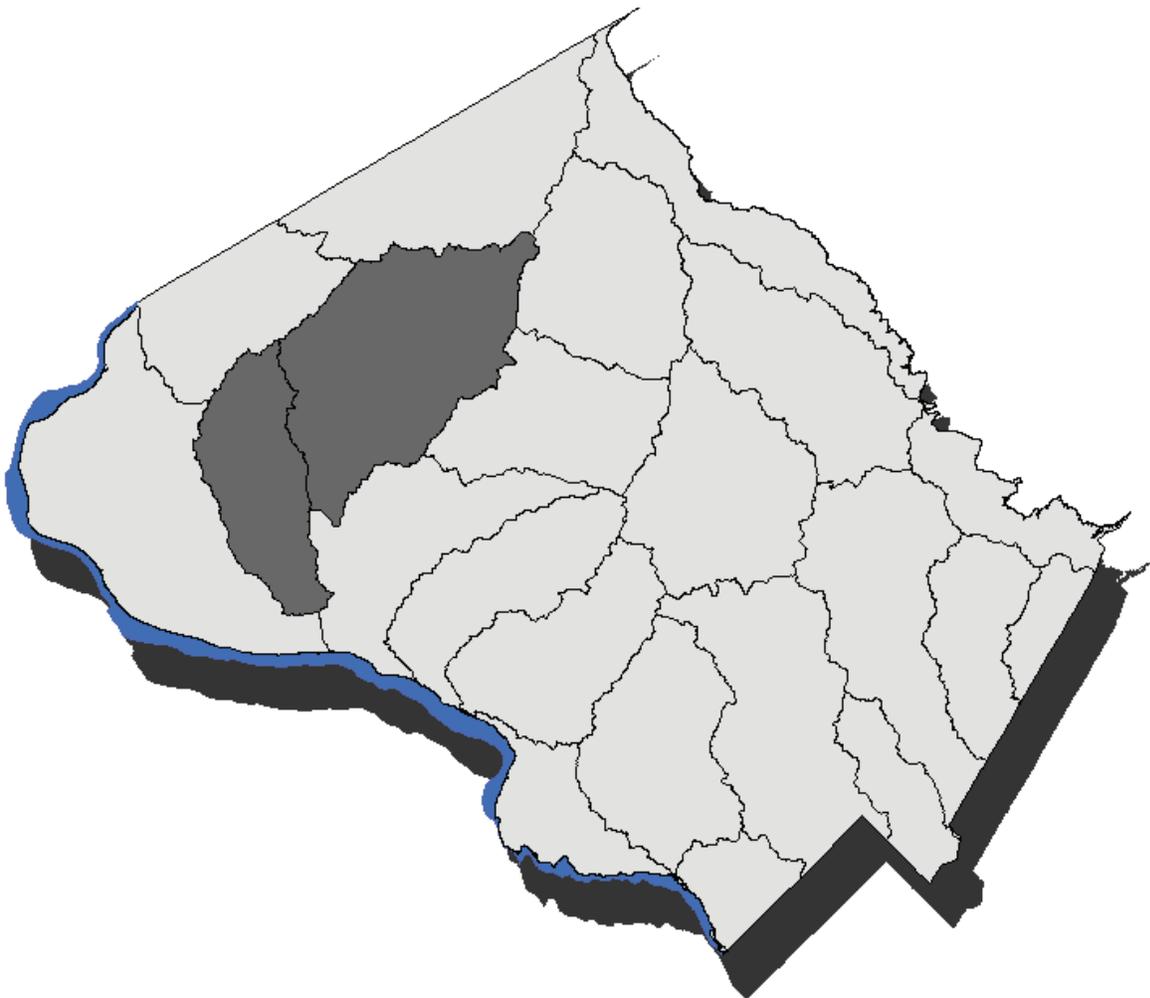




# DRY SENECA CREEK & LITTLE SENECA CREEK Pre-Assessment Report

PREPARED FOR:  
MONTGOMERY COUNTY  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
255 Rockville Pike, Suite 120



May 2011



# **PRE-ASSESSMENT REPORT**

## **Dry Seneca Creek and Little Seneca Creek**

**May 2011**

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## 1. INTRODUCTION

To successfully meet its regulatory requirements and environmental goals, Montgomery County must complete watershed assessments until all land area in the County is covered by a specific action plan to address the water quality problems that are identified through the assessments. No watershed assessment or action plan has yet been completed for the Dry Seneca Creek and Little Seneca Creek. Therefore, the County has undertaken preparation of this "Pre-Assessment" as the first step toward completing a watershed restoration plan that will, ultimately, address changing watershed conditions, apply new restoration technologies, and refine implementation strategies, as needed to achieve watershed restoration success. The Recommended Framework for Watershed Restoration Plans describes this process in detail and provides background information on how the pre-assessments are being developed and will evolve into watershed restoration plans.

### 1.1 REGULATORY AND PROGRAMMATIC CONTEXT

The Dry Seneca Creek and Little Seneca Creek subwatersheds in Montgomery County drain to Seneca Creek which continues flowing to the Potomac River. The Great Seneca subwatershed is the other subwatershed that comprises the Seneca Creek watershed. Based on the 2008 Integrated Report (combined 303(d) List and 305b Report), Seneca Creek (Basin Code 02140208) is impaired for total phosphorus (TP) as of 1996 with an approved TMDL. Seneca Creek is also impaired for total suspended solids (TSS) as of 1996 with a pending TMDL, and is biologically impaired as of 2006 (combination of benthic and fish bioassessments) but as of February 2011 is without an approved TMDL.

Each watershed restoration plan must also meet the following water quality goals defined in the County's Chapter 19, Article IV. Water Quality Control, adopted in 1994:

- Protect, maintain, and restore high quality chemical, physical, and biological conditions in the waters of the state in the County
- Reverse past trends of stream deterioration through improved water management practices
- Maintain physical, chemical, biological, and stream habitat conditions in County streams that support aquatic life along with appropriate recreational, water supply, and other water uses
- Restore County streams damaged by inadequate water management practices of the past, by reestablishing the flow regime, chemistry, physical conditions, and biological diversity of natural stream systems as closely as possible
- Help fulfill interjurisdictional commitments to restore and maintain the integrity of the Anacostia River, the Potomac River, the Patuxent River, and the Chesapeake Bay

- Promote and support educational and volunteer initiatives that enhance public awareness and increase direct participation in stream stewardship and the reduction of water pollution.

## 1.2 GOALS OF THE PRE-ASSESSMENT

The specific goals of the pre-assessment for the Dry Seneca Creek and Little Seneca Creek are:

- Summarize the current environmental conditions of the watershed including 303d listed waterbodies and 305b reports and indices of biological integrity
- Describe the current land uses of the watershed, particularly imperviousness and its distribution across land uses, as well as forest cover, especially as it relates to stream buffer
- Describe existing stormwater management practices
- Conduct a neighborhood-scale desktop analysis of stormwater BMP retrofit opportunities using priorities developed with County staff.
- Identify initial strategies to reduce trash loads in accordance with the targets set forth in the Potomac Trash Treaty.

Once the Pre-Assessment is completed for Dry Seneca Creek and Little Seneca Creek, a full watershed restoration plan will be undertaken. The watershed restoration plan will update any environmental condition information and include results from field investigations to identify specific watershed problem areas and restoration sites. Following the field investigations, concept plans would be developed for candidate restoration sites that will serve as the action inventory. Pollutant loading estimates and public involvement would also be conducted to assign priorities and coordinate with the Great Seneca Watershed Implementation Plan. Projects, public involvement, and associated pollutant reductions for the combined Seneca Watershed Implementation Plan will then be integrated into the Countywide Coordinated Implementation Strategy.

## **2. ENVIRONMENTAL CONDITIONS**

### **2.1 THE DRY SENECA CREEK AND LITTLE SENECA CREEK**

Figure 2-1 delineates the Dry Seneca Creek and Little Seneca Creek subwatersheds in the County. Figure 2-2 shows major landmarks in and around the two subwatersheds.

#### **2.1.1 Dry Seneca Creek**

Dry Seneca Creek originates south of Barnesville and receives drainage from Beallsville and the Town of Poolesville. The primary land use is agriculture, with the exception of the Town of Poolesville. Large lot residential areas are permitted within the Agricultural Preserve. Much of the upper drainage contains forested areas. The habitat in the stream is generally good, although certain areas are influenced by excessive levels of sediment deposition due to effects of urbanization.

In 2000, the stream reach below the Town of Poolesville's wastewater treatment plant (WWTP) was found to be biologically impaired. The DEP has worked with Maryland Department of the Environment and the Town of Poolesville to ensure that the WWTP and sewer lines are upgraded and that the source of the impairment has been corrected.

