	0	0	0	N/A	14
Crossings	0	12	9	9	3	0	0	0	1	0	0	N/A	34
Ditches and Pipes	1	1	0	3	2	0	0	0	0	0	0	N/A	7
Erosion	0	0	0	8	4	3	0	0	0	0	0	N/A	15
Head Cut	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Obstruction	0	0	1	2	2	1	0	0	0	0	0	N/A	6
Utility	0	0	0	2	0	0	0	0	0	0	0	0	2
<b>Total</b>	<b>1</b>	<b>13</b>	<b>11</b>	<b>28</b>	<b>16</b>	<b>7</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>78</b>

**TABLE 3-19**  
 Habitat Assessment Summary for Dead Run Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Dead Run	0 (0.00)	0 (0.00)	6,718 (47.11)	6,436 (45.14)	1,105 (7.75)	14,260
Tributary to Dead Run	0 (0.00)	3,740 (22.98)	12,532 (77.02)	0 (0.00)	0 (0.00)	16,271
Tributary to Potomac River	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1,087 (100.00)	1,087
<b>Watershed Total</b>	<b>0 (0.00)</b>	<b>3,740 (11.83)</b>	<b>19,250 (60.88)</b>	<b>6,436 (20.36)</b>	<b>2,193 (6.93)</b>	<b>31,618</b>

**TABLE 3-20**  
 Infrastructure Assessment Summary for Dead Run Watershed  
*Fairfax County Stream Physical Assessment*

Impact Score	0	1	2	3	4	5	6	7	8	9	10	>10	Total
Deficient Buffers	0	0	0	5	6	1	0	2	0	0	0	N/A	14
Crossings	1	12	8	2	1	0	0	0	0	0	0	N/A	24
Ditches and Pipes	0	1	2	1	0	0	0	0	0	0	0	N/A	4
Erosion	0	0	0	0	0	2	1	0	0	0	0	N/A	3
Head Cut	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Obstruction	0	0	0	0	1	1	0	0	0	0	0	N/A	2
Utility	0	0	0	0	0	0	2	0	0	0	0	0	2
<b>Total</b>	<b>1</b>	<b>13</b>	<b>10</b>	<b>8</b>	<b>8</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>49</b>

**TABLE 3-21**  
Habitat Assessment Summary for Turkey Run Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Tributary to Turkey Run	0 (0.00)	1,487 (24.89)	4,488 (75.11)	0 (0.00)	0 (0.00)	5,975
Turkey Run	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	8,801 (100.00)	8,801
<b>Watershed Total</b>	<b>0 (0.00)</b>	<b>1,487 (10.07)</b>	<b>4,488 (30.37)</b>	<b>0 (0.00)</b>	<b>8,801 (59.56)</b>	<b>14,777</b>

**TABLE 3-22**  
Infrastructure Assessment Summary for Turkey Run Watershed  
*Fairfax County Stream Physical Assessment*

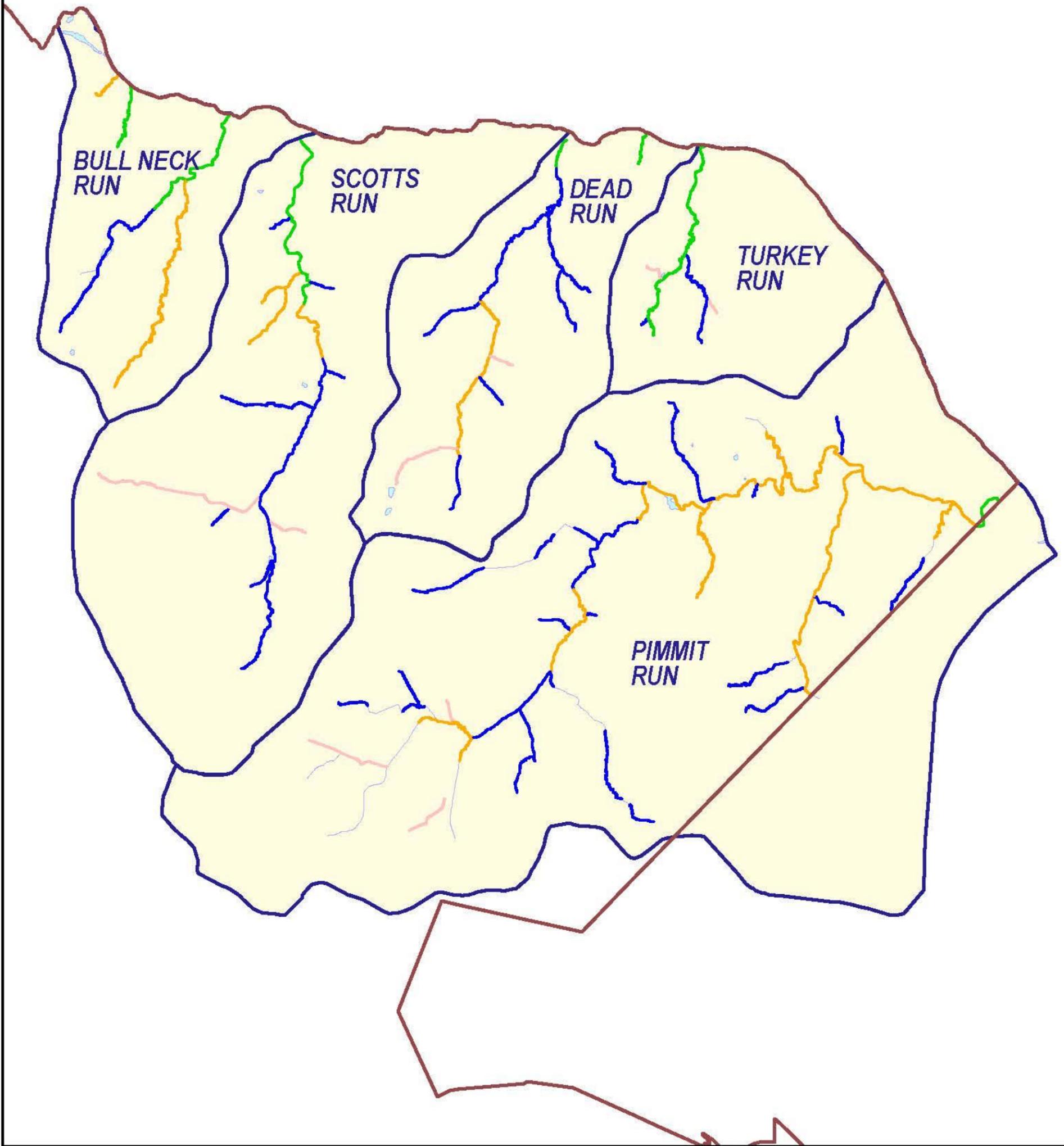
Impact Score	0	1	2	3	4	5	6	7	8	9	10	>10	Total
Deficient Buffers	0	0	0	0	4	3	0	0	0	0	0	N/A	7
Crossings	0	1	2	3	1	0	0	0	0	0	0	N/A	7
Ditches and Pipes	0	0	1	0	0	0	0	0	0	0	0	N/A	1
Erosion	0	0	0	0	2	1	0	1	0	0	0	N/A	4
Head Cut	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Obstruction	0	0	0	2	0	0	0	0	0	0	0	N/A	2
Utility	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>5</b>	<b>7</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21</b>

**TABLE 3-23**  
 Habitat Assessment Summary for Pimmit Run Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Bryan Branch	0 (0.00)	0 (0.00)	0 (0.00)	4,073 (100.00)	0 (0.00)	4,073
Burkes Spring Branch	0 (0.00)	0 (0.00)	3,580 (100.00)	0 (0.00)	0 (0.00)	3,580
Little Pimmit Run	0 (0.00)	0 (0.00)	6,729 (42.39)	9,146 (57.61)	0 (0.00)	15,875
Pimmit Run	0 (0.00)	5,554 (7.73)	34,317 (47.78)	30,329 (42.22)	1,631 (2.27)	71,830
<b>Watershed Total</b>	<b>0 (0.00)</b>	<b>5,554 (5.82)</b>	<b>44,626 (46.80)</b>	<b>43,547 (45.67)</b>	<b>1,631 (1.71)</b>	<b>95,357</b>

**TABLE 3-24**  
 Infrastructure Assessment Summary for Pimmit Run Watershed  
*Fairfax County Stream Physical Assessment*

Impact Score	0	1	2	3	4	5	6	7	8	9	10	>10	Total
Deficient Buffers				14	38	15	8			1		N/A	76
Crossings	4	7	42	20	7	1	2					N/A	83
Ditches and Pipes	46	1	17	26	5	3						N/A	98
Erosion				2	2	13	10	3	1		1	N/A	32
Head Cut												N/A	0
Obstruction	1		2	2	4	1			1			N/A	11
Utility				1	2	2	4	2				0	11
<b>Total</b>	<b>51</b>	<b>8</b>	<b>61</b>	<b>65</b>	<b>58</b>	<b>35</b>	<b>24</b>	<b>5</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>311</b>



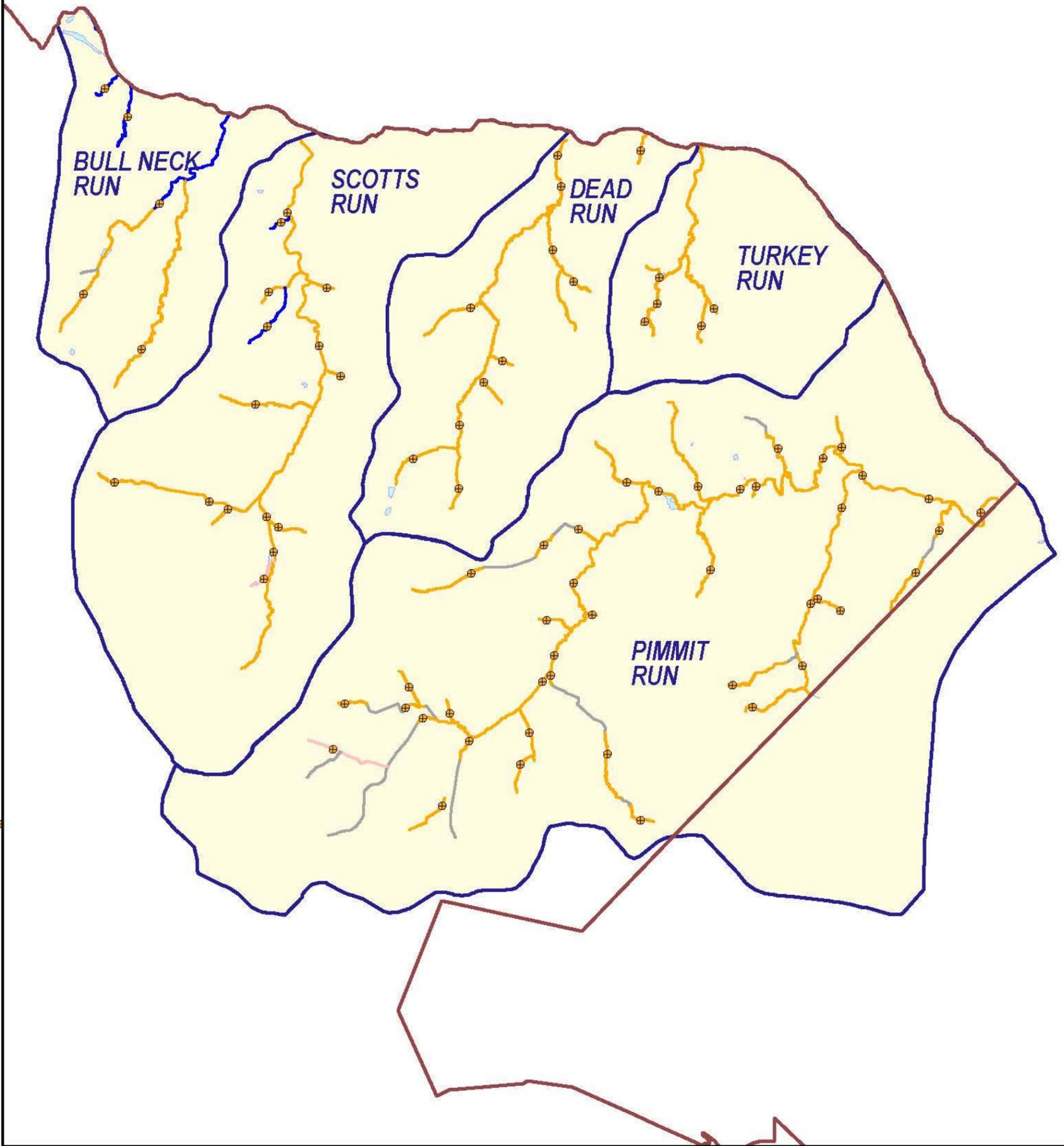
- Fairfax County Boundary
- Habitat Rating
  - Excellent
  - Good
  - Fair
  - Poor
  - Very Poor
  - No Habitat Assessment
- Lakes and Ponds
- Watersheds

**WATERSHED GROUP:  
MIDDLE POTOMAC**



0 2000 4000 6000 8000 Feet

**Figure 3-24**  
**Habitat Assessment**  
**Middle Potomac Group**  
**Fairfax County Stream Physical Assessment**



Inventory Types

- Cross Section
- ⚡ Head Cut

CEM Stage

- Not Assigned
- 1
- 2
- 3
- 4
- 5

- ▭ Fairfax County Boundary
- ▭ Lakes and Ponds
- ▭ Streams
- ▭ Watersheds

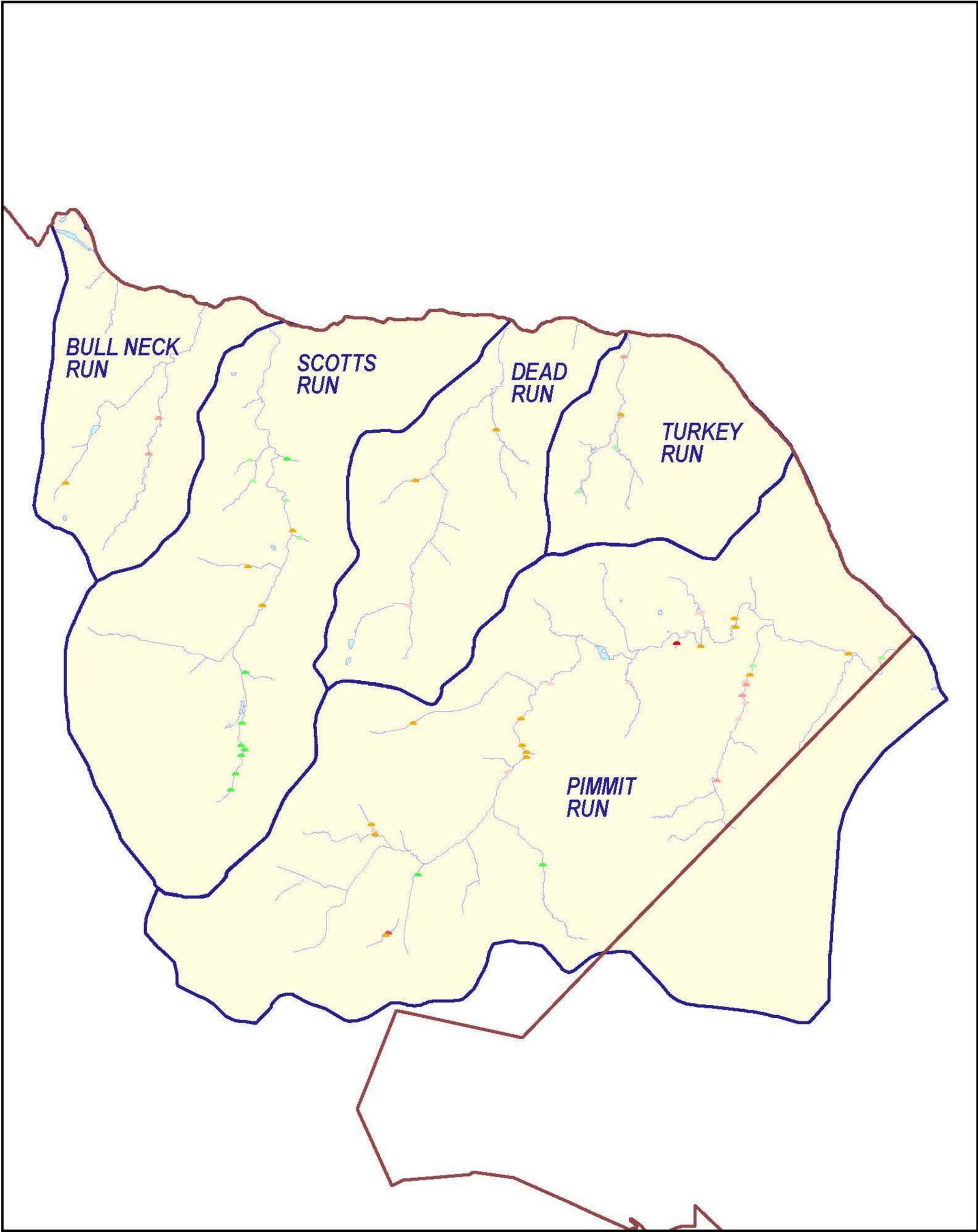
WATERSHED GROUP:  
MIDDLE POTOMAC



0 2000 4000 6000 8000 Feet

Figure 3-25  
CEM Categories  
Middle Potomac Group  
Fairfax County Stream Physical Assessment





Erosion by Impact Score

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

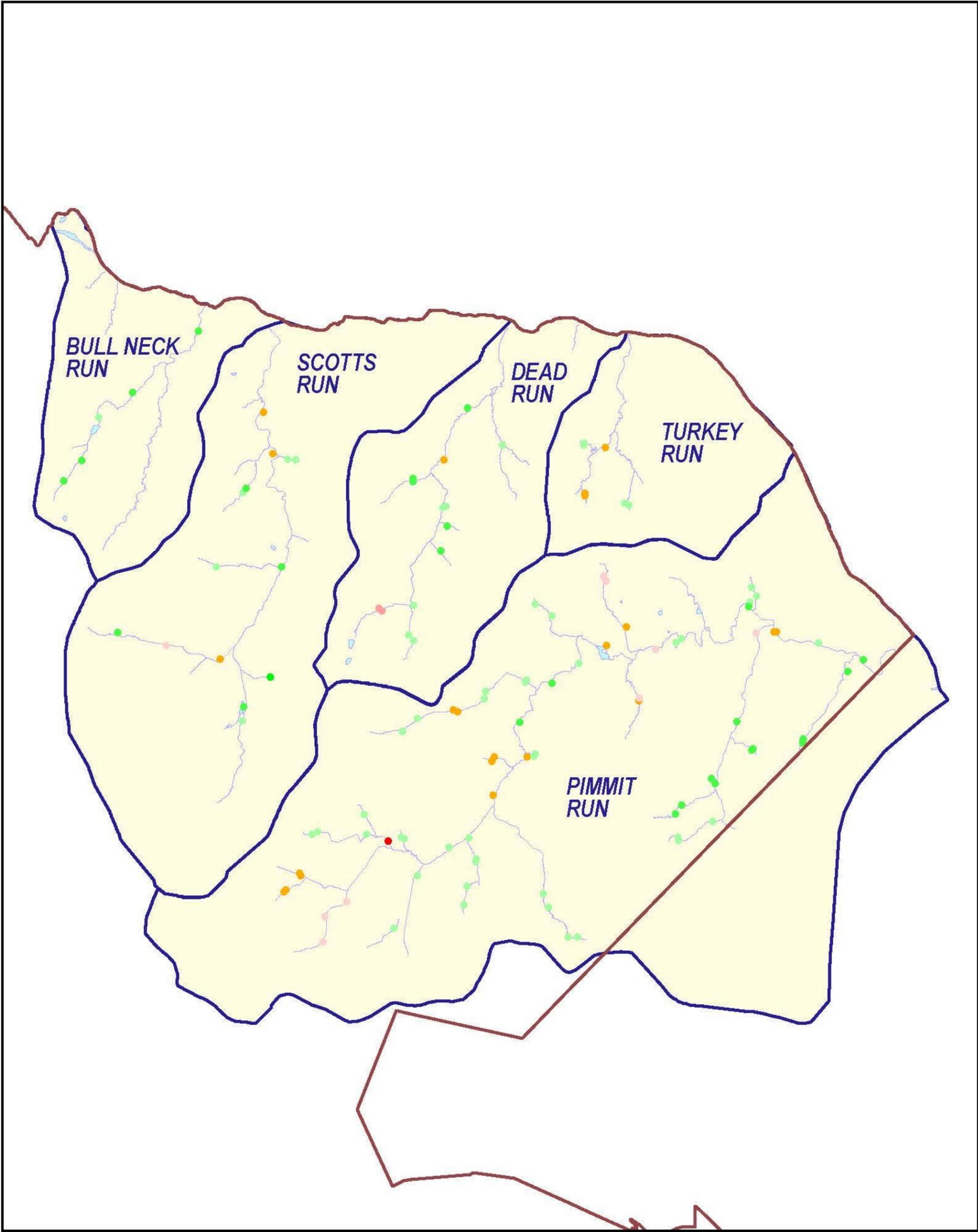
WATERSHED GROUP:  
MIDDLE POTOMAC



0 2000 4000 6000 8000 Feet

**Figure 3-26**  
**Erosion Impacts**  
**Middle Potomac Group**  
**Fairfax County Stream Physical Assessment**





Deficient Buffer by Impact Score

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

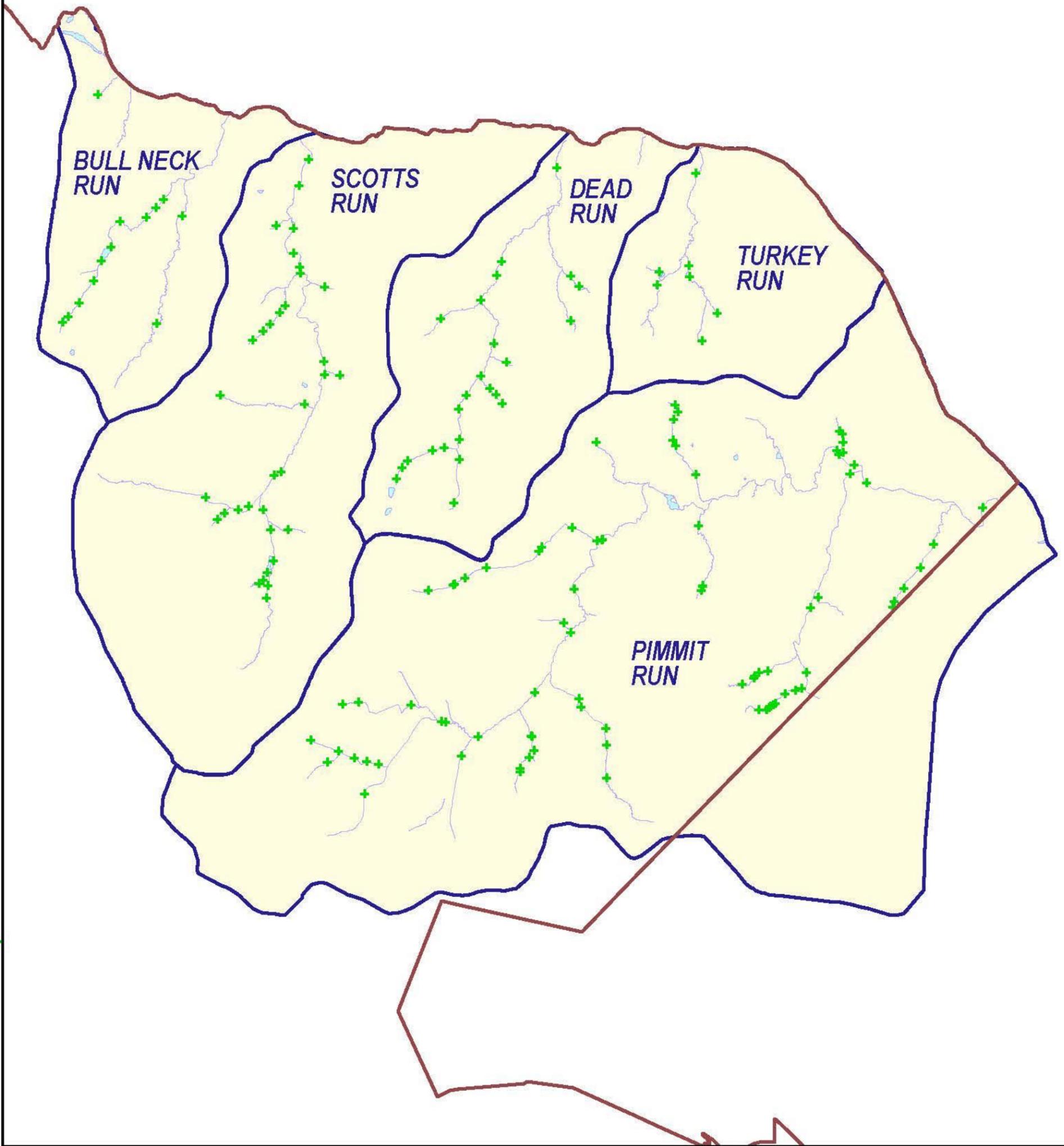
**WATERSHED GROUP:  
MIDDLE POTOMAC**



0 2000 4000 6000 8000 Feet

**Figure 3-27**  
**Deficient Buffer Impacts**  
**Middle Potomac Group**  
**Fairfax County Stream Physical Assessment**





**WATERSHED GROUP:  
MIDDLE POTOMAC**

**Figure 3-28  
Crossings  
Middle Potomac Group  
Fairfax County Stream Physical Assessment**

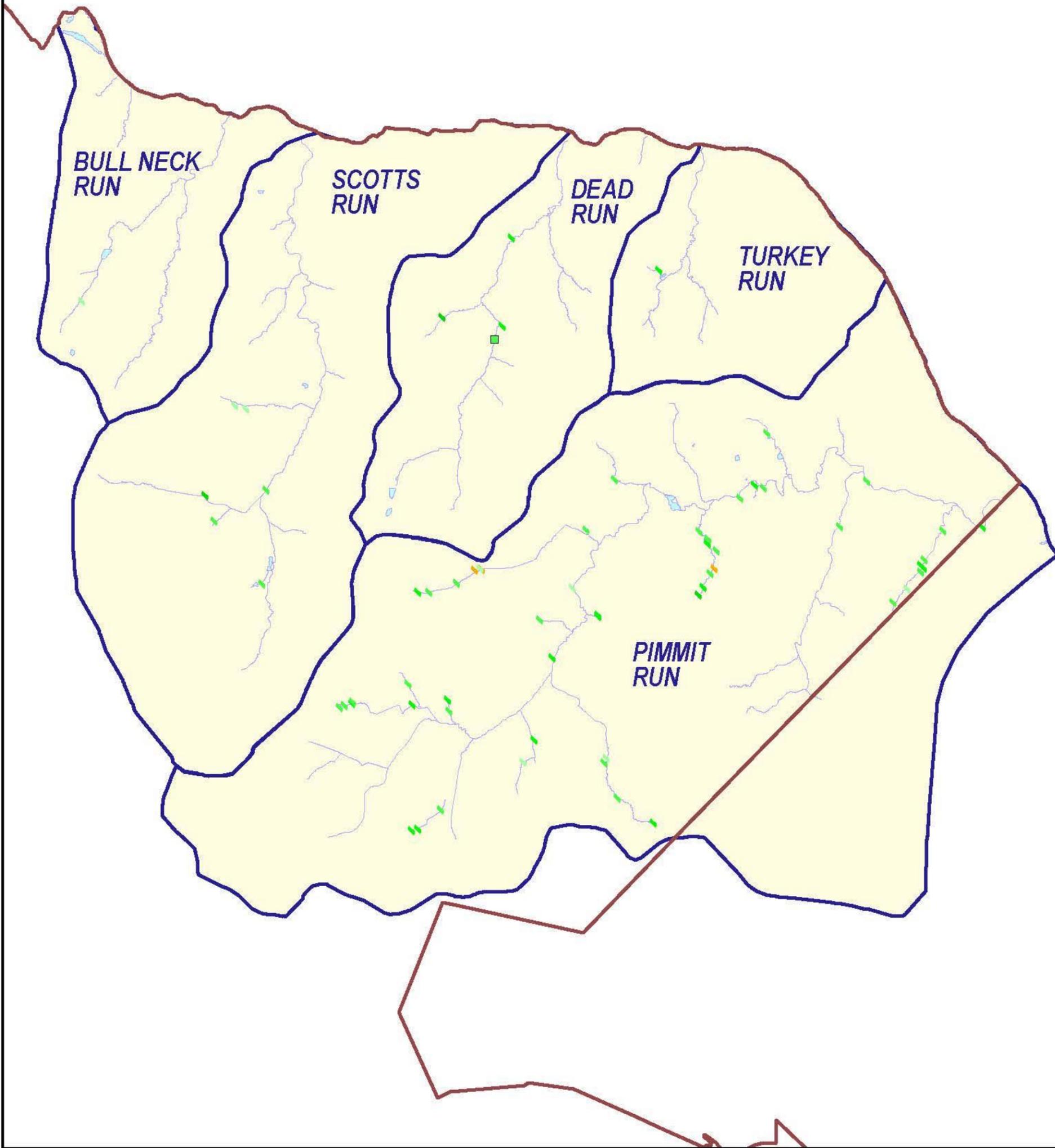
**Inventory Type**  
+ Crossing

-  Fairfax County Boundary
-  Lakes and Ponds
-  Streams
-  Watersheds



0 2000 4000 6000 8000 Feet





Pipe / Ditch by Impact Score

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

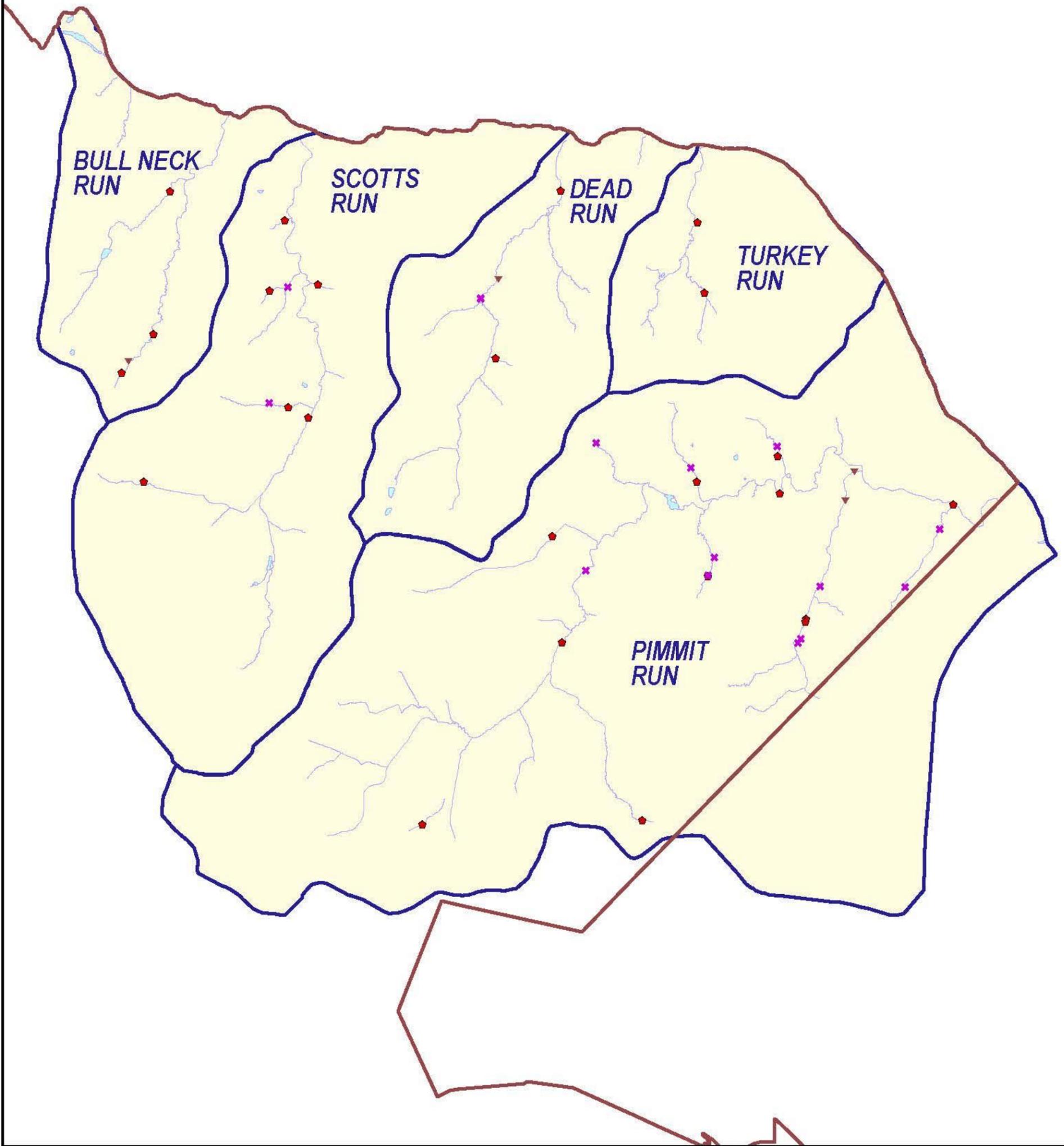
- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

WATERSHED GROUP:  
MIDDLE POTOMAC



0 2000 4000 6000 8000 Feet

Figure 3-29  
Pipe and Ditch Impacts  
Middle Potomac Group  
Fairfax County Stream Physical Assessment



**Inventory Types**

- ▼ Dump
- ◆ Obstruction
- \* Utility

- ▭ Fairfax County Boundary
- ▭ Lakes and Ponds
- ▭ Streams
- ▭ Watersheds

**WATERSHED GROUP:  
MIDDLE POTOMAC**



0 2000 4000 6000 8000 Feet

**Figure 3-30**  
**Dumps, Obstructions, and Utilities**  
**Middle Potomac Group**  
**Fairfax County Stream Physical Assessment**



## 3.2.5 Cameron Run Group Summary

### 3.2.5.1 Cameron Run Watershed

**Description.** Cameron Run Watershed is a large watershed, with approximately 49 miles of stream assessed. The main stem drains through the City of Alexandria prior to re-entering Fairfax County and draining into the Potomac River.

