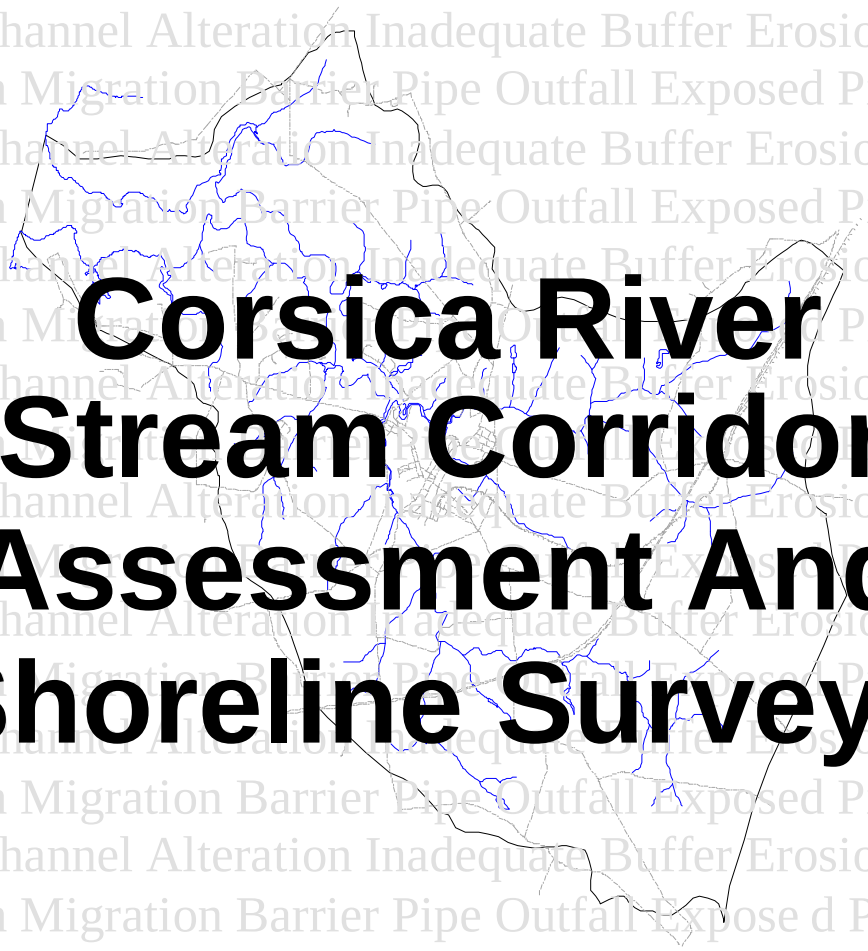
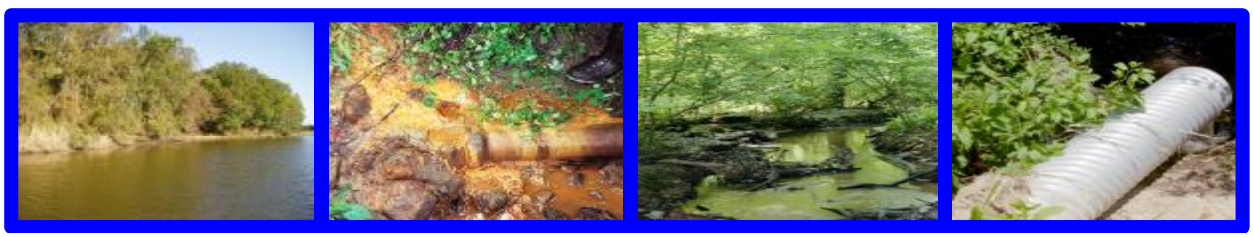


Corsica River Stream Corridor Assessment And Shoreline Surveys

Watershed Assessment and Targeting Division
Watershed Services Unit
Maryland Department of Natural Resources
August 2004



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CORSICA RIVER STREAM CORRIDOR ASSESSMENT AND SHORELINE SURVEYS

BY

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Watershed Services Unit
Maryland Department of Natural Resources

August 2004

Financial Assistance provided by the Coastal Zone Management Act of 1972, as amended, administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration (NOAA). A report of the Maryland Coastal Zone Management Program, Department of Natural Resources pursuant to NOAA Award No. NA170Z2337

SUMMARY

In 1998, the Maryland Clean Water Action Plan identified the Corsica 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), the Town of Centreville, Queen Anne's County and local stakeholders formed a partnership to develop a Watershed Restoration Action Strategy (WRAS) for the Corsica River watershed. The following Stream Corridor Assessment (SCA) and Shoreline Surveys is part of the WRAS development process.

The SCA and Shoreline Surveys provide descriptive and positional data for potential environmental problems along a watershed's non-tidal streams and tidal shoreline. Developed by DNR's Watershed Services Unit, the surveys are a watershed management tool to identify environmental problems and help prioritize restoration opportunities on a watershed basis. As part of the surveys, specially trained personnel either walk a watershed's streams, or slowly cruise along the shoreline in a small boat and record data and the location for potential environmental problems that can be easily observed. Each potential problem site is also ranked on a scale of one to five for its severity, correctability, and access for restoration work. SCA survey fieldwork for the Corsica River began in May 2003 and was completed by August 2003. The tidal portion of the survey was conducted in October, 2003. To complete the survey, field crews walked over 45 miles of streams, and slowly cruised along the 25 miles of shoreline.

During the stream survey, field teams identified 247 potential environmental problem sites. The observed potential problems were: erosion sites (57 sites, 12.2 miles), pipe outfalls (56 sites), fish barriers (53 sites), inadequately buffered stream or river banks (34 sites, 4 miles), altered shorelines (24 sites), channel alterations (20 sites, 1.17 miles), unusual conditions/comments (11 sites), trash dumping sites (8 sites), in/near stream construction (4 sites), and exposed pipes (4 sites). Additionally, crews recorded descriptive habitat condition data at 27 representative sites.

The shoreline survey identified 49 potential environmental problems. The most frequently reported problem was altered shorelines, which were seen at 24 sites and estimated to be 10% (2.5 miles) of the tidal shoreline of the Corsica River. The second most frequently observed problem was inadequate shoreline buffers. Eighteen inadequate buffer sites were identified, which covered approximately 19% (4.7 miles) of the total shoreline. The last problem identified during the shoreline survey was shoreline erosion. Excessive shoreline erosion was seen at 7 sites and covered 3% (0.7 miles) of the tidal shoreline.

The Stream Corridor Assessment and Shoreline Surveys provides a rapid overview of the entire stream network in order to determine the location of potential environmental problems and to collect some basic environmental information. The value of the present surveys are that they help in placing individual problems into a watershed context so that future restoration work can be prioritized. Results of the present surveys have been given to the Corsica River Watershed WRAS committee, which is developing a Watershed Restoration Action Strategy for the Corsica River. Information on the Corsica River WRAS can be found on the Department of Natural Resources' website www.dnr.state.md.us/watersheds/surf/proj/wras.html).

ACKNOWLEDGEMENTS

Without the hard work and dedication of the Elk Neck Crew of the Maryland Conservation Corps, this survey would not have been possible. The crew chief during the survey was Margot Pruett. The crewmembers were Heidi Butterworth, Mike Elliott, Grant Holly, Mike Miller, Joe Supik, and Matt Webb. We also wish to acknowledge The Chester Riverkeeper, Dr. Eileen McLellan and the Chester River Association who volunteered both their time and boat to assist us in doing the Shoreline Survey.

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SHORELINE SURVEY

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 Corsica River Watershed. This watershed encompasses approximately 25,298 acres of land and water in the Chester River Watershed of Maryland's Eastern Shore (Figure 1). In response to the findings of the Maryland Clean Water Action Plan, the Maryland Department of Natural Resources formed a partnership with the Town of Centreville, Queen Anne's County and local stakeholders to assess and improve environmental conditions in the Corsica and Chester River Watersheds. The main goal of this partnership is to develop and implement a Watershed Restoration Action Strategy (WRAS) for the Corsica River.

The Corsica River is a tributary of the Chester River. Located in central Queen Anne's County with the Town of Centreville located at the river's tidal head (Shanks, 2003). The watershed covers approximately 23,903 acres of land (37.3 square miles) and 1,395 acres of water (2.2 square miles). According to categories established by the Maryland Department of Planning land use data for 2000, the land use in the watershed is 64% agricultural, 28% forest/scrub/shrub, 7% developed, and less than 0.5% wetland. Figure 2 shows a digital orthophoto map of the watershed. Figure 3 shows the same watershed boundaries superimposed on a 7.5 minute USGS topographic quadrangle maps.

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, 2004). Secondly, a synoptic water quality surveys, as well as surveys of the fish and macroinvertebrate communities, were conducted at selected stations throughout the Corsica River watershed to provide information on the present condition of water quality and aquatic resources (Primrose, 2003). Lastly, Stream Corridor Assessment (SCA) and Shoreline Surveys are done to provide specific information on the location of potential environmental problems and restoration opportunities. This report details the results of the Corsica River Stream Corridor Assessment and Shoreline Surveys.

Survey teams walked over 48 miles of the Corsica River's stream network from May 2003 to August 2003, and boated over 24 miles of coastline in October 2003. At each site during the survey, field crews collected descriptive data, recorded the location on field maps, and took a photograph to document each potential environmental problem observed. As an aid to prioritizing future restoration work, crews rated all problem sites on a scale of one to five 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 machinery necessary to complete restoration work. In addition, field teams collect descriptive data for both in- and near-stream habitat conditions at representative sites spaced at approximately 1-mile intervals along the stream.

One of the main goals of the Corsica River SCA survey is to compile a list of observable environmental problems in this watershed to help 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 watersheds' management and plan future restoration work at specific problem sites.

To this end, the Maryland Department of Natural Resources is working with the town of Centreville, Queen Anne's County and the WRAS committee to develop a Watershed Restoration Action Strategy (WRAS) of the Corsica River Watershed. As part of this process, data collected during the Stream Corridor Assessment and the Shoreline Surveys will be used to help define present environmental conditions and possible restoration opportunities in the watershed. This information, combined with the watershed characterization, synoptic water quality surveys, recent biological surveys, and local knowledge of the watershed will be used to develop a Watershed Restoration Action Strategy for the Corsica River. The Watershed Restoration Action Strategy, in turn, will help guide future restoration and preservation efforts with the ultimate goals of restoring the area's natural resources and meeting State water quality standards.