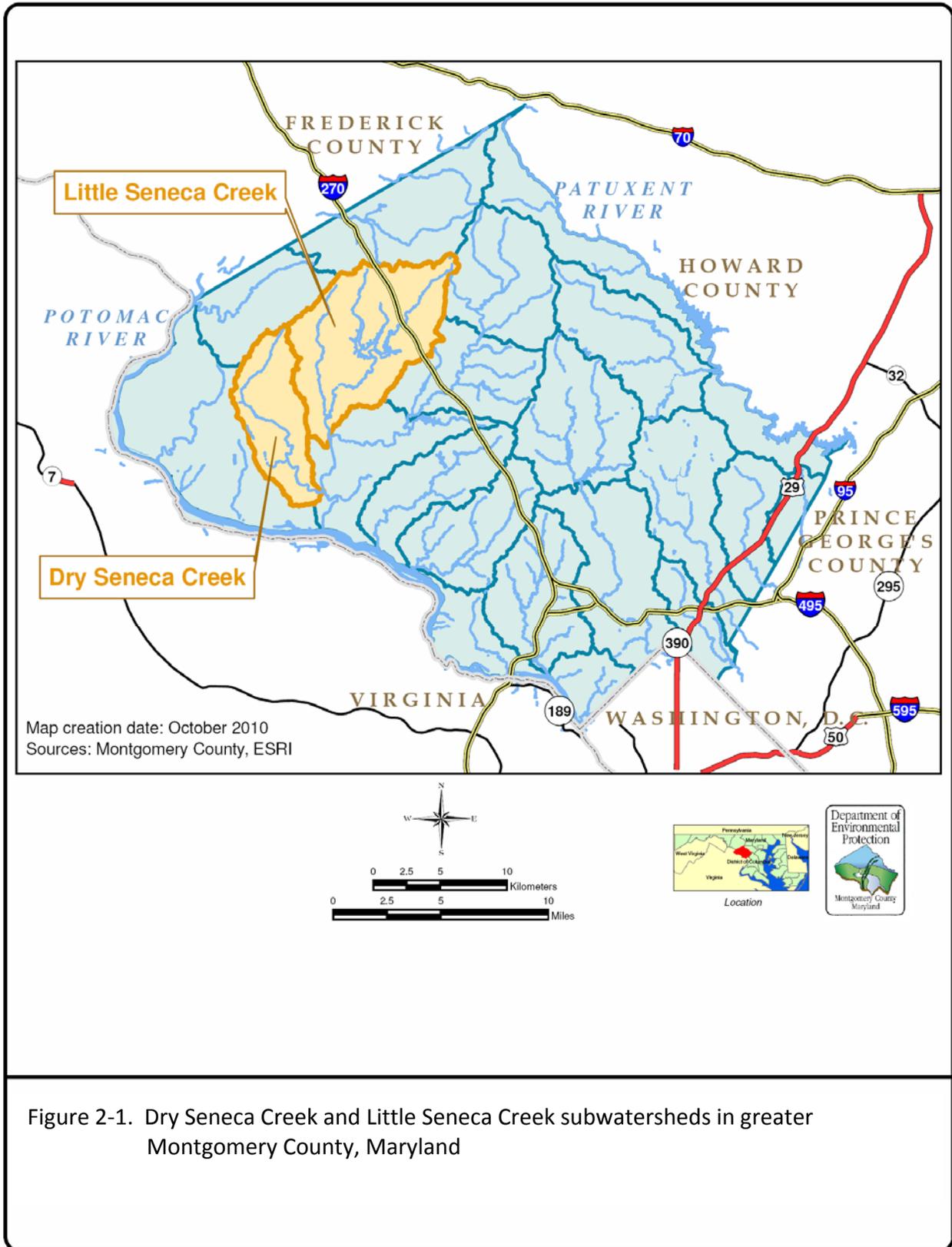


Figure 2-1. Dry Seneca Creek and Little Seneca Creek subwatersheds in greater Montgomery County, Maryland

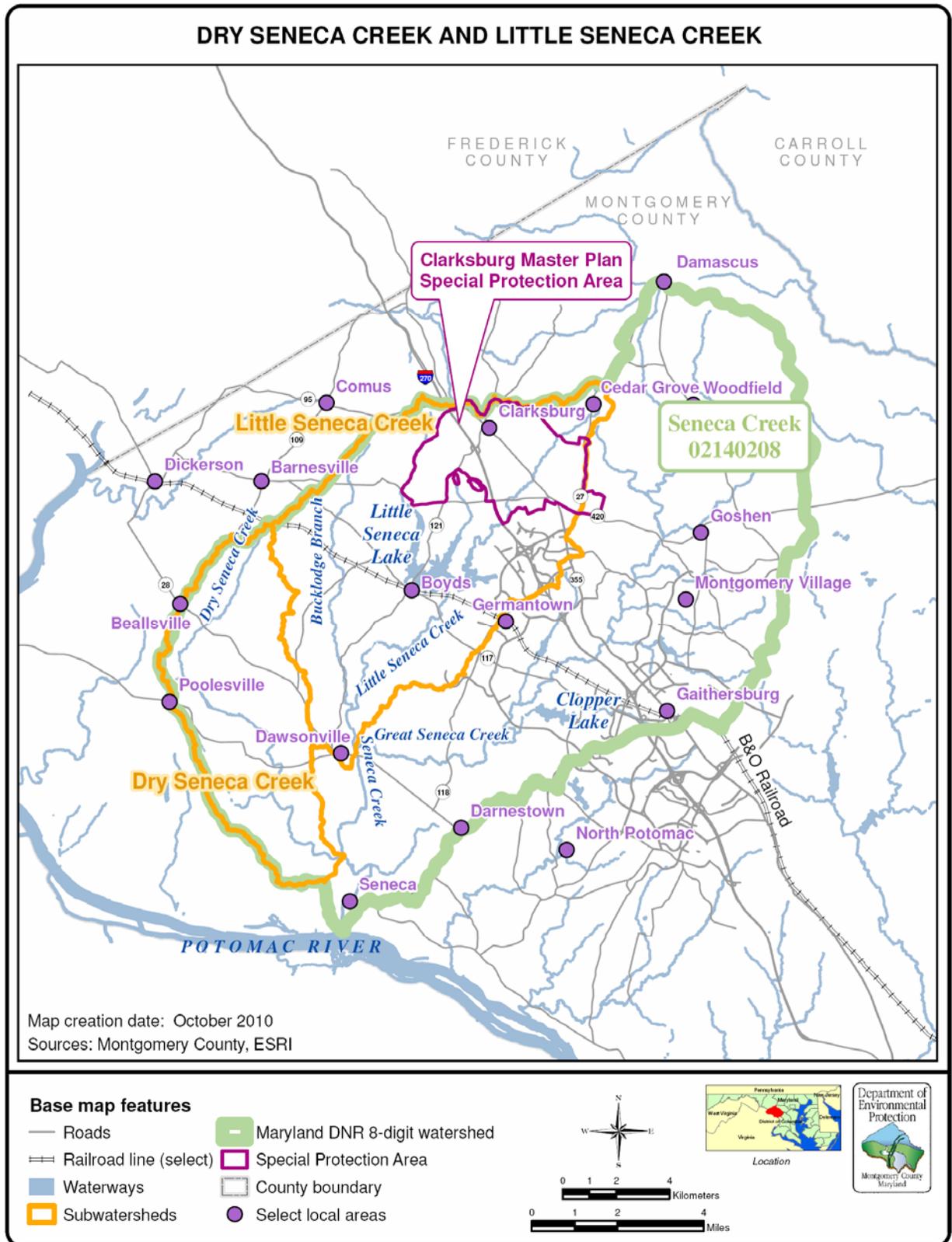


Figure 2-2. Landmarks in and around Little Seneca Creek and Dry Seneca Creek in Montgomery County, Maryland

### 2.1.2 Little Seneca Creek

Little Seneca Creek drains a sizeable portion of the northern and western part of the County, including areas of Clarksburg, Germantown, and Boyds. The stream begins south of Damascus, and flows southwest before joining Bucklodge Branch north of Dawsonville and finally to Seneca Creek. Land uses in the Little Seneca Creek watershed are mixed, ranging from older rural and agricultural uses, to newer high-density residential and commercial areas. To protect this watershed from the effects of ongoing urbanization in the headwaters, there have been extensive planning efforts including density limitations, stream valley park acquisition, reforestation, and designation of part of Clarksburg as an SPA.

### 2.2 LAND-USE CHARACTERISTICS

Land-uses within the subwatersheds are summarized in Table 2-1 and shown in Figure 2-3.

Land-use Category	Dry Seneca Creek		Little Seneca Creek	
	Acres	Percent of Total	Acres	Percent of Total
Agricultural	7,414.5	59.8	17,983.8	71.3
Open Urban Land, etc	3,986.3	32.2	2,248.6	8.9
Low-density residential	561.9	4.5	1,303.6	5.2
Medium-density residential	216.0	1.7	1,753.6	7.0
High-density residential	0.0	0.0	392.7	1.6
Roadways	167.0	1.3	681.6	2.7
Commercial	51.9	0.4	274.5	1.1
Industrial	0.0	0.0	583.3	2.3
<b>TOTAL</b>	<b>12,397.6</b>	<b>100</b>	<b>25,221.8</b>	<b>100</b>

Data source: Maryland Department of Planning, 2002

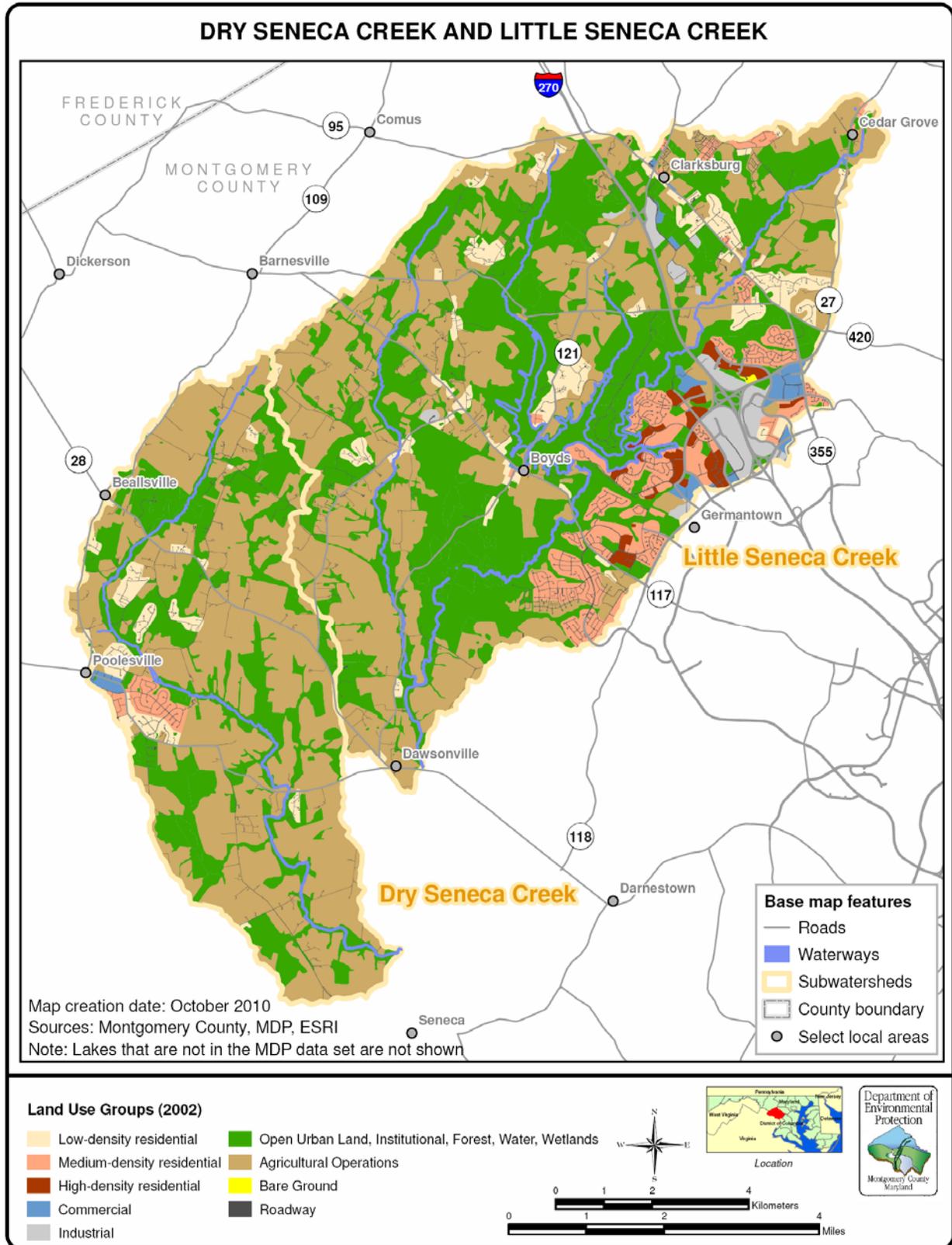


Figure 2-3. Land use in Dry Seneca Creek and Little Seneca Creek subwatersheds, Montgomery County, Maryland

The Dry Seneca Creek subwatershed, which covers 12,397.6 acres, is dominated by agriculture (59.8% of land cover) followed by open urban land (32.2%). The Little Seneca Creek subwatershed is more than twice as large (25,221.8 acres) with agriculture at 71.3% of land cover. The remainder is primarily made up of open urban land and medium-density residential, with areas of more intense development associated with Germantown and the Clarksburg Town Center.