**Habitat.** The habitat assessment results for Cameron Run Watershed are summarized by stream in Table 3-25. Habitat scores for each reach are depicted in Figure 3-31. Based on a length weighted habitat score of 92 (Table 3-2), Cameron Run Watershed is one of the poorest watersheds, compared to the rest of the County. Approximately 2 miles of stream were categorized as having “very poor” habitat conditions, 19 miles as “poor,” 23 miles as “fair,” and 4 miles as “good.”

**CEM.** Based on the CEM evaluations approximately three quarters of the channels assessed in Cameron Run Watershed are in Evolutionary Stage 3 (Table 3-3), with most of the remainder of the watershed in Stage 4. Figure 3-32 summarizes the CEM results for Cameron Run Watershed.

**Infrastructure.** The infrastructure inventory resulted in 1015 inventory points. The most significant problems were related to a utility line, which was given an impact score of 15, and several pipes, ditches, erosional areas that were given impact scores of 10. The infrastructure inventory results are summarized in Table 3-26. Figures 3-33, 3-34, 3-35, 3-36, and 3-37 summarize impact scores for the erosion problems; deficient buffers; crossings; pipes/ ditches; and dumps, obstructions, and utilities, respectively.

### 3.2.5.2 Four Mile Run Watershed

**Description.** Four Mile Run Watershed is a large watershed with very little stream channel in the County, with approximately 1 miles of stream assessed. The majority of the watershed is contained within the City of Alexandria and Arlington County. Four Mile Run eventually drains to the Potomac River.

**Habitat.** The habitat assessment results for Four Mile Run Watershed are summarized by stream in Table 3-27. Habitat scores for each reach are depicted in Figure 3-31. Based on a length weighted habitat score of 96 (Table 3-2), Four Mile Run Watershed is in the lower range of quality, compared to the rest of the County. Nearly the entire mile assessed was categorized as “fair.”

**CEM.** Based on the CEM evaluations approximately 60 percent of the channels assessed in Four Mile Run Watershed are in Evolutionary Stage 4 (Table 3-3), with most of the remainder of the watershed in Stage 3. Figure 3-32 summarizes the CEM results for Four Mile Run Watershed.

**Infrastructure.** The infrastructure inventory resulted in 32 inventory points. The most significant problems were related to two utilities and a buffer, which was given impact scores of 6. The infrastructure inventory results are summarized in Table 3-28. Figures 3-33, 3-34, 3-35, 3-36, and 3-37 summarize impact scores for the erosion problems; deficient buffers; crossings; pipes/ ditches; and dumps, obstructions, and utilities, respectively.

**TABLE 3-25**  
Habitat Assessment Summary for Cameron Run Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Backlick Run	3,359 (6.48)	19,609 (37.81)	28,893 (55.71)	0 (0.00)	0 (0.00)	51,861
Cameron Run	5,246 (32.86)	6,036 (37.82)	4,680 (29.32)	0 (0.00)	0 (0.00)	15,962
Holmes Run	296 (0.37)	30,373 (37.44)	34,736 (42.81)	13,800 (17.01)	1,927 (2.37)	81,133
Indian Run	0 (0.00)	1,882 (10.34)	16,321 (89.66)	0 (0.00)	0 (0.00)	18,202
Pike Branch	0 (0.00)	11,344 (65.71)	5,920 (34.29)	0 (0.00)	0 (0.00)	17,264
Poplar Branch	0 (0.00)	1,554 (77.27)	457 (22.73)	0 (0.00)	0 (0.00)	2,011
Poplar Branch Trib to Indian Run	0 (0.00)	1,428 (24.41)	4,422 (75.59)	0 (0.00)	0 (0.00)	5,850
Tributary to Backlick Run	0 (0.00)	0 (0.00)	1,696 (41.02)	2,439 (58.98)	0 (0.00)	4,135
Tributary to Cameron Run	0 (0.00)	0 (0.00)	976 (100.00)	0 (0.00)	0 (0.00)	976
Tributary to Holmes Run	0 (0.00)	814 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)	814
Tributary to Indian Run	0 (0.00)	1,314 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)	1,314
Tributary to Tripps Run	0 (0.00)	10,992 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)	10,992
Tripps Run	0 (0.00)	6,605 (57.75)	3,371 (29.47)	1,462 (12.78)	0 (0.00)	11,438
Turkeycock Creek	0 (0.00)	5,891 (34.81)	11,032 (65.19)	0 (0.00)	0 (0.00)	16,923
Turkeycock Run	0 (0.00)	4,306 (23.43)	9,525 (51.83)	4,546 (24.74)	0 (0.00)	18,377
<b>Watershed Total</b>	<b>8,901 (3.46)</b>	<b>102,149 (39.71)</b>	<b>122,029 (47.44)</b>	<b>22,247 (8.65)</b>	<b>1,927 (0.75)</b>	<b>257,252</b>

**TABLE 3-26**  
Infrastructure Assessment Summary for Cameron Run Watershed  
*Fairfax County Stream Physical Assessment*

<b>Impact Score</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>&gt;10</b>	<b>Total</b>
Deficient Buffers	4	2	18	23	28	107	38	38	11	3	0	272
Crossings	97	50	49	22	16	11	3	0	0	1	0	249
Ditches and Pipes	192	38	40	15	8	11	2	0	7	2	4	319
Erosion	0	1	0	2	4	18	14	28	8	3	3	81
Head Cut	0	0	0	1	2	1	0	0	0	0	1	5
Obstruction	3	1	7	10	13	6	8	5	4	2	1	60
Utility	2	0	0	8	3	3	6	3	0	2	2	29
<b>Total</b>	<b>298</b>	<b>92</b>	<b>114</b>	<b>81</b>	<b>74</b>	<b>157</b>	<b>71</b>	<b>74</b>	<b>30</b>	<b>13</b>	<b>11</b>	<b>1015</b>

**TABLE 3-27**  
Habitat Assessment Summary for Four Mile Run Watershed  
*Fairfax County Stream Physical Assessment*

<b>Stream</b>	<b>Linear Feet (Percent) of Stream</b>					<b>Total</b>
	<b>Very Poor</b>	<b>Poor</b>	<b>Fair</b>	<b>Good</b>	<b>Excellent</b>	
Four Mile Run	0 (0.00)	0 (0.00)	1,654 (100.00)	0 (0.00)	0 (0.00)	1,654
Long Branch	0 (0.00)	0 (0.00)	2,422 (100.00)	0 (0.00)	0 (0.00)	2,422
<b>Watershed Total</b>	<b>0 (0.00)</b>	<b>0 (0.00)</b>	<b>4,076 (100.00)</b>	<b>0 (0.00)</b>	<b>0 (0.00)</b>	<b>4,076</b>

**TABLE 3-28**  
 Infrastructure Assessment Summary for Four Mile Run Watershed  
*Fairfax County Stream Physical Assessment*

<b>Impact Score</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>&gt;10</b>	<b>Total</b>
Deficient Buffers	0	0	0	0	0	5	1	0	0	0	0	N/A	6
Crossings	0	7	0	1	0	0	0	0	0	0	0	N/A	8
Ditches and Pipes	14	0	0	0	0	0	0	0	0	0	0	N/A	14
Erosion	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Head Cut	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Obstruction	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Utility	0	0	0	0	0	2	2	0	0	0	0	0	4
<b>Total</b>	<b>14</b>	<b>7</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>7</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>32</b>



-  Fairfax County Boundary
- Habitat Rating**
-  Excellent
-  Good
-  Fair
-  Poor
-  Very Poor
-  No Habitat Assessment
-  Lakes and Ponds
-  Watersheds

**WATERSHED GROUP:  
CAMERON RUN**



0 3000 6000 9000 12000 Feet



**Figure 3-31**  
**Habitat Assessment**  
**Cameron Run Group**  
**Fairfax County Stream Physical Assessment**





Inventory Types

- Cross Section
- ⚡ Head Cut

CEM Stage

- Not Assigned
- 1
- 2
- 3
- 4
- 5

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

WATERSHED GROUP:  
CAMERON RUN



0 3000 6000 9000 12000 Feet

**Figure 3-32**  
**CEM Stages**  
**Cameron Run Group**  
**Fairfax County Stream Physical Assessment**





Erosion by Impact Score

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

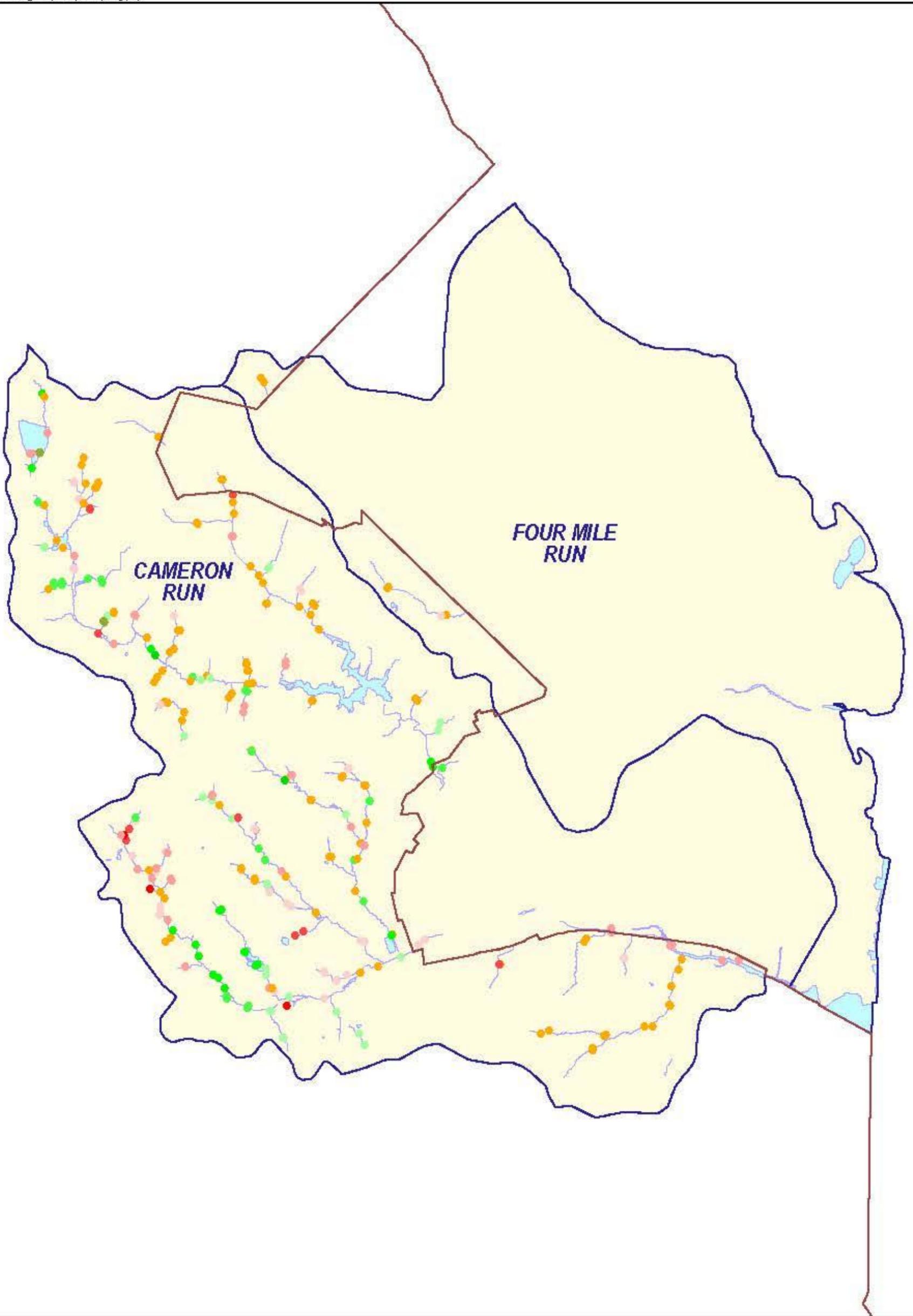
WATERSHED GROUP:  
CAMERON RUN



0 3000 6000 9000 12000 Feet

**Figure 3-33**  
**Erosion Impacts**  
**Cameron Run Group**  
**Fairfax County Stream Physical Assessment**





Deficient Buffer by Impact Score

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

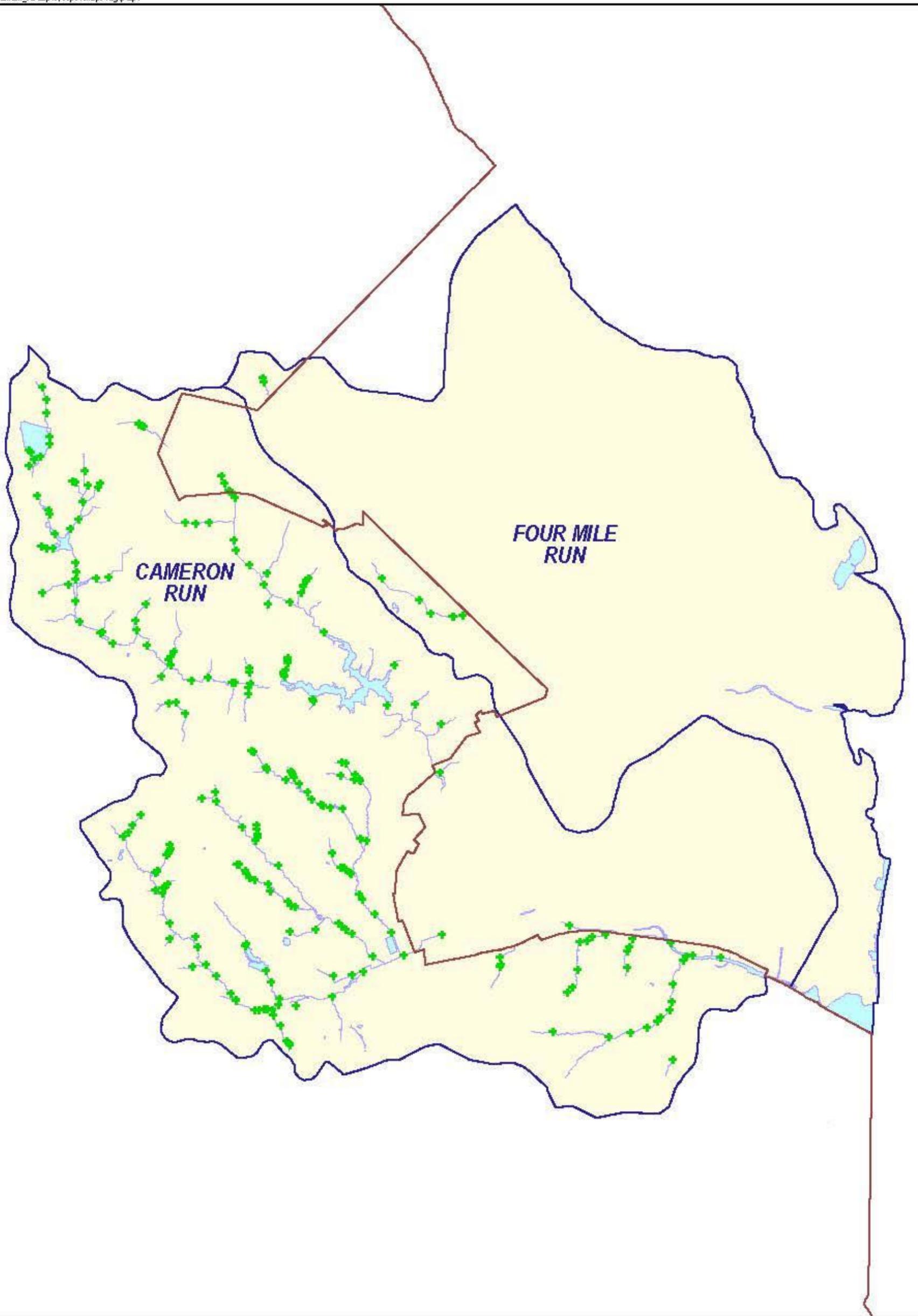
WATERSHED GROUP:  
CAMERON RUN



0 3000 6000 9000 12000 Feet

**Figure 3-34**  
**Deficient Buffer Impacts**  
**Cameron Run Group**  
**Fairfax County Stream Physical Assessment**





**Inventory Type**

+ Crossing

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

**WATERSHED GROUP:  
CAMERON RUN**

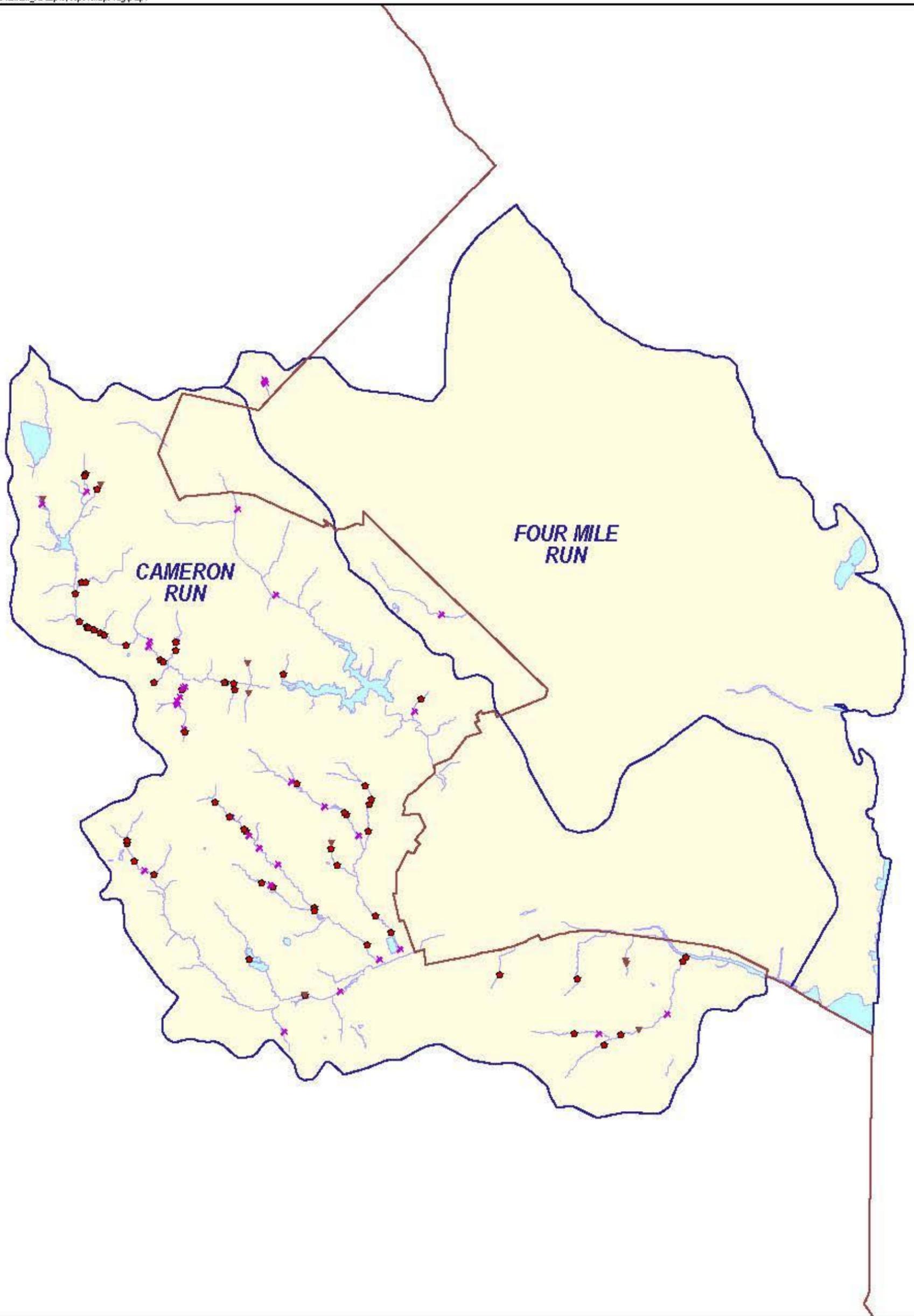


0 3000 6000 9000 12000 Feet

**Figure 3-35  
Crossings  
Cameron Run Group  
Fairfax County Stream Physical Assessment**







**Inventory Types**

- ▼ Dump
- ◆ Obstruction
- ✕ Utility

- ▭ Fairfax County Boundary
- ▭ Lakes and Ponds
- ▭ Streams
- ▭ Watersheds

**WATERSHED GROUP:  
CAMERON RUN**



0 3000 6000 9000 12000 Feet

**Figure 3-37**  
**Dumps, Obstructions, and Utilities**  
**Cameron Run Group**  
**Fairfax County Stream Physical Assessment**



## 3.2.6 Lower Potomac Group Summary

### 3.2.6.1 Dogue Creek Watershed

**Description.** Dogue Creek Watershed is a medium-sized watershed, with approximately 17 miles of stream assessed. It is located along the middle of the southeastern boundary of the County. The watershed is entirely contained within the County Boundaries, and drains directly to the Potomac River.

**Habitat.** The habitat assessment results for Dogue Creek Watershed are summarized by stream in Table 3-29. Habitat scores for each reach are depicted in Figure 3-38. Based on a length weighted habitat score of 96 (Table 3-2), Dogue Creek Watershed is in the lower range of quality, compared to the rest of the County. Approximately 5 miles of stream were categorized as having “poor” habitat conditions, 9 miles as “fair,” and 3 miles as “good.”

**CEM.** Based on the CEM evaluations approximately 50 percent of the channels assessed in Dogue Creek Watershed are in Evolutionary Stage 3 (Table 3-3), with most of the remainder of the watershed in Stage 4. Figure 3-39 summarizes the CEM results for Dogue Creek Watershed.

**Infrastructure.** The infrastructure inventory resulted in 313 inventory points. The most significant problems were 10 inventory points, which was given impact scores of 10, including deficient buffers, head cuts, obstructions, and an erosional area. The infrastructure inventory results are summarized in Table 3-30. Figures 3-40, 3-41, 3-42, 3-43, and 3-44 summarize impact scores for the erosion problems; deficient buffers; crossings; pipes/ ditches; and dumps, obstructions, and utilities, respectively.

### 3.2.6.2 Little Hunting Creek Watershed

**Description.** Little Hunting Creek Watershed is a medium-sized watershed, with approximately 10 miles of stream assessed. It is located along the southeastern boundary of the County. The watershed is entirely contained within the County Boundaries, and drains directly to the Potomac River.

**Habitat.** The habitat assessment results for Little Hunting Creek Watershed are summarized by stream in Table 3-31. Habitat scores for each reach are depicted in Figure 3-38. Based on a length weighted habitat score of 82 (Table 3-2), Little Hunting Creek Watershed is one of the poorest quality watersheds in the County. Approximately 2 miles of stream were categorized as having “very poor” habitat conditions, 4 miles as “poor,” 5 miles as “fair.”

**CEM.** Based on the CEM evaluations approximately 40 percent of the channels assessed in Little Hunting Creek Watershed are in Evolutionary Stage 3 (Table 3-3), with most of the remainder of the watershed in Stage 4. Figure 3-39 summarizes the CEM results for Little Hunting Creek Watershed.

**Infrastructure.** The infrastructure inventory resulted in 207 inventory points. The most significant problems were related to a pipe and a deficient buffer, which was given impact scores of 9. The infrastructure inventory results are summarized in Table 3-32. Figures 3-40, 3-41, 3-42, 3-43, and 3-44 summarize impact scores for the erosion problems; deficient buffers; crossings; pipes/ ditches; and dumps, obstructions, and utilities, respectively.

### 3.2.6.3 Belle Haven Watershed

**Description.** Belle Haven Watershed is a small watershed, with approximately 2 miles of stream assessed. It is located on the eastern boundary of the County. The watershed is entirely contained within the County Boundaries, containing multiple tributaries that drain directly to Cameron Run and the Potomac River.

**Habitat.** The habitat assessment results for Belle Haven Watershed are summarized by stream in Table 3-33. Habitat scores for each reach are depicted in Figure 3-38. Based on a length weighted habitat score of 71 (Table 3-2), Belle Haven Watershed is the poorest quality watershed in the County. Approximately 1 mile of stream was categorized as having “poor” habitat conditions and 0.5 mile as “fair.”

**CEM.** Based on the CEM evaluations all of the channels assessed in Belle Haven Watershed are in Evolutionary Stage 3 (Table 3-3). Figure 3-39 summarizes the CEM results for Belle Haven Watershed.

**Infrastructure.** The infrastructure inventory resulted in 35 inventory points. The most significant problem was related to an erosional area, which was given an impact score of 8. The infrastructure inventory results are summarized in Table 3-34. Figures 3-40, 3-41, 3-42, 3-43, and 3-44 summarize impact scores for the erosion problems; deficient buffers; crossings; pipes/ditches; and dumps, obstructions, and utilities, respectively.

**TABLE 3-29**  
Habitat Assessment Summary for Little Dogue Creek Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Barnyard Run	0 (0.00)	0 (0.00)	843 (27.07)	2,271 (72.93)	0 (0.00)	3,114
Dogue Creek	304 (1.35)	5,078 (22.46)	5,636 (24.93)	11,586 (51.26)	0 (0.00)	22,603
North Fork	0 (0.00)	3,320 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)	3,320
North Fork of Dogue Creek	0 (0.00)	12,430 (41.03)	17,866 (58.97)	0 (0.00)	0 (0.00)	30,295
Piney Run	0 (0.00)	3,951 (15.31)	21,855 (84.69)	0 (0.00)	0 (0.00)	25,806
Tributary to Douge Creek	0 (0.00)	0 (0.00)	0 (0.00)	2,355 (100.00)	0 (0.00)	2,355
<b>Watershed Total</b>	<b>304 (0.35)</b>	<b>24,778 (28.32)</b>	<b>46,199 (52.80)</b>	<b>16,212 (18.53)</b>	<b>0 (0.00)</b>	<b>87,493</b>

**TABLE 3-30**  
Infrastructure Assessment Summary for Dogue Creek Watershed  
*Fairfax County Stream Physical Assessment*

Impact Score	0	1	2	3	4	5	6	7	8	9	10	>10	Total
Deficient Buffers	0	0	0	3	1	6	5	41	14	6	2	N/A	78
Crossings	32	20	30	13	12	3	0	1	0	0	0	N/A	111
Ditches and Pipes	43	21	5	5	3	1	0	0	0	0	0	N/A	78
Erosion	0	0	0	0	1	1	2	8	4	1	1	N/A	18
Head Cut	0	0	0	0	0	1	0	0	0	0	4	N/A	5
Obstruction	6	2	0	0	1	0	1	1	3	4	3	N/A	21
Utility	0	0	0	1	0	0	0	0	1	0	0	0	2
<b>Total</b>	<b>81</b>	<b>43</b>	<b>35</b>	<b>22</b>	<b>18</b>	<b>12</b>	<b>8</b>	<b>51</b>	<b>22</b>	<b>11</b>	<b>10</b>	<b>0</b>	<b>313</b>

**TABLE 3-31**  
 Habitat Assessment Summary for Little Hunting Creek Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Little Hunting Creek	6,610 (32.96)	6,322 (31.52)	7,125 (35.52)	0 (0.00)	0 (0.00)	20,057
North Branch	1,127 (9.14)	10,111 (81.96)	1,098 (8.90)	0 (0.00)	0 (0.00)	12,337
Paul Spring Branch	0 (0.00)	3,267 (17.08)	15,860 (82.92)	0 (0.00)	0 (0.00)	19,127
Tributary to Potomac River	0 (0.00)	732 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)	732
<b>Watershed Total</b>	<b>7,737 (14.81)</b>	<b>20,433 (39.10)</b>	<b>24,083 (46.09)</b>	<b>0 (0.00)</b>	<b>0 (0.00)</b>	<b>52,253</b>

**TABLE 3-32**  
 Infrastructure Assessment Summary for Little Hunting Creek Watershed  
*Fairfax County Stream Physical Assessment*

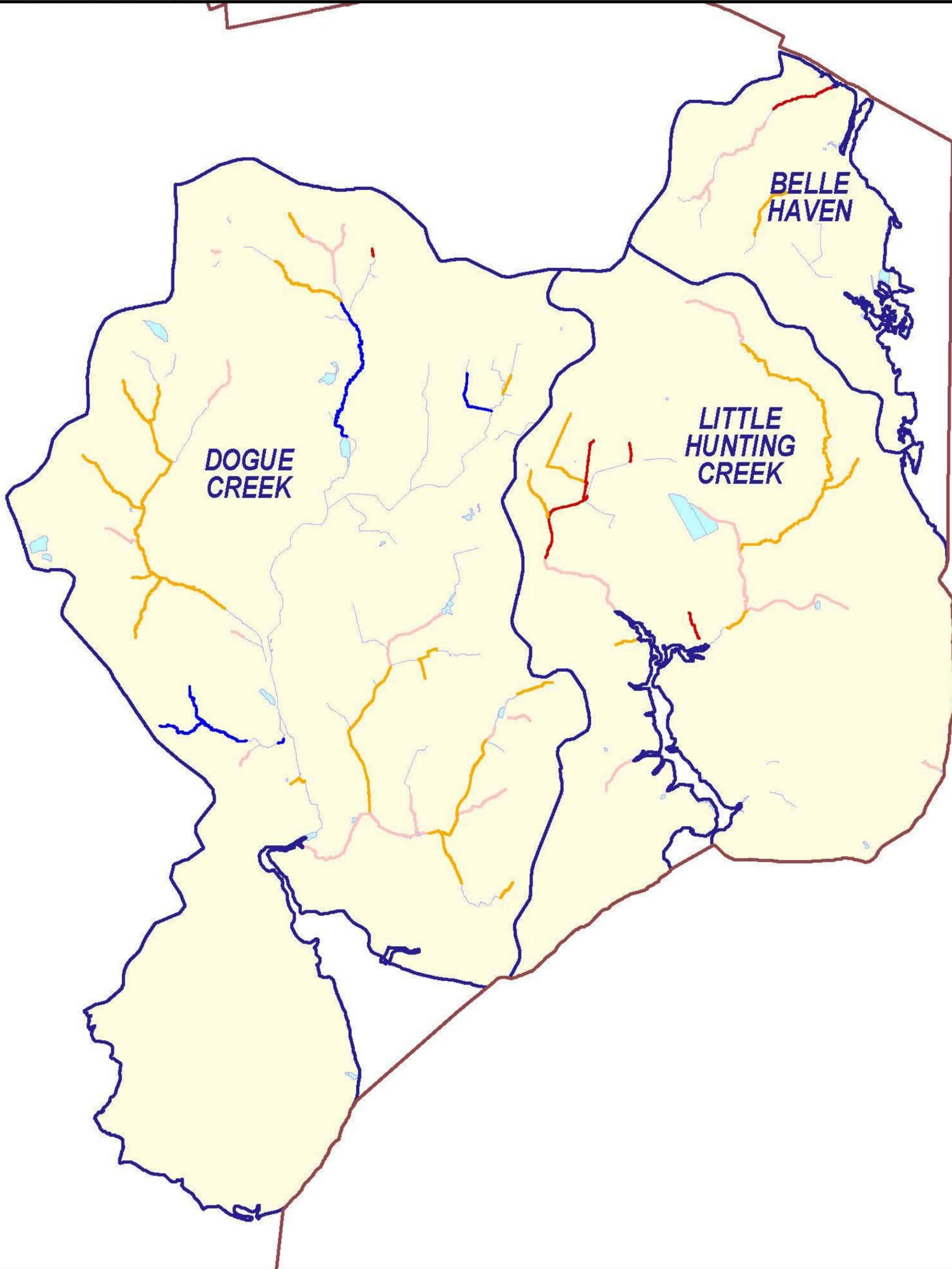
Impact Score	0	1	2	3	4	5	6	7	8	9	10	>10	Total
Deficient Buffers	1	0	5	15	4	20	4	8	1	1	0	N/A	59
Crossings	26	11	5	2	1	2	2	1	0	0	0	N/A	50
Ditches and Pipes	38	8	5	5	3	0	1	1	0	1	0	N/A	62
Erosion	0	0	0	0	0	3	2	1	0	0	0	N/A	6
Head Cut	0	0	0	0	2	0	0	0	0	0	0	N/A	2
Obstruction	0	1	6	9	1	1	1	0	0	0	0	N/A	19
Utility	1	2	3	3	0	0	0	0	0	0	0	0	9
<b>Total</b>	<b>66</b>	<b>22</b>	<b>24</b>	<b>34</b>	<b>11</b>	<b>26</b>	<b>10</b>	<b>11</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>207</b>

