Assessing the Sucker Branch Subwatershed of the Lower Patapsco River for Restoration Opportunities

Prepared for:
Howard County, Maryland
Department of Public Works
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NPDES Watershed Management Program

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EXECUTIVE SUMMARY

In 2005, Howard County received a Section 319(h) incremental grant, which are funds intended to support development of Watershed Restoration Action Strategies (WRAS) under Section 319 of the Clean Water Act. In response to this grant, Howard County organized a workgroup to develop a WRAS for the Lower Patapsco River watershed. The workgroup selected two subwatersheds of the Lower Patapsco River for additional data collection and analysis, for the development of a detailed subwatershed restoration plan. A Stream Corridor Assessment (SCA) for the Lower Patapsco River watershed was completed in 2002, and this information was used by the workgroup to help with subwatershed selection. The workgroup used information on the number and types (by severity) of various environmental problems, which were identified and mapped as a result of the SCA, as well as information on impervious surface coverage.

Based on the SCA information the workgroup was able to get an idea of the spatial distribution of land-use and the different types of environmental problems across the Lower Patapsco River watershed. The workgroup decided to focus on a relatively less developed subwatershed and on a relatively urban/suburban subwatershed for more detailed study. The Patapsco WRAS workgroup selected Rockburn Branch (less developed) and Sucker Branch (urban/suburban) as the two subwatersheds for further assessments. The Rockburn Branch watershed contains low-density residential development, and portions of the Patapsco Valley State Park and Rockburn Branch Park. The Sucker Branch watershed contains high to low-density residential development, with commercial areas along Route 40 and the I-70/MD-29 interchange.

Based on the results of the SCA and the priorities set up by the Patapsco WRAS workgroup, field-based watershed-wide reconnaissance was conducted to: 1) evaluate priority stream corridor problem sites (from workgroup), 2) identify opportunities for stormwater retrofits and new stormwater management facilities, 3) evaluate pollution-producing behaviors in individual neighborhoods, 4) identify residential, business, and municipal problem behaviors (targeted for stormwater education and outreach, or enforcement), and 5) perform hotspot investigations. Reconnaissance field work was conducted by staff from Tetra Tech, The Center for Watershed Protection and Howard County.

This field work resulted in a list of recommended restoration projects and activities for each subwatershed. This list includes many of the original priority sites targeted by the workgroup, and also includes new sites that were added during the field work. Hot spot inventories and neighborhood assessments were also conducted to highlight behaviors and areas of concern that are likely contributing to water quality and habitat problems and can be targeted for outreach/education efforts. Some priority problem sites were not recommended as priority restoration project sites because field reconnaissance showed these sites to be less severe or not practical to pursue due to poor access, high cost, or space limitations. Recommended projects to improve stormwater management and stream channel conditions in the Sucker Branch include buffer restoration, stormwater facility retrofits, installing or improving stormwater facilities in areas currently under treated, and several opportunities for education/outreach efforts. This report summarizes field reconnaissance and the preliminary list of restoration recommendations for the **Sucker Branch Subwatershed** and should be used in support of WRAS development.

The next steps for plan development need to involve further investigation and prioritization of the restoration projects. The prioritization used for this report was based on fairly generalized information and categorization of each project site that did not include the detailed information needed for actual project implementation planning. Information needed includes more site specific information for calculations of potential for increased water quality treatment, site specific mapping of landscape engineering opportunities or barriers, cost estimates and funding sources, and community-based barriers to project development. This information should be gathered for priority sites so that a refined priority list and implementation plan can be developed and the County can move forward into restoration activities. In the meantime, implementation can begin on a number of the other recommendations including enforcement projects, maintenance projects and outreach projects.

SECTION 1: INTRODUCTION

1.1 Background

The Lower Patapsco River watershed is located in the eastern portion of Howard County and is approximately 37.9 square miles. The Patapsco River corridor is designated a Regional Greenway and the County has already conducted numerous watershed protection and restoration projects within this watershed. In 2005, the County received a Section 319(h) incremental grant to assist in development of a Watershed Restoration Action Strategy (WRAS) for the Howard County portion of the Lower Patapsco River watershed. In response to this grant, Howard County formed the Lower Patapsco WRAS workgroup, referred to as the workgroup, to coordinate development of the WRAS. The workgroup agreed to select two subwatersheds for additional data collection and analysis.

Based on information from previous studies the workgroup was able to get an idea of the spatial distribution of land-use and the different types of environmental problems across the Lower Patapsco River watershed. The workgroup decided to focus on a relatively less developed subwatershed and on a relatively urban/suburban subwatershed for additional analysis. The workgroup selected Rockburn Branch (less developed) and Sucker Branch (urban/suburban) as the two subwatersheds for further assessments and development of subwatershed restoration plans.

1.2 Study Purpose and Scope

This report summarizes work that identifies and prioritizes watershed restoration opportunities in the **Sucker Branch** subwatershed. These opportunities have been put through a preliminary prioritization procedure to highlight projects representing best candidates for implementation (Section 3). The final prioritization of projects and WRAS development will involve input from community stakeholders and County officials who will work together to focus on projects with the best cost:benefit ratios. This study builds on past County and State efforts to assess conditions in the Lower Patapsco River watershed, and takes these efforts to the next level by looking at subwatershed-scale conditions and opportunities within the subwatershed and developing practical implementation plans.

The objectives for this report are:

1. Produce subwatershed maps that identify candidate and priority project locations, stream conditions, monitoring locations, conservation areas, land use, ownership, and other pertinent and available information
2. Identify the causes of observed problem areas as well as opportunities for correction based on space, access, and cost effectiveness.
3. Recommend potential projects that will address restoration of identified problem areas

1.3 Sucker Branch Subwatershed Description

Sucker Branch is a suburban subwatershed of approximately 4.2 square miles. The watershed is located in eastern Howard County and contains portions of Ellicott City. The watershed has predominantly low density residential development, with a cluster of medium and high density residential and office/commercial development along Route 40 and the I-70/MD-29 interchange (Figures 1 and 2). Approximately 29% of the watershed is in parkland and open space, with a majority of this land being located in Patapsco Valley State Park.

1.4 Additional Studies and Technical Information

Background studies include an impervious coverage assessment and biological monitoring of streams throughout Howard County. Summaries of the findings for these studies are provided in the following subsections to provide additional information on the current conditions of the Sucker Branch subwatershed. The monitoring data should be used as a baseline to assess restoration effectiveness of implemented projects or to monitor stream condition impacts from future development.

1.4.1 Impervious Area Assessment

Urbanization is rapidly increasing across the United States and with it pressure on water resources is also increasing. With increased development comes increased impervious surfaces, which are areas such as roof tops, roads, parking lots, and driveways. The designation as an "impervious" surface indicates that these areas prevent infiltration of water into the underlying soil, a very important process for natural hydrologic cycling. This leads to excessive and often polluted runoff from these increased impervious surfaces that cause water quality degradation and erosion. The extensive hydrologic alteration of watersheds from urbanization is the most difficult impact on water courses to control and correct. Development practices that reduce effective impervious area and include other strategies to protect water quality have been shown to be more effective and less costly than remedial restoration efforts. Impervious area estimates and projections are an effective tool for highlighting areas that are at-risk for aquatic resources degradation or where stream system integrity is likely to decline in the near future if effective planning and management programs are not implemented.

An impervious area assessment for Howard County was conducted by dividing the County into 64 subwatersheds ranging in size from 2 to 10 square miles. Based on the level of impervious cover, the subwatersheds were ranked as sensitive, impacted and non-supporting for existing and future conditions. Sensitive watersheds have low levels of impervious cover and are expected to have good to excellent stream conditions. Impacted watersheds have medium levels of impervious cover and are expected to have fair to good stream conditions but show clear signs of degradation. Non-supporting watersheds have high levels of impervious cover and are expected to have poor to fair stream conditions, with significant degradation in aquatic habitat and water quality.

The Lower Patapsco River watershed was subdivided into eleven subwatersheds (Table 1). To meet the requirements of the County's National Pollutant Discharge Elimination System

(NPDES) stormwater permit, the County prioritized all subwatersheds for future restoration efforts to improve water quality, based on this impervious area assessment. As shown in Table 1, the Sucker Branch is in the impacted category based on existing and future imperviousness. The predicted increase in future impervious cover will be relatively small, based on projected development according to current zoning.

Table 1. Impervious area summary results for Lower Patapsco River subwatersheds.

Subwatershed	Area (sq. miles)	% Existing Impervious	Existing Category	% Future Impervious	Future Category	Change % Imp.
Davis Branch Woodstock	4.0	2.5	Sensitive	8.9	Sensitive	6.4
N Br Patapsco to Daniels Mill	4.1	10.7	Impacted	12.9	Impacted	2.2
Sucker Branch	**4.2**	**17.9**	**Impacted**	**21.8**	**Impacted**	**3.9**
Tiber-Hudson	3.0	27.7	Non-Supporting	31.8	Non-Supporting	4.1
Bonnie Branch	3.7	11.7	Impacted	18.6	Impacted	6.9
Rockburn Branch	5.8	9.9	Sensitive	11.9	Impacted	2.1
Elkridge	1.8	19.2	Impacted	23.2	Impacted	4.1
Deep Run tribs.	5.2	22.2	Impacted	31.2	Non-Supporting	9.0
Deep Run on County Line *	0.0	2.2	Sensitive	2.2	Sensitive	0.0
Upper Deep Run	3.0	26.4	Non-Supporting	28.4	Non-Supporting	2.0
Lower Deep Run	3.1	28.2	Non-Supporting	37.0	Non-Supporting	8.8

*Deep Run on County Line is 23 acres or 0.04 square miles and is predominantly within Patapsco Valley State Park.
Notes:
Sensitive watersheds have impervious cover less than or equal to 10%.
Impacted watersheds have impervious cover greater than 10% and less than or equal to 25%.
Non-supporting watersheds have impervious cover greater than 25%.