### 2.3 IMPERVIOUS FEATURES

Impervious land cover constituents across the two subwatersheds are illustrated in Figure 2-4 and specified in Table 2-2. The Little Seneca Creek subwatershed contains more than three times the percentage of impervious cover as the Dry Seneca Creek subwatershed and six times as much total impervious acres. Roads, parking lots and roofs account for the majority of impervious cover in the Little Seneca Creek subwatershed. Roads and roofs are the primary constituents of imperviousness in the Dry Seneca Creek subwatershed. Areas of contiguous imperviousness in and around Germantown (Little Seneca Creek) and the Town of Poolesville (Dry Seneca Creek) are obvious in Figure 2-4.

Major Impervious Constituents	Dry Seneca Creek	Little Seneca Creek
<b>Roads (acres)</b>	<b>168.8</b>	<b>695.1</b>
County jurisdiction roads	60.6	423.9
Other roads	108.2	271.2
<b>Parking Lots (acres)</b>	<b>31.5</b>	<b>472.8</b>
County parcels (lots < 1 acre)	0.4	29.4
County parcels (lots > 1 acre)	2.7	69.1
Other	28.5	374.2
<b>Roofs (acres)</b>	<b>86.8</b>	<b>542.4</b>
County parcels	1.8	58.1
Single-family residential, detached	68.6	258.9
Schools	1.5	19.3
Other roofs	14.9	206.1
<b>Other (acres)*</b>	<b>2.1</b>	<b>48.5</b>
Sidewalks	2.1	48.4
Paved Courts	0	0
<b>Total Impervious Acres</b>	<b>289.2</b>	<b>1758.8</b>
<b>Percent Imperviousness</b>	<b>2.3</b>	<b>7.0</b>

\* Driveways have not been included in these impervious cover calculations.

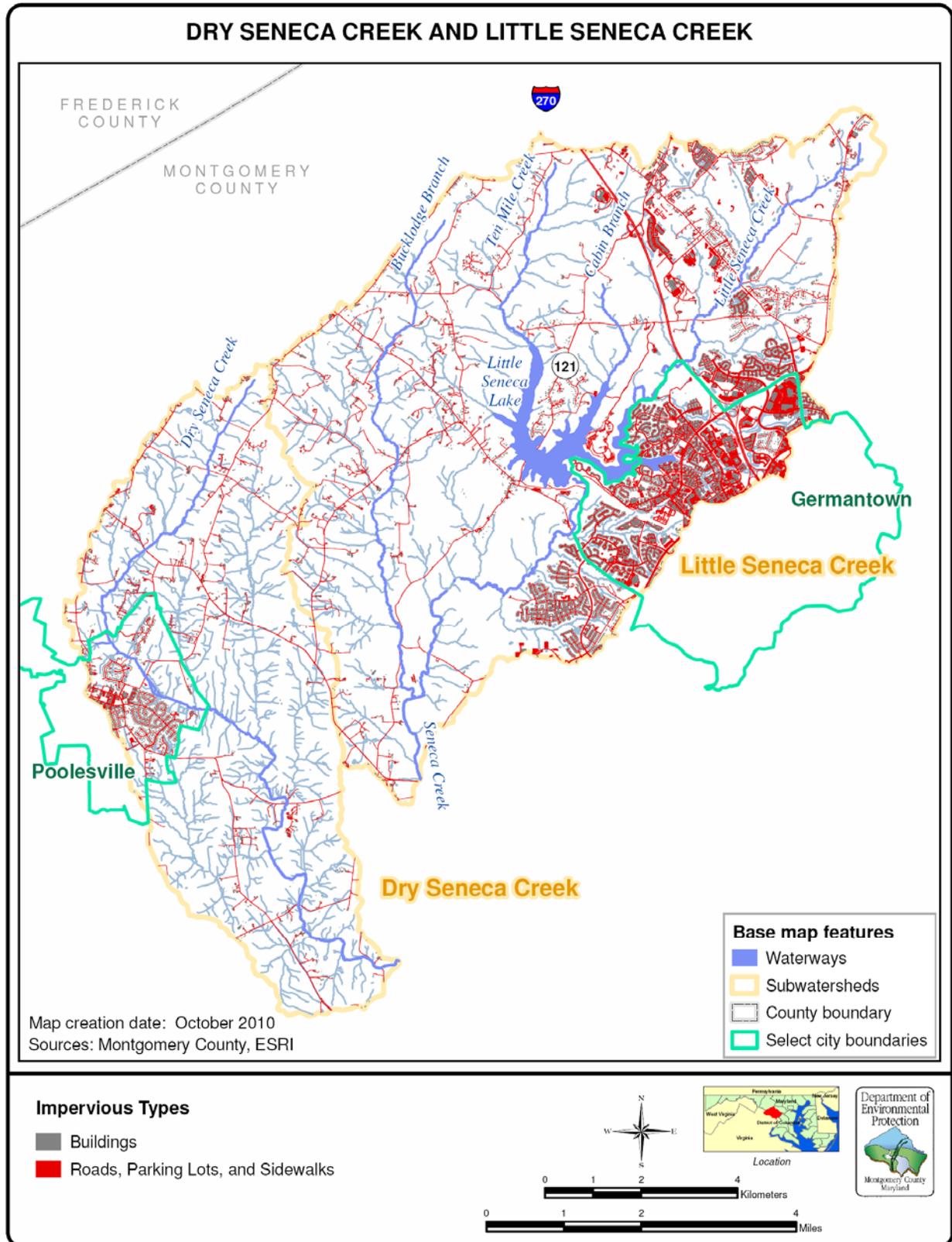


Figure 2-4. Impervious cover in Dry Seneca Creek and Little Seneca Creek subwatersheds, Montgomery County, Maryland

## 2.4 HYDROLOGIC SOIL GROUPS

Figure 2-5 illustrates the extent of the three hydrologic soil groups found in Dry Seneca Creek and Little Seneca Creek subwatersheds. The majority of soils in the Little Seneca Creek subwatershed are B soils. There are no 'A' soils in these two subwatersheds. Dry Seneca Creek subwatershed has significant areas of C soils in its northern portion and C soils in the southern half. Soils designated as A and B are able to infiltrate water more easily than soils designated as C and D.

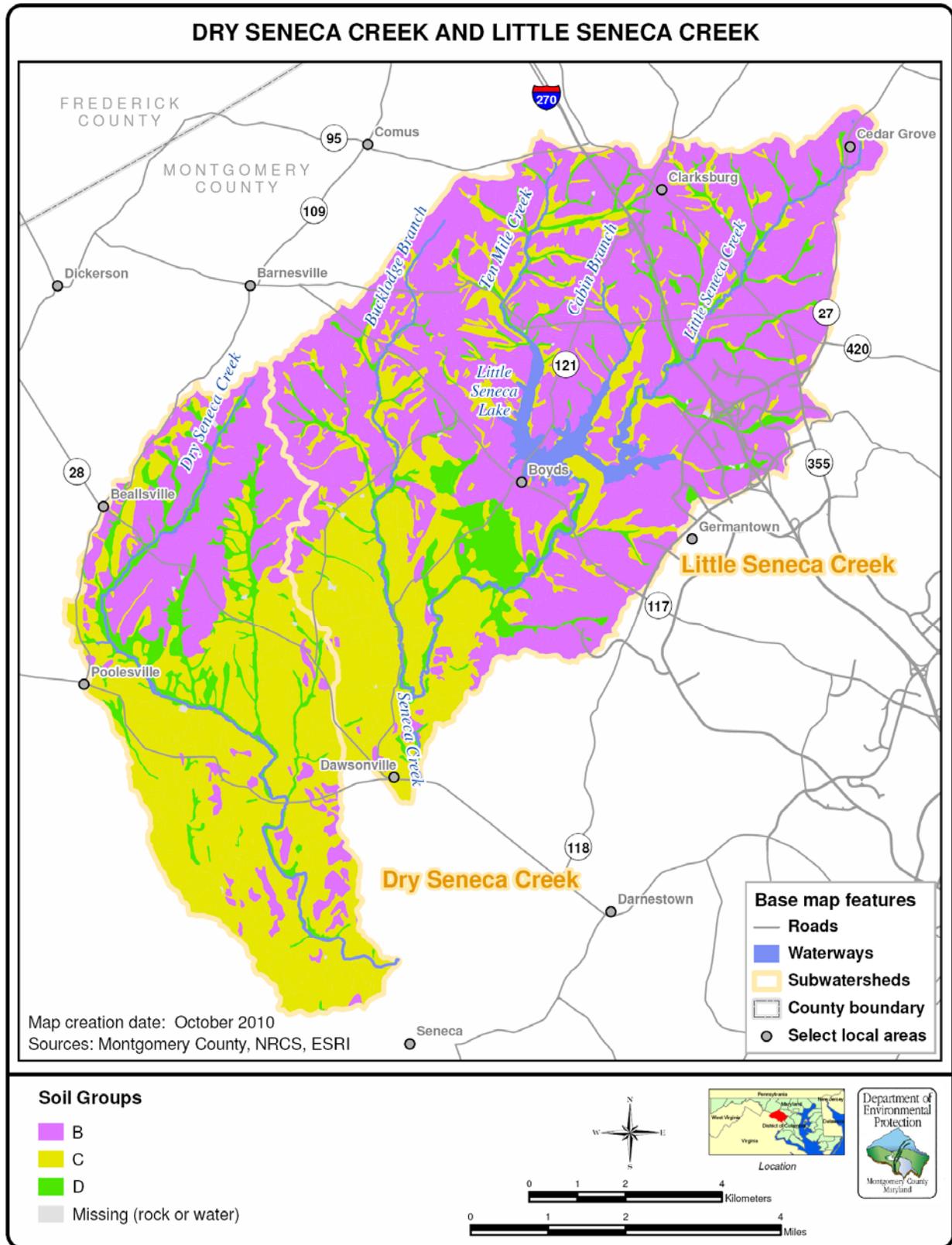


Figure 2-5. Hydrologic soil groups in Dry Seneca Creek and Little Seneca Creek subwatersheds, Montgomery County, Maryland

## 2.5 FOREST COVER

Forest cover tends to follow existing stream channels, as illustrated in Figure 2-6. The two subwatersheds contain 12,206 acres of forest in total; 3,492.9 acres in Dry Seneca Creek and 8,713.1 acres in Little Seneca Creek. The majority of forest in the combined subwatersheds (71.4%) resides in Little Seneca Creek. About one third of both subwatersheds are covered by forest, 34.5% in Little Seneca Creek and 28.2% in Dry Seneca Creek.