Corsica River Watershed
Queen Anne's County, Maryland

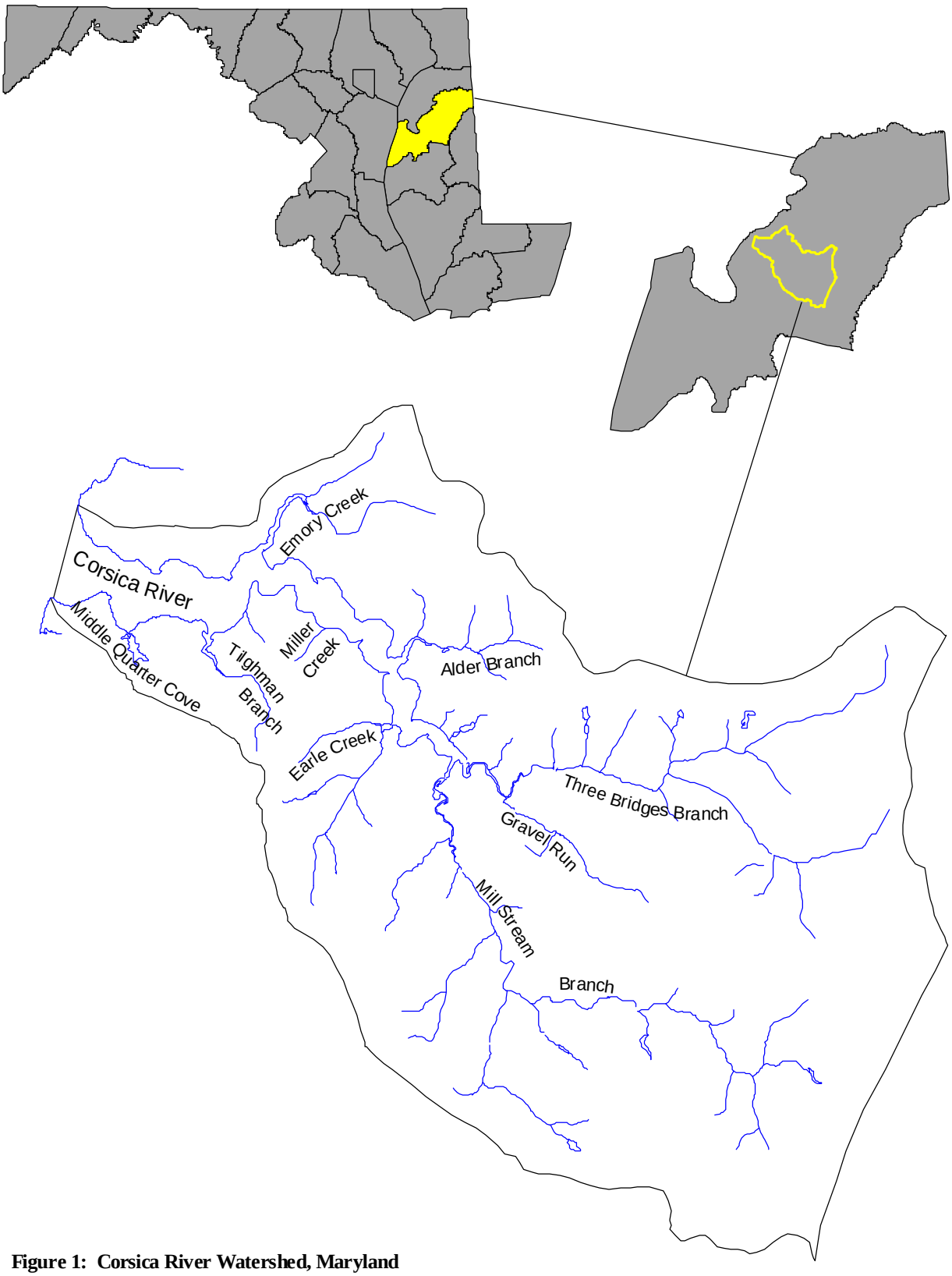


Figure 1: Corsica River Watershed, Maryland

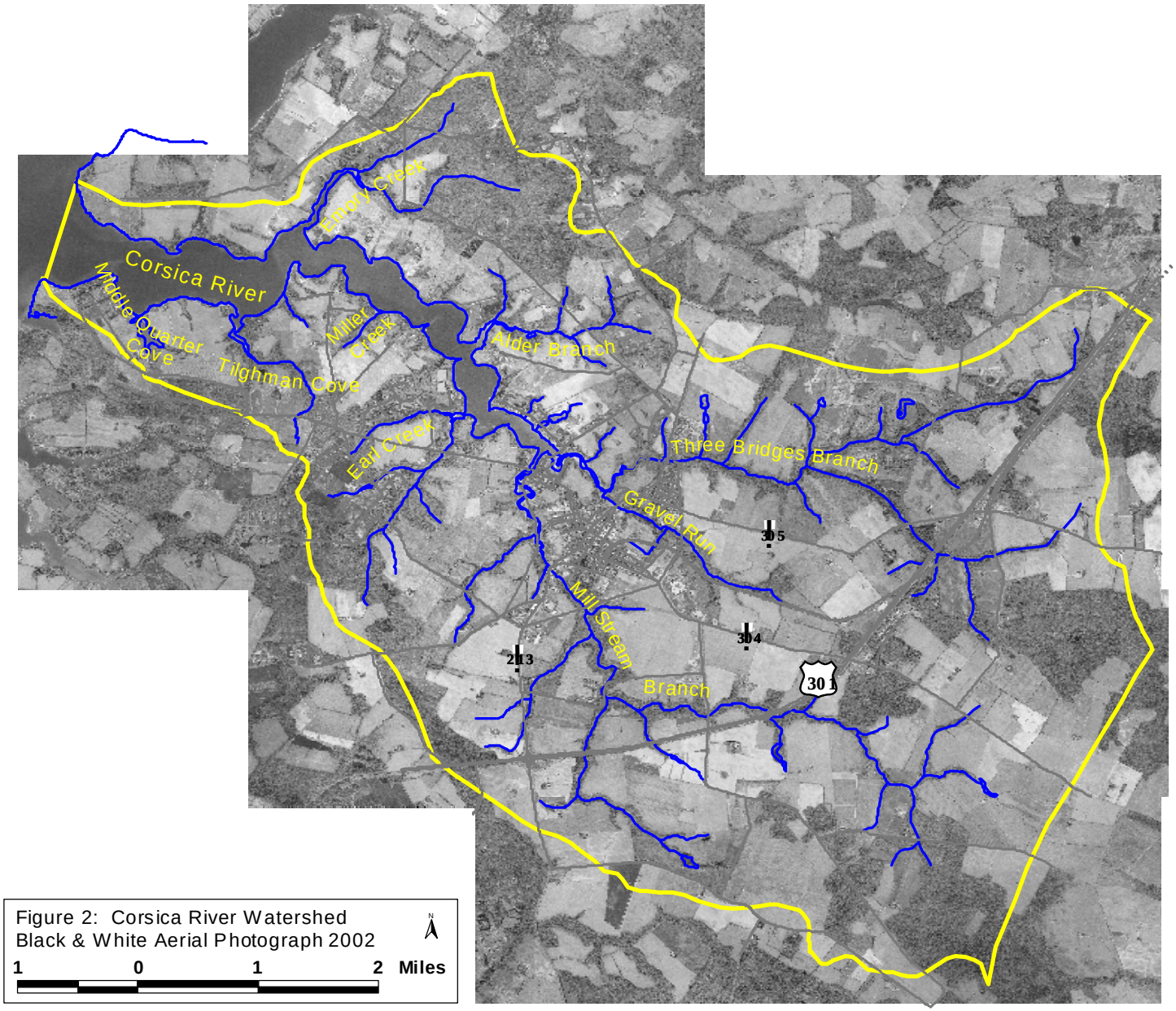
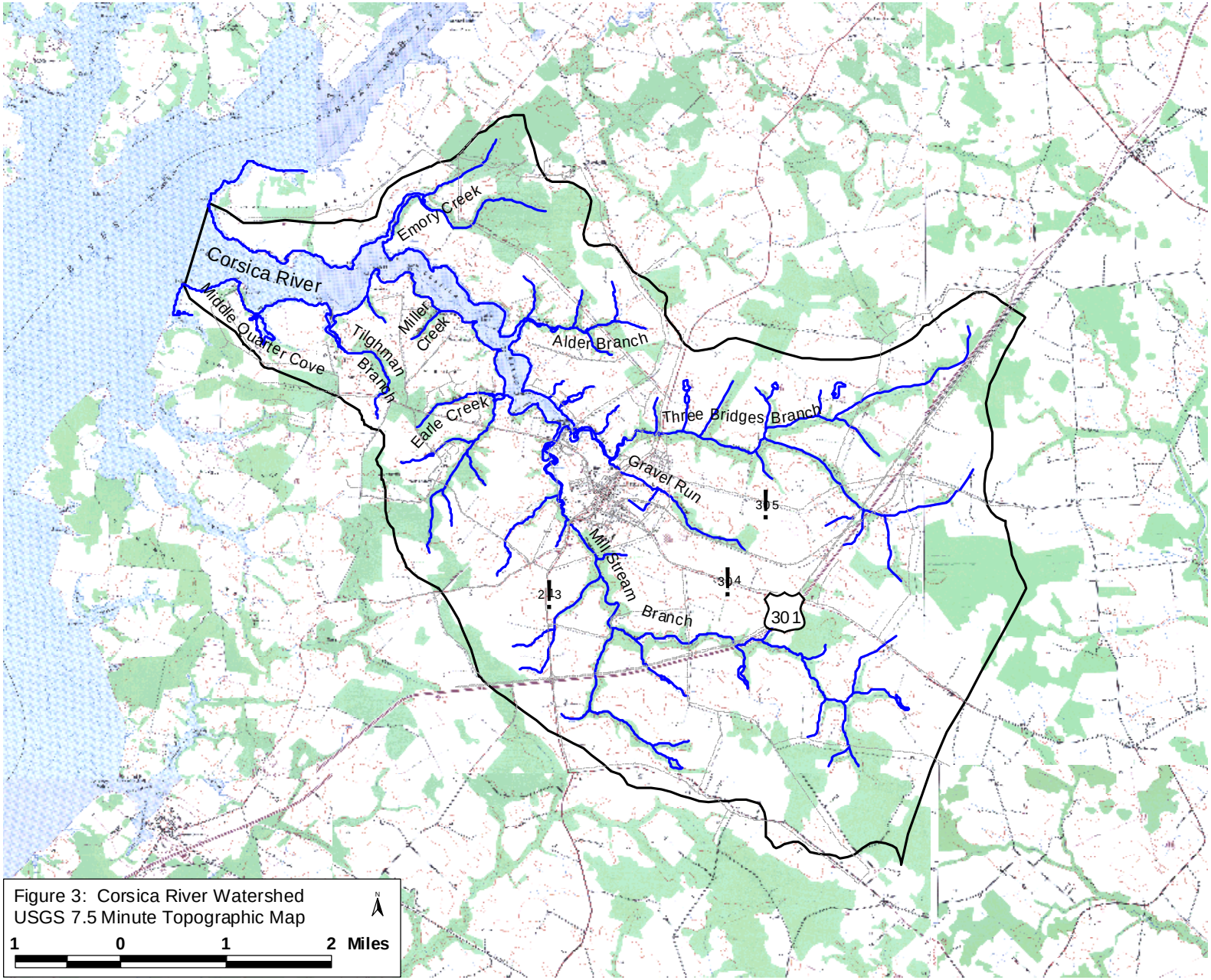


Figure 2: Corsica River Watershed
Black & White Aerial Photograph 2002

1 0 1 2 Miles


Corsica River
Emory Creek
Middle Quarter Cove
Tilghman Branch
Miller Creek
Alder Branch
Earle Creek
Three Bridges Branch
Gravel Run
Mill Stream Branch
305
304
303
301
Figure 3: Corsica River Watershed
USGS 7.5 Minute Topographic Map
1 0 1 2 Miles

METHODS

Goals of the Stream Corridor Assessment and Shoreline Surveys

To help identify some of the common problems that affect streams and shorelines in a rapid and cost effective manner, the Watershed Services Unit of the Maryland Department of Natural Resources developed the Stream Corridor Assessment (SCA) and Shoreline Surveys. The main objectives of the surveys are to provide:

1. A list of easily observable environmental problems present either along the non-tidal stream network or tidal shoreline.