**TABLE 3-33**  
Habitat Assessment Summary for Belle Haven Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Hunting Creek	2,664 (60.72)	1,723 (39.28)	0 (0.00)	0 (0.00)	0 (0.00)	4,387
Tributary to Hunting Creek	0 (0.00)	2,583 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)	2,583
Tributary to Potomac River	0 (0.00)	0 (0.00)	2,396 (100.00)	0 (0.00)	0 (0.00)	2,396
<b>Watershed Total</b>	<b>2,664 (28.44)</b>	<b>4,306 (45.98)</b>	<b>2,396 (25.58)</b>	<b>0 (0.00)</b>	<b>0 (0.00)</b>	<b>9,366</b>

**TABLE 3-34**  
Infrastructure Assessment Summary for Belle Haven Watershed  
*Fairfax County Stream Physical Assessment*

Impact Score	0	1	2	3	4	5	6	7	8	9	10	>10	Total
Deficient Buffers	0	0	0	3	2	3	0	3	0	0	0	N/A	11
Crossings	8	0	0	0	0	0	0	0	0	0	0	N/A	8
Ditches and Pipes	10	0	0	0	0	0	0	0	0	0	0	N/A	10
Erosion	0	0	0	0	0	2	0	0	1	0	0	N/A	3
Head Cut	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Obstruction	0	0	0	0	0	1	0	1	0	0	0	N/A	2
Utility	0	0	0	1	0	0	0	0	0	0	0	0	1
<b>Total</b>	<b>18</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>6</b>	<b>0</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>35</b>



-  Fairfax County Boundary
- Habitat Rating**
-  Excellent
-  Good
-  Fair
-  Poor
-  Very Poor
-  No Habitat Assessment
-  Lakes and Ponds
-  Watersheds

**WATERSHED GROUP:  
LOWER POTOMAC**

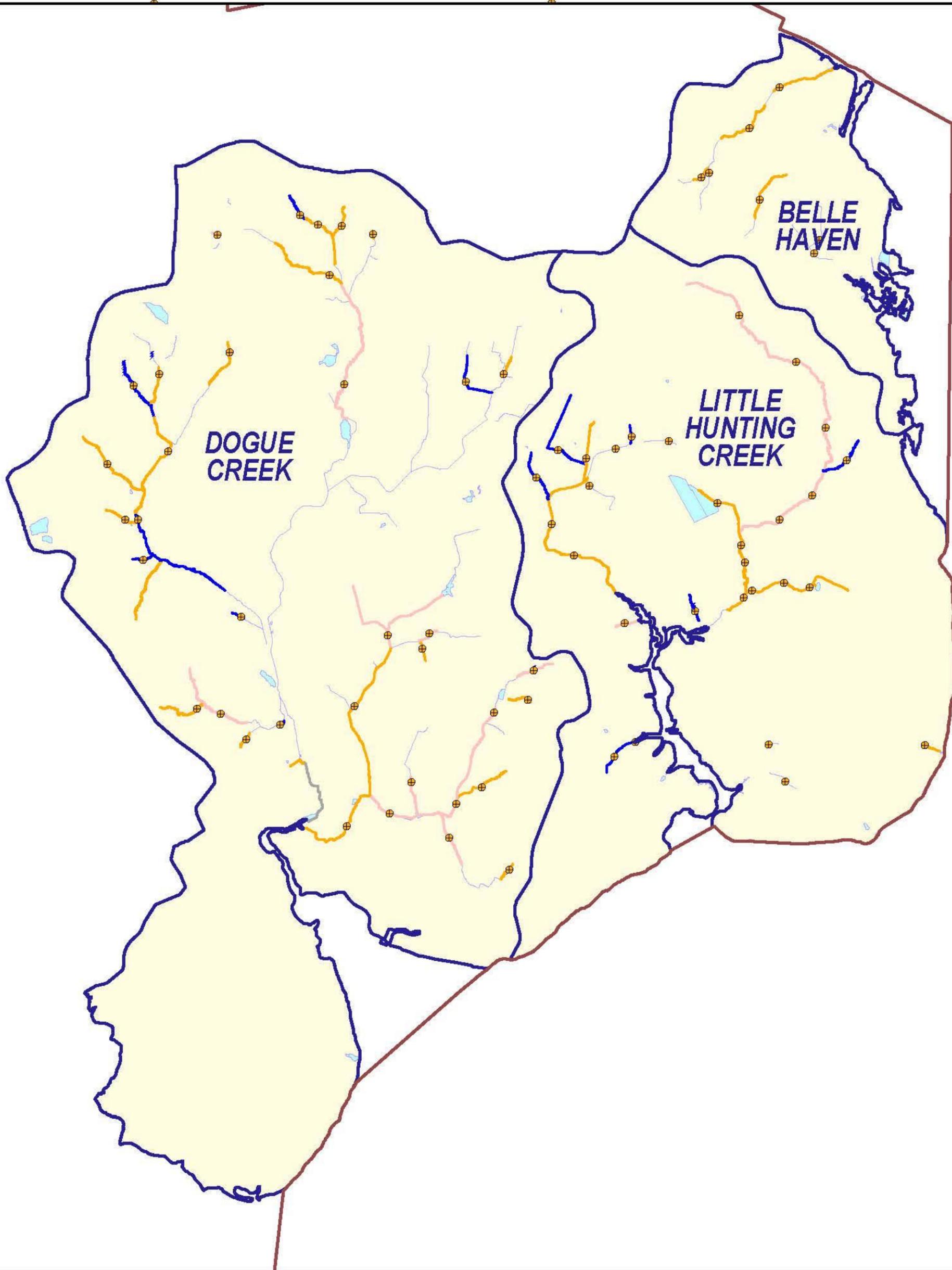


0 2000 4000 6000 8000 Feet



**Figure 3-38**  
**Habitat Assessment**  
**Lower Potomac Group**  
**Fairfax County Stream Physical Assessment**





**Inventory Types**

⊕ Cross Section

⚡ Head Cut

**CEM Stage**

⋯ Not Assigned

1

2

3

4

5

▭ Fairfax County Boundary

▭ Lakes and Ponds

▭ Streams

▭ Watersheds

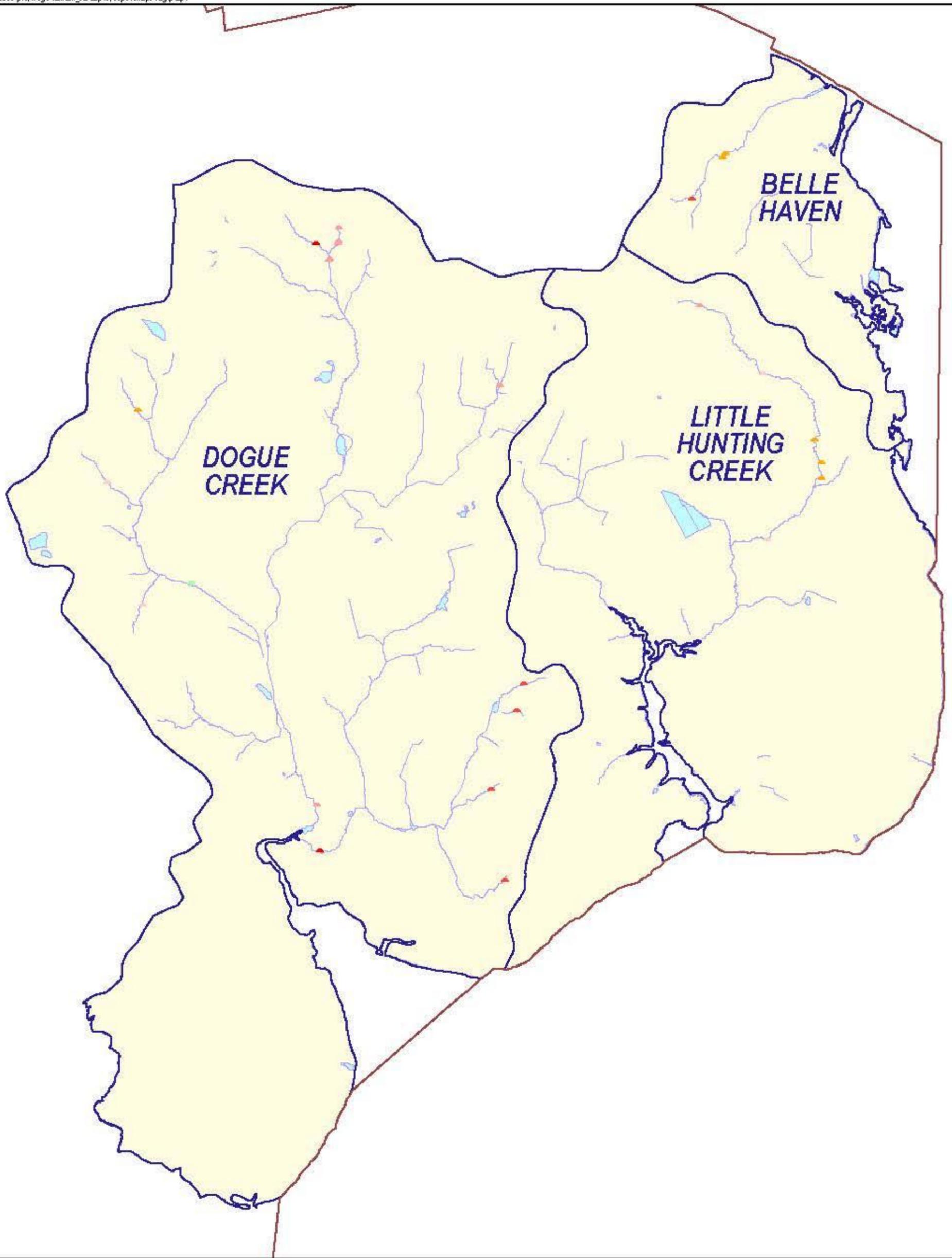
**WATERSHED GROUP:  
LOWER POTOMAC**



0 2000 4000 6000 8000 Feet

**Figure 3-39**  
**CEM Stages**  
**Lower Potomac Group**  
**Fairfax County Stream Physical Assessment**





Erosion by Impact Score

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

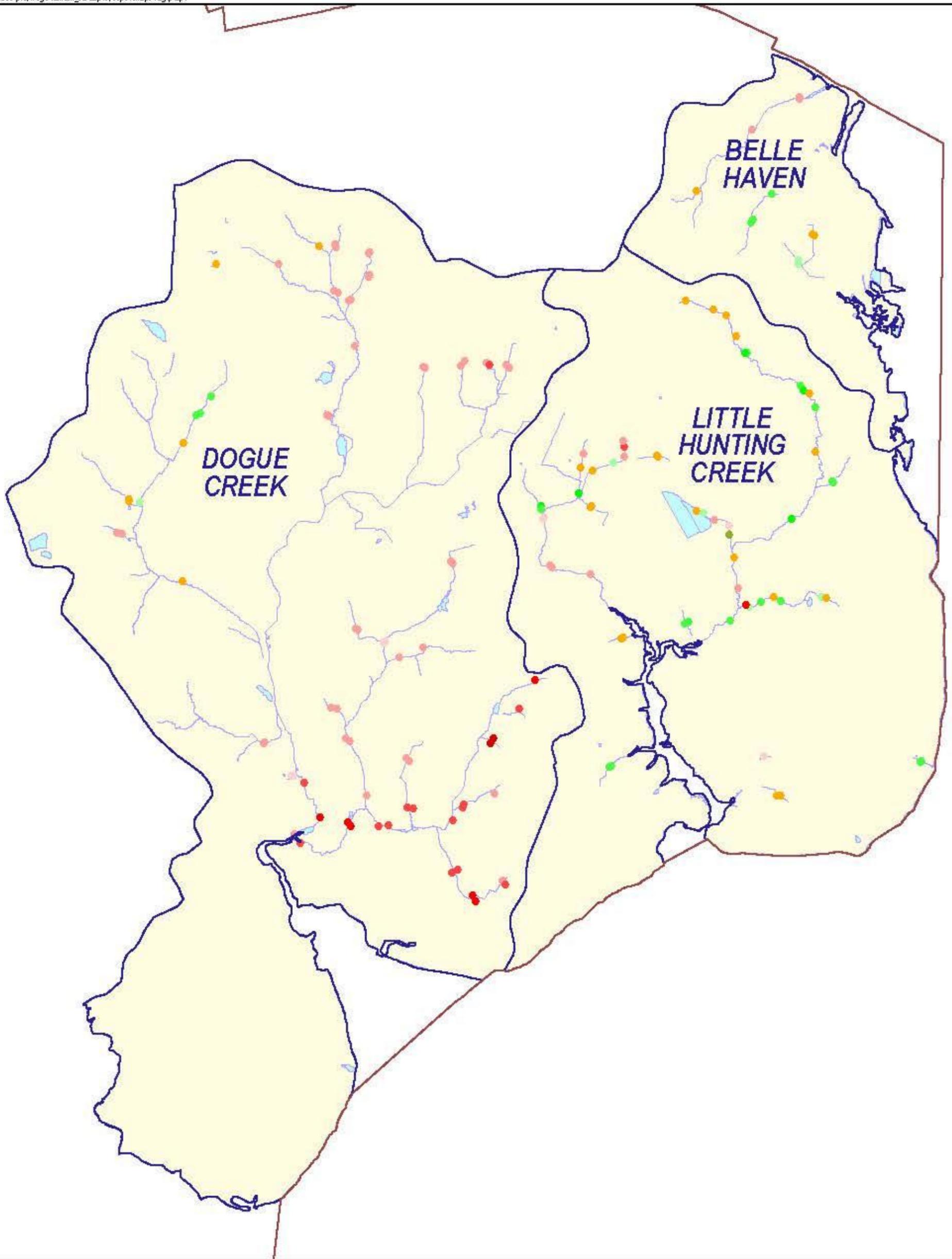
WATERSHED GROUP:  
LOWER POTOMAC



0 2000 4000 6000 8000 Feet

**Figure 3-40**  
**Erosion Impacts**  
**Lower Potomac Group**  
**Fairfax County Stream Physical Assessment**





Deficient Buffer by Impact Score

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- ▭ Fairfax County Boundary
- ▭ Lakes and Ponds
- ▭ Streams
- ▭ Watersheds

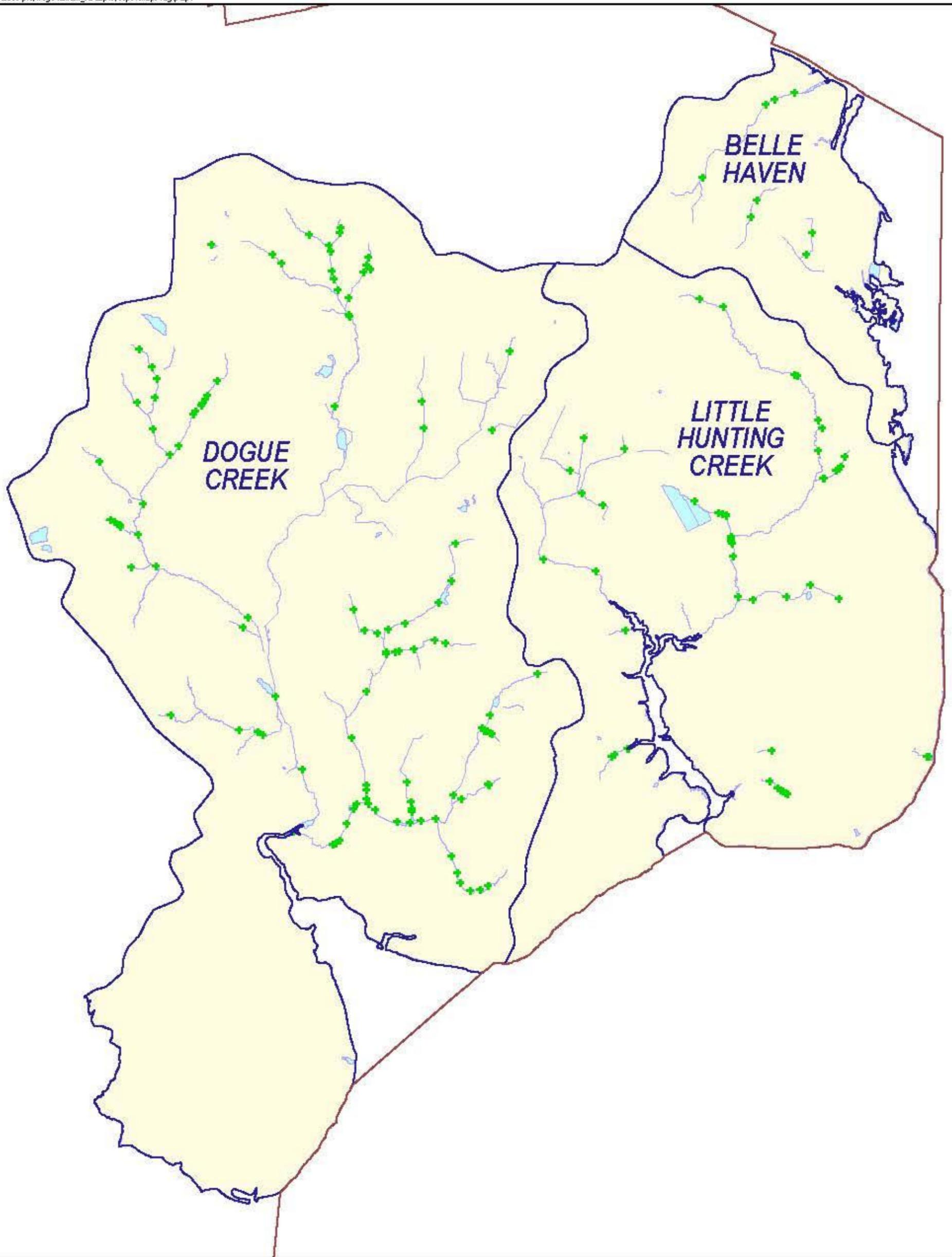
WATERSHED GROUP:  
LOWER POTOMAC



0 2000 4000 6000 8000 Feet

**Figure 3-41**  
**Deficient Buffer Impacts**  
**Lower Potomac Group**  
**Fairfax County Stream Physical Assessment**





**WATERSHED GROUP:  
LOWER POTOMAC**

**Figure 3-42  
Crossings  
Lower Potomac Group  
Fairfax County Stream Physical Assessment**

**Inventory Type**  
+ Crossing

-  Fairfax County Boundary
-  Lakes and Ponds
-  Streams
-  Watersheds

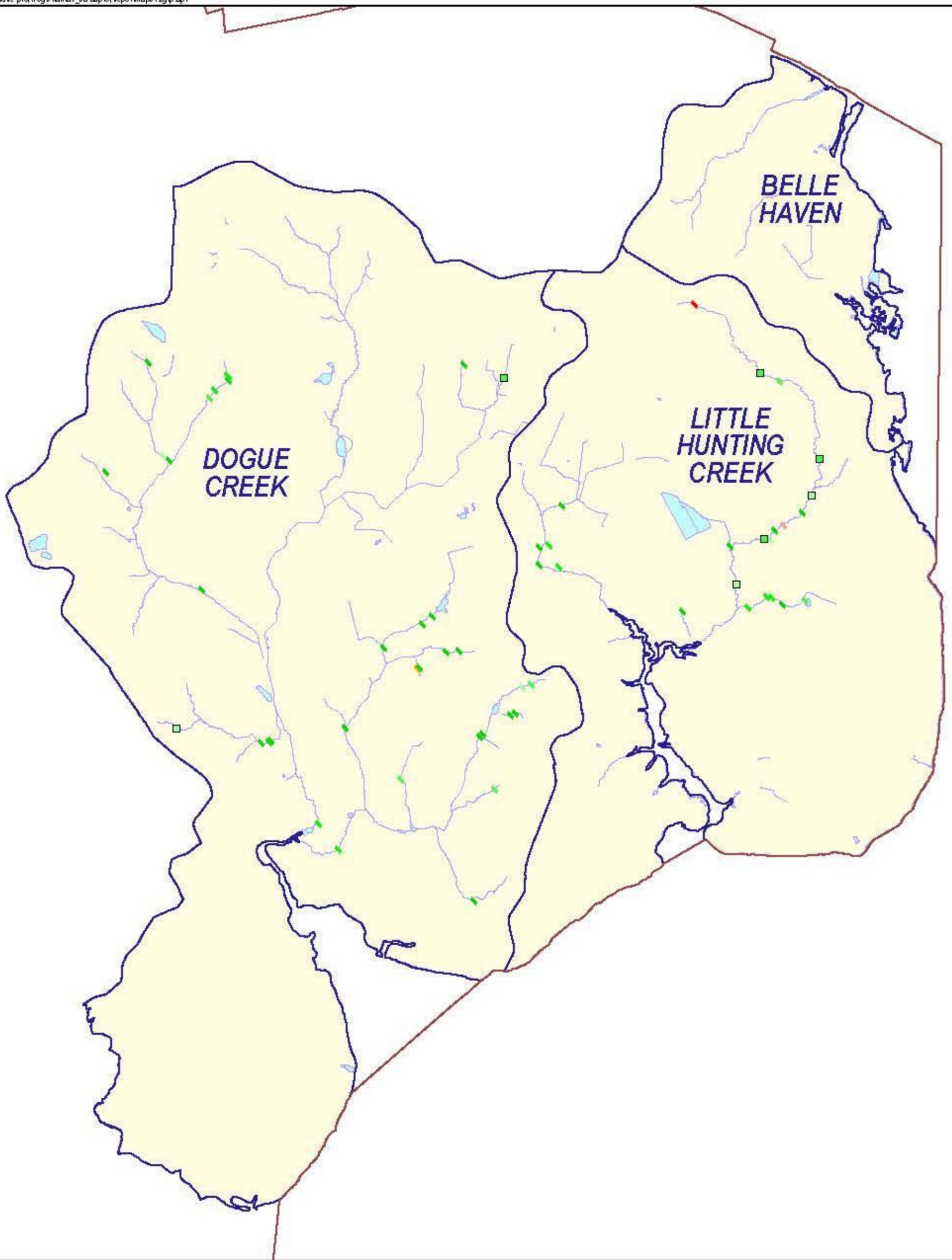


0 2000 4000 6000 8000 Feet



A horizontal scale bar with markings at 0, 2000, 4000, 6000, and 8000 feet.





Pipe / Ditch by Impact Score

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

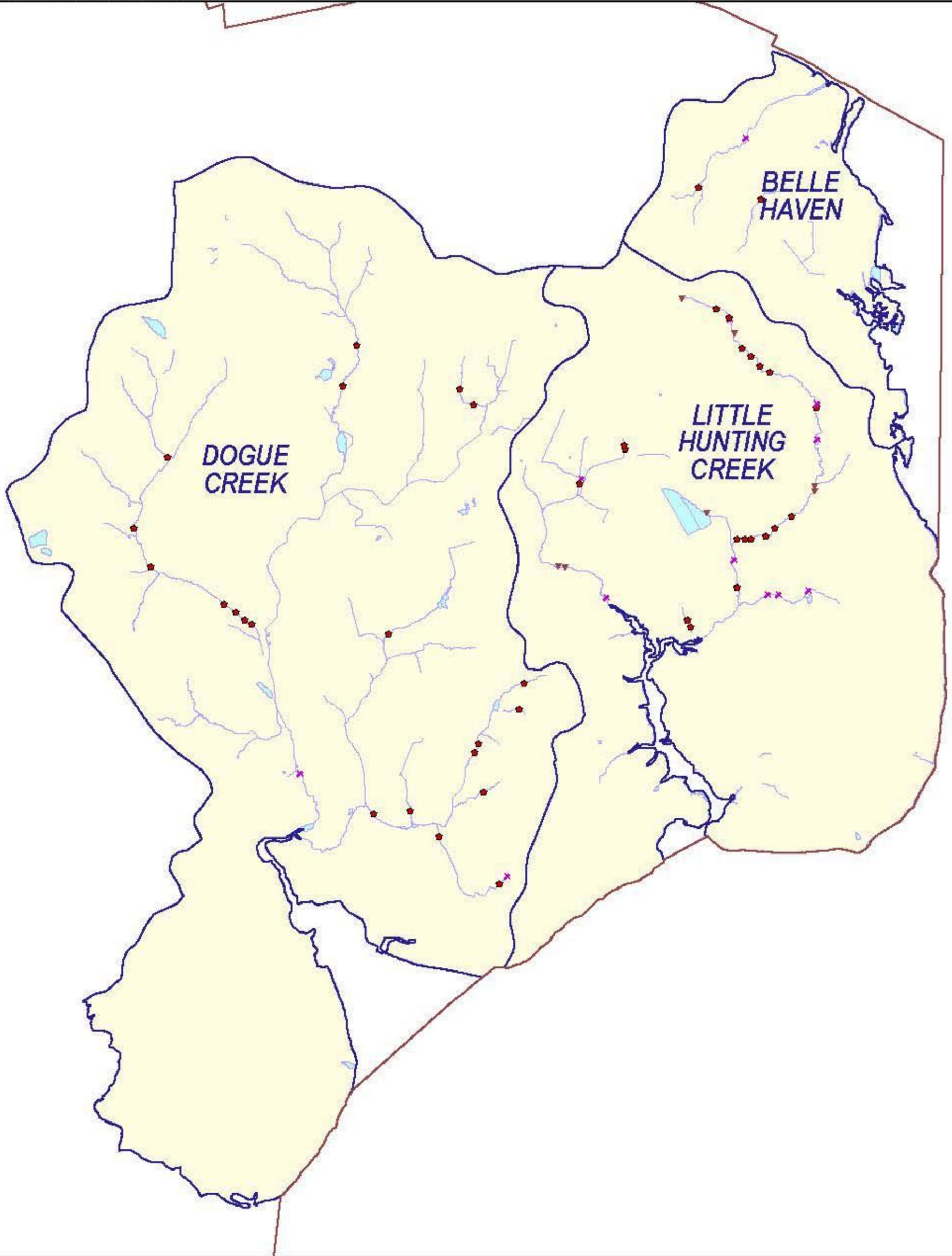
WATERSHED GROUP:  
LOWER POTOMAC



0 2000 4000 6000 8000 Feet

**Figure 3-43**  
**Pipe and Ditch Impacts**  
**Lower Potomac Group**  
**Fairfax County Stream Physical Assessment**





**Inventory Types**

- ▼ Dump
- ◆ Obstruction
- ✕ Utility

- ▭ Fairfax County Boundary
- ▭ Lakes and Ponds
- ▭ Streams
- ▭ Watersheds

**WATERSHED GROUP:  
LOWER POTOMAC**



**Figure 3-44**  
**Dumps, Obstructions, and Utilities**  
**Lower Potomac Group**  
**Fairfax County Stream Physical Assessment**



## 3.2.7 Accotink Creek Group Summary

### 3.2.7.1 Accotink Creek Watershed

**Description.** Accotink Creek Watershed is one of the largest watersheds in Fairfax County, with just over 91 miles of stream assessed. It is a long narrow watershed located in the center of the County. The watershed is contained entirely within the county boundaries, and drains to Accotink Bay, and then into Gunston Cove and the Potomac River.

**Habitat.** The habitat assessment results for Accotink Creek Watershed are summarized by stream in Table 3-35. Habitat scores for each reach are depicted in Figure 3-45. Based on a length weighted habitat score of 100 (Table 3-2), Accotink Creek Watershed is in the lower middle range of quality, compared to the rest of the County. Just over 3 miles of stream were categorized as having “very poor” habitat conditions, 26 miles as “poor,” 33 miles as “fair,” 25 miles as “good,” and 4 miles as “excellent.”

**CEM.** Based on the CEM evaluations 91 percent of the channels assessed in Accotink Creek Watershed are in Evolutionary Stage 3 (Table 3-3). Figure 3-46 summarizes the CEM results for Accotink Creek Watershed.

**Infrastructure.** The infrastructure inventory resulted in 1211 inventory points. The most significant problems were related to 15 deficient buffers, 4 head cuts, 2 exposed utility lines, and 1 pipe that were each given an impact score of 10. The infrastructure inventory results are summarized in Table 3-36. Figures 3-47, 3-48, 3-49, 3-50, and 3-51 summarize impact scores for the erosion problems; deficient buffers; crossings; pipes/ditches; and dumps, obstructions, and utilities, respectively.