## 2.6 WETLANDS

Wetlands are quite scarce in the two subwatersheds, covering 1707 acres in total. Of the six wetland types illustrated in Figure 2-7, palustrine forested and lacustrine dominate.

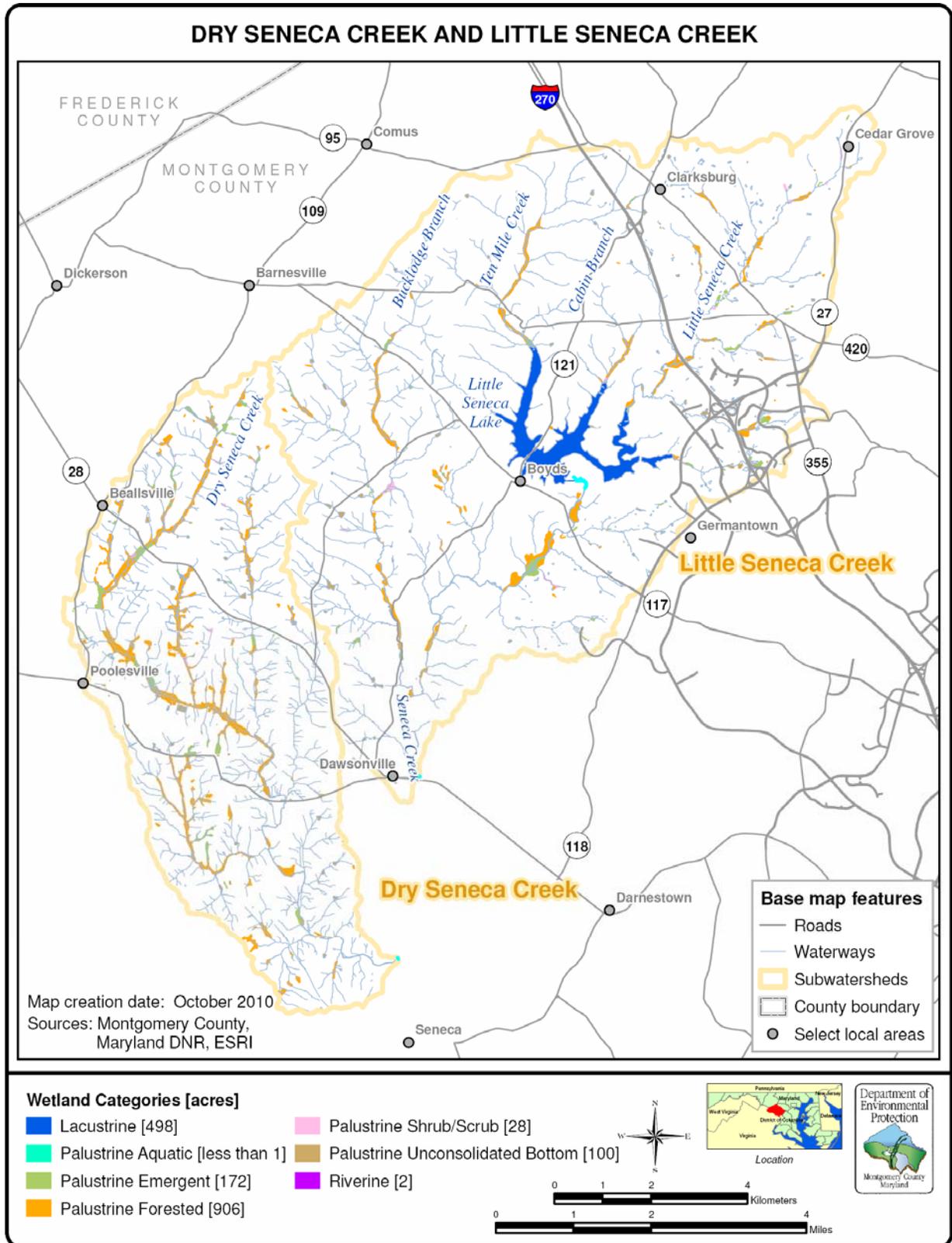


Figure 2-7. Wetland types and extent in Dry Seneca Creek and Little Seneca Creek subwatersheds, Montgomery County, Maryland

## 2.7 BIOLOGICAL INDICATORS OF WATERSHED CONDITION

Figure 2-8 shows the stream condition ratings for individual catchments within Dry Seneca Creek and Little Seneca Creek, based on one sampling site in each drainage area. Stream conditions ranged from excellent to poor, with most of the streams in good condition. Figures 2-9 and 2-10 show the benthic index of biological integrity (BIBI) and fish index of biological integrity (FIBI) scores, respectively, at each sampling site in the two subwatersheds. Both the BIBI and FIBI scores varied at some individual stream sites that were sampled more than once.

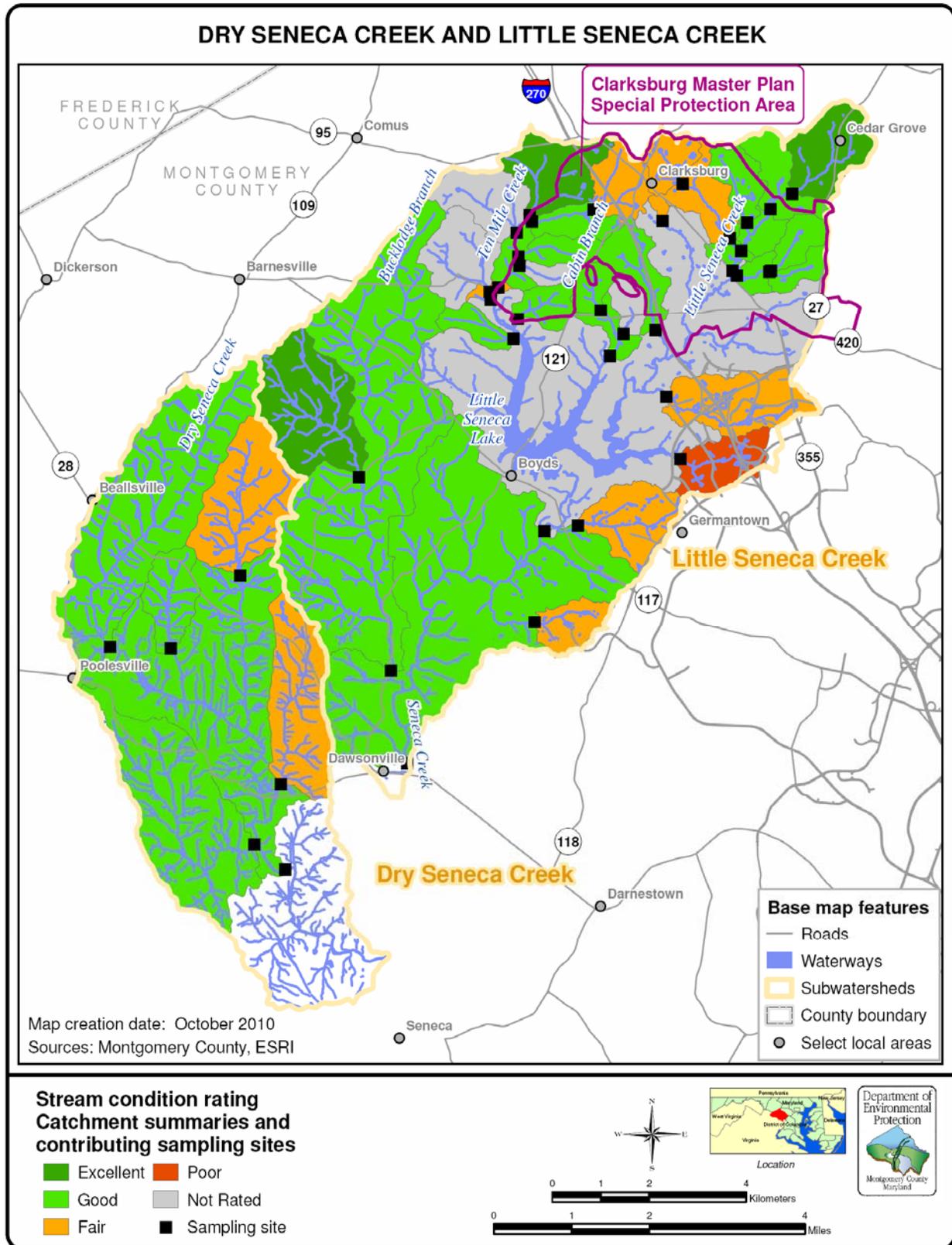


Figure 2-8. Stream condition ratings in Dry Seneca Creek and Little Seneca Creek subwatersheds, Montgomery County, Maryland