1.4.2 Stream Monitoring Study Results

The physical, chemical, and hydrologic characteristics of streams make up the environment in which stream biota live. Since benthic macroinvertebrate (aquatic insect) and fish communities are specifically adapted to those environmental conditions in a stream, physical and chemical changes in streams often result in systematic changes in these communties. Understanding biological responses to environmental change is key to interpreting the results of biological monitoring programs.

In 2001, the Howard County Department of Public Works (DPW) Stormwater Management Division (SWMD) initiated biological monitoring for County streams and wadeable rivers on an annual, rotating basin cycle. The primary goal of this program was to assess the current status of the County's streams and watersheds and to establish a baseline for comparing future assessments. The program was designed to provide assessments at three geographic scales: stream-specific; watershed wide; and after the three-year sampling rotation is complete, county-

wide. The Howard County Biomonitoring Program was designed to be comparable with the statewide Maryland Biological Stream Survey (MBSS) conducted by the Maryland Department of Natural Resources (DNR).

Along with biological data, physical habitat characteristics and quality were assessed at each sampling location, and are assumed to reflect the results of geomorphic and hydrologic alteration of the stream ecosystem. These changes in habitat, which can be caused by both broad scale landscape runoff or point discharges of stormwater, are recognized as habitat degradation because they reduce the capacity of the stream to support a "healthy biota". In addition to degraded physical habitat quality, the disruption of natural hydrologic regimes influence the sources of energy, water quality (for example, toxic chemicals, nutrient enrichment, temperature increases, suspended particulates, etc.), and biological interactions (for example, frequency of disease, parasites, nonnative predators or competitors) that often lead to biological degradation of streams.

Sampling in Sucker Branch occurred in March 2005, and was conducted by DNR as part of the services offered under the WRAS grant. The methods used were identical to those used by the Maryland Biological Stream Survey (MBSS). In addition to MBSS protocols, substrate particle size distribution and stream channel cross sectional area were also evaluated. Assessment of physical habitat quality was conducted via combined methods of the MBSS and USEPA's Rapid Bioassessment Protocols (RBPs). A rating scale based on the latter was assigned to each site, and used categories of: comparable (to a reference stream), supporting, partially supporting, or non-supporting to characterize the habitat quality in each site (Table 2).

Table 2. Total habitat scoring range for each narrative rating.

Scores	Narrative Habitat Rating	Definition
> 180	Comparable	Capable of maintaining biological conditions similar to reference streams
150.2 – 179.8	Supporting	Habitat of somewhat reduced condition, but often can support reference quality biology
120.2 - 150	Partially Supporting	Capable of supporting biological conditions of lower quality than reference conditions
< 120	Non-Supporting	Not able to maintain healthy biological conditions

Sucker Branch had eight sites assessed as non-supporting, three as partially supporting and one as supporting (Table 3 and Figure 1). The Sucker Branch clearly has degraded habitat conditions and this is likely due to the level and age of development in this subwatershed. The average score was 110, which indicates non-supporting conditions overall in the watershed. The results of the biological monitoring will be included in a future report, but were not completed for this report.

Table 3. Summary of physical habitat scores and narrative ratings for sites within the Sucker Branch subwatershed from the biomonitoring study.

Station ID	Total Physical Habitat Score	Narrative Habitat Rating
Sucker 1	115	**Non Supporting**
Sucker 4	81	**Non Supporting**
Sucker 6	75	**Non Supporting**
Sucker 7	100	**Non Supporting**
Sucker 8	82	**Non Supporting**
Sucker 10	132	Partially Supporting
Sucker 11	142	Partially Supporting
Sucker 13	164	**Supporting**
Sucker 15	105	**Non Supporting**
Sucker 16	97	**Non Supporting**
Sucker 18	100	**Non Supporting**
Sucker 20	125	Partially Supporting
Mean Score	110	**Non Supporting**

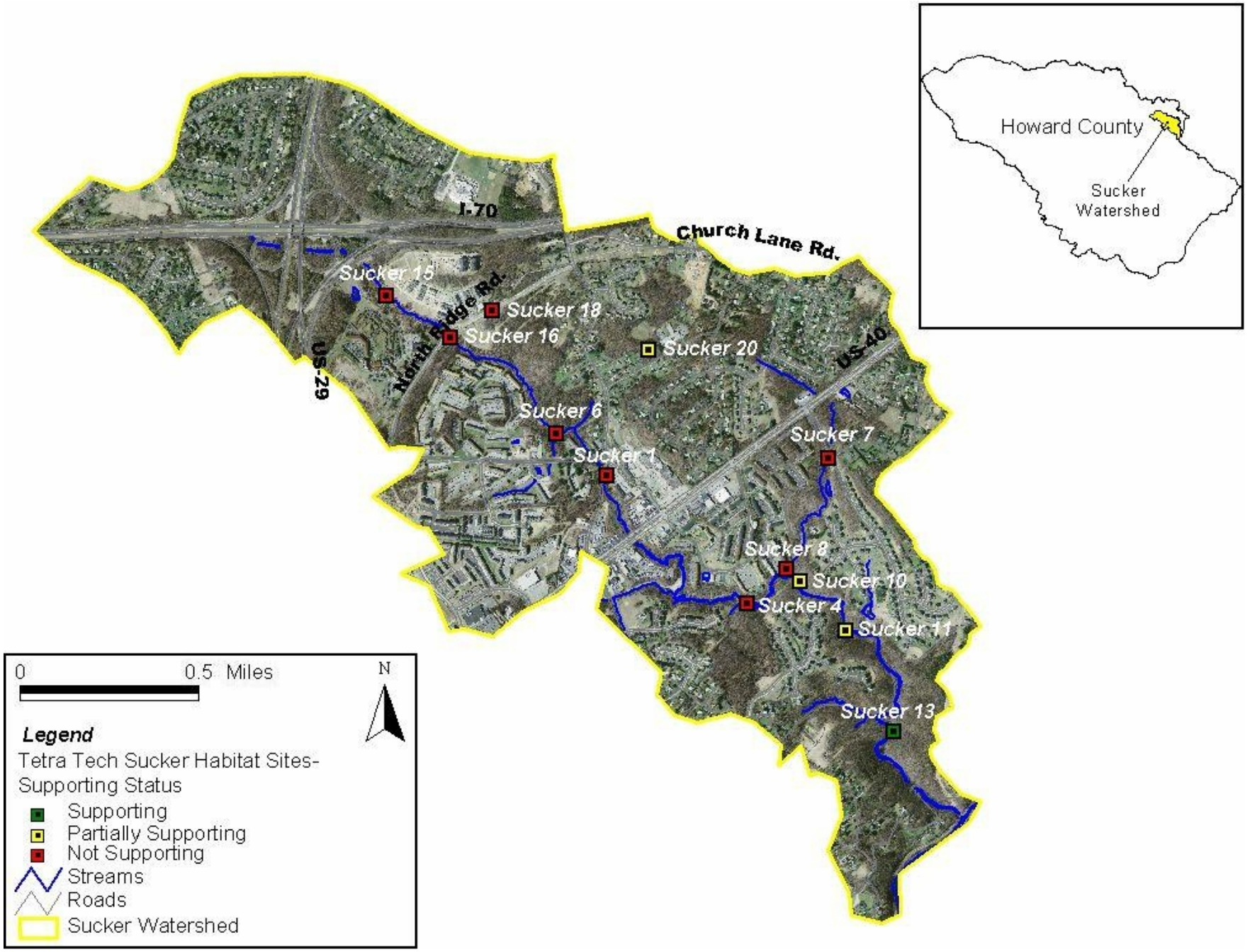


Figure 1. Locations along the Sucker Branch where biological and habitat sampling was conducted for the WRAS study. Truncated subwatershed area is the portion that surrounds where the biomonitoring was conducted

SECTION 2: PROBLEM IDENTIFICATION

This section summarizes the SCA results for the Sucker Branch subwatershed, and details the study methods and assessment results of the fieldwork that followed up the SCA. The field reconnaissance was based on the project priority list developed by the workgroup (Figure 2). The field work included a Unified Stream Assessment (USA) of the priority sites, Unified Subwatershed and Site Reconnaissance (USSR), and stormwater management retrofitting evaluations. The Sucker Branch priority problems sites were verified and upland areas were assessed in 2005 as part of this subwatershed study. This work was conducted by field teams from Tetra Tech, Howard County, and the Center for Watershed Protection.

2.1 Stream Corridor Assessment for Sucker Branch

The Maryland Department of Natural Resources and the Howard County Department of Public Works formed a partnership to complete a Stream Corridor Assessment (SCA) survey of the stream network within the South Branch and the Lower North Branch of the Patapsco River watershed within Howard County. Standing alone, the SCA survey is not a detailed scientific evaluation of the watershed. Instead, the SCA survey is designed to provide a rapid overview of the entire stream network to determine the location of potential environmental problems and to collect some basic habitat information about streams. The value of the survey is that it helps in placing individual stream problems into their watershed context and was useful to the Patapsco WRAS workgroup to prioritize future potential restoration projects.

The four main objectives of SCA are to provide:

1. A list of observable environmental problems present within a stream system and along the riparian corridor.
2. Sufficient information on each problem in order to make a preliminary determination of the severity of each problem and the probability of correcting them.
3. Sufficient information to prioritize restoration efforts.
4. A quick assessment of both in- and near-stream habitat conditions to make comparisons among the conditions of different stream segments.