TABLE 3-35  
Habitat Assessment Summary for Accotink Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Accotink Creek	1,372 (0.93)	38,013 (25.84)	45,305 (30.79)	57,502 (39.09)	4,927 (3.35)	147,119
Bear Branch	0 (0.00)	12,002 (42.18)	16,452 (57.82)	0 (0.00)	0 (0.00)	28,454
Calamo Run	0 (0.00)	0 (0.00)	7,655 (100.00)	0 (0.00)	0 (0.00)	7,655
Coon Branch	0 (0.00)	7,278 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)	7,278
Crook Branch	906 (6.01)	6,686 (44.31)	7,497 (49.68)	0 (0.00)	0 (0.00)	15,089
Daniels Run	5,082 (28.03)	3,898 (21.50)	9,149 (50.47)	0 (0.00)	0 (0.00)	18,129
Fieldlark Branch	0 (0.00)	0 (0.00)	523 (11.58)	3,988 (88.42)	0 (0.00)	4,511
Flag Run	0 (0.00)	0 (0.00)	6,504 (100.00)	0 (0.00)	0 (0.00)	6,504
Hunters Branch	0 (0.00)	3,501 (31.33)	0 (0.00)	7,672 (68.67)	0 (0.00)	11,173
Long Branch (Central)	0 (0.00)	0 (0.00)	18,564 (69.94)	7,979 (30.06)	0 (0.00)	26,543
Long Branch (North)	0 (0.00)	9,658 (64.86)	5,232 (35.14)	0 (0.00)	0 (0.00)	14,890
Long Branch (South)	0 (0.00)	0 (0.00)	2,651 (13.11)	9,432 (46.63)	8,144 (40.26)	20,227
Long Branch Tributary	0 (0.00)	0 (0.00)	0 (0.00)	2,739 (100.00)	0 (0.00)	2,739
Tributary to Accotink Creek	5,614 (5.64)	45,533 (45.76)	25,629 (25.76)	15,469 (15.55)	7,264 (7.30)	99,510
Tributary to Crook Branch	0 (0.00)	491 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)	491
Tributary to Hunters Branch	1,134 (28.20)	1,277 (31.75)	1,610 (40.05)	0 (0.00)	0 (0.00)	4,021
Tributary to Long Branch (Central)	0 (0.00)	8,398 (52.58)	7,574 (47.42)	0 (0.00)	0 (0.00)	15,972
Tributary to Long Branch (North)	2,271 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	2,271

TABLE 3-35  
Habitat Assessment Summary for Accotink Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Tributary to Long Branch (South)	0 (0.00)	1,035 (12.86)	3,424 (42.54)	3,590 (44.60)	0 (0.00)	8,049
Turkey Run	447 (4.17)	0 (0.00)	10,255 (95.83)	0 (0.00)	0 (0.00)	10,702
<b>Watershed Total</b>	<b>16,826 (3.73)</b>	<b>137,770 (30.53)</b>	<b>168,024 (37.23)</b>	<b>108,371 (24.01)</b>	<b>20,335 (4.51)</b>	<b>451,325</b>

TABLE 3-36  
Infrastructure Assessment Summary for Accotink Watershed  
*Fairfax County Stream Physical Assessment*

Impact Score	0	1	2	3	4	5	6	7	8	9	10	>10	Total
Deficient Buffers		1	16	55	97	66	18	44	1		15		313
Crossings	67	119	91	43	16	4	4	1					345
Ditches and Pipes	144	45	65	64	20	13	1	8	1		1		362
Erosion				1	6	12	2	18					39
Head Cut				3	4	1					4		12
Obstruction	2	1	2	46	19	27	4	4	5	1			111
Utility	2	1	1	12	4		5	2			2		29
<b>Total</b>	<b>215</b>	<b>167</b>	<b>175</b>	<b>224</b>	<b>166</b>	<b>123</b>	<b>34</b>	<b>77</b>	<b>7</b>	<b>1</b>	<b>22</b>	<b>0</b>	<b>1211</b>



-  Fairfax County Boundary
- Habitat Rating**
-  Excellent
-  Good
-  Fair
-  Poor
-  Very Poor
-  No Habitat Assessment
-  Lakes and Ponds
-  Watersheds

**WATERSHED GROUP:  
ACCOTINK CREEK**



0 3000 6000 9000 12000 Feet



**Figure 3-45**  
**Habitat Assessment**  
**Accotink Creek Group**  
**Fairfax County Stream Physical Assessment**





**Inventory Types**

- Cross Section
- ⚡ Head Cut

**CEM Stage**

- Not Assigned
- 1
- 2
- 3
- 4
- 5

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

**WATERSHED GROUP:  
ACCOTINK CREEK**



0 3000 6000 9000 12000 Feet



**Figure 3-46**  
**CEM Categories**  
**Accotink Creek Group**  
**Fairfax County Stream Physical Assessment**





Erosion by Impact Score

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

WATERSHED GROUP:  
ACCOTINK CREEK

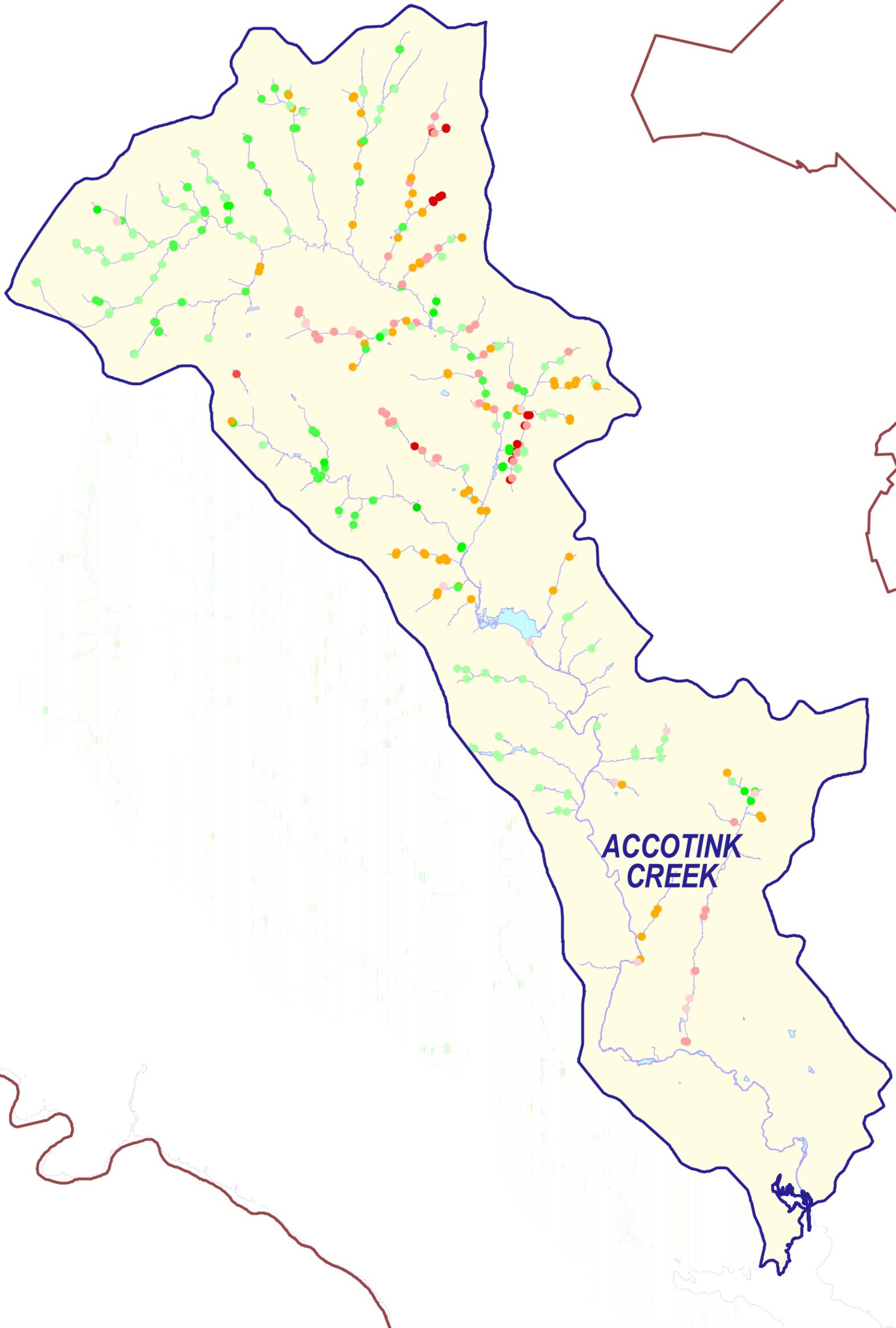


0 3000 6000 9000 12000 Feet



**Figure 3-47**  
**Erosion Impacts**  
**Accotink Creek Group**  
**Fairfax County Stream Physical Assessment**





Deficient Buffer by Impact Score

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

-  Fairfax County Boundary
-  Lakes and Ponds
-  Streams
-  Watersheds

WATERSHED GROUP:  
ACCOTINK CREEK

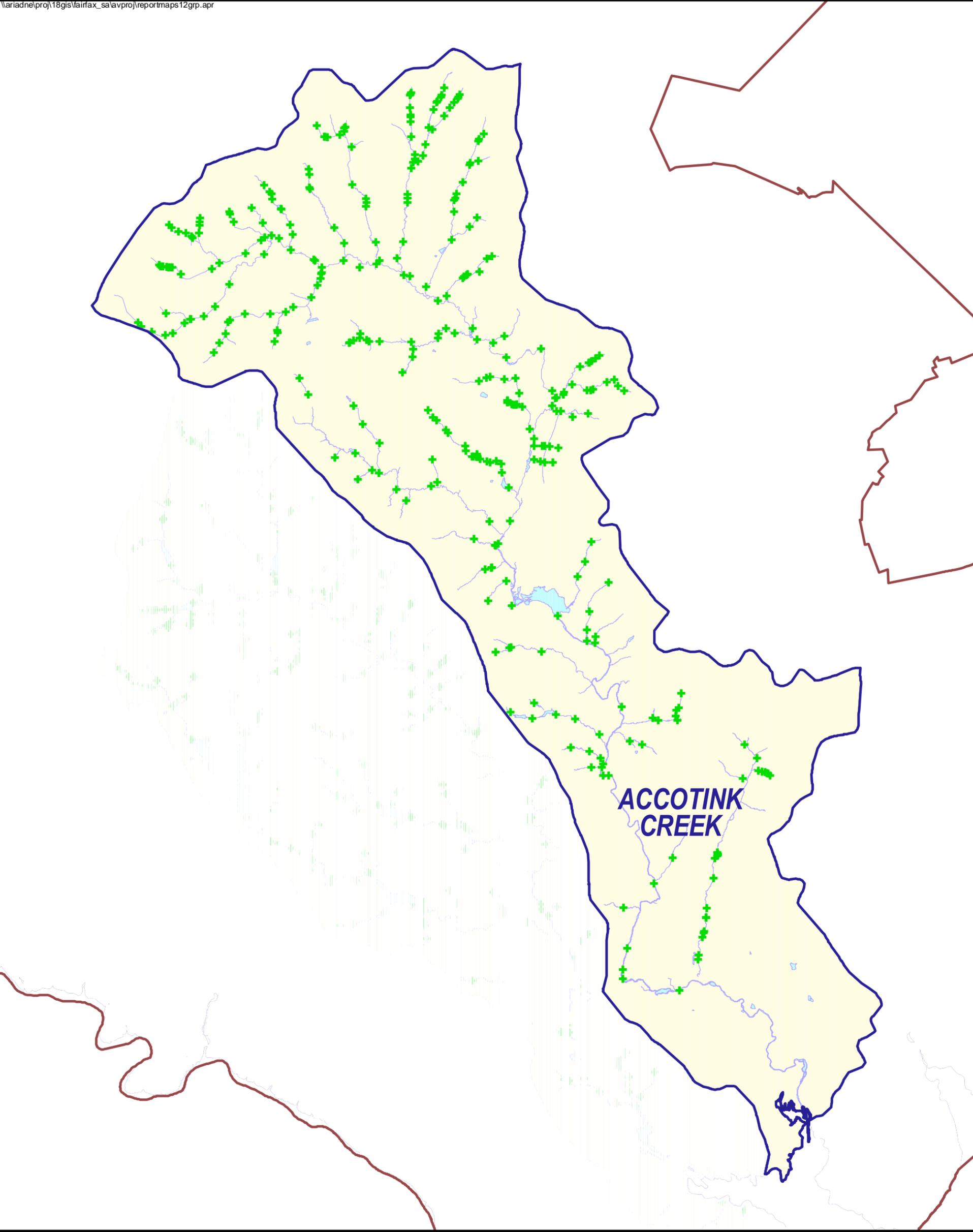


0 3000 6000 9000 12000 Feet



Figure 3-48  
Deficient Buffer Impacts  
Accotink Creek Group  
Fairfax County Stream Physical Assessment





**WATERSHED GROUP:  
ACCOTINK CREEK**

Inventory Type  
+ Crossing

-  Fairfax County Boundary
-  Lakes and Ponds
-  Streams
-  Watersheds

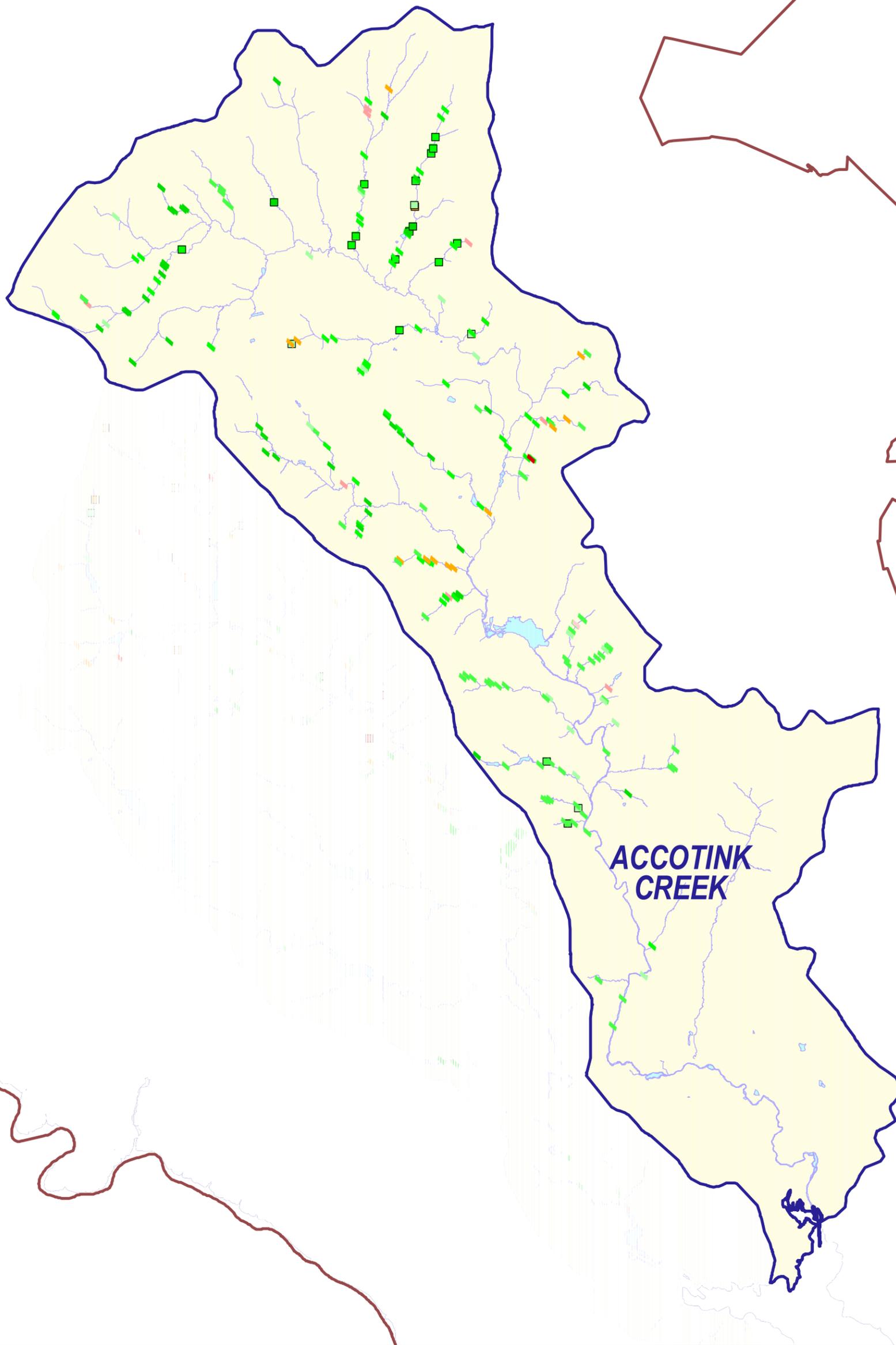


0 3000 6000 9000 12000 Feet



**Figure 3-49  
Crossings  
Accotink Creek Group  
Fairfax County Stream Physical Assessment**





Pipe / Ditch by Impact Score

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

WATERSHED GROUP:  
ACCOTINK CREEK

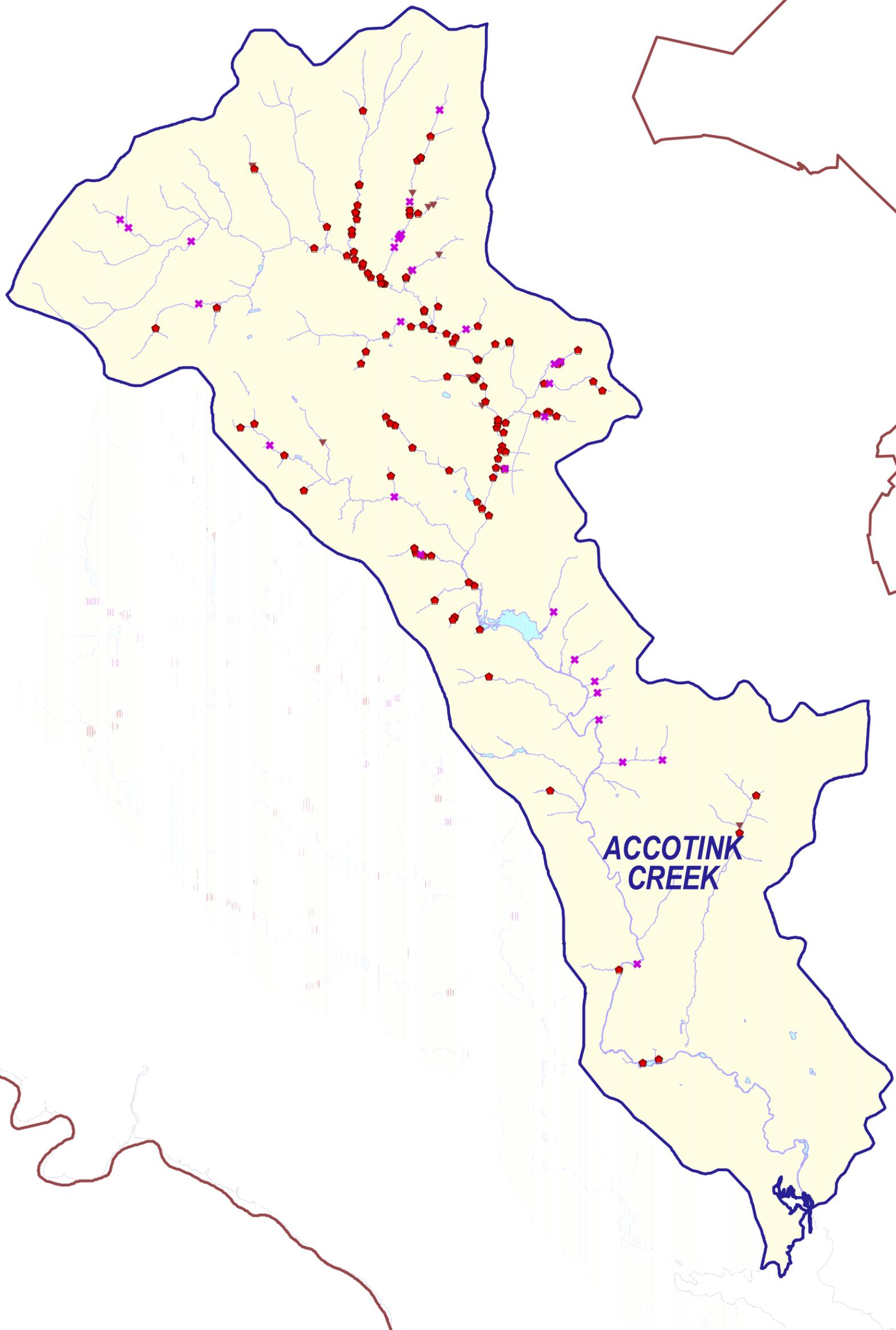


0 3000 6000 9000 12000 Feet



Figure 3-50  
Pipe and Ditch Impacts  
Accotink Creek Group  
Fairfax County Stream Physical Assessment





**WATERSHED GROUP:  
ACCOTINK CREEK**

**Figure 3-51  
Dumps, Obstructions, and Utilities  
Accotink Creek Group  
Fairfax County Stream Physical Assessment**

**Inventory Types**

- ▼ Dump
- ◆ Obstruction
- \* Utility

- ▭ Fairfax County Boundary
- ▭ Lakes and Ponds
- ▭ Streams
- ▭ Watersheds



0 3000 6000 9000 12000 Feet



## 3.2.8 Pohick Creek Summary

### 3.2.8.1 Pohick Creek Watershed

**Description.** Pohick Creek Watershed is one of the largest watersheds in Fairfax County, with just over 69 miles of stream assessed. It is a long narrow watershed located in the center of the County. The watershed is contained entirely within the county boundaries, and drains to Pohick Bay, and then into Gunston Cove and the Potomac River.

**Habitat.** The habitat assessment results for Pohick Creek Watershed are summarized by stream in Table 3-37. Habitat scores for each reach are depicted in Figure 3-52. Based on a length weighted habitat score of 95, Pohick Creek Watershed is one of the poorest quality watersheds, compared to the rest of the County. Approximately 2 miles of stream were categorized as having “very poor” habitat conditions, 20 miles as “poor,” 37 miles as “fair,” and 10 miles as “good.”

**CEM.** Based on the CEM evaluations approximately three quarters of the channels assessed in Pohick Creek Watershed are in Evolutionary Stage 3 (Table 3-3), with most of the remainder of the watershed in Stage 4. Figure 3-53 summarizes the CEM results for Pohick Creek Watershed.

**Infrastructure.** The infrastructure inventory resulted in 871 inventory points. The most significant problems were related to four head cuts, two exposed utility lines and one pipe, which were each given an impact score of 10. The infrastructure inventory results are summarized in Table 3-38. Figures 3-54, 3-55, 3-56, 3-57, and 3-58 summarize impact scores for the erosion problems; deficient buffers; crossings; pipes/ditches; and dumps, obstructions, and utilities, respectively.

TABLE 3-37  
Habitat Assessment Summary for Pohick Creek Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Cherry Run	0 (0.00)	0 (0.00)	1,308 (12.70)	8,993 (87.30)	0 (0.00)	10,301
Middle Run	0 (0.00)	0 (0.00)	0 (0.00)	8,855 (100.00)	0 (0.00)	8,855
Oppossum Branch	0 (0.00)	3,366 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)	3,366
Peyton Run	0 (0.00)	0 (0.00)	6,163 (100.00)	0 (0.00)	0 (0.00)	6,163
Pohick Creek	7,570 (7.18)	17,693 (16.79)	68,116 (64.63)	12,020 (11.40)	0 (0.00)	105,399
Rabbit Branch	0 (0.00)	5,914 (19.09)	25,059 (80.91)	0 (0.00)	0 (0.00)	30,972
Rocky Branch	0 (0.00)	0 (0.00)	3,535 (100.00)	0 (0.00)	0 (0.00)	3,535
Sangster Branch	0 (0.00)	0 (0.00)	2,274 (100.00)	0 (0.00)	0 (0.00)	2,274
Sideburn Branch	0 (0.00)	7,866 (53.06)	6,959 (46.94)	0 (0.00)	0 (0.00)	14,825
Silver Brook	0 (0.00)	3,728 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)	3,728
South Run	0 (0.00)	492 (2.31)	8,463 (39.69)	12,370 (58.01)	0 (0.00)	21,325
Tributary to Crooked Branch	0 (0.00)	503 (8.99)	5,092 (91.01)	0 (0.00)	0 (0.00)	5,595
Tributary to Middle Run	0 (0.00)	297 (2.50)	10,795 (90.71)	809 (6.80)	0 (0.00)	11,901
Tributary to Pohick Creek	0 (0.00)	27,212 (43.31)	27,172 (43.25)	8,443 (13.44)	0 (0.00)	62,828
Tributary to Rabbit Branch	4,943 (27.65)	5,003 (27.99)	5,801 (32.45)	2,128 (11.91)	0 (0.00)	17,876
Tributary to Sideburn Branch	0 (0.00)	16,644 (72.40)	6,346 (27.60)	0 (0.00)	0 (0.00)	22,990
Tributary to South Run	0 (0.00)	14,226 (41.02)	20,457 (58.98)	0 (0.00)	0 (0.00)	34,683
<b>Watershed Total</b>	<b>12,514 (3.41)</b>	<b>102,945 (28.08)</b>	<b>197,539 (53.88)</b>	<b>53,618 (14.63)</b>	<b>0 (0.00)</b>	<b>366,615</b>

**TABLE 3-38**  
 Infrastructure Assessment Summary for Pohick Creek Watershed  
*Fairfax County Stream Physical Assessment*

<b>Impact Score</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>&gt;10</b>	<b>Total</b>
Deficient Buffers	0	0	18	26	64	48	14	9	4	0	0	N/A	183
Crossings	136	66	50	21	10	10	2	1	1	0	0	N/A	297
Ditches and Pipes	162	17	12	10	20	24	6	4	1	3	1	N/A	260
Erosion	0	0	0	0	2	7	15	13	8	2	0	N/A	47
Head Cut	0	0	1	0	4	4	2	0	0	1	4	N/A	16
Obstruction	8	7	5	12	12	5	0	0	0	1	0	N/A	50
Utility	0	0	0	1	4	4	5	1	1	0	2	0	18
<b>Total</b>	<b>306</b>	<b>90</b>	<b>86</b>	<b>70</b>	<b>116</b>	<b>102</b>	<b>44</b>	<b>28</b>	<b>15</b>	<b>7</b>	<b>7</b>	<b>0</b>	<b>871</b>



-  Fairfax County Boundary
- Habitat Rating**
-  Excellent
-  Good
-  Fair
-  Poor
-  Very Poor
-  No Habitat Assessment
-  Lakes and Ponds
-  Watersheds

**WATERSHED GROUP:  
POHICK CREEK**



0 3000 6000 9000 12000 Feet



**Figure 3-52**  
**Habitat Assessment**  
**Pohick Creek**  
**Fairfax County Stream Physical Assessment**





Inventory Types

- Cross Section
- ⚡ Head Cut

CEM Stage

- Not Assigned
- 1
- 2
- 3
- 4
- 5

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

WATERSHED GROUP:  
POHICK CREEK



0 3000 6000 9000 12000 Feet



**Figure 3-53**  
**CEM Stages**  
**Pohick Creek**  
**Fairfax County Stream Physical Assessment**





Erosion by Impact Score

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

WATERSHED GROUP:  
POHICK CREEK



0 3000 6000 9000 12000 Feet



Figure 3-54  
Erosion Impacts  
Pohick Creek  
Fairfax County Stream Physical Assessment





Deficient Buffer by Impact Score

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- ▭ Fairfax County Boundary
- ▭ Lakes and Ponds
- ▭ Streams
- ▭ Watersheds

WATERSHED GROUP:  
POHICK CREEK

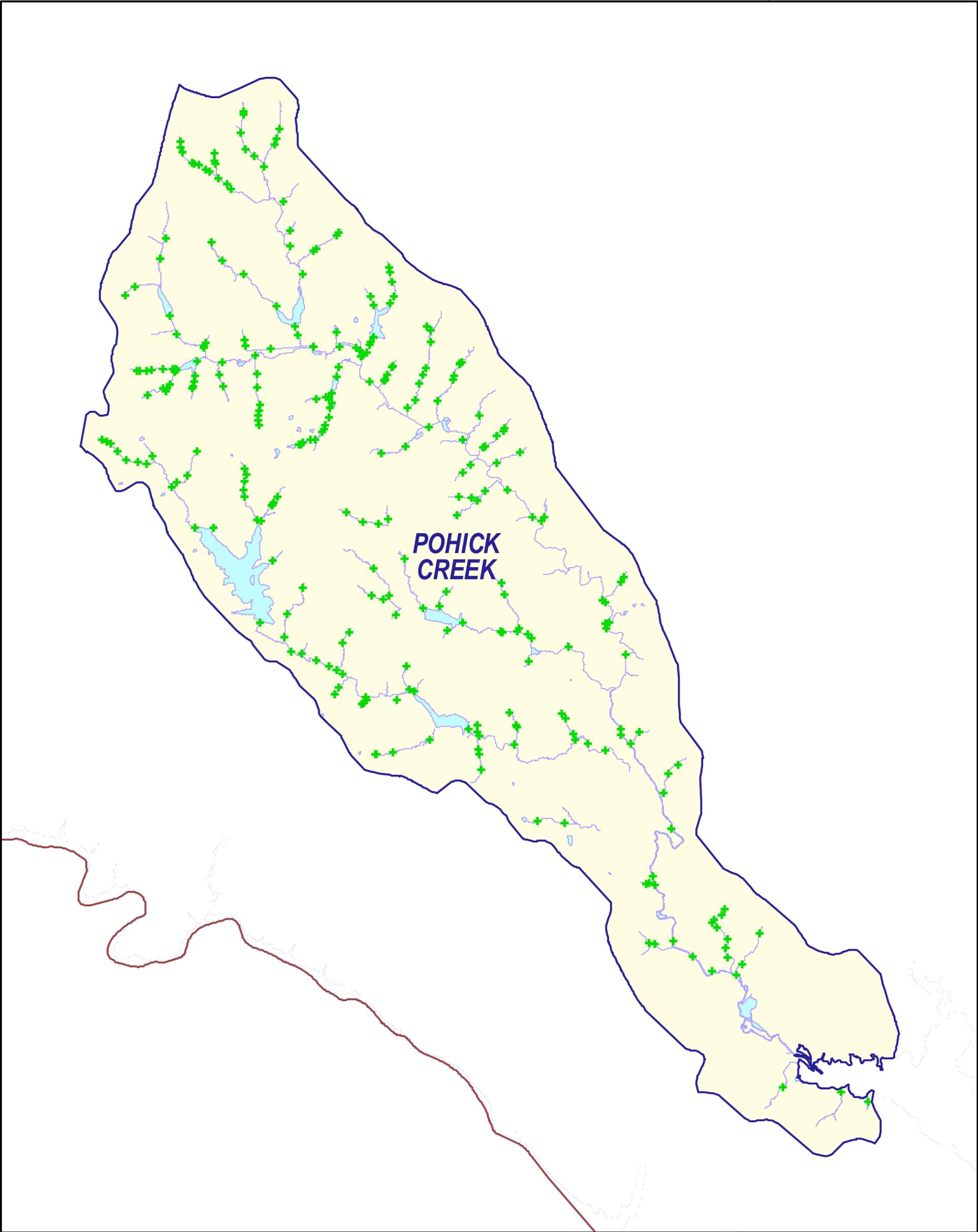


0 3000 6000 9000 12000 Feet



Figure 3-55  
Deficient Buffer Impacts  
Pohick Creek  
Fairfax County Stream Physical Assessment





**WATERSHED GROUP:  
POHICK CREEK**

**Figure 3-56  
Crossings  
Pohick Creek**

**Fairfax County Stream Physical Assessment**

**Inventory Type**

-  Crossing
-  Fairfax County Boundary
-  Lakes and Ponds
-  Streams
-  Watersheds



0 3000 6000 9000 12000 Feet





Pipe / Ditch by Impact Score

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

WATERSHED GROUP:  
POHICK CREEK



0 3000 6000 9000 12000 Feet



Figure 3-57  
Pipe and Ditch Impacts  
Pohick Creek  
Fairfax County Stream Physical Assessment





Inventory Types

- ▼ Dump
- ◆ Obstruction
- \* Utility

- ▭ Fairfax County Boundary
- ▭ Lakes and Ponds
- ▭ Streams
- ▭ Watersheds

WATERSHED GROUP:  
POHICK CREEK



0 3000 6000 9000 12000 Feet

Figure 3-58  
Dumps, Obstructions, and Utilities  
Pohick Creek  
Fairfax County Stream Physical Assessment



## 3.2.9 Upper Bull Run Group Summary

### 3.2.9.1 Cub Run Watershed

**Description.** Cub Run Watershed is a large watershed, with approximately 75 miles of stream assessed. The watershed encompasses most of the eastern end of the County, with the upper portion of the watershed is located in Loudoun County. Cub Run drains to Bull Run, which eventually joins the Occoquan River.

**Habitat.** The habitat assessment results for Cub Run Watershed are summarized by stream in Table 3-39. Habitat scores for each reach are depicted in Figure 3-59. Based on a length weighted habitat score of 110 (Table 3-2), Cub Run Watershed is in the upper middle range of quality, compared to the rest of the County. Approximately 1 mile of stream was categorized as having “very poor” habitat conditions, 13 miles as “poor,” 24 miles as “fair,” and 28 miles as “good,” and 8 miles as “excellent.”

**CEM.** Based on the CEM evaluations approximately 60 percent of the channels assessed in Cub Run Watershed are in Evolutionary Stage 3 (Table 3-3) and most of the rest are in Stage 4. Figure 3-60 summarizes the CEM results for Cub Run Watershed.

**Infrastructure.** The infrastructure inventory resulted in 1473 inventory points. The most significant problem was related to 20 deficient buffers as well as a variety of other infrastructures with an impact score of 10. Figures 3-61, 3-62, 3-63, 3-64, and 3-65 summarize impact scores for the erosion problems; deficient buffers; crossings; pipes/ditches; and dumps, obstructions, and utilities, respectively.

### 3.2.9.2 Bull Run Watershed

**Description.** Bull Run Watershed is a medium-sized watershed, with approximately 13 miles of stream assessed. It is located at the eastern most portion of the County. The watershed consists of many small tributaries to Bull Run, with some of the upper most headwaters located in Loudoun County. Bull Run eventually drains into the Occoquan River.

**Habitat.** The habitat assessment results for Bull Run Watershed are summarized by stream in Table 3-41. Habitat scores for each reach are depicted in Figure 3-59. Based on a length weighted habitat score of 108 (Table 3-2), Bull Run Watershed is in the upper middle range of quality, compared to the rest of the County. Just over 1 mile of stream was categorized as having “poor” habitat conditions; 8 miles were “fair,” and 4 miles were “good.”

**CEM.** Based on the CEM evaluations approximately two thirds of the channels assessed in Bull Run Watershed are in Evolutionary Stage 3 (Table 3-3) with the remainder in Stage 2. Figure 3-60 summarizes the CEM results for Bull Run Watershed.

**Infrastructure.** The infrastructure inventory resulted in 59 inventory points. The most significant problems were related to a crossing that was given an impact score of 8 and five deficient buffers that were given an impact score of 7. The infrastructure inventory results are summarized in Table 3-42. Figures 3-61, 3-62, 3-63, 3-64, and 3-65 summarize impact scores for the erosion problems; deficient buffers; crossings; pipes/ditches; and dumps, obstructions, and utilities, respectively.