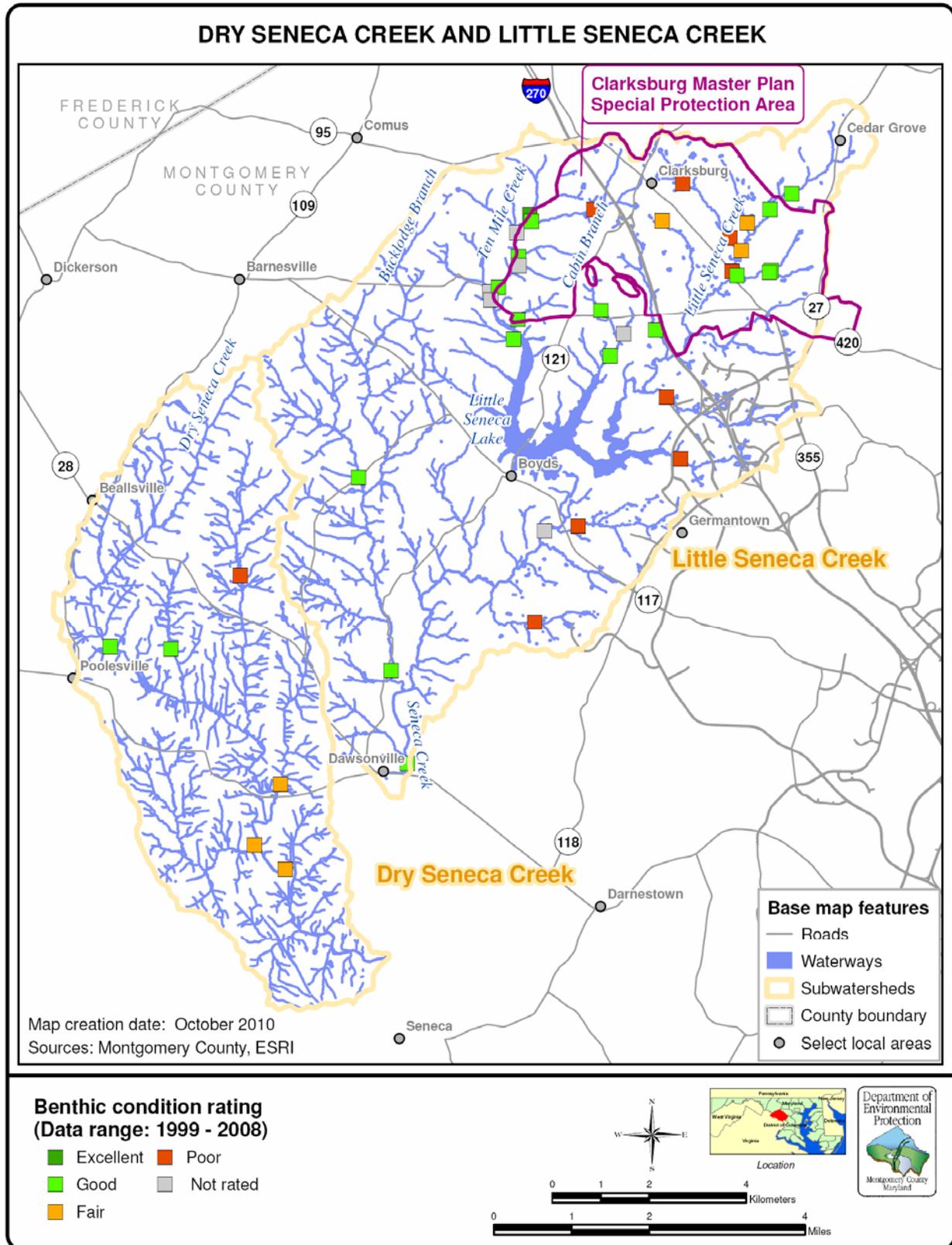


Figure 2-9. Benthic condition (BIBI) rating at sampling points in the Dry Seneca Creek and Little Seneca Creek subwatersheds, Montgomery County, Maryland

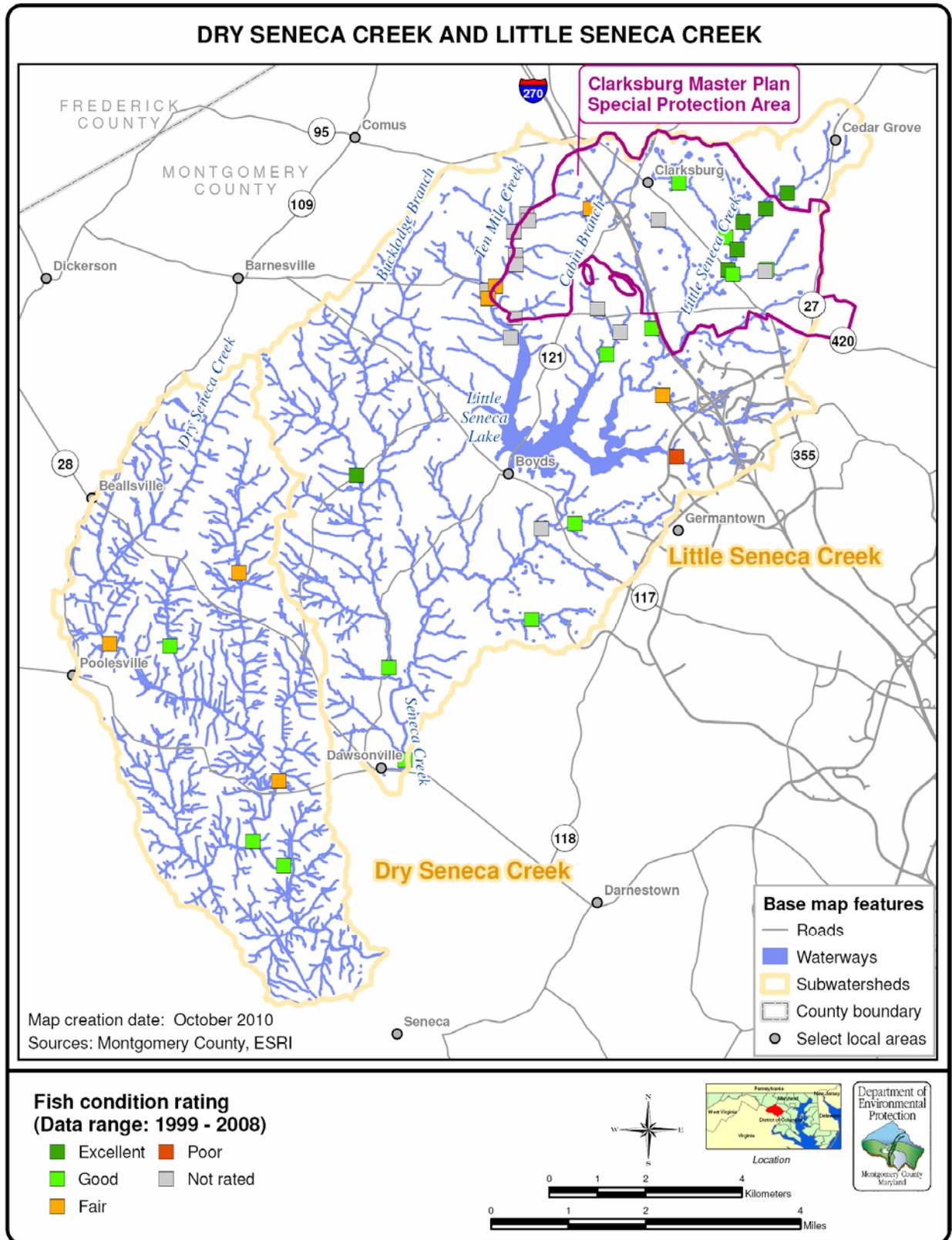


Figure 2-10. Fish condition (FIBI) rating at sampling points in the Dry Seneca Creek and Little Seneca Creek subwatersheds, Montgomery County, Maryland

## 2.8 EXISTING STORMWATER BEST MANAGEMENT PRACTICES (BMPS)

Figure 2-11 illustrates the locations of existing stormwater management devices, or “BMPs,” and the catchment area draining to or being “treated” by individual BMPs.

The Guidance Document identifies three distinct “design eras,” as follows:

- **Era 1: Pre-1986.** BMPs installed prior to full implementation of the Maryland Stormwater law of 1984, which typically focused on detention and peak discharge reduction
- **Era 2a: 1986 to 2002.** These practices reflect a design era where water quality was an important part of design, although water quality sizing and design standards were not as great
- **Era 2b: 2002 to 2009.** These practices were built to the more stringent water quality and channel protection sizing requirements and BMP design standards contained in the 2000 edition of the Maryland Stormwater Manual

Currently 364 BMPs exist within the subwatershed grouping; 14 were permitted before 1986 and are therefore candidates for retrofit. The majority of BMPs (350) were permitted after 1986 (see Table 2-3). Note that drainage areas for BMPs demarcated in Figure 2-11 are often smaller than the icon indicating the location of the BMP; so that the drainage area to those facilities may not be evident in the figure. The “excluded area” is also indicated in Figure 2-11. Excluded areas are lands not under the County’s NPDES MS4 permit coverage (jurisdiction) but are still within the County boundary.

Table 2-3 shows the number of stormwater BMPs (facilities) in the subwatershed grouping and the accounting that must be followed to meet the County's NPDES MS4 permit requirements for watershed restoration. The majority (332) of stormwater BMPs and their drainage areas are within the MS4 boundary (jurisdiction).

Table 2-3 also indicates stormwater management facilities that lie within the excluded zone, but that have drainage area both within and outside the County jurisdiction. There are 18 such facilities permitted after 1986 outside the County jurisdiction, with a total drainage of 219 acres; 89 acres of which are within the County’s jurisdiction.

Table 2-3 also distinguishes between those BMPs permitted for construction before and after 1986. Significantly more BMPs were permitted after 1986 than before 1986 (350 versus 14). However, those older BMPs, permitted before 1986, treat much greater land areas on average. The average drainage area of pre-1986 facilities is 58 acres treated on average per device, versus only 6 average drainage area acres for those facilities permitted after 1986. This difference is readily apparent in Figure 2-11. In fact, for facilities permitted before 1986, just 14 facilities treat 810 acres. The trend since 1986 has been for stormwater facilities to treat much smaller drainage areas per facility and therefore to be more numerous.