The Stream Corridor Assessment fieldwork consisted of walking over 200 miles of stream in the Patapsco Watershed, with fieldwork completed in 2001-2002. The survey teams walked most of the drainage network and collected information on potential environmental problems. Commonly identified problems include: inadequate stream buffers (i.e., areas of no tree or shrub cover, non-native vegetation or a very narrow vegetated buffer), excessive bank erosion (i.e., exposed soil and bank failures), channelized stream sections (i.e., where natural bends have been straightened or disconnected from flood-plain), fish migration blockages (i.e., dams and impoundments), construction in or near the stream, trash dumping sites, any other unusual conditions, and pipe outfalls. In addition, the survey recorded information on the general condition of in-stream and riparian habitats and the location of existing pond sites and potential wetland creation sites. In order to document each potential environmental problem, survey teams collected data, recorded the location, and took a photograph at each of these sites. As an aid to prioritizing future restoration work, field crews rated all problem sites on a scale of 1 to 5 in three categories: 1)

how *severe* the problem was compared to others in its category; 2) how *correctable* the specific problem was using current restoration techniques; and 3) how *accessible* the site was for work crews and any necessary machinery. For pond sites, survey teams recorded descriptions of pond type, embankment condition and maintenance, and the presence of eutrophic conditions. In addition, field teams collected descriptive information of both in- and near-stream habitat conditions at representative sites spaced at approximately ½- to 1-mile intervals along the stream.

The Sucker Branch SCA sites all scored relatively low for in- and near-stream habitat. The Sucker Branch sites running through the main section of Ellicott City, received more marginal to poor ratings than other areas in the sub-watershed. The Sucker Branch's macroinvertabrate substrate, shelter for fish, and bank condition were frequently rated as marginal, and its embeddedness was frequently cited as poor. Low ratings in these categories indicate higher rates of erosion, increased sediment load to the stream, and lack of natural bends, undercuts and treefall to provide habitat for all types of stream life. In this branch, there were 7 erosion sites and 6 inadequate buffer sites as well as one construction site identified as priority problem sites (Table 4 and Figure 2). At the head of this branch, there was a very severe channel alteration site, made of 1,600 feet of concrete. These results correspond with the studies discussed earlier on impervious land-use and biological monitoring. It is clear that the Sucker Branch waterways have been severely degraded from the land-use and development history of this subwatershed and therefore immediate and intensive restoration actions must be implemented if this condition is to be reversed.

Table 4. Summary of SCA problem priority areas identified by the workgroup in the Sucker Branch subwatershed.

Priority Problem Type	Number of Sites
Erosion	7
Inadequate buffer	6
Construction Site	1

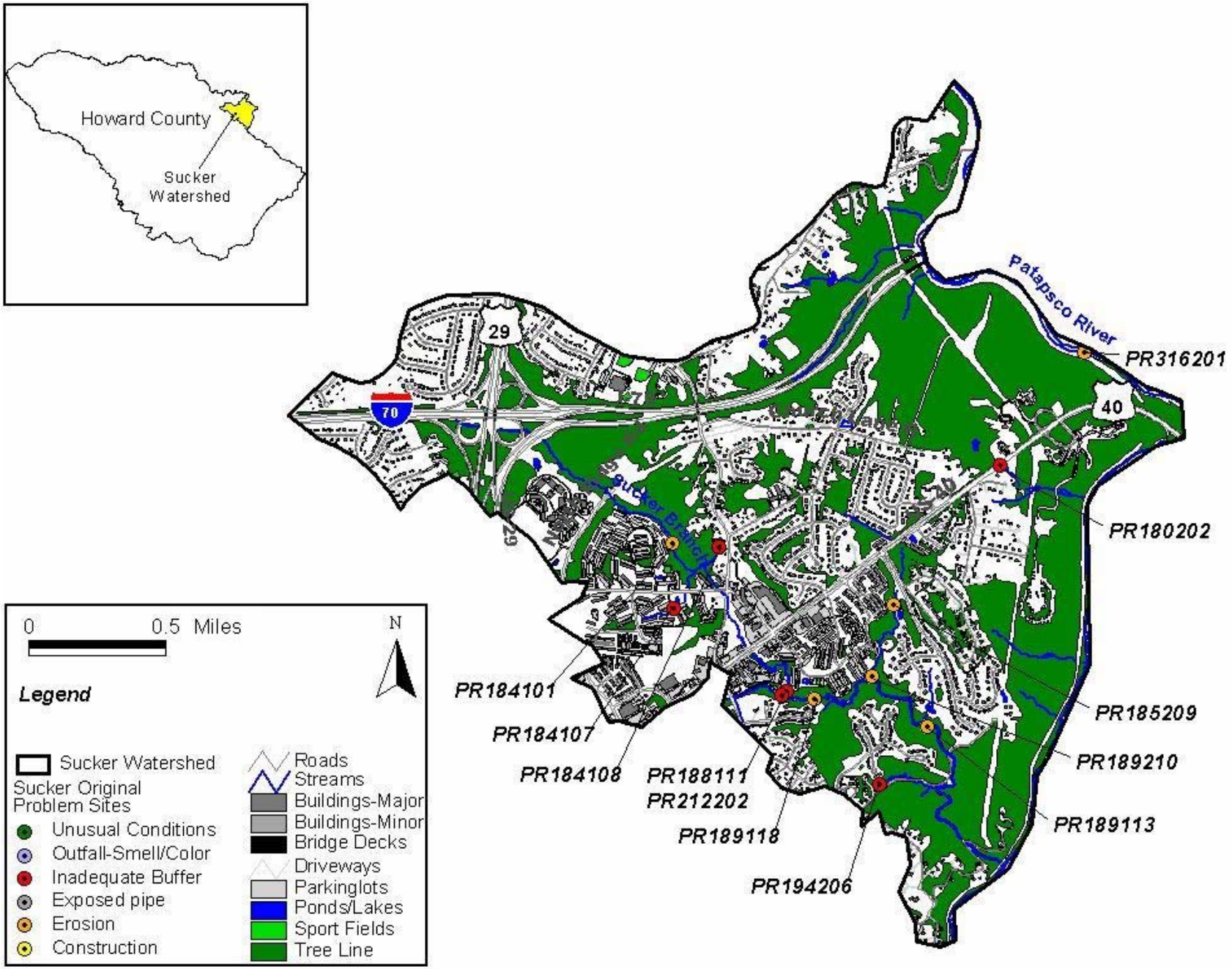


Figure 2. Sucker Branch Subwatershed problem site locations and types from the SCA

2.2 Unified Stream Assessment (USA), Unified Subwatershed and Site Reconnaissance (USSR) and Subwatershed Retrofitting Evaluations

Based on the results of the SCA and the priorities set up by the Patapsco WRAS workgroup (Figure 2), field-based watershed-wide reconnaissance was conducted by Tetra Tech, Center for Watershed Protection and Howard County staff to: 1) evaluate priority stream corridor problem sites (from Workgroup), 2) identify opportunities for stormwater retrofits and new stormwater management facilities, 3) evaluate pollution-producing behaviors in individual neighborhoods, 4) identify residential, business, and municipal problem behavior (targeted for stormwater education and outreach or enforcement), and 5) perform hotspot investigations. All of these surveys were used to develop restoration projects. Copies of the field forms from these surveys are in section 4.

2.2.1 Hot Spot Investigations

Potential stormwater pollution sources are called hotspots. Hotspots for the Sucker Branch were identified via the field reconnaissance at locations such as gas stations, school dumpsters and maintenance storage locations. For each potential hotspot pollution area, a Hotspot Site Investigation was done to assess potential stormwater runoff pollution (Table 5 and Figure 3). Suggested follow-up actions primarily involve owner education on appropriate equipment storage and dumpster management.

Table 5. Summary of Hot spot inventories for the Sucker Branch subwatershed.

Hot Spot Site #	Name/Location	Operation	Description	Follow-up Actions
HS1	Mr. Tire	Tire Repair/Service Center	Some staining at vehicle entrance/exit into maintenance area.	Stormwater retrofit
HS2	Rte.40 Shell Station	Gas Station	Staining observed in downstream culvert.	Stormwater retrofit, divert flows from pumping area
HS3	Miller Brothers Ford	Car Dealership	No stormwater treatment of runoff from vehicle maintenance or washing areas. Trash and debris also observed dumped down adjacent stream bank.	Owner education regarding car washing practices, stormwater retrofit, trash clean up, covered maintenance areas
HS4	High's Convenience/Shell Gas Station	Gas Station	Staining in fueling area and hydrocarbons observed in drain inlet.	Stormwater retrofit
HS5	Acura Dealership	Car Dealership	Surfactants observed in downstream channel at drain outlet from dealership parking lot. Cars washed onsite with no stormwater quality treatment prior to entering downstream channels.	Owner education regarding car washing practices, covered maintenance areas, and dumpster management
HS6	GM Dealer (Ridge Rd.)	Car Dealership	No stormwater treatment of runoff from vehicle maintenance or washing areas. Staining observed adjacent to garages and dumpster.	Stormwater retrofit

2.2.2 Neighborhood Source Assessment

Neighborhoods and apartment complexes in the Sucker Branch subwatershed were evaluated for pollution producing behaviors. Outreach and education strategies such as lawn care education, downspout disconnection, or raingarden implementation were suggested. In a few cases, structural restoration projects were also suggested. Recommended practices for the assessed neighborhoods are in Table 6. Projects that were developed within the neighborhoods assessed are noted on the table with the project number. Blank boxes are where nothing was noted on those problems within the neighborhood because they were not applicable or not evaluated.

2.2.3 Stream Assessment

The Unified Stream Assessment field work targeted problem areas identified by the SCA and prioritized by the workgroup (Figure 2). Erosion, impacted buffer, exposed pipe and construction sites were visited. The unified stream assessment method, which is similar to the SCA methodology, looks at specific impacts and assesses the potential for restoration. For example, an impacted buffer site is assessed based on land ownership, land-use, restorable length and width, accessibility and utility conflicts. Some workgroup priority sites do not have an associated project because the follow-up assessment found the impacts to not be as severe as the SCA surveyors had determined, the impact was no longer there (for example, construction), or access or other logistical issues made projects infeasible. Identified projects in the stream corridor were prioritized along with those from the hotspot site investigations and retrofit inventory for restoration planning. These projects are listed and described in 2.2.6 and Section 3. The original field sheets are included in Section 4.