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

3. Sufficient data so that restoration efforts can be prioritized.

4. For the stream survey a quick assessment of both in- and near-stream habitat conditions to make comparisons among the conditions of different stream segments.

The two surveys provides a rapid method of examining and cataloguing the observable environmental problems within a watershed so that better targeting of future monitoring, management and/or conservation efforts can be done. This surveys are not a detailed scientific surveys, nor will it replace chemical and biological surveys in determining overall stream and estuary conditions. One advantage of the surveys over chemical and biological surveys is that they can be done on a watershed basis both quickly and at relatively low cost.

Field Training and Procedure for Stream Corridor Assessment Survey

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 the Corsica River SCA Survey, the members of the MCC's Elk Neck 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 macroinvertebrates and fish and healthy riparian habitat. These reference sites for habitat condition are located at approximately 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 Elk Neck 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 were contacted and asked if field crews could cross their property during the survey. Most individuals gave permission and of the watersheds 48 miles of streams, only 3 miles were not surveyed because field teams were denied access by landowners

The MCC crew conducted field surveys of the Corsica River Watershed from May to August 2003. The survey teams walked most of the River's drainage network, collecting information on potential environmental problems. Common potential problems 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 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 Maryland Department of Natural Resource'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 of the Maryland Department of Natural Resources, Annapolis, MD.

Overall Ranking System for Stream Corridor Assessment Survey

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, correctibility, 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 other in the State with inadequate stream buffers. A trash dumping site with a very 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 is 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 severest 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.

Procedure and Ranking for Shoreline Survey

The Shoreline Survey is a new survey that is being developed by DNR to help assess the environmental condition of Maryland shorelines and identify the location of potential environmental problems. The methods used for the shoreline survey generally follow the protocols for the Stream Corridor Assessment Survey. The two main differences from the SCA survey were: 1) Instead of walking, the survey was completed from a small boat that cruised just offshore of the shoreline and 2) Instead of using the MCC, the survey was done members of DNR's Watershed Service Unit.

The ranking of the severity of potential problems identified during the Shoreline Survey were done using criteria presented in Table 1. Correctability and accessibility rating generally follow the same criteria of the SCA survey.

Table 1. Criteria used to rank problem severity in the Corica River Shoreline Survey.

	Very Severe	Moderate	Minor
Altered Shoreline	>1000 feet long Wall/Bulkhead	500 feet long Combination	<100 feet long Rip-rap
Fish Barrier	Complete blockage to both anadromous and resident fish	Blockage mainly to resident fish	Temporary or seasonal blockage
Inadequate Buffer	>1000 feet long No trees or marsh Lawn	500 feet long 0 foot width Shrubs/Small trees	<100 feet long <50 foot forest buffer present
Pipe Outfall	Large amount of discharge Strong odor and color Significant impact downstream	Small discharge Little/no odor or color Local impact downstream	Stormwater outfalls No dry weather discharge Not causing erosion
Shoreline Erosion	>1000 feet long >10 feet high banks	500 feet long 5 feet high banks	<100 feet long 1-2 foot high banks

Data Analysis and Presentation

Following the completion of the surveys, crews entered and information from the field data sheets into a Microsoft Access database and verified the accuracy of the data. Field crews labeled and organized the photographs taken during the survey by site number and placed them in binders in both print and digital form. Members of the Department of Natural Resources' Watershed Services Unit incorporated the map location, recorded data, and digitized photographs into the ArcGIS computer software. The GIS project is an electronic geodatabase that integrates all the collected problem locations and descriptive data by site number, links photographs to each potential problem site, and produces the maps presented in this report. This data can then be used alongside of other digital geographic datasets available for features within the watersheds. A final copy of the ArcView files was given to the partners in the Watershed Restoration Action Strategy committee for their use in developing a Watershed Action Strategy for the Corsica River Watershed.

RESULTS

The Stream Corridor Assessment Survey identified a total of 247 potential environmental problems within the stream corridor (Table 2). Of these, 10 are considered very severe, 31 severe, 23 moderate, 96 of low severity, and 87 minor. The most frequently observed problem sites were erosion sites, reported at 57 sites (or 12.18 miles of stream) and pipe outfalls, reported at 56 sites. Although not as numerous, inadequately forested stream buffers [34 sites (3.96 miles of stream)] were present throughout the watershed. Erosion sites occur along 26% of the 45 miles of streams walked during the survey, and inadequately buffered streams occur along 8%.

The Shoreline Survey identified a total of 49 potential environmental problems (Table 3). Of these, 2 were considered very severe, 7 severe, 15 moderate, 13 low severity and 12 minor. The most frequently observed potential environmental problem was altered shorelines. Approximately 2.5 miles or 10 % of the Corsica Rivers 42.44 miles of shoreline had been altered primarily with bulkheads and rip-rap. The second most frequently reported potential problem was inadequate buffers along the shoreline. Inadequate shoreline buffers were observed at 18 sites and results indicate that there are approximately 4.7 miles (19%) of shoreline along the tidal portion of the Corsica River with either no tree buffer or a tree buffer of less than 50 feet. The final problem that was reported during the Shoreline Survey was shoreline erosion. Excessive erosion was seen at 7 sites and the total amount of shoreline in the Corsica River with an erosion problem was estimated to be 0.7 miles .

Table 2 presents a summary of non-tidal survey results; Table 3 is a summary of the tidal survey results. Appendices A and B list the data collected during the survey. Appendix A provides a listing of information by site number and location, referenced latitude and longitude. In Appendix B, the data is presented by problem type and lists the collected descriptive data. Presenting the data by problem type allows the reader to see which problems are rated as most severe or easiest to correct within each category.

Table 2. Summary of results from the Corsica River SCA Non-tidal Survey.

Potential Problems Identified	Number	Estimated Length	Very Severe	Severe	Moderate	Low Severity	Minor
Channel Alterations	20	6,185ft. (1.17 Miles)	0	0	0	9	11
Erosion Sites	57	64,312ft. (12.18 Miles)	3	17	7	25	5
Exposed Pipes	5	365ft.	0	1	0	1	3
Fish Barriers	52	NA	1	0	0	22	29
In/Near Stream Construction	4	4,150ft. (0.79 Miles)	1	0	1	1	1
Inadequate Buffers	34	20,915ft. (3.96 Miles)	2	8	2	8	14
Pipe Outfalls	56	NA	3	1	9	23	20
Trash Dumpings	8	NA	0	0	1	4	3
Unusual Conditions	11	NA	0	1	4	5	1
Total	247		10	28	24	98	87
Representative Sites	27						

Table 3. Summary of results from the Corsica River SCA Tidal Survey.

Potential Problems Identified	Number	Estimated Length	Very Severe	Severe	Moderate	Low Severity	Minor
Altered Shoreline	24	13,055ft. (2.47 Miles)	1	1	10	6	6
Inadequate Buffers	18	24,705ft. (4.68 Miles)	1	5	4	6	2
Shoreline Erosion	7	3,630ft. (0.69 Miles)	0	1	1	1	4
Total	49		2	7	15	13	12

STREAM CORRIDOR ASSESSMENT SURVEY RESULTS

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 below a specific alteration, such as a pipe outfall or road crossing, or in area's where 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. While survey teams are asked to visually assess whether the stream was down-cutting, widening, or head-cutting at a specific site, the only way to evaluate the full significance of the erosion processes at a specific site is to do more detailed monitoring over time. During the Corsica River survey, 50 sites were identified as widening, 6 as down-cutting, and 1 as a headcut.

The SCA survey found 57 eroding stream banks over the length of 64,312 feet (12.18 miles) of stream, or about 26% of streams surveyed. The severity and location of erosion sites is shown in Figure 4b. Three sites are ranked as very severe, 17 as of severe, 7 as moderate, 25 as low severity, and 5 as minor (Figure 4a). Length of these sites varies from 15 to 7,230 feet. Heights of the stream banks at erosion sites in the Corsica River watershed vary from 1 to 12 feet (Appendix B).

Twelve erosion sites are most likely caused by specific infrastructure placed in the stream. Seven sites are below a road crossing, 3 may possibly be related to a land use change upstream, 1 is below channelization, and 1 is caused by in-stream debris. To restore the stream banks in these cases, stormwater management and reinforcement of the stream banks using natural design techniques may be a possibility. Methods, such as using stone cross-veins in the channel and vegetative stabilization on the banks, could succeed in reducing the erosion at some location, however, while stream restoration projects that physical alter the stream can be effective, the monitory cost of these projects can be fairly high. Also it is important to first identify and treat the cause of the problem before attempting to deal with a specific erosion problem. If for example the erosion problem is caused by excessive storm runoff entering upstream of the site it is important that the possibility of improving stormwater management in the watershed be examined before the specific erosion problem is addressed.

Land use in the stream corridor along the stream's banks was also recorded. At 30 erosion sites, forest was present on both sides of the stream, and at 14 sites crop fields were present along both banks. The remaining site had a combination of forest, pasture, crop field and lawns in the stream's riparian zone.