TABLE 3-39  
Habitat Assessment Summary for Cub Run Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Big Rocky Run	0 (0.00)	5,415 (7.16)	24,886 (32.90)	24,549 (32.45)	20,802 (27.50)	75,653
Cain Branch	0 (0.00)	0 (0.00)	4,901 (37.10)	8,307 (62.90)	0 (0.00)	13,208
Cub Run	753 (0.88)	19,278 (22.61)	19,837 (23.26)	39,805 (46.68)	5,607 (6.57)	85,279
Dead Run	0 (0.00)	2,253 (28.19)	0 (0.00)	5,740 (71.81)	0 (0.00)	7,993
Elklick Run	0 (0.00)	561 (1.52)	17,257 (46.90)	14,563 (39.58)	4,414 (12.00)	36,794
Flatlick Branch	0 (0.00)	4,835 (12.02)	23,571 (58.58)	10,596 (26.34)	1,234 (3.07)	40,236
Frog Branch	0 (0.00)	0 (0.00)	0 (0.00)	7,716 (100.00)	0 (0.00)	7,716
Oxlick Branch	0 (0.00)	8,157 (60.55)	3,018 (22.40)	2,297 (17.05)	0 (0.00)	13,472
Round Lick Branch	0 (0.00)	4,782 (24.31)	6,178 (31.40)	7,104 (36.11)	1,609 (8.18)	19,673
Sand Branch	0 (0.00)	0 (0.00)	0 (0.00)	769 (100.00)	0 (0.00)	769
Schneider Branch	0 (0.00)	5,212 (27.12)	3,938 (20.49)	10,066 (52.38)	0 (0.00)	19,217
Tributary to Big Rocky Run	0 (0.00)	3,245 (20.14)	3,983 (24.73)	8,880 (55.13)	0 (0.00)	16,108
Tributary to Bull Run	0 (0.00)	0 (0.00)	922 (24.05)	405 (10.57)	2,507 (65.38)	3,834
Tributary to Cub Run	0 (0.00)	12,573 (37.44)	11,203 (33.36)	5,792 (17.25)	4,016 (11.96)	33,583
Tributary to Flatlick Branch	6,096 (32.88)	4,364 (23.53)	4,974 (26.83)	3,108 (16.76)	0 (0.00)	18,542
Tributary to Frog Branch	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1,693 (100.00)	1,693
<b>Watershed Total</b>	<b>6,849 (1.74)</b>	<b>70,675 (17.95)</b>	<b>124,669 (31.66)</b>	<b>149,697 (38.02)</b>	<b>41,882 (10.64)</b>	<b>393,770</b>

TABLE 3-40  
Infrastructure Assessment Summary for Cub Run Watershed  
*Fairfax County Stream Physical Assessment*

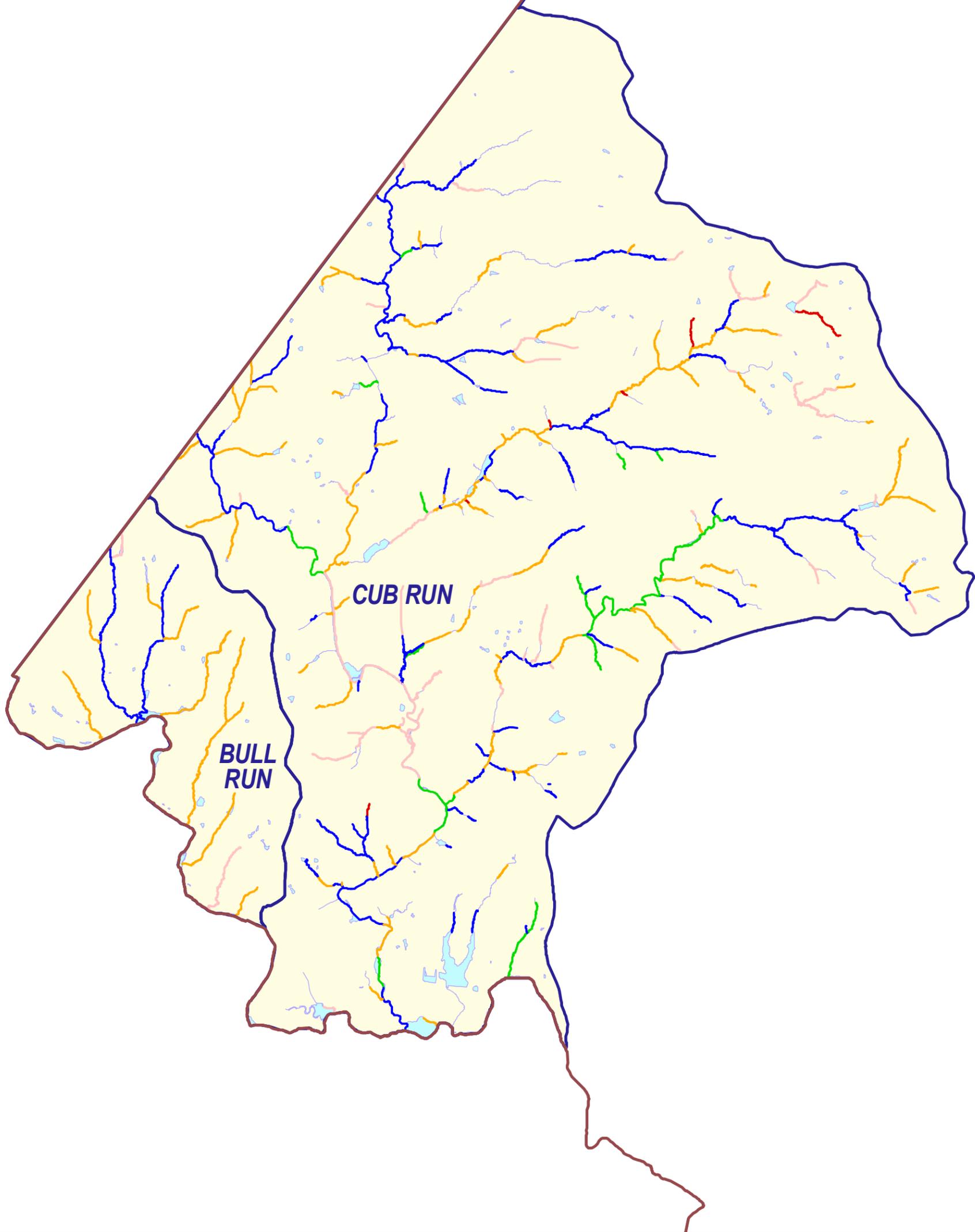
<b>Impact Score</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>&gt;10</b>	<b>Total</b>
Deficient Buffers	0	6	88	65	46	125	14	43	8	2	20	N/A	417
Crossings	73	113	81	19	11	16	2	5	1	0	1	N/A	322
Ditches and Pipes	232	66	57	22	6	27	5	3	5	1	5	N/A	429
Erosion	0	0	5	8	10	41	12	26	1	1	2	N/A	106
Head Cut	0	0	1	7	6	3	1	0	0	0	8	N/A	26
Obstruction	12	2	14	45	20	24	7	11	9	4	4	N/A	152
Utility	10	1	1	3	0	2	0	2	0	0	2	0	21
<b>Total</b>	<b>327</b>	<b>188</b>	<b>247</b>	<b>169</b>	<b>99</b>	<b>238</b>	<b>41</b>	<b>90</b>	<b>24</b>	<b>8</b>	<b>42</b>	<b>0</b>	<b>1473</b>

TABLE 3-41  
Habitat Assessment Summary for Bull Run Watershed  
*Fairfax County Stream Physical Assessment*

<b>Stream</b>	<b>Linear Feet (Percent) of Stream</b>					<b>Total</b>
	<b>Very Poor</b>	<b>Poor</b>	<b>Fair</b>	<b>Good</b>	<b>Excellent</b>	
Tributary to Bull Run	0 (0.00)	6,443 (9.34)	40,594 (58.83)	21,970 (31.84)	0 (0.00)	69,007
<b>Watershed Total</b>	<b>0 (0.00)</b>	<b>6,443 (9.34)</b>	<b>40,594 (58.83)</b>	<b>21,970 (31.84)</b>	<b>0 (0.00)</b>	<b>69,007</b>

TABLE 3-42  
Infrastructure Assessment Summary for Bull Run Watershed  
*Fairfax County Stream Physical Assessment*

<b>Impact Score</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>&gt;10</b>	<b>Total</b>
Deficient Buffers	0	0	2	13	0	5	4	5	0	0	0	N/A	29
Crossings	0	5	8	3	2	0	1	0	1	0	0	N/A	20
Ditches and Pipes	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Erosion	0	0	0	0	0	1	0	0	0	0	0	N/A	1
Head Cut	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Obstruction	2	0	1	3	2	0	0	0	0	0	0	N/A	8
Utility	0	0	0	0	0	1	0	0	0	0	0	0	1
<b>Total</b>	<b>2</b>	<b>5</b>	<b>11</b>	<b>19</b>	<b>4</b>	<b>7</b>	<b>5</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>59</b>



-  Fairfax County Boundary
- Habitat Rating**
-  Excellent
-  Good
-  Fair
-  Poor
-  Very Poor
-  No Habitat Assessment
-  Lakes and Ponds
-  Watersheds

**WATERSHED GROUP:  
UPPER BULL RUN**



0 3000 6000 9000 12000 Feet



**Figure 3-59**  
**Habitat Assessment**  
**Upper Bull Run Group**  
**Fairfax County Stream Physical Assessment**





Inventory Types

- Cross Section
- ⚡ Head Cut

CEM Stage

- ⚡ Not Assigned
- 1
- 2
- 3
- 4
- 5

- ▭ Fairfax County Boundary
- ▭ Lakes and Ponds
- ▭ Streams
- ▭ Watersheds

WATERSHED GROUP:  
UPPER BULL RUN



0 3000 6000 9000 12000 Feet



Figure 3-60  
CEM Stages  
Upper Bull Run Group  
Fairfax County Stream Physical Assessment





Erosion by Impact Score

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

WATERSHED GROUP:  
UPPER BULL RUN

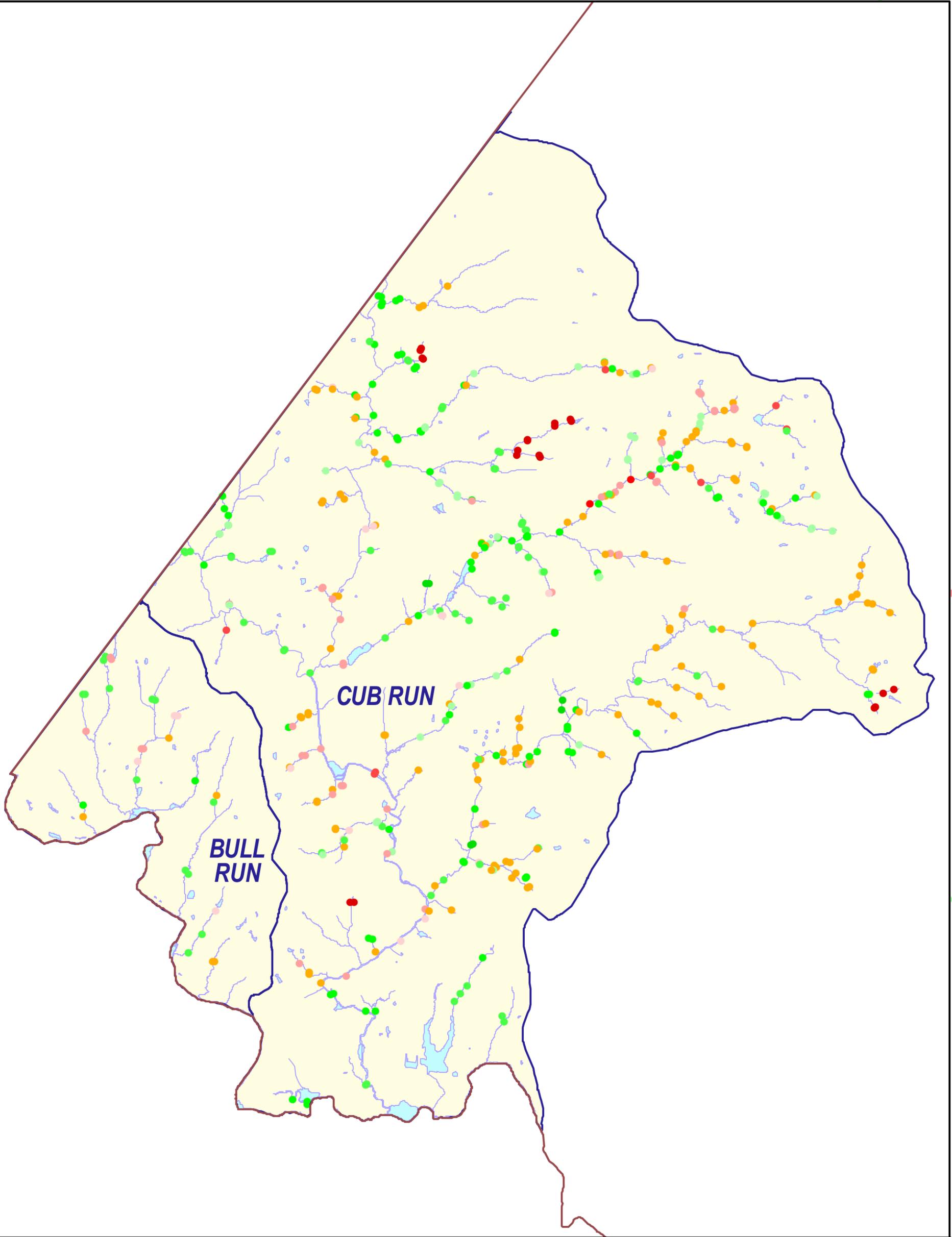


0 3000 6000 9000 12000 Feet



Figure 3-61  
Erosion Impacts  
Upper Bull Run Group  
Fairfax County Stream Physical Assessment





Deficient Buffer by Impact Score

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- ▭ Fairfax County Boundary
- ▭ Lakes and Ponds
- ▭ Streams
- ▭ Watersheds

WATERSHED GROUP:  
UPPER BULL RUN

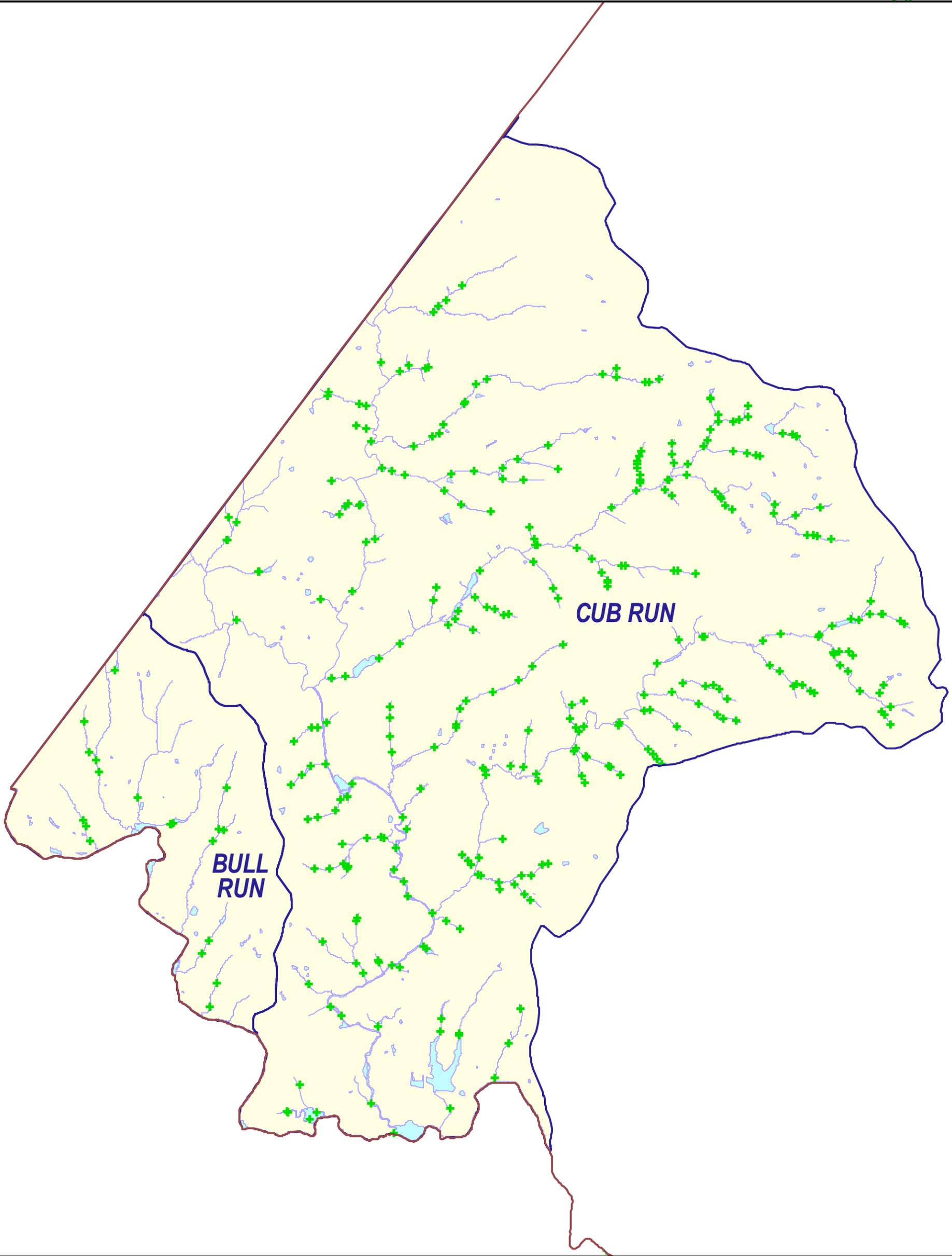


0 3000 6000 9000 12000 Feet



Figure 3-62  
Deficient Buffer Impacts  
Upper Bull Run Group  
Fairfax County Stream Physical Assessment





**WATERSHED GROUP:  
UPPER BULL RUN**



**Inventory Type**

-  Crossing
-  Fairfax County Boundary
-  Lakes and Ponds
-  Streams
-  Watersheds



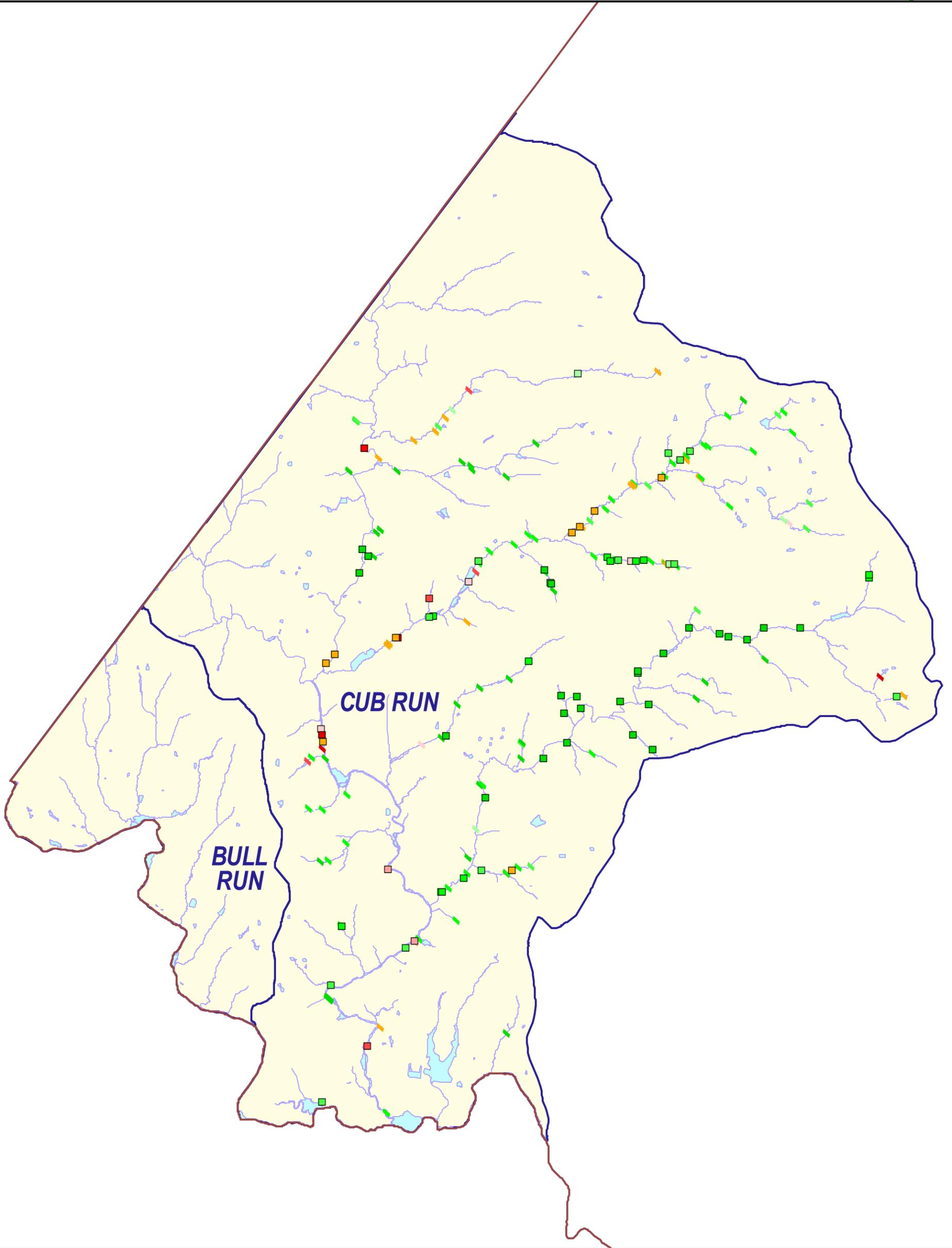
0 3000 6000 9000 12000 Feet



A horizontal scale bar with markings at 0, 3000, 6000, 9000, and 12000 feet.

**Figure 3-63**  
**Crossings**  
**Upper Bull Run Group**  
**Fairfax County Stream Physical Assessment**





Pipe / Ditch by Impact Score

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

WATERSHED GROUP:  
UPPER BULL RUN

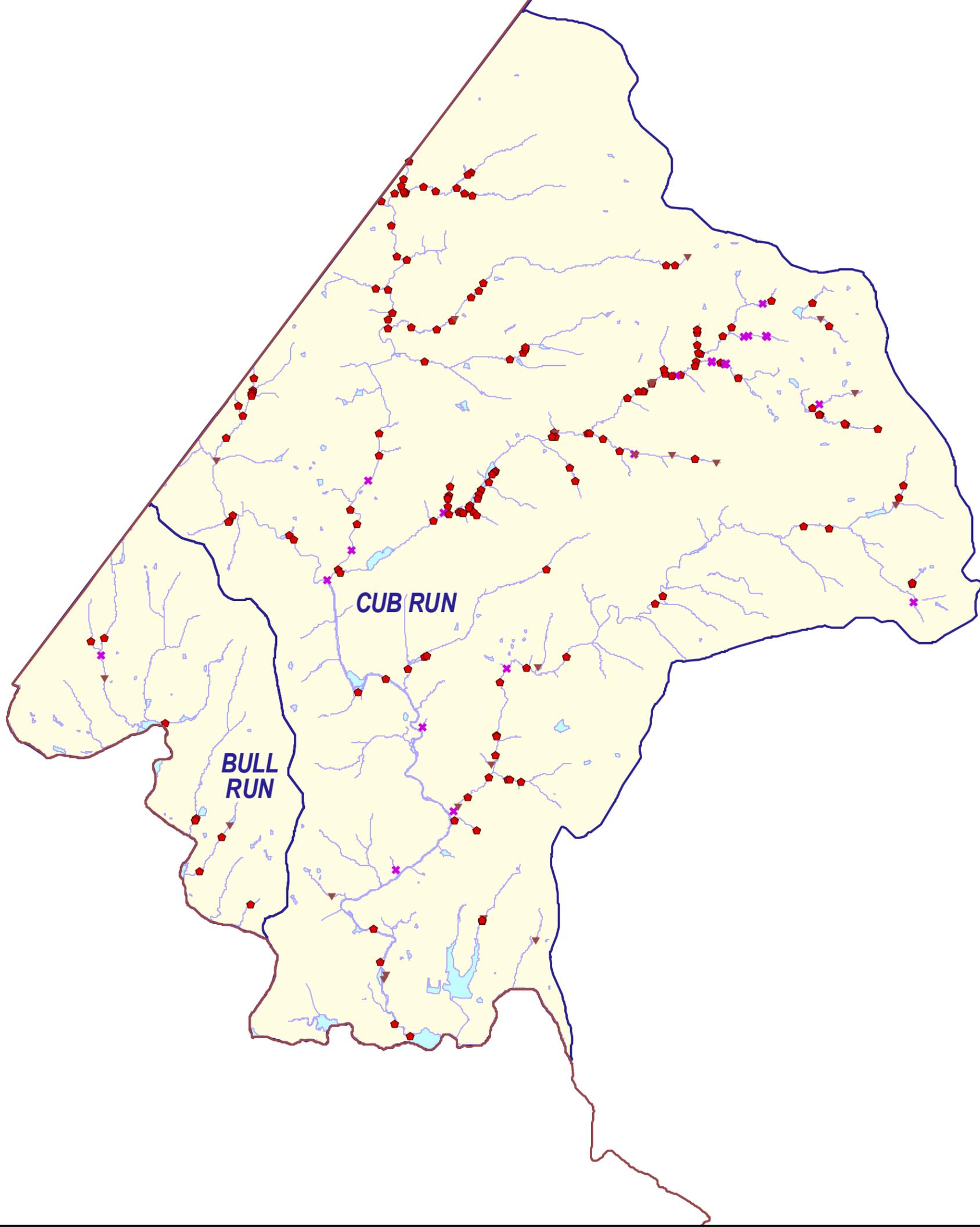


0 3000 6000 9000 12000 Feet



Figure 3-64  
Pipe and Ditch Impacts  
Upper Bull Run Group  
Fairfax County Stream Physical Assessment





**Inventory Types**

- ▼ Dump
- ◆ Obstruction
- \* Utility

- ▭ Fairfax County Boundary
- ▭ Lakes and Ponds
- ▭ Streams
- ▭ Watersheds

**WATERSHED GROUP:  
UPPER BULL RUN**



0 3000 6000 9000 12000 Feet

**Figure 3-65**  
**Dumps, Obstructions, and Utilities**  
**Upper Bull Run Group**  
**Fairfax County Stream Physical Assessment**



## 3.2.10 Lower Bull Run Group Summary

### 3.2.10.1 Little Rocky Run Watershed

**Description.** Little Rocky Run Watershed is a medium-sized watershed, with approximately 13 miles of stream assessed. It is located along the middle of the southwestern boundary of the County. The watershed is entirely contained within the County Boundaries, and drains directly to Bull Run, which eventually discharges to the Potomac River.

**Habitat.** The habitat assessment results for Little Rocky Run Watershed are summarized by stream in Table 3-43. Habitat scores for each reach are depicted in Figure 3-66. Based on a length weighted habitat score of 102 (Table 3-2), Little Rocky Run Watershed is in the lower middle range of quality, compared to the rest of the County. Approximately 2 miles of stream were categorized as having “poor” habitat conditions, 8 miles as “fair,” 2 miles as “good,” and less than 1 mile as “excellent.”

**CEM.** Based on the CEM evaluations approximately half of the channels assessed in Little Rocky Run Watershed are in Evolutionary Stage 3 (Table 3-3) and the remainder are split between Stages 2 and 4. Figure 3-67 summarizes the CEM results for Little Rocky Run Watershed.

**Infrastructure.** The infrastructure inventory resulted in 153 inventory points. The most significant problem was related to an erosional area, which was given an impact score of 8. The infrastructure inventory results are summarized in Table 3-44. Figures 3-68, 3-69, 3-70, 3-71, and 3-72 summarize impact scores for the erosion problems; deficient buffers; crossings; pipes/ditches; and dumps, obstructions, and utilities, respectively.

### 3.2.10.2 Johnny Moore Creek Watershed

**Description.** Johnny Moore Creek Watershed is a medium-sized watershed, with approximately 12 miles of stream assessed. It is located along the middle of the southwestern boundary of the County. The watershed is entirely contained within the County Boundaries, and drains directly to Bull Run, which eventually discharges to the Potomac River.

**Habitat.** The habitat assessment results for Johnny Moore Creek Watershed are summarized by stream in Table 3-45. Habitat scores for each reach are depicted in Figure 3-66. Based on a length weighted habitat score of 104 (Table 3-2), Johnny Moore Creek Watershed is in the middle range of quality, compared to the rest of the County. Approximately 2 miles of stream were categorized as having “poor” habitat conditions, 7 miles as “fair,” and nearly 3 miles as “good.”

**CEM.** Based on the CEM evaluations approximately 97 percent of the channels assessed in Johnny Moore Creek Watershed are in Evolutionary Stage 3 (Table 3-3). Figure 3-67 summarizes the CEM results for Johnny Moore Creek Watershed.

**Infrastructure.** The infrastructure inventory resulted in 127 inventory points. The most significant problem was related to an erosional area, which was given an impact score of 9. The infrastructure inventory results are summarized in Table 3-46. Figures 3-68, 3-69, 3-70,

3-71, and 3-72 summarize impact scores for the erosion problems; deficient buffers; crossings; pipes/ ditches; and dumps, obstructions, and utilities, respectively.

### 3.2.10.3 Popes Head Creek Watershed

**Description.** Popes Head Creek Watershed is a large watershed, with approximately 50 miles of stream assessed. It is located along the middle of the southwestern boundary of the County. The watershed is entirely contained within the County Boundaries, and drains directly to Bull Run, which eventually discharges to the Potomac River.

**Habitat.** The habitat assessment results for Popes Head Creek Watershed are summarized by stream in Table 3-47. Habitat scores for each reach are depicted in Figure 3-66. Based on a length weighted habitat score of 103 (Table 3-2), Popes Head Creek Watershed is in the middle range of quality, compared to the rest of the County. Approximately 1 mile of stream was categorized as having “very poor” habitat conditions, 8 miles as “poor,” 27 miles as “fair,” and 13 miles as “good.”

**CEM.** Based on the CEM evaluations approximately 60 percent of the channels assessed in Popes Head Creek Watershed are in Evolutionary Stage 3 (Table 3-3), with most of the remainder of the watershed in Stage 4. Figure 3-67 summarizes the CEM results for Popes Head Creek Watershed.

**Infrastructure.** The infrastructure inventory resulted in 382 inventory points. The most significant problem was related to a pipe, which was given an impact score of 9. The infrastructure inventory results are summarized in Table 3-48. Figures 3-68, 3-69, 3-70, 3-71, and 3-72 summarize impact scores for the erosion problems; deficient buffers; crossings; pipes/ ditches; and dumps, obstructions, and utilities, respectively.

**TABLE 3-43**  
Habitat Assessment Summary for Little Rocky Run Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Little Rocky Run	0 (0.00)	5,030 (10.84)	28,153 (60.64)	9,659 (20.81)	3,581 (7.71)	46,424
Tributary to Bull Run	0 (0.00)	0 (0.00)	656 (100.00)	0 (0.00)	0 (0.00)	656
Tributary to Little Rocky Run	0 (0.00)	7,880 (76.03)	2,484 (23.97)	0 (0.00)	0 (0.00)	10,365
Willow Springs Branch	0 (0.00)	0 (0.00)	12,090 (100.00)	0 (0.00)	0 (0.00)	12,090
<b>Watershed Total</b>	<b>0 (0.00)</b>	<b>12,911 (18.57)</b>	<b>43,383 (62.39)</b>	<b>9,659 (13.89)</b>	<b>3,581 (5.15)</b>	<b>69,534</b>

**TABLE 3-44**  
Infrastructure Assessment Summary for Little Rocky Run Watershed  
*Fairfax County Stream Physical Assessment*

<b>Impact Score</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>&gt;10</b>	<b>Total</b>
Deficient Buffers	0	0	0	3	5	3	1	7	0	0	0	N/A	19
Crossings	13	17	21	9	3	2	0	1	0	0	0	N/A	66
Ditches and Pipes	24	10	10	2	0	1	1	0	0	0	0	N/A	48
Erosion	0	0	0	0	0	1	2	0	1	0	0	N/A	4
Head Cut	0	0	0	0	1	0	0	0	0	0	0	N/A	1
Obstruction	6	1	0	0	3	2	0	2	0	0	0	N/A	14
Utility	0	0	0	1	0	0	0	0	0	0	0	0	1
<b>Total</b>	<b>43</b>	<b>28</b>	<b>31</b>	<b>15</b>	<b>12</b>	<b>9</b>	<b>4</b>	<b>10</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>153</b>

**TABLE 3-45**  
Habitat Assessment Summary for Johnny Moore Creek Watershed  
*Fairfax County Stream Physical Assessment*

<b>Stream</b>	<b>Linear Feet (Percent) of Stream</b>					<b>Total</b>
	<b>Very Poor</b>	<b>Poor</b>	<b>Fair</b>	<b>Good</b>	<b>Excellent</b>	
Johnny Moore Creek	0 (0.00)	0 (0.00)	12,811 (52.93)	11,393 (47.07)	0 (0.00)	24,204
Polecat Branch	0 (0.00)	1,570 (35.02)	2,914 (64.98)	0 (0.00)	0 (0.00)	4,484
Tributary to Bull Run	0 (0.00)	0 (0.00)	0 (0.00)	2,110 (100.00)	0 (0.00)	2,110
Tributary to Johnny Moore Creek	677 (2.34)	8,007 (27.66)	19,136 (66.10)	1,131 (3.91)	0 (0.00)	28,951
Tributary to Polecat Branch	0 (0.00)	0 (0.00)	2,344 (100.00)	0 (0.00)	0 (0.00)	2,344
<b>Watershed Total</b>	<b>677 (1.09)</b>	<b>9,577 (15.42)</b>	<b>37,204 (59.92)</b>	<b>14,634 (23.57)</b>	<b>0 (0.00)</b>	<b>62,092</b>

**TABLE 3-46**  
Infrastructure Assessment Summary for Johnny Moore Creek Watershed  
*Fairfax County Stream Physical Assessment*