2.2.4 Stormwater Retrofit Inventory

During the field reconnaissance, stormwater management facilities were investigated and any potential nonresidential and residential stormwater retrofit opportunities to increase water quality treatment, detention, and recharge were described. Each project plan considered opportunities to improve water quality functions on privately-owned land, and on publicly-owned land such as schools and parks. Retrofit options could include disconnecting impervious cover, incorporating sand filters to treat parking lot runoff, applying flow spreaders, and installing grass swales and bioretention areas. These retrofit projects are included in the overall project recommendations section and are noted as “retrofit” sites (Section 2.2.6, Section 3 and in Appendix A).

Table 6. Summary table of neighborhood assessments for behaviors that may be contributing to stream degradation and recommendations (empty boxes were either not applicable or not evaluated).

		Recommended Pollution Source Control and Stormwater Management Strategies						
Name	**Description**	**Structural Retrofit or Stream Repair**	**Lawn Care Education**	**Downspout Disconnection**	**Rain barrel/rain gardens**	**Stream Buffer Education**	**Dumpster Management**	**Tree Planting**
Heartlands	Candidate for outreach in regards to better dumpster management and stormwater pond retrofits.	yes					yes	
Charleston	Candidate for stormwater disconnection practices where site slopes are not prohibitive.			yes				
Dominion at Great Oaks	Drain inlets in this apartment complex generally appeared undersized for volume of runoff they receive from roof drains and parking lots.		yes	yes	yes			
Howard Crossing (Town & Country)	Large apartment complex	yes (projects SB-6 and SB-7	Yes, with property management company	some exists, additional possible	no	yes		
Wilton Farm Acres	Older homes with some remodeling but few turf managed yards.		yes	yes	possible	yes		yes
Normandy Heights/ Dearfield Old	Older homes with some remodeling but few turf managed yards.		yes	yes	possible	yes		yes

2.2.5 Project Priority Procedure

The process for evaluating and prioritizing the proposed restoration projects involved consideration of all currently available information on each project (i.e., field crew notes and opinions, best professional judgment, and specific sites requested to be included as priority by the county). Several factors are typically considered and weighed when prioritizing and ranking restoration/retrofit projects (Table 7). Scoring for any project should be refined with detailed cost estimates, information on land-owner cooperation, and space and logistical constraints. The actual sites chosen for restoration, therefore, may change when more detailed information becomes available.

Table 7. Scoring criteria used for project prioritization.

Factor	Description	Scoring Criteria	
Cost	Based on type of practice. Low: Buffer planting, education, trash clean-up, raingardens Medium: Retrofits, dry ponds, bioretention facilities High: Stormwater planters, underground sand filter, stream daylighting	Low	2
		Medium	1
		High	0
Feasibility	High: Public land, enforcement or outreach Moderate: Private land, but funding available or institutional (3); large property owner (2); small property owner and funding unlikely (1) Low: known uncooperative owner	Highly Feasible	4
		Moderately Feasible	1-3
		Low Feasibility	0
Physical Constraints	Includes: Other utility conflicts, space limitation, soils, access	None	4
		Minor/ unknown	1-3
		Major	0
Water Quality Benefits	How much area is treated?	>5 acres	5
		2-5 acres	3-4
		0.5-1.9 acres	2
		0.1-0.49 acres	1
		None	0
Channel Protection	Will erosive velocities be reduced? Will channel slope be protected?	Protection provided	2
		Channel armored	1
		Not provided	0
Natural Area Impacts	Are existing forest or wetlands impacted? Buffer plantings or any conversion of asphalt to stormwater treatment area would be considered a gain.	Net gain	3
		No loss or gain	1-2
		Net loss	0

Cost scoring were very rough estimates based on average costs per project type from previous reports put out by the Center for Watershed Protection and estimates included in field notes. Costs will be different for each individual project within each type based on size and intensity of the project selected, as many sites included more than one restoration option. Table 8 summarizes average project costs by type. These gross estimates were used for prioritizing projects based on assumed problem severity and project size, but could be significantly different for each individual project when engineering evaluations for site specific issues are considered.

Table 8. Cost estimates for each type of project.

Project Type	Level	Average Cost
Stormwater Retrofits	Low	<$50,000
	Medium	$50,000 to $200,000
	High	>$200,000
Buffer Restoration	Low	<$50,000
	Medium	$50,000 to $100,000
	High	>$100,000
Bioinfiltration Cell Construction	Low	<$50,000
	Medium	$50,000-$150,000
	High	>$150,000
Dry Swale Construction	Low	<$50,000
	Medium	$50,000 to $150,000
	High	>$150,000
Bioretention Cell	Low	<$50,000
	Medium	$50,000 to $150,000
	High	$150,000-$250,000
RainGarden		<$20,000
Wetland Construction		>$250,000
Education/Outreach		$10,000
Demonstration Retrofits		$75,000

2.2.6 Final Sucker Branch Project Priority List

For the Sucker Branch subwatershed, 25 projects were designated as priority based on the preliminary ranking system described in section 2.2.5 (Tables 7 and 8) and best professional judgement. All education and outreach projects were also selected as priority regardless of score, since these are low cost projects that could be easily incorporated into a larger county program. Private land projects will have their feasibility depend heavily on land-owner cooperation, and so each of these projects will need to be evaluated further to determine if the project should be the focus of restoration efforts. The final list of 25 priority projects include 11 retrofit projects, 8 buffer/bank restoration projects, 4 education/outreach projects and 2 stormwater management facility maintenance projects (Table 9). Pictures and descriptions of all projects from Table 9 are in the project summaries in Section 3. Figure 3 shows the location of each project site within the subwatershed.

Table 9. Summary of Sucker Branch priority scoring for each project.

Project Number	Location	Description	Ownership	Cost	Feasibility	Physical Constraints	Water Quality Benefits	Channel Protection	Natural Area Impacts	Total
Project - SB - 4	Apartments at Rogers Rd	Combination of all types proposed	Private	2	2	4	3	2	3	16
Project - SB - 7B	Howard Crossing South	Buffer Restoration	Private	2	2	4	3	2	3	16
Project - SB - 6A	Howard Crossing (Town & Country)	Channel repair	Private	1	2	3	5	2	3	16
Project-SB-27	North Ridge Professional Building	Stormwater Retrofit	Private	1	2	4	4	2	2	15
Project - SB - 3	Rte 40 Plunge Pool	Bank Stabilization/Maintenance	Public	1	4	4	2	2	2	15
Project - SB - 6D	Howard Crossing (Town & Country)	Stormwater Retrofit	Private	1	2	3	5	2	2	15
Project-SB-30	Rockland Art Center	Parking Lot Demonstration Proj.	Public	1	4	4	2	2	2	15
Project - SB - 7A	Howard Crossing South - Pool area	Buffer Restoration	Private	2	2	3	3	1	3	14
Project - SB - 6B	Howard Crossing (Town & Country)	Buffer Restoration	Private	2	2	3	2	2	3	14
Project - SB - 14	Howard Crossing Retrofits	Stream Restoration/Outreach	Private	1	4	4	2	1	2	14
Project - SB - 2(A&B)	Charleston Manor (The Great Oaks)	Bank Stabilization/Stormwater retrofit	Private	0	2	2	5	2	3	14
Project - SB - 10	Dominion at Great Oaks #2	Stormwater Retrofit	Private	1	2	4	2	2	2	13
Project - SB - 5	Rogers Buffers	Buffer Restoration/outreach	Private	2	1	4	1	2	3	13
Project - SB - 1	Our Ladies of Perpetual Help	Buffer/Bank Restor.	Private	1	3	2	2	2	3	13
Project - SB - 12	Swimming Pool Outreach	Education/Outreach	Private	2	4	4	1	0	2	13
Project-SB-28	Heartlands Stormwater Ponds	Stormwater Retrofit	Private	1	2	4	2	2	2	13
Project - SB - 11	Rte 40 Bioretention	Stormwater Retrofit	Public	1	4	3	1	2	2	13
Project - SB - 15	Chandler Lee - GMC Dealer	Combination of stormwater mngt.	Private	1	1	3	4	2	2	13
Project-SB-22	Normandy Shopping Center	Stormwater Retrofit	Private	0	1	3	5	2	2	13
Project - SB - 6C	Howard Crossing (Town & Country)	Maintenance	Private	2	2	4	0	2	2	12
Project-SB-18	Charleston Manor Tennis Parking	Stormwater Retrofit	Private	1	2	3	2	2	2	12
Project-SB-19	Charleston Manor Residential Parking	Stormwater Retrofit	Private	1	2	3	2	2	2	12
Project-SB-24	Infiniti Dealership	Stormwater Retrofit	Private	1	2	4	1	2	2	12
Project - SB - 9	Dominion at Great Oaks Pool Parking	Stormwater Retrofit	Private	1	2	2	2	2	2	11
Project-SB-26	Big Screen Store	Trash Removal	Private	2	2	4	1	0	2	11
Project - SB - 13	Rogers Daylight	Combination of all types proposed	Private	0	1	4	1	2	3	11
Project-SB-23	Miller Brothers Ford	Trash Removal	Private	2	2	4	1	0	2	11
Project-SB-29	Papa John's Stormwater Pond	Stormwater Retrofit	Private	1	1	3	2	2	2	11
Project-SB-20	Business Complex 8569 Rte. 40	Stormwater Retrofit	Private	0	1	3	2	2	2	10
Project - SB - 8	Charleston	Stormwater Retrofit	Private	1	2	3	1	2	1	10
Project-SB-16	Saturn Dealer	Stormwater Retrofit	Private	0	1	3	2	2	2	10
Project-SB-17	Shell Station - Rte 40	Stormwater Retrofit	Private	0	1	3	2	2	2	10
Project-SB-25	Big Screen Store	Stormwater Retrofit	Private	0	1	3	1	2	2	9
Project-SB-21	Shell/High's Market on Normandy	Stormwater Retrofit	Private	1	1	2	1	2	2	9