Three sites were found to be very severe. Site 021103 is on the south tributary to Emory Creek, and was identified as widening erosion site. The erosion problem extends for 1,037 feet, average bank height was 4 feet, and is surrounded by forest. Site 138202 is located on the south fork of the Three Bridges Branch, and is possibly being caused by an altered channel upstream. This site stretches for 7,230 feet, with average stream bank height of 4 feet and is surrounded by forest. Site 160102 is on the headwaters of Gravel Run and is found below a railroad crossing. This site is 3,430ft. long with 4 feet high banks and a crop field on the right and forest on the left. Seventeen additional sites were identified as severe (Figure 4a) and information on them is presented in Appendix A & B.

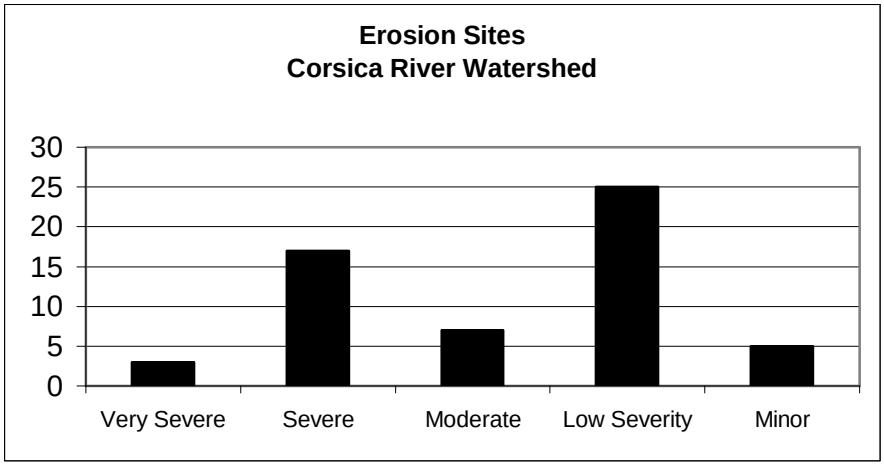


Figure 4a. Histograph showing the frequency of severity ratings given to erosion sites during the Corsica River SCA survey.

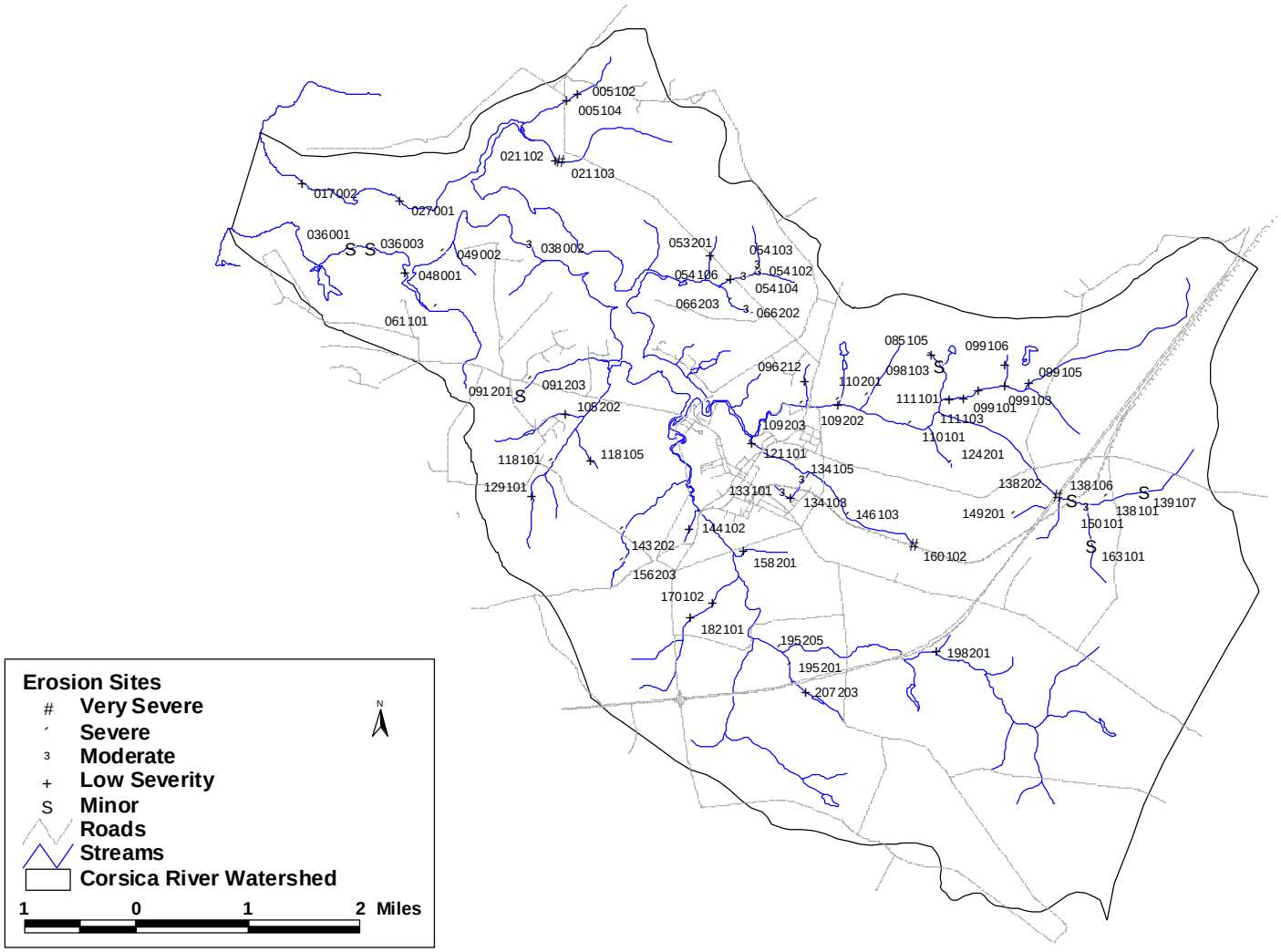


Figure 4b: Corsica River Erosion Site Locations.

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 56 pipe outfalls. The severity and location of pipe outfall sites is shown in Figure 5b, and the distribution of severity ratings in Figure 5a.

Ninety-three percent, or 52 of 56, of pipe outfalls surveyed were given a minor to moderate severity rating. These outfalls drained crop fields, carried stormwater, or discharged from a small pond. No pipe outfalls were cited as potential causes of stream bank erosion. Of the outfalls observed, 22 were dry when surveyed and 29 had a clear discharge with no associated odor. The remaining 5 pipe outfalls all had a medium brown discharge associated with them.

Three pipes were rated very severe and one severe. Site 096211 is a very severely rated plastic 6in. pipe on the right bank of a tributary of Three Bridges Branch. This pipe has created a channel 2ft. wide, and has a medium brown discharge. The purpose for the pipe is unknown. Site 121104 is a 12-inch smooth metal sewage overflow pipe on the left bank of Gravel Run. Although no discharge was observed the field crew did see debris caught under the clapper valve and believed that the pipe could have recently discharged. The pipe outfall was given a very severe rating. Site 121106 is an 18 inch 4 feet long corrugated metal stormwater pipe located on the left bank of Gravel Run. A medium brown musky smelling discharged was observed, and the site was given a very severe rating. Site 121110 is a 4-inch pipe with a medium brown discharge on Gravel Run. This site was given a severe rating.

No immediate follow up actions were taken as part of this study to determine the source of the color coming from the pipe. In some cases, coloration from a storm drainpipe may be a sporadic occurrence; this is especially true in areas where no stormwater management system is present. In addition, we made no estimate of the amount of fluid released from the pipes.

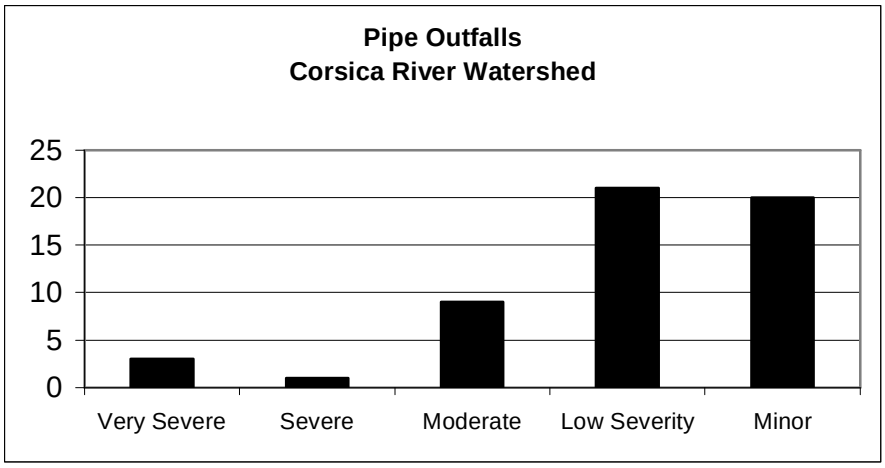


Figure 5a. Histograph showing the frequency of severity ratings given to pipe outfalls during the Corsica River SCA survey.

