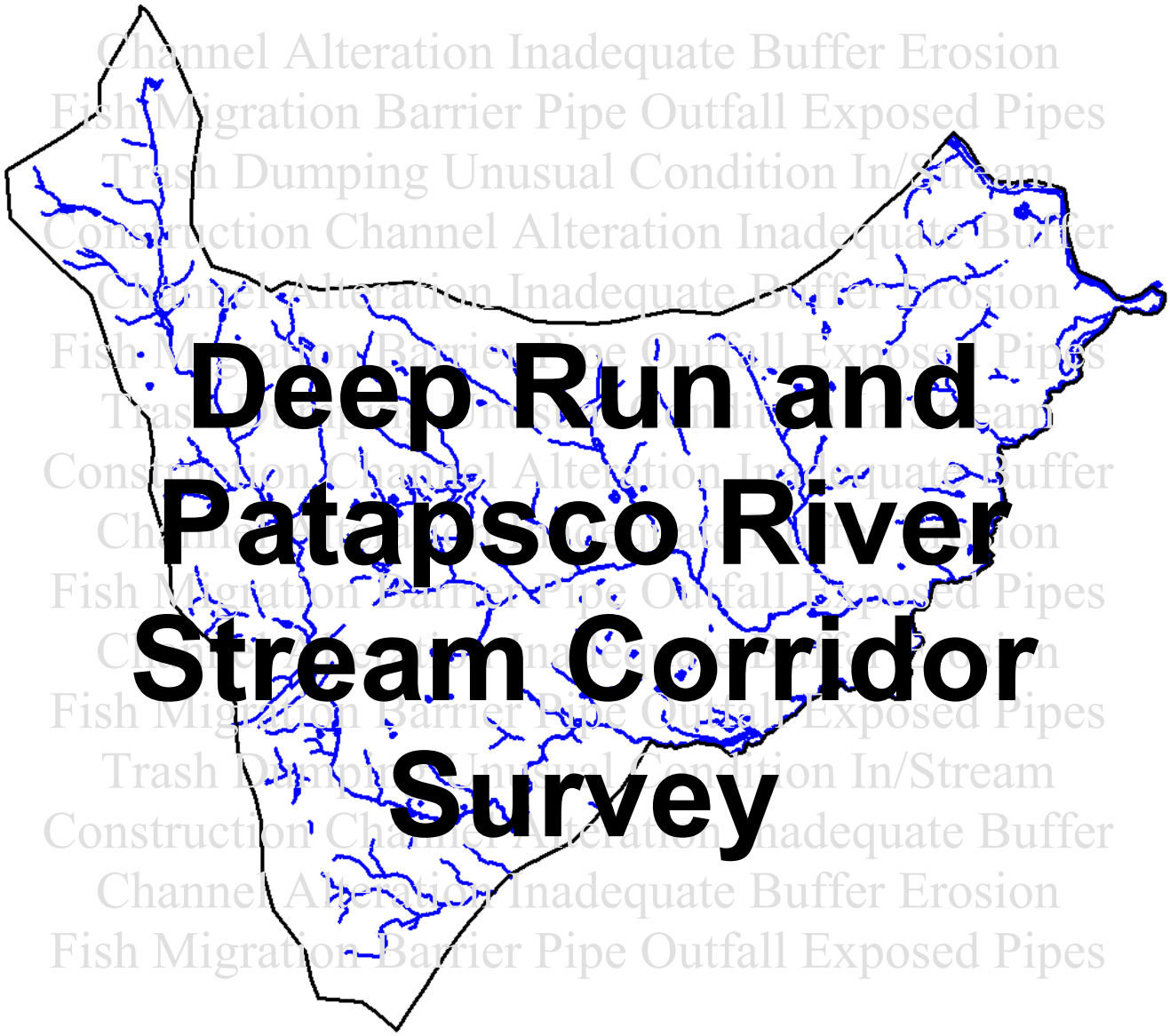

Deep Run and Patapsco River Stream Corridor Survey

Maryland Department of Natural Resources
Watershed Services
Technical and Planning Services
April 2005

Robert L. Ehrlich, Jr.
Governor

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Lieutenant Governor

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DEEP RUN AND PATAPSCO RIVER STREAM CORRIDOR ASSESSMENT SURVEY In Howard County

PREPARED BY
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WATERSHED SERVICES
TECHNICAL AND PLANNING SERVICES
MARYLAND DEPARTMENT OF NATURAL RESOURCES
ANNAPOLIS, MARYLAND

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SUMMARY

In 1998, the Maryland Clean Water Action Plan identified the Patapsco River watershed as one of the State's water bodies that did not meet water quality requirements. In response to this finding, the Maryland Department of Natural Resources (DNR) and Howard County formed a partnership to develop a Watershed Restoration Action Strategy (WRAS) for the Lower North Branch Patapsco River watershed in Howard County. The following Stream Corridor Assessment (SCA) survey is part of the WRAS development process.

The Patapsco River Watershed stretches over four counties and empties into the Chesapeake Bay at Baltimore City. In the central portion of its watershed, the system encompasses over 32,000 acres in Howard County. The Maryland Department of Natural Resources and the Howard County Department of Planning and Zoning formed a partnership to complete a Stream Corridor Assessment (SCA) survey of Deep Run and part of the Patapsco Mainstem within the Lower North Branch of the watershed within Howard County. The remaining area of the Patapsco watershed in Howard County was surveyed in 2001-2002. 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 its streams. The value of the present survey is its help in placing individual stream problems into their watershed context, and its potential use among resource managers and land-use planners to cooperatively and consistently prioritize future restoration work.

The Stream Corridor Assessment fieldwork consisted of walking approximately 57 miles in Deep Run and 21 miles of the mainstem in the Patapsco Watershed, with fieldwork completed in 2003-2004. Over the streams assessed, survey teams identified 314 potential environmental problems. As of the time of the survey, the most frequently observed environmental concern in this portion of the watershed is pipe outfalls, reported at 123 sites. Other potential environmental problems recorded during the survey include: 56 erosion sites, 48 inadequately forested stream buffers, 36 tree blockages, 23 fish barrier, 9 exposed pipes, 7 channel alterations, 7 construction sites, 4 trash dumping sites and1 unusual condition. Additionally, the survey recorded descriptive information for 115 pond sites and 25 representative 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 is compared to others in its category; 2) how *correctable* the specific problem is using current restoration techniques; and 3) how *accessible* the site is 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 Maryland Department of Natural Resources (DNR) Watershed Services Unit developed the Stream Corridor Assessment Survey (SCA) as a watershed management tool.

All of the problems identified as part of the Stream Corridor Assessment survey can be addressed through existing State or Local government programs. One of the main goals of the SCA survey is to compile a list of observable environmental problems in a watershed in order to target future restoration efforts. Once this list is compiled and distributed, county planners, resource managers, and others can initiate a dialog to cooperatively set the direction and goals for the watershed's management and plan future restoration work at the most effective specific problem sites. Results of the present survey will be given to the Lower North Branch Patapsco Watershed WRAS committee, which is developing a Watershed Restoration Action Strategy for the Lower North Branch Patapsco Watershed. Information on the Watershed Restoration Action Strategy can be found on the Department of Natural Resources' website (www.dnr.maryland.gov/watersheds/wras).

ACKNOWLEDGMENTS

Without the hard work and dedication of the Chesapeake Bay Restoration Crew of the Maryland Conservation Corps, this survey would not have been possible. The crew chief during the survey was Tina Stevens. The crewmembers were Dorothy Vauls, Jim Quinn, Marcel Demers, Veronica Valeriano, and Michelle Hyun.

TABLE OF CONTENTS

SUMMARY……... i

ACKNOWLEDGEMENTS…….. iii

TABLE OF CONTENTS…….. iv

INTRODUCTION……..…… 1

METHODS……. 5

RESULTS……... 11

Pipe Outfalls…….. 13

Erosion Sites……..…… 16

Inadequate Buffers…… 19

Tree Blockages…….…… 23

Fish Barriers…….…… 25

Exposed Pipes……... 29

Channel Alterations……... 32

In/Near Stream Construction…… 35

Trash Dumping…….. 37

Unusual Conditions and Comments…….. 39

Pond Sites…….. 41

Representative Sites…….. 43

DISCUSSION……. 46

REFERENCES……... 48

APPENDIX A: Problem Sites by Site Number

APPENDIX B: Problem Sites by Category

INTRODUCTION

In 1998, Maryland's Clean Water Action Plan identified bodies of water that failed to meet water quality requirements or other natural resource goals. One of the areas identified in the report was the Patapsco watershed. The Patapsco River flows into the Chesapeake Bay at Baltimore City after running through Carroll, Howard, Anne Arundel, and Baltimore Counties. The Maryland Department of Natural Resources (DNR) formed a partnership with Howard County to assess and improve environmental conditions in the Howard County portion of the Lower North Branch Patapsco Watershed. The main goal of this partnership is to develop and implement a Watershed Restoration Action Strategy (WRAS).

The first step in developing a Restoration Action Strategy for this watershed is to complete an overall assessment of the condition of the watershed and the streams it contains. This initial step was accomplished using three approaches. First, a watershed characterization was completed that compiles and analyzes existing water quality, land use, and living resource data about the watersheds (Shanks, 2005). Secondly, a synoptic water quality survey, as well as surveys of the fish and macroinvertebrate communities, was conducted at selected stations throughout the Lower North Branch Patapsco Watershed to provide information on the present condition of aquatic resources (Primrose, 2005). Lastly, a Stream Corridor Assessment (SCA) survey was completed for the watershed non-tidal stream network to provide specific information on the present location of potential environmental problems and restoration opportunities. This report details the results of the Deep Run and Patapsco Main Stem Stream Corridor Assessment Survey, and highlights potential restoration opportunities within the watershed based on the survey.

The Patapsco watershed lies within the Baltimore-Washington Metropolitan Corridor, and includes the communities of Damascus, Ellicott City, Relay, Savage, Sykesville, and Woodbine and sections of Patapsco Valley State Park (Maryland's Surf Your Watershed-Watershed Profiles, *Lower North and South Branch Patapsco*). Of the land area, 49 percent is categorized as rural, 26 percent as forested, and 25 percent as urban. The Patapsco Watershed in Howard County is predominately located within the Maryland Piedmont Plateau, with streams flowing through a characteristic landscape of rolling hills and low ridges. The Deep Run watershed encompasses 8,677 acres (13.55 square miles) of land. The survey included approximately 57 miles of stream in Deep Run and 21 miles of the mainstem. Figure 1 shows the geographic location of the watershed targeted in this survey. A digital orthophoto map of the Lower North Branch Patapsco watershed in Howard County is shown in Figure 2. The map is based on aerial photographs taken in April 1993. Figure 3 shows the same area with the targeted watershed boundaries superimposed on a 7.5 minute USGS topographic quadrangle map.

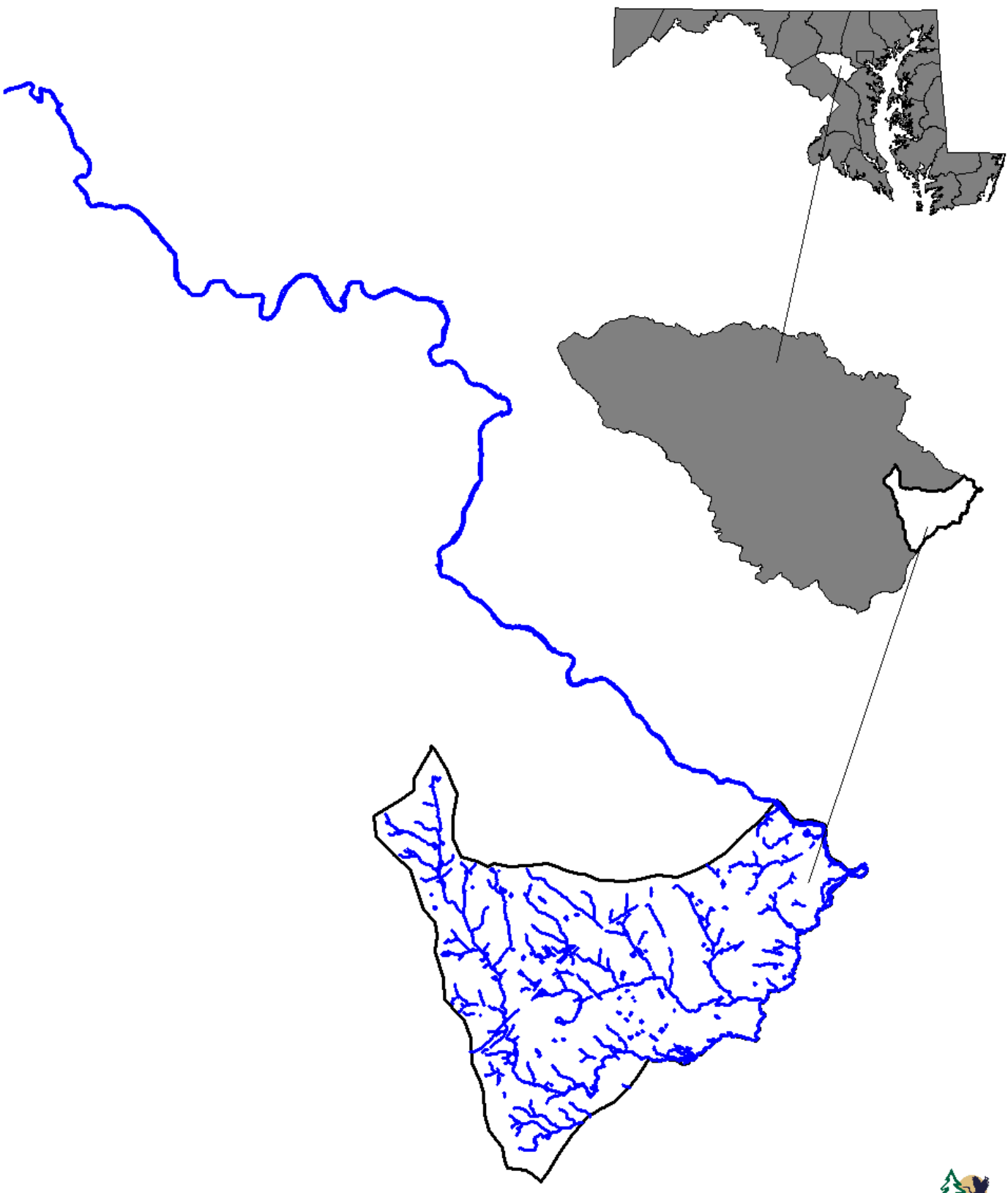


Figure 1: Map showing the location of Deep Run and Surveyed Patapsco River

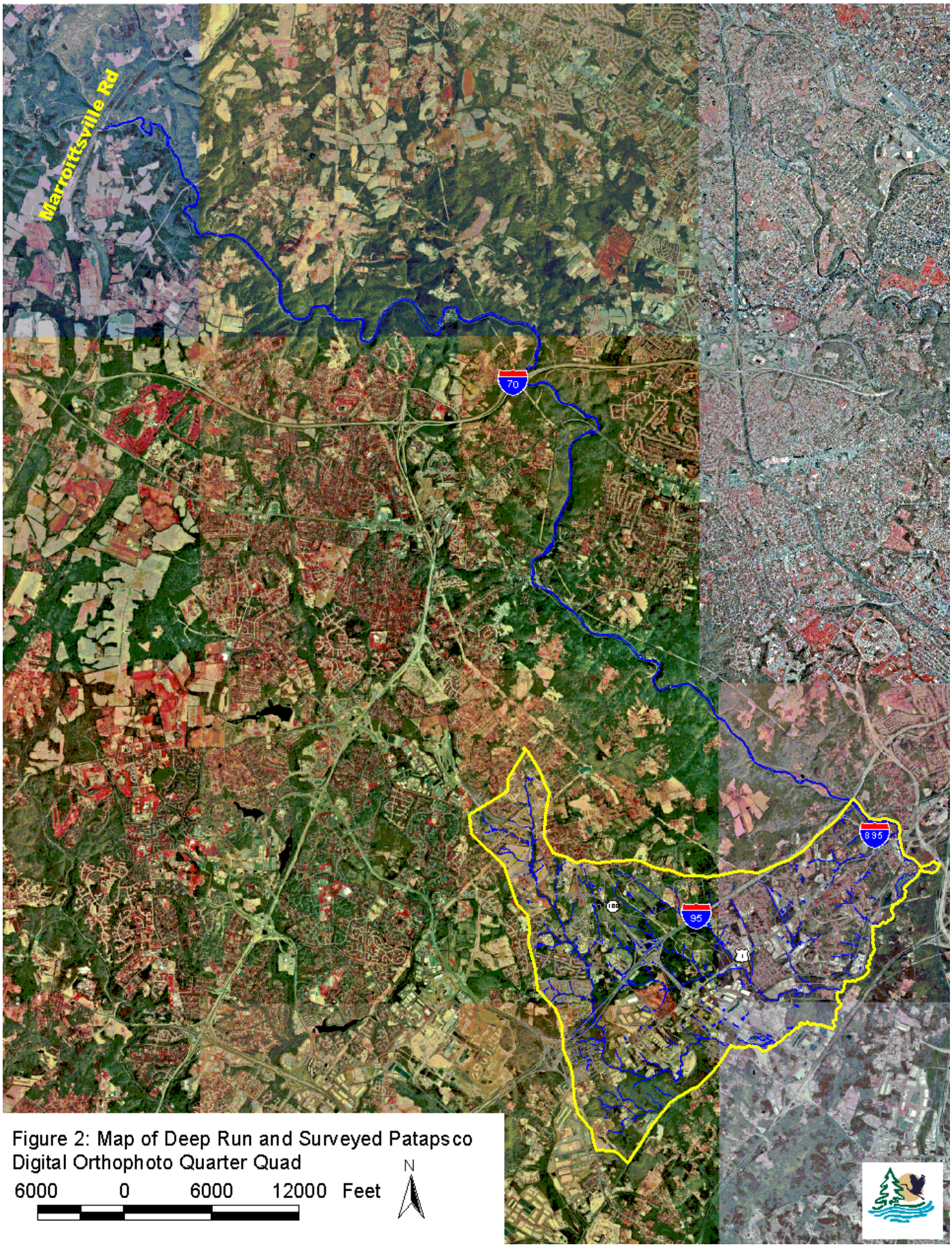


Figure 2: Map of Deep Run and Surveyed Patapsco
Digital Orthophoto Quarter Quad

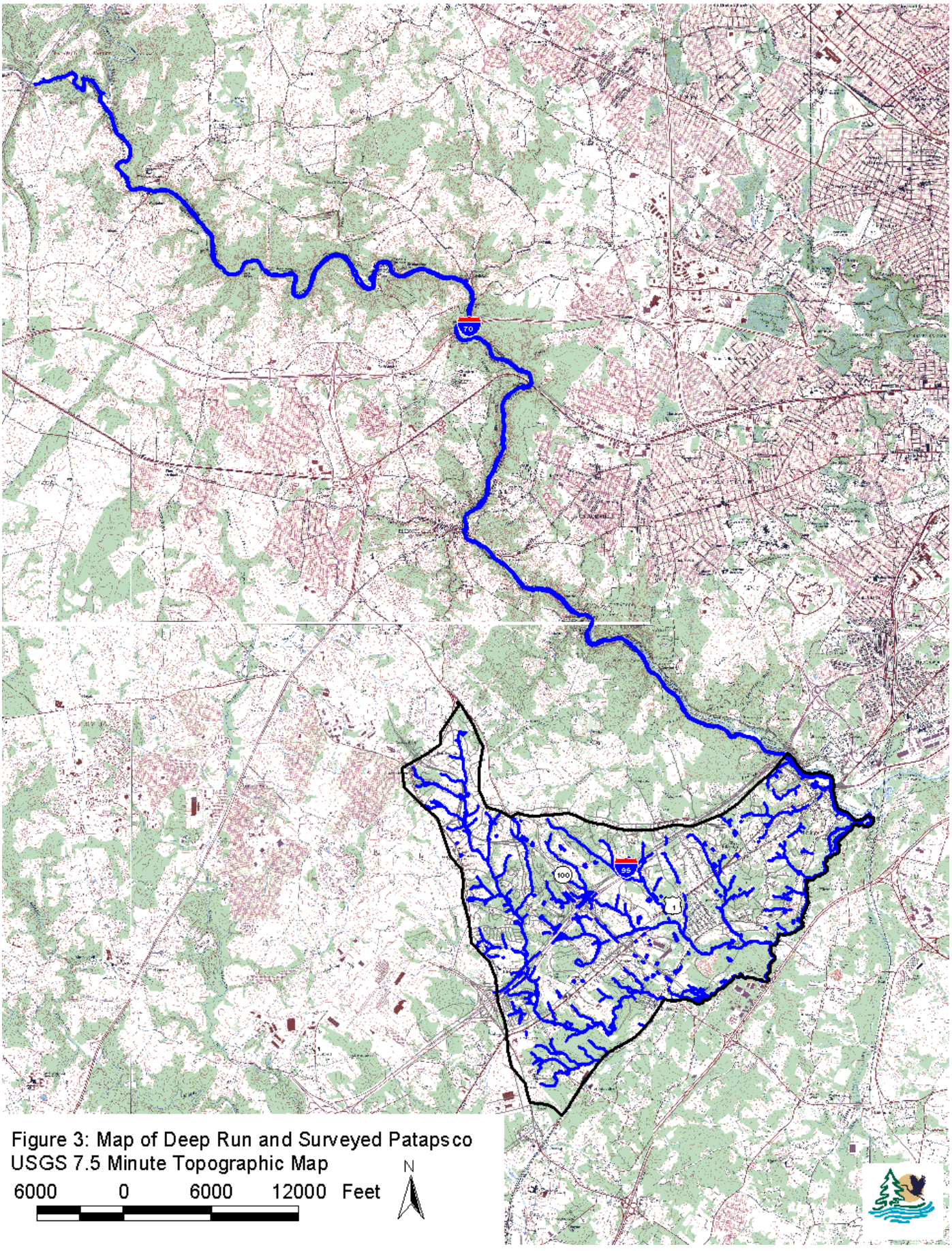


Figure 3: Map of Deep Run and Surveyed Patapsco
USGS 7.5 Minute Topographic Map

METHODS

Goals of the SCA Survey

To help identify some of the common problems that affect streams in a rapid and cost effective manner, the Watershed Restoration Division of the Maryland Department of Natural Resources developed the Stream Corridor Assessment (SCA) survey. The four main objectives of the survey are to provide:

1. A list of observable environmental problems present within a stream system and along its riparian corridor.

2. Sufficient information on each problem in order to make a preliminary determination of both the severity and correctability of each problem.

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 SCA survey is not a detailed scientific survey, nor will it replace chemical and biological surveys in determining overall stream conditions and health. Instead, the SCA survey provides a rapid method of examining and cataloguing the observable environmental problems within an entire drainage network to better target future monitoring, management and/or conservation efforts. One advantage of the SCA survey over chemical and biological surveys is that the SCA survey can be done on a watershed basis both quickly and at relatively low cost.

Maryland's SCA survey is both a refinement and systematization of an old approach – the stream walk survey. Many of the common environmental problems affecting streams can be straightforward to identify by an individual walking along a stream. These include: excessive stream bank erosion, blockages to fish migration, stream segments without trees along their banks, or a sewage pipeline exposed by stream bank erosion leaking sewage into the stream. With a limited amount of training, most people can correctly identify these common environmental problems.

Over the years, many groups standardized a stream walk survey approach for their particular purpose or interest. Many earlier approaches, such as EPA's, "Streamwalk Manual" (EPA, 1992), Maryland Save our Stream's "Conducting a Stream Survey," (SOS, 1970) and Maryland Public Interest Research Foundation "Streamwalk Manual" (Hosmer, 1988), focused on utilizing citizen volunteers with little or no training. While these surveys can be a good guide for citizens interested in seeing their community's streams, the data collected during these surveys can vary significantly based on the background of the surveyor. In the *Maryland Save our Stream* "Stream Survey," for example, training for citizen groups includes giving guidance on how to organize a survey and a slide show explaining how to complete the field work. After approximately one hour of training, citizen volunteers are sent out in groups to walk designated

stream segments. During the survey, volunteers usually walk their assigned stream segment in under a few hours and return their data sheets to the survey organizers for analysis. While these surveys can help make communities more aware of the problems present in their local stream, citizen groups normally do not have the expertise or resources to properly analyze or fully interpret the collected information. In addition, the data collected from these surveys often only indicates that a potential environmental problem exists at a specific location, but it does not provide sufficient information to judge the severity of the problem.

Other visual stream surveys, such as the Natural Resources Conservation Service's "Stream Visual Assessment Protocols" (NRCS, 1998), are designed for use by trained professionals analyzing a very specific stream reach type, such as a stream passing through an individual farmer's property. While this survey can provide useful information on a specific stream segment, it is usually not carried out on a watershed basis.

The Maryland SCA survey bridges the gap between these two approaches. The survey is designed to be completed by a small group of well-trained individuals who walk the entire stream network in a watershed. While those working on the survey are usually not professional natural resource managers, they do receive several days of training in both stream ecology and SCA survey methods.

Field Training and Procedure

While almost any group of dedicated volunteers can be trained to do a SCA survey, the Maryland Conservation Corps (MCC) has proven to be an ideal group to do this work in Maryland. The Maryland Conservation Corps is part of the AmeriCorps Program, initiated to promote greater involvement of young volunteers in their communities and the environment. The MCC program is managed by DNR's Forest and Park Service. Volunteers with the MCC are 17-25 years old and can have educational backgrounds ranging from high school to graduate degrees. With the proper training and supervision, MCC volunteers are able to significantly contribute to the State's efforts to inventory and evaluate water quality and habitat problems from a watershed perspective. For more information on the Maryland Conservation Corps call their main office in Annapolis at (410) 260-8166 or visit their web site at: www.dnr.state.md.us/mcc.

Prior to the start of Patapsco SCA Survey, the members of the MCC's Chesapeake Bay Crew received training in assessing both environmental problem sites and habitat conditions in and along Maryland streams. For problem sites, crewmembers learned how to identify common problems observable within the stream corridor, record problem locations on survey maps, and accurately complete data sheets for each specific problem type. For habitat conditions, the crew learned and practiced assessing stream health based on established criteria indicating both favorable conditions for macroinvertabrates and fish and healthy riparian habitat. These reference sites for habitat condition are located at approximately 1/2- to 1-mile intervals along the stream. In addition, the field crew reviewed a standard procedure for assigning site numbers based on the 3-digit map number, 1-digit team number, and 2-digit problem number for each problem and reference site during the survey. Lastly, in order to have a visual record of existing conditions at the time of the SCA survey, the MCC's Chesapeake Bay Crew received guidelines

for taking photographs at all problem and reference sites.

Several weeks prior to the beginning of the survey, property owners along the stream reach received letters informing them of what the survey is and when it was to be completed. This letter also provided a phone number to call if individuals did not want MCC crews surveying the stream on their property. In addition, survey crews were not to cross fence lines or enter any areas that are marked "No Trespassing" unless they had specific permission from the property owner.

The MCC crew conducted field surveys of the Deep Run-Patapsco River Watershed in Howard County from November 2003 to May of 2004. The survey teams walked the streams drainage network collecting information on potential environmental problems. Those commonly identified during the SCA Survey include: inadequate stream buffers, excessive bank erosion, channelized stream sections, fish migration blockages, in or near stream construction, trash dumping sites, 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.

More detailed information on the procedures used in the Maryland SCA survey can be found in, "Stream Corridor Assessment Survey – Survey Protocols" (Yetman, 2001). A copy of the survey protocols can found on DNR's web site at http://www.dnr.state.md.us/streams/pubs/other.html. Hard copies of the protocols also can be obtained by contacting the Watershed Services Unit, Maryland Department of Natural Resources, Annapolis, MD.

Overall Ranking System

The SCA survey field crews evaluate and score all problems on a scale of 1 to 5 in three separate areas: problem severity, correctability, and accessibility. A major part of the crew's training on survey methods is devoted to properly rating the different problems identified during the survey. This ranking system developed from an earlier survey that found 453 potential environmental problems along 96 miles of stream of the Swan Creek Watershed in Harford County. The most frequently reported problem during the survey was stream bank erosion, reported at 179 different locations (Yetman et. al., 1996). Follow-up surveys found that while stream bank erosion was a common problem throughout the watershed, the severity of the erosion problem varied substantially among the sites and that the erosion problems at many sites were minor in severity. Based on this experience and its goal of helping to prioritize restoration work, the SCA survey rates the severity, correctability, and access of each problem site.

While the ratings are subjective, they have proven to be very valuable in providing a starting point for more detailed follow-up evaluations. Once the SCA survey is completed, the collected data can be used by different resource professionals to help target future restoration efforts. A regional forester, for example, can use data collected on inadequate stream buffers to help plan future riparian buffer plantings, while the local fishery biologist can use the data on fish blockages to help target future fish passage projects. The inclusion of a rating system in the

survey gives resource professional an idea of which sites the field crew believed were the most severe, easiest to correct and easiest to access. This information combined with photographs of the site can help resource managers focus their own follow up evaluations and fieldwork at the most important sites.

A general description of the rating system is given below. More specific information on the criteria used to rate each problem category is provided in the *SCA – Survey Protocol*s (Yetman, 2000). It is important to note that the rating system is designed to contrast problems within a specific problem category and is not intended to be applied across categories. When assigning a severity rating to a site with an inadequate stream buffer for example, the rating is only intended to compare the site to others in the State with inadequate stream buffers. A trash dumping site with a severe rating may not necessarily be a more significant environmental problem than a stream bank erosion site that received a moderate severity rating.