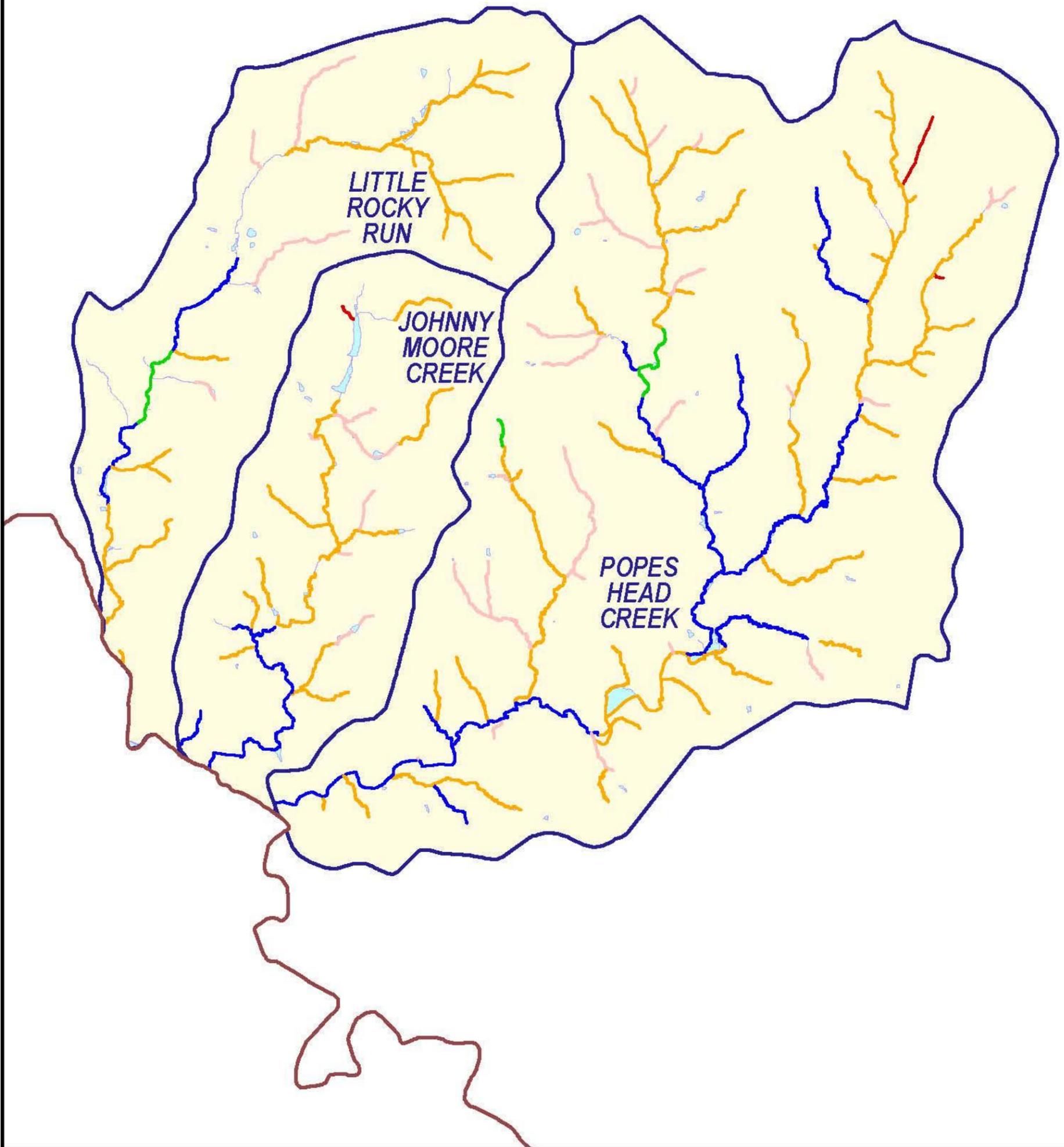
<b>Impact Score</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>&gt;10</b>	<b>Total</b>
Deficient Buffers	0	0	2	12	12	2	14	2	0	0	0	N/A	44
Crossings	50	3	5	6	0	1	0	2	0	0	0	N/A	67
Ditches and Pipes	4	0	0	0	0	0	0	0	0	0	0	N/A	4
Erosion	0	0	0	0	0	0	0	1	0	1	0	N/A	2
Head Cut	0	0	0	0	0	1	0	0	0	0	0	N/A	1
Obstruction	3	0	1	4	1	0	0	0	0	0	0	N/A	9
Utility	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>57</b>	<b>3</b>	<b>8</b>	<b>22</b>	<b>13</b>	<b>4</b>	<b>14</b>	<b>5</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>127</b>

**TABLE 3-47**  
Habitat Assessment Summary for Popes Head Creek Watershed  
*Fairfax County Stream Physical Assessment*

<b>Stream</b>	<b>Linear Feet (Percent) of Stream</b>					<b>Total</b>
	<b>Very Poor</b>	<b>Poor</b>	<b>Fair</b>	<b>Good</b>	<b>Excellent</b>	
Castle Creek	0 (0.00)	15,736 (50.89)	14,034 (45.38)	0 (0.00)	1,153 (3.73)	30,923
East Fork	0 (0.00)	2,180 (13.70)	13,726 (86.30)	0 (0.00)	0 (0.00)	15,906
Piney Branch	0 (0.00)	16,109 (23.24)	32,232 (46.50)	17,256 (24.90)	3,715 (5.36)	69,312
Popes Head Creek	0 (0.00)	6,303 (4.76)	73,978 (55.83)	52,230 (39.42)	0 (0.00)	132,511
Tributary to East Fork	419 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	419
Tributary to Piney Branch	0 (0.00)	3,005 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)	3,005
Tributary to Popes Head Creek	2,866 (28.80)	313 (3.15)	6,771 (68.05)	0 (0.00)	0 (0.00)	9,951
<b>Watershed Total</b>	<b>3,285 (1.25)</b>	<b>43,647 (16.66)</b>	<b>140,741 (53.71)</b>	<b>69,486 (26.52)</b>	<b>4,868 (1.86)</b>	<b>262,027</b>

**TABLE 3-48**  
 Infrastructure Assessment Summary for Popes Head Creek Watershed  
*Fairfax County Stream Physical Assessment*

<b>Impact Score</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>&gt;10</b>	<b>Total</b>
Deficient Buffers	0	7	21	54	34	5	1	0	0	0	0	N/A	122
Crossings	90	36	22	13	7	2	1	1	2	0	0	N/A	174
Ditches and Pipes	17	12	2	1	2	2	0	0	0	1	0	N/A	37
Erosion	0	0	0	0	1	0	2	0	0	0	0	N/A	3
Head Cut	0	0	1	2	5	4	0	1	1	0	0	N/A	14
Obstruction	0	5	8	4	8	2	1	1	1	0	0	N/A	30
Utility	1	0	0	0	1	0	0	0	0	0	0	0	2
<b>Total</b>	<b>108</b>	<b>60</b>	<b>54</b>	<b>74</b>	<b>58</b>	<b>15</b>	<b>5</b>	<b>3</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>382</b>



-  Fairfax County Boundary
- Habitat Rating**
-  Excellent
-  Good
-  Fair
-  Poor
-  Very Poor
-  No Habitat Assessment
-  Lakes and Ponds
-  Watersheds

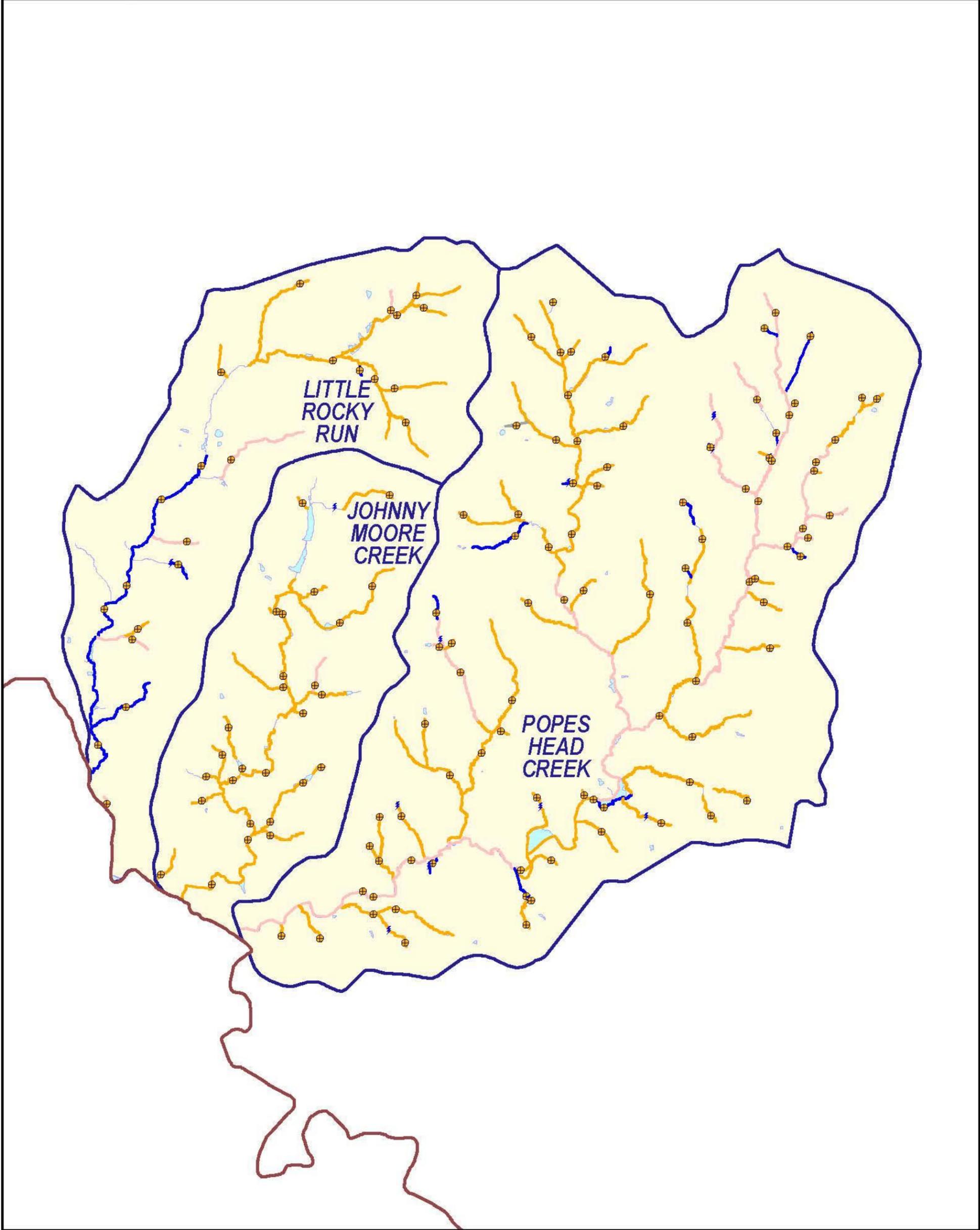
**WATERSHED GROUP:  
LOWER BULL RUN**



0 2000 4000 6000 8000 Feet



**Figure 3-66**  
**Habitat Assessment**  
**Lower Bull Run Group**  
**Fairfax County Stream Physical Assessment**



**Inventory Types**

- ⊕ Cross Section
- ⚡ Head Cut

**CEM Stage**

- ⚡ Not Assigned
- 1
- 2
- 3
- 4
- 5

- ▭ Fairfax County Boundary
- ▭ Lakes and Ponds
- ▭ Streams
- ▭ Watersheds

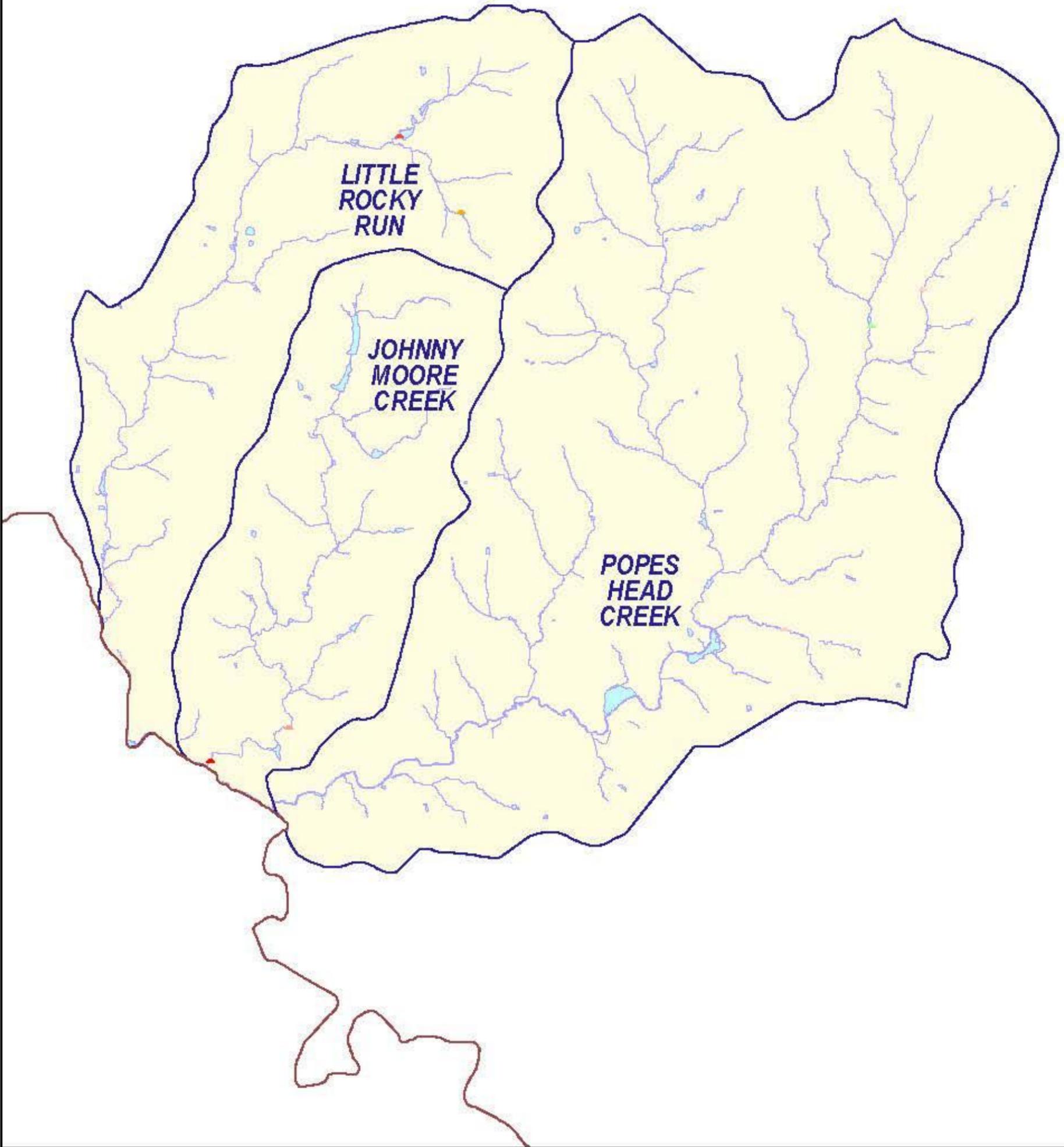
**WATERSHED GROUP:  
LOWER BULL RUN**



0 2000 4000 6000 8000 Feet

**Figure 3-67**  
**CEM Stages**  
**Lower Bull Run Group**  
**Fairfax County Stream Physical Assessment**





Erosion by Impact Score

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

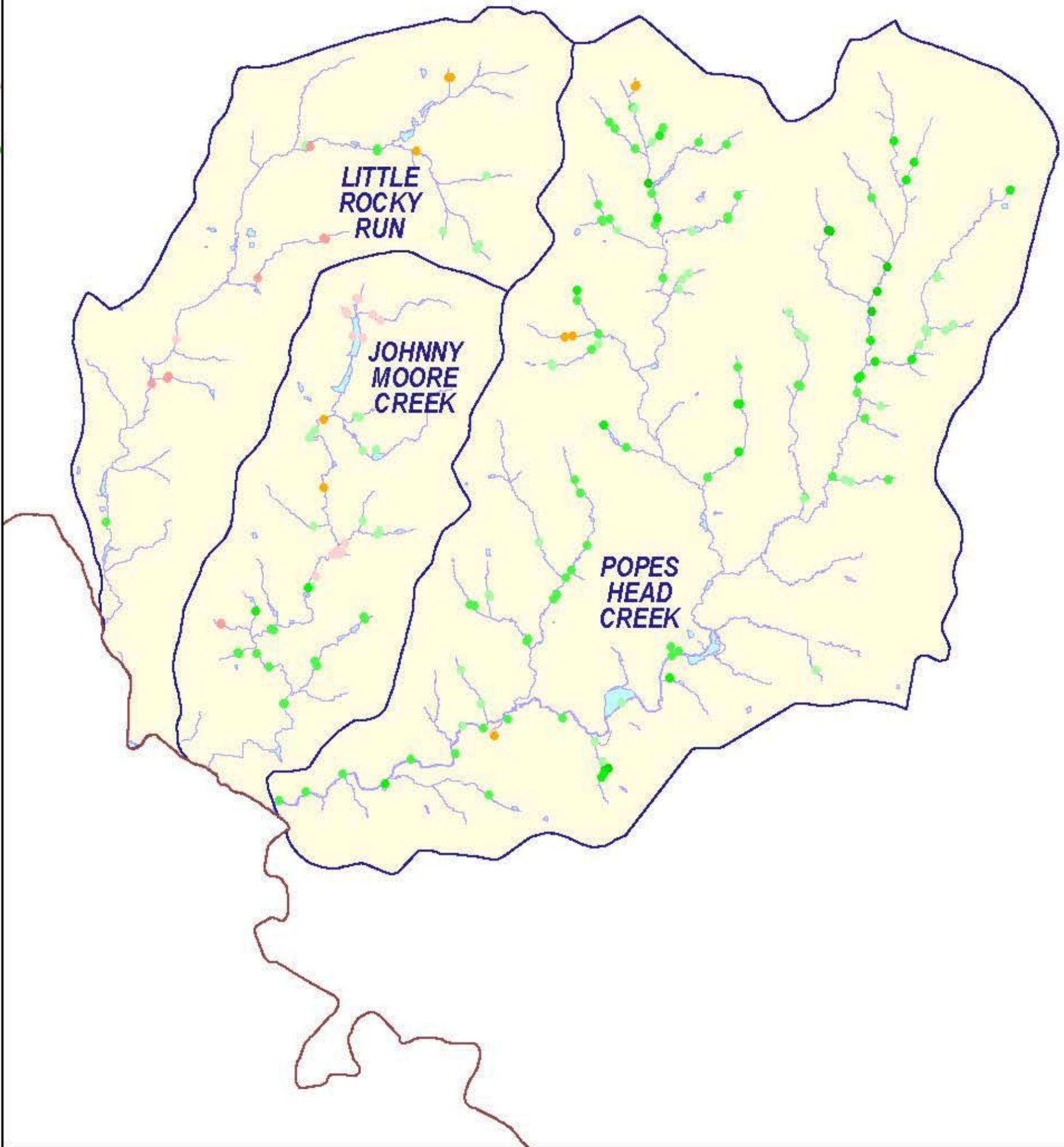
WATERSHED GROUP:  
LOWER BULL RUN



0 2000 4000 6000 8000 Feet

**Figure 3-68**  
**Erosion Impacts**  
**Lower Bull Run Group**  
**Fairfax County Stream Physical Assessment**





Deficient Buffer by Impact Score

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

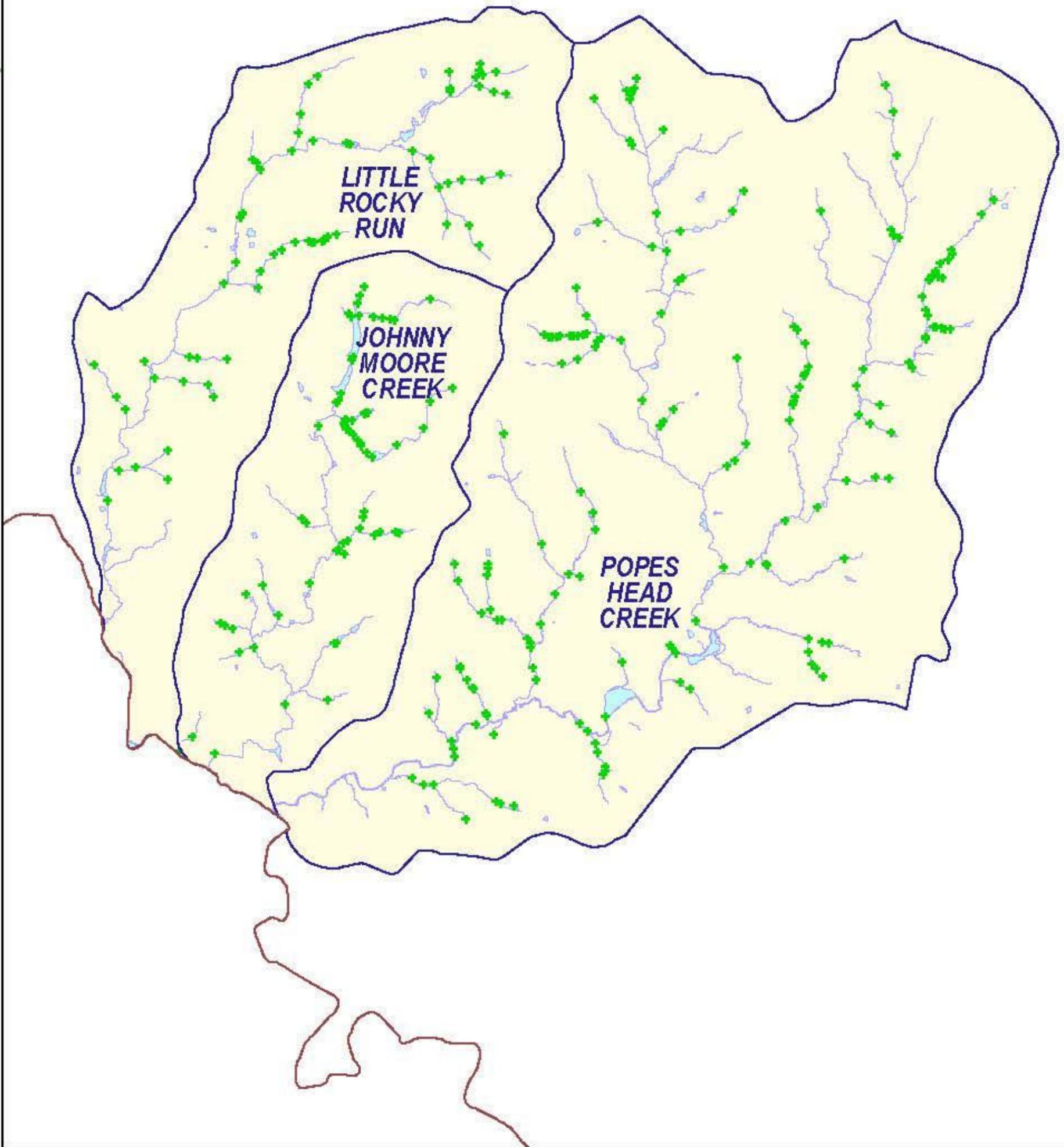
- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

WATERSHED GROUP:  
LOWER BULL RUN



0 2000 4000 6000 8000 Feet

**Figure 3-69**  
**Deficient Buffer Impacts**  
**Lower Bull Run Group**  
**Fairfax County Stream Physical Assessment**



**Inventory Type**

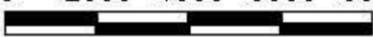
+ Crossing

-  Fairfax County Boundary
-  Lakes and Ponds
-  Streams
-  Watersheds

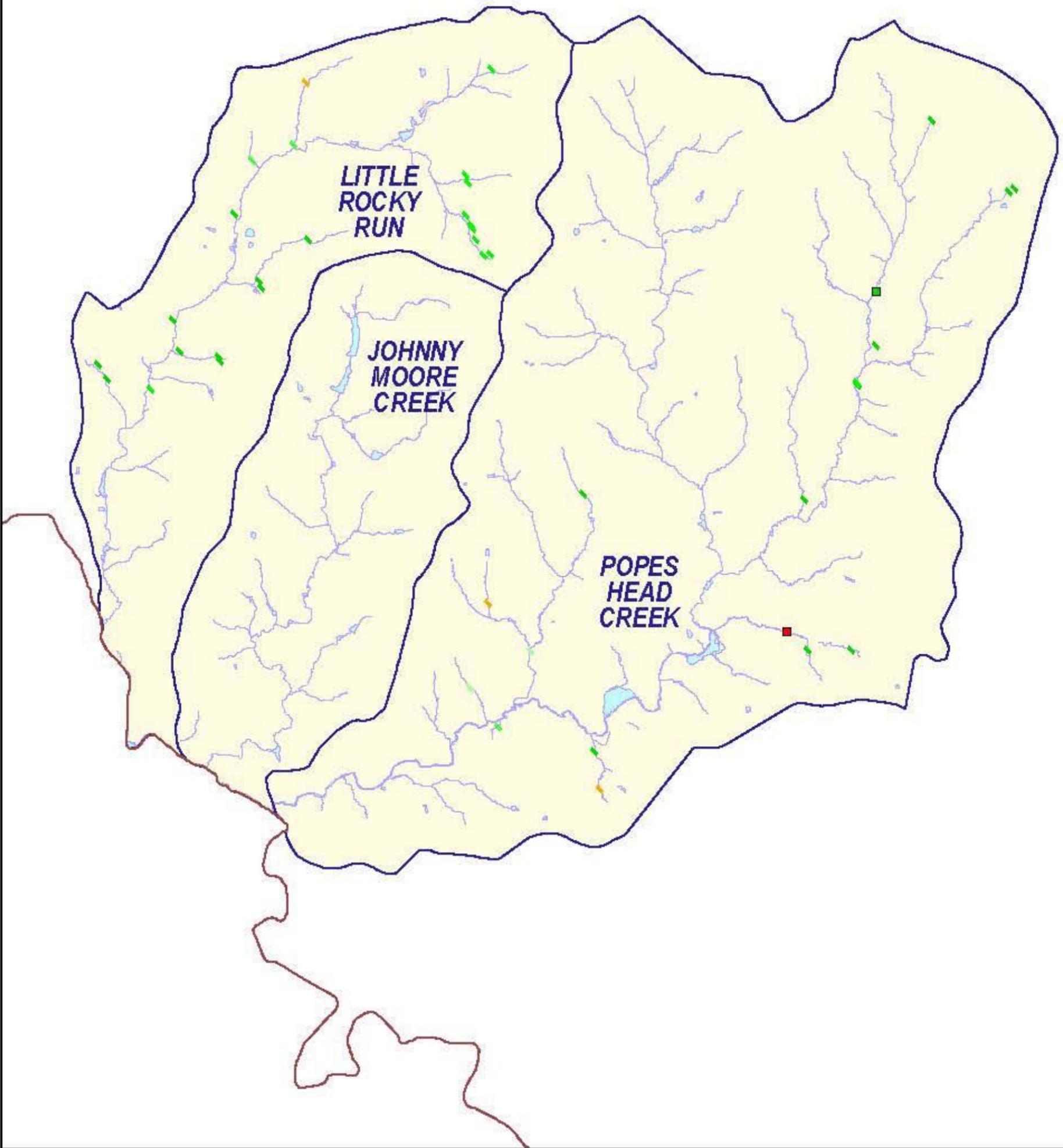
**WATERSHED GROUP:  
LOWER BULL RUN**



0 2000 4000 6000 8000 Feet



**Figure 3-70**  
**Crossings**  
**Lower Bull Run Group**  
**Fairfax County Stream Physical Assessment**



Pipe / Ditch by Impact Score

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

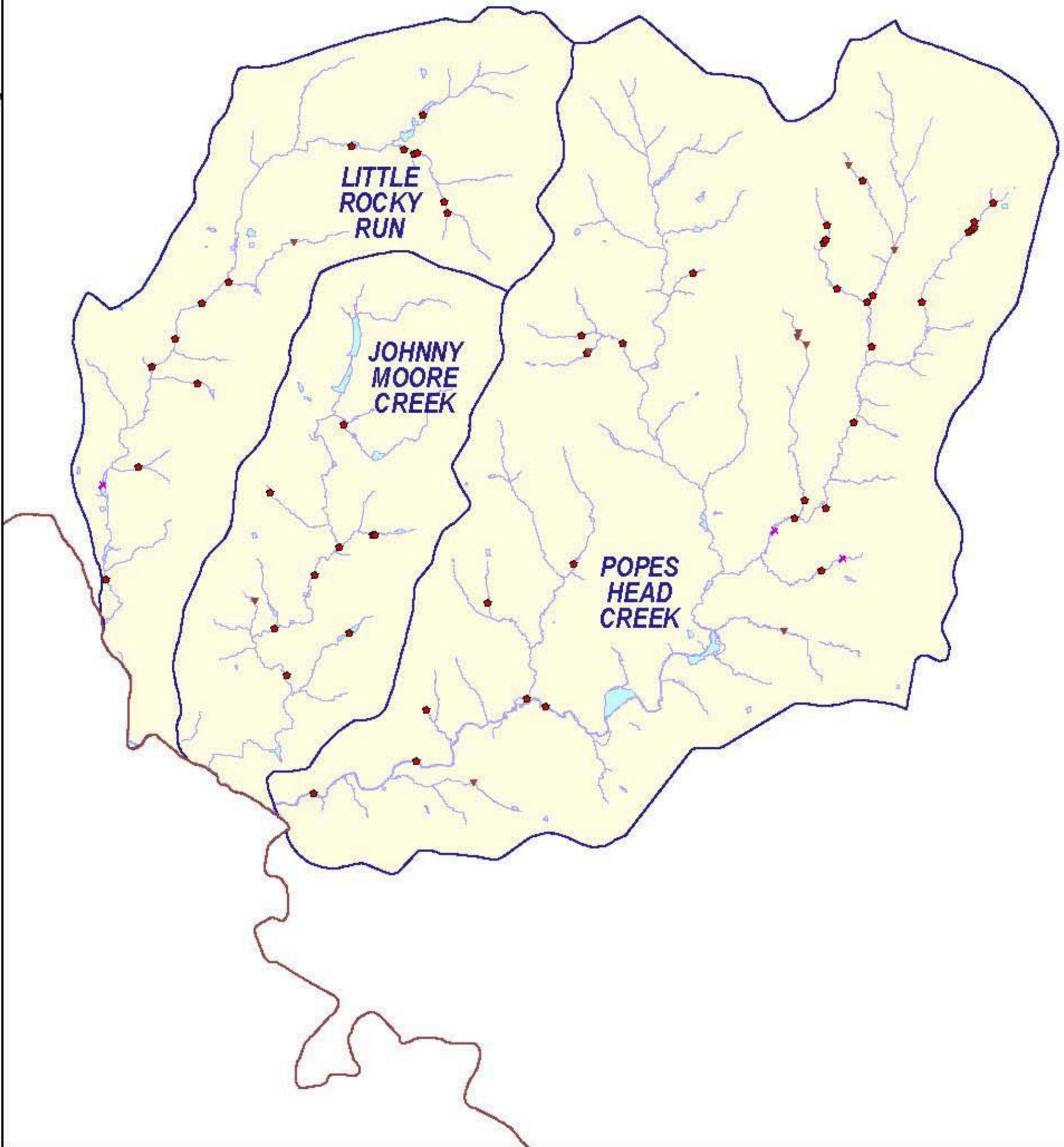
WATERSHED GROUP:  
LOWER BULL RUN



0 2000 4000 6000 8000 Feet

**Figure 3-71**  
**Pipe and Ditch Impacts**  
**Lower Bull Run Group**  
**Fairfax County Stream Physical Assessment**





**Inventory Types**

- ▼ Dump
- ◆ Obstruction
- \* Utility

- ▭ Fairfax County Boundary
- ▭ Lakes and Ponds
- ▭ Streams
- ▭ Watersheds

**WATERSHED GROUP:  
LOWER BULL RUN**



0 2000 4000 6000 8000 Feet

**Figure 3-72**  
**Dumps, Obstructions, and Utilities**  
**Lower Bull Run Group**  
**Fairfax County Stream Physical Assessment**

## 3.2.11 Upper Occoquan Group Summary

### 3.2.11.1 Old Mill Branch Watershed

**Description.** Old Mill Branch Watershed is a small watershed, with approximately 6 miles of stream assessed. It is located along the middle of the southwestern boundary of the County. The watershed is entirely contained within the County Boundaries, and contains several small tributaries which each drain directly to Bull Run or Occoquan River, and eventually to the Potomac River.

**Habitat.** The habitat assessment results for Old Mill Branch Watershed are summarized by stream in Table 3-49. Habitat scores for each reach are depicted in Figure 3-73. Based on a length weighted habitat score of 99 (Table 3-2), Old Mill Branch Watershed is lower range of quality compared to the rest of the County. Nearly all 6 miles of stream assessed were categorized as “fair.”

**CEM.** Based on the CEM evaluations approximately three quarters of the channels assessed in Old Mill Branch Watershed are in Evolutionary Stage 3 (Table 3-3) with the remainder in Stage 4. Figure 3-74 summarizes the CEM results for Old Mill Branch Watershed.

**Infrastructure.** The infrastructure inventory resulted in 29 inventory points. The most significant problem was related to a crossing, which was given an impact score of 9. The infrastructure inventory results are summarized in Table 3-50. Figures 3-75, 3-76, 3-77, 3-78, and 3-79 summarize impact scores for the erosion problems; deficient buffers; crossings; pipes/ditches; and dumps, obstructions, and utilities, respectively.

### 3.2.11.2 Wolf Run Watershed

**Description.** Wolf Run Watershed is a medium-sized watershed, with approximately 16 miles of stream assessed. It is located along the middle of the southwestern boundary of the County. The watershed is entirely contained within the County Boundaries, and drains directly to the Occoquan River, which eventually discharges to the Potomac River.

**Habitat.** The habitat assessment results for Wolf Run Watershed are summarized by stream in Table 3-51. Habitat scores for each reach are depicted in Figure 3-73. Based on a length weighted habitat score of 99 (Table 3-2), Wolf Run Watershed is in the lower range of quality, compared to the rest of the County. Approximately 1.5 miles of stream were categorized as having “poor” habitat conditions, 11 miles as “fair,” and 3 miles as “good.”

**CEM.** Based on the CEM evaluations approximately 98 percent of the channels assessed in Wolf Run Watershed are in Evolutionary Stage 3 (Table 3-3). Figure 3-74 summarizes the CEM results for Wolf Run Watershed.

**Infrastructure.** The infrastructure inventory resulted in 133 inventory points. The most significant problem was related to a head cut, which was given an impact score of 10. The infrastructure inventory results are summarized in Table 3-52. Figures 3-75, 3-76, 3-77, 3-78, and 3-79 summarize impact scores for the erosion problems; deficient buffers; crossings; pipes/ditches; and dumps, obstructions, and utilities, respectively.