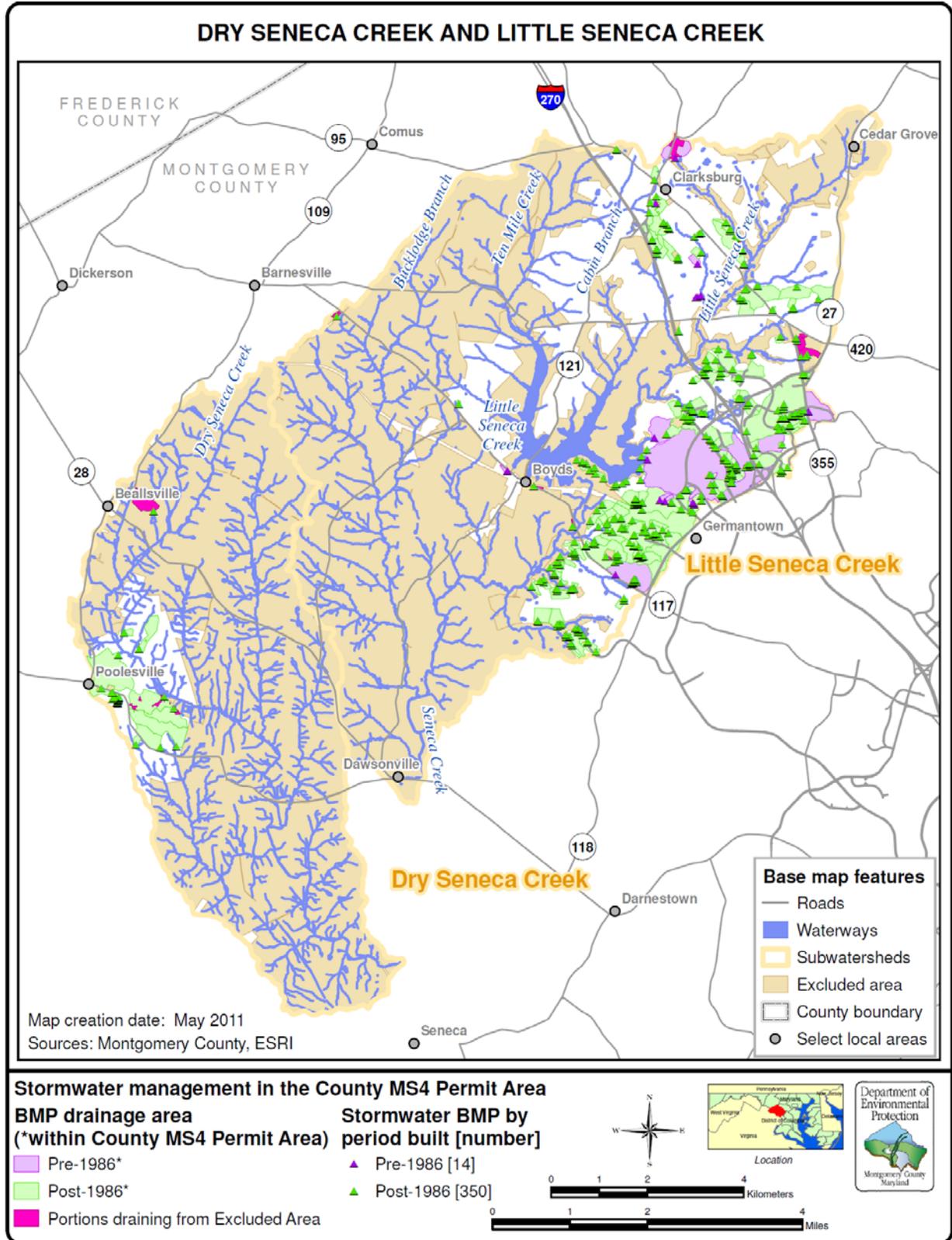


Figure 2-11. Existing stormwater management BMPs and their drainage areas in Little Monocacy and Broad Run subwatersheds, Montgomery County, Maryland

Table 2-3. Characteristics of stormwater BMPs (facilities) permitted before and after 1986 in Dry Seneca Creek and Little Seneca Creek subwatersheds, Montgomery County, Maryland

<b>BMP Permit Date</b>	<b>Number of BMPs within County Jurisdiction</b>	<b>Total Drainage Area for BMPs within County Jurisdiction (acres)</b>	<b>Total Impervious Drainage Area within County Jurisdiction (acres)</b>	<b>Average Drainage Area per BMP (acres)</b>	<b>Average Impervious Acreage Treated per BMP</b>	<b>Number of BMPs Outside of County Jurisdiction with Part or All of Drainage within County Jurisdiction</b>	<b>Total Drainage Area of BMPs Residing Outside County Jurisdiction (acres) <sup>(b)</sup></b>
Before 1986	14	810	265	58	57.8	1	18
After 1986	350	2253	659	6	6.4	18	89
Year Not Specified	0	0	0	0	0	0	0
Total (all years)	364	3063	924	Not Applicable	Not Applicable	19	107

(a) Includes those BMPs categorized by County as bio-retention-type quality control as per Table B.16 General BMP Coding of Montgomery County BMP Database of the Implementation Plan Guidance Document.

(b) Represents facility drainage area residing within county non-excluded (MS4) area only.

## 2.9 RIPARIAN FORESTED BUFFERS

Figure 2-12 indicates where the watershed’s streams and rivers are protected by 100-foot forested stream buffers on each side of the stream (as measured from the centerline of the streams and from the shoreline of the rivers). Riparian forested buffers are being considered as a type of stormwater BMP for purposes of the NPDES MS4 permit accounting system. A minimum width of 100 feet on each side of the stream will be considered to provide nutrient and pollutant removal.

Table 2-4 summarizes presence and absence of 100-foot forested riparian buffer. Notable is the significant percentage of unbuffered streams in Dry Seneca Creek (59%), totaling 1,968 acres in need of tree planting.

Table 2-4. Forested acres and percent forest cover along 100 foot riparian buffer in Dry Seneca Creek and Little Seneca Creek subwatersheds, Montgomery County, Maryland				
Riparian Condition	Acres		Percent	
	Dry Seneca Creek	Little Seneca Creek	Dry Seneca Creek	Little Seneca Creek
Forested	1,354	2,129	41	61
Not Forested	1,968	1,389	59	39
TOTAL	3,322	3,518	100	100

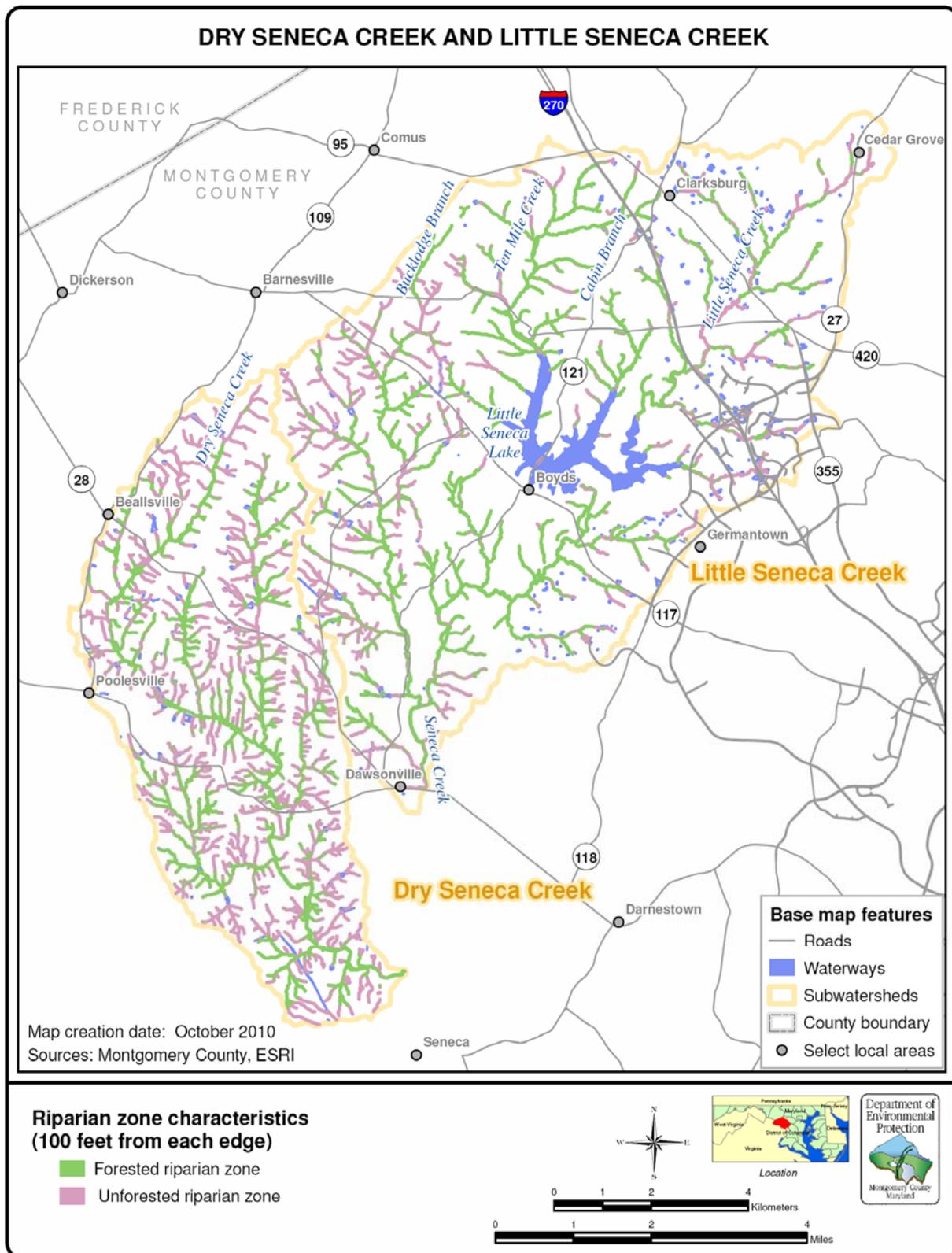


Figure 2-12. Presence or absence of forest in 100-foot riparian zone on each side of waterway, Dry Seneca Creek and Little Seneca Creek subwatersheds, Montgomery County, Maryland

### 3. ACTION INVENTORY

#### 3.1 DESKTOP ANALYSIS OF NEIGHBORHOOD-SCALE STORMWATER BMP RETROFIT OPPORTUNITIES

In coordination with Montgomery County DEP staff, priorities have been developed for implementation of candidate stormwater (BMP) retrofit projects. Figure 3-1 illustrates the location and prioritization of neighborhood-types which are grouped by Maryland Department of Planning guidelines for land-use types. Table 3-1 summarizes the total acreage and percentage associated with each land-use category and its relative contribution to the County’s jurisdiction.

Table 3-1. Stormwater BMP Retrofit Priorities in Dry Seneca Creek and Little Seneca Creek subwatersheds						
Stormwater BMP Retrofit Priority		Candidate Acres in Subwatersheds (County Jurisdiction Only)			Percent in County Jurisdiction in Subwatersheds	
		Dry Seneca Creek	Little Seneca Creek	Total Candidate Acres (Percentage of Total Candidate Acres)	Dry Seneca Creek	Little Seneca Creek
High	Areas treated by Pre-1986 Permitted BMPs	0.0	838.3	838.3 (15.6%)	0.0	8.8
<b>Land-use Type</b>						
Medium - a	Commercial, Industrial, and Churches	51.6	1,431.0	1482 (27.6%)	3.3	15.0
Medium - b	Private schools	0.0	0.0	0 (0.0%)	0.0	0.0
Medium - c	Apartments & Condominiums	0.0	375.5	375.5 (7.0%)	0.0	3.9
Medium - d	Townhouse units	12.4	213.2	225.6 (4.2%)	0.8	2.2
Medium - e	High and Medium Scoring Residential Properties	135.4	799.7	935.1 (17.4%)	8.6	8.4
Low - a	Low Scoring Residential	128.6	1312.2	1440.7 (26.8%)	8.2	13.8
Low - b	Historic and other properties	39.8	36.1	75.9 (1.4%)	2.5	0.4
	<b>TOTAL</b>	367.7 candidate acres – or 23.4% of total County jurisdiction	5006 candidate acres - or 52.6% of total County jurisdiction	<b>5373.7</b> candidate acres of 11083 total acres in County jurisdiction – or <b>48.5%</b>		

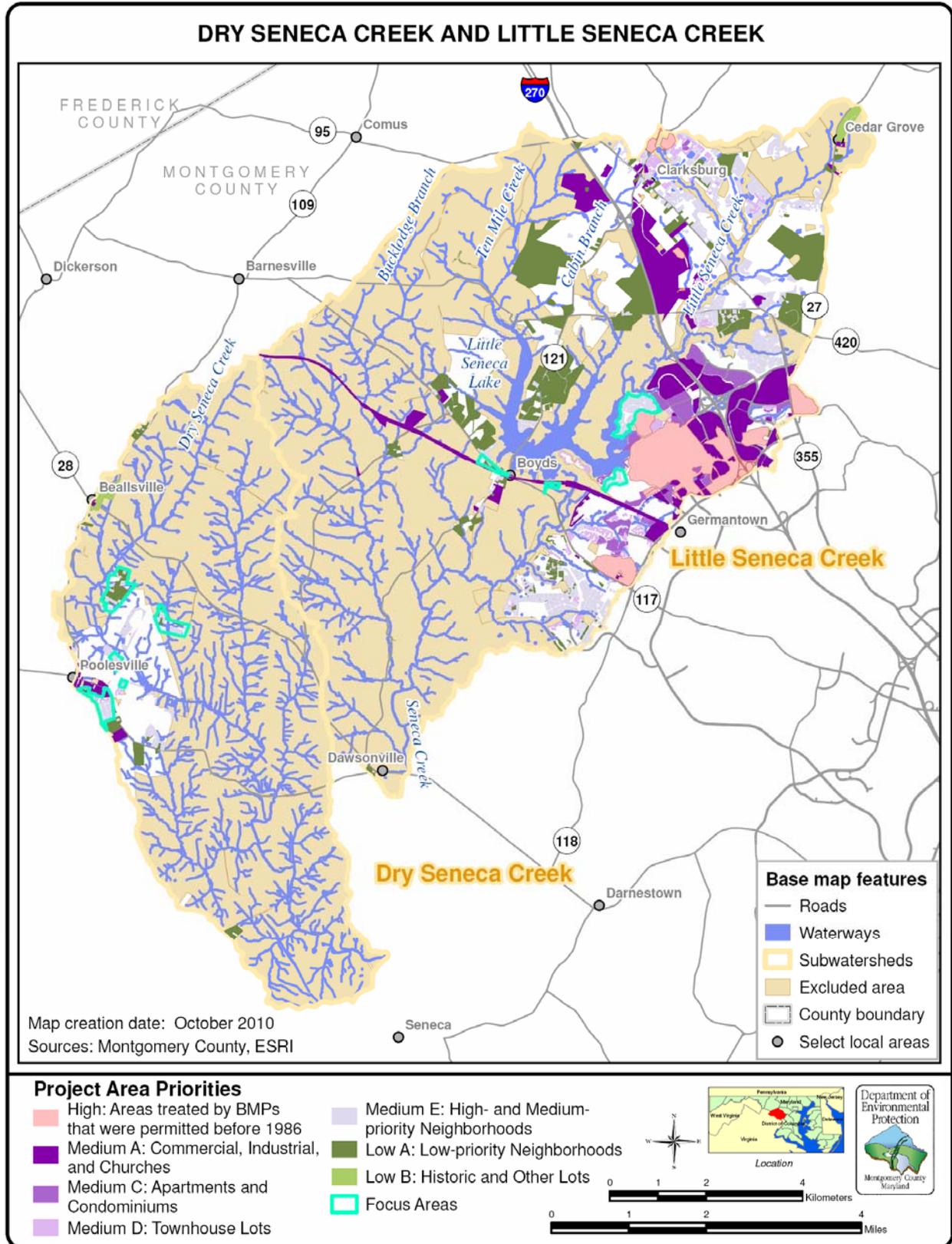


Figure 3-1. Project area BMPs for candidate stormwater retrofit in Dry Seneca Creek and Little Seneca Creek subwatersheds, Montgomery County, Maryland

The priorities for stormwater BMP retrofit project areas are as follows:

- **High Priority** candidate projects are modifications of or improvements to *existing BMP facilities*, which, in the case of Dry Seneca Creek and Little Seneca Creek, equates to 14 facilities permitted *before* 1986, making up 383.3 acres or 15.6% of total candidate acreage for retrofit, all of which reside in the Little Seneca Creek subwatershed. See Table 3-1.
- **Medium Priority** for the County is the retrofit of developed privately owned parcels which have no existing stormwater management, with prioritization by particular *land-use types and a separate neighborhood assessment ranking for residential areas*. In the Implementation Plan Guidance Document, Table B.3, Schueler, T.S, and Biohabitats, Inc. (2009) summarize findings for imperviousness for various land uses, which are cited below.

#### a) Commercial/Industrial/Churches

Commercial and industrial properties, and some churches, tend to have large expanses of impervious surfaces in the form of parking lots and large flat roofs; 72% imperviousness on average with only 14.8% forest and 13% turf cover. This is the highest imperviousness of any land use in the subwatershed grouping with the exception of roadways. In the case of commercial/industrial/churches land uses, 1482.6 acres or 27.6% under County jurisdiction are not currently managed for stormwater.

#### b) Private Schools

While schools tend to have large parking lots and average 35.2% imperviousness with 50% in turf cover no private schools exist within the County MS4 area of these two watersheds. Public schools are not included in the analysis for stormwater BMP retrofit opportunities for pre-assessments, at the request of Montgomery County DEP staff, because these properties are being assessed under a separate study.

#### c) Apartments and Condominiums (Multi-Family Residential)

Average imperviousness is 44.4%, with 14.6% in forest cover and 49% as turf. This land-use category makes up 375.5 candidate acres (7.0%) for retrofit which are exclusively in the Little Seneca Creek subwatershed.

#### d) Townhouses Lots

This land-use type (high density residential) has an average 36.8% imperviousness with 48% as turf. This land-use type makes up 225.6 acres, or 4.2% of the total candidate acreage within the County's jurisdiction, which lie mostly in Little Seneca Creek.

#### e) High and Medium Scoring Residential Lots

The analysis for residential neighborhood priorities in Montgomery County included conditions such as lot size, ownership status, and community involvement in a homeowners association to derive a ranking system for opportunities for stormwater BMP retrofit in residential areas.

High- and Medium-scoring residential areas are relatively prominent in Little Seneca Creek, at 799.7 acres, and to a lesser degree in Dry Seneca Creek at 135.4 acres. Combined for both subwatersheds, this category accounts for 17.4% of total candidate acreage in the County MS4.

- **Low Priority** candidate projects are unique in each watershed. The priority list is headed by the Low-scoring residential neighborhood assessments, and includes regional areas that the Montgomery County DEP staff has identified as having some potential for stormwater BMP retrofit, but represent a lower priority.

#### a) Low Scoring Residential

The residential neighborhood analysis conducted by Biohabitats, Inc., resulted in a three-tiered ranking for stormwater BMP retrofit potential; the areas that received a low score in the composite analysis are included as the Low-a category for the pre-assessments.

The Little Seneca Creek and Dry Seneca Creek contain 1312.2 and 128.5 acres of Low-scoring residential ranking, respectively. The Low-a category accounts for about 26.8% of the total candidate acres in the watershed.

#### b) Historic and Other Properties

Historically zoned and other properties make up 1.4% of combined candidate acreage in the two subwatersheds, or 39.8 acres in Dry Seneca Creek and 36.1 acres in Little Seneca Creek.

### 3.2 COUNTY FOCUS AREAS

The desktop analysis, refined by first-hand knowledge provided by DEP staff who understand the historic land-use changes, planned zoning changes, planned development, status of existing stormwater BMPs, socio-political priorities, and constraints, among other factors, resulted in restoration Focus Areas as seen in Figure 3-2. These nine (9) Focus Areas include a range of sizes from 1.2 to 85.5 acres, primarily within the medium priority retrofit category. County schools are not included since these sites are being included as part of the County's public property retrofit assessments. Table 3-2 summarizes the size, amount of imperviousness and whether a Focus Area currently has any stormwater BMPs in place.

Table 3-2. Untreated Acres, Untreated Impervious Area, and Percent in the total Untreated acres in the Focus Areas of the Dry Seneca Creek and Little Seneca Creek subwatersheds, Montgomery County MD					
Focus Area	Subwatershed	BMP Status <sup>(a)</sup>	Untreated Land Area in Focus Area (Acres)	Untreated Impervious Area in Focus Area (Acres)	Untreated Percent Impervious in Focus Area (%)
1	Dry Seneca Creek	None <sup>(b)</sup>	56.5	14.8	26.3
2	Dry Seneca Creek	None	4.5	2.1	46.1
3	Dry Seneca Creek	None	13.5	1.5	11.3
4	Dry Seneca Creek	None	85.5	6.4	7.5
5	Dry Seneca Creek	None	55.3	4.3	7.9
		<b>TOTAL</b>	<b>215.3</b>	<b>29.2</b>	<b>19.8%</b>
6	Little Seneca Creek	Pre-1986 <sup>(c)</sup>	1.5	1.2	78.0
7	Little Seneca Creek	None	1.2	0.5	42.6
8	Little Seneca Creek	None	9.3	3.0	32.4
9	Little Seneca Creek	None	7.2	3.0	42.0
		<b>TOTAL</b>	<b>138.7</b>	<b>33.3</b>	<b>57%</b>
<b>Grand Total for Both Subwatersheds</b>			<b>354 Untreated Focus Areas acres</b>	<b>62.5 Untreated Focus Areas Impervious acres</b>	<b>38.4% Average Imperviousness across both Subwatersheds</b>
<p><sup>(a)</sup> BMP status indicates that one or more BMPs may exist in the particular Focus Area of the indicated BMP treatment era. Existing BMP drainage areas have been subtracted, hence specific indication of “untreated” acres in subsequent columns.</p> <p><sup>(b)</sup> “None” indicates that areas do not currently have any stormwater management in place.</p> <p><sup>(c)</sup> Consist of one BMP permitted in 1973 with a drainage area of 2.3 acres.</p>					