The **severity** rating indicates how bad a specific problem is relative to others in the same problem category. It is often the most useful rating because it answers questions such as: where are the worst stream bank erosion sites in the watershed, or where is the largest section of stream with an inadequate buffer? The scoring is based on the overall impression of the survey team of the severity of the problem at the time of the survey, based on the established criteria for each problem category (Yetman, 2000).

* A very severe rating of 1 is used to identify problems that have a direct and wide reaching impact on the stream's aquatic resources. Within a specific problem category, a very severe rating indicates that the problem is among the worst that the field teams have seen or would expect to see. Examples include a discharge from a pipe that was discoloring the water over a long stream reach (greater than 1000 feet) or a long section of stream (greater than 1000 feet) with high raw vertical banks that are unstable and eroding at a rapid rate.

* A moderate severity rating of 3 identifies problems that have some adverse environmental impacts but the severity and/or length of affected stream is fairly limited. While a moderate severity rating would indicate that field crews did believe it was a significant problem, it also indicates that they have seen or would expect to see worse problems in the specific problem category. Examples include: a small fish blockage that is passable by strong swimming fish like trout, but a barrier to resident species such as sculpins or a site where several hundred feet of stream has an inadequate forest buffer.

* A minor severity rating of 5 identifies problems that do not have a significant impact on stream and aquatic resources. A minor rating indicates that a problem is present, but compared to other problems in the same category it is considered minor. One example of a site with a minor rating is an outfall pipe from a storm water management structure that is not discharging during dry weather and does not have an erosion problem at the outfall or immediately downstream. Another example is a section of stream with stable banks that has a partial forest buffer less than 50 feet wide along both banks.

The **correctability** rating provides a relative measure on how easily the field teams believe the problem can be corrected. The correctability rating can be helpful in determining which problems can be easily dealt with when developing a restoration plan for a drainage basin. One restoration strategy, for example, would initially target the most severe problems that are the easiest to fix. The correctability rating also can be useful in identifying simple projects that can be done by volunteers, as opposed to projects that require more significant planning and engineering efforts to complete.

* A minor correctability rating of 1 indicates problems that can be corrected quickly and easily using hand labor, with a minimal amount of planning. These types of projects would usually not need any Federal, State or local government permits. It is a job that small group of volunteers (10 people or less) could fix in a day or two without using heavy equipment. Examples include removing debris from a blocked culvert pipe, removing less than two pickup truck loads of trash from an easily accessible area or planting trees along a short stretch of stream.

* A moderate correctability rating of 3 indicates sites that may require a small piece of equipment, such as a backhoe, and some planning to correct the problem. This would not be the type of project that volunteers would usually do alone, although volunteers could assist in some aspects of the project, such as final landscaping. This type of project would usually require a week or more to complete. The project may require some local, State or Federal government notification or permits. However, environmental disturbance would be small and approval should be easy to obtain.

* A very difficult correctability rating of 5 indicates problems that would require a large expensive effort to correct. These projects would usually require heavy equipment, significant amount of funding ($100,000 or more), and construction could take a month or more. The amount of disturbance would be large and the project would need to obtain a variety of Federal, State and/or local permits. Examples include a potential restoration area where the stream has deeply incised several feet over a long distance (i.e., several thousand feet) or a fish blockage at a large dam.

The **accessibility** rating provides a relative measure of how difficult it is to reach a specific problem site. The rating is made at the site by the field survey team, using a survey map and field observations. While factors such as land ownership and surrounding land use can enter into the field judgments of accessibility, the rating assumes that access to the site could be obtained if requested from the property owner.

* A very easy accessibility rating of 1 indicates sites that are readily accessible both by car and on foot. Examples include a problem in an open area inside a public park where there is sufficient room to park safely near the site.

* A moderate accessibility rating of 3 indicates sites that are easily accessible by foot but not easily accessible by a vehicle. Examples would include a stream section that can be

reached by crossing a large field or a site that is accessible only by 4-wheel drive vehicles.

* A very difficult accessibility rating of 5 is assigned to sites that are difficult to reach both on foot and by a vehicle. To reach the site it would be necessary to hike at least a mile, and if equipment were needed to do the restoration work, an access road would need to be built through rough terrain. Examples include a site where there are no roads or trails nearby.

Data Analysis and Presentation

Following the completion of the survey, crews entered information from the field data sheets into a Microsoft Access database and verified the accuracy of the data. Field crews labeled and organized the 403 photographs taken during the survey by site number and placed them in binders. Members of the Department of Natural Resources' Watershed Services Unit then digitized the photographs using a flat bed scanner and placed the files on a compact disc. They then incorporated the data and photographs into the ArcGIS computer software to integrate all the collected problem information, provide an electronic record of problem locations by site number, and produce the maps presented in this report.

RESULTS

The Stream Corridor Assessment identified a total of 314 potential environmental problems, 115 pond sites and 25 representative sites. As of the time of the survey, the most frequently observed environmental concern in this portion of the watershed is pipe outfalls, reported at 123 sites. Other potential environmental problems recorded during the survey include: 56 erosion sites, 48 inadequately forested stream buffers, 36 tree blockages, 23 fish barrier, 9 exposed pipes, 7 channel alterations, 7 construction sites, 4 trash dumping sites and1 unusual condition.

Table 1 presents a summary of survey results and Appendices A and B lists the data collected during the survey. Appendix A provides a listing of information by site number and location, referenced by both X, Y Coordinate and by tributary name. When working with maps showing the location of problem sites, information in this format is useful to determine what problems are present along a specific stream reach. In Appendix B, the data is presented by problem type and it lists more detailed descriptive data about each problem. Presenting the data by problem type allows the reader to see which problems the field crews rated as most severe or easiest to fix within each category and gives other details about the problem or surrounding area.

Table 1. Summary of results from Deep Run\Patapsco River SCA Survey.

Potential Problems Identified	Number	Estimated Length	Very Severe	Severe	Moderate	Low Severity	Minor
Pipe Outfall	123		-	6	96	1	20
Erosion	56	25,212 ft (4.7 miles)	3	2	16	23	12
Inadequate Buffer	48	45,600 ft (8.6 miles)	4	7	13	15	9
Tree Blockages	36		3	-	12	-	21
Fish Barrier	23		-	1	4	4	14
Exposed Pipe	9	88 ft (0.016 miles)	-	-	5	1	3
Channel Alteration	7	2,580 feet (0.48 miles)	-	-	4	1	2
In or Near stream Construction	7		-	1	3	2	1
Trash Dumping	4		-	-	2	-	2
Unusual Condition	1		-	-	1	-	-
Total	**314**		**10**	**17**	**156**	**47**	**84**
Comments	**1**						
Pond Sites	**115**						
Representative Sites	**25**						

Table 2. Summary of results from Main Stem Patapsco River only.

Potential Problems Identified	Number	Estimated Length	Very Severe	Severe	Moderate	Low Severity	Minor
Pipe Outfall	2		-	-	1	-	1
Erosion	4	1,900 ft (0.36 miles)	-	-	3	-	1
Inadequate Buffer	2	2,200 ft (0.42 miles)	-	-	-	2	-
Tree Blockages			-	-	-	-	-
Fish Barrier	1		-	1	-	-	-
Exposed Pipe	1	50 ft (0.009 miles)	-	-	1	-	-
Channel Alteration	2	350 ft (0.067 miles)	-	-	-	-	2
In or Near stream Construction			-	-	-	-	-
Trash Dumping			-	-	-	-	-
Unusual Condition			-	-	-	-	-
Total	**12**		**0**	**1**	**5**	**2**	**4**
Comments							
Pond Sites							
Representative Sites	**5**						

Table 3: Summary of results by major stream segment

Stream Segment	Channel Alteration	Comments	Construction	Erosion	Exposed Pipes	Fish Barriers	Inadequate Buffers	Pipe Outfalls	Pond Sites	Representative Sites	Trash Dumping	Tree Blockages	Unusual Conditions	Total
Deep Run	4	1	7	50	8	17	42	107	114	15	3	32	1	401
Patapsco Main Stem	2			4	1	1	2	2		5				17
Unnamed Tributary 1						2	1	4			1			8
Unnamed Tributary 2	1			1		3	3	9	1	2		4		24

Pipe Outfalls

Pipe outfalls include any pipes or small, constructed channels that discharge into the stream through the stream corridor. Pipe outfalls are considered a potential environmental problem in the survey because they can carry uncontrolled runoff and pollutants such as oil, heavy metals and nutrients to a stream system. The survey crew identified a total of 123 pipe outfalls (Figure 4a). The locations of pipe outfalls are shown in Figures 4b-c.

Eighty-three percent or 102 of the 123, of outfall pipes observed during the survey released a discharge. Of these, ten had a discharge with some coloration or smell associated with it (Appendix B) at the time of the survey. Several sites were rated as severe (PR407101, PR417201, PR431207, PR439201). They all had an unusual coloration to them.

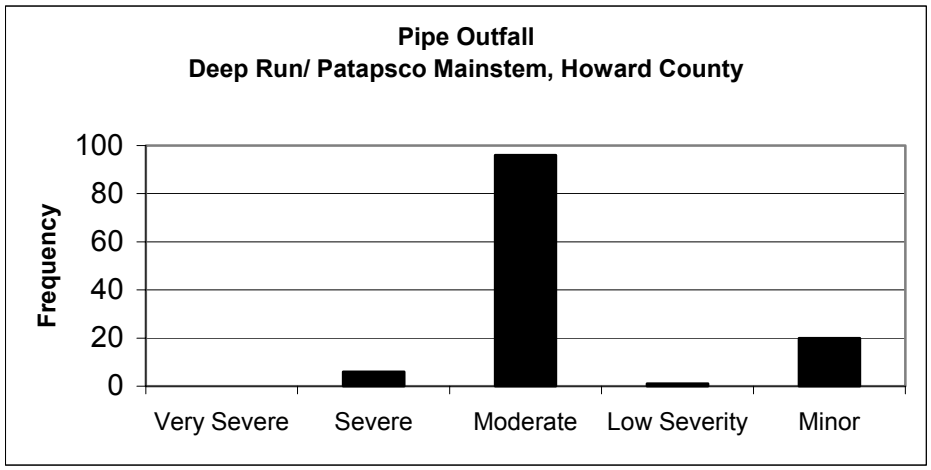


Figure 4a. Histograph showing the frequency of severity ratings given to pipe outfall sites during the Patapsco SCA survey in Howard County

Pipe Outfalls

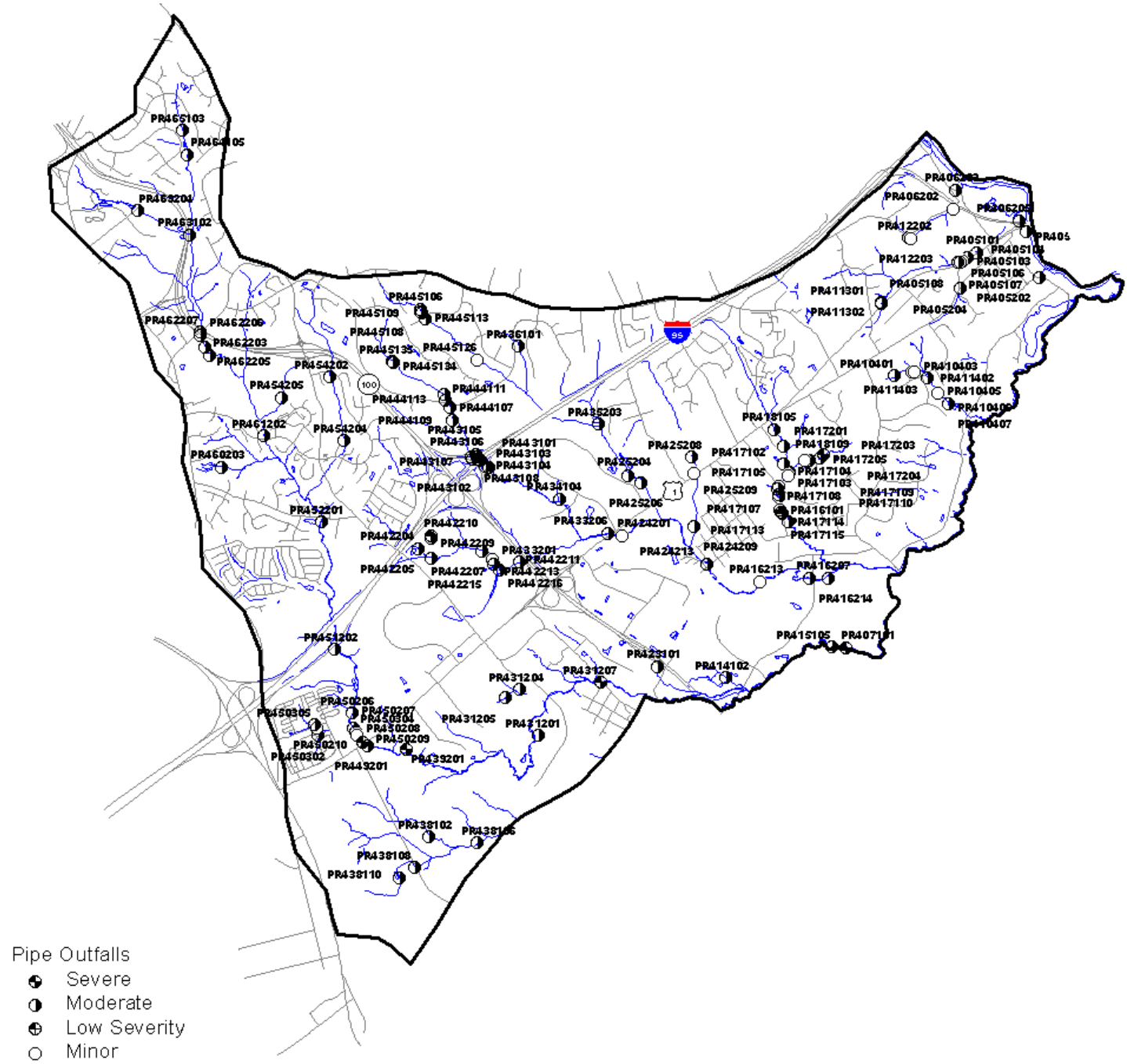


Figure 4b: Map showing the location of the Pipe Outfalls in Deep Run

Pipe Outfalls

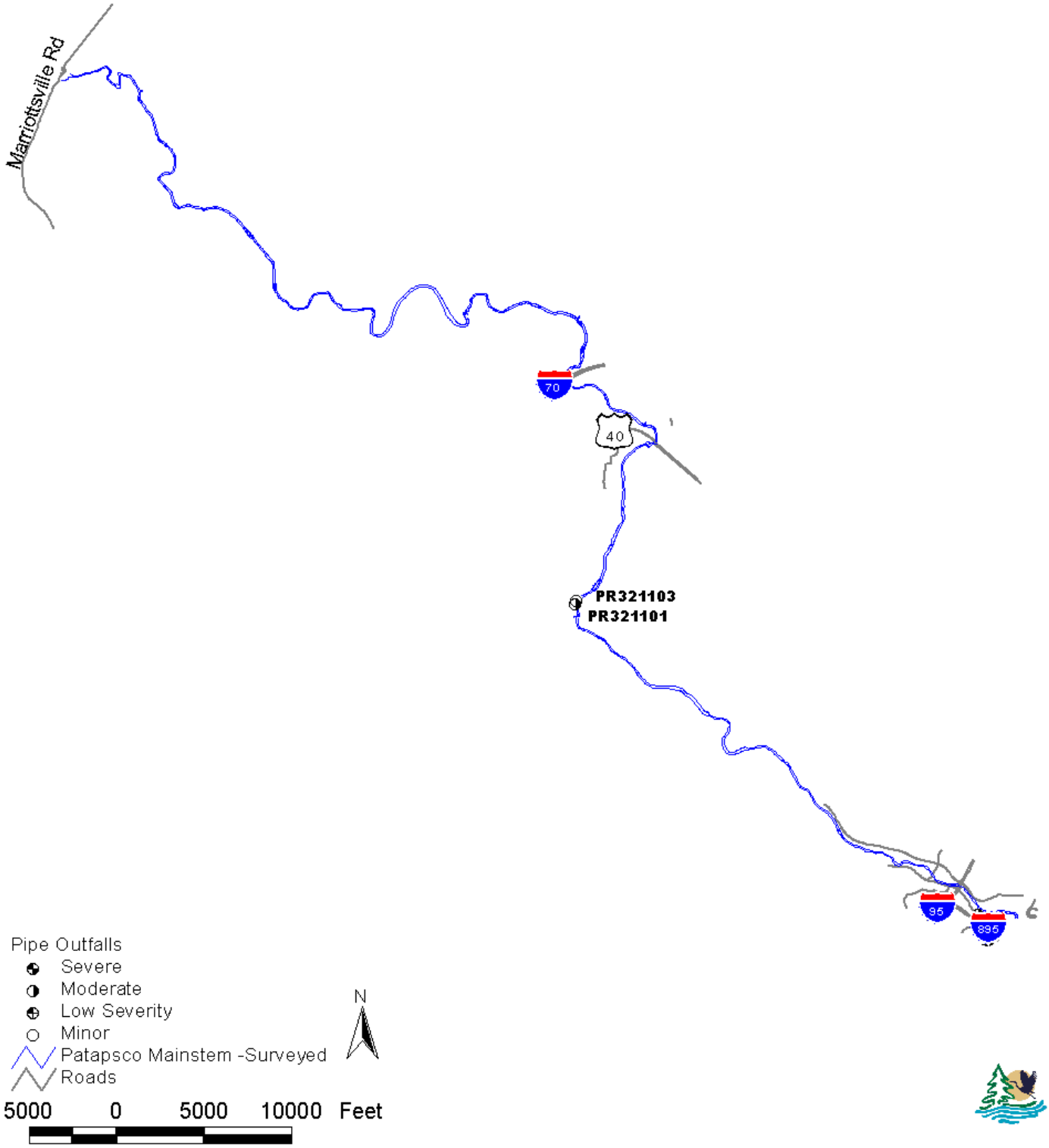


Figure 4c: Map showing the location of the Pipe Outfalls on the surveyed Patapsco Mainstem

Erosion Sites

Erosion is a natural process necessary to maintain good aquatic habitat. Too much erosion, however, can have the opposite effect on the stream by destabilizing stream banks, destroying in-stream habitat, and causing significant sediment pollution problems downstream. Erosion problems occur when either a stream's hydrology and/or sediment supply are significantly altered. This often occurs when land use in a watershed changes. For example, as a watershed becomes more urbanized, forest and agricultural fields are developed into residential housing complexes and commercial properties. As a result, the amount of impervious surface, or land area where rainwater cannot seep into the groundwater directly, increases in a drainage basin. This causes the amount of runoff entering a stream to increase. Over time, a stream channel will adjust to the greater rain-induced flows by eroding the streambed and banks to raise water-carrying capacity. This channel readjustment can extend over decades, during which time excessive amounts of sediment from unstable eroding stream banks can have very detrimental impacts on a stream's aquatic resources. In this survey, unstable eroding streams are defined as areas where the stream banks are almost vertical, and the vegetative roots along the stream are unable to hold the soil onto the banks.

This survey found 56 unstable eroding banks sites with a total length of approximately 4.7 miles of stream (Appendix B). Figure 5a shows the frequency of the severity rating given to erosion sites. Within this watershed, there were three very severe erosion sites (PR406204, PR417106, PR418111) and two severe sites (PR416205, PR444103). The majority of erosion sites were minor- to moderate-in severity. The lengths of stream segments with unstable banks varied from 20 feet to 3,300 feet of stream (Appendix B).

Twenty-one of these sites are within a 100 foot distance of an inadequate buffer. Tree plantings may help alleviate the erosion problem. However, in areas where streams are going through major readjustments, tree planting alone will not stop the erosion. Headcut erosion, for example, occurs when the streambed drops suddenly, indicating a continuous readjustment of the stream channel due to stream hydrology and/or sediment supply changes.

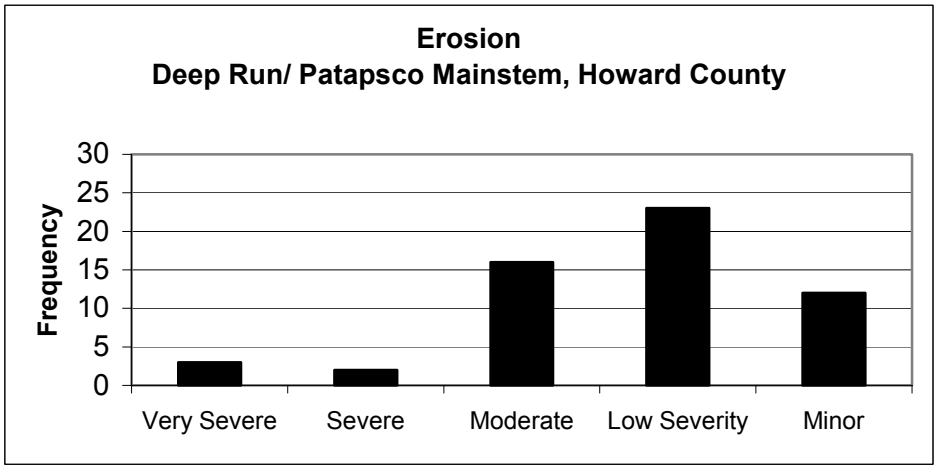


Figure 5a. Histograph showing the frequency of severity ratings given to erosion sites during the Patapsco SCA survey in Howard County.

Erosion Sites

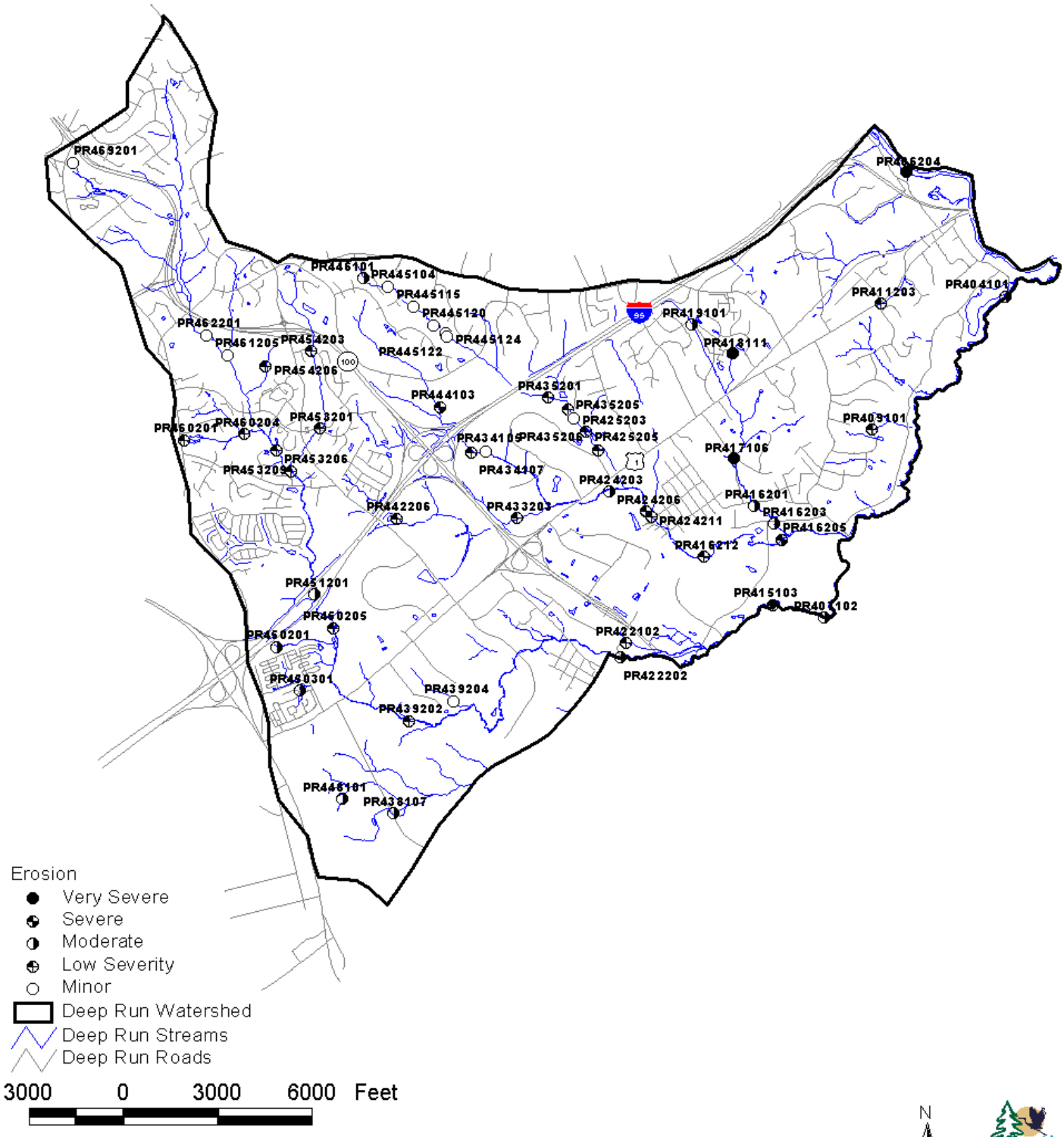


Figure 5b: Map showing the location of the Erosion Sites in Deep Run

Erosion Sites

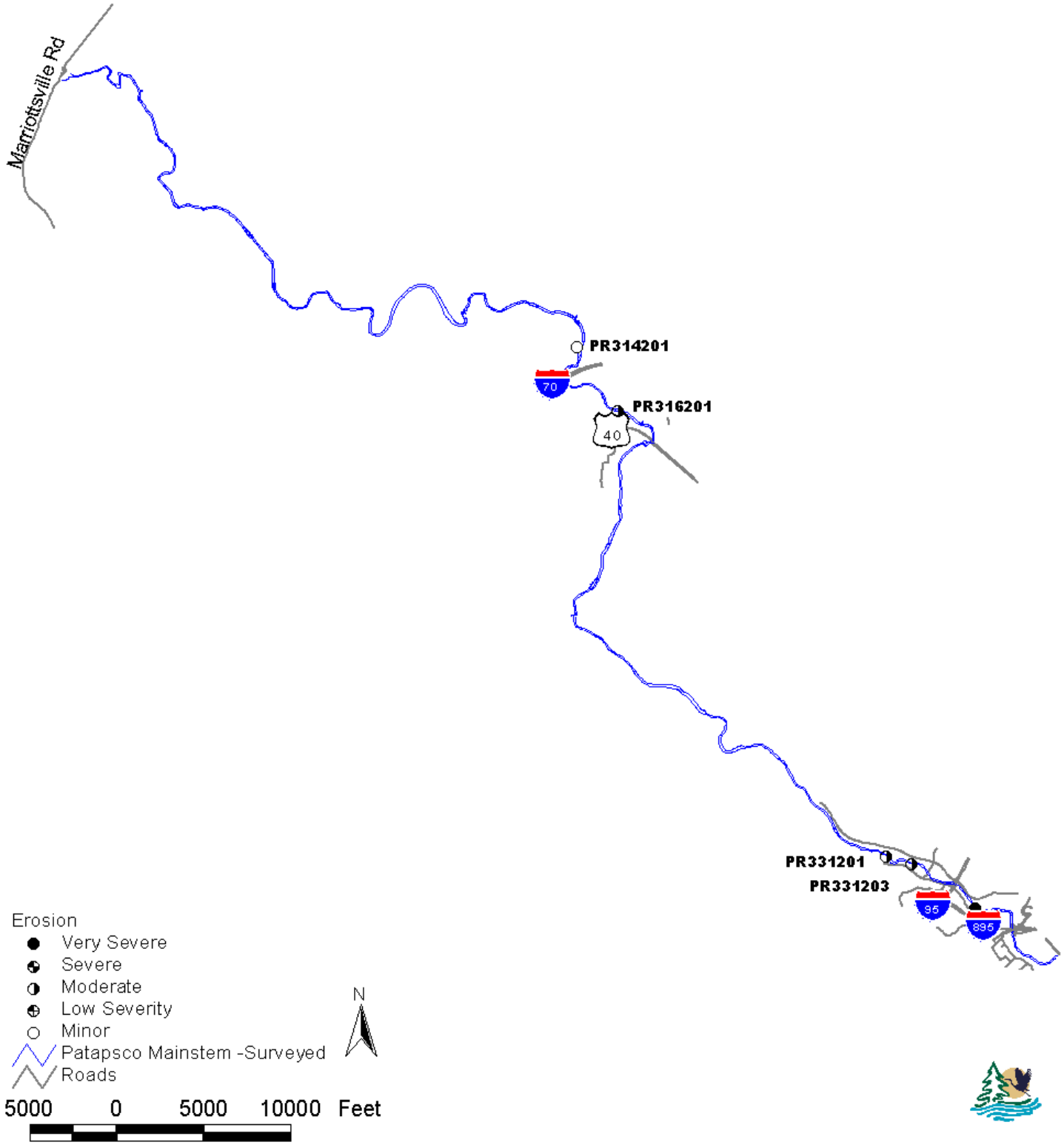


Figure 5c: Map showing the location of the Erosion Sites the surveyed Patapsco Mainstem

Inadequate Buffers

Forests are the historically occurring ecosystem around Howard County streams and are very important for maintaining stream health in Maryland. Forested buffer areas along streams play a crucial role in increasing water quality, stabilizing stream banks, trapping sediment, mitigating floods, and providing the required habitat for all types of stream life, including fish. Tree roots capture and remove pollutants and excess nutrients from shallow flowing water, and their structure helps prevent erosion and slow down water flow, reducing sediment load and the risk of flooding. Shading from the tree canopy provides the cooler water temperatures necessary for most stream life, especially cold-water species like trout. In smaller streams such as those surveyed, terrestrial plant material falling into the stream is the primary source of plant food for stream life (Illustration 1). Tree leaves provide seasonal, instant food for stream life, while fallen tree branches and trunks provide a more consistent, slow-release food source throughout the year. Tree roots and snags also provide necessary fish habitat. Maintaining healthy streams is important in reducing the nutrient and sediment loadings to the Chesapeake Bay. Therefore, Maryland is committed to recreating forest buffers along streams because they are essential to healthy stream function and habitat.