### 3.2.11.3 Sandy Run Watershed

**Description.** Sandy Run Watershed is a medium-sized watershed, with approximately 20 miles of stream assessed. It is located along the middle of the southwestern boundary of the County. The watershed is entirely contained within the County Boundaries, and drains directly to the Occoquan River, which eventually discharges to the Potomac River.

**Habitat.** The habitat assessment results for Sandy Run Watershed are summarized by stream in Table 3-53. Habitat scores for each reach are depicted in Figure 3-73. Based on a length weighted habitat score of 104 (Table 3-2), Sandy Run Watershed is in the middle range of quality, compared to the rest of the County. Approximately 17 miles of stream were categorized as having “fair” habitat conditions and 3 miles as “fair.”

**CEM.** Based on the CEM evaluations approximately 65 percent of the channels assessed in Sandy Run Watershed are in Evolutionary Stage 3 (Table 3-3), with the remainder in Stage 4. Figure 3-74 summarizes the CEM results for Sandy Run Watershed.

**Infrastructure.** The infrastructure inventory resulted in 171 inventory points. The most significant problem was related to a head cut which was given an impact score of 10. The infrastructure inventory results are summarized in Table 3-54. Figures 3-75, 3-76, 3-77, 3-78, and 3-79 summarize impact scores for the erosion problems; deficient buffers; crossings; pipes/ditches; and dumps, obstructions, and utilities, respectively.

### 3.2.11.4 Ryans Dam Watershed

**Description.** Ryans Dam Watershed is a small watershed, with approximately 4 miles of stream assessed. It is located along the middle of the southwestern boundary of the County. The watershed is entirely contained within the County Boundaries, and consists of several small tributaries which each drain directly to the Occoquan River, and eventually to the Potomac River.

**Habitat.** The habitat assessment results for Ryans Dam Watershed are summarized by stream in Table 3-55. Habitat scores for each reach are depicted in Figure 3-73. Based on a length weighted habitat score of 145 (Table 3-2), Ryans Dam Watershed is the highest rated watershed in the County. Nearly 2 miles of stream were categorized as having “good” habitat conditions and 2.5 miles as “excellent.”

**CEM.** Based on the CEM evaluations the channels assessed in Ryans Dam Watershed are nearly evenly divided between Evolutionary Stages 2 and 3 (Table 3-3). Figure 3-74 summarizes the CEM results for Ryans Dam Watershed.

**Infrastructure.** The infrastructure inventory resulted in 10 inventory points. The most significant problem was related to crossing which was given an impact score of 8. The infrastructure inventory results are summarized in Table 3-56. Figures 3-75, 3-76, 3-77, 3-78, and 3-79 summarize impact scores for the erosion problems; deficient buffers; crossings; pipes/ditches; and dumps, obstructions, and utilities, respectively.

### 3.2.11.5 Occoquan Watershed

**Description.** Occoquan Watershed is a small watershed, with approximately 6 miles of stream assessed. It is located along the middle of the southern boundary of the County. The

watershed is entirely contained within the County Boundaries, and consists of several small tributaries that drain directly to the Occoquan River.

**Habitat.** The habitat assessment results for Occoquan Watershed are summarized by stream in Table 3-57. Habitat scores for each reach are depicted in Figure 3-73. Based on a length weighted habitat score of 117 (Table 3-2), Occoquan Watershed is in the upper middle range of quality, compared to the rest of the County. Approximately 3 miles of stream were categorized as having “fair” habitat conditions and 3 miles as “good.”

**CEM.** Based on the CEM evaluations approximately 80 percent of the channels assessed in Occoquan Watershed are in Evolutionary Stage 3 (Table 3-3), with the remainder of the watershed in Stages 2 and 4. Figure 3-74 summarizes the CEM results for Occoquan Watershed.

**Infrastructure.** The infrastructure inventory resulted in 40 inventory points. The most significant problems were related to two erosional areas and a head cut, which were given impact scores of 10. The infrastructure inventory results are summarized in Table 3-58. Figures 3-75, 3-76, 3-77, 3-78, and 3-79 summarize impact scores for the erosion problems; deficient buffers; crossings; pipes/ditches; and dumps, obstructions, and utilities, respectively.

**TABLE 3-49**  
Habitat Assessment Summary for Old Mill Branch Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Old Mill Branch	0 (0.00)	0 (0.00)	8,755 (100.00)	0 (0.00)	0 (0.00)	8,755
Tributary to Bull Run	0 (0.00)	1,586 (7.47)	17,734 (83.47)	1,927 (9.07)	0 (0.00)	21,247
Tributary to Old Mill Branch	0 (0.00)	0 (0.00)	1,627 (100.00)	0 (0.00)	0 (0.00)	1,627
<b>Watershed Total</b>	<b>0 (0.00)</b>	<b>1,586 (5.02)</b>	<b>28,116 (88.89)</b>	<b>1,927 (6.09)</b>	<b>0 (0.00)</b>	<b>31,629</b>

**TABLE 3-50**  
Infrastructure Assessment Summary for Old Mill Branch Watershed  
*Fairfax County Stream Physical Assessment*

<b>Impact Score</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>&gt;10</b>	<b>Total</b>
Deficient Buffers	0	0	0	2	2	3	1	1	0	0	0	N/A	9
Crossings	9	2	0	1	1	0	1	1	0	1	0	N/A	16
Ditches and Pipes	1	0	0	0	0	1	0	0	0	0	0	N/A	2
Erosion	0	0	0	0	0	0	1	1	0	0	0	N/A	2
Head Cut	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Obstruction	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Utility	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>10</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>29</b>

**TABLE 3-51**  
Habitat Assessment Summary for Wolf Run Watershed  
*Fairfax County Stream Physical Assessment*

<b>Stream</b>	<b>Linear Feet (Percent) of Stream</b>					<b>Total</b>
	<b>Very Poor</b>	<b>Poor</b>	<b>Fair</b>	<b>Good</b>	<b>Excellent</b>	
Maple Branch	0 (0.00)	0 (0.00)	7,679 (100.00)	0 (0.00)	0 (0.00)	7,679
Swift Run	0 (0.00)	0 (0.00)	6,540 (100.00)	0 (0.00)	0 (0.00)	6,540
Tributary to Wolf Run	3,430 (9.45)	8,042 (22.15)	24,841 (68.41)	0 (0.00)	0 (0.00)	36,313
Wolf Run	0 (0.00)	0 (0.00)	20,695 (60.06)	13,761 (39.94)	0 (0.00)	34,457
<b>Watershed Total</b>	<b>3,430 (4.04)</b>	<b>8,042 (9.46)</b>	<b>59,756 (70.31)</b>	<b>13,761 (16.19)</b>	<b>0 (0.00)</b>	<b>84,989</b>

**TABLE 3-52**  
Infrastructure Assessment Summary for Wolf Run Watershed  
*Fairfax County Stream Physical Assessment*

<b>Impact Score</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>&gt;10</b>	<b>Total</b>
Deficient Buffers	0	1	7	24	17	8	0	0	0	0	0	N/A	57
Crossings	33	11	11	6	4	0	0	0	0	0	0	N/A	65
Ditches and Pipes	4	0	1	1	0	0	0	0	0	0	0	N/A	6
Erosion	0	0	0	0	1	0	0	0	0	0	0	N/A	1
Head Cut	0	0	0	1	0	0	0	0	0	0	1	N/A	2
Obstruction	0	0	0	0	2	0	0	0	0	0	0	N/A	2
Utility	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>37</b>	<b>12</b>	<b>19</b>	<b>32</b>	<b>24</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>133</b>

**TABLE 3-53**  
Habitat Assessment Summary for Sandy Run Watershed  
*Fairfax County Stream Physical Assessment*

<b>Stream</b>	<b>Linear Feet (Percent) of Stream</b>					<b>Total</b>
	<b>Very Poor</b>	<b>Poor</b>	<b>Fair</b>	<b>Good</b>	<b>Excellent</b>	
Sandy Run	0 (0.00)	0 (0.00)	5,407 (28.88)	13,315 (71.12)	0 (0.00)	18,722
Tributary to Occoquan River	0 (0.00)	0 (0.00)	12,270 (90.83)	1,238 (9.17)	0 (0.00)	13,509
Tributary to Sandy Run	0 (0.00)	4,734 (6.28)	70,602 (93.72)	0 (0.00)	0 (0.00)	75,337
<b>Watershed Total</b>	<b>0 (0.00)</b>	<b>4,734 (4.40)</b>	<b>88,280 (82.07)</b>	<b>14,553 (13.53)</b>	<b>0 (0.00)</b>	<b>107,567</b>

**TABLE 3-54**  
 Infrastructure Assessment Summary for Sandy Run Watershed  
 Fairfax County Stream Physical Assessment

<b>Impact Score</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>&gt;10</b>	<b>Total</b>
Deficient Buffers	1	5	26	15	4	2	0	0	0	0	0	N/A	53
Crossings	24	42	16	11	2	1	0	1	0	0	0	N/A	97
Ditches and Pipes	1	1	0	1	0	0	0	0	0	0	0	N/A	3
Erosion	0	0	1	1	2	1	1	0	0	0	0	N/A	6
Head Cut	0	0	0	0	1	0	0	0	0	0	1	N/A	2
Obstruction	0	1	4	2	1	1	0	0	0	0	0	N/A	9
Utility	0	0	0	0	1	0	0	0	0	0	0	0	1
<b>Total</b>	<b>26</b>	<b>49</b>	<b>47</b>	<b>30</b>	<b>11</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>171</b>

**TABLE 3-55**  
 Habitat Assessment Summary for Ryans Dam Watershed  
 Fairfax County Stream Physical Assessment

<b>Stream</b>	<b>Linear Feet (Percent) of Stream</b>					<b>Total</b>
	<b>Very Poor</b>	<b>Poor</b>	<b>Fair</b>	<b>Good</b>	<b>Excellent</b>	
Stillwell Run	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	7,561 (100.00)	7,561
Tributary to Occoquan River	0 (0.00)	0 (0.00)	0 (0.00)	9,326 (62.47)	5,603 (37.53)	14,929
<b>Watershed Total</b>	<b>0 (0.00)</b>	<b>0 (0.00)</b>	<b>0 (0.00)</b>	<b>9,326 (41.47)</b>	<b>13,164 (58.53)</b>	<b>22,490</b>

**TABLE 3-56**  
Infrastructure Assessment Summary for Ryans Dam Watershed  
*Fairfax County Stream Physical Assessment*

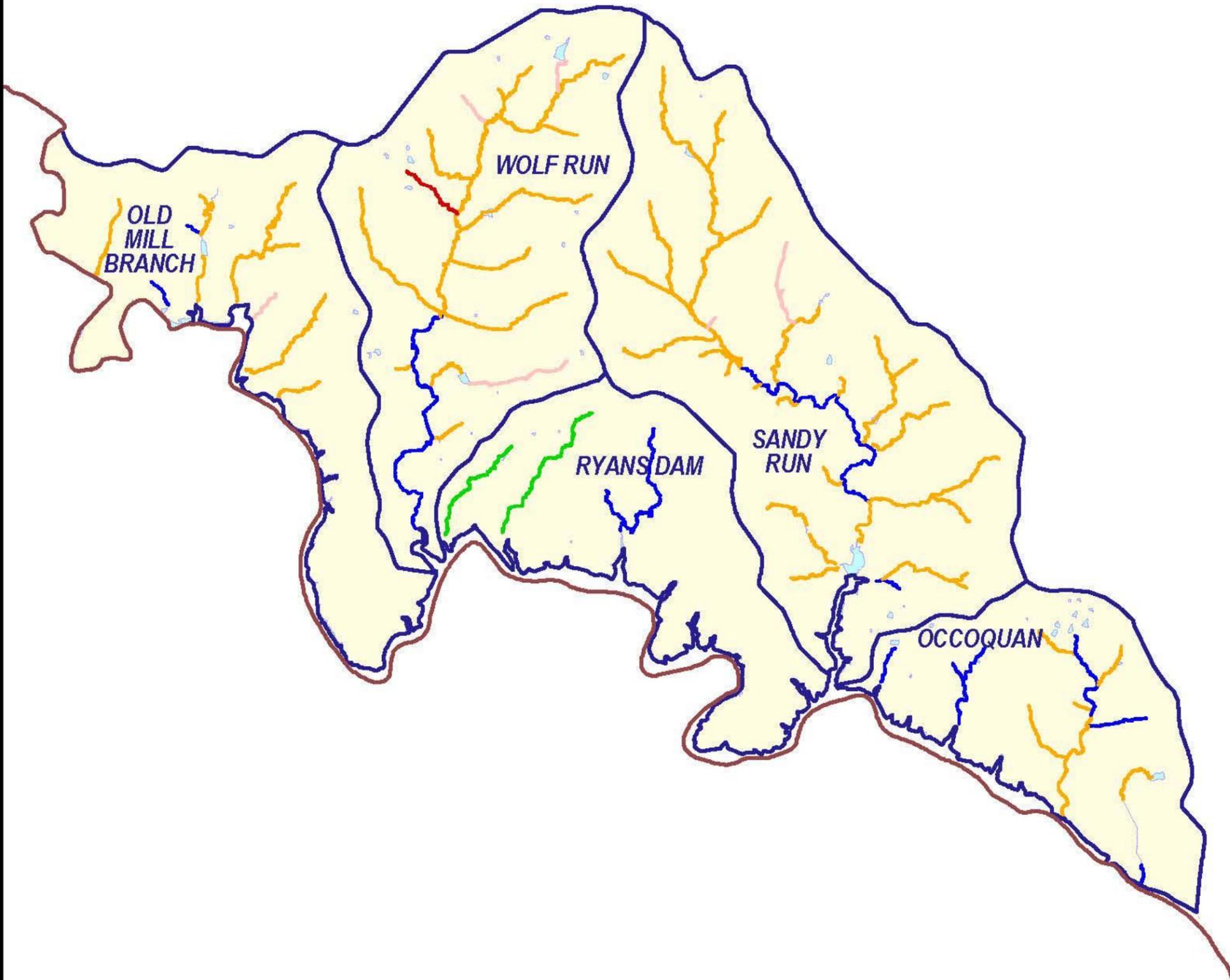
<b>Impact Score</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>&gt;10</b>	<b>Total</b>
Deficient Buffers	0	0	0	0	0	0	0	1	0	0	0	N/A	1
Crossings	0	0	3	3	1	0	0	0	1	0	0	N/A	8
Ditches and Pipes	0	1	0	0	0	0	0	0	0	0	0	N/A	1
Erosion	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Head Cut	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Obstruction	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Utility	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>

**TABLE 3-57**  
Habitat Assessment Summary for Occoquan Watershed  
*Fairfax County Stream Physical Assessment*

<b>Stream</b>	<b>Linear Feet (Percent) of Stream</b>					<b>Total</b>
	<b>Very Poor</b>	<b>Poor</b>	<b>Fair</b>	<b>Good</b>	<b>Excellent</b>	
Elk Horn Run	0 (0.00)	0 (0.00)	14,002 (75.51)	4,542 (24.49)	0 (0.00)	18,544
Little Occoquan Creek	0 (0.00)	0 (0.00)	2,874 (74.71)	973 (25.29)	0 (0.00)	3,846
Tributary to Elk Horn Run	0 (0.00)	0 (0.00)	0 (0.00)	2,742 (100.00)	0 (0.00)	2,742
Tributary to Occoquan River	0 (0.00)	0 (0.00)	0 (0.00)	6,796 (100.00)	0 (0.00)	6,796
<b>Watershed Total</b>	<b>0 (0.00)</b>	<b>0 (0.00)</b>	<b>16,876 (52.85)</b>	<b>15,053 (47.15)</b>	<b>0 (0.00)</b>	<b>31,929</b>

**TABLE 3-58**  
 Infrastructure Assessment Summary for Occoquan Watershed  
*Fairfax County Stream Physical Assessment*

<b>Impact Score</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>&gt;10</b>	<b>Total</b>
Deficient Buffers	0	0	0	3	5	0	0	0	0	0	0	N/A	8
Crossings	9	2	2	2	1	0	0	0	0	0	0	N/A	16
Ditches and Pipes	0	5	0	0	0	0	0	0	0	0	0	N/A	5
Erosion	0	0	0	0	0	0	0	0	0	0	2	N/A	2
Head Cut	0	0	0	1	1	0	0	0	0	0	1	N/A	3
Obstruction	0	0	3	1	1	0	0	1	0	0	0	N/A	6
Utility	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>9</b>	<b>7</b>	<b>5</b>	<b>7</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>40</b>



-  Fairfax County Boundary
- Habitat Rating**
-  Excellent
-  Good
-  Fair
-  Poor
-  Very Poor
-  No Habitat Assessment
-  Lakes and Ponds
-  Watersheds

**WATERSHED GROUP:  
UPPER OCCOQUAN**



0 2000 4000 6000 8000 Feet



**Figure 3-73**  
**Habitat Assessment**  
**Upper Occoquan Group**  
**Fairfax County Stream Physical Assessment**





**Inventory Types**

- Cross Section
- Head Cut

**CEM Stage**

- Not Assigned
- 1
- 2
- 3
- 4
- 5

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

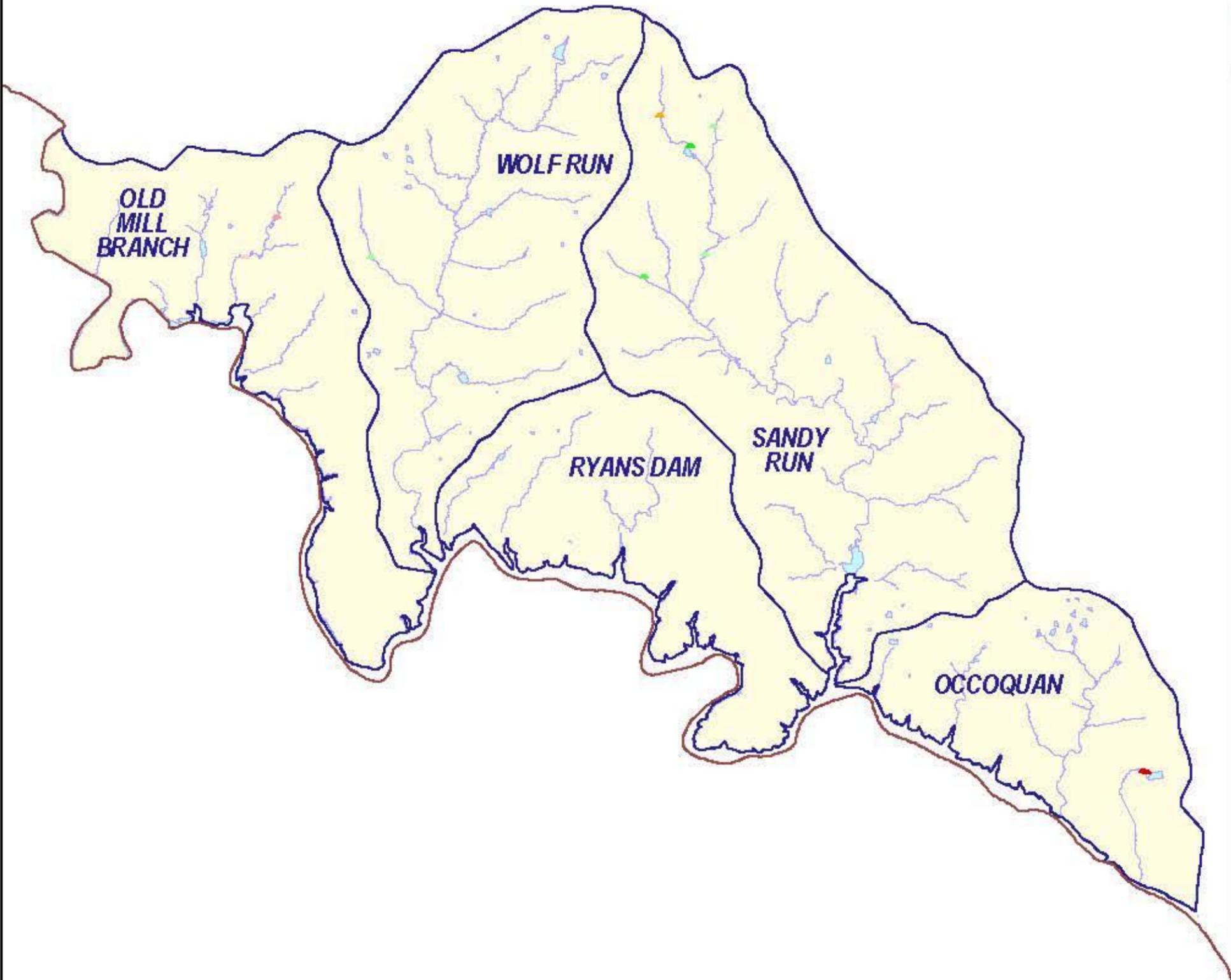
**WATERSHED GROUP:  
UPPER OCCOQUAN**



0 2000 4000 6000 8000 Feet

**Figure 3-74**  
**CEM Stages**  
**Upper Occoquan Group**  
**Fairfax County Stream Physical Assessment**





Erosion by Impact Score

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

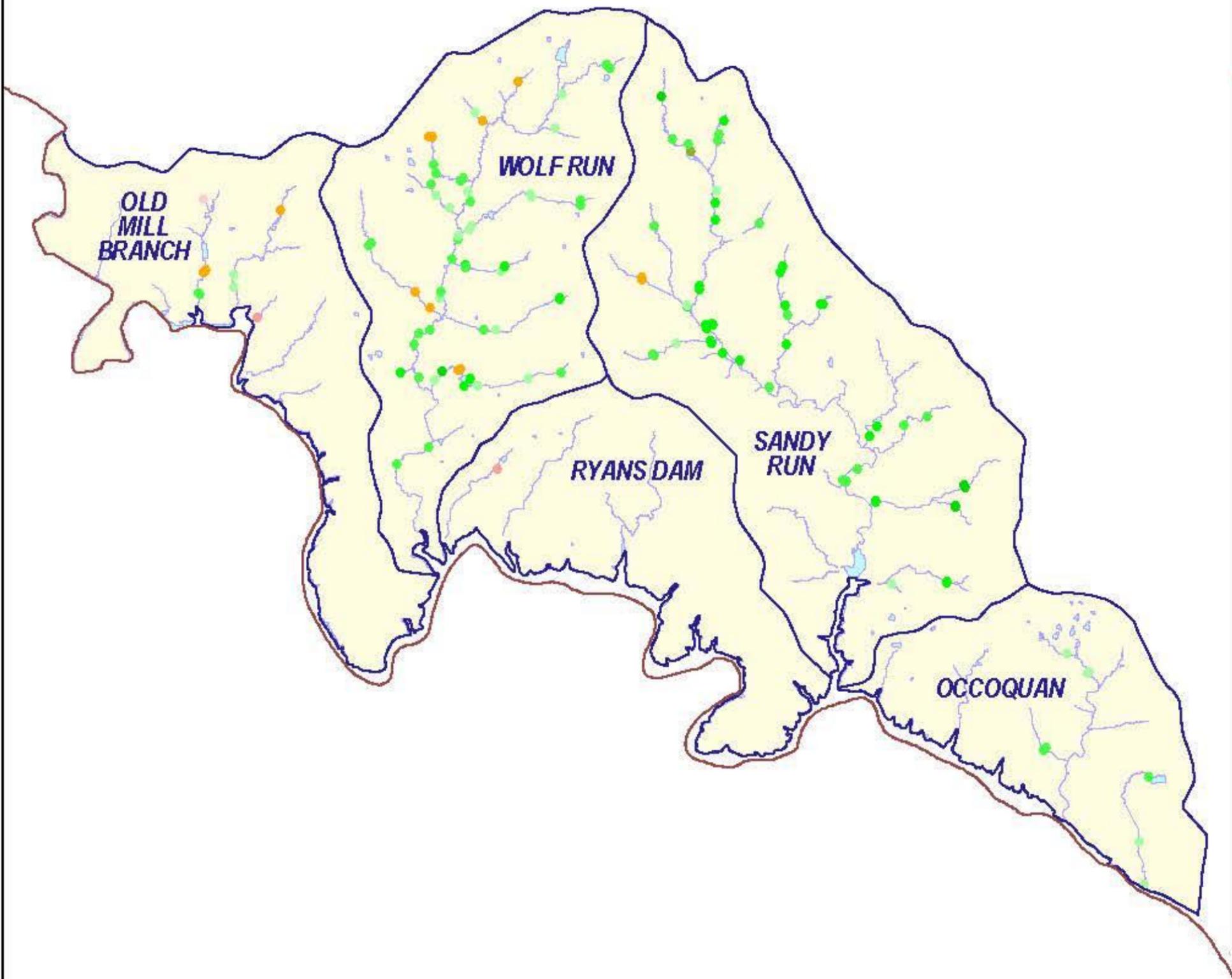
WATERSHED GROUP:  
UPPER OCCOQUAN



0 2000 4000 6000 8000 Feet

**Figure 3-75**  
**Erosion Impacts**  
**Upper Occoquan Group**  
**Fairfax County Stream Physical Assessment**





Deficient Buffer by Impact Score

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

-  Fairfax County Boundary
-  Lakes and Ponds
-  Streams
-  Watersheds

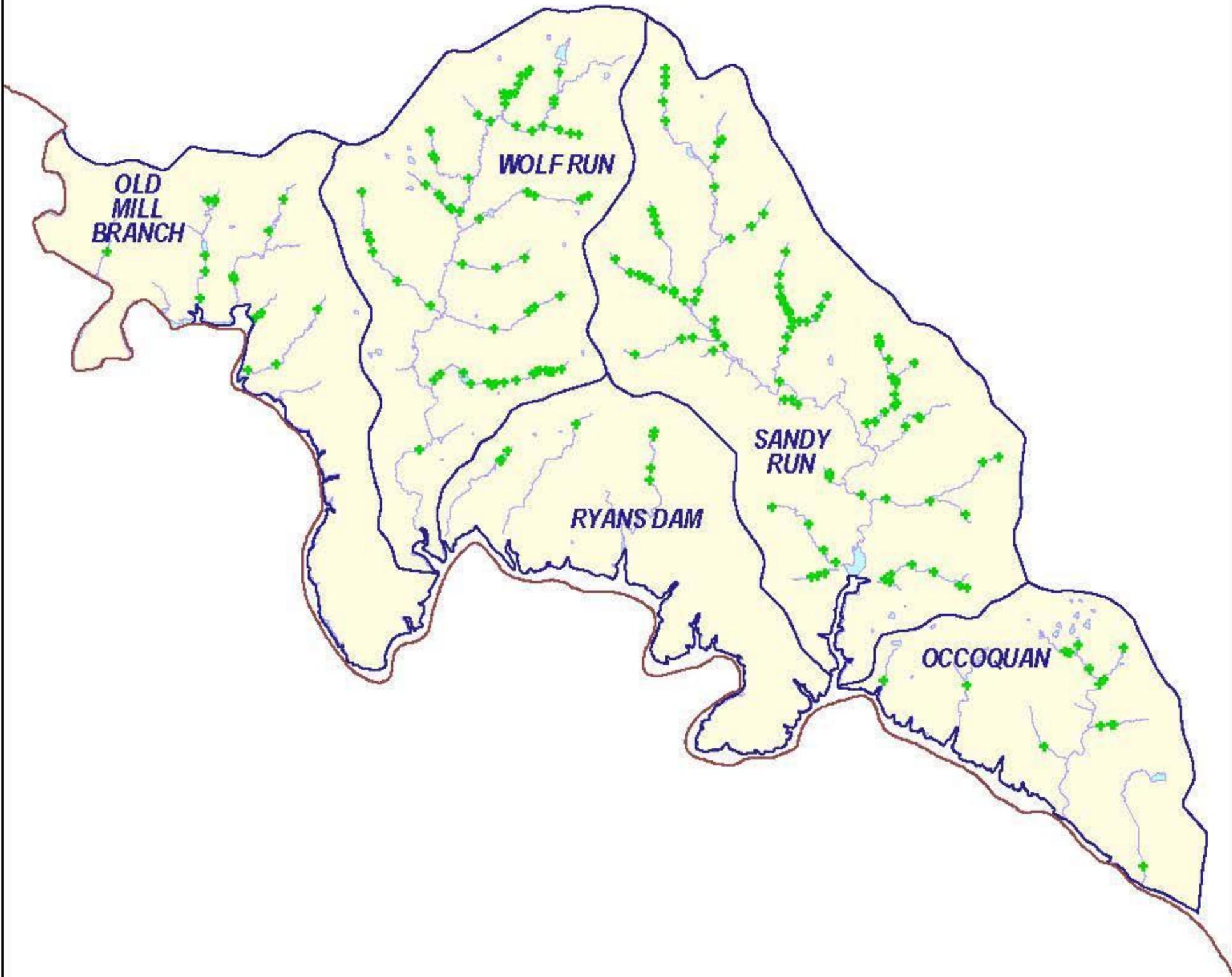
WATERSHED GROUP:  
UPPER OCCOQUAN



0 2000 4000 6000 8000 Feet

**Figure 3-76**  
**Deficient Buffer Impacts**  
**Upper Occoquan Group**  
**Fairfax County Stream Physical Assessment**





**Inventory Type**

+ Crossing

-  Fairfax County Boundary
-  Lakes and Ponds
-  Streams
-  Watersheds

**WATERSHED GROUP:  
UPPER OCCOQUAN**

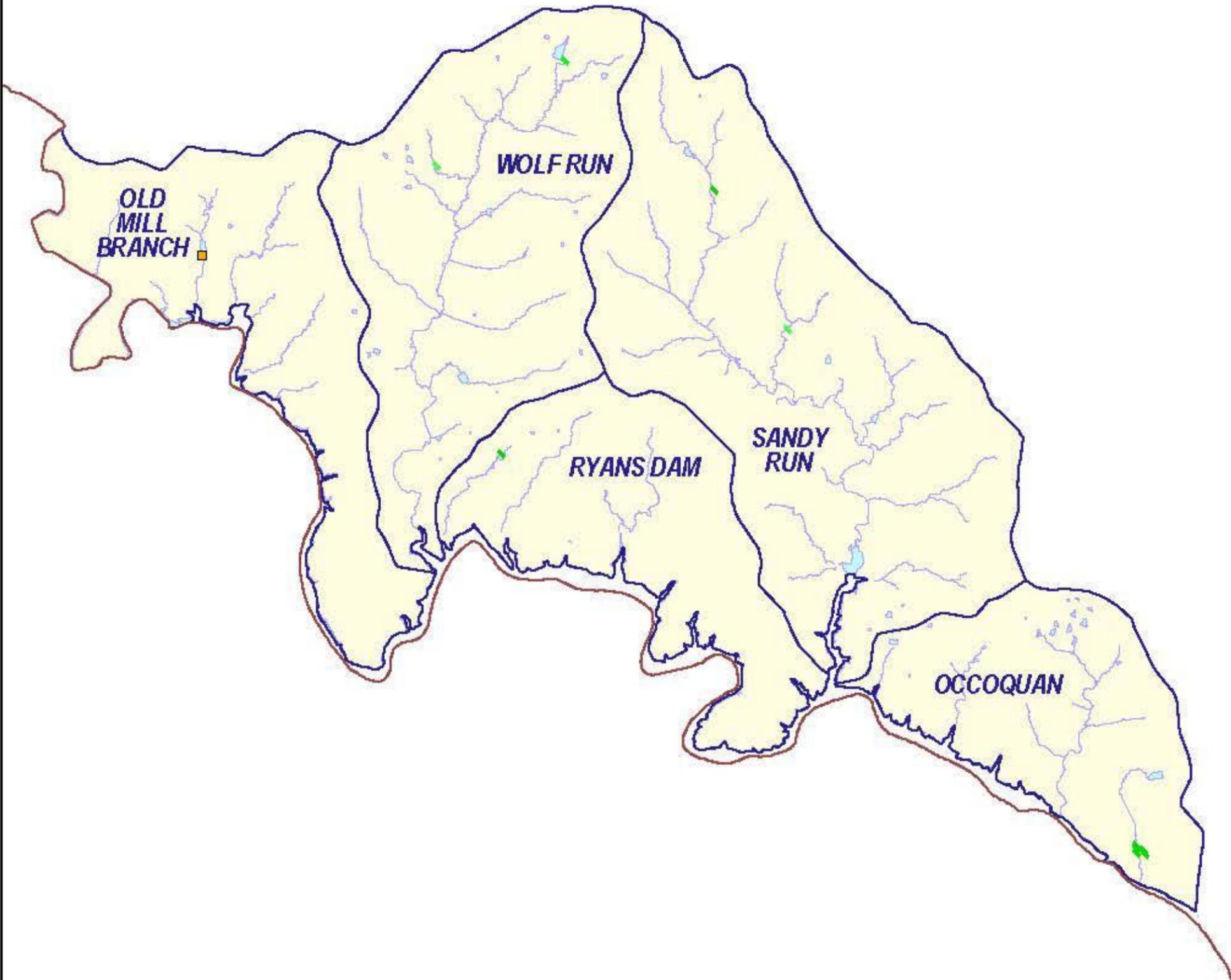


0 2000 4000 6000 8000 Feet



**Figure 3-77**  
**Crossings**  
**Upper Occoquan Group**  
**Fairfax County Stream Physical Assessment**





Pipe / Ditch by Impact Score

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

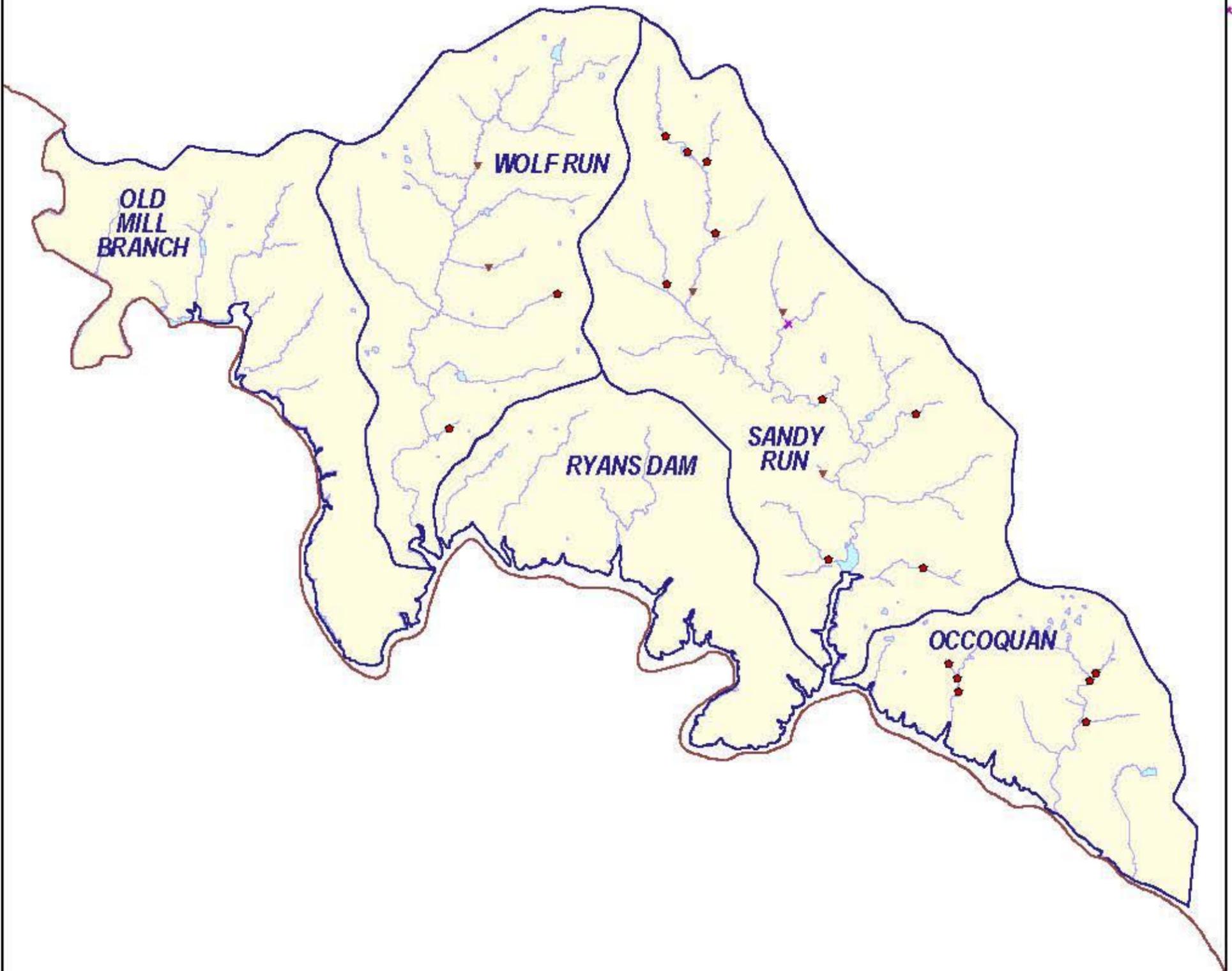
WATERSHED GROUP:  
UPPER OCCOQUAN



0 2000 4000 6000 8000 Feet

**Figure 3-78**  
**Pipe and Ditch Impacts**  
**Upper Occoquan Group**  
**Fairfax County Stream Physical Assessment**





**Inventory Types**

- ▼ Dump
- ◆ Obstruction
- \* Utility

- ▭ Fairfax County Boundary
- ▭ Lakes and Ponds
- ▭ Streams
- ▭ Watersheds

**WATERSHED GROUP:  
UPPER OCCOQUAN**



0 2000 4000 6000 8000 Feet

**Figure 3-79**  
**Dumps, Obstructions, and Utilities**  
**Upper Occoquan Group**  
**Fairfax County Stream Physical Assessment**





## 3.2.12 Lower Occoquan Group Summary

### 3.2.12.1 Mill Branch Watershed

**Description.** Mill Branch Watershed is a medium-sized watershed, with approximately 14 miles of stream assessed. It is located along the middle of the southern boundary of the County. The watershed is entirely contained within the County Boundaries, and drains to the Occoquan River, and eventually discharges to the Potomac River.