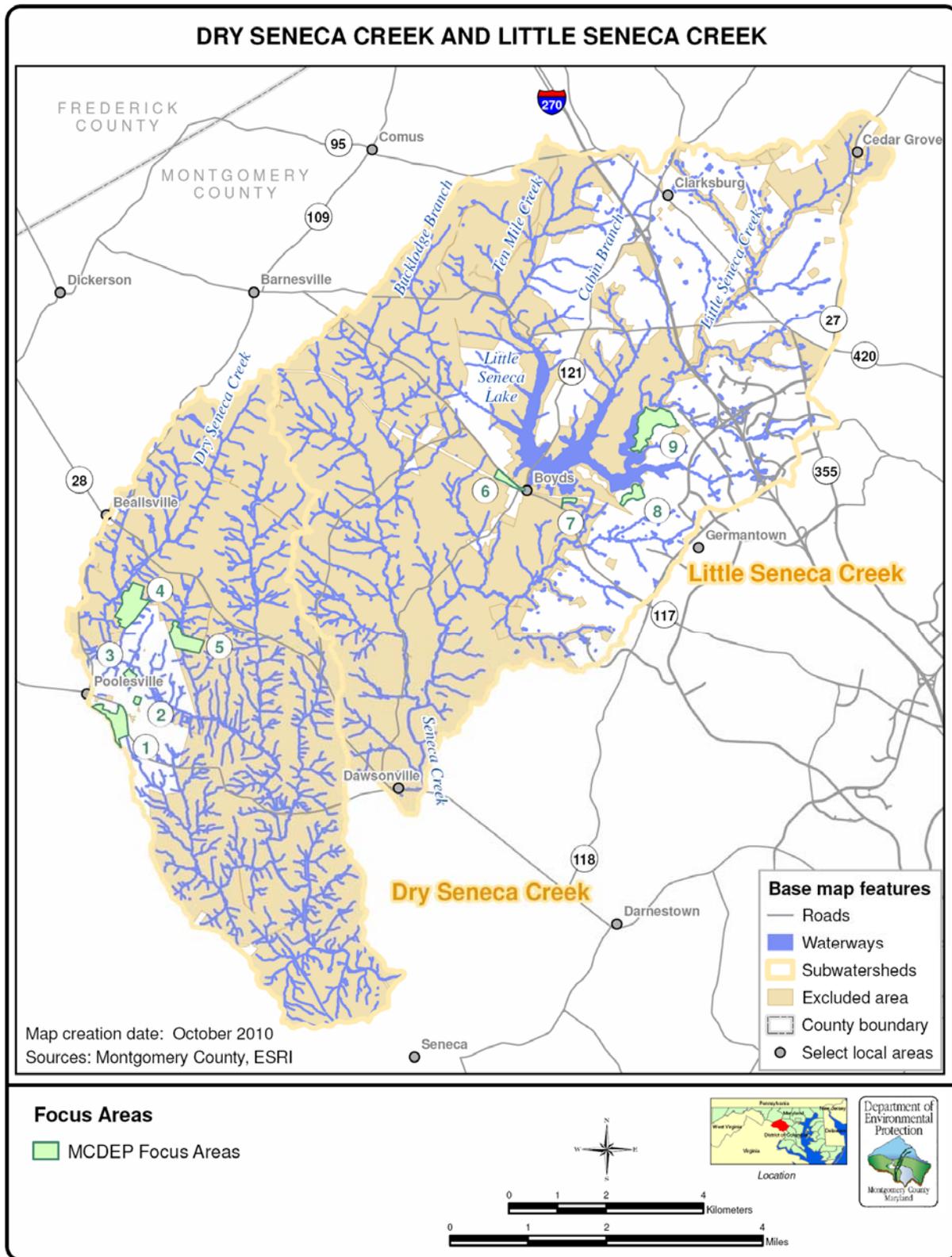


Figure 3-2. Focus Areas for restoration projects identified by Montgomery County DEP in Dry Seneca Creek and Little Seneca Creek subwatersheds, Montgomery County, Maryland

There are a total of 354 acres of untreated acres in the Focus Areas, 215.3 of which lie in the Dry Seneca Creek subwatershed with the remaining 138.7 in Little Seneca Creek. On average, 19.8% of the Focus Area acres in the Dry Seneca Creek subwatershed are untreated impervious acres, but this varies greatly by Focus Area with a range of between 7.9% to 46.1% untreated imperviousness.

Focus Areas in the Little Seneca Creek subwatershed have a much higher percentage of untreated impervious acres, 57.0% on average. Even though the Dry Seneca Creek subwatershed has a greater total number of Focus Area acres, because the Little Seneca Creek subwatershed has a much higher percentage of average untreated imperviousness in its Focus Areas, the total untreated impervious acres is almost the same in both subwatersheds, 29.2 acres in Dry Seneca Creek and 33.3 acres in Little Seneca Creek. Together, there are 62.5 untreated impervious acres in the two subwatersheds' Focus Areas.

### **3.3 EDUCATION AND OUTREACH FOR TRASH REDUCTION**

There are no extensive data on specific trash and litter issues in the Dry Seneca Creek and Little Seneca Creek subwatersheds. However, they are subject to conditions of the Trash Free Potomac Treaty. Since most of the developed lands are residential, it is likely that the trash reduction will occur through education and outreach. The Countywide Coordinated Implementation Strategy provides more specific guidance for using these non-structural approaches.

As is the case in other watersheds in Montgomery County, the focus for trash reduction will be through anti-littering education and outreach. In the course of developing the implementation plans, a series of practice sheets were developed to target key messages that use appropriate delivery methods for the population demographics in each watershed. It is anticipated that messages will be developed concerning dumpster management; littering enforcement, playing field trash disposal, and residential trash can maintenance.

In addition, practice sheets were developed that target reductions in private parking lot imperviousness, reduction in residential roof runoff, and riparian reforestation. All of these practices will be applied, as appropriate, in the watershed implementation plan.

### **3.4 NEXT STEPS**

As described above, this pre-assessment is the first step in developing watershed assessments and implementations plans for this part of the watershed grouping. These plans will detail how the County will meet its MS4 permit obligations, which include addressing waste load allocations (WLAs) for EPA-approved Total Maximum Daily Loads for total phosphorus (1996) and TSS (1996), as well as restoring an additional 20% of the total untreated impervious acres to the MEP on a Countywide basis during the five-year permit cycle, and providing trash and litter management as a condition of the Trash-Free Potomac Treaty.

Table 3.3 shows results from the pre-assessment desktop analyses for Dry Seneca and Little Seneca subwatersheds which identified high-, medium- and low-priority areas for stormwater BMP retrofit. Based on the scope of this pre-assessment, 62.5 impervious acres have been identified within Focus Areas (see Table 3-2) and 265 acres of impervious acres within pre-1986 BMP drainage areas (see Table 2-3).

Impervious Area	Acres
County MS4 total impervious cover	1520 acres
Remainder untreated	861 acres
Focus Area projects impervious	62 acres
Pre-1986 Stormwater BMP retrofit treatment	265 acres

### 3.4.1 Steps to Complete the Watershed Assessment

As described in the Watershed Restoration Plan Framework, the watershed assessment will add to the pre-Assessment by updating any environmental condition information and conducting field investigations to identify specific watershed restoration sites. Following the field investigations, concept plans would be developed for candidate restoration sites to serve as part of the action inventory. Pollutant loading estimates and public involvement would also be conducted to assign priorities and integrate the watershed assessment into the Countywide Coordinated Implementation Strategy.

Field Investigations: The ideal method for identifying restoration sites is to complete comprehensive stream and upland walks to ground truth the pre-assessment, watershed-wide. Recognizing budget constraints, it is recommended that the field investigations be targeted to the high-priority areas identified by the desktop analysis for the pre-assessments, as well as the Focus Areas identified by DEP staff. The high-priority areas are existing BMPs that can be retrofitted, while the Focus Areas comprise the best candidate areas of varying land use types based on institutional knowledge.

It is recommended that subsequent watershed assessment include the following field investigations:

- Stream Reconnaissance. Conduct stream corridor assessments (SCAs) or comparable investigations of the streams within the 354 untreated acres in the Focus Areas. The stream reconnaissance might address the entire untreated stream network or focus on the stream miles nearest to the 62.5 acres of untreated impervious surface to reduce the level of effort.
- Retrofit Investigations. Conduct retrofit reconnaissance investigations (RRIs) or comparable investigations at sites identified in the stream reconnaissance, as well as the fourteen (14) BMPs permitted before 1986. It is estimated that approximately 20

retrofit investigations may be needed to address the 62.5 acres of untreated impervious surface.

- Upland Investigations. Conduct hotspot investigations (HSIs), neighborhood source assessments (NSAs), and pervious area assessments (PAAs) or comparable investigations at sites identified in the stream reconnaissance. These investigations would identify source reductions and additional restoration practices beyond those identified in the retrofit investigations. Perhaps a dozen of each type of investigation would be necessary to identify specific practices to address the remaining acres of untreated impervious surface.

These field investigations may require approximately \$100,000 of effort.

Action Inventory: Following the field investigations, completion of the watershed assessment would involve completing the Action Inventory using the following steps:

- Concept Plans for Restoration Projects would follow the 2009 Maryland Stormwater Design Manual and address treatment of water quality and water quantity, providing stream channel protection as appropriate. An estimated 20 concept plans would be developed for a level of effort of \$60,000.
- Community Education and Stakeholder Involvement would be an extension of the Public Outreach and Stewardship Work Plan developed as part of the Countywide Coordinated Implementation Strategy. This level of effort is estimated at \$50,000.
- Pollutant Loads and Anticipated Load Reductions would be determined using the simple WTM modeling approach defined in the Guidance Document. This level of effort is estimated at \$50,000.
- Priorities for Proposed Projects would be developed using a scoring and ranking system that reflects County priorities and is conducive to implementation planning.
- Preliminary Action Inventory. As described above, the candidate projects within the existing BMP retrofits and Focus Areas could treat 5373.7 acres of impervious area. TMDL or trash reduction targets will also be determined by the modeling to be conducted as part of the full watershed assessments.

The action inventory obtained from the watershed assessment would support the development of an implementation plan per the Guidance Document and meet the County obligations under the MS4 permit. The estimated level of effort developing the priorities and integrating public involvement into the effort to complete the action inventory is \$50,000.

The estimated level of effort for all aspects of the watershed assessment is \$300,000.

## 4. REFERENCES

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