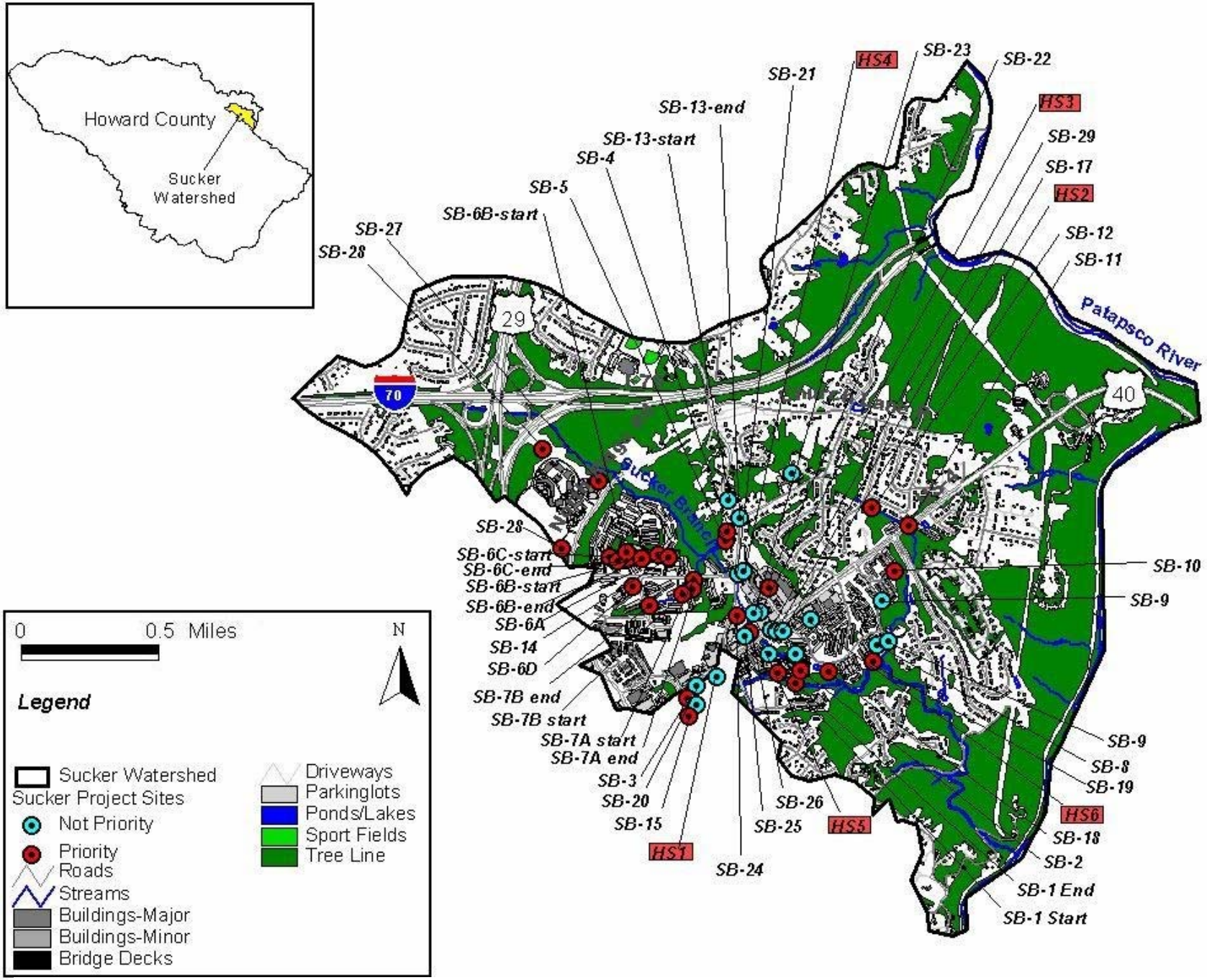


Figure 3. Map of the project sites (SB-#) and Hot spots (HSI) for the Sucker Branch Subwatershed. Sites are color coded for priority status

SECTION 3: PROJECT DESCRIPTIONS AND RESTORATION RECOMMENDATION

This section describes each site visited during the field reconnaissance, problems encountered at each site, and the recommendations on appropriate follow-up actions for each problem. Recommendations include combinations of education, retrofits, downspout disconnection, buffer restoration, and/or stream bank/channel restoration. All projects shown in Figure 3 are listed and described in this section. Those with "recommendation" in bold and marked with an * are the projects selected as "priority projects" from the priority ranking exercises (Tables 9). Projects are listed in order of project number (not priority).

3.1 Sucker Branch projects

Our Lady of Perpetual Help (Project - SB – 1)

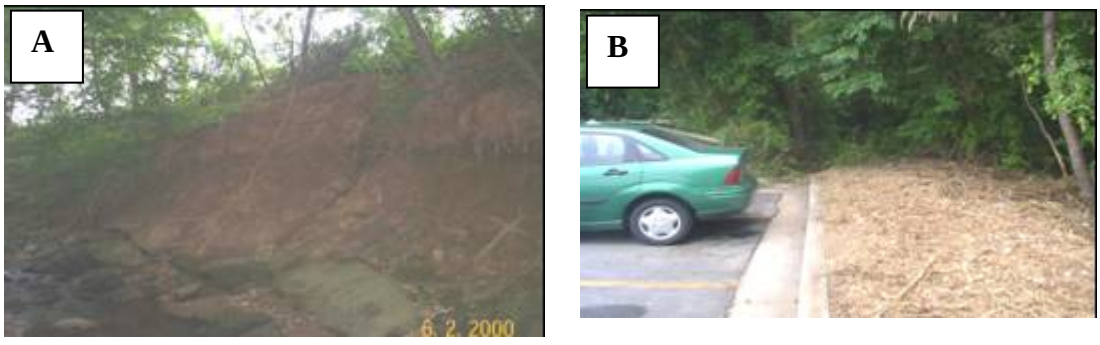
Description: This section of stream is lacking an adequate riparian buffer and the bank channel is showing signs of erosion.

A) View of stream with little riparian buffer. B) View of stream bank.

***Recommendation**: Proposed project is a combination of riparian buffer revegetation and bank stabilization along approximately 500 linear feet of stream channel. On site use for a devotional area, sewer lines, a trailer adjacent to the stream, and the road location constrain potential buffer projects. With these constraints in mind along with cost this project is still considered a priority given its high potential feasibility as it is an institutional area. At the very least it should be targeted for education and outreach to the landowners. There may be the potential for revegetation projects to be undertaken by the community that uses this land.

Charleston Manor (Project SB – 2A and Project SB-2B)

Description: An approximately 20-foot high eroding bank (picture A) was observed on the main stem of Sucker Branch downslope from an apartment complex parking lot. The parking lot is a retrofit candidate, specifically where stormwater leaves the parking lot via a curb cut (picture B) and enters an eroding gully and Sucker Branch.



A) View of high eroding bank. B) View of curb cut from parking lot into the stream.

***Recommendation**: Proposed practices include a parking lot bioretention facility (project SB-2A) and bank stabilization/revegetation measures for the eroding bank (project SB-2B). This site is priority because part of the stream in this section may lie on public land and the erosion is a problem that must be addressed.

Rte 40 Plunge Pool (Project - SB – 3)
Description: State Highway Administration culvert under Route 40 is undermined and causing bank erosion.

View of eroding bank at the culvert outfall.

***Recommendation:** The end section of the culvert should be repaired and a plunge pool could be added for energy dissipation. The repair of this erosion site is feasible due to its location in the highway right-of-way. The access to the site requires clearing of brush, but tree impacts can likely be avoided.

Apartments at Rogers Avenue (Project - SB – 4)
Description: Overall this 4-unit residential complex has poor stormwater management. The apartment building rooftops drain onto the parking lot, which discharges directly to the stream. The stream also has inadequate stream buffers.

View of the asphalt parking lot and outfall.

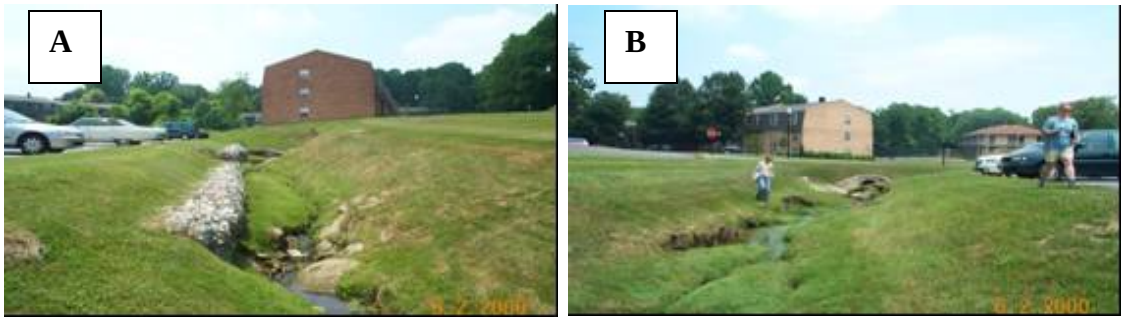
***Recommendation**: The runoff from the roof drains and asphalt parking lot could be diverted to constructed raingardens in landscaped areas adjacent to the stream. Buffer plantings and bank stabilization should also be encouraged.

Rogers Avenue Buffers (Project - SB – 5)
Description: Residential property along left bank of stream adjacent to and downstream of Project-SB-4 is mowed to top of bank.

View of left bank with mowed lawn.

***Recommendation**: This area should be included in the County buffer program and Education/Outreach. There are approximately 300 linear feet of restorable buffer area within this project.

Howard Crossing Channel (Town & Country) Project - SB - 6A
Description: The channel adjacent to 8872-8882 Town and Country Blvd., has severe erosion problems.



A) Upstream view of eroding channel. B) Downstream view of eroding channel.

***Recommendation**: This channel needs structural repair. Hydraulic calculations need to be done to determine if a more natural channel design is an option. This site should be targeted for education on no-mow vegetation to increase water retention. This area may also be a candidate for a bioretention facility for water quality treatment of the parking lot, and would require landowner cooperation. At this time it is in the priority list due to the fact that all the other Howard Crossing projects are priorities, and the county will talk about all potential projects with this landowner.