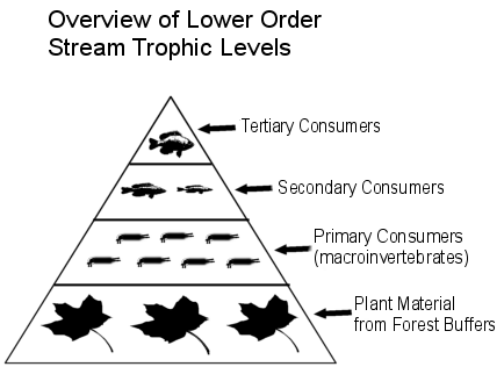


Illustration 1. Schematic diagram of stream trophic levels in lower order streams within historically forested regions.

While there is no single minimum standard for how wide a stream buffer should be in Maryland, for the purposes of this study a buffer is considered inadequate if it is less than 50 feet wide, measured from the edge of the stream. The survey crew identified 48 inadequate buffers sites (Figures 6b-c), and provided an estimate of the length of the inadequate stream buffer at all sites (Appendix B). Based on the collected data, there are approximately 45,600 feet (8.6 miles) of inadequate buffers.

There are four very severe and seven severe inadequate buffers sites in this watershed. Two of the four inadequate buffer sites rated as very severe are categorized as pasture. The very severe sites are (PR430201, PR435101, PR453102, PR438109). The combined length of the very severe sites is 7,500 feet. The severe sites are (PR411401, PR431206, PR433205, PR439203, PR442212, PR461201, PR464104). The combined length of the severe sites is 11,050 feet.

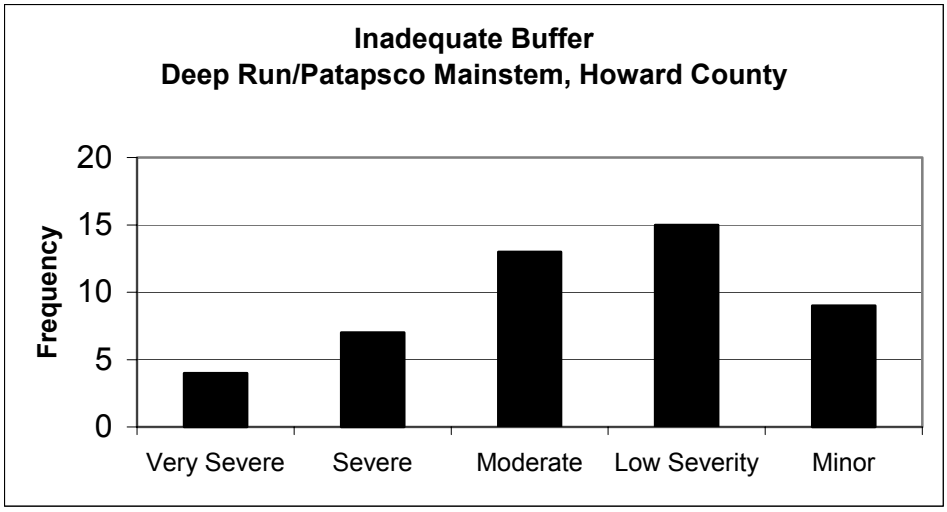


Figure 6a. Histograph showing the frequency of severity ratings given to inadequate buffers during the Patapsco SCA survey in Howard County.

Inadequate Buffers

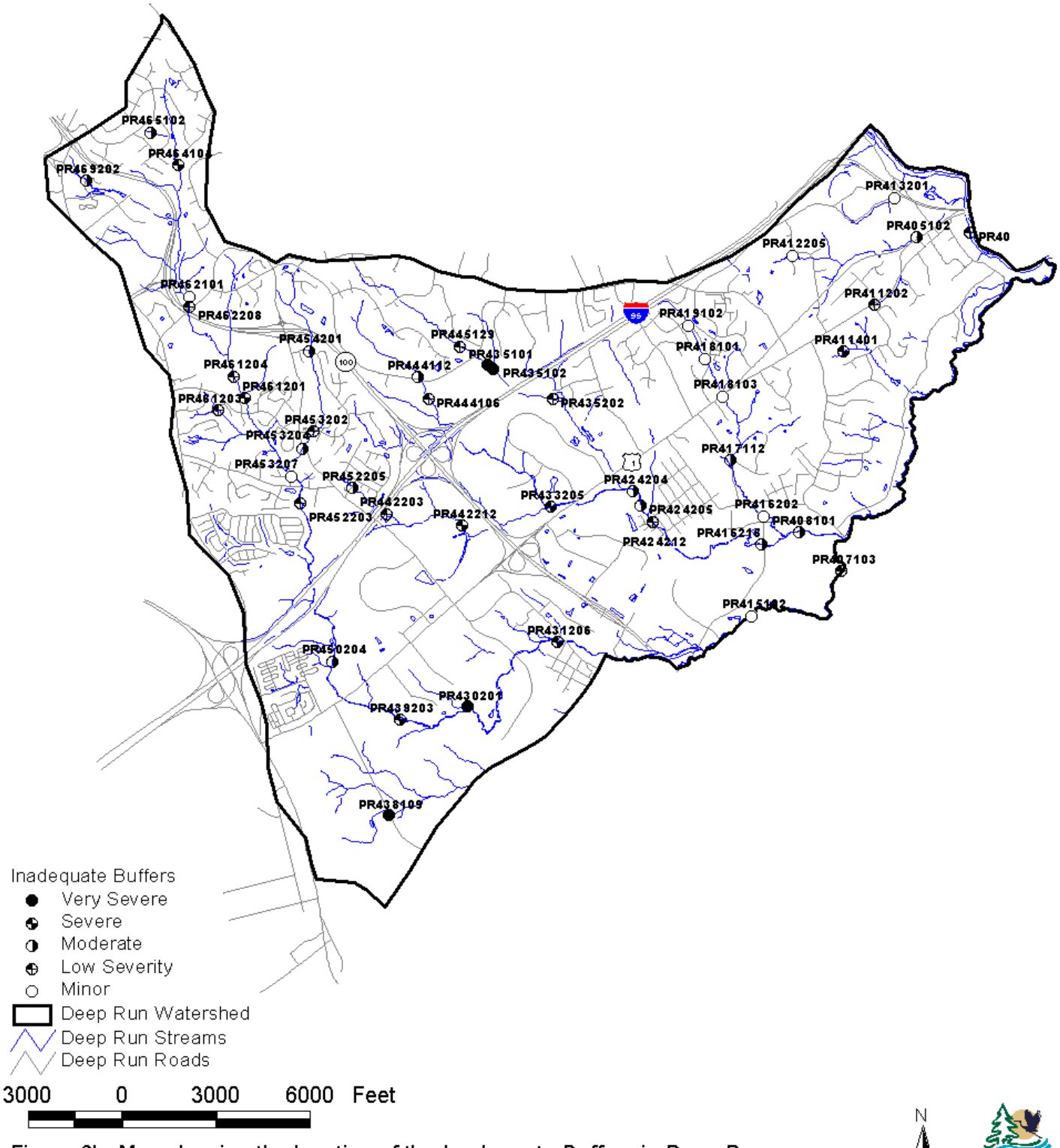


Figure 6b: Map showing the location of the Inadequate Buffers in Deep Run

Inadequate Buffers

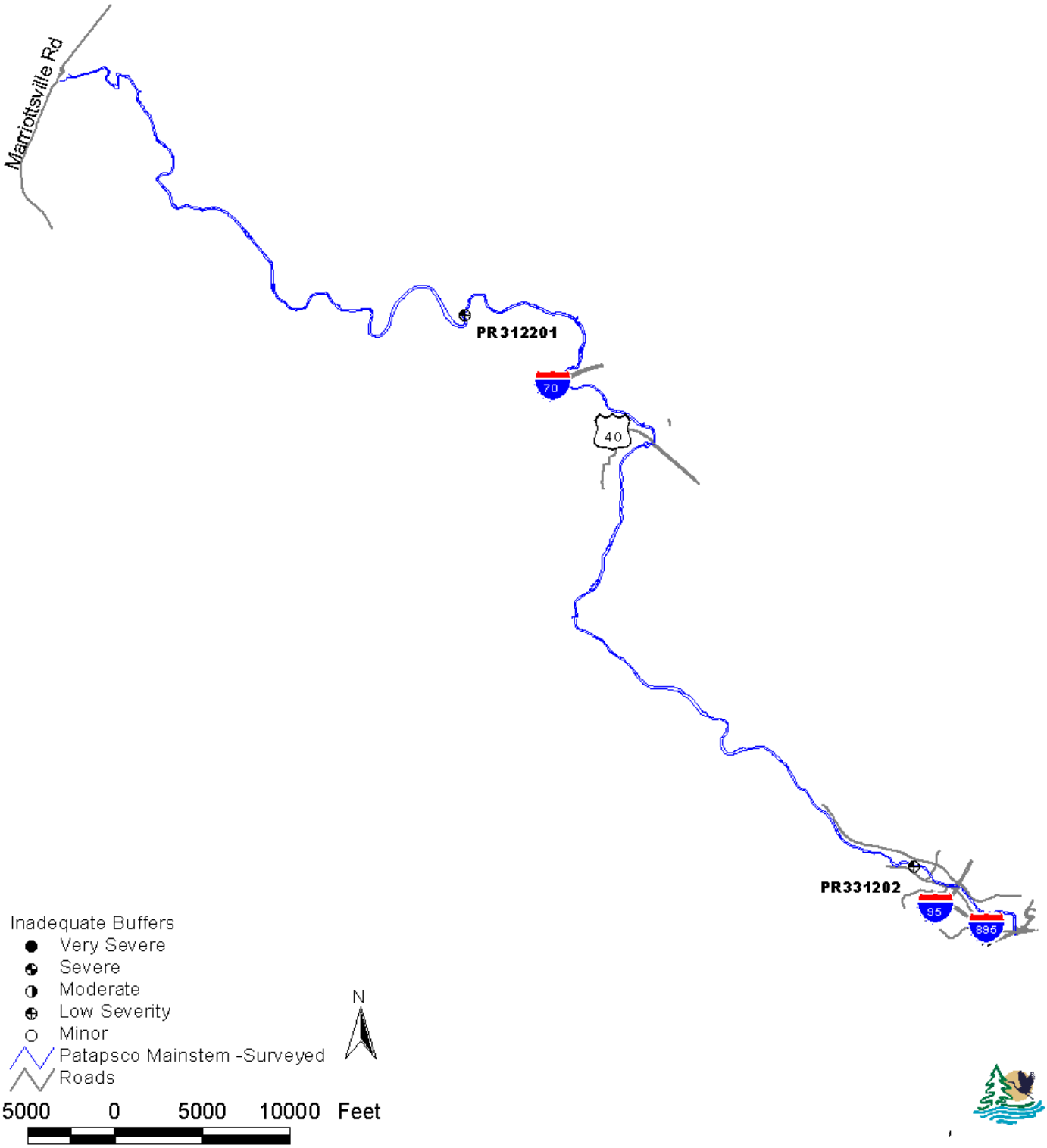


Figure 6c: Map showing the location of the Inadequate Buffers on the surveyed Patapsco Mainstem

Tree Blockages

At the request of Howard County, the Patapsco SCA survey recorded the locations of tree blockages within the stream. Fallen trees provide both a refuge for fish and other animals and a food supply for stream life. However, large blockages can also trap debris, creating a temporary dam and causing the flooding of adjacent land. In a high water event, a breach of a debris dam also could cause extensive damage downstream. If a blockage occurs at or near a road crossing, an increase in stream flow could overtop the road. Debris clogging of road culverts is one of the main causes of road failure during large rain events. The SCA survey recorded the proximity of tree blockages to road crossings, the amount of stream channel affected by the blockage, and the surrounding land use for each tree blockage observed (Appendix B). The severity rating for tree blockages, as either "severe," "moderate," or "minor," is based on the size of the blockage and the amount of debris present at the site.

The survey crew recorded 36 tree blockage sites. The locations of tree blockages are shown in Figure 7b. There are 12 sites with a severity rating of "moderate" and 21 sites rated as "minor." Twenty of the recorded blockages have had some impact on the stream bank or bed and are collecting some amount of debris (32 sites).

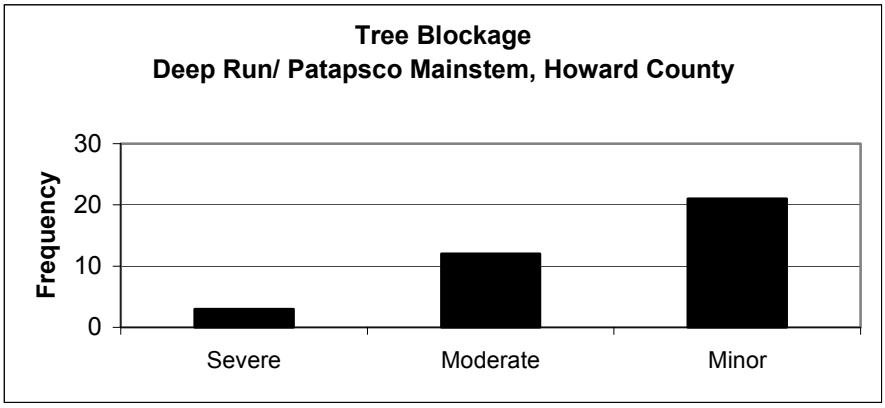


Figure 7a. Histograph showing the frequency of severity ratings given to tree blockage sites during the Patapsco SCA survey in Howard County.

Tree Blockages

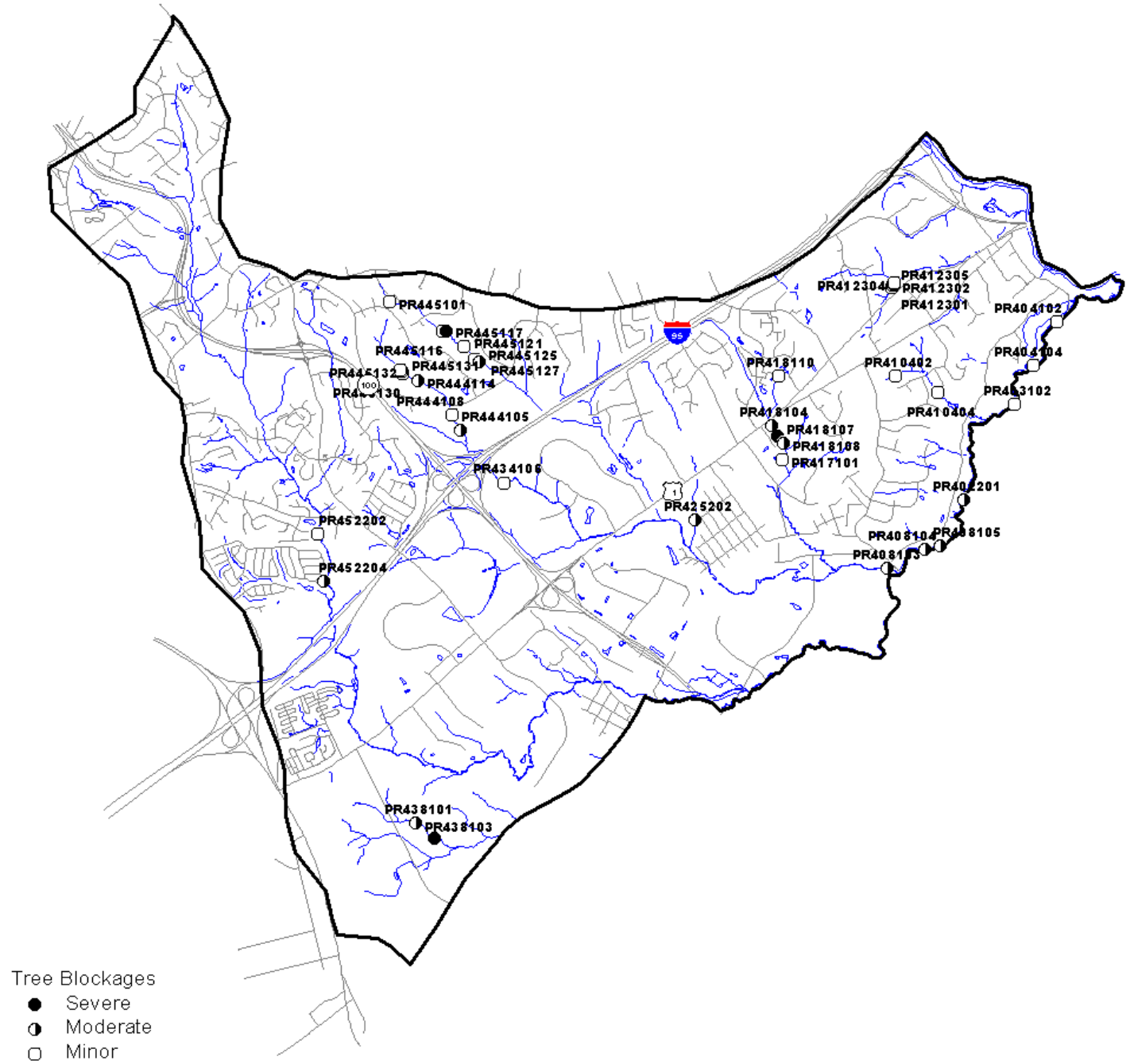


Figure 7b: Map showing the location of the Tree Blockages in Deep Run

Fish Migration Barriers

Fish migration barriers include anything in the stream that significantly interferes with the free, upstream movement of fish. Unimpeded fish passage is especially important for anadromous fish that live most of their lives in tidal waters but must migrate into non-tidal rivers and streams to spawn. Unobstructed upstream movement is also important for resident fish species, many of which also travel both up and down stream during different parts of their life cycle. In addition, without free fish passage, certain sections in a stream network become isolated from others. This becomes detrimental to species survival when a disturbance occurs in an isolated stretch of stream. A sediment discharge from a construction project, for example, or a sewage line break discharging into a small tributary can eliminate some or all of the fish species in an isolated stream stretch. With a fish blockage present, there is no avenue for fish to repopulate the inaccessible section. As a result, the disturbance will reduce diversity of the fish community in the area, and the remaining biological community may deviate from its natural balance and composition.

Fish blockages can be caused by man-made structures such as dams or road culverts and by natural features such as waterfalls or beaver dams. A structure becomes a blockage for fish if the stream water over or under it is too high, shallow, or fast. First, a vertical water drop such as a dam can be too high for fish to migrate over the obstacle. A vertical drop of 6 inches may cause a fish passage problem for some resident fish species, while anadromous fish can usually move through water drops of up to 1 foot, providing there is sufficient water flow and depth. Second, water too shallow for fish passage can occur in channelized stream sections or at road crossings, where the entire stream volume is spread over a large, flat area. Finally, a structure may be a fish blockage if the water is moving too fast through it for fish to swim through. This can occur at road crossings where the culvert pipe is placed at a steep angle, and the water moving through the pipe has a velocity higher than a fish's swimming ability.

In restoration work, priority is given to addressing fish barriers that will yield access to the greatest quality and quantity of upstream habitat per dollar spent. The mainstem is ideally kept as barrier-free as possible, allowing anadromous fish to migrate to spawn and a source of fish species for tributaries in the event of a disturbance. Restoration planning includes targeting barriers for removal that isolate entire tributaries, those that isolate significant portions of the upper tributary, and those that isolate quality fish habitat.

The Patapsco SCA survey observed 23 fish migration barriers. The locations of fish blockages are shown in Figure 8b-c. The fish barriers are due to natural falls (5), road crossings (7), channelized stream sections (2), debris dams (5), Beaver dams (1), pipe crossings (1), and constructed dams (2). The majority of fish migration barriers are moderate to minor in severity, with one severe site recorded (Figure 8a). This site (PR317101) was located on the main stem approximately 600 feet below Route 40.

Several species of fish are reported downstream of the SCA survey area in Patapsco River tributaries. Coyne, et. al. (2002) conducted fish species surveys from 2001-2002 in the Patapsco River south of the Bloede Dam (located between Bonnie and Rockburn Branches). This study found 24 species of fish in Deep, Herbert, and Stony Runs and Sawmill Creek;

migratory fish present included white perch, alewife, blueback herring, sea lamprey, and American eel. The second year of sampling found river herring in all tributaries, with the exception of blueback herring in Herbert Run. Alewife dominated the migratory fish found, and Deep Run had the greatest amount of migratory fish within the tributaries sampled. This previous study also located and rated the severity and correctability of fish migration barriers within the sampling area.

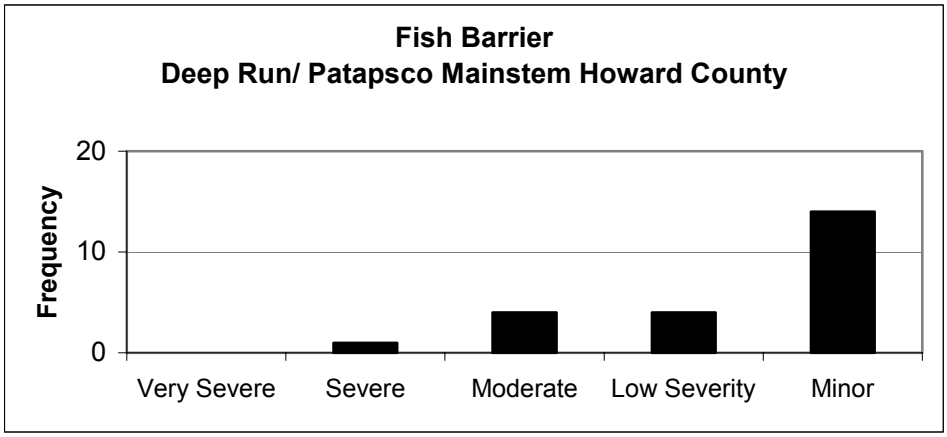


Figure 8a. Histograph showing the frequency of severity ratings given to fish migration barrier sites during the Patapsco SCA survey in Howard County.

Fish Barriers

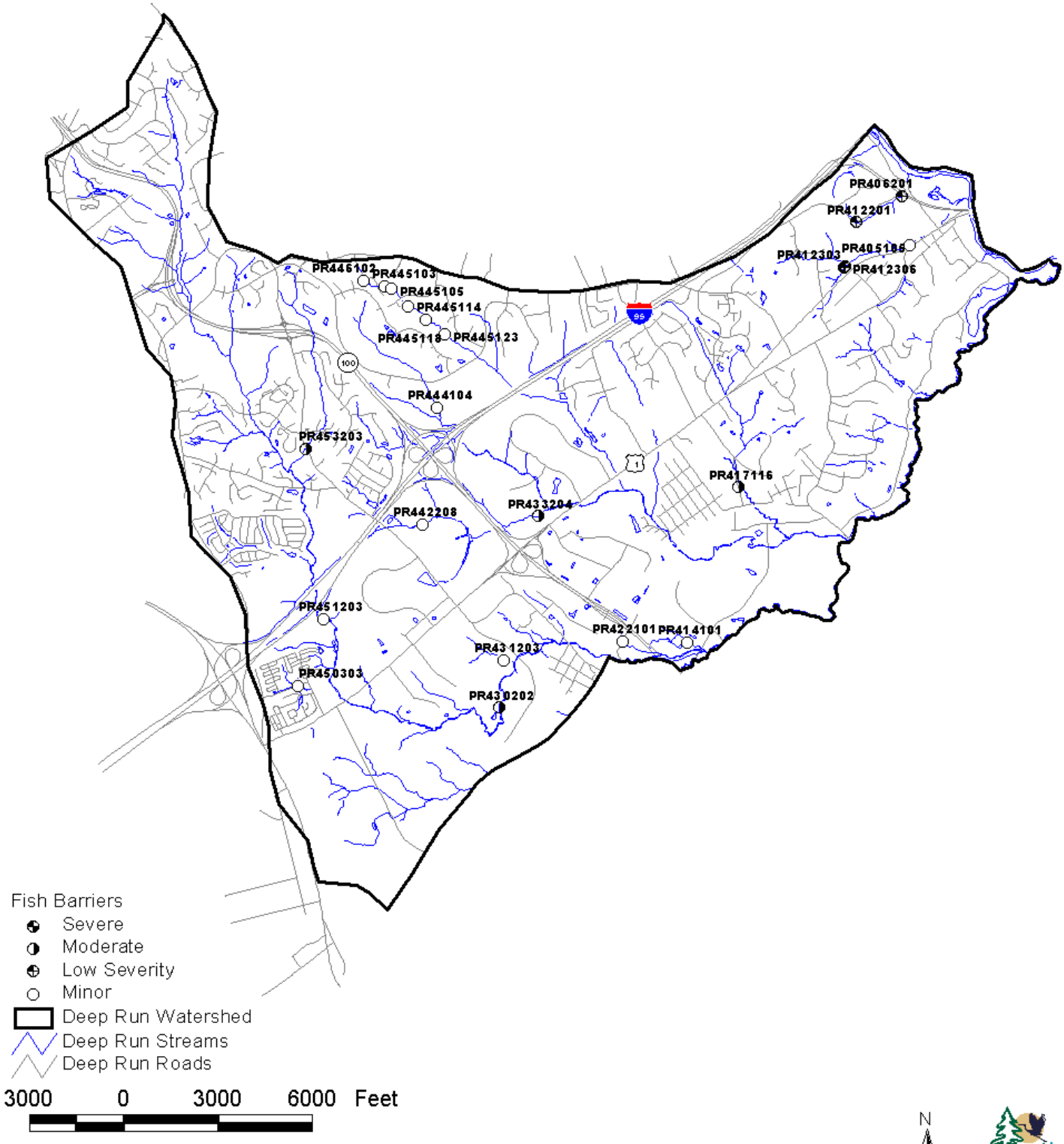


Figure 8b: Map showing the location of the Fish Barriers in Deep Run

Fish Barriers

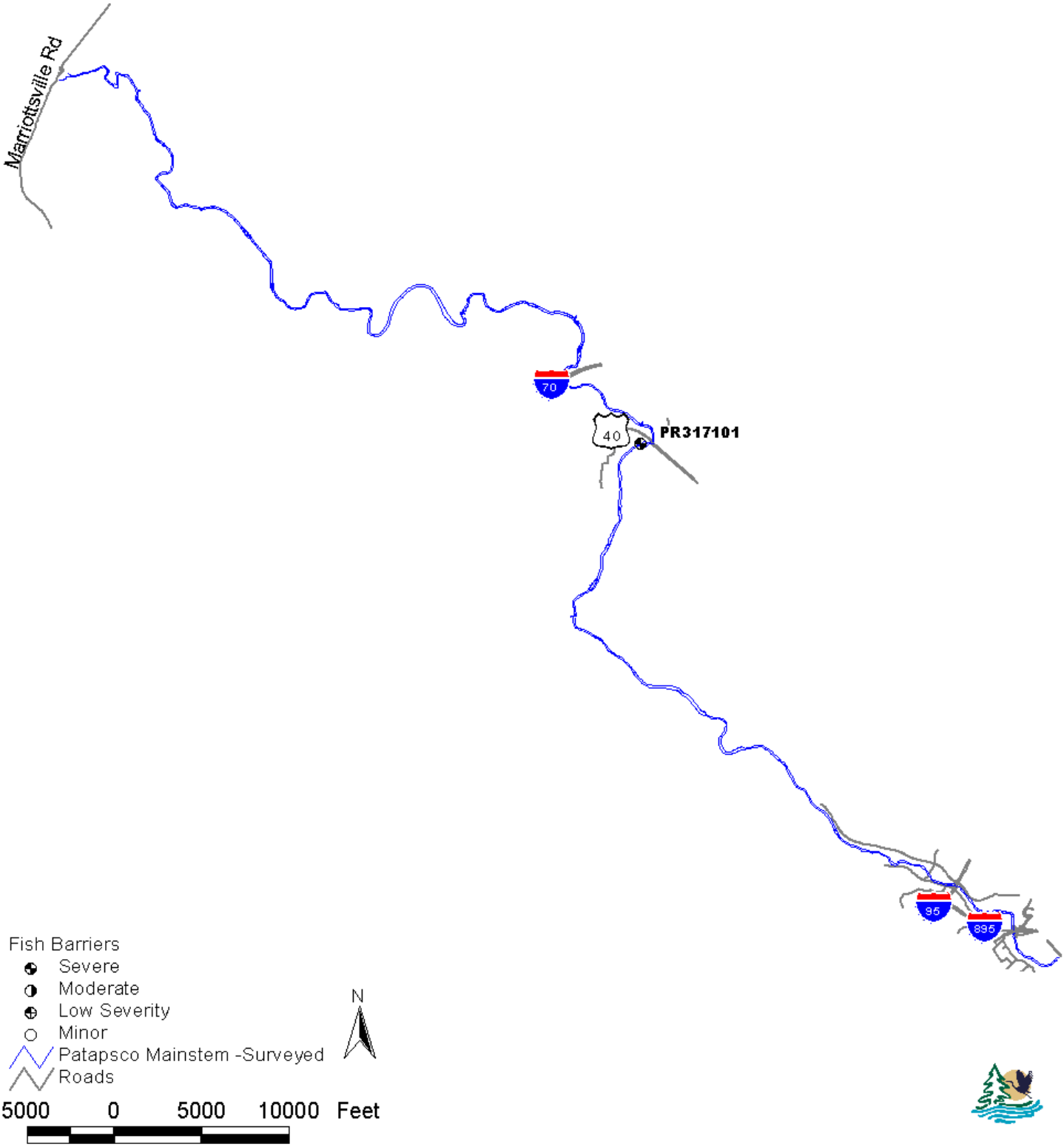


Figure 8c: Map showing the location of the Fish Barriers on the surveyed Patapsco Mainstem

Exposed Pipes

Any pipes that are in the stream or along the stream's immediate banks that could be damaged by a high flow event are recorded as exposed pipes in the SCA survey. Exposed pipes include: 1) manhole stacks in or along the edge of the stream channel, 2) pipes that are exposed along the stream banks, 3) pipes that run under the stream bed and were exposed by stream down-cutting, and 4) pipes built over a stream that are low enough to be affected by frequent high storm flows. Exposed pipes do not include pipe outfalls, where only the open end of the pipe is exposed to the stream bed.