**Habitat.** The habitat assessment results for Mill Branch Watershed are summarized by stream in Table 3-59. Habitat scores for each reach are depicted in Figure 3-80. Based on a length weighted habitat score of 106 (Table 3-2), Mill Branch Watershed is in the middle range of quality, compared to the rest of the County. Approximately 6 miles of stream were categorized as having “poor” habitat conditions, 3 miles as “fair,” 3 miles as “good,” and 3 miles as “excellent.”

**CEM.** Based on the CEM evaluations approximately three quarters of the channels assessed in Mill Branch Watershed are in Evolutionary Stage 3 (Table 3-3), with the remainder of the watershed in Stage 2. Figure 3-81 summarizes the CEM results for Mill Branch Watershed.

**Infrastructure.** The infrastructure inventory resulted in 98 inventory points. The most significant problems were related to a utility line, which was given an impact score of 20, and a head cut which was given a score of 10. The infrastructure inventory results are summarized in Table 3-60. Figures 3-82, 3-83, 3-84, 3-85, and 3-86 summarize impact scores for the erosion problems; deficient buffers; crossings; pipes/ditches; and dumps, obstructions, and utilities, respectively.

### 3.2.12.2 Kane Creek Watershed

**Description.** Kane Creek Watershed is a small watershed, with approximately 7 miles of stream assessed. It is located at the southern most end of the County. The watershed is entirely contained within the County Boundaries, and drains to Belmont Bay, and the Potomac River.

**Habitat.** The habitat assessment results for Kane Creek Watershed are summarized by stream in Table 3-61. Habitat scores for each reach are depicted in Figure 3-80. Based on a length weighted habitat score of 128 (Table 3-2), Kane Creek Watershed is in the upper range of quality, compared to the rest of the County. Approximately 6 miles of stream were categorized as having “good” habitat and just over 1 mile as “excellent.”

**CEM.** Based on the CEM evaluations approximately two thirds of the channels assessed in Kane Creek Watershed are in Evolutionary Stage 2 (Table 3-3), with the remainder of the watershed in Stage 3. Figure 3-81 summarizes the CEM results for Kane Creek Watershed.

**Infrastructure.** The infrastructure inventory resulted in 13 inventory points. The most significant problem was related to a crossing, which was given an impact score of 5. The infrastructure inventory results are summarized in Table 3-62. Figures 3-82, 3-83, 3-84, 3-85, and 3-86 summarize impact scores for the erosion problems; deficient buffers; crossings; pipes/ditches; and dumps, obstructions, and utilities, respectively.

### 3.2.12.3 High Point Watershed

**Description.** High Point Watershed is a small watershed, with approximately 3 miles of stream assessed. It is located at the southern most end of the County. The watershed is entirely contained within the County Boundaries, primarily draining the Mason Neck State Park and National Wildlife Refuge. The channels in the watershed consist of several small tributaries, which each drain directly to the Potomac River.

**Habitat.** The habitat assessment results for High Point Watershed are summarized by stream in Table 3-63. Habitat scores for each reach are depicted in Figure 3-80. Based on a length weighted habitat score of 124 (Table 3-2), High Point Watershed is in the upper range of quality, compared to the rest of the County. Nearly all 3 miles of stream were categorized as having “good” habitat conditions.

**CEM.** Based on the CEM evaluations all of the channels assessed in High Point Watershed are in Evolutionary Stage 2 (Table 3-3). Figure 3-81 summarizes the CEM results for High Point Watershed.

**Infrastructure.** The infrastructure inventory resulted in 6 inventory points. The most significant problems were related to two deficient buffers, which were given impact scores of 5. The infrastructure inventory results are summarized in Table 3-64. Figures 3-82, 3-83, 3-84, 3-85, and 3-86 summarize impact scores for the erosion problems; deficient buffers; crossings; pipes/ ditches; and dumps, obstructions, and utilities, respectively.

**TABLE 3-59**  
Habitat Assessment Summary for Mill Branch Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Giles Run	1,065 (2.20)	25,567 (52.92)	9,245 (19.14)	3,352 (6.94)	9,087 (18.81)	48,316
Mills Branch	0 (0.00)	0 (0.00)	4,376 (88.06)	593 (11.94)	0 (0.00)	4,970
South Branch	0 (0.00)	0 (0.00)	0 (0.00)	6,403 (100.00)	0 (0.00)	6,403
Tributary to Occoquan River	0 (0.00)	4,951 (31.76)	2,655 (17.03)	3,132 (20.09)	4,850 (31.11)	15,588
<b>Watershed Total</b>	<b>1,065 (1.41)</b>	<b>30,518 (40.54)</b>	<b>16,276 (21.62)</b>	<b>13,480 (17.91)</b>	<b>13,937 (18.51)</b>	<b>75,276</b>

**TABLE 3-60**  
Infrastructure Assessment Summary for Mill Branch Watershed  
*Fairfax County Stream Physical Assessment*

Impact Score	0	1	2	3	4	5	6	7	8	9	10	>10	Total
Deficient Buffers	0	0	9	4	13	7	3	0	1	0	0	N/A	37
Crossings	34	0	1	0	0	0	0	1	0	0	0	N/A	36
Ditches and Pipes	14	1	0	0	0	0	0	0	0	0	0	N/A	15
Erosion	0	0	0	0	0	0	1	0	0	0	0	N/A	1
Head Cut	0	0	1	0	2	0	0	0	0	0	1	N/A	4
Obstruction	0	1	1	1	0	0	0	0	0	0	0	N/A	3
Utility	1	0	0	0	0	0	0	0	0	0	0	0	2
<b>Total</b>	<b>49</b>	<b>2</b>	<b>12</b>	<b>5</b>	<b>15</b>	<b>7</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>98</b>

**TABLE 3-61**  
Habitat Assessment Summary for Kane Creek Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Kane Creek	0 (0.00)	0 (0.00)	2,072 (10.48)	10,666 (53.94)	7,034 (35.58)	19,772
Thompson Creek	0 (0.00)	0 (0.00)	0 (0.00)	15,493 (100.00)	0 (0.00)	15,493
Tributary to Potomac River	0 (0.00)	0 (0.00)	0 (0.00)	1,300 (100.00)	0 (0.00)	1,300
Tributary to Thompson Creek	0 (0.00)	0 (0.00)	0 (0.00)	1,970 (100.00)	0 (0.00)	1,970
<b>Watershed Total</b>	<b>0 (0.00)</b>	<b>0 (0.00)</b>	<b>2,072 (5.38)</b>	<b>29,429 (76.37)</b>	<b>7,034 (18.25)</b>	<b>38,535</b>

**TABLE 3-62**  
Infrastructure Assessment Summary for Kane Creek Watershed  
*Fairfax County Stream Physical Assessment*

Impact Score	0	1	2	3	4	5	6	7	8	9	10	>10	Total
Deficient Buffers	0	0	0	1	0	1	0	0	0	0	0	N/A	2
Crossings	9	0	0	0	0	0	0	1	0	0	0	N/A	10
Ditches and Pipes	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Erosion	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Head Cut	0	0	0	1	0	0	0	0	0	0	0	N/A	1
Obstruction	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Utility	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13</b>

**TABLE 3-63**  
Habitat Assessment Summary for High Point Watershed  
*Fairfax County Stream Physical Assessment*

Stream	Linear Feet (Percent) of Stream					Total
	Very Poor	Poor	Fair	Good	Excellent	
Tributary to Potomac River	0 (0.00)	0 (0.00)	638 (4.02)	15,218 (95.98)	0 (0.00)	15,856
<b>Watershed Total</b>	<b>0 (0.00)</b>	<b>0 (0.00)</b>	<b>638 (4.02)</b>	<b>15,218 (95.98)</b>	<b>0 (0.00)</b>	<b>15,856</b>

**TABLE 3-64**  
Infrastructure Assessment Summary for High Point Watershed  
*Fairfax County Stream Physical Assessment*

Impact Score	0	1	2	3	4	5	6	7	8	9	10	>10	Total
Deficient Buffers	0	0	0	0	0	2	0	0	0	0	0	N/A	2
Crossings	3	0	0	1	0	0	0	0	0	0	0	N/A	4
Ditches and Pipes	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Erosion	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Head Cut	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Obstruction	0	0	0	0	0	0	0	0	0	0	0	N/A	0
Utility	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>



-  Fairfax County Boundary
- Habitat Rating**
-  Excellent
-  Good
-  Fair
-  Poor
-  Very Poor
-  No Habitat Assessment
-  Lakes and Ponds
-  Watersheds

**WATERSHED GROUP:  
LOWER OCCOQUAN**

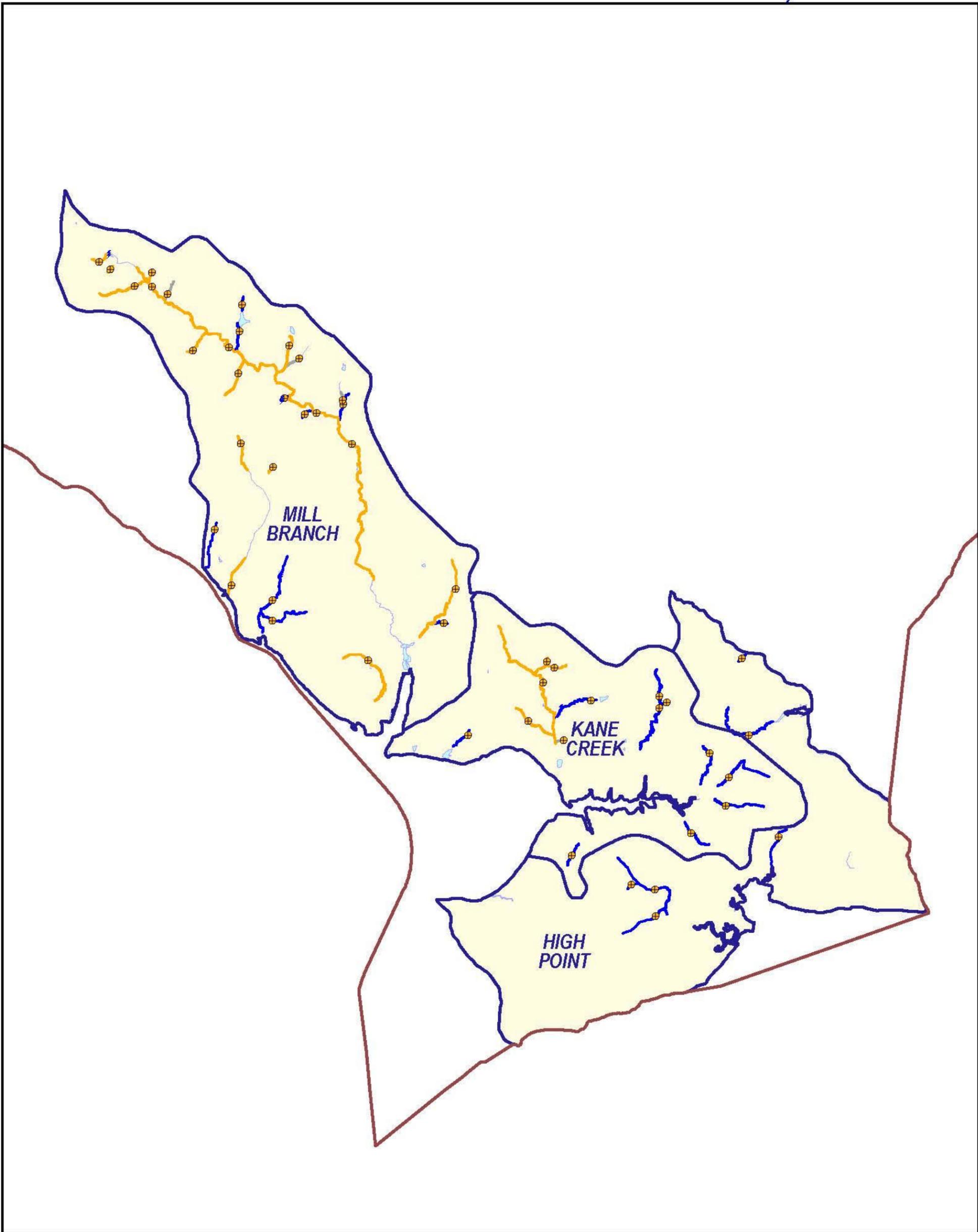


0 2000 4000 6000 8000 Feet



**Figure 3-80**  
**Habitat Assessment**  
**Lower Occoquan Group**  
**Fairfax County Stream Physical Assessment**





**Inventory Types**

- Cross Section
- Head Cut

**CEM Stage**

- Not Assigned
- 1
- 2
- 3
- 4
- 5

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

**WATERSHED GROUP:  
LOWER OCCOQUAN**



0 2000 4000 6000 8000 Feet

**Figure 3-81**  
**CEM Stages**  
**Lower Occoquan Group**  
**Fairfax County Stream Physical Assessment**





Erosion by Impact Score

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

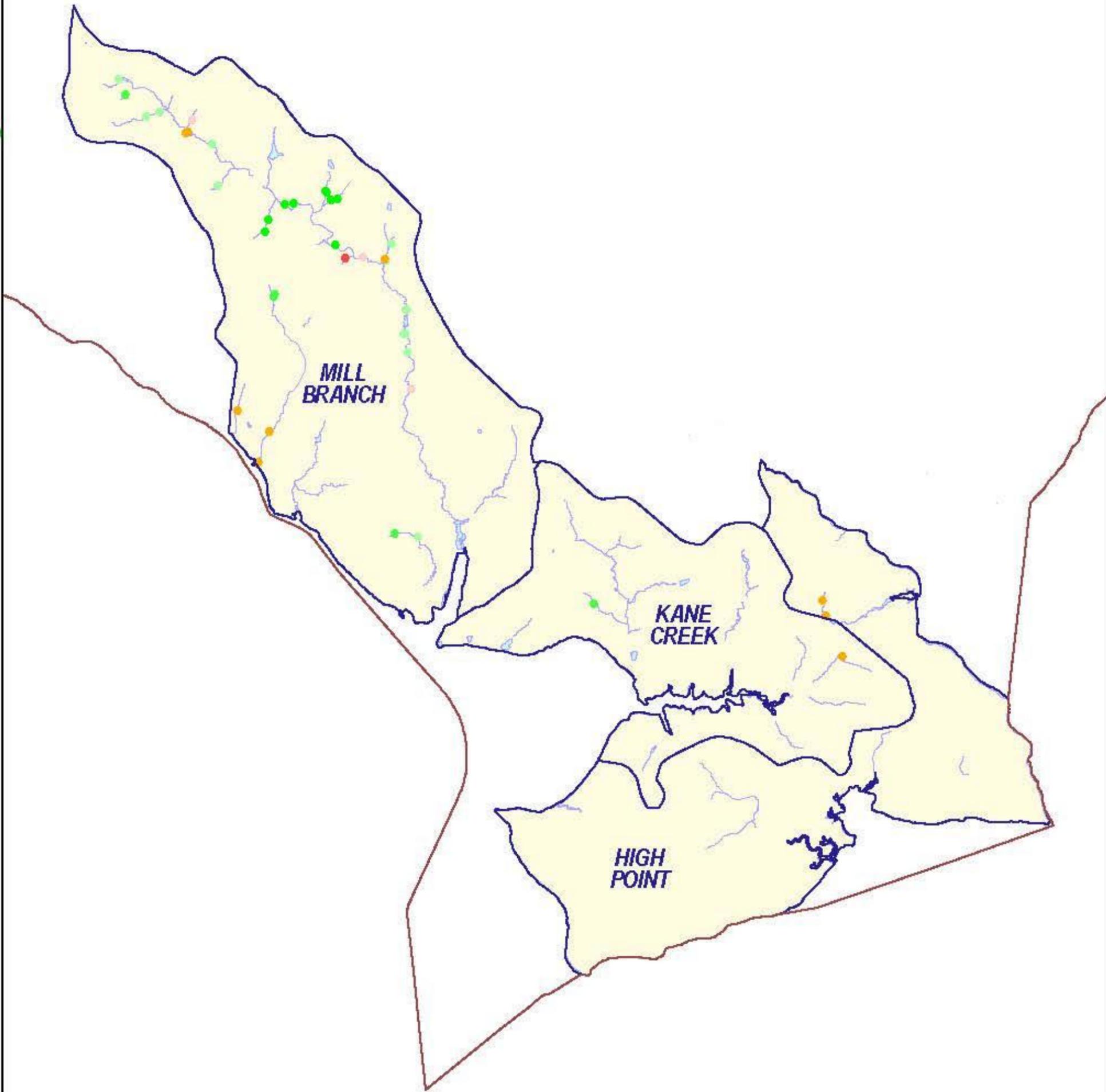
WATERSHED GROUP:  
LOWER OCCOQUAN



0 2000 4000 6000 8000 Feet

**Figure 3-82**  
**Erosion Impacts**  
**Lower Occoquan Group**  
**Fairfax County Stream Physical Assessment**





Deficient Buffer by Impact Score

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- ▭ Fairfax County Boundary
- ▭ Lakes and Ponds
- ▭ Streams
- ▭ Watersheds

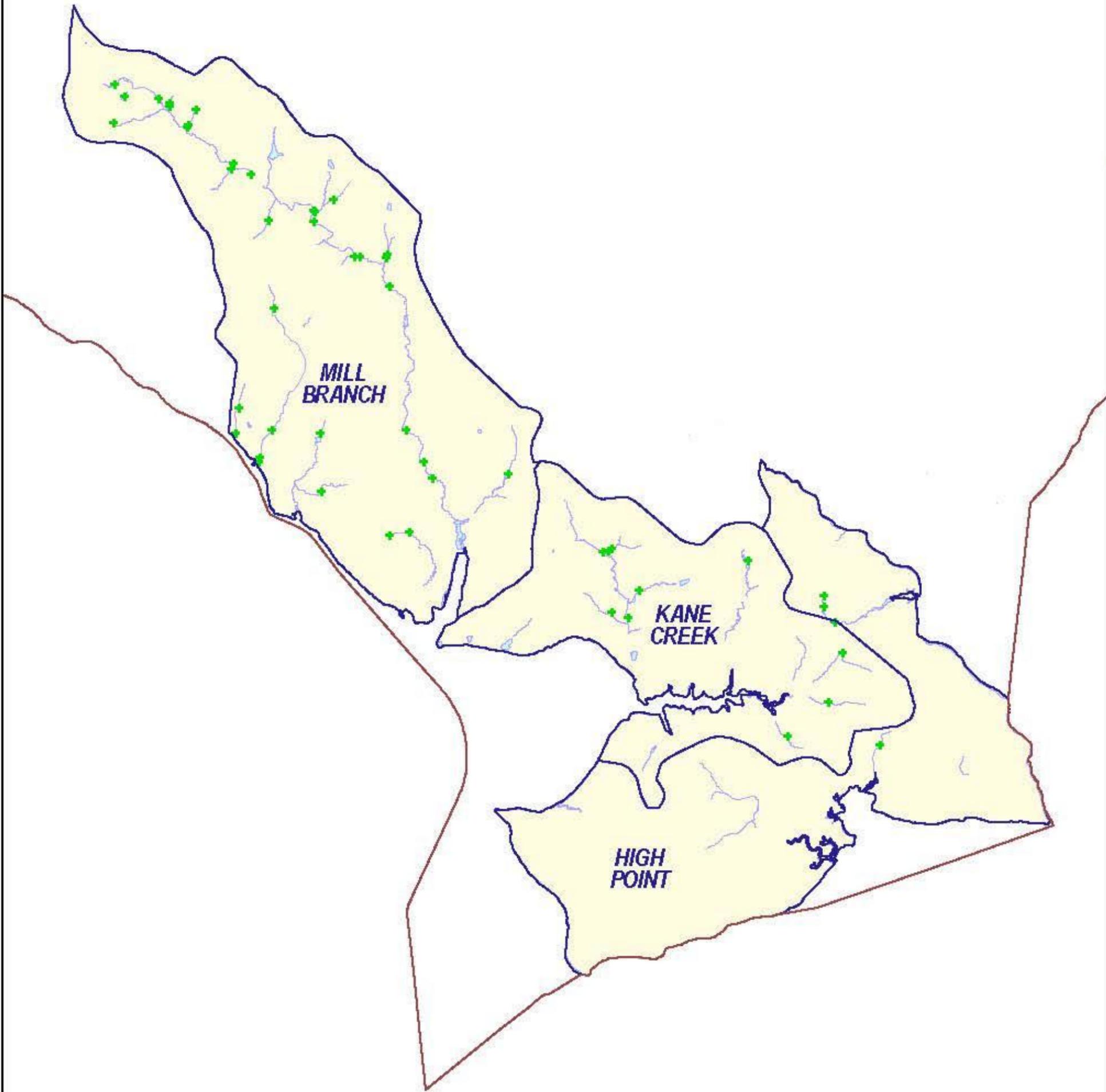
WATERSHED GROUP:  
LOWER OCCOQUAN



0 2000 4000 6000 8000 Feet

**Figure 3-83**  
**Deficient Buffer Impacts**  
**Lower Occoquan Group**  
**Fairfax County Stream Physical Assessment**





**Inventory Type**

-  Crossing
-  Fairfax County Boundary
-  Lakes and Ponds
-  Streams
-  Watersheds

**WATERSHED GROUP:  
LOWER OCCOQUAN**



0 2000 4000 6000 8000 Feet



**Figure 3-84**  
**Crossings**  
**Lower Occoquan Group**  
**Fairfax County Stream Physical Assessment**





Pipe / Ditch by Impact Score

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

- Fairfax County Boundary
- Lakes and Ponds
- Streams
- Watersheds

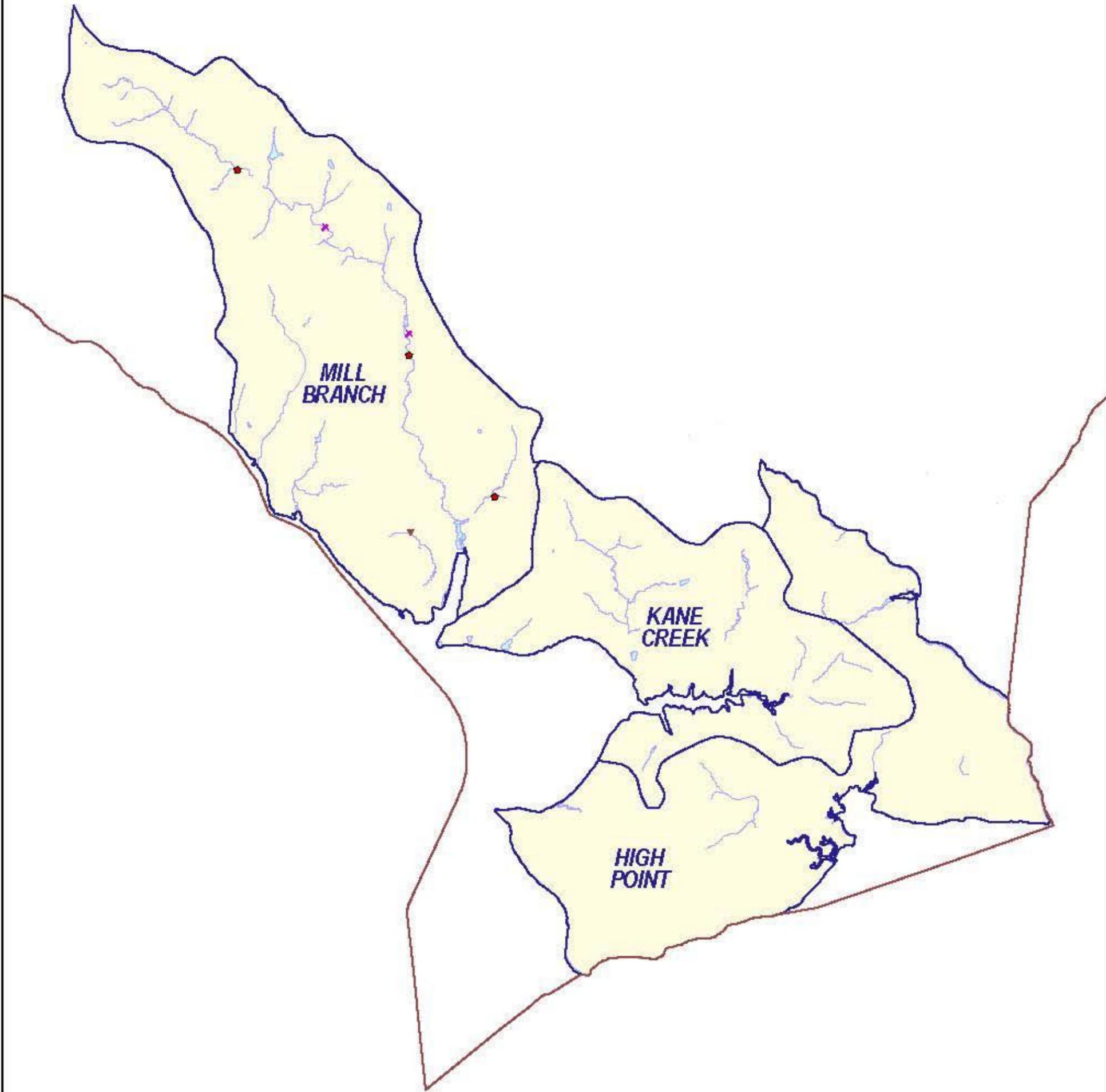
WATERSHED GROUP:  
LOWER OCCOQUAN



0 2000 4000 6000 8000 Feet

**Figure 3-85**  
**Pipe and Ditch Impacts**  
**Lower Occoquan Group**  
**Fairfax County Stream Physical Assessment**





**Inventory Types**

- ▼ Dump
- ◆ Obstruction
- ✕ Utility

- ▭ Fairfax County Boundary
- ▭ Lakes and Ponds
- ▭ Streams
- ▭ Watersheds

**WATERSHED GROUP:  
LOWER OCCOQUAN**



0 2000 4000 6000 8000 Feet

**Figure 3-86**  
**Dumps, Obstructions, and Utilities**  
**Lower Occoquan Group**  
**Fairfax County Stream Physical Assessment**



## 3.2.8 Pohick Creek Summary

### 3.2.8.1 Pohick Creek Watershed

**Description.** Pohick Creek Watershed is one of the largest watersheds in Fairfax County, with just over 69 miles of stream assessed. It is a long narrow watershed located in the center of the County. The watershed is contained entirely within the county boundaries, and drains to Pohick Bay, and then into Gunston Cove and the Potomac River.

**Habitat.** The habitat assessment results for Pohick Creek Watershed are summarized by stream in Table 3-37. Habitat scores for each reach are depicted in Figure 3-52. Based on a length weighted habitat score of 95, Pohick Creek Watershed is one of the poorest quality watersheds, compared to the rest of the County. Approximately 2 miles of stream were categorized as having “very poor” habitat conditions, 20 miles as “poor,” 37 miles as “fair,” and 10 miles as “good.”

**CEM.** Based on the CEM evaluations approximately three quarters of the channels assessed in Pohick Creek Watershed are in Evolutionary Stage 3 (Table 3-3), with most of the remainder of the watershed in Stage 4. Figure 3-53 summarizes the CEM results for Pohick Creek Watershed.

**Infrastructure.** The infrastructure inventory resulted in 871 inventory points. The most significant problems were related to four head cuts, two exposed utility lines and one pipe, which were each given an impact score of 10. The infrastructure inventory results are summarized in Table 3-38. Figures 3-54, 3-55, 3-56, 3-57, and 3-58 summarize impact scores for the erosion problems; deficient buffers; crossings; pipes/ditches; and dumps, obstructions, and utilities, respectively.

#### SECTION 4

# Conclusions

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A stream physical assessment project to support the development of watershed management plans was initiated by Fairfax County in August 2002. Data obtained from this project provided a detailed understanding of stream and watersheds in the County through the evaluation of stream habitats and an account of such features as stream crossings, drainage pipes, utility crossings, stream bank erosion, deficient buffers, and stream obstructions.

The analysis characterized stream habitat conditions in 30 watersheds and indicated that many of the streams in Fairfax County have fair or good habitat. On the basis of the length-weighted average total habitat score, one watershed (Ryans Dam) was rated to have excellent habitat, six watersheds (Bull Neck Run, High Point, Kane Creek, Nichol Run, Occoquan, and Turkey Run) had good habitat, and two watersheds (Belle Haven and Little Hunting Creek) had poor habitat. The remaining watersheds were rated to have fair habitat.

SECTION 5

# References

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