Howard Crossing (Town & Country) Invasives/Buffer (Project - SB - 6B)
Description: The buffer in this section is dominated by invasive plant species.

A) View of invasive plants on both banks of stream. B) View of invasive plants along stream, and mowed lawn adjacent to stream.

***Recommendation**: Clear invasive plant species from the stream buffer and extend the stream buffer. This will allow the riparian buffer to be more effective at slowing and treating stormwater runoff as well as providing the necessary stream ecosystem functions (for example, shading, cover, organic matter inputs, etc.) that adequate buffers do. This project should be targeted for education/outreach.

Howard Crossing (Town & Country) Concrete Channel (Project - SB - 6C)
Description: The concrete channel draining stormwater is broken and undermined.

A) View of broken channel. B) Different section of same broken channel and exposed soils.

***Recommendation**: The concrete channel needs repair and, if runoff flows allow, should be replaced with a grassed swale that could provide some water quality treatment. Understory plantings should be initiated to cover bare soils in the adjacent area.

Howard Crossing (Town & Country) Retrofit (Project - SB – 6D)
Description: A concrete channel that receives flow from parking lots and buildings near the corner of W. Spring Dr. and Town and Country Blvd., is cracked and there is erosion near the channel.

A) View of broken channel. B) Different view of same broken channel and erosion.

***Recommendation**: Project would involve retrofitting this channel by creating a diversion wall to lengthen the flow path and creating a wet swale\wetland area in the adjacent grass.

Howard Crossing (Town & Country) South - Pool area (Project - SB - 7A)
Description: This area is adjacent to the swimming pool, at a visible location near the entrance to the community. Existing stream channel is an 8-10 foot mowed trapezoidal channel. Baseflow is underground and daylights at the entrance to a culvert under Town and Country Blvd.

A) Upstream view of channel. B) Downstream view of channel

***Recommendation**: This area should be targeted with the other Howard Crossing buffer education projects as another opportunity for buffer reforestation (30' on L bank and 100' on R bank). The mowed area appears unused and could be used as stormwater pond if the culvert entrance was modified to become a riser, or for some other type of water quality treatment facility.

Howard Crossing (Town & Country) South (Project - SB - 7B)
Description: This section of stream channel flows between apartment buildings and is mowed right to the bank. Some areas are marshy.

A) Upstream view 1 of channel. B) Upstream view 2.

***Recommendation**: Establish a 10- to 30-foot stream buffer of no-mow native vegetation. In addition to the filtering and shading benefits of a buffer, this no mow zone will prevent landscapers from fertilizing the stream banks.

Charleston Manor (2) (Project - SB – 8)
Description: The stormdrain network that discharges immediately downstream of this parking lot drains a large commercial and residential area, causing bank erosion downstream.

A) View of storm drain inlet on parking lot. B) View of residential parking lot.

Recommendation: The proposed treatment includes construction of a stormwater wetland or infiltration basin that would capture flows before entering a smaller tributary to Sucker Branch. Flows could be diverted from the storm drain network to an open area adjacent to the outfall. Alternatively, only parking lot runoff could be treated.

Dominion at Great Oaks Swimming Pool Parking Lot Project - SB - 9
Description: This parking lot drain inlet is clogged with sediment from an eroding gully. A second inlet between this one and the eroding gully is also clogged with sediment..

A) View of clogged drain inlet. B) View of road leading to clogged inlet.

Recommendation: The potential retrofit projects include repairing/stabilizing the eroding gully, removing sediment from the clogged inlets, and redirecting runoff to a new bioretention area within the parking lot where the clogged inlet is located.

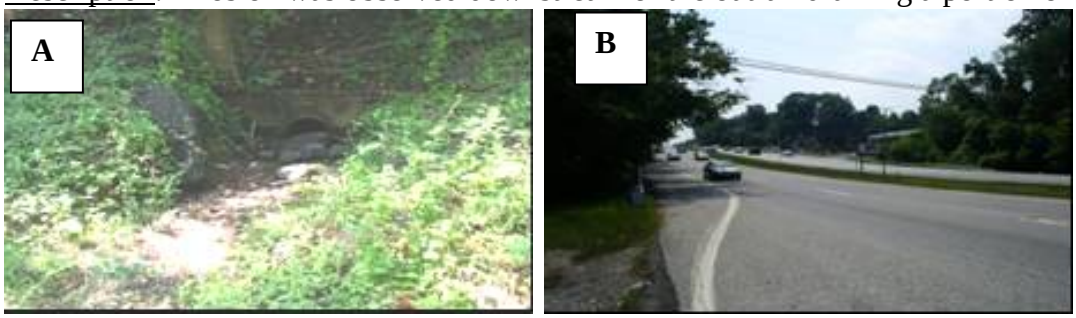
Dominion at Great Oaks #2 (Project - SB – 10)
Description: Drain inlet runoff is eroding a steep wooded slope that leads to a tributary to Sucker Branch.

A) View of Drain inlet. B) View of eroding banks.

***Recommendation**: This area should have rooftop drain disconnection and construction of rain gardens to treat the rooftop runoff, as well as a bioretention facility adjacent to the existing drain inlet. These practices would provide flow attenuation and reduce peak flows.

Rte 40 Bioretention (Project - SB – 11)

Description: Erosion was observed downstream of the outfall draining a portion of Route 40.



A) View of storm drain outfall. B) View of Route 40, where inlet is located.

***Recommendation**: A bioretention retrofit of the existing storm drain inlet located in the center median of Rte. 40 would encourage infiltration and attenuate peak flows in an attempt to minimize downstream erosion. The Department of Natural Resources has indicated that the State Highway Administration has funds for retrofits and other water quality improvements to treat highway runoff, therefore this project is flagged as a priority.

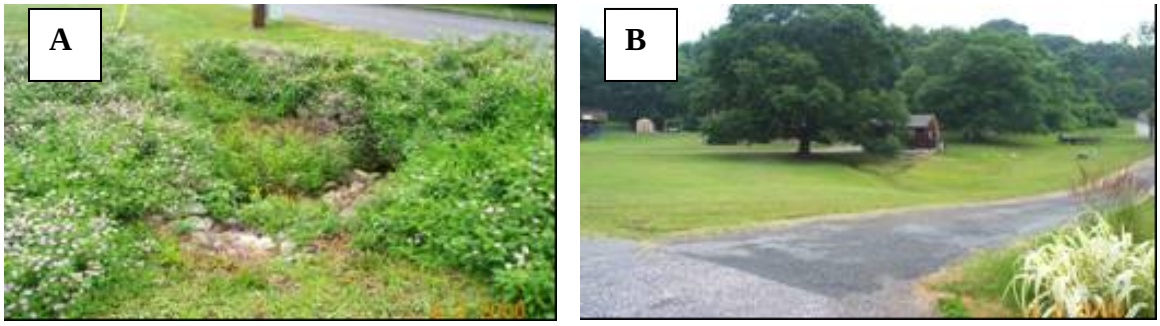
Swimming Pool Outreach (Project - SB – 12)

Description: A drain outlet from a residential swimming pool was observed discharging directly to a Sucker Branch tributary.

View of residential swimming pool outlet.

***Recommendation**: An inexpensive outreach/education program could alter the behavior of this residence.

Rogers Avenue Daylight (Project - SB – 13)
Description: Stream sections upstream of the intersection of Rogers Ave and High Ridge Road are either piped or treated as ditches.



A) View of intersection (Rogers Ave. and High Ridge Road). B) View of stream running through mowed lawn.

Recommendation: An ambitious program would work with homeowners northeast of this intersection to daylight and buffer the stream through their yards. A less intense alternative is education about nutrient management and creation of no-mow zones for unbuffered streams.

Howard Crossing (Project - SB – 14)
Description: The stormwater management facility is not functioning as it should as evidenced by the outlet level during dry weather. This facility appears to be an infiltration basin or bioretention cell.

Picture of malfunctioning stormwater facility. The stream runs in behind this facility and the pool on the north side of Town and Country Blvd.
(*Note: No field sheets were made for this site*)

***Recommendation**: This facility should be immediately tended to by maintenance personnel. Howard County enforcement should contact the property owner to ensure maintenance is performed. In the grass area behind and downhill of the pool, it may be feasible to daylight an additional section of stream channel or employ a flow-splitter at the upstream road crossing to divert low flows. The grass area could be converted to a stormwater wetland for water quality benefits. A less costly alternative is reforestation of this turf area.

Chandler Lee - Pontiac/Buick/GMC Dealer (Project - SB – 15)

Description: Large car dealer with little stormwater management. Roof downspouts discharge to the asphalt lot and staining is seen off areas where cars are washed and from the dumpster. The parking lot drain is clogged with sediment and the stream below this area has erosion problems.

A) View of parking lot and drain inlet. B) View of roof downspouts.

***Recommendation**: The parking lot could have vegetated areas put in to break up the impervious areas, and a bioretention strip could be installed along the edge of the parking lot to slow and treat the stormwater runoff before it gets to the stream.

Saturn Dealer on Route 40 (Project-SB-16)

Description: This parking lot shows signs of undercutting and downslope erosion occurring where runoff currently leaves this site.

A)View of parking lot. B). Drain inlet in corner of parking lot.

Recommendation: This site should be included in education outreach program for business owners. Treatment should be provided for parking lot runoff and car washing facility. A sand filter could be installed to treat and slow runoff as well.