In urban areas, it is very common for pipelines and other utilities to be placed in the stream corridor. This is especially true for gravity sewage lines, which depend on the continuous downward slope of the pipeline to move sewage to a pumping station or treatment plant. Since streams flow through the lowest points of the local landscape, engineers often build sewage lines paralleling streams to collect sewage from adjacent neighborhoods. While the pipelines are stationary, streams migrate to different areas within the floodplain. Over time, this variance in stream location can expose previously buried pipelines, making them vulnerable to puncture by debris in the stream. Fluids in the pipelines can be discharged into the stream, causing a serious water quality problem.

Field crews observed nine exposed pipes during the survey, all moderate to minor in severity (Figure 9a). Locations of these sites are shown in Figures 9a-b. Four pipes were recorded as being sewage. The remaining exposed pipes are recorded as unknown in purpose.

Survey crews did not observe any exposed pipes releasing a discharge at the time of the survey. There also were no signs that the stream may undermine or break any of the pipes in the near future. Therefore, all the sites have a moderate to minor severity rating. Photographs of the exposed pipes observed can be reviewed by public works officials and follow-up visits made to the sites based on their evaluations.

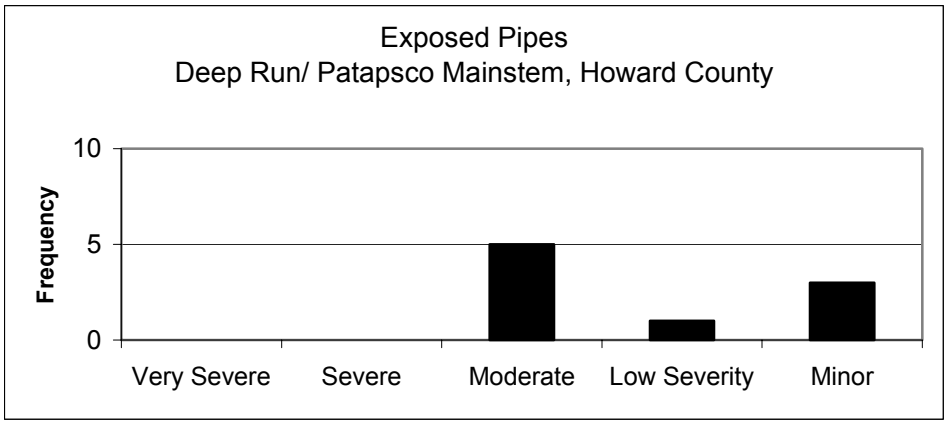


Figure 9a. Histograph showing the frequency of severity ratings given to exposed pipe sites during the Patapsco SCA survey in Howard County.

Exposed Pipes

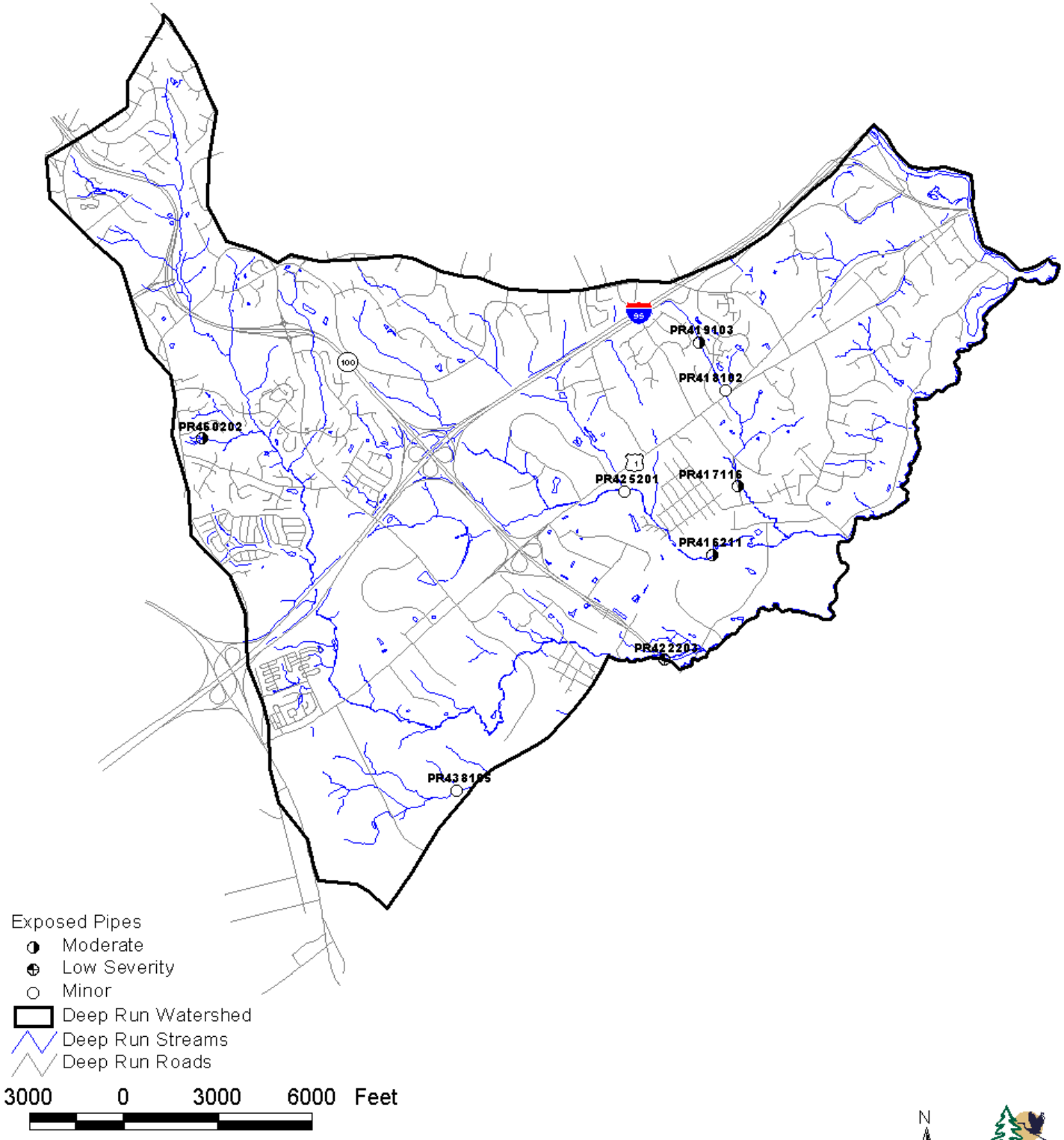


Figure 9b: Map showing the location of the Exposed Pipes in Deep Run

Exposed Pipes

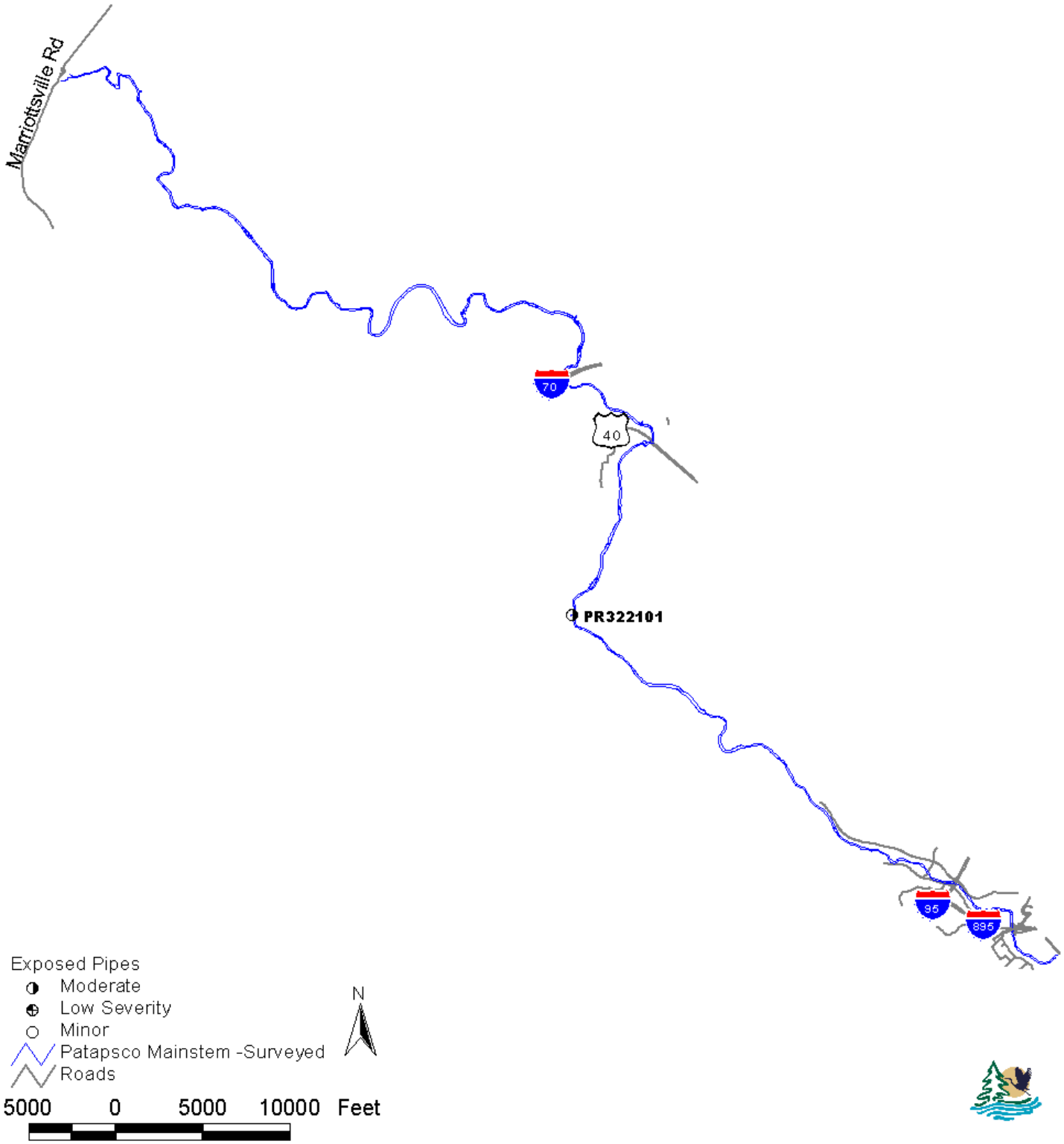


Figure 9c: Map showing the location of the Exposed Pipe on the surveyed Patapsco Mainstem

Channel Alterations

Channel alterations are sections where the stream's banks or channel are significantly altered from their naturally occurring structure or condition. These channelized streams are straightened and/or the banks hardened using rock, gabion baskets or concrete over a significant length of stream (usually 100 feet or more). Most frequently, channels are altered to decrease the likelihood of flooding by increasing the stream velocity through an area, making stream channelization more common near development or roadways.

For the purposes of this survey, there are two types of channel alternations *not* recorded. The first are tributaries where the entire stream branch is piped underground and storm drains replace the stream channel. While these stream sections are significantly altered, it is not possible to know precisely where this was done by walking the stream corridor. Secondly, crews do not specifically record road crossings unless a significant portion of the stream above or below the road is channelized.

Results of this survey show recognizably altered stream channels at seven sites. The severity and location of channel alterations are shown in Figure 10b-c. The total length of stream affected by channelization is estimated to be 2,580 feet (0.48 miles).

The channel alteration in this watershed is most often over a short stretch and constructed of a variety of materials, from concrete to earth channels. All of sites are rated as moderate to minor in severity (Figure 10a). These channel alterations are a made of earth channels, gabion baskets, rip-rap, and concrete.

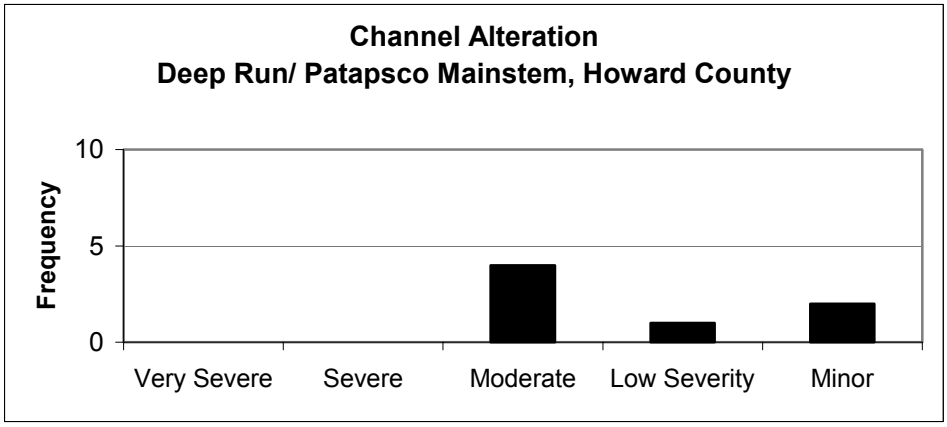


Figure 10a. Histograph showing the frequency of severity ratings given to channel alteration sites during the Patapsco SCA survey in Howard County.

Channel Alteration

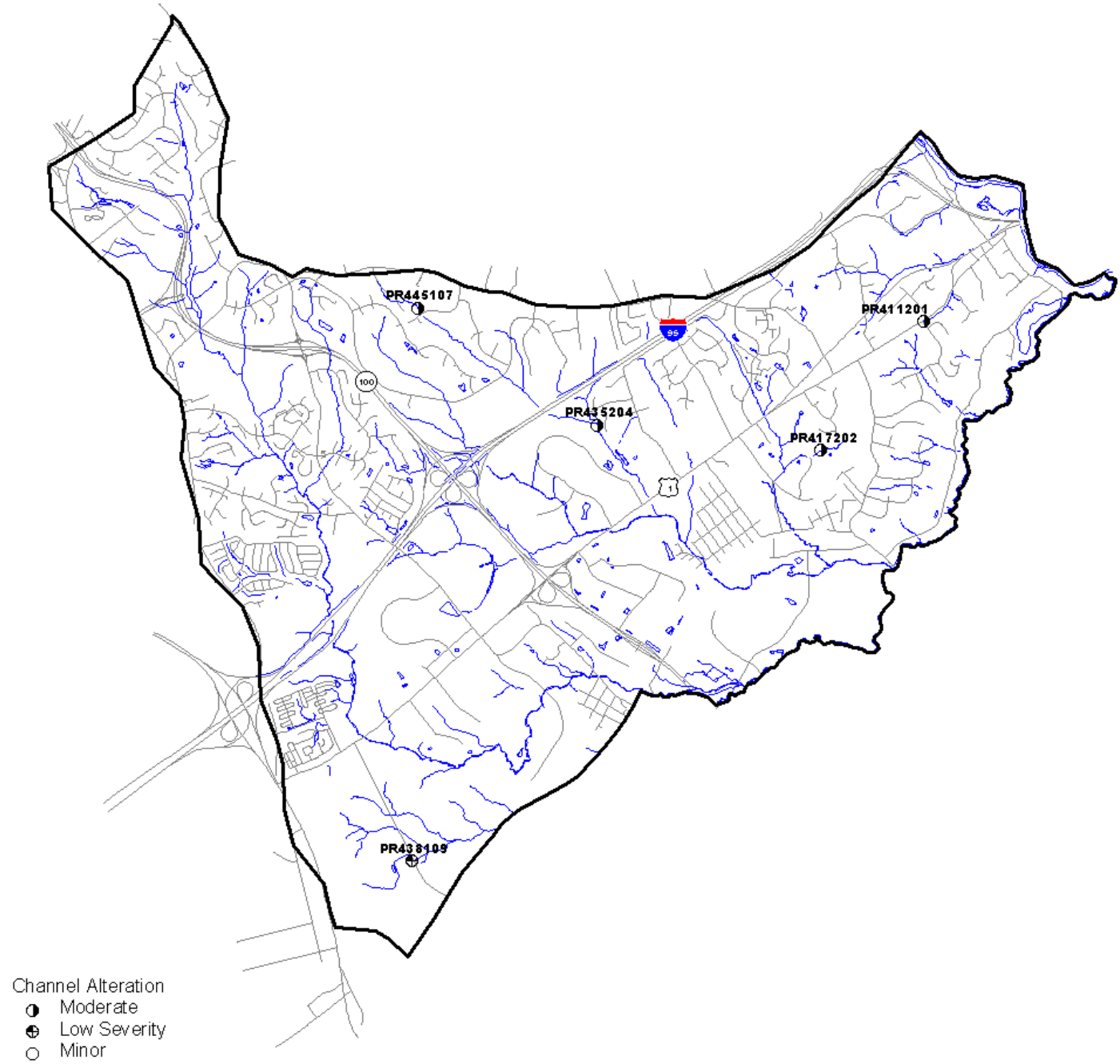


Figure 10b: Map showing the location of the Channel Alterations in Deep Run

Channel Alteration

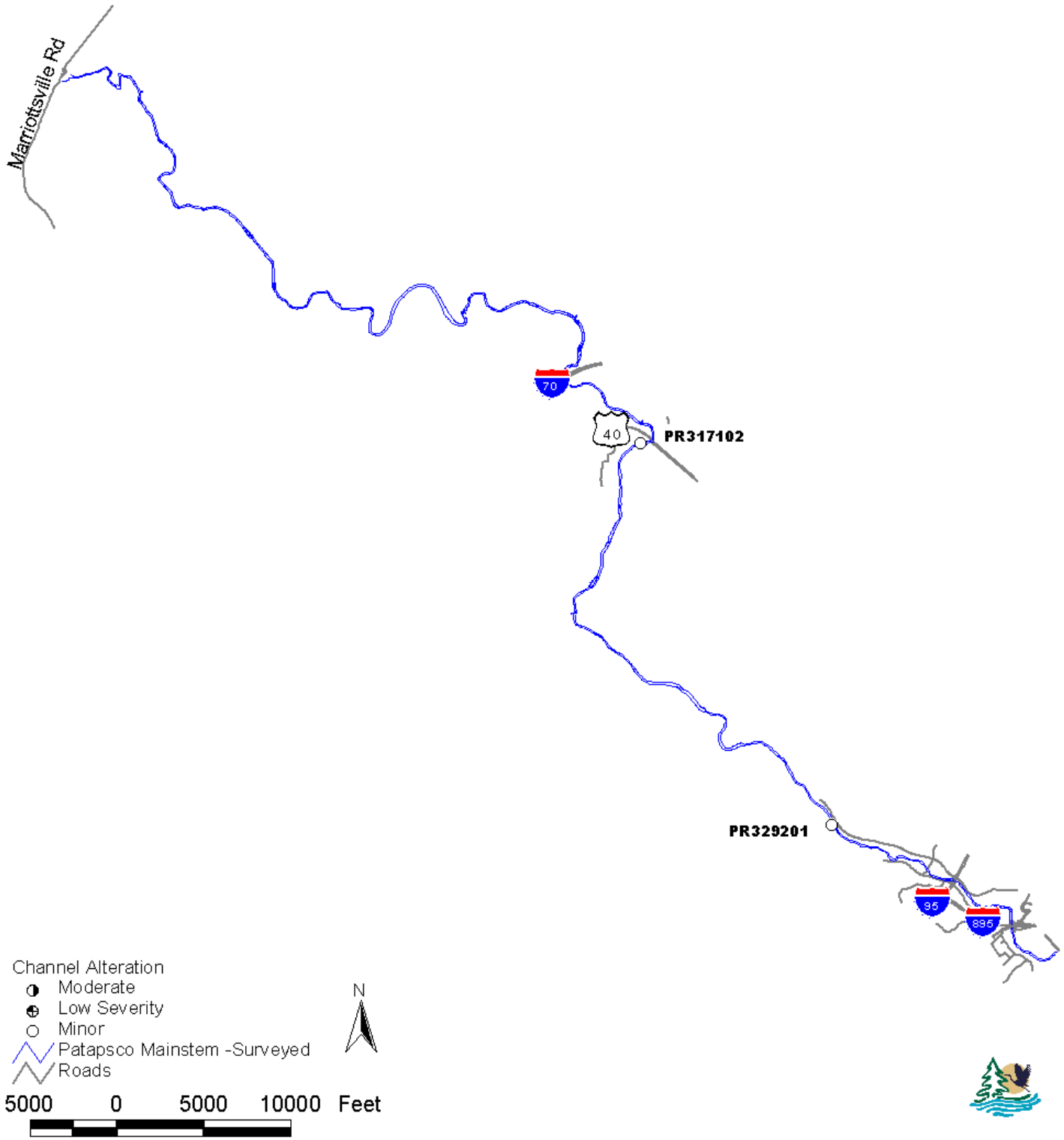


Figure 10c: Map showing the location of the Channel Alterations on the surveyed Patapsco Mainstem

In/Near Stream Construction Sites

In or near stream construction projects cause major disturbances inside or near the stream corridor at the time of the survey, field teams note their location and record any effect on the stream corridor. Survey teams report evidence of inadequate sediment control measures and any sediment pollution from the site affecting the stream. Locations of in- or near-stream construction sites are shown in Figure 11b.

Seven construction sites affected a nearby stream during the time of the survey. Types of construction included: residential construction (2), a golf course (1), road crossings (2), industrial construction (1) and an unknown (1). All but one site was rated as moderate to minor in severity (Figure 11a).

The one site rated as severe, PR445128, was depositing much sediment into the tributary. No silt fence was present.

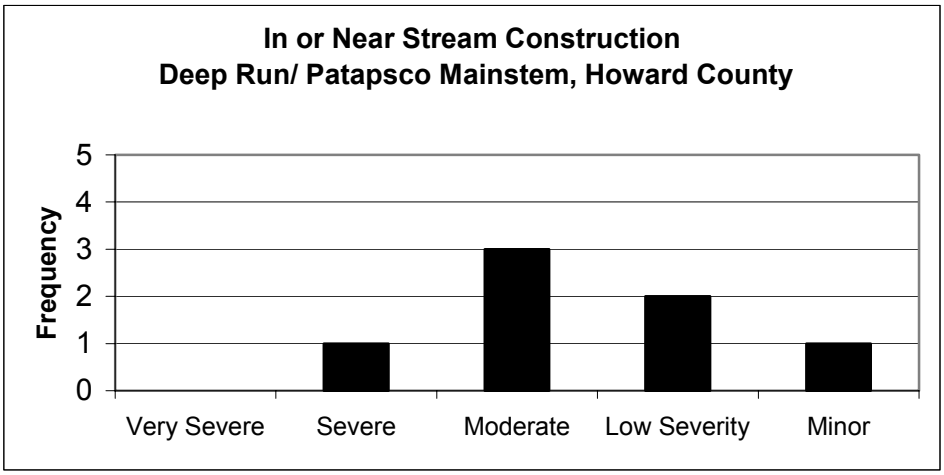


Figure 11a. Histograph showing the frequency of severity ratings given to in or near stream construction sites during the Patapsco SCA survey in Howard County.

Construction Sites

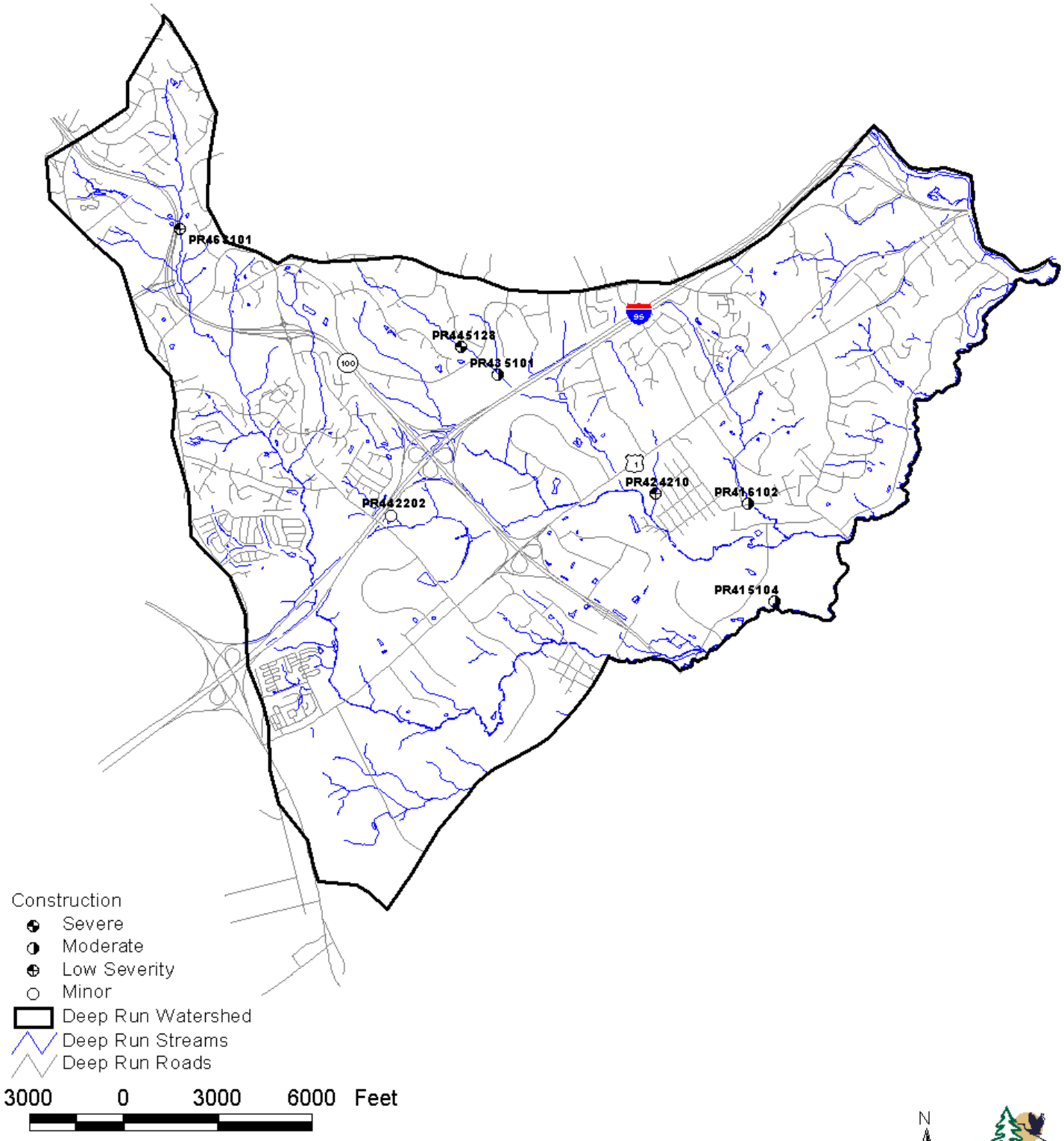


Figure 11b: Map showing the location of the Construction Sites in Deep Run

Trash Dumping Sites

Trash dumping sites are places where large amounts of trash are inside the stream corridor, either as a site of deliberate dumping or as a place where trash tends to accumulate (often a result of storm drainage). The field survey crew found four trash dumping sites; locations are listed in Figure 12.

The types of trash sites present during the survey were all residential waste. All the sites were moderate to minor. Three of the four sites could be considered for volunteer clean-up projects within the county (Appendix B).

Trash Dumping

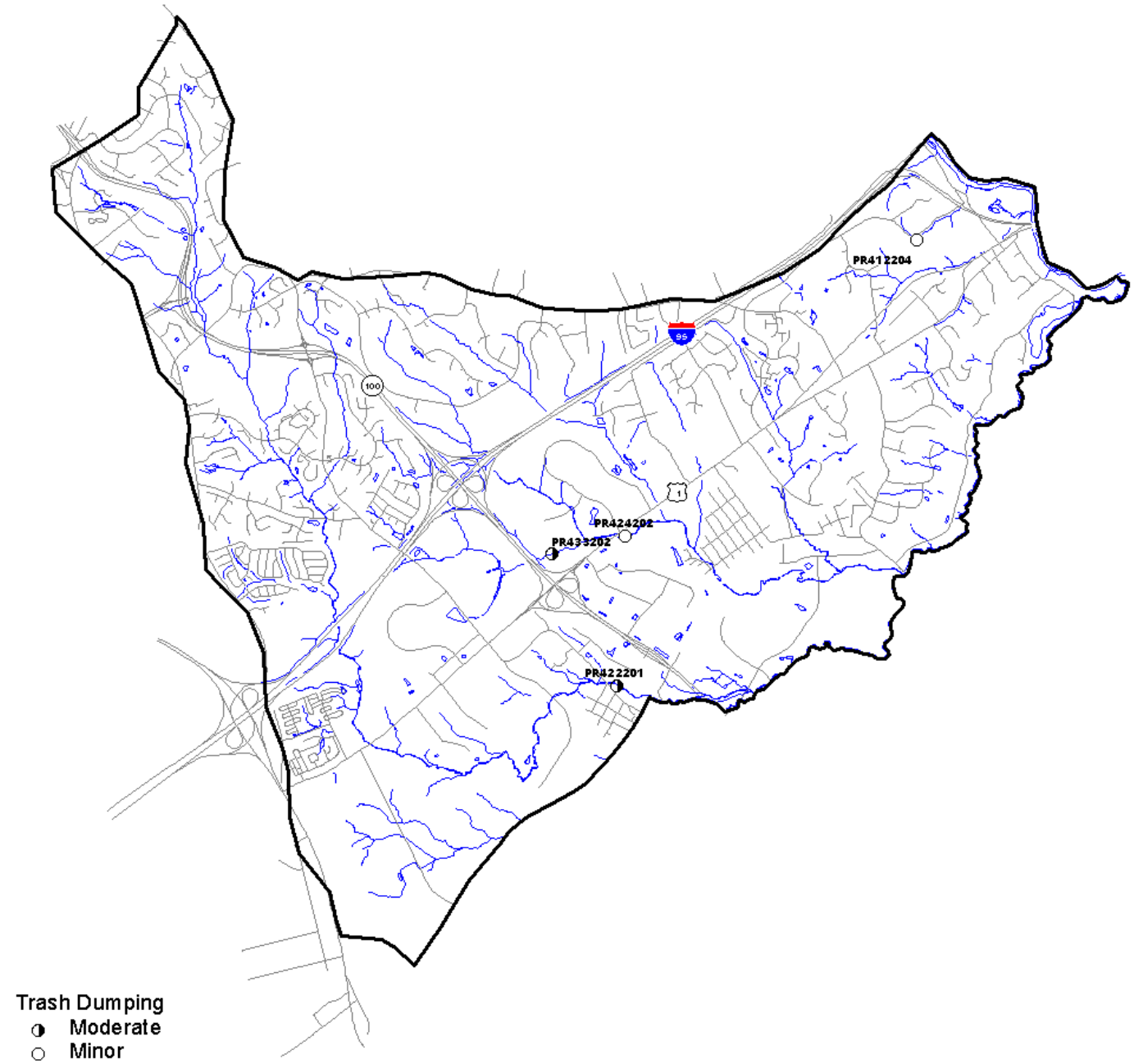


Figure 12 : Map showing the location of the Trash Dumpings in Deep Run

Unusual Conditions

Survey teams record unusual conditions or comments to note the location of anything out of the ordinary observed during the survey or to provide additional written comments on a specific problem site. The survey crew identified one unusual condition site during the survey (Figure 13). It was moderate in severity. There were concrete road barriers in stream. They could have been placed for bank protection but they are now located in the middle of the stream.

Unusual Conditions

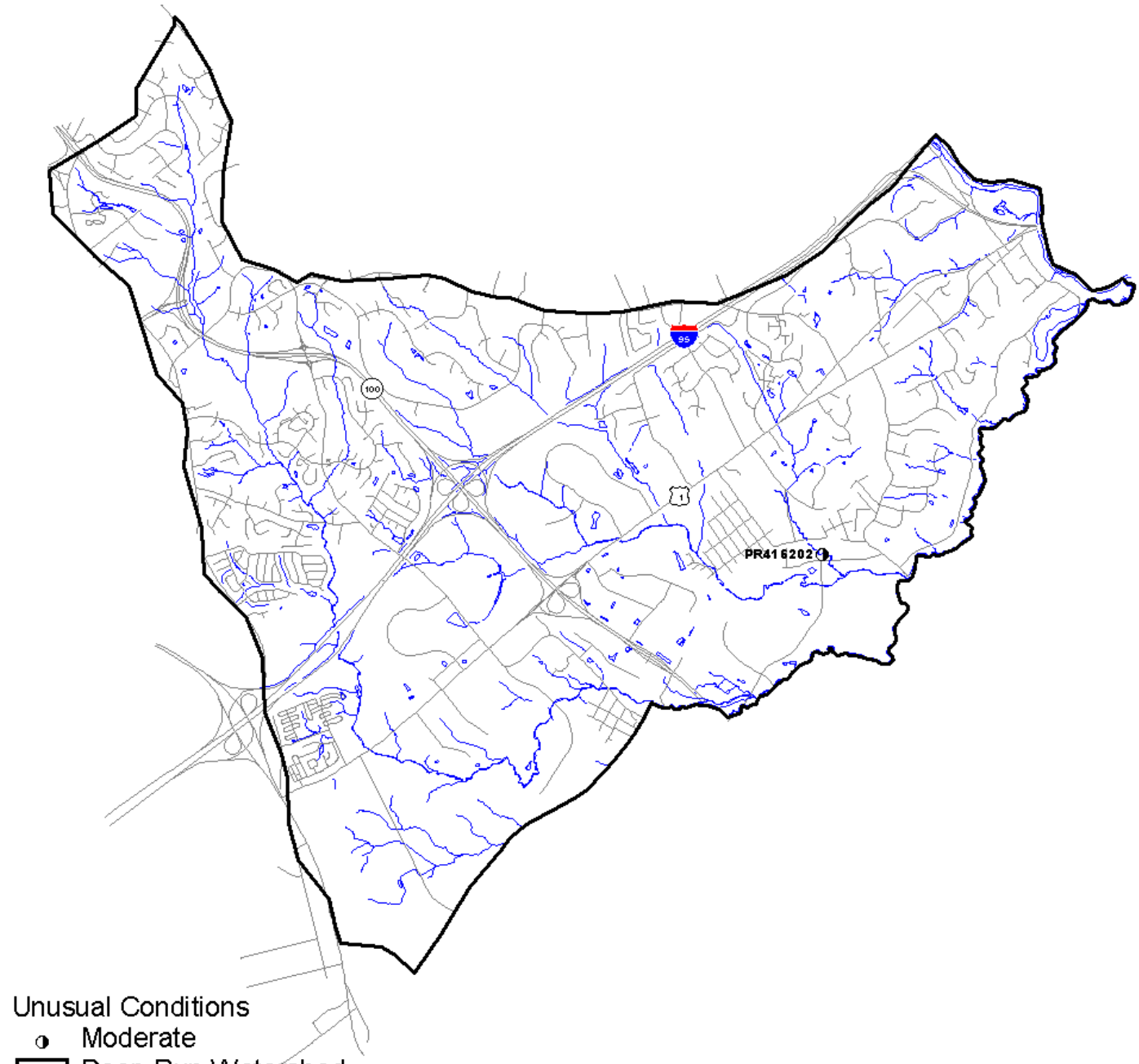


Figure 13 : Map showing the location of the Unusal Conditions in Deep Run

Pond Sites

Survey teams looked for any signs of eutrophic conditions and evidence of routine maintenance on the embankment. The teams investigated whether the embankment is regularly mowed to prevent the growth of large trees, as tree roots create weak spots that could lead to a possible breach. Crews also documented any large trees or animal burrows present on the embankment

One hundred and fifteen pond sites are recorded from this survey, and their locations are shown in Figures 14b. The majority of the watershed's ponds (90) are stormwater ponds (Figure 14a). Of these, seven are recorded as not maintained or abandoned (Appendix B).

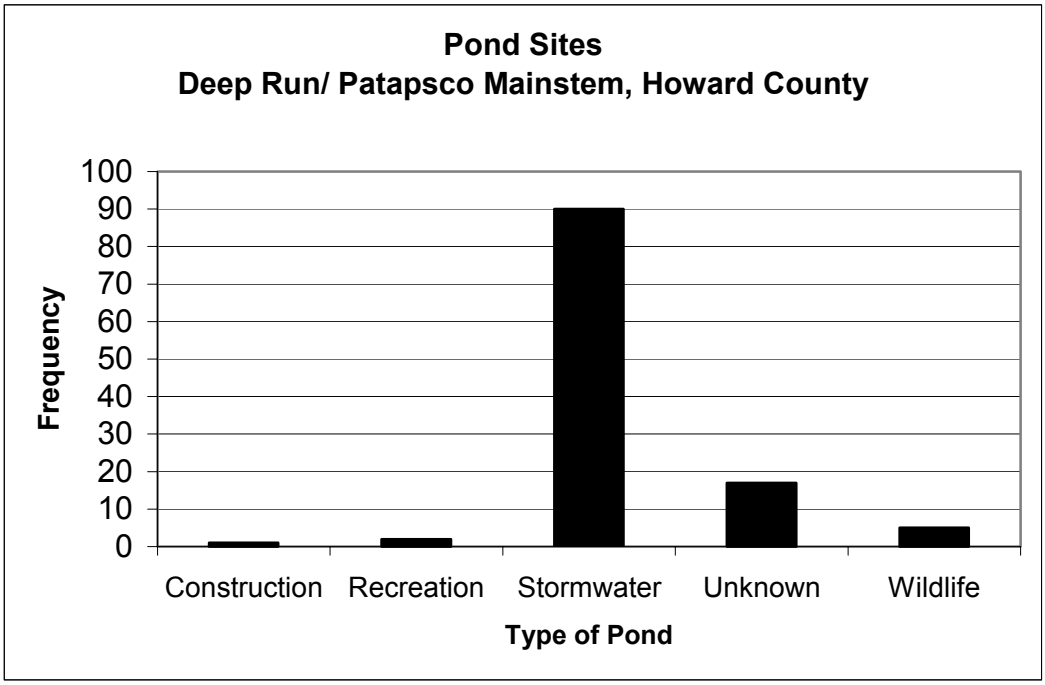


Figure 14a. Histograph showing the number of pond types given to pond sites during the Patapsco SCA survey in Howard County

Pond Sites

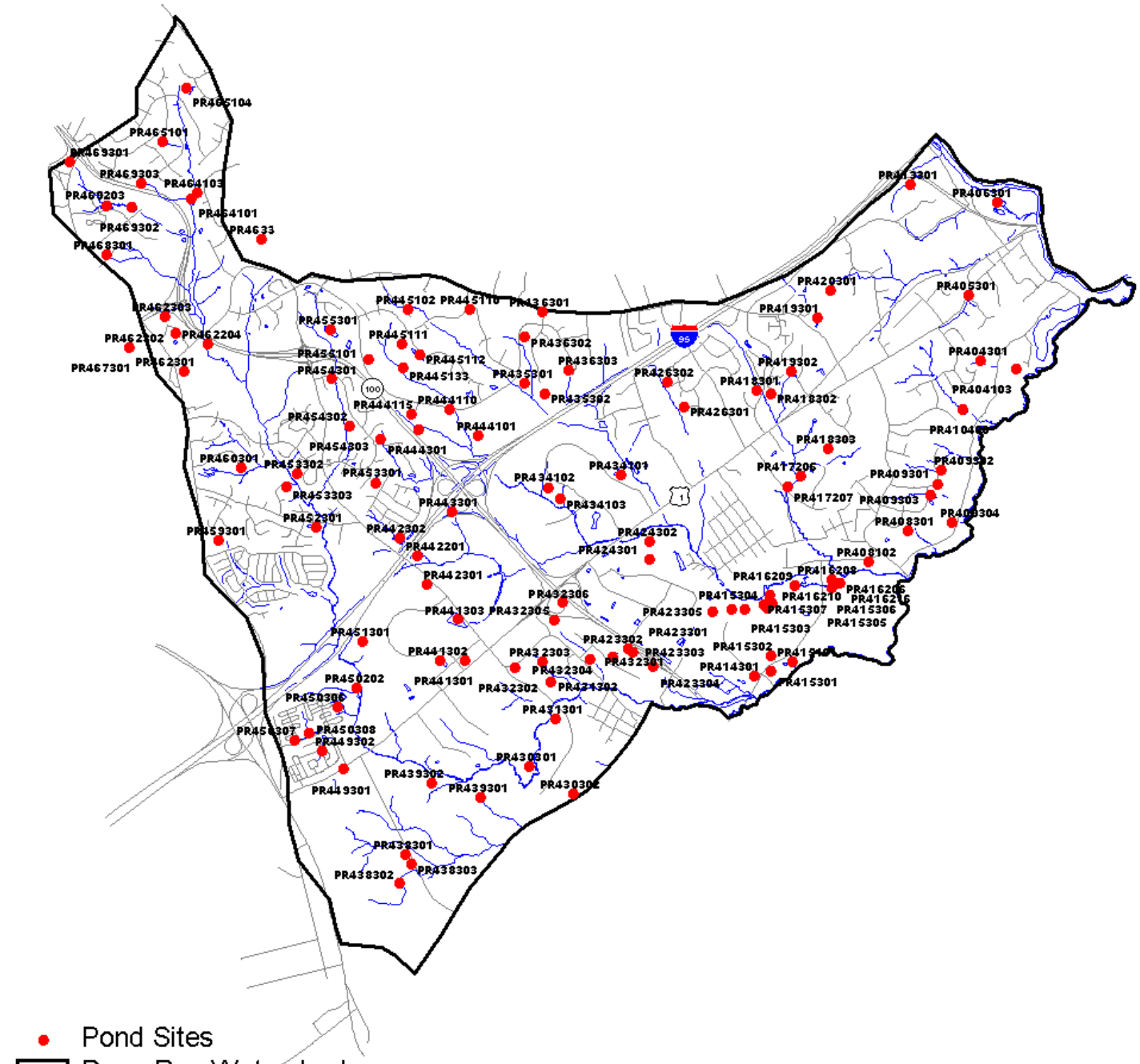


Figure 14b: Map showing the location of the Pond Sites in Deep Run

Representative Sites

Representative sites are used to document the general condition of both in-stream habitat and the adjacent riparian corridor (including and up to 50 feet beyond the stream bank). The SCA survey's representative site evaluations are based on the habitat assessment procedures outlined in EPA's rapid bioassessment protocols (Plafkin, et. al., 1989), and they are very similar to the habitat evaluations of Maryland Save-Our-Stream's Heartbeat Program. At each representative site, the following 10 separate categories related to stream habitat health are evaluated:

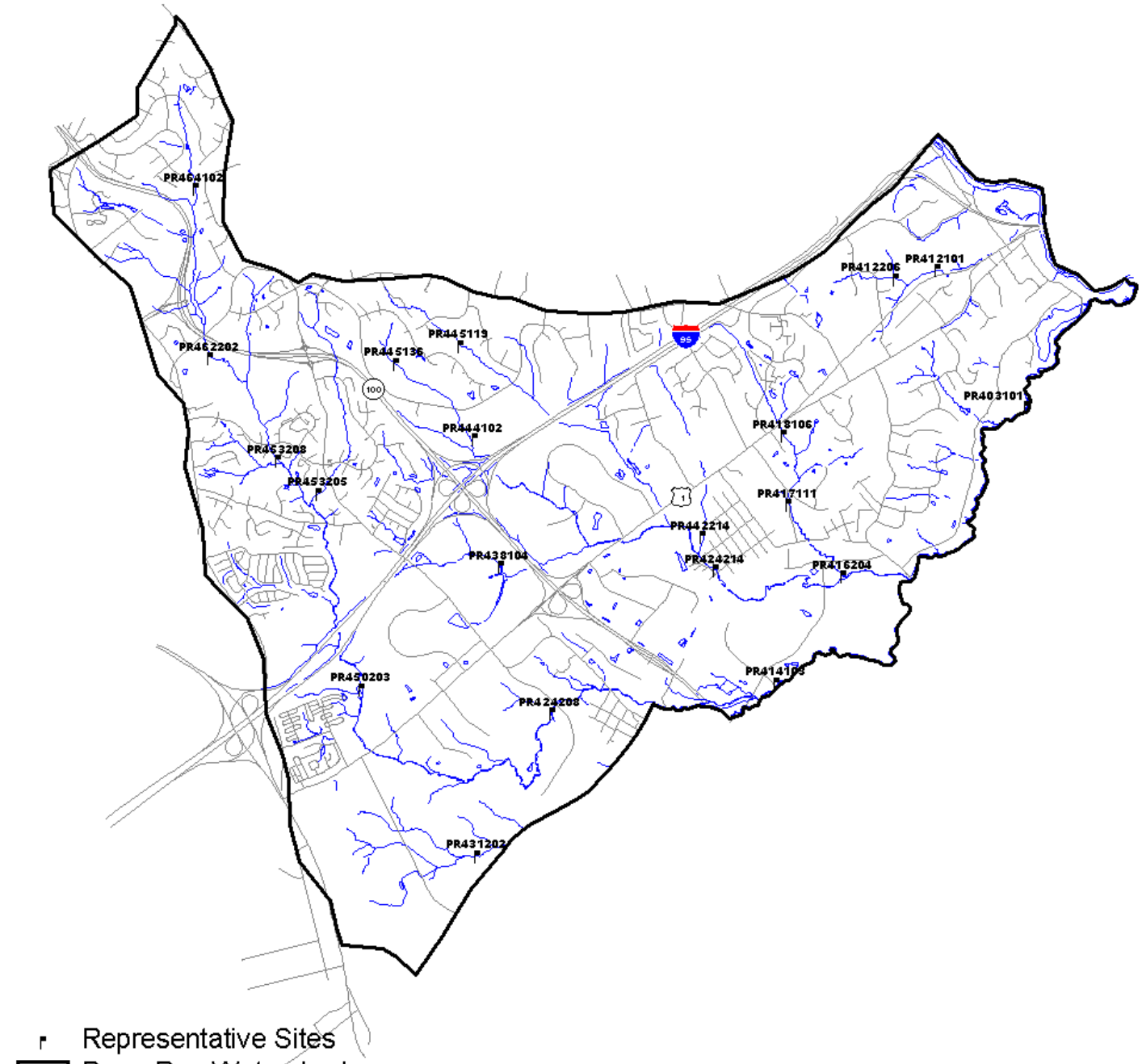
* Attachment Sites for Macroinvertabrates
* Shelter for Fish
* Sediment Deposition
* Channel Flow Status
* Condition of Banks
* Embeddedness
* Channel Alteration
* Velocity and Depth Regime
* Bank Vegetation Protection
* Riparian Vegetative Zone Width

Under each category, field crews base a rating of optimal, suboptimal, marginal or poor on established grading criteria developed to reflect ideal wildlife habitat for rocky bottom streams. In addition to the habitat ratings, teams collect data on the stream's wetted width and pool depths at both runs and riffles at each representative site. Depth measurements are taken along the stream thalweg (main flow path). At representative sites, field crews also indicate whether the bottom sediments are primarily silt, sand, gravel, cobble, boulder, or bedrock. Representative sites are located at approximately ½ mile intervals along the stream. Survey crews evaluated 25 representative sites in the Deep Run/Patapsco mainstem watershed. Locations of representative sites are shown in Figure 15b-c, and data collected for all categories are listed in Appendix B

Deep Run's streams are rated suboptimal for macroinvertebrate substrata. The bottom type was mostly gravel with silt coming in second. Embeddedness was averaged to be suboptimal. Some areas of the stream are covered with silt. Shelter for Fish was found to be suboptimal. There was some fish habitat. Channel Alteration was suboptimal. There are areas were the stream channel has been altered from the natural form. Bridges or roads would be included in this category. There has noticeable bar formations and therefore the category of sediment deposition was marginal. The bank condition was marginal. There are many areas of bank erosion. Riparian vegetation was found to be suboptimal. There were several areas where the stream did not have a riparian buffer.

In the main stem of the Lower North Branch of the Patapsco the macroinvertebrate substrata was mostly optimal. The shelter for fish was optimal. Channel alteration was rated to be optimal. Sediment Deposition was rated as suboptimal. There are several areas where bars have formed. The bank condition was found to be mostly stable along the main stem and it was found to be mostly adequately buffered.

Representative Sites



Representative Sites
Deep Run Watershed
Deep Run Streams
Deep Run Roads

3000 0 3000 6000 Feet

Figure 15b: Map showing the location of the Representative Sites in Deep Run

Representative Sites

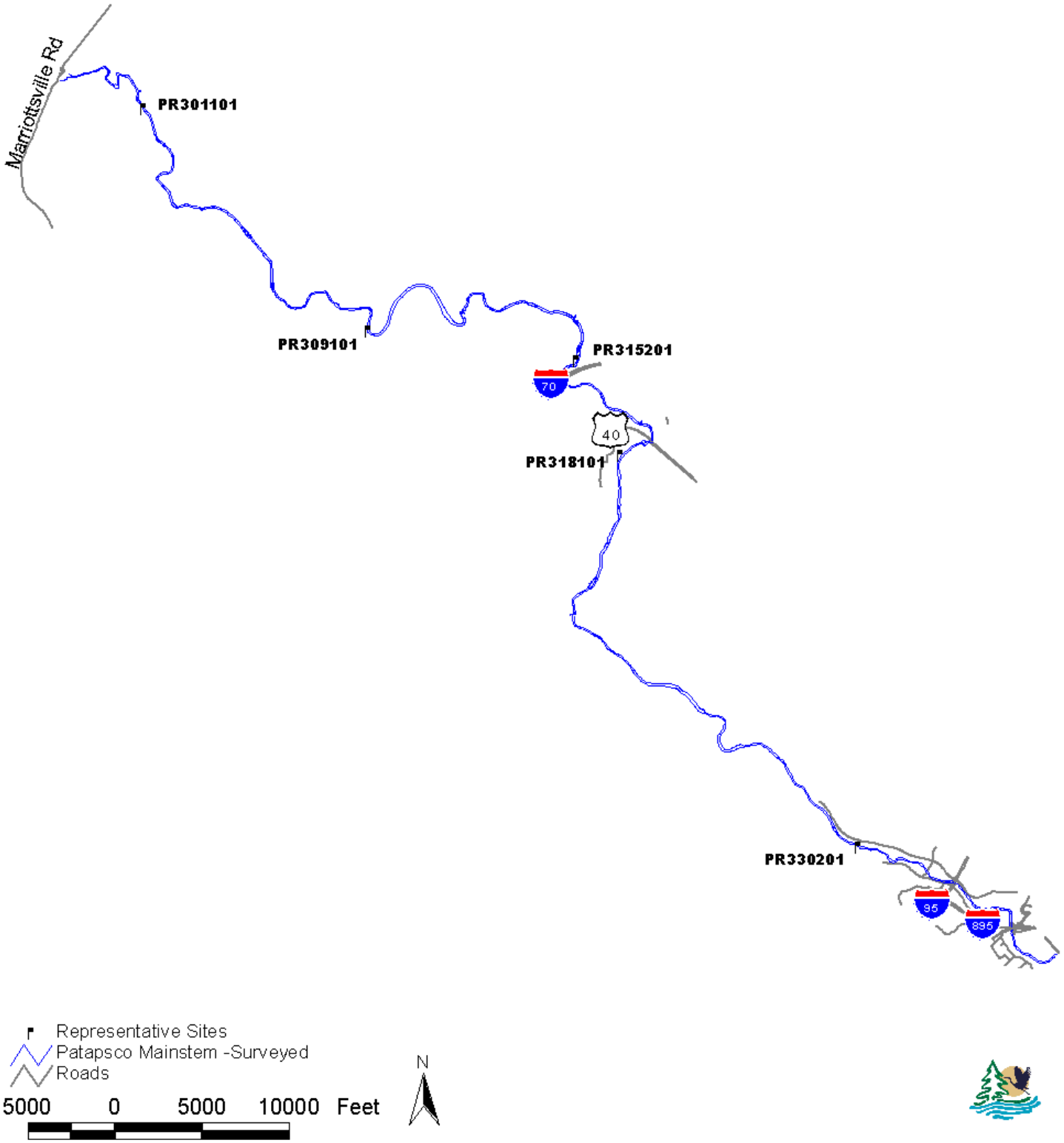


Figure 15c: Map showing the location of the Representative Sites on the surveyed Patapsco Mainstem

DISCUSSION

The Stream Corridor Assessment fieldwork consisted of walking approximately 57 miles in Deep Run and 21 miles of the mainstem in the Lower North Branch Patapsco Watershed, with fieldwork completed in 2003-2004. Over the streams assessed, survey teams identified 314 potential environmental problems. As of the time of the survey, the most frequently observed environmental concern in this portion of the watershed is pipe outfalls, reported at 123 sites. Other potential environmental problems recorded during the survey include: 56 erosion sites, 48 inadequately forested stream buffers, 36 tree blockages, 23 fish barrier, 9 exposed pipes, 7 channel alterations, 7 construction sites, 4 trash dumping sites and1 unusual condition. Additionally, the survey recorded descriptive information for 115 pond sites and 25 representative sites. Results of the Stream Corridor Assessment survey indicate that there are a number of stream segments that could be enhanced by restoration projects.

This area of the Patapsco has some inadequate buffer sites with little or no forest buffer extending for a short distances were there is also some erosion occurring. Some of these areas could benefit from tree plantings. Erosion site PR411203 coincides with inadequate buffer site PR411202 and erosion site PR422202 and inadequate buffer site PR431206 also coincide. Restoring inadequate buffers would create longer continuous stretches of forested habitat for both aquatic and terrestrial wildlife.

Erosion in the Deep Run Watershed of Howard County is characterized mainly by many sites with small bank heights extending over moderate distances. In areas where infrastructure is causing erosion, established erosion- and flood-control techniques that more closely mimic natural stream flow could be utilized to safeguard residential homes and roadways while maintaining proper flood levels in the area. In the main stem of the Patapsco, erosion was found to be mostly moderate with 3 to 8 feet bank heights over short distances.

The fish migration barriers in the watershed are characterized by many minor sites dispersed through out the Deep Run watershed. The first barrier reported on Deep Run mainstem is PR430202, approximately 6 miles from the mouth.

The Maryland Department of Natural Resources (DNR) Watershed Restoration Division developed the Stream Corridor Assessment Survey (SCA) as a watershed management tool. The value of the present survey is its help in placing individual stream problems into their watershed context and its potential common use among resource managers and land-use planners to cooperatively and consistently prioritize future restoration work. One of the main goals of the SCA survey was to compile a list of observable environmental problems in a watershed in order to most successfully target future restoration efforts. With this list, county planners, resource managers, and others can initiate a dialog to cooperatively set the direction and goals for the watershed's management and more effectively plan future restoration work for specific problem sites within the watershed.

As mentioned earlier, the Maryland Department of Natural Resources has formed a partnership with Howard County to develop a Watershed Restoration Action Strategy (WRAS)

for the Lower North Branch Patapsco watershed. Results from this survey will be combined with other GIS data and local information about the area to help establish priorities for the types and location of restoration projects that will be pursued in the watershed in the future. The value of the present survey is its help in placing individual stream problems into their watershed context and its potential common use among resource managers and land-use planners to cooperatively and consistently prioritize future restoration work. Results of the present survey will be given to the Patapsco Watershed WRAS committee, which is developing a Watershed Restoration Action Strategy for the Lower North Branch Patapsco Watershed in Howard County. Information on the Patapsco Watershed Action Strategy can be found on the Department of Natural Resources' website (www.dnr.maryland.gov/wras).

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Appendix A

Listing of sites by site number

Appendix A

Problem	Severity	Correctability	Access	X_Coordinate	Y_Coordinate	Stream
Representative Site				410279.96352	186549.70060	N Br of Patapsco
Representative Site				414197.12763	182677.78033	N Br of Patapsco
Inadequate Buffer	4	2	2	415869.95911	182971.86529	N Br of Patapsco
Erosion	5	2	2	417815.44427	182409.88916	N Br of Patapsco
Representative Site				417794.01298	182155.09490	N Br of Patapsco
Erosion	3	3	2	418508.38941	181293.08067	N Br of Patapsco
Fish Barrier	2	4	3	418922.72774	180732.29517	N Br of Patapsco
Channel Alteration	5	3	3	418920.34649	180731.10454	N Br of Patapsco
Representative Site				418573.87392	180495.36032	N Br of Patapsco
Pipe Outfall	5	2	3	417751.15039	178047.43041	N Br of Patapsco
Pipe Outfall	3	2	3	417717.81282	177977.18339	N Br of Patapsco
Exposed Pipe	3	3	1	417730.90973	177750.96418	N Br of Patapsco
Channel Alteration	5	3	1	422257.67506	174057.63802	N Br of Patapsco
Representative Site				422722.01975	173689.73416	N Br of Patapsco
Erosion	3	3	4	423204.22384	173542.09636	N Br of Patapsco
Inadequate Buffer	4	1	1	423643.56535	173425.41487	N Br of Patapsco
Erosion	3	3	1	423644.75598	173425.41487	N Br of Patapsco
Tree Blockage	3			424805.46224	169766.66997	Deep Run
Representative Site				425263.02686	170633.81302	Deep Run
Tree Blockage	5			425263.02686	170633.81302	Deep Run
Erosion	3	3	1	425719.62816	171436.95696	Deep Run
Tree Blockage	5			425650.42099	171388.84297	Deep Run
Pond Site				425176.20945	170967.59531	Deep Run
Tree Blockage	5			425431.17513	170984.83937	Deep Run
Pond Site				424851.03582	171042.73013	Deep Run
Pipe Outfall	3	2	2	424917.07249	172008.28941	N Br of Patapsco
Inadequate Buffer	3	4	1	424900.57532	172013.36547	Unnamed 2
Pipe Outfall	5	1	2	424837.12464	171971.48802	Unnamed 2
Pipe Outfall	3	4	4	424825.70352	171962.60492	Unnamed 2
Fish Barrier	5	3	1	424796.51620	171946.10775	Unnamed 2
Pipe Outfall	5	1	1	424785.09508	171938.49367	Unnamed 2
Pipe Outfall	5	1	1	424767.32889	171925.80353	Unnamed 2
Pipe Outfall	3	2	1	424740.67961	171913.11339	Unnamed 2
Pipe Outfall	3	2	2	425371.37935	172196.10342	Deep Run
Pipe Outfall	3	2	1	425490.66662	171779.86697	Deep Run
Inadequate Buffer	4	3	4	425422.13989	172056.51193	Deep Run
Pipe Outfall	3	2	1	424771.13593	171679.61490	Unnamed 2
Pond Site				424749.56270	171639.00647	Unnamed 2
Fish Barrier	4	4	1	424726.72046	172415.64276	Unnamed 1
Pipe Outfall	5	1	1	424705.14723	172409.29770	Unnamed 1
Pipe Outfall	3	2	1	424724.18243	172576.80749	Unnamed 1
Erosion	1	5	1	424762.25284	172632.64408	N Br of Patapsco
Pipe Outfall	3	2	1	425309.19768	172295.08648	Unnamed 2
Pond Site				424999.55837	172471.47936	Deep Run
Pipe Outfall	2	3	1	423722.03704	168410.44821	Deep Run
Erosion	3	3	2	423967.41185	168320.23688	Deep Run
Inadequate Buffer	4	1	1	424178.50636	168780.31465	Deep Run
Inadequate Buffer	3	1	2	423762.35715	169159.50975	Deep Run
Pond Site				423844.94826	169232.92407	Deep Run
Tree Blockage	3			424103.20935	169145.08908	Deep Run
Tree Blockage	3			424442.75058	169323.38100	Deep Run

Appendix A

Problem	Severity	Correctability	Access	X_Coordinate	Y_Coordinate	Stream
Tree Blockage	3			424580.40243	169356.15525	Deep Run
Pond Site				424194.22323	169520.98188	Deep Run
Erosion	4	3	1	424436.19573	170141.42627	Deep Run
Pond Site				424461.10416	169938.22592	Deep Run
Pond Site				424495.18938	170052.28031	Deep Run
Pond Site				424398.17760	169841.21414	Deep Run
Pond Site				424593.51213	169592.12984	Deep Run
Pipe Outfall	3	2	1	424158.27009	170884.74625	Deep Run
Tree Blockage	5			424174.00173	170888.67916	Deep Run
Pipe Outfall	3	2	2	424468.96998	170859.83782	Deep Run
Tree Blockage	5			424562.68574	170740.53955	Deep Run
Pipe Outfall	5	1	2	424565.98176	170724.80791	Deep Run
Pipe Outfall	3	2	2	424662.99354	170630.41808	Deep Run
Pipe Outfall	3	2	2	424662.99354	170621.24129	Deep Run
Pond Site				424689.21294	170601.57674	Deep Run
Channel Alteration	3	4	3	424490.06877	171355.46770	Unnamed 2
Inadequate Buffer	4	2	1	424493.87358	171356.73597	Unnamed 2
Erosion	4	2	1	424517.64521	171366.44939	Unnamed 2
Pipe Outfall	3	2	4	424040.84202	171543.22759	Unnamed 2
Pipe Outfall	3	2	4	424045.82169	171551.94201	Unnamed 2
Inadequate Buffer	2	2	1	424195.83053	170902.69593	Deep Run
Pipe Outfall	5	1	2	424323.92563	170925.52476	Deep Run
Pipe Outfall	5	1	3	424344.21792	170922.98822	Deep Run
Representative Site				424450.41970	171874.37550	Unnamed 2
Fish Barrier	4	3	1	424285.38777	172164.20217	Unnamed 1
Pipe Outfall	3	2	1	424297.29491	172142.03265	Unnamed 1
Pipe Outfall	5	1	1	424312.23392	172134.56315	Unnamed 1
Trash Dumping	5	1	1	424322.19325	172135.80807	Unnamed 1
Inadequate Buffer	5	1	1	423698.48986	171834.53816	Unnamed 2
Representative Site				424078.18953	171792.21098	Deep Run
Tree Blockage	5			424141.37746	171698.68136	Unnamed 2
Tree Blockage	5			424155.49463	171717.70885	Unnamed 2
Fish Barrier	4	2	3	424161.59896	171724.98547	Unnamed 2
Tree Blockage	5			424165.31527	171731.21223	Unnamed 2
Tree Blockage	5			424167.15664	171736.12255	Unnamed 2
Fish Barrier	4	3	3	424170.31338	171738.67956	Unnamed 2
Inadequate Buffer	5	2	1	424691.93359	172400.97538	Unnamed 1
Pond Site				424216.37531	172642.48927	Deep Run
Fish Barrier	5	2	3	422654.14878	168118.19509	Deep Run
Pipe Outfall	3	2	3	422625.77984	168137.10771	Deep Run
Representative Site				423004.03234	168153.31854	Unnamed 2
Pond Site				422806.80068	168201.95100	Deep Run
Pond Site				423153.98243	168334.33937	Deep Run
Inadequate Buffer	5	2	1	423304.68804	168352.25476	Deep Run
Erosion	4	2	2	423479.09894	168444.51559	Deep Run
Construction	3			423490.47356	168503.91641	Deep Run
Pipe Outfall	3	2	1	423592.84518	168414.18326	Deep Run
Pond Site				422960.80348	168242.47805	Deep Run
Pond Site				422955.39987	168388.37544	Deep Run
Pond Site				422717.64116	168808.50589	Deep Run
Pond Site				422895.96019	168846.33114	Deep Run

Appendix A

Problem	Severity	Correctability	Access	X_Coordinate	Y_Coordinate	Stream
Pond Site				422926.56146	168821.13037	Deep Run
Pond Site				422963.68406	168863.52522	Deep Run
Pond Site				422949.13349	168897.35528	Deep Run
Pipe Outfall	3	2	2	423193.46949	169556.70105	Deep Run
Construction	3			423240.23184	169453.06559	Deep Run
Erosion	3	3	2	423292.54034	169409.73610	Deep Run
Inadequate Buffer	5	3	2	423428.54506	169316.57010	Deep Run
Unusual Condition	3	3	2	423428.12338	169316.26574	Deep Run
Erosion	3	2	1	423488.81347	169237.21190	Deep Run
Representative Site				423606.74750	169118.14611	Deep Run
Erosion	2	2	2	423555.47750	169080.08047	Deep Run
Pond Site				423579.40801	169040.58594	Deep Run
Pipe Outfall	3	2	3	423554.92977	169047.37067	Deep Run
Pond Site				423506.46364	169075.80046	Deep Run
Pond Site				423168.15267	169017.94803	Deep Run
Pond Site				422950.57722	168936.20003	Deep Run
Exposed Pipe	3	4	3	422895.20157	168948.79059	Deep Run
Erosion	4	2	3	422806.73228	168912.13903	Deep Run
Pipe Outfall	5	1	3	422940.70007	169020.82988	Deep Run
Pipe Outfall	3	3	1	423389.36580	169044.84297	Deep Run
Inadequate Buffer	3	3	2	423399.47657	169038.52374	Deep Run
Pond Site				423502.69066	169001.59843	Deep Run
Tree Blockage	5			423147.97100	170127.95995	Deep Run
Pipe Outfall	3	2	2	423149.23484	170073.61452	Deep Run
Pipe Outfall	3	2	3	423202.31642	170006.63062	Deep Run
Pipe Outfall	5	1	3	423199.78873	169991.46446	Deep Run
Pipe Outfall	5	1	1	423106.26404	169890.35669	Deep Run
Erosion	1	5	1	423099.94481	169860.02436	Deep Run
Pipe Outfall	3	2	1	423097.41711	169862.55205	Deep Run
Pipe Outfall	3	2	1	423099.94481	169862.55205	Deep Run
Pipe Outfall	3	2	1	423106.26404	169808.20663	Deep Run
Pipe Outfall	3	2	2	423107.52789	169785.45738	Deep Run
Representative Site				423111.31943	169761.44428	Deep Run
Inadequate Buffer	3	2	1	423099.94481	169860.02436	Deep Run
Pipe Outfall	5	1	1	423125.22175	169678.03038	Deep Run
Pipe Outfall	3	3	1	423134.06868	169642.64266	Deep Run
Pipe Outfall	4	3	1	423135.33253	169630.00418	Deep Run
Exposed Pipe	3	5	2	423141.65176	169611.04648	Deep Run
Fish Barrier	3	4	2	423141.65176	169611.04648	Deep Run
Pipe Outfall	2	3	1	423522.06974	170158.29228	Deep Run
Channel Alteration	3	3	1	423539.76360	170170.93075	Deep Run
Pipe Outfall	3	2	1	423480.36279	170133.01534	Deep Run
Pipe Outfall	3	2	1	423383.04656	170109.00224	Deep Run
Pipe Outfall	5	1	1	423343.86730	170117.84917	Deep Run
Pond Site				423225.06567	170002.83908	Deep Run
Pond Site				423105.00020	169915.63363	Deep Run
Inadequate Buffer	5	2	1	422855.22724	170832.31758	Deep Run
Exposed Pipe	5	4	1	423020.53754	170537.40401	Deep Run
Inadequate Buffer	5	3	2	423024.50499	170473.92485	Deep Run
Tree Blockage	3			423041.69726	170435.57286	Deep Run
Pipe Outfall	3	2	2	423060.21202	170390.60846	Deep Run

Appendix A

Problem	Severity	Correctability	Access	X_Coordinate	Y_Coordinate	Stream
Representative Site				423066.82443	170378.70612	Deep Run
Tree Blockage	1			423098.56400	170328.45179	Deep Run
Tree Blockage	3			423150.14082	170271.58504	Deep Run
Pipe Outfall	3	2	2	423150.14082	170235.87802	Deep Run
Tree Blockage	5			423106.49890	170891.82929	Deep Run
Erosion	1	5	2	423087.98415	170873.31454	Deep Run
Pond Site				422828.77759	170774.12836	Deep Run
Pond Site				422954.41342	170746.35623	Deep Run
Pond Site				423476.79397	170250.42533	Deep Run
Erosion	3	2	1	422692.56191	171161.61570	Deep Run
Inadequate Buffer	5	2	1	422692.56191	171160.29322	Deep Run
Exposed Pipe	3	4	2	422766.62092	170994.98292	Deep Run
Pond Site				423377.60779	171431.40211	Deep Run
Pond Site				423138.23848	170943.40610	Deep Run
Pond Site				423493.98624	171674.73887	Deep Run
Fish Barrier	5	4	1	422020.56583	168128.39666	Deep Run
Erosion	4	2	1	422051.10441	168072.14140	Deep Run
Trash Dumping	3	2	1	421588.20392	168078.57057	Deep Run
Erosion	3	3	1	422004.49290	167937.12875	Deep Run
Exposed Pipe	4	5	2	422428.81835	167933.91417	Deep Run
Pipe Outfall	3	3	2	422002.05438	168240.57629	Deep Run
Pond Site				422434.95994	168787.17421	Deep Run
Pond Site				421663.89247	168451.92748	Deep Run
Pond Site				421713.45068	168421.31800	Deep Run
Pond Site				421895.64999	168284.30412	Deep Run
Pond Site				422602.58331	168810.49572	Deep Run
Pipe Outfall	5	1	2	421674.97350	169433.81613	Deep Run
Trash Dumping	5	1	2	421668.34807	169444.41681	Deep Run
Erosion	3	3	2	421887.54228	169549.60942	Deep Run
Inadequate Buffer	3	2	2	422151.10019	169560.95880	Deep Run
Inadequate Buffer	3	3	2	422226.76274	169418.46099	Deep Run
Erosion	4	3	2	422245.67838	169352.88677	Deep Run
Representative Site				420975.49071	167878.43664	Deep Run
Pipe Outfall	3	3	2	422334.86627	169515.97145	Deep Run
Construction	4			422342.77866	169549.60942	Deep Run
Erosion	4	3	2	422296.12009	169301.18402	Deep Run
Inadequate Buffer	4	3	1	422338.99553	169254.52545	Deep Run
Pipe Outfall	3	3	1	422451.47383	169174.09929	Deep Run
Representative Site				422453.75041	169172.55768	Deep Run
Pond Site				421858.53830	169259.56962	Deep Run
Pond Site				421862.32143	169417.19994	Deep Run
Exposed Pipe	5	2	2	422042.65052	169563.48089	Deep Run
Tree Blockage	3			422349.08388	169592.48487	Deep Run
Erosion	4	3	3	421671.29540	170114.80287	Deep Run
Pipe Outfall	3	3	2	421734.95612	169984.66912	Deep Run
Erosion	4	3	3	421781.61470	169950.62097	Deep Run
Pipe Outfall	3	3	1	421844.66683	169916.57282	Deep Run
Pipe Outfall	3	3	3	422316.29677	170135.99423	Deep Run
Pipe Outfall	5	1	2	422341.51762	170012.41206	Deep Run
Pond Site				422173.79895	170626.53981	Deep Run
Pond Site				422018.69071	170853.52748	Deep Run

Appendix A

Problem	Severity	Correctability	Access	X_Coordinate	Y_Coordinate	Stream
Inadequate Buffer	1	2	1	420559.48674	167461.05517	Deep Run
Fish Barrier	3	4	1	420834.98606	167480.34012	Deep Run
Pond Site				420778.50870	167383.91536	Deep Run
Pond Site				421169.71773	167135.96597	Deep Run
Pipe Outfall	3	3	2	420910.74838	167612.57979	Deep Run
Representative Site				420312.16776	166593.40282	Deep Run
Fish Barrier	5	4	1	420881.82095	167940.42398	Deep Run
Pipe Outfall	3	3	3	420755.09126	168029.96126	Deep Run
Pipe Outfall	3	3	2	420617.34160	167952.82145	Deep Run
Inadequate Buffer	2	2	1	421413.53463	168096.08110	Deep Run
Pipe Outfall	2	2	1	421481.03196	168091.94861	Deep Run
Pond Site				421011.30563	167813.69430	Deep Run
Pond Site				420969.98073	168153.93595	Deep Run
Pond Site				421526.48935	168372.95791	Deep Run
Pond Site				420649.02402	168279.28814	Deep Run
Pond Site				420891.46342	168335.76550	Deep Run
Pond Site				421323.99735	168353.67296	Deep Run
Pond Site				420993.39817	168710.44458	Deep Run
Pond Site				421070.53798	168866.10169	Deep Run
Pipe Outfall	3	3	1	420753.71376	169191.19089	Deep Run
Trash Dumping	3	1	3	420994.77567	169277.97317	Deep Run
Erosion	4	3	3	421003.04065	169288.99315	Deep Run
Fish Barrier	3	4	1	421198.64516	169333.07304	Deep Run
Inadequate Buffer	2	2	1	421351.29539	169409.84068	Deep Run
Pipe Outfall	3	3	1	421552.66179	169454.29274	Deep Run
Pond Site				421603.18855	170016.49539	Deep Run
Pond Site				420940.31355	169903.24795	Deep Run
Pond Site				421049.03109	169808.12010	Deep Run
Pipe Outfall	3	3	2	421101.87989	169765.84106	Deep Run
Erosion	5	2	2	420713.81867	169942.50706	Deep Run
Tree Blockage	5			420615.67089	169918.34761	Deep Run
Erosion	4	3	3	420565.84202	169922.87751	Deep Run
Construction	3			420830.18677	170690.65542	Deep Run
Inadequate Buffer	1	2	3	420749.67841	170760.91726	Deep Run
Inadequate Buffer	1	2	1	420803.83858	170724.32255	Deep Run
Erosion	4	2	2	421295.67144	170453.52172	Deep Run
Inadequate Buffer	4	2	3	421371.78843	170437.42005	Deep Run
Pipe Outfall	3	3	2	421465.47088	170438.88384	Deep Run
Channel Alteration	3	3	2	421481.57255	170400.82534	Deep Run
Erosion	4	3	2	421488.89149	170336.41866	Deep Run
Erosion	5	3	1	421554.76196	170252.98273	Deep Run
Pond Site				420743.82326	170845.81698	Deep Run
Pond Site				420909.23134	170744.81559	Deep Run
Pipe Outfall	3	3	1	420735.15339	171153.21925	Deep Run
Pond Site				420894.53955	171481.21226	Deep Run
Pond Site				420743.05684	171259.91577	Deep Run
Pond Site				421125.05673	170955.63310	Deep Run
Tree Blockage	3			419809.34913	166821.40766	Deep Run
Pipe Outfall	3	3	2	419922.59657	166684.00077	Deep Run
Tree Blockage	1			419975.44537	166664.37121	Deep Run
Representative Site				420521.28475	169203.53646	Deep Run

Appendix A

Problem	Severity	Correctability	Access	X_Coordinate	Y_Coordinate	Stream
Exposed Pipe	5	3	4	420435.98495	166671.92104	Deep Run
Pipe Outfall	3	3	3	420366.52653	166629.64200	Deep Run
Erosion	3	3	1	419810.85909	166412.20691	Deep Run
Pipe Outfall	3	3	1	419794.24947	166403.14712	Deep Run
Channel Alteration	4	3	1	419792.73950	166403.14712	Deep Run
Inadequate Buffer	1	4	1	419791.22954	166403.14712	Deep Run
Pipe Outfall	3	3	2	419647.78278	166309.52924	Deep Run
Pond Site				419668.92230	166593.40282	Deep Run
Pond Site				419614.56353	166326.13886	Deep Run
Pond Site				419717.24121	166501.29490	Deep Run
Pipe Outfall	2	2	1	419716.16043	167487.55368	Deep Run
Erosion	4	3	2	419961.24752	167315.18473	Deep Run
Inadequate Buffer	2	3	2	419899.30243	167343.46401	Deep Run
Erosion	5	2	3	420397.55641	167510.44643	Deep Run
Pond Site				420346.89697	167108.30117	Deep Run
Pond Site				419905.98694	167236.64827	Deep Run
Pond Site				420203.11428	168341.58373	Deep Run
Pond Site				419977.50249	168347.36865	Deep Run
Pond Site				420140.92641	168714.71092	Deep Run
Pond Site				419770.69168	169290.31023	Deep Run
Construction	5			419793.83135	169339.48203	Deep Run
Inadequate Buffer	4	2	1	419767.79922	169336.58957	Deep Run
Pipe Outfall	3	3	1	419825.64840	169316.34236	Deep Run
Pipe Outfall	3	3	1	419828.54086	169313.44990	Deep Run
Erosion	4	3	3	419844.44938	169284.52531	Deep Run
Pipe Outfall	3	3	4	419945.68544	169223.78367	Deep Run
Fish Barrier	5	4	3	420100.43199	169251.26203	Deep Run
Pipe Outfall	3	3	3	419945.68544	169408.90104	Deep Run
Pipe Outfall	2	3	2	419948.57790	169433.48694	Deep Run
Pipe Outfall	3	3	1	420407.03262	169293.20268	Deep Run
Inadequate Buffer	2	2	1	420508.26868	169223.78367	Deep Run
Pipe Outfall	5	1	1	420506.82245	169223.78367	Deep Run
Representative Site				422328.90719	169473.94686	Deep Run
Pipe Outfall	3	3	1	420512.60737	169174.61187	Deep Run
Pipe Outfall	3	3	1	420564.67163	169119.65516	Deep Run
Pond Site				419853.12676	169035.77385	Deep Run
Pond Site				419605.82153	169447.94923	Deep Run
Pipe Outfall	3	3	2	420470.66672	170039.45706	Deep Run
Pipe Outfall	3	3	2	420438.84967	170058.25804	Deep Run
Pipe Outfall	3	3	2	420391.12410	170111.76853	Deep Run
Pipe Outfall	3	3	2	420378.10804	170121.89214	Deep Run
Pipe Outfall	3	3	2	420362.19951	170139.24689	Deep Run
Pipe Outfall	3	3	2	420347.73722	170165.27902	Deep Run
Pipe Outfall	3	3	2	420308.68902	170137.80066	Deep Run
Pipe Outfall	3	3	1	420321.70509	170118.99968	Deep Run
Pond Site				420080.18478	169686.57708	Deep Run
Pond Site				420325.46082	170372.20367	Deep Run
Representative Site				420287.81767	170342.62690	Deep Run
Erosion	2	3	4	420270.34049	170361.44848	Deep Run
Fish Barrier	5	1	4	420235.38613	170376.23686	Deep Run
Tree Blockage	3			420217.90895	170391.02525	Deep Run

Appendix A

Problem	Severity	Correctability	Access	X_Coordinate	Y_Coordinate	Stream
Inadequate Buffer	4	4	2	420177.57700	170440.76799	Deep Run
Pipe Outfall	3	3	1	420142.62264	170478.41114	Deep Run
Tree Blockage	5			420137.24505	170533.53147	Deep Run
Pipe Outfall	3	3	1	420117.07907	170591.34061	Deep Run
Pond Site				420067.33633	170607.47339	Deep Run
Pipe Outfall	3	3	2	420070.02513	170658.56052	Deep Run
Inadequate Buffer	3	3	1	420071.36953	170658.56052	Deep Run
Pipe Outfall	3	3	2	420059.26994	170708.30326	Deep Run
Tree Blockage	3			419830.72222	170848.12070	Deep Run
Pond Site				419713.75956	170557.73065	Deep Run
Pond Site				419776.94628	170417.91321	Deep Run
Tree Blockage	5			419571.25333	171563.34064	Deep Run
Comment				419686.88543	171510.88143	Deep Run
Pond Site				419686.87159	171510.90910	Deep Run
Fish Barrier	5	2	1	419737.95873	171544.51906	Deep Run
Erosion	5	1	1	419760.81350	171536.45267	Deep Run
Fish Barrier	5	2	1	419802.48985	171524.35308	Deep Run
Pipe Outfall	3	3	2	419842.82180	171488.05433	Deep Run
Channel Alteration	3	3	1	419845.51060	171478.64354	Deep Run
Pipe Outfall	3	3	2	419850.88819	171466.54395	Deep Run
Pipe Outfall	3	3	2	419854.92139	171457.13316	Deep Run
Pond Site				420250.17451	171506.87590	Deep Run
Pond Site				419631.75126	171199.00867	Deep Run
Pond Site				419793.07906	171102.21199	Deep Run
Pipe Outfall	3	3	2	419893.90894	171395.29084	Deep Run
Fish Barrier	5	2	2	419959.78446	171357.64768	Deep Run
Erosion	5	1	2	420012.21600	171338.82611	Deep Run
Tree Blockage	5			420053.89235	171301.18295	Deep Run
Tree Blockage	1			420088.84671	171276.98378	Deep Run
Fish Barrier	5	2	3	420135.90065	171221.86345	Deep Run
Representative Site				420156.06663	171189.59789	Deep Run
Erosion	5	3	2	420208.49816	171162.70992	Deep Run
Tree Blockage	5			420251.51891	171155.98793	Deep Run
Erosion	5	2	2	420322.77203	171083.39041	Deep Run
Fish Barrier	5	3	2	420314.70564	171088.76801	Deep Run
Erosion	5	3	2	420332.18281	171053.81365	Deep Run
Tree Blockage	5			420351.00439	171041.71406	Deep Run
Pipe Outfall	5	1	2	420369.82597	171032.30327	Deep Run
Tree Blockage	3			420384.61435	171018.85929	Deep Run
Construction	2			420474.68904	170958.36136	Deep Run
Inadequate Buffer	4	3	2	420486.78863	170950.29497	Deep Run
Tree Blockage	5			419694.93798	170915.34062	Deep Run
Tree Blockage	5			419676.11640	170936.85099	Deep Run
Tree Blockage	5			419666.70561	170948.95058	Deep Run
Pond Site				419643.85084	170979.87174	Deep Run
Pipe Outfall	3	3	1	419603.51889	171005.41531	Deep Run
Pipe Outfall	3	3	1	419586.04171	171013.48170	Deep Run
Representative Site				419572.59773	171025.58128	Deep Run
Erosion	3	3	1	419521.94503	171611.50660	Deep Run
Fish Barrier	5	3	1	419528.55963	171595.63157	Deep Run
Erosion	3	3	5	419317.30626	166552.62518	Deep Run

Appendix A

Problem	Severity	Correctability	Access	X_Coordinate	Y_Coordinate	Stream
Pipe Outfall	3	3	2	419358.08826	167517.76931	Deep Run
Pond Site				419104.52950	167359.81467	Deep Run
Pond Site				418906.39343	167521.92601	Deep Run
Erosion	3	3	3	418684.70271	168035.97135	Deep Run
Pond Site				419225.07383	168094.16516	Deep Run
Representative Site				419266.64084	168099.70743	Deep Run
Inadequate Buffer	3	2	2	419240.31507	167904.34249	Deep Run
Erosion	4	2	2	419232.00166	168217.48062	Deep Run
Pipe Outfall	3	3	2	419222.30270	167815.66620	Deep Run
Pipe Outfall	3	3	2	419232.00166	167672.95281	Deep Run
Pipe Outfall	3	3	1	419255.55630	167648.01260	Deep Run
Pipe Outfall	5	2	1	419273.56867	167617.53013	Deep Run
Pipe Outfall	2	2	1	419319.29238	167549.63735	Deep Run
Erosion	3	3	1	418906.39343	167609.21673	Deep Run
Pipe Outfall	3	3	1	418906.39343	167610.60229	Deep Run
Fish Barrier	5	4	1	418895.00386	167699.04248	Deep Run
Pipe Outfall	5	1	1	418903.62229	167688.19404	Deep Run
Pipe Outfall	3	3	1	418878.68209	167707.59198	Deep Run
Pond Site				419047.72126	167927.89713	Deep Run
Pond Site				418658.37694	167627.22910	Deep Run
Pond Site				418788.62024	167690.96518	Deep Run
Erosion	3	2	2	419054.64909	168547.24556	Deep Run
Pipe Outfall	3	3	2	419062.96249	168398.98990	Deep Run
Fish Barrier	5	3	1	419137.78311	168342.18165	Deep Run
Pond Site				419281.65701	168517.06168	Deep Run
Pipe Outfall	3	3	2	418938.26147	169554.55275	Deep Run
Tree Blockage	5			418917.47796	169457.56306	Deep Run
Inadequate Buffer	4	3	2	418934.10477	169440.93625	Deep Run
Tree Blockage	3			418967.35837	169025.26616	Deep Run
Inadequate Buffer	3	2	1	419435.35661	169592.28584	Deep Run
Pond Site				418853.74188	169549.01048	Deep Run
Erosion	4	2	1	419099.66806	170152.27980	Deep Run
Inadequate Buffer	4	3	1	419061.79855	170127.46874	Deep Run
Fish Barrier	3	3	1	418959.94264	169979.90825	Deep Run
Inadequate Buffer	3	3	1	418953.41342	169973.37903	Deep Run
Representative Site				418873.75687	169863.68804	Deep Run
Erosion	4	3	3	418820.21722	169744.85614	Deep Run
Inadequate Buffer	5	3	3	418845.02828	169701.76326	Deep Run
Representative Site				418515.95533	170152.27980	Deep Run
Erosion	4	2	3	418681.79765	169942.03874	Deep Run
Pond Site				419389.56566	169951.17966	Deep Run
Pond Site				418679.18596	170025.61283	Deep Run
Pond Site				418582.55342	169917.22769	Deep Run
Inadequate Buffer	3	1	1	419013.48229	170907.05823	Deep Run
Pipe Outfall	3	3	1	419018.70567	170869.18873	Deep Run
Erosion	4	2	1	419013.48229	170904.44654	Deep Run
Pipe Outfall	3	3	1	419151.90186	170292.00522	Deep Run
Pipe Outfall	3	3	3	418574.71835	170682.45289	Deep Run
Erosion	4	2	3	418576.02420	170754.27436	Deep Run
Pond Site				418992.58877	170878.32964	Deep Run
Pond Site				419154.51355	170456.54169	Deep Run

Appendix A

Problem	Severity	Correctability	Access	X_Coordinate	Y_Coordinate	Stream
Pond Site				419441.79946	170335.09810	Deep Run
Pond Site				419330.80263	171059.84210	Deep Run
Pond Site				418987.36539	171319.70527	Deep Run
Pond Site				417977.98796	169432.44467	Deep Run
Erosion	4	3	1	417786.46842	170038.44189	Deep Run
Exposed Pipe	3	5	4	417966.57546	170060.95527	Deep Run
Pipe Outfall	3	3	1	418029.95223	170046.98503	Deep Run
Erosion	4	3	2	418374.46495	170096.71182	Deep Run
Pond Site				418175.81747	170080.82002	Deep Run
Inadequate Buffer	2	4	2	418396.97833	170450.30433	Deep Run
Pipe Outfall	3	3	1	418412.87013	170331.11584	Deep Run
Inadequate Buffer	4	3	2	418137.41229	170332.44016	Deep Run
Inadequate Buffer	4	1	1	418285.73574	170662.19497	Deep Run
Erosion	5	3	3	418218.19560	170864.81540	Deep Run
Inadequate Buffer	5	1	1	417862.57471	171441.78993	Deep Run
Erosion	5	3	3	418009.83139	171063.12989	Deep Run
Representative Site				417903.41059	171077.97930	Deep Run
Pipe Outfall	3	3	1	417919.49746	171070.55460	Deep Run
Pond Site				417872.47432	171199.24951	Deep Run
Pipe Outfall	3	3	3	417873.71177	171143.56421	Deep Run
Pipe Outfall	3	3	1	417837.82569	171252.45991	Deep Run
Pipe Outfall	3	3	1	417835.35078	171280.92128	Deep Run
Inadequate Buffer	4	2	1	417857.62490	171340.31894	Deep Run
Pond Site				417667.05743	170951.75929	Deep Run
Pond Site				417589.09801	171290.82089	Deep Run
Pond Site				417487.62702	171438.07757	Deep Run
Construction	4			417749.96666	172102.58882	Deep Run
Pipe Outfall	3	3	2	417737.59215	172169.41118	Deep Run
Pond Site				418363.74240	172138.47490	Deep Run
Pond Site				417730.16744	172507.23533	Deep Run

Appendix B

Listing of sites by problem category

Pipe Outfalls

Problem	Site Number	Outfall Type	Pipe Type	Location of Pipe	Diameter (in)	Channel Width	Discharge	Color	Odor	Severity	Correctability	Access
Pipe Outfall	PR407101	Stormwater	Concrete Channel	Right Bank		8	Yes	Green Brown	None	2	3	1
Pipe Outfall	PR417201	Stormwater	Concrete Pipe	Left Bank		1.5	Yes	Other	Musky	2	3	1
Pipe Outfall	PR431207	Stormwater	Concrete Pipe	Right Bank	24		Yes	Medium Brown	None	2	2	1
Pipe Outfall	PR439201	Stormwater	Concrete Pipe	Right Bank	40		Yes	Green Brown	None	2	2	1
Pipe Outfall	PR442210	Unknown	Smooth Metal Pipe	Head of stream	24		Yes	Yellow Brown	None	2	3	2
Pipe Outfall	PR450210	Stormwater	Corrugated Metal	Right Bank	20		Yes	Medium Brown	None	2	2	1
Pipe Outfall	PR321103	Stormwater	Corrugated Metal	Right bank	30		Yes	Clear	None	3	2	3
Pipe Outfall	PR405101	Stormwater	Corrugated Metal	Right Bank	18		Yes	Clear	None	3	2	2
Pipe Outfall	PR405104	Unknown	Smooth Metal Pipe	Left Bank	1		Yes	Other	Chlorine	3	4	4
Pipe Outfall	PR405108	Stormwater	Corrugated Metal	Right Bank	36		Yes	Clear	None	3	2	1
Pipe Outfall	PR405201	Stormwater	Concrete Channel	Right Bank		24	Yes	Clear	None	3	2	2
Pipe Outfall	PR405202	Stormwater	Concrete Pipe	Head of stream	24		Yes	Clear	None	3	2	1
Pipe Outfall	PR405204	Stormwater	Corrugated Metal	Left Bank	24		Yes	Dark Brown	None	3	2	1
Pipe Outfall	PR406203	Stormwater	Corrugated Metal	Left Bank	36		Yes	Clear	None	3	2	1
Pipe Outfall	PR406205	Stormwater	Corrugated Metal	Right Bank	72		Yes	Clear	None	3	2	1
Pipe Outfall	PR410401	Stormwater	Concrete Pipe	Right Bank	12		Yes	Clear	None	3	2	1
Pipe Outfall	PR410403	Stormwater	Concrete Pipe	Right Bank	18		Yes	Clear	None	3	2	2
Pipe Outfall	PR410406	Stormwater	Concrete Pipe	Right Bank	36		Yes	Clear	None	3	2	2
Pipe Outfall	PR410407	Stormwater	Corrugated Metal	Right Bank	18		Yes	Clear	None	3	2	2
Pipe Outfall	PR411301	Stormwater	Concrete Pipe	Left Bank	24		Yes	Clear	None	3	2	4
Pipe Outfall	PR411302	Stormwater	Corrugated Metal	Right Bank	12		Yes	Clear	None	3	2	4
Pipe Outfall	PR412202	Stormwater	Concrete Pipe	Right Bank	24		Yes	Clear	None	3	2	1
Pipe Outfall	PR414102	Stormwater	Corrugated Metal	Left Bank	36		Yes	Clear	None	3	2	3
Pipe Outfall	PR415105	Stormwater	Corrugated Metal	Right Bank	30		Yes	Clear	None	3	2	1
Pipe Outfall	PR416101	Stormwater	Concrete Pipe	Right Bank	24		Yes	Clear	None	3	2	2
Pipe Outfall	PR416207	Stormwater	Concrete Pipe	Left Bank		4	Yes	Clear	None	3	2	3
Pipe Outfall	PR416214	Stormwater	Smooth Metal Pipe	Left Bank	18		Yes	Medium Brown	None	3	3	1
Pipe Outfall	PR417102	Industrial	Concrete Pipe	Right Bank	36		Yes	Clear	None	3	2	2
Pipe Outfall	PR417103	Stormwater	Concrete Pipe	Left Bank	36		Yes	Clear	None	3	2	3
Pipe Outfall	PR417107	Stormwater	Plastic	Right Bank	3		Yes	Clear	None	3	2	1
Pipe Outfall	PR417108	Stormwater	Corrugated Metal	Right Bank	48		Yes	Clear	None	3	2	1
Pipe Outfall	PR417109	Stormwater	Concrete Pipe	Left Bank	36		Yes	Clear	None	3	2	1
Pipe Outfall	PR417110	Stormwater	Concrete Pipe	Right Bank	16		Yes	Clear	None	3	2	2
Pipe Outfall	PR417114	Stormwater	Concrete Pipe	Right Bank	36		Yes	Clear	None	3	3	1
Pipe Outfall	PR417203	Stormwater	Concrete Pipe	Right Bank	18		Yes	Clear	None	3	2	1
Pipe Outfall	PR417204	Stormwater	Concrete Pipe	Right Bank	18		Yes	Clear	None	3	2	1
Pipe Outfall	PR418105	Industrial	Smooth Metal Pipe	Right Bank	2		Yes	Clear	None	3	2	2
Pipe Outfall	PR418109	Stormwater	Concrete Pipe	Left Bank	24		Yes	Clear	None	3	2	2

Pipe Outfalls

Problem	Site Number	Outfall Type	Pipe Type	Location of Pipe	Diameter (in)	Channel Width	Discharge	Color	Odor	Severity	Correctability	Access
Pipe Outfall	PR423101	Stormwater	Concrete Pipe	Left Bank	24		Yes	Medium Brown	None	3	3	2
Pipe Outfall	PR424209	Stormwater	Corrugated Metal	Right Bank	36		Yes	Clear	None	3	3	2
Pipe Outfall	PR424213	Stormwater	Corrugated Metal	Right Bank	60		Yes	Clear	None	3	3	1
Pipe Outfall	PR425204	Stormwater	Concrete Pipe	Left Bank	36		Yes	Clear	None	3	3	2
Pipe Outfall	PR425206	Stormwater	Corrugated Metal	Left Bank	24		Yes	Clear	None	3	3	1
Pipe Outfall	PR425208	Stormwater	Concrete Pipe	Left Bank	36		Yes	Clear	None	3	3	3
Pipe Outfall	PR431201	Stormwater	Corrugated Metal	Left Bank	24		Yes	Clear	None	3	3	2
Pipe Outfall	PR431204	Stormwater	Corrugated Metal	Left Bank	24		Yes	Clear	None	3	3	3
Pipe Outfall	PR431205	Stormwater	Corrugated Metal	Head of stream	60		Yes	Clear	None	3	3	2
Pipe Outfall	PR433201	Stormwater	Concrete Channel	Right Bank		3	Yes	Clear	None	3	3	1
Pipe Outfall	PR433206	Unknown	Concrete Pipe	Left Bank	30		Yes	Clear	None	3	3	1
Pipe Outfall	PR434104	Stormwater	Concrete Pipe	Head of stream	36		Yes	Clear	None	3	3	2
Pipe Outfall	PR435203	Stormwater	Corrugated Metal	Left Bank	30		Yes	Clear	None	3	3	2
Pipe Outfall	PR436101	Stormwater	Earth Channel	Left Bank		0.5	Yes	Clear	None	3	3	1
Pipe Outfall	PR438102	Stormwater	Concrete Pipe	Left Bank	24		Yes	Clear	None	3	3	2
Pipe Outfall	PR438106	Stormwater	Corrugated Metal	Right Bank	18		Yes	Clear	None	3	3	3
Pipe Outfall	PR438108	Stormwater	Concrete Pipe	Right Bank	18		Yes	Clear	None	3	3	1
Pipe Outfall	PR438110	Industrial	Concrete Channel	Right Bank		2	Yes	Clear	None	3	3	2
Pipe Outfall	PR442204	Stormwater	Smooth Metal Pipe	Right Bank	9		Yes	Clear	None	3	3	1
Pipe Outfall	PR442205	Stormwater	Smooth Metal Pipe(3)	Left Bank	6		Yes	Clear	None	3	3	1
Pipe Outfall	PR442207	Unknown	Concrete Pipe	Right Bank	4		Yes	Clear	None	3	3	4
Pipe Outfall	PR442209	Stormwater	Concrete Pipe	Head of stream	24		Yes	Clear	None	3	3	3
Pipe Outfall	PR442211	Stormwater	Smooth Metal Pipe	Left Bank	18		Yes	Clear	None	3	3	1
Pipe Outfall	PR442215	Unknown	Plastic	Right Bank	5		Yes	Clear	None	3	3	1
Pipe Outfall	PR442216	Stormwater	Smooth Metal Pipe	Left Bank	18		Yes	Clear	None	3	3	1
Pipe Outfall	PR443101	Stormwater	Concrete Channel	Left Bank		1	Yes	Clear	None	3	3	2
Pipe Outfall	PR443102	Stormwater	Corrugated Metal	Right Bank	18		Yes	Clear	None	3	3	2
Pipe Outfall	PR443103	Stormwater	Corrugated Metal	Right Bank	1.5		Yes	Clear	None	3	3	2
Pipe Outfall	PR443104	Stormwater	Corrugated Metal	Right Bank	18		Yes	Clear	None	3	3	2
Pipe Outfall	PR443105	Stormwater	Concrete Channel	Left Bank		1.5	Yes	Clear	None	3	3	2
Pipe Outfall	PR443106	Stormwater	Concrete Channel	Left Bank	1.5		Yes	Clear	None	3	3	2
Pipe Outfall	PR443107	Stormwater	Concrete Pipe	Left Bank	24		Yes	Clear	None	3	3	2
Pipe Outfall	PR443108	Stormwater	Corrugated Metal	Left Bank	14		Yes	Clear	None	3	3	1
Pipe Outfall	PR444107	Industrial	Smooth Metal Pipe	On Bridge	2		Yes	Clear	None	3	3	1
Pipe Outfall	PR444109	Industrial	Plastic	On Bridge	2		Yes	Clear	None	3	3	1
Pipe Outfall	PR444111	Stormwater	Smooth Metal Pipe	On Bridge	2		Yes	Clear	None	3	3	2
Pipe Outfall	PR444113	Stormwater	Plastic	Left Bank	4		Yes	Clear	None	3	3	2
Pipe Outfall	PR445106	Stormwater	Concrete Pipe	Left Bank	30		Yes	Clear	None	3	3	2

Pipe Outfalls

Problem	Site Number	Outfall Type	Pipe Type	Location of Pipe	Diameter (in)	Channel Width	Discharge	Color	Odor	Severity	Correctability	Access
Pipe Outfall	PR445108	Stormwater	Corrugated Metal	Left Bank	18		Yes	Clear	None	3	3	2
Pipe Outfall	PR445109	Stormwater	Plastic	Right Bank	3		Yes	Clear	None	3	3	2
Pipe Outfall	PR445113	Stormwater	Plastic	Right Bank	3		Yes	Clear	None	3	3	2
Pipe Outfall	PR445134	Industrial	Plastic	Left Bank	3		Yes	Clear	None	3	3	1
Pipe Outfall	PR445135	Industrial	Plastic	Left Bank	6		Yes	Clear	None	3	3	1
Pipe Outfall	PR449201	Stormwater	Concrete Pipe	Right Bank	36		Yes	Medium Brown	None	3	3	2
Pipe Outfall	PR450206	Stormwater	Concrete Pipe	Right Bank	24		Yes	Clear	None	3	3	2
Pipe Outfall	PR450207	Stormwater	Corrugated Metal	Right Bank	48		Yes	Clear	None	3	3	2
Pipe Outfall	PR450208	Stormwater	Corrugated Metal	Right Bank	24		Yes	Clear	None	3	3	1
Pipe Outfall	PR450302	Stormwater	Concrete Pipe	Right Bank	12		Yes	Clear	None	3	3	1
Pipe Outfall	PR450305	Stormwater	Concrete Channel	Left Bank		1	Yes	Clear	None	3	3	1
Pipe Outfall	PR451202	Stormwater	Concrete Channel	Right Bank		3	Yes	Clear	None	3	3	2
Pipe Outfall	PR452201	Stormwater	Smooth Metal Pipe	Right Bank	24		Yes	Clear	None	3	3	2
Pipe Outfall	PR454202	Stormwater	Corrugated Metal	Right Bank	24		Yes	Clear	None	3	3	1
Pipe Outfall	PR454204	Stormwater	Concrete Pipe	Left Bank	30		Yes	Clear	None	3	3	1
Pipe Outfall	PR454205	Stormwater	Plastic	Left Bank	5		Yes	Clear	None	3	3	3
Pipe Outfall	PR460203	Stormwater	Corrugated Metal	Left Bank	36		Yes	Clear	None	3	3	1
Pipe Outfall	PR461202	Stormwater	Concrete Pipe	Left Bank	18		Yes	Clear	None	3	3	1
Pipe Outfall	PR462203	Pumping Station	Concrete Pipe	Right Bank	8		Yes	Clear	None	3	3	1
Pipe Outfall	PR462205	Stormwater	Corrugated Metal	Right Bank	12		Yes	Clear	None	3	3	3
Pipe Outfall	PR462206	Stormwater	Concrete Pipe	Left Bank	24		Yes	Clear	None	3	3	1
Pipe Outfall	PR462207	Stormwater	Concrete Pipe	Right Bank	36		Yes	Clear	None	3	3	1
Pipe Outfall	PR463102	Stormwater	Concrete Pipe	Left Bank	30		Yes	Clear	None	3	3	2
Pipe Outfall	PR464105	Stormwater	Concrete Pipe	Left Bank	36		Yes	Clear	None	3	3	3
Pipe Outfall	PR465103	Stormwater	Corrugated Metal	Left Bank	24		Yes	Clear	None	3	3	3
Pipe Outfall	PR469204	Stormwater	Corrugated Metal	Left Bank	18		Yes	Clear	None	3	3	1
Pipe Outfall	PR417115	Stormwater	Corrugated Metal	Left Bank	30		No			4	3	1
Pipe Outfall	PR321101	Stormwater	Corrugated Metal	Right bank	24		No			5	2	3
Pipe Outfall	PR405103	Stormwater	Concrete Pipe	Right Bank	12		No			5	1	2
Pipe Outfall	PR405106	Stormwater	Concrete Pipe	Right Bank	36		No			5	1	1
Pipe Outfall	PR405107	Stormwater	Concrete Pipe	Right Bank	36		No			5	1	1
Pipe Outfall	PR406202	Stormwater	Corrugated Metal	Left Bank	24		No			5	1	1
Pipe Outfall	PR410405	Stormwater	Concrete Pipe	Left Bank	18		No			5	1	2
Pipe Outfall	PR411402	Stormwater	Plastic	Right Bank	3		No			5	1	2
Pipe Outfall	PR411403	Stormwater	Concrete Pipe	Left Bank	18		No			5	1	3
Pipe Outfall	PR412203	Stormwater	Corrugated Metal	Head of stream	24		No			5	1	1
Pipe Outfall	PR416213	Stormwater	Corrugated Metal	Left Bank	24		No			5	1	3
Pipe Outfall	PR417104	Stormwater	Corrugated Metal	Left Bank	36		No			5	1	3

Pipe Outfalls

Problem	Site Number	Outfall Type	Pipe Type	Location of Pipe	Diameter (in)	Channel Width	Discharge	Color	Odor	Severity	Correctability	Access
Pipe Outfall	PR417105	Stormwater	Corrugated Metal	Left Bank	36		No			5	1	1
Pipe Outfall	PR417113	Stormwater	Corrugated Metal	Right Bank	30		No			5	1	1
Pipe Outfall	PR417205	Stormwater	Concrete Channel	Right Bank		4	No			5	1	1
Pipe Outfall	PR424201	Stormwater	Concrete Pipe	Left Bank	24		No			5	1	2
Pipe Outfall	PR425209	Stormwater	Concrete Channel	Left Bank		4	No			5	1	2
Pipe Outfall	PR442213	Stormwater	Smooth Metal Pipe	Right Bank	6		No			5	1	1
Pipe Outfall	PR445126	Stormwater	Plastic	Right Bank	2		No			5	1	2
Pipe Outfall	PR450209	Stormwater	Corrugated Metal	Right Bank	20		No			5	2	1
Pipe Outfall	PR450304	Stormwater	Concrete Channel	Right Bank		1	No			5	1	1

Erosion

Problem	Site Number	Type	Possible Cause	Height(ft)	Length(ft)	Land Use Left	Land Use Right	Infrastructure Threatened?	Describe	Severity	Correctability	Access
Erosion	PR406204	Downcutting	Below road crossing	10	3300	Shrubs/Small Trees	Shrubs/Small Trees	No		1	5	1
Erosion	PR417106	Unknown	Unknown	15	1400	Shrubs/Small Trees	Paved	No		1	5	1
Erosion	PR418111	Widening	Bend at steep slope	8	1000	Shrubs/Small Trees	Lawn	No		1	5	2
Erosion	PR416205	Widening	Bend at steep slope	10	150	Pasture	Shrubs/Small Trees	No		2	2	2
Erosion	PR444103	Downcutting	Land use change upstream	5	2500	Forest	Forest	No		2	3	4
Erosion	PR316201	Headcutting	unknown	3	750	Forest	Forest	No		3	3	2
Erosion	PR331201	Downcutting		8	600	Forest	Forest	No		3	3	4
Erosion	PR331203	Downcutting		6	500	Lawn	Forest	No		3	3	1
Erosion	PR404101	Widening	Unknown	4	1000	Forest	Paved	No		3	3	1
Erosion	PR407102	Widening	Bend at steep slope	10	400	Forest	Shrubs/Small Trees	No		3	3	2
Erosion	PR416201	Downcutting	Land use change upstream	8	50	Shrubs/Small Trees	Shrubs/Small Trees	No		3	3	2
Erosion	PR416203	Downcutting	Below channelization	5	350	Pasture	Pasture	No		3	2	1
Erosion	PR419101	Widening	Land use change upstream	5	300	Lawn	Lawn	No		3	2	1
Erosion	PR422202	Widening	Unknown	3	1000	Shrubs/Small Trees	Shrubs/Small Trees	No		3	3	1
Erosion	PR424203	Widening	Below channelization	5	500	Shrubs/Small Trees	Shrubs/Small Trees	No		3	3	2
Erosion	PR438107	Widening	Below road crossing	4	500	Paved	Lawn	No		3	3	1
Erosion	PR446101	Headcutting	Land use change upstream	4	500	Pasture	Forest	No		3	3	1
Erosion	PR448101	Headcutting	Unknown	8	500	Forest	Forest	No		3	3	5
Erosion	PR450201	Widening	Bend at steep slope	3	800	Forest	Forest	No		3	3	3
Erosion	PR450301	Downcutting	Below road crossing	8	250	Shrubs/Small Trees	Shrubs/Small Trees	No		3	3	1
Erosion	PR451201	Headcutting	Unknown	7	200	Shrubs/Small Trees	Shrubs/Small Trees	No		3	2	2
Erosion	PR409101	Downcutting	Land use change upstream	2	600	Forest	Shrubs/Small Trees	No		4	3	1
Erosion	PR411203	Headcutting	Below channelization	3	200	Shrubs/Small Trees	Shrubs/Small Trees	No		4	2	1
Erosion	PR415103	Widening	Land use change upstream	5	350	Lawn	Shrubs/Small Trees	No		4	2	2
Erosion	PR416212	Headcutting	Below road crossing	3	100	Shrubs/Small Trees	Shrubs/Small Trees	No		4	2	3
Erosion	PR422102	Widening	Below road crossing	4	50	Shrubs/Small Trees	Pasture	Yes		4	2	1
Erosion	PR424206	Widening	Land use change upstream	4	200	Shrubs/Small Trees	Shrubs/Small Trees	No		4	3	2
Erosion	PR424211	Widening	Unknown	3	100	Lawn	Shrubs/Small Trees	No		4	3	2
Erosion	PR425203	Widening	Bend at steep slope	5	250	Shrubs/Small Trees	Shrubs/Small Trees	No		4	3	3
Erosion	PR425205	Widening	Bend at steep slope	5.5	100	Shrubs/Small Trees	Shrubs/Small Trees	No		4	3	3
Erosion	PR433203	Widening	Below road crossing	4	200	Shrubs/Small Trees	Shrubs/Small Trees	No		4	3	3
Erosion	PR434107	Widening	Land use change upstream	3	500	Forest	Forest	No		4	3	3
Erosion	PR435201	Widening	Bend at steep slope	4	200	Shrubs/Small Trees	Shrubs/Small Trees	No		4	2	2
Erosion	PR435205	Widening	Bend at steep slope	4.5	150	Lawn	Shrubs/Small Trees	No		4	3	2

Erosion

Problem	Site Number	Type	Possible Cause	Height(ft)	Length(ft)	Land Use Left	Land Use Right	Infrastructure Threatened?	Describe	Severity	Correctability	Access
Erosion	PR439202	Widening	Bend at steep slope	3	550	Shrubs/Small Trees	Shrubs/Small Trees	No		4	3	2
Erosion	PR442206	Widening	Bend at steep slope	3	400	Shrubs/Small Trees	Shrubs/Small Trees	No		4	3	3
Erosion	PR450205	Downcutting	Bend at steep slope	3	250	Shrubs/Small Trees	Shrubs/Small Trees	No		4	2	2
Erosion	PR453201	Downcutting	Bend at steep slope	6	20	Lawn	Shrubs/Small Trees	No		4	2	1
Erosion	PR453206	Downcutting	Bend at steep slope	5	100	Shrubs/Small Trees	Shrubs/Small Trees	No		4	3	3
Erosion	PR453209	Widening	Land use change upstream	4	800	Shrubs/Small Trees	Forest	No		4	2	3
Erosion	PR454203	Widening	Below road crossing	2	2200	Shrubs/Small Trees	Lawn	No		4	2	1
Erosion	PR454206	Widening	Bend at steep slope	5	500	Shrubs/Small Trees	Shrubs/Small Trees	No		4	2	3
Erosion	PR460201	Widening	Land use change upstream	5	350	Lawn	Lawn	No		4	3	1
Erosion	PR460204	Widening	Bend at steep slope	3	300	Shrubs/Small Trees	Lawn	No		4	3	2
Erosion	PR314201	Downcutting	Land use change upstream	5	50	Shrubs/Small Trees	Shrubs/Small Trees	No		5	2	2
Erosion	PR434105	Widening	Bend at steep slope	8	40	Other	Forest	No		5	2	2
Erosion	PR435206	Widening	Bend at steep slope	5	50	Lawn	Shrubs/Small Trees	Yes	close to house	5	3	1
Erosion	PR439204	Downcutting	Below road crossing	2	550	Forest	Forest	No		5	2	3
Erosion	PR445104	Widening	Land use change upstream	4	200	Forest	Forest	No		5	1	1
Erosion	PR445115	Widening	Land use change upstream	4	50	Forest	Forest	No		5	1	2
Erosion	PR445120	Widening	Bend at steep slope	5	30	Forest	Forest	No		5	3	2
Erosion	PR445122	Headcutting	Land use change upstream	4	50	Shrubs/Small Trees	Forest	No		5	2	2
Erosion	PR445124	Widening	Bend at steep slope	4	50	Shrubs/Small Trees	Forest	No		5	3	2
Erosion	PR461205	Widening	Bend at steep slope	4	400	Shrubs/Small Trees	Shrubs/Small Trees	No		5	3	3
Erosion	PR462201	Widening	Bend at steep slope	5	350	Shrubs/Small Trees	Shrubs/Small Trees	No		5	3	3
Erosion	PR469201	Headcutting	Below road crossing	1	250	Shrubs/Small Trees	Shrubs/Small Trees	No		5	2	1

Inadequate Buffers

Problem	Site Number	Sides	Unshaded	WidthLeft(ft)	WidthRight(ft)	LengthLeft(ft)	LengthRight(ft)	Land Use Left	Land Use Right	RecentlyestablishedLivestock		Severity	Correctability	Access	Wetland
Inadequate Buffer	PR430201	Both	Left	10	25	4500	4500	Shrubs/Small trees	Shrubs/Small trees	No	No	1	2	1	2
Inadequate Buffer	PR435101	Both	Both	0	0	900	900	Pasture	Pasture	No	No	1	2	3	3
Inadequate Buffer	PR435102	Both	Both	0	0	1250	1100	Pasture	Pasture	No	No	1	2	1	4
Inadequate Buffer	PR438109	Both	Both	0	0	800	1000	Paved	Paved	No	No	1	4	1	5
Inadequate Buffer	PR411401	Right	Neither	0	0	1300	2100	Shrubs/Small trees	Lawn	No	No	2	2	1	4
Inadequate Buffer	PR431206	Right	Right		0		3000	Shrubs/Small trees	Lawn	No	No	2	2	1	3
Inadequate Buffer	PR433205	Both	Both	0	0	750	750	Paved	Lawn	No	No	2	2	1	3
Inadequate Buffer	PR439203	Left	Both	5	30	1700		Shrubs/Small trees	Shrubs/Small trees	No	No	2	3	2	2
Inadequate Buffer	PR442212	Both	Both	0	0	1200	1200	Cemetery	Cemetery	No	No	2	2	1	3
Inadequate Buffer	PR461201	Both	Both	0	0	800	900	Shrubs/Small trees	Shrubs/Small trees	No	No	2	4	2	3
Inadequate Buffer	PR464104	Both	Neither	5	5	1100	1400	Shrubs/Small trees	Lawn	No	No	2	4	3	5
Inadequate Buffer	PR405102	Both	Both	10	0	1000	1000	Shrubs/Small trees	Paved	No	No	3	4	1	5
Inadequate Buffer	PR408101	Right	Neither		0		2000	Shrubs/Small trees	Shrubs/Small trees	No	No	3	1	2	3
Inadequate Buffer	PR416215	Both	Both	0	0	600	525	Construction	Construction	No	No	3	3	2	4
Inadequate Buffer	PR417112	Right			0		1400	Paved		No	No	3	2	1	5
Inadequate Buffer	PR424204	Both	Both	0	10	400	400	Shrubs/Small trees	Shrubs/Small trees	No	No	3	2	2	4
Inadequate Buffer	PR424205	Left	Left	0		900		Shrubs/Small trees		No	No	3	3	2	5
Inadequate Buffer	PR444112	Left	Left	0		250		Golf Course	Golf Course	No	No	3	3	1	5
Inadequate Buffer	PR450204	Left	Both	0		2100		Shrubs/Small trees	Shrubs/Small trees	No	No	3	2	2	3
Inadequate Buffer	PR452205	Both	Left	0	10	500	500	Shrubs/Small trees	Other	No	No	3	2	1	2
Inadequate Buffer	PR453204	Both	Both	0		350		Lawn	Lawn	No	No	3	3	1	5
Inadequate Buffer	PR454201	Right	Right		0		1400	Shrubs/Small trees	Lawn	No	No	3	1	1	3
Inadequate Buffer	PR465102	Left	Neither	0		500		Lawn	Shrubs/Small trees	No	No	3	3	3	4
Inadequate Buffer	PR469202	Both	Both	10	10	1500	1500	Shrubs/Small trees	Shrubs/Small trees	No	No	3	2	1	3
Inadequate Buffer	PR312201	Right	Neither		5		1000	Shrubs/Small trees	Shrubs/Small trees	No	No	4	2	2	3
Inadequate Buffer	PR331202	Right	Right		10		1200	Forest	Lawn	No	No	4	1	1	5
Inadequate Buffer	PR405203	Both	Right	0	0	800	800	Shrubs/Small trees	Shrubs/Small trees	No	No	4	3	4	3
Inadequate Buffer	PR407103	Right	Right		0		300	Forest	Pasture	No	No	4	1	1	3
Inadequate Buffer	PR411202	Both	Both	0	0	200	450	Shrubs/Small trees	Shrubs/Small trees	No	No	4	2	1	3
Inadequate Buffer	PR424212	Both	Neither	10	10	1000	1000	Lawn	Lawn	No	No	4	3	1	5
Inadequate Buffer	PR435202	Both	Neither	10	20	1500	1500	Lawn	Shrubs/Small trees	No	No	4	2	3	3
Inadequate Buffer	PR442203	Both	Both	0	0	200	200	Lawn	Lawn	No	No	4	2	1	2
Inadequate Buffer	PR444106	Left	Neither	20		700		Golf Course	Golf Course	No	No	4	4	2	2

Inadequate Buffers

Problem	Site Number	Sides	Unshaded	WidthLeft(ft)	WidthRight(ft)	LengthLeft(ft)	LengthRight(ft)	Land Use Left	Land Use Right	RecentlyestablishedLivestock		Severity	Correctability	Access	Wetland
Inadequate Buffer	PR445129	Both	Both	0	0	500	500	Construction	Construction	No	No	4	3	2	4
Inadequate Buffer	PR452203	Left	Left	0		400		Lawn	Shrubs/Small trees	No	No	4	3	2	5
Inadequate Buffer	PR453202	Both	Neither	15	15	600	600	Lawn	Lawn	No	No	4	3	1	4
Inadequate Buffer	PR461203	Left	Neither	10		500		Lawn	Shrubs/Small trees	No	No	4	3	2	3
Inadequate Buffer	PR461204	Both	Both	0	0	200	200	Lawn	Lawn	No	No	4	1	1	4
Inadequate Buffer	PR462208	Both	Neither	10	5	200	200	Lawn	Lawn	No	No	4	2	1	5
Inadequate Buffer	PR412205	Both	Neither	20	20	500	500	Lawn	Lawn	No	No	5	1	1	4
Inadequate Buffer	PR413201	Left	Neither	10		1400		Paved	Shrubs/Small trees	No	No	5	2	1	5
Inadequate Buffer	PR415102	Right	Right		10		300	Shrubs/Small trees	Lawn	No	No	5	2	1	3
Inadequate Buffer	PR416202	Right		20	5	500	500	Shrubs/Small trees	Shrubs/Small trees	No	No	5	3	2	2
Inadequate Buffer	PR418101	Both		0	15	300	300	Lawn	Lawn	No	No	5	2	1	4
Inadequate Buffer	PR418103	Right	Right		0		200	Lawn	Paved	No	No	5	3	2	5
Inadequate Buffer	PR419102	Both	Neither	10	30	150	100	Lawn	Lawn	No	No	5	2	1	4
Inadequate Buffer	PR453207	Right	Right		0		100	Shrubs/Small trees	Lawn	No	No	5	3	3	5
Inadequate Buffer	PR462101	Left	Neither	20		1200		Other	Shrubs/Small trees	No	No	5	1	1	1

Tree Blockages

Problem	Site Number	Extent	Severity	Tree Size	Instream Location	Orientation To Flow	Composition	Debris Collection	Impacts	Nearest Bridge/Culvert	Surrounding Land Use	Floodplain Size
Tree Blockage	PR402201	Partial	Moderate	Large	Wholly	Perpendicular	Trunk	Lots	No Impact	More Than 1/2 mile	Partially Developed	Medium
Tree Blockage	PR403102	Most	Minor	Medium	Wholly	Perpendicular	Trunk	Some	One Bank	More Than 1/2 mile	Natural	Large
Tree Blockage	PR404102	Most	Minor	Medium	Wholly	Perpendicular	Trunk	Some	One Bank	Within 1/2 mile	Natural	Large
Tree Blockage	PR404104	Partial	Minor	Small	Wholly	Perpendicular	Trunk	Some	No Impact	More Than 1/2 mile	Natural	Large
Tree Blockage	PR408103	Partial	Moderate	Medium	Partially	Angle	Trunk	Some	One Bank	Within 1/2 mile	Partially Developed	Small
Tree Blockage	PR408104	Partial	Moderate	Large	Partially	Perpendicular	Trunk	None	One Bank	Within 1/2 mile	Natural	Small
Tree Blockage	PR408105	Partial	Moderate	Large	Wholly	Perpendicular	Trunk	Some	One Bank	Within 1/2 mile	Natural	Small
Tree Blockage	PR410402	Partial	Minor	Small	Partially	Perpendicular	Branches	Some	One Bank	Within 1/2 mile	Fully Developed	Small
Tree Blockage	PR410404	Minor	Minor	Small	Partially	Perpendicular	Trunk	Some	One Bank	Within 1/2 mile	Fully Developed	Small
Tree Blockage	PR412301	Most	Minor	Small	Wholly	Perpendicular	Branches	Some	No Impact	Within 1/2 mile	Partially Developed	Large
Tree Blockage	PR412302	Most	Minor	Large	Partially	Perpendicular	Branches	Lots	One Bank	Within 1/2 mile	Partially Developed	Large
Tree Blockage	PR412304	Minor	Minor	Small	Partially	Angle	Branches	Some	No Impact	Within 1/2 mile	Partially Developed	Large
Tree Blockage	PR412305	Minor	Minor	Small	Partially	Perpendicular	Branches	Some	No Impact	Within 1/2 mile	Partially Developed	Large
Tree Blockage	PR417101	Minor	Minor	Small	Wholly	Angle	Trunk	Some	One Bank	Within 1/2 mile	Natural	Small
Tree Blockage	PR418104	Most	Moderate	Medium	Partially	Angle	Trunk	Some	No Impact	More Than 1/2 mile	Mostly Developed	Small
Tree Blockage	PR418107	Most	Severe	Medium	Wholly	Perpendicular	Trunk	Some	No Impact	More Than 1/2 mile	Partially Developed	Medium
Tree Blockage	PR418108	Minor	Moderate	Small	Wholly	Perpendicular	Trunk	Some	No Impact	More Than 1/2 mile	Partially Developed	Medium
Tree Blockage	PR418110	Partial	Minor	Medium	Wholly	Angle	Trunk	None	One Bank	Within 1/2 mile	Partially Developed	Medium
Tree Blockage	PR425202	Complete	Moderate	Small	Wholly	Perpendicular	Branches	Some	No Impact	More Than 1/2 mile	Partially Developed	Medium
Tree Blockage	PR434106	Most	Minor	Medium	Partially	Perpendicular	Trunk	Some	No Impact	More Than 1/2 mile	Natural	Small
Tree Blockage	PR438101	Partial	Moderate	Small	Partially	Angle	Branches	Some	No Impact	More Than 1/2 mile	Partially Developed	Small
Tree Blockage	PR438103	Partial	Severe	Medium	Partially	Perpendicular	Branches	Lots	One Bank	More Than 1/2 mile	Partially Developed	Small
Tree Blockage	PR444105	Most	Moderate	Small	Partially	Perpendicular	Trunk	Some	No Impact	Within 1/2 mile	Natural	Small
Tree Blockage	PR444108	Partial	Minor	Medium	Partially	Angle	Trunk	None	No Impact	More Than 1/2 mile	Fully Developed	Small
Tree Blockage	PR444114	Most	Moderate	Medium	Partially		Trunk	Some	No Impact	Within 250 ft.	Fully Developed	Small
Tree Blockage	PR445101	Minor	Minor	Medium	Partially	Perpendicular	Trunk	Some	One Bank	Within 250 ft.	Partially Developed	Small
Tree Blockage	PR445116	Partial	Minor	Small	Partially	Perpendicular	Trunk	Lots	One Bank	More Than 1/2 mile	Partially Developed	Medium
Tree Blockage	PR445117	Complete	Severe	Medium	Wholly	Perpendicular	Branches	Lots	One Bank	More Than 1/2 mile	Partially Developed	Medium
Tree Blockage	PR445121	Minor	Minor	Small	Partially	Perpendicular	Branches	Some	One Bank	Within 1/2 mile	Partially Developed	Medium
Tree Blockage	PR445125	Most	Minor	Small	Partially	Perpendicular	Branches	Lots	No Impact	Within 1/2 mile	Partially Developed	Small
Tree Blockage	PR445127	Complete	Moderate	Small	Partially	Perpendicular	Branches	Lots	No Impact	Within 100 ft.	Partially Developed	Small
Tree Blockage	PR445130	Minor	Minor	Small	Partially	Angle	Trunk	Some	One Bank	Within 250 ft.	Fully Developed	Small

Tree Blockages

Problem	Site Number	Extent	Severity	Tree Size	Instream Location	Orientation To Flow	Composition	Debris Collection	Impacts	Nearest Bridge/Culvert	Surrounding Land Use	Floodplain Size
Tree Blockage	PR445131	Minor	Minor	Medium	Wholly	Angle	Trunk	None	One Bank	Within 250 ft.	developed	Small
Tree Blockage	PR445132	Minor	Minor	Medium	Partially	Perpendicular	Trunk	Some	One Bank	Within 250 ft.	Partially Developed	Small
Tree Blockage	PR452202	Partial	Minor	Large	Wholly	Perpendicular	Trunk	Some	One Bank	Within 1/2 mile	Fully Developed	Medium
Tree Blockage	PR452204	Partial	Moderate	Medium	Partially	Perpendicular	Trunk	Some	One Bank	Within 1/2 mile	Partially Developed	Medium

Fish Barriers

Problem	Site Number	Blockage	Type	Reason	Drop(In)	Depth(In)	Severity	Correctability	Access
Fish Barrier	PR317101	Partial	Dam	Too high	24		2	4	3
Fish Barrier	PR417116	Total	Pipe Crossing	Too high	36		3	4	2
Fish Barrier	PR430202	Total	Road crossing	Too high	36		3	4	1
Fish Barrier	PR433204	Total	Road crossing	Too high	10		3	4	1
Fish Barrier	PR453203	Total	Road crossing	Too high	24		3	3	1
Fish Barrier	PR406201	Total	Channelized	Too high	36		4	4	1
Fish Barrier	PR412201	Total	Road crossing	Too high	36		4	3	1
Fish Barrier	PR412303	Temporary	Debris dam	Too high	24		4	2	3
Fish Barrier	PR412306	Total	Dam	Too high	24		4	3	3
Fish Barrier	PR405105	Total	Natural falls	Too high	20		5	3	1
Fish Barrier	PR414101	Temporary	Beaver dam	Too high	36		5	2	3
Fish Barrier	PR422101	Total	Road crossing	Too high	24		5	4	1
Fish Barrier	PR431203	Partial	Road crossing	Too shallow		2	5	4	1
Fish Barrier	PR442208	Total	Channelized	Too high	6		5	4	3
Fish Barrier	PR444104	Temporary	Debris dam	Too high	20		5	1	4
Fish Barrier	PR445103	Total	Natural falls	Too high	24		5	2	1
Fish Barrier	PR445105	Total	Natural falls	Too high	36		5	2	1
Fish Barrier	PR445114	Total	Debris dam	Too high	24		5	2	2
Fish Barrier	PR445118	Temporary	Debris dam	Too high	12		5	2	3
Fish Barrier	PR445123	Total	Natural falls	Too high	60		5	3	2
Fish Barrier	PR446102	Total	Natural falls	Too high	24		5	3	1
Fish Barrier	PR450303	Total	Road crossing	Too high	24		5	4	1
Fish Barrier	PR451203	Partial	Debris Dam	Too high	36		5	3	1

Exposed Pipes

Problem	Site Number	Location of Pipe	Type	Diameter(in)	Length(ft)	Purpose	Discharge	Color	Odor	Severity	Correctability	Access
Exposed Pipe	PR322101	eposed along stream bank	smooth me	36	50	unknown	No			3	3	1
Exposed Pipe	PR416211	Exposed manhole	concrete	36	3	sewage	No			3	4	3
Exposed Pipe	PR417116	Exposed across bottom of stream	concrete	36	15	unknown	No			3	5	2
Exposed Pipe	PR419103	Exposed manhole	concrete	36	5	sewage	No			3	4	2
Exposed Pipe	PR460202	Exposed along stream bank	concrete	18	4	unknown	No			3	5	4
Exposed Pipe	PR422203	Exposed manhole	concrete	36	2	unknown	No			4	5	2
Exposed Pipe	PR418102	Exposed manhole	concrete	36	3	sewage	No			5	4	1
Exposed Pipe	PR425201	Exposed across bottom of stream	plastic	4	5	unknown	No			5	2	2
Exposed Pipe	PR438105	Exposed manhole	concrete	24	1	sewage	No			5	3	4

Channel Alterations

Problem	Site Number	Type	BottomWidth(in)	Length(ft)	Perennial Flow	Sedimentation	Veg in Channel	Road Crossing	LengthAbove(ft)	LengthBelow(ft)	Severity	Correctability	Access
Channel Alteration	PR411201	Concrete	24	100	Yes	Yes	No	Below		100	3	4	3
Channel Alteration	PR417202	Concrete	24	700	Yes	No	No	No			3	3	1
Channel Alteration	PR435204	Rip-Rap	60	30	Yes	No	Yes	No			3	3	2
Channel Alteration	PR445107	Concrete	48	200	Yes	No	No	Above			3	3	1
Channel Alteration	PR438109	Earth Channel	36	1200	Yes	No	No	No			4	3	1
Channel Alteration	PR317102	Gabion	240	100	Yes	No	No	No			5	3	3
Channel Alteration	PR329201	Gabion	240	250	Yes	No	No	No			5	3	1

In/Near Stream Construction

Problem	Site Number	Type of Activity	Sediment Control	Why, if inadequate	Excess Sediment?	Length	Company	Severity
Construction	PR445128	Golf course?	Inadequate	No silt fence; Sediment in stream	Yes	40		2
Construction	PR415104	Residential development	Inadequate	Sediment coming over silt fence	Yes			3
Construction	PR416102	Road crossing	Inadequate		No			3
Construction	PR435101	Unknown	Adequate		Yes			3
Construction	PR424210	Residential development	Adequate		No	400		4
Construction	PR463101	Road	Inadequate	Fence, erosion control torn	No			4
Construction	PR442202	Industrial development	Adequate		No	100		5

Trash Dumping

Problem	Site Number	Type	Truckloads	Other measure	Extent	Volunteer Project?	Owner Type	Owner Name	Severity	Correctability	Access
Trash Dumping	PR422201	Residential	12		Large Area	No	Private		3	2	1
Trash Dumping	PR433202	Residential	4		Single Site	Yes	Unknown		3	1	3
Trash Dumping	PR412204	Residential	2		Large Area	Yes	Private		5	1	1
Trash Dumping	PR424202	Residential	1		Single Site	Yes	Unknown		5	1	2

Unusual Conditions

Problem	Site Number	Describe	Cause	Severity	Correctability	Access
Unusual Condition	PR416202	Concrete road barriers in stream; potentially for bank protection		3	3	2
Comment	PR445102	Pond being drained at time of survey				

Pond Sites

Problem	Site Number	Type	Primary Use	Pond on Map?	Maintained?	Maintenance:	Eutrophication?	Trees/Animals
Pond Site	PR404103	Wet	Wildlife	Yes	Abandoned		No	Yes
Pond Site	PR404301	Wet	Wildlife	Yes	No		Too Cold	Yes
Pond Site	PR405301	Wet	StormWater	Yes	Yes		Too Cold	No
Pond Site	PR406301	Wet	Unknown	Yes	Yes		Too Cold	Unknown
Pond Site	PR408102	Wet	StormWater	Yes	Yes		Too Cold	Unknown
Pond Site	PR408301	Wet	StormWater	Yes	No	Trees cut	Too Cold	Yes
Pond Site	PR409301	Wet	StormWater	Yes	Yes		Too Cold	Yes
Pond Site	PR409302	Wet	StormWater	Yes	Yes		No	Yes
Pond Site	PR409303	Wet	StormWater	No	Yes		Too Cold	No
Pond Site	PR409304	Wet	StormWater	No	Yes		Too Cold	No
Pond Site	PR410408	Wet	StormWater	Yes	Yes		Too Cold	Yes
Pond Site	PR413301	Wet	Wildlife	Yes	No	Trees cut	Too Cold	Yes
Pond Site	PR414301	Wet	StormWater	Yes	Yes		Too Cold	Yes
Pond Site	PR415101	Wet	StormWater	Yes	Yes		Too Cold	Yes
Pond Site	PR415301	Wet	StormWater	Yes	Yes		Too Cold	Yes
Pond Site	PR415302	Wet	StormWater	Yes	Yes		Too Cold	No
Pond Site	PR415303	Wet	Unknown	Yes	Yes		Too Cold	Unknown
Pond Site	PR415304	Wet	Unknown	Yes	Yes		Too Cold	Unknown
Pond Site	PR415305	Wet	Unknown	Yes	Yes		Too Cold	Yes
Pond Site	PR415306	Wet	Unknown	Yes	Yes		Too Cold	Yes
Pond Site	PR415307	Wet	StormWater	Yes	Yes		Too Cold	Yes
Pond Site	PR416206	Wet	StormWater	No	Yes		Too Cold	No
Pond Site	PR416208	Wet	StormWater	No	Yes		Too Cold	No
Pond Site	PR416209	Dry	Unknown	Yes	Abandoned		Dry	No
Pond Site	PR416210	Wet	StormWater	Yes	Yes		Too Cold	Yes
Pond Site	PR416216	Wet	StormWater	No	Yes		No	No
Pond Site	PR417206	Wet	StormWater	No	Yes		Too Cold	No
Pond Site	PR417207	Dry	StormWater	No	Yes		Too Cold	No
Pond Site	PR418301	Wet	StormWater	Yes	Yes		No	No
Pond Site	PR418302	Wet	StormWater	Yes	Yes		No	Yes
Pond Site	PR418303	Wet	StormWater	Yes	Yes		Too Cold	No
Pond Site	PR419301	Wet	Unknown	Yes	Yes		No	Yes
Pond Site	PR419302	Wet	StormWater	Yes	Yes		No	No

Pond Sites

Problem	Site Number	Type	Primary Use	Pond on Map?	Maintained?	Maintenance:	Eutrophication?	Trees/Animals
Pond Site	PR420301	Wet	StormWater	Yes	Yes		No	No
Pond Site	PR423301	Wet	StormWater	Yes	Yes		Too Cold	Yes
Pond Site	PR423302	Wet	Wildlife	Yes	Yes		Too Cold	Yes
Pond Site	PR423303	Wetlands	Wildlife	Yes	No		Yes	Yes
Pond Site	PR423304	Wet	StormWater	Yes	Yes		No	Yes
Pond Site	PR423305	Wet	Unknown	Yes	Yes		Too Cold	No
Pond Site	PR424301	Wetlands	StormWater	Yes	Yes		No	No
Pond Site	PR424302	Dry	Unknown	Yes	Abandoned		Dry	Yes
Pond Site	PR426301	Wet	StormWater	Yes	Yes		Too Cold	No
Pond Site	PR426302	Wet	StormWater	Yes	Yes		Too Cold	Yes
Pond Site	PR430301	Wet	StormWater	Yes	Yes		No	No
Pond Site	PR430302	Wet	StormWater	Yes	Yes		No	Yes
Pond Site	PR431301	Wet	StormWater		No		No	Unknown
Pond Site	PR431302	Wet	StormWater	Yes	Yes		Too Cold	No
Pond Site	PR432301	Wet	StormWater	Yes	Yes		No	No
Pond Site	PR432302	Wet	StormWater	Yes	Yes		No	Yes
Pond Site	PR432303	Wet	StormWater	Yes	Yes		No	No
Pond Site	PR432304	Wet	StormWater	Yes	Yes		Yes	Yes
Pond Site	PR432305	Wetlands	StormWater	Yes	Yes		No	No
Pond Site	PR432306	Wet	StormWater	Yes	Yes		No	No
Pond Site	PR434101	Wet	StormWater	Yes	Yes		Too Cold	No
Pond Site	PR434102	Wet	StormWater	Yes	Yes		Too Cold	No
Pond Site	PR434103	Wet	StormWater	No	Yes		No	Yes
Pond Site	PR435301	Wet	StormWater	Yes	Yes		Too Cold	Yes
Pond Site	PR435302	Dry	StormWater	Yes	Yes		Yes	No
Pond Site	PR436301	Dry	Unknown	No	No		No	No
Pond Site	PR436302	Wet	Recreation	Yes	Yes		No	No
Pond Site	PR436303	Wet	StormWater	Yes	Yes		Yes	Yes
Pond Site	PR438301	Wet	StormWater	Yes	Yes		No	Yes
Pond Site	PR438302	Wet	Unknown	Yes	Unknown		Yes	Yes
Pond Site	PR438303	Wetlands	StormWater	Yes	Yes		No	No
Pond Site	PR439301	Wet	StormWater	Yes	Yes		No	No
Pond Site	PR439302	Wet	StormWater	Yes	Yes		No	No

Pond Sites

Problem	Site Number	Type	Primary Use	Pond on Map?	Maintained?	Maintenance:	Eutrophication?	Trees/Animals
Pond Site	PR441301	Wetlands	Unknown	Yes			No	No
Pond Site	PR441302	Dry	StormWater	Yes	Yes		Dry	Yes
Pond Site	PR441303	Wet	StormWater	Yes	Yes		No	Yes
Pond Site	PR442201	Wet	StormWater	Yes	Yes		No	No
Pond Site	PR442301	Wet	StormWater	Yes	Yes		No	Yes
Pond Site	PR442302	Wet	StormWater	Yes	Yes		No	No
Pond Site	PR443301	Wet	StormWater	Yes	Yes		Too Cold	Yes
Pond Site	PR444101	Wet	StormWater	Yes	Yes		Too Cold	No
Pond Site	PR444110	Wet	Recreation	No	Yes		Too Cold	No
Pond Site	PR444115	Wet	StormWater	Yes	Yes		Too Cold	No
Pond Site	PR444301	Wet	StormWater	Yes	Yes		Too Cold	No
Pond Site	PR445102	Wet	StormWater	Yes	Yes		Too Cold	No
Pond Site	PR445110	Wet	StormWater	Yes	Yes		Yes	No
Pond Site	PR445111	Wet	StormWater	Yes	Yes		No	No
Pond Site	PR445112	Wet	StormWater		Yes		Yes	No
Pond Site	PR445133	Other	Unknown	No	Yes		Too Cold	Yes
Pond Site	PR449301	Wet	StormWater	Yes	Yes		Yes	No
Pond Site	PR449302	Wetlands	StormWater	Yes	Yes		No	Yes
Pond Site	PR450202	Wet	StormWater	No	No		Too Cold	Unknown
Pond Site	PR450306	Wet	StormWater	Yes	No		No	No
Pond Site	PR450307	Wet	Unknown	No	No		No	Yes
Pond Site	PR450308	Wet	Unknown	Yes	Yes		No	No
Pond Site	PR451301	Dry	Unknown	Yes	Abandoned		Dry	No
Pond Site	PR452301	Wet	StormWater	Yes	Yes		Too Cold	Yes
Pond Site	PR453301	Wet	StormWater	Yes	Yes		No	No
Pond Site	PR453302	Wet	StormWater	Yes	Yes		No	No
Pond Site	PR453303	Wet	StormWater	Yes	Yes		Too Cold	No
Pond Site	PR454301	Wet	StormWater	No	Yes		No	No
Pond Site	PR454302	Wet	StormWater	Yes	Yes		No	No
Pond Site	PR454303	Dry	StormWater	No	Abandoned		Dry	No
Pond Site	PR455101	Wet	StormWater	Yes	Yes		Too Cold	No
Pond Site	PR455301	Wet	Unknown	Yes	Yes		No	No
Pond Site	PR459301	Wet	StormWater	Yes	Yes		Too Cold	No

Pond Sites

Problem	Site Number	Type	Primary Use	Pond on Map?	Maintained?	Maintenance:	Eutrophication?	Trees/Animals
Pond Site	PR460301	Wet	StormWater	Yes	Yes		No	No
Pond Site	PR462204	Wet	StormWater	Yes	Yes		No	Yes
Pond Site	PR462301	Wet	StormWater	Yes	Yes		No	Yes
Pond Site	PR462302	Wet	StormWater	Yes	No		Yes	No
Pond Site	PR462303	Dry	Construction	Yes	Unknown		Dry	No
Pond Site	PR463301	Wet	StormWater	Yes	Yes		Too Cold	No
Pond Site	PR464101	Wet	StormWater	Yes	Yes		No	No
Pond Site	PR464103	Wet	StormWater	No	No		No	Yes
Pond Site	PR465101	Wet	StormWater	Yes	No		No	Yes
Pond Site	PR465104	Wet	StormWater	Yes	Yes		Yes	No
Pond Site	PR467301	Wet	StormWater	Yes	Yes		Too Cold	No
Pond Site	PR468301	Wet	StormWater	Yes	Yes		No	No
Pond Site	PR469203	Wet	StormWater	No	Yes		Too Cold	Yes
Pond Site	PR469301	Wet	StormWater	Yes	Yes		No	Yes
Pond Site	PR469302	Wet	StormWater	Yes	Yes		No	No
Pond Site	PR469303	Wet	StormWater	Yes	Yes		No	Yes

Representative Sites A

Problem	Site Number	Substrate	Embeddedness	Shelter for Fish	Channel Alteration	Sediment Deposition	Velocity/Depth	Flow	Vegetation	Bank Condition	Riparian Vegetation
Patapsco Mainstem											
Representative Site	PR301101	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal
Representative Site	PR309101	Optimal	Suboptimal	Optimal	Optimal	Suboptimal	Optimal	Optimal	Suboptimal	Optimal	Optimal
Representative Site	PR315201	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal
Representative Site	PR318101	Optimal	Optimal	Optimal	Suboptimal	Optimal	Optimal	Optimal	Optimal	Optimal	Suboptimal
Representative Site	PR330201	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Poor	Optimal	Optimal	Optimal	Optimal	Optimal
Deep Run											
Representative Site	PR403101	Marginal	Poor	Suboptimal	Suboptimal	Poor	Suboptimal	Suboptimal	Suboptimal	Optimal	Optimal
Representative Site	PR412101	Suboptimal	Optimal	Suboptimal	Suboptimal	Marginal	Optimal	Optimal	Marginal	Marginal	Marginal
Representative Site	PR412206	Suboptimal	Optimal	Suboptimal	Suboptimal	Optimal	Suboptimal	Suboptimal	Marginal	Suboptimal	Marginal
Representative Site	PR414103	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Marginal	Suboptimal	Suboptimal
Representative Site	PR416204	Optimal	Optimal	Marginal	Optimal	Suboptimal	Optimal	Optimal	Suboptimal	Marginal	Optimal
Representative Site	PR417111	Marginal	Marginal	Marginal	Suboptimal	Marginal	Suboptimal	Suboptimal	Suboptimal	Marginal	Suboptimal
Representative Site	PR418106	Poor	Poor	Marginal	Suboptimal	Poor	Suboptimal	Suboptimal	Marginal	Suboptimal	Suboptimal
Representative Site	PR424208	Suboptimal	Suboptimal	Optimal	Suboptimal	Suboptimal	Optimal	Suboptimal	Suboptimal	Marginal	Suboptimal
Representative Site	PR424214	Optimal	Optimal	Marginal	Optimal	Optimal	Optimal	Optimal	Suboptimal	Marginal	Marginal
Representative Site	PR431202	Optimal	Optimal	Suboptimal	Suboptimal	Suboptimal	Optimal	Optimal	Suboptimal	Suboptimal	Marginal
Representative Site	PR438104	Suboptimal	Suboptimal	Optimal	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Optimal	Optimal	Optimal
Representative Site	PR442214	Suboptimal	Suboptimal	Marginal	Optimal	Suboptimal	Suboptimal	Optimal	Poor	Marginal	Poor
Representative Site	PR444102	Optimal	Suboptimal	Marginal	Suboptimal	Marginal	Optimal	Optimal	Suboptimal	Marginal	Optimal
Representative Site	PR445119	Optimal	Marginal	Suboptimal	Optimal	Marginal	Optimal	Optimal	Suboptimal	Suboptimal	Suboptimal
Representative Site	PR445136	Optimal	Suboptimal	Suboptimal	Optimal	Marginal	Suboptimal	Suboptimal	Suboptimal	Marginal	Suboptimal
Representative Site	PR450203	Suboptimal	Suboptimal	Marginal	Optimal	Suboptimal	Suboptimal	Optimal	Suboptimal	Marginal	Marginal
Representative Site	PR453205	Suboptimal	Suboptimal	Suboptimal	Optimal	Suboptimal	Optimal	Optimal	Suboptimal	Marginal	Suboptimal
Representative Site	PR453208	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Optimal	Optimal	Optimal	Suboptimal	Suboptimal	Suboptimal
Representative Site	PR462202	Optimal	Optimal	Optimal	Optimal	Suboptimal	Optimal	Optimal	Suboptimal	Suboptimal	Marginal
Representative Site	PR464102	Marginal	Marginal	Optimal	Optimal	Marginal	Optimal	Optimal	Optimal	Optimal	Optimal

Representative Sites B

Problem	Site Number	Width Riffle	Width Run	Width Pool	Depth Riffle	Depth Run	Depth Pool	Bottom Type
Patapsco Mainstem								
Representative Site	PR301101	180	360	120	12	36	72	Gravel
Representative Site	PR309101	240	360	96	18	30	72	Gravel
Representative Site	PR315201	60	60	24	12	12	12	Cobble
Representative Site	PR318101	600	780	120	18	36	66	Gravel
Representative Site	PR330201	180	360	120	18	48	48	Cobble
Deep Run								
Representative Site	PR403101	48	120	48	24	36	40	Silt
Representative Site	PR412101	12	48	48	6	240	36	Gravel
Representative Site	PR412206	8	36	24	2	3	5	Silt
Representative Site	PR414103	48	180	120	6	30	36	Gravel
Representative Site	PR416204	36	48	24	3	5	24	Cobble
Representative Site	PR417111	30	84		3	24		Bedrock
Representative Site	PR418106	12	48	36	2	3	18	Silt
Representative Site	PR424208	7	36	12	234	24	36	Gravel
Representative Site	PR424214	96	120	60	6	8	24	Gravel
Representative Site	PR431202	36	72	24	4	8	10	Gravel
Representative Site	PR438104	36	40	30	12	10	15	Sand
Representative Site	PR442214	48	48	12	2	10	18	Silt
Representative Site	PR444102	48	60	24	4	4	12	Gravel
Representative Site	PR445119	30	120	48	6	8	30	Gravel
Representative Site	PR445136	24	24	60	1	3	12	Cobble
Representative Site	PR450203	36	96	24	3	10	3	Cobble
Representative Site	PR453205	24	40	18	2	8	12	Silt
Representative Site	PR453208	48	84	48	5	12	36	Silt
Representative Site	PR462202	48	72	30	4	6	18	Cobble
Representative Site	PR464102	30	30	30	3	6	15	Gravel