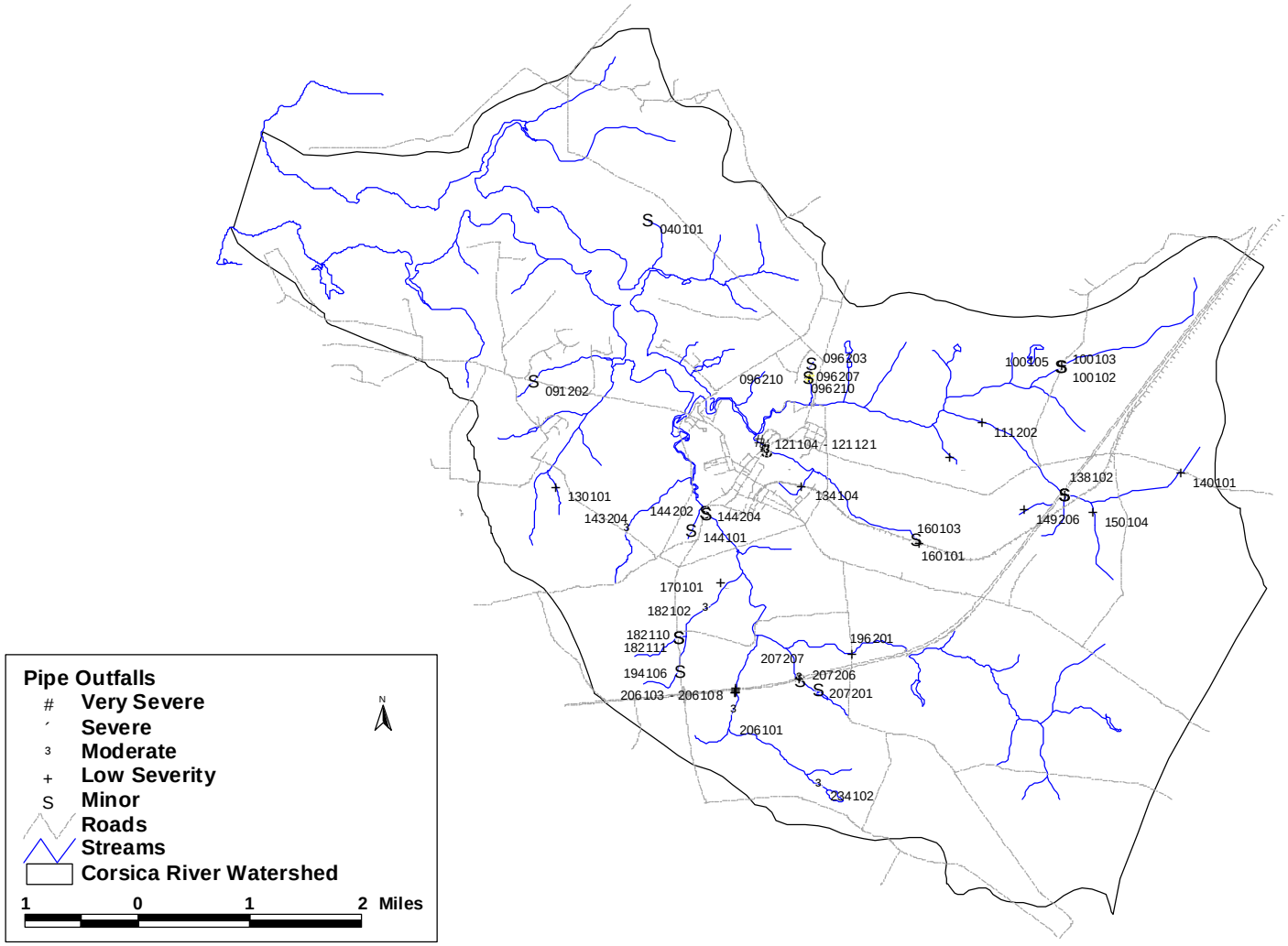


Figure 5b: Corsica River Pipe Outfall Locations.

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 sectio. 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 one 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 removing 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 best restoration sites also are far from other existing fish barriers.

The Corsica River SCA survey found 52 fish migration barriers. The locations of fish blockages are shown in Figure 6a. Fish barriers in these watersheds are due to natural falls (24 sites), road crossings (11 sites), beaver dams (5 sites), pipe crossings (3 sites), channelized streams (1 site), and a dam. The majority of fish migration barriers (51 out of 52) are low to minor in severity (Figure 6a). These sites were given low severity rankings because they are either temporary blockages, or they isolate only a short section of stream. Site 121122 is a dam on Gravel Run with a drop of 60in. at the extent of the tidal area. This dam may impede the movement of anadromous fish in the tributary. This site is located on public land and is a potential fish passage project site.

In all cases, areas should be assessed for viable fish habitat before restoration work begins, giving preference to sites with the most potential habitat area created.

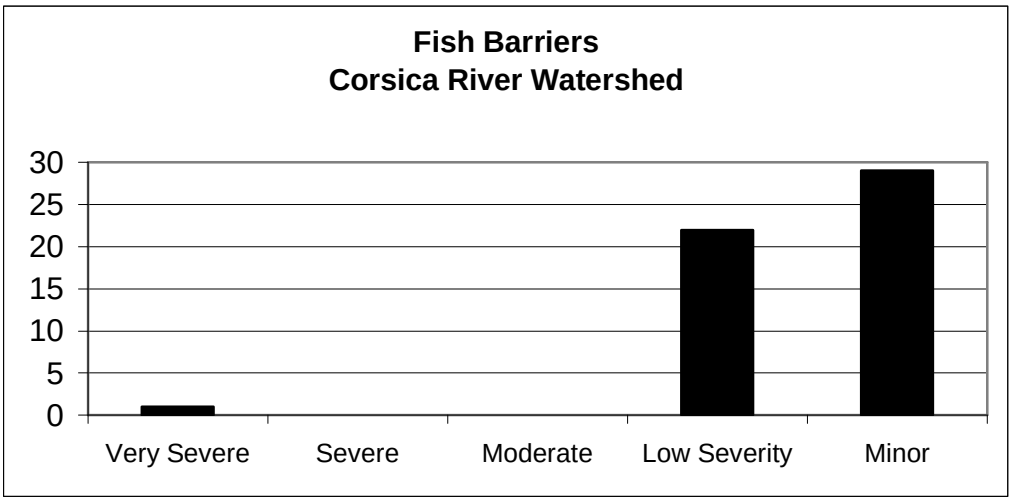


Figure 6a. Histograph showing the frequency of severity ratings given to fish barriers during the Corsica River SCA survey.

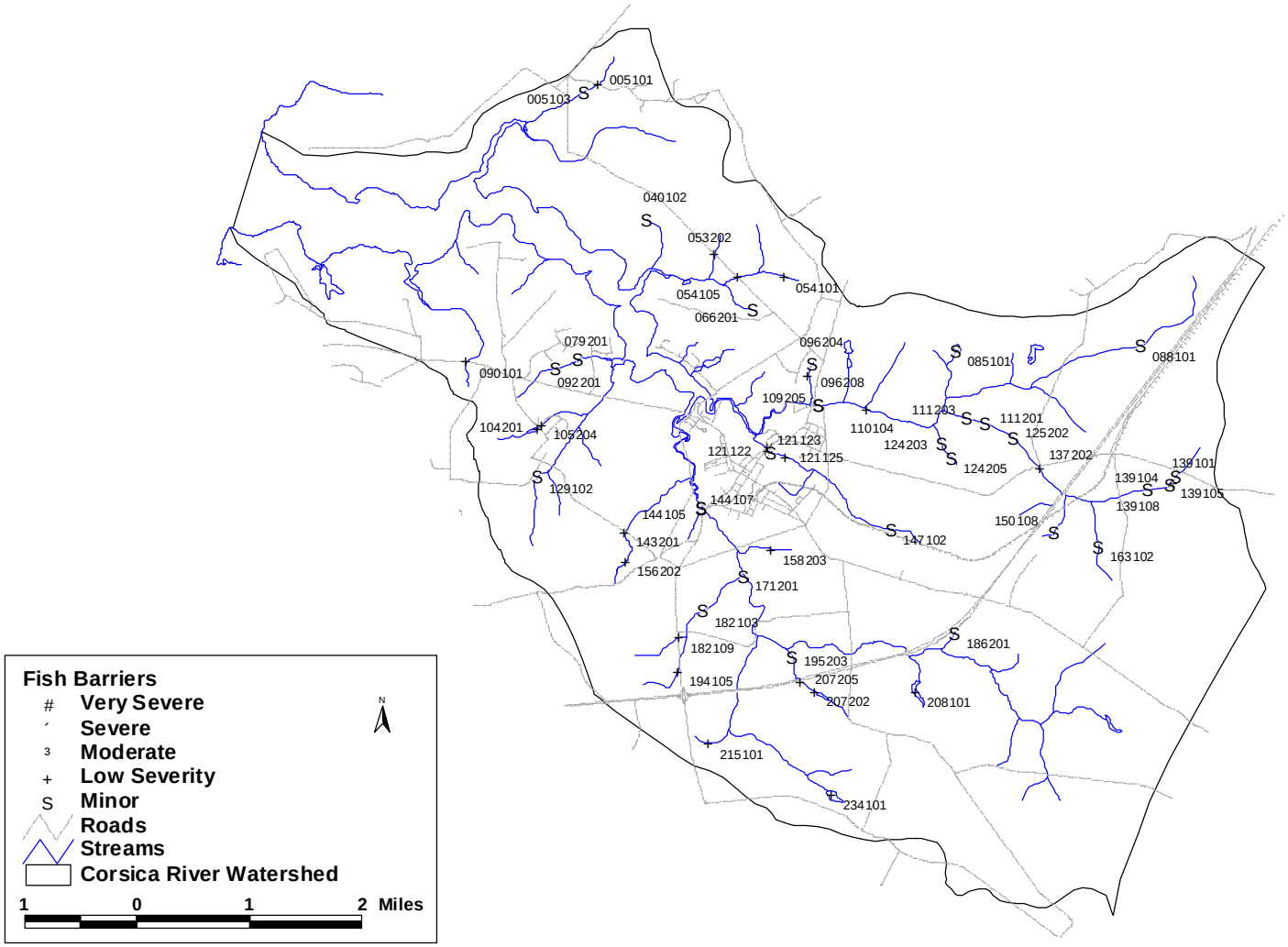


Figure 6b: Corsica River Fish Barrier Locations.

Inadequate Buffers

Forests are the historically occurring ecosystem around Maryland 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. 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 coastal bays.

While there is no single minimum standard for how wide a stream buffer should be in Maryland, for the purposes of this study a forest buffer is considered inadequate if it is less than 50 feet wide, measured from the edge of the stream. The severity of inadequate forest buffers is based on both the length and width of the site. Those sites over 1,000 feet long with no forest on either side of the stream rank as the most severe.

Survey crews identified 34 inadequate buffer sites with a total length of 20,915ft. (3.96 miles), or approximately 8% of streams surveyed. The severity and location of inadequate buffer sites is shown in Figure 7a. Twenty-four of these sites are ranked as moderate to minor severity, while the other ten sites are very severe and severe (Figure 7b). Lengths of inadequately buffered streams ranged from 70ft. to 2,165ft. Six of the 34 sites did not have a forest buffer on either side of the stream. Land use along the stream at inadequate buffer sites is recorded for both sides of the stream; therefore the land use amounts will be double the site amounts. Examples of land use for the sides of streams are as follows: cropland (39 sites), forest (9 sites), lawn (9 sites), pasture (5 sites), shrubs and small trees (4 sites), railroad tracks (1 site), and a construction site (1 site). Site 085103 had a recent buffer planting along the stream on a tributary of Three Bridges Branch. Crews reported that horses had access to the stream at site 215102.

Site 128101 is a very severe site with no buffer width stretching for 1,615ft. through a crop field on the headwaters of Three Bridges Branch. Site 193103 is also a very severe site with no buffer width for 1,575ft. through a crop field on the headwaters of Mill Stream Branch. Eight sites were given severe ratings and include: Sites 156201, 199203, 217201, and 229201 on Mill Stream Branch; Sites 117201, and 130102 on Earle Creek; Site 090102 on Middle Quarter Creek; and Site 149205 on Three Bridges Branch.

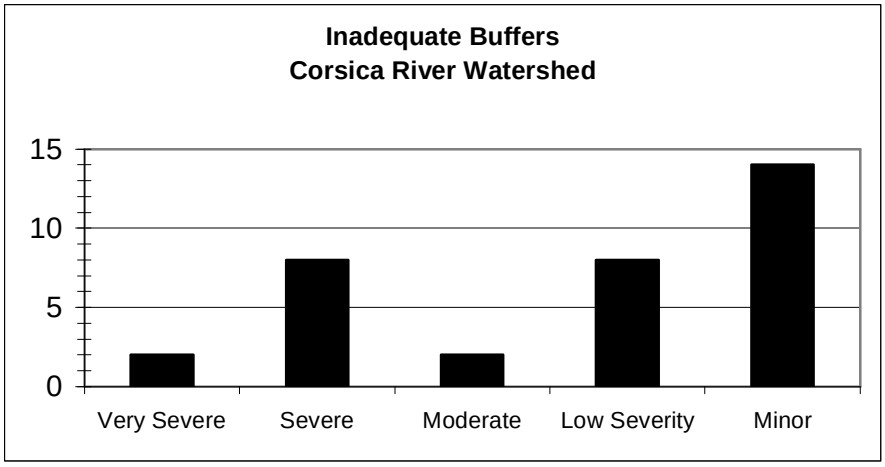


Figure 7a. Histograph showing the frequency of severity ratings given to inadequate buffers during the Corsica River SCA survey.

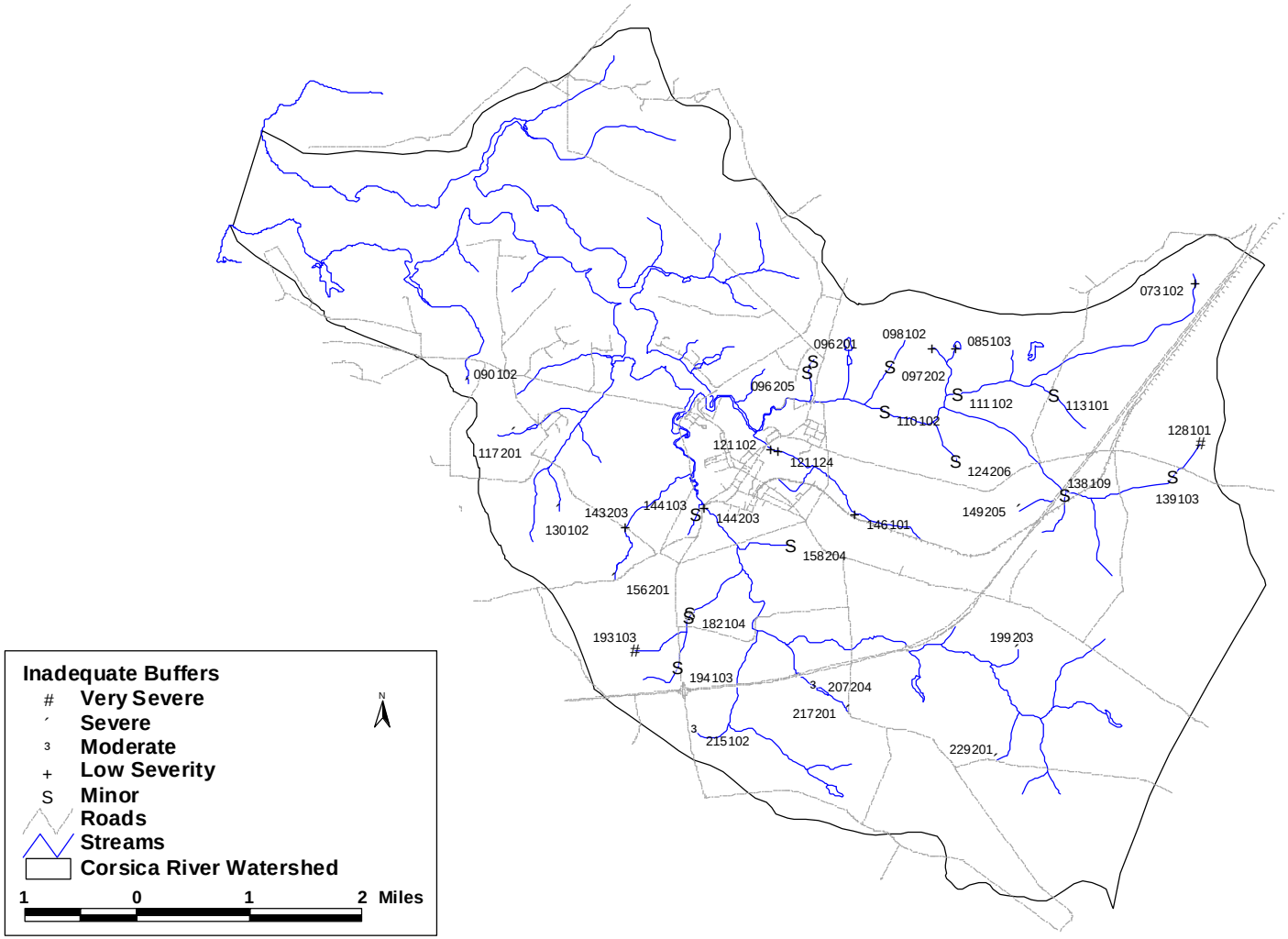


Figure 7b: Corsica River Inadequate Buffer Locations.

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, deepened, 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. On Maryland's Eastern Shore, earth channels also are created for drainage purposes.

For the purposes of this survey, there are three 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. Lastly, the survey does not report places where a small section of only one side of the stream bank is stabilized to reduce erosion.

Results of this survey show recognizably altered stream channels at 20 sites. The severity and location of channel alteration sites is shown in Figure 8a. The total length of stream affected by channelization is estimated to be 6,185 feet (1.17 miles), or 2.41% of streams surveyed. All channel alteration sites were ranked low (9 sites) to minor (11 sites) in severity. The majority of sites (11 sites) were documented as earth channels. Also found were concrete channels (4 sties), rip-rap (2 sties), corrugated pipe (1 site), gabion baskets (1 site), and a metal pipe channel. Eight sights were found at road crossings. Bottom width ranged from 1.5ft. to 12ft., and length of the sights ranged from 5ft. to 1,000ft.

Survey crews documented the presence of sedimentation and vegetation in the channelized segments of streams. The presence of sedimentation and vegetation in a channel shows that the stream system is reverting back to a natural system. Fourteen out of 20 channel alteration sites were found with sedimentation in the channel, while 11 sites were documented as having vegetation in the channel. Eight sites were found with both sedimentation and vegetation. Eight channel alterations were found on Mill Stream Branch, as well as 8 on Three Bridges Branch. Two sites were reported on both Gravel Run and Earle Creek.

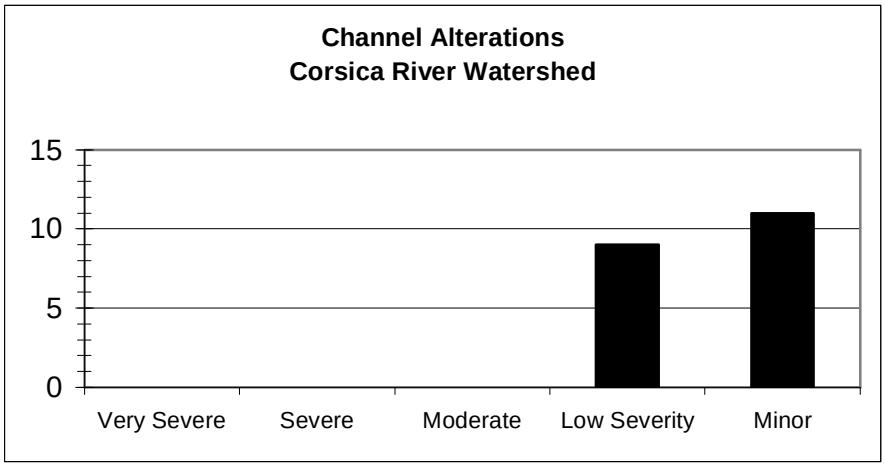


Figure 8a. Histograph showing the frequency of severity ratings given to channel alterations during the Corsica River SCA survey.

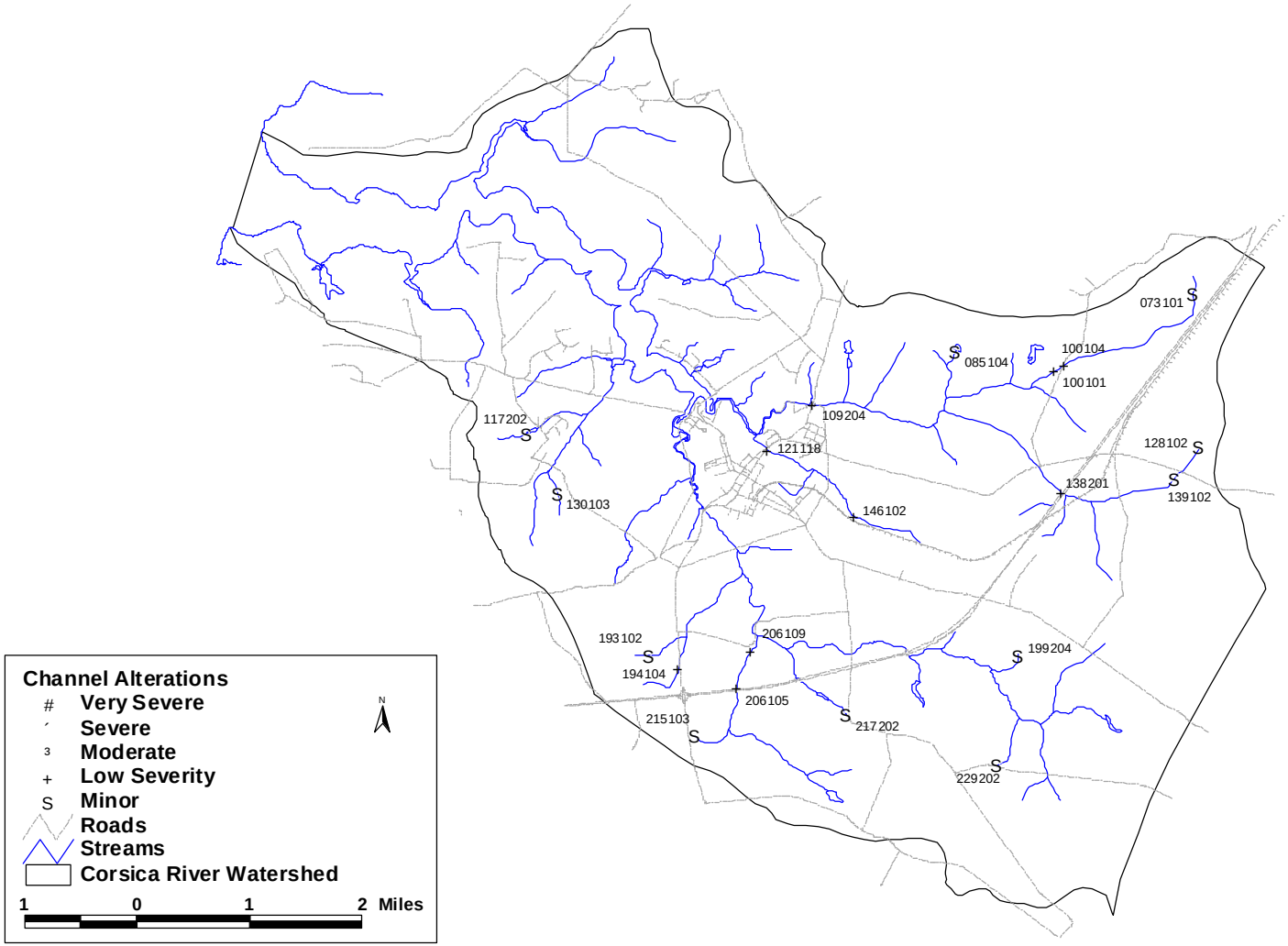


Figure 8b: Corsica River Channel Alteration Locations.

Trash Dumping

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). Site severity rankings are based on size, contents of trash, and potential impact on the stream.

Survey crews found 8 trash dumping sites (Figure 9a). This is a very low number of sites compared to other watersheds previously surveyed throughout Maryland. In terms of severity rating, 1 sites were ranked as moderate, 4 were given a low severity rating, and 3 were considered minor (Figure 9b). Two sites contained residential waste, 3 sites had construction materials and lumber, 1 site had industrial material, 1 site had tires and one site was characterized as junkyard of cars and buses. The one moderate site (144106) consisted of a junkyard of cars and buses over a larger area within the stream corridor behind a residence on Mill Stream Branch. Site 096202 at a construction site on Three Bridges Branch, was the only other site considered a large area. All other sites were located at confined sites, and 5 sites, 096202, 099102, 105203, 118102, and 147103 are potential sites for volunteer clean-up projects. Ownership of lands containing the trash dumping sites were either private (5 sites) or unknown (3 sites).

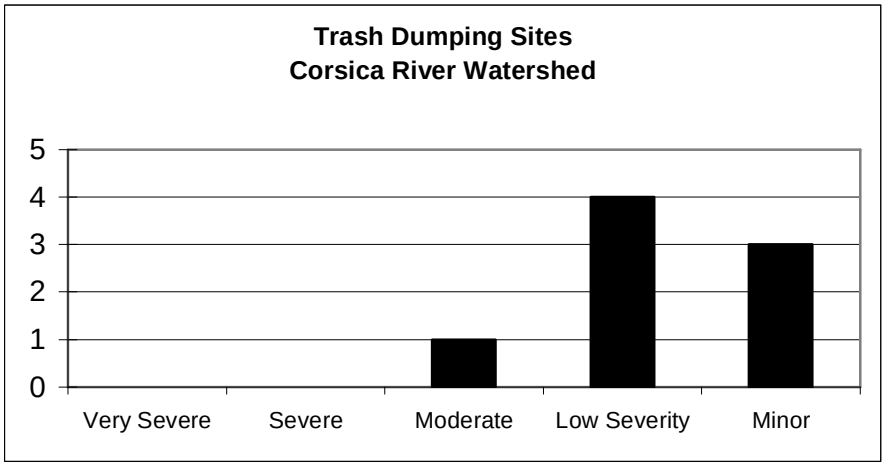


Figure 9a. Histograph showing the frequency of severity ratings given to trash dumping sites during the Corsica River SCA survey.

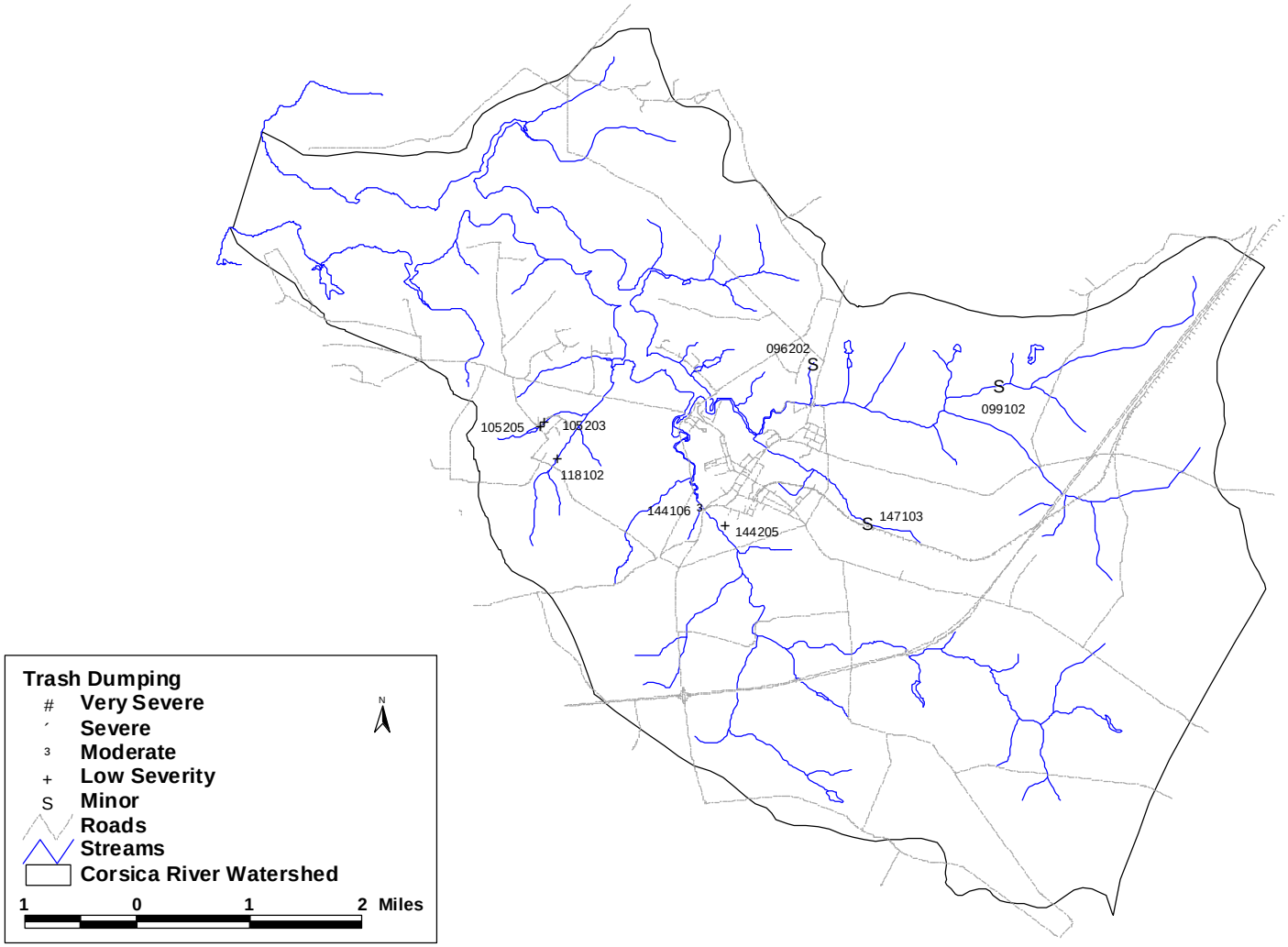


Figure 9b: Corsica River Trash Dumping Locations.

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.

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 5 exposed pipes during the survey. One of these sites received a severe rating while the others were given low severity (1 site) or minor (3 site) ratings (Figure 10a). Figure 10b shows the location of these sites. Two pipes were exposed across the bottom of the stream, 2 were exposed along the stream bank, and 1 pipe was exposed below a bridge. Three pipes were documented as smooth metal pipes, 1 as a plastic pipe, and 1 as a concrete sewage pipe. Pipe diameters ranged from 2 to 36 inches, and the lengths of the exposed pipes ranged from 8 to 300 feet. None of the observed pipes had a discharge, and all but one sewage pipe were unknown in origin. Site 121108 is the only severe pipe to be documented. This site is a pipe 36in. in diameter concrete sewage pipe exposed across the bottom of the stream below the Rte. 213 bridge on Gravel Run. Follow-up visits could be made to the sites to further evaluate their severities and a means for repairing or replacing the pipes.

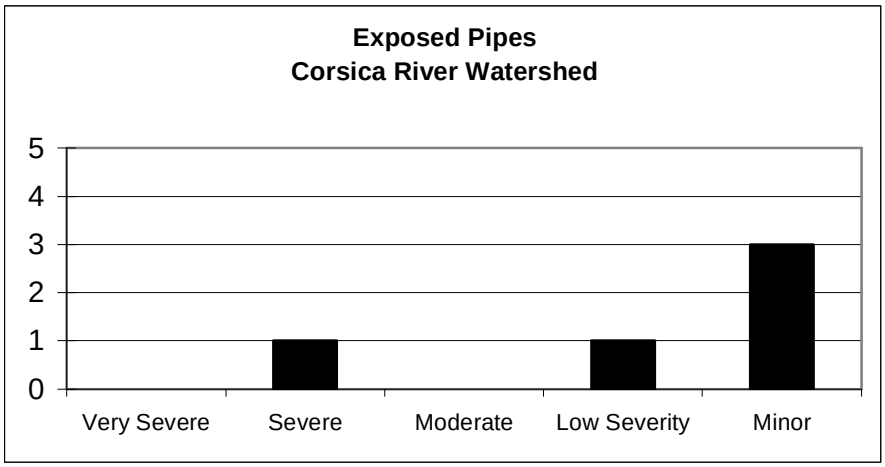


Figure 10a. Histograph showing the frequency of severity ratings given to exposed pipes during the Corsica River SCA survey.

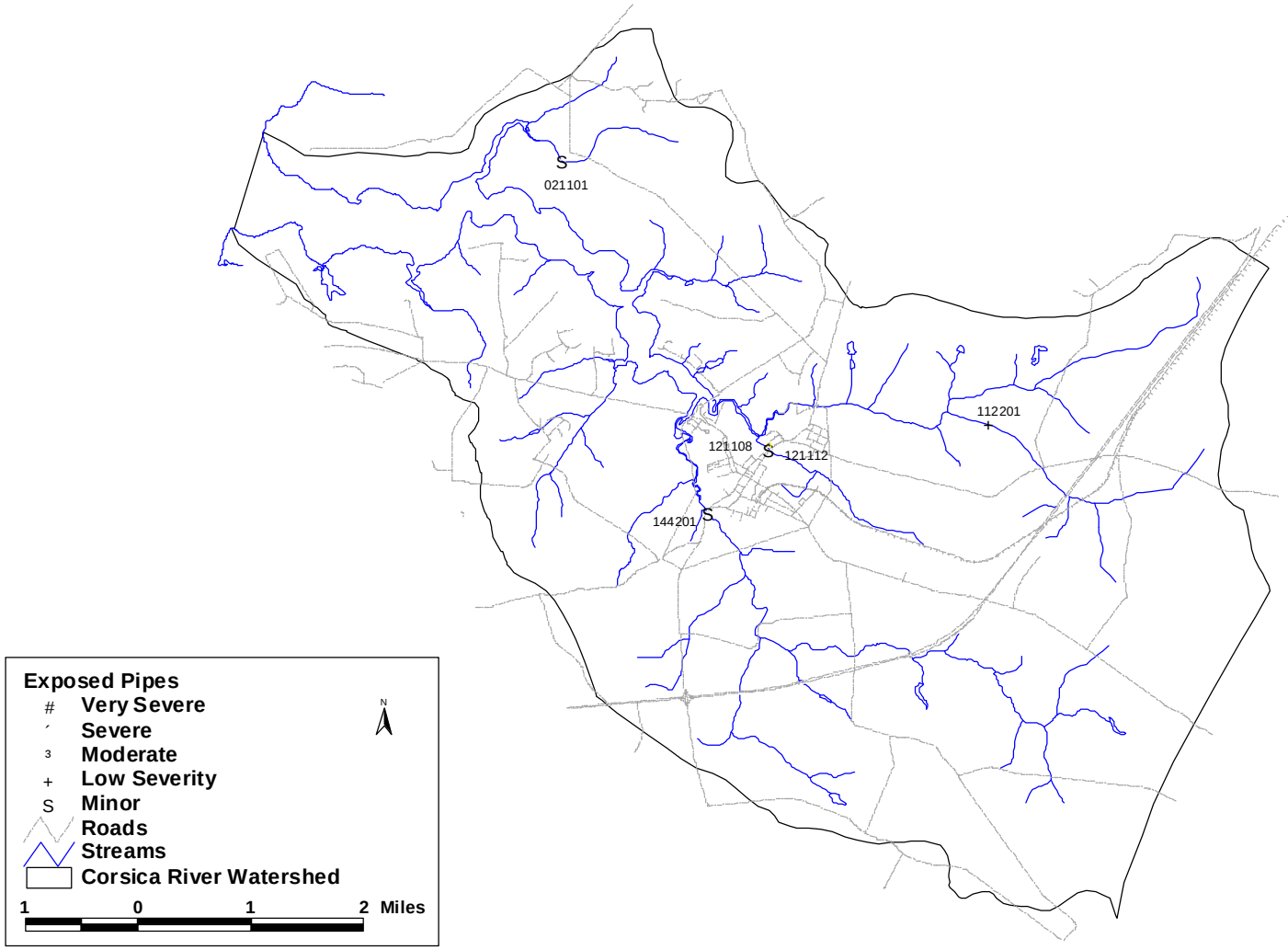


Figure 10b: Corsica River Pipe Outfall Locations

In/Near Stream Construction

In or near stream construction data sheets are used to document the locations of construction disturbances seen by the survey teams inside or near the stream corridor. Survey team members are not trained sediment inspectors, but as part of their training they do receive a quick review of the different type of sediment control measures they may see while doing an SCA survey. Survey teams report evidence of inadequate sediment control measures or fine sediment pollution from the site that has affected the stream.

In or near stream construction was reported at 4 sites during the Corsica River survey. Two sites were found on tributaries of Three Bridges Branch, 1 site was observed on Gravel Run and one was observed on Mill Stream Branch. Three sites were involving residential development, and one was involving logging. Three sites were found to have adequate sediment control, while one (site 182105) did not. Two sites had excess sediment in the stream. Lengths of sites ranged from 150ft. to 1800ft. The locations of in/near stream construction sites are shown in Figure 11b.

Most sites were given a low to minor severity rating (Figure 11a). One site (096101) was given a severe rating. The site is located at a new residential development site at the head of a tributary on Three Bridges Branch. Field crews reported what appeared to be excess sediment in the stream channel downstream of the new development. The town of Centreville was notified about this site shortly after it was observed.

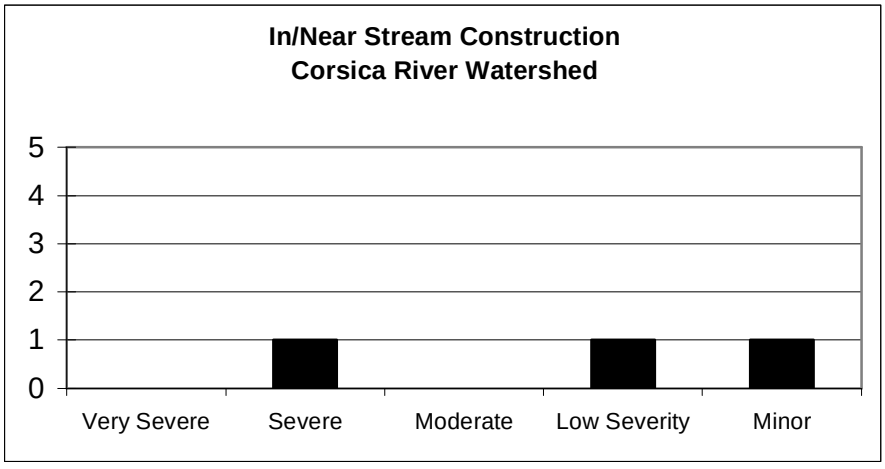


Figure 11a. Histograph showing the frequency of severity ratings given to in/near stream construction sites during the Corsica River SCA survey.

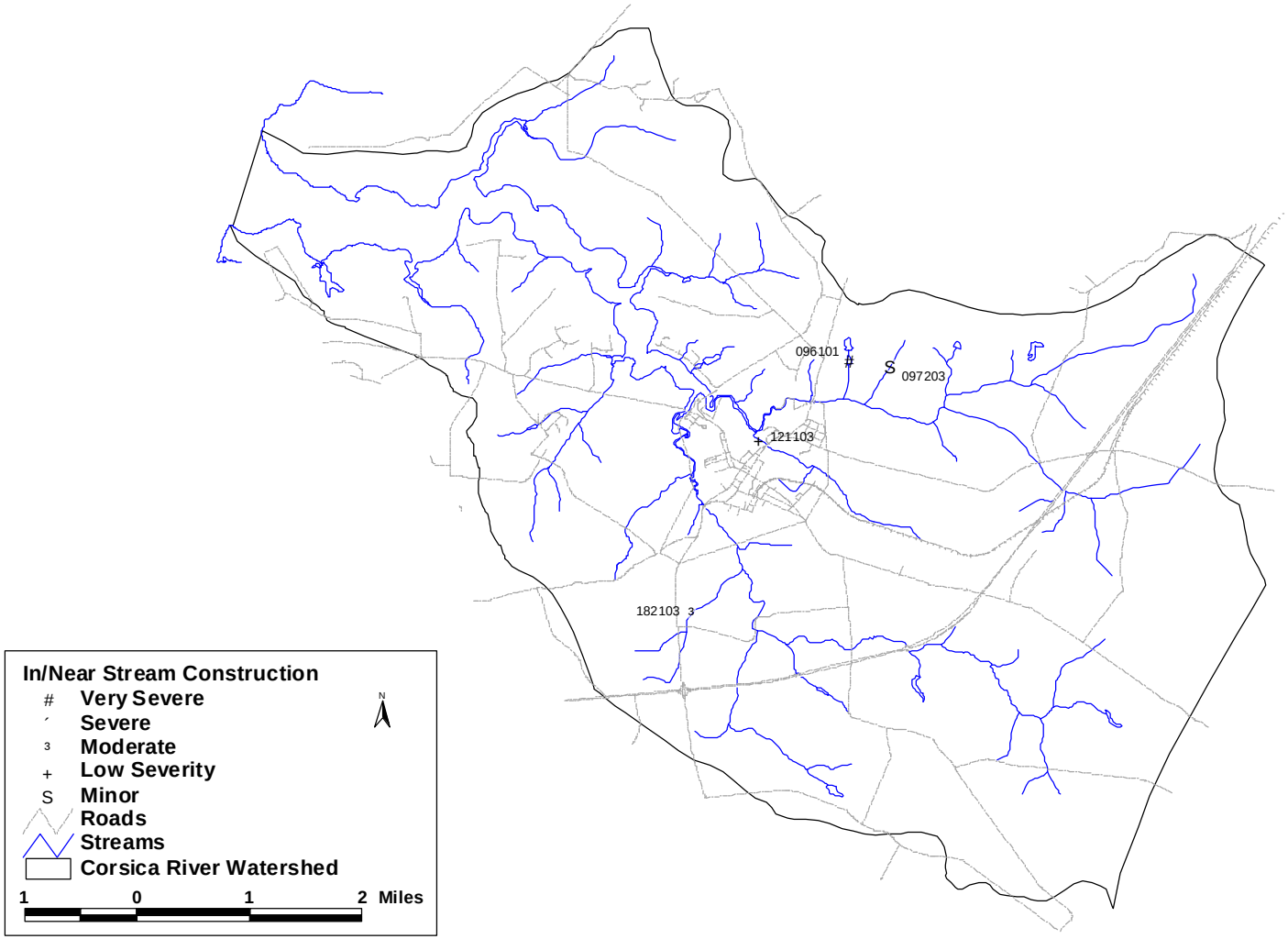


Figure 11b: Corsica River Pipe Outfall Locations

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 Macroinvertebrates
* 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 channel). 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 one-mile intervals along the stream. Survey crews evaluated 27 representative sites in the Corsica River watershed.

The streams in these watersheds show typical characteristics for coastal plain streams in Maryland. Gravel, sand and silt were the only bottom types recorded. As a result, the substrate sites were marginal to poor for attachment sites for macroinvertebrates, and suboptimal to marginal for embeddedness. The sediment deposition was suboptimal to marginal and the channel flow optimal to marginal, indicating that most streams filled their channel from bank to bank with few sediment bars forming. The bank conditions were suboptimal to marginal, and the bank vegetation sites were optimal to suboptimal, but shelter for fish sites were observed as optimal to marginal. Riparian vegetation was mostly optimal.

In areas with little channel alteration, this characteristic ranked as mostly optimal. Similarly, in areas with few inadequate buffer sites, riparian vegetation ranked as optimal. Locations of representative sites are shown in Figure 12, and data collected for all categories are listed in Appendix B.