Shell Station - Rte 40 (Project-SB-17)

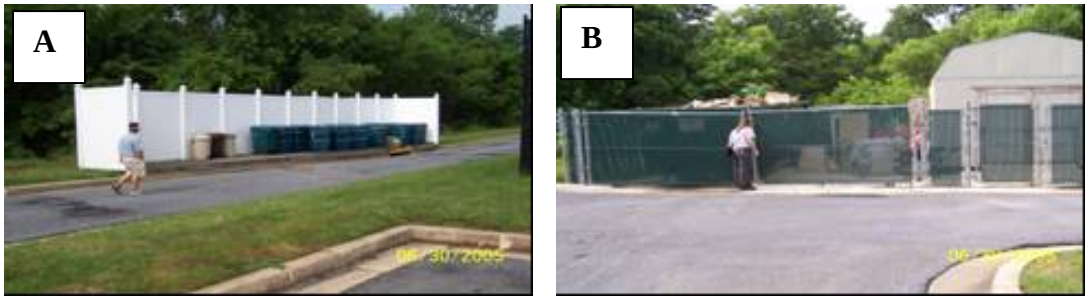
Description: Staining observed at downstream outfall possibly from gas station runoff, which is a likely source of pollutants to stream.

A) View of stormwater drain on parking lot. B) View of gas station were downstream staining may be coming from.

Recommendation: Along with education and outreach, construct an oil/grit separator at the entrance to the existing drain inlet to treat stormwater runoff prior to entering the storm drain system.

Charleston Manor Tennis Court Parking Lot (Project-SB-18)

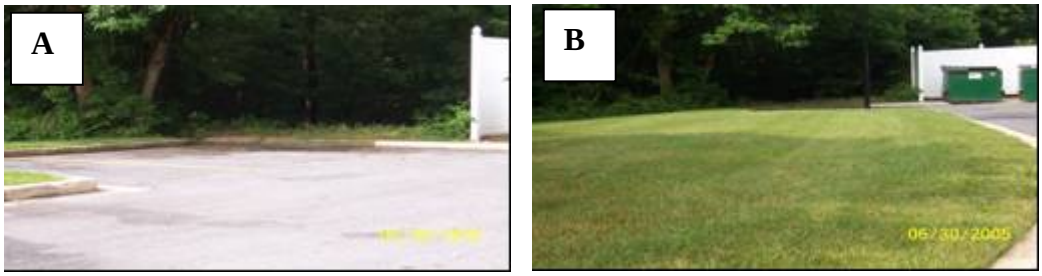
Description: This parking lot is near the tennis court and has room for a small stormwater management facility to offset some of the impacts from parking lot and rooftop runoff in this area. The runoff discharges to a grassed/wooded area and is causing downstream scour/erosion.



A) View of parking lot. B) Different view of same parking lot.

***Recommendation:** Retrofit parking lot spaces with permeable pavers or porous paving, as it appears to be utilized for seasonal or temporary swimming pool, tennis court, and car vacuum station parking. A bioretention cell could be built in the back corner of the lot. Curb cuts along the back would help move water into this facility.

Charleston Manor Residential Parking Lot (Project-SB-19)
Description: A residential parking lot in this housing complex past the pool area.



A) View of parking lot median. B) Side view of same area of parking lot.

***Recommendation**: Convert grassed parking lot median and corner of parking lot to bioretention areas, providing attenuation to downstream channel where scour and erosion was observed.

Business Complex 8569 Rte. 40 (Project-SB-20)
Description: This area has parking lot and curb failures that are not functioning to route water as designed. Runoff should flow to a single drain inlet at the rear of the property, but at one location runoff flows over an eroded curb, causing downstream erosion.

View of eroded curb where runoff bypasses drain inlet and causes erosion.

Recommendation: Onsite retrofit opportunities include repairing parking lot curb failure and increasing curb height; converting planter boxes to stormwater planters; creating infiltration areas in parking lot peninsulas; and creating a linear sand filter along the back of the parking lot.

Shell/High's Market on Normandy Center Drive (Project-SB-21)
Description: Fueling area runoff drains across the lot, through a curb cut to a storm drain inlet on the road. This is a likely pollutant source to the stream.

A) View of fueling area. B) View of current drainage area from gas station.

Recommendation: Divert runoff from fueling area to a new an oil/grit separator at the existing storm drain.

Normandy Shopping Center (Project-SB-22)
Description: This area is a large complex of stores and parking lots with minimal stormwater management in place.

A) View parking lot median. B) View of parking area at rear of building.

***Recommendation**: This site has limited space, so management facilities may need to include sacrificing some parking area, perhaps in the back of the buildings. It may be possible to construct bioretention areas within two available grassed areas, and/or a parking lot median. An additional option would be to retrofit the overflow parking area at rear of shopping center with permeable pavers/porous paving.

Miller Brothers Ford (Project-SB-23)
Description: Trash and debris were observed on the stream bank near this site. Observed debris included multiple drums, metal grates, construction waste and assorted trash.

Recommendation: Remove trash and debris dumped down stream bank on western edge of property.

No Pictures Available.

Infiniti Dealership (Project-SB-24)
Description: An existing stormwater pond onsite has a concrete low flow channel that directs low flows directly to overflow structure, preventing any infiltration and minimizing potential water quality benefits.

View of concrete low flow channel in stormwater pond.

***Recommendation**: Remove concrete low flow channel and re-vegetate pond to improve treatment capacity. Should be a fairly straight-forward and feasible project to improve stormwater treatment and retention in this area.

Big Screen Store (Project-SB-25)
Description: This was recently remodeled and expanded. A new storm drain has been directed to a steep slope leading to a channel where scouring and erosion was observed.

View of newly constructed building, with new storm drain.

Recommendation: Install stormwater planters to provide water quality treatment and some attenuation of small storm flows from the roof drains.

Big Screen Store (Project-SB-26)
Description: Trash, including hypodermic needles and appliances, was observed along the banks of the stream behind this site.

*__**Recommendation**__: Organize an effort to remove trash (hypodermic needles, appliances, etc.) from stream bank behind building and conduct a clean stream education/outreach effort.

No Pictures Available.

North Ridge Professional Building (Project-SB-27)
__Description__: This site has a stormwater pond that is a good opportunity for improving water quality treatment at an existing facility.

Overview of stormwater pond.

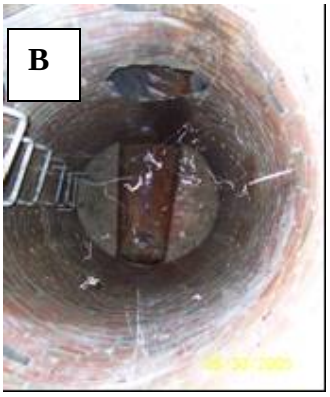
*__**Recommendation**__: Improve treatment of existing stormwater pond by creating habitat/vegetation/pocket wetlands within existing facility. This project should be a priority as it is a cost effective way to improve stormwater treatment.

Heartlands Stormwater Ponds (Project-SB-28)
__Description__: Two ponds located onsite could be improved with minor retrofits.

A) View of the two ponds. B) View of area surrounding the ponds.

__***Recommendation**__: Repair erosion and vegetate drainage channel to one pond, and enhance habitat/vegetation along the perimeter of the pond to prevent bank erosion. Revegetate an area that is currently mowed in the second pond and reforest nearby areas. These low cost improvements should be priority.

Papa John's Stormwater Pond (Project-SB-29)
Description: This site has a treatment pond that may be able to be retrofitted to treat more area.



A) View of pond parallel to Route 40. B) View inside low flow orifice.

Recommendation: Investigate the capacity of the pond to determine feasibility of treating adjacent areas. Plant bottom and banks of pond with native vegetation, and investigate raising low flow orifice to increase water quality treatment capacity.

Rockland Art Center (Project-SB-30)
Description: Parking lot does not have treatment and roof drains discharge to pavement.

A) View of roof discharging to pavement, B) View of driveway with erosion along edge of paving

***Recommendation**: Build bioretention cell off parking lot and along the driveway to capture impervious runoff and drainage from roof. Should consider re-directing roof leaders into the bioretention cell and using a grass swale for conveyance. As a nonprofit association that is open to the public and receives public funding, the Howard County Arts Council may be willing to implement a demonstration project.

3.2 Next Steps

The Sucker Branch project relied on established protocols for stream, upland and retrofit assessments, as well as qualitative information and best professional judgment for extracting priority sites from this subwatershed. That process made use of previous studies containing information on the general condition of the subwatershed and specific problem areas. The next steps for final project development will require further workgroup and County input, receptiveness of the landowners and community, and detailed cost estimates from stormwater facility experts and/or landscape engineers. In the meantime, implementation can begin on a number of the other recommendations including enforcement projects, maintenance projects and outreach projects.

The recommended next steps are as follows:

1. Begin to plan enforcement, maintenance and outreach efforts.
2. Consult with private property owners and community representatives.
3. Conduct more detailed site investigations for identified priority projects.
4. Develop cost estimates and determine funding sources/availability based on information from #2 and #3.

Once these steps are completed and the restoration project list finalized, we recommend that a program be developed that includes a process for monitoring the effectiveness of any restoration activity. Monitoring should include interim goals for restoration engineering success and stormwater management, but must also include final goals for in-stream habitat restoration and improved biological condition. With this process in place Howard County can utilize information on project specific successes and challenges to improve and expand stream restoration efforts throughout the county.

SECTION 4: DATA SHEET COPIES

Copies of the field forms used for field validations that lead to project descriptions and restoration recommendations are provided here. Copies of each Hot spot investigation and Neighborhood assessments which were used to help develop projects are also provided.

4.1 Sucker Branch Projects Forms

(copies available upon request)

4.2 Sucker Branch Hot spot Investigation Forms

(copies available upon request)

4.3 Sucker Branch Neighborhood Source Assessment Forms

(copies available upon request)

APPENDIX A

SUMMARY TABLES OF THE RESULTS OF THE FIELD RECONNAISSANCE WORK FOR THE SUCKER BRANCH

Field Personnel	Sucker Branch Potential Restoration Projects					
	Site ID	**Name**	**SCA Point**	**Project Type**	**Field Forms**	**Description**
PES/SCH/EMC/KL/SO	Project - SB - 1	Our Lady Of Perpetual Help	PR188106	Buffer Restoration/Bank Stabilization	Stream Repair, IB	Proposed project is a combination of riparian buffer revegetation and bank stabilization along approximately 500 linear feet of stream channel.
PES/SCH/EMC/KL/SO	Project - SB - 2	The Great Oaks	PR188110	Bank Stabilization/Stormwater Retrofit	Stream Repair/Retrofit	An approximately 35 foot high eroding bank was observed on the main stem of Sucker Branch downslope from an apartment complex parking lot. The parking lot is a retrofit canidate, specifically where stormwater leaves the parking lot via a curb cut and enters an eroding gully and Sucker Branch. Proposed practices include a parking lot bioretention facility (SB-2A) and bank stabilization/revegetation measures for the eroding bank (SB-2B).
SCH/KL/SO	Project - SB - 3	Rte 40 Plunge Pool	--	Maintenance / Bank Stabilization	OT	SHA culvert under route 40 is in undermined and causing bank erosion. Endsection/end wall should be repaired. Plunge Pool could be added for energy dissipation.
SCH/KL/SO	Project - SB - 4	Apartments at Rogers Rd	PR184108	Buffer Restoration/Bank Stabilization/Retrofit/Homeowner Education	Stream Repair	Divert runoff from roof drains and asphalt parking/driveway to raingarden in landscaped area. Buffer plantings possible. Educate owner about impervious area disconnection and methods to reduce erosion.
SCH/KL/SO	Project - SB - 5	Rogers Buffers	PR184108	Buffer Restoration/Homeowner Education	IB	Residential property along left bank is moved to top of bank. Candidate for County buffer program. 300 linear feet restorable.
SCH/KL/SO	Project - SB - 6A	Town & Country Channel	--	Stream/Channel Repair	Stream Repair	Erodiing channel adjacent to 8872-8882 Town and Country Blvd. Structural repair needed. Hydraulic calcs needed to determine is more natural channel design is an option. Possibility for added no-mow vegetation. Possible bioretention for water quality treatment of parking lot.
SCH/KL/SO	Project - SB - 6B	Town and Country Invasives/Buffer		Buffer Restoration	Stream Repair	Clear invasives brom stream buffer and extend stream buffer
SCH/KL/SO	Project - SB - 6C	Town and Country Concrete Channel		Maintenance	Stream Repair	Concrete channel is broken and undermined. Needs repair. Some bare soils need understory plantings.
SCH/KL/SO	Project - SB - 7A	Town & Country South - Pool area	PR184107	Buffer Restoration	Stream Repair	Existing stream channel is a 8-10 foot mowed trapazoidal channel. Baseflow is underground until daylighting at entrance to culvert under Town and Country Blvd. Opportunity for buffer reforestation - 30' on L bank; 100' on R bank. Mowed area unused. Adjacent to swimming pool, at visible location near entrace to community.
SCH/KL/SO	Project - SB - 7B	Town & Country South		Buffer Restoration	Stream Repair	Stream channel with baseflow between apartment building is mowed. Some areas are marshy. Possible for 10 to 30 feet of no-mow vegetation to create stream buffer and prevent in-stream fertilization.

Field Personnel	Sucker Branch Potential Restoration Projects					
	Site ID	**Name**	**SCA Point**	**Project Type**	**Field Forms**	**Description**
PES/EMC	Project - SB - 8	Charleston	--	Stormwater Retrofit	Retrofit	Potential opportunity to treat stormwater from a large drainage network in a commercial and residential area. The proposed treatment includes construction of a stormwater wetland or infiltration basin that would capture flows before entering a smaller tributary to Sucker Branch. This site also warrents investigating retrofit opportunities within the upstream network.
PES/EMC	Project - SB - 9	Dominion at Great Oaks Swimming Pool Parking Lot	--	Stormwater Retrofit	Retrofit/NSA	A parking lot drain inlet is clogged with sediment from an eroding gully located downstream of a second drain inlet within the townhouse complex. The potential retrofit project includes repairing/stabilizing the eroding gully, repairing the second drain inlet, and creating a bioretention area within the parking where the clogged inlet is located.
PES/EMC	Project - SB - 10	Dominion at Great Oaks #2	--	Stormwater Retrofit	Retrofit/NSA	Drain inlet runoff eroding slope and banks of a tributary to Sucker Branch. Potential for rooftop disconnection and construction of rain gardens to treat rooftop runoff, as well as a bioretention facility adjacent to the existing drain inlet. Practices would provide flow attenuation and reduce peak flows.
PES/EMC	Project - SB - 11	Rte 40 Bioretention	--	Stormwater Retrofit	Retrofit	Retrofit of existing drain inlet located in center median of Rte. 40. Erosion was observed downstream of current pipe inlet, and proposed bioretention retrofit would encourage infiltration and attenuate peak flows in an attempt to minimize downstream erosion.
PES/EMC	Project - SB - 12	Swimming Pool Outreach	--	Outreach/Education	USA Miscellaneous	Drain outlet from swimming pool observed from residence discharging to Sucker Branch tributary. Targeted outreach/education recommended.
SCH/KL/SO	Project - SB - 13	Rogers Daylight		Buffer Restoration/Sream Repair/Homeowner Education	Stream Repair	Stream sections upstream of the intersection of Rogers Ave and High Ridge Road are not mapped, because they are either piped or treated as ditches. An ambitious program would work with homeowner northeast of this intersection to daylight and buffer streams through their yards. A less intense alternative is education about nutrient management and creation of no-mow zones for unbuffered streams.
SCH/KL/SO	Project - SB - 14	Howard Crossing Retrofits			NSA	Needs follow-up (were followed up see Section 3)
SCH/KL/SO	Project - SB - 15	Chandler Lee - Pontiac/Buick/GMC Dealer			OT	Needs follow-up (were followed up see Section 3)
EMC/PES/MR	Project-SB-16	Saturn Dealer	--	Stormwater Retrofit	Retrofit	Provide treatment for parking lot runoff and car washing facility. Parking lot undercutting and downslope erosion ocurring where runoff currently leaves site. Install a sand filter to treat and slow runoff.
EMC/PES/MR	Project-SB-17	Shell Station - Rte 40	--	Stormwater Retrofit	Retrofit	Construct a sand filter at entrance to existing drain inlet to treat stormwater runoff prior to entering storm drain system. Staining observed at downstream outfall possibly from gas station runoff.

Field Personnel	Sucker Branch Potential Restoration Projects					
	Site ID	**Name**	**SCA Point**	**Project Type**	**Field Forms**	**Description**
EMC/PES/MR	Project-SB-18	Charleston Manor Tennis Court Parking Lot	--	Stormwater Retrofit	Retrofit	Possibility to retrofit parking lot spaces with permeable pavers or porous paving, as it apears to be utilized for seasonal or temporary swimming pool, tennis court, and car vacuum station parking.
EMC/PES/MR	Project-SB-19	Charleston Manor Residential Parking Lot	--	Stormwater Retrofit	Retrofit	Convert grassed parking lot medians/features to bioretention areas, providing attenuation to downstream channel where scour and erosion was observed.
EMC/PES/MR	Project-SB-20	Business Complex 8569 Rte. 40	--	Stormwater Retrofit	Retrofit	Onsite retrofit opportunities include repairing parking lot failure, increasing curb height, converting planter boxes to stormwater planters, and creating a linear sand filter along back parking lot.
EMC/PES/MR	Project-SB-21	Shell/High's Market on Normandy	--	Stormwater Retrofit	Retrofit	Divert runoff from fueling area to a new bioretention facility in a landscaped area with an underdrain system connecting to existing storm drain.
EMC/PES/MR	Project-SB-22	Normandy Shopping Center	--	Stormwater Retrofit	Retrofit	Construct bioretention areas within two available grassed areas, a parking lot median, and within extra parking spaces at the rear of the building. Retrofit overflow parking area at rear of shopping center with permeable pavers/porous paving.
EMC/PES/MR	Project-SB-23	Miller Brothers Ford	--	Trash Removal	Trash and Debris	Remove trash and debris dumped down stream bank on western edge of property. Observed debris included multiple drums, metal grates, construction waste and assorted trash.
EMC/PES/MR	Project-SB-24	Infiniti Dealership	--	Stormwater Pond Retrofit	Miscellaneous	An existing stormwater pond onsite has a concrete low flow channel that directs low flows directly to overflow structure, preventing any infiltration and minimizing potential water quality benefits. Remove low flow channel and revegetate pond to improve treatment capacity.
EMC/PES/MR	Project-SB-25	Big Screen Store	--	Stormwater Retrofit	Retrofit	The building is currently being remodeled and a new stormdrain has been directed to a steep slope leading to a channel where scouring and erosion was observed. Install stormwater planters to provide water quality treatment and some attenuation of small storm flows.
EMC/PES/MR	Project-SB-26	Big Screen Store	--	Trash Removal	Trash and Debris	Organize an effort to remove trash (hypedermic needles, appliances) from stream bank behind building and conduct a clean stream education/outreach effort.
EMC/PES/MR	Project-SB-27	North Ridge Professional Building	--	Stormwater Retrofit	Retrofit	Improve treatment of existing stormwater pond by creating habitat/vegetation/pocket wetlands within existing facility.

Field Personnel	Sucker Branch Potential Restoration Projects					
	Site ID	**Name**	**SCA Point**	**Project Type**	**Field Forms**	**Description**
EMC/PES/MR	Project-SB-28	Heartlands Stormwater Ponds	--	Stormwater Pond Retrofit	Retrofit	Two ponds located onsite, could be improved with minor retrofits, enhancing habitat/vegetation along perimeter and installing alternative erosion control practices.
EMC/PES/MR	Project-SB-29	Papa John's Stormwater Pond	--	Stormwater Pond Retrofit	Retrofit	Investigate capacity of pond to determine feasibility of treating adjacent areas, plant bottom and banks of pond with native vegetation, and investigate raising low flow orifice to increase water quality treatment capacity.
	Project-SB-30	Rockland Art Center	--	Parking Lot Demo.	Bioretention Pond	Possibility of building bioretention pond off parking lot to capture lot runoff and drainage from roof. Should consider re-directing roof leaders into pond and build wet swale area to pond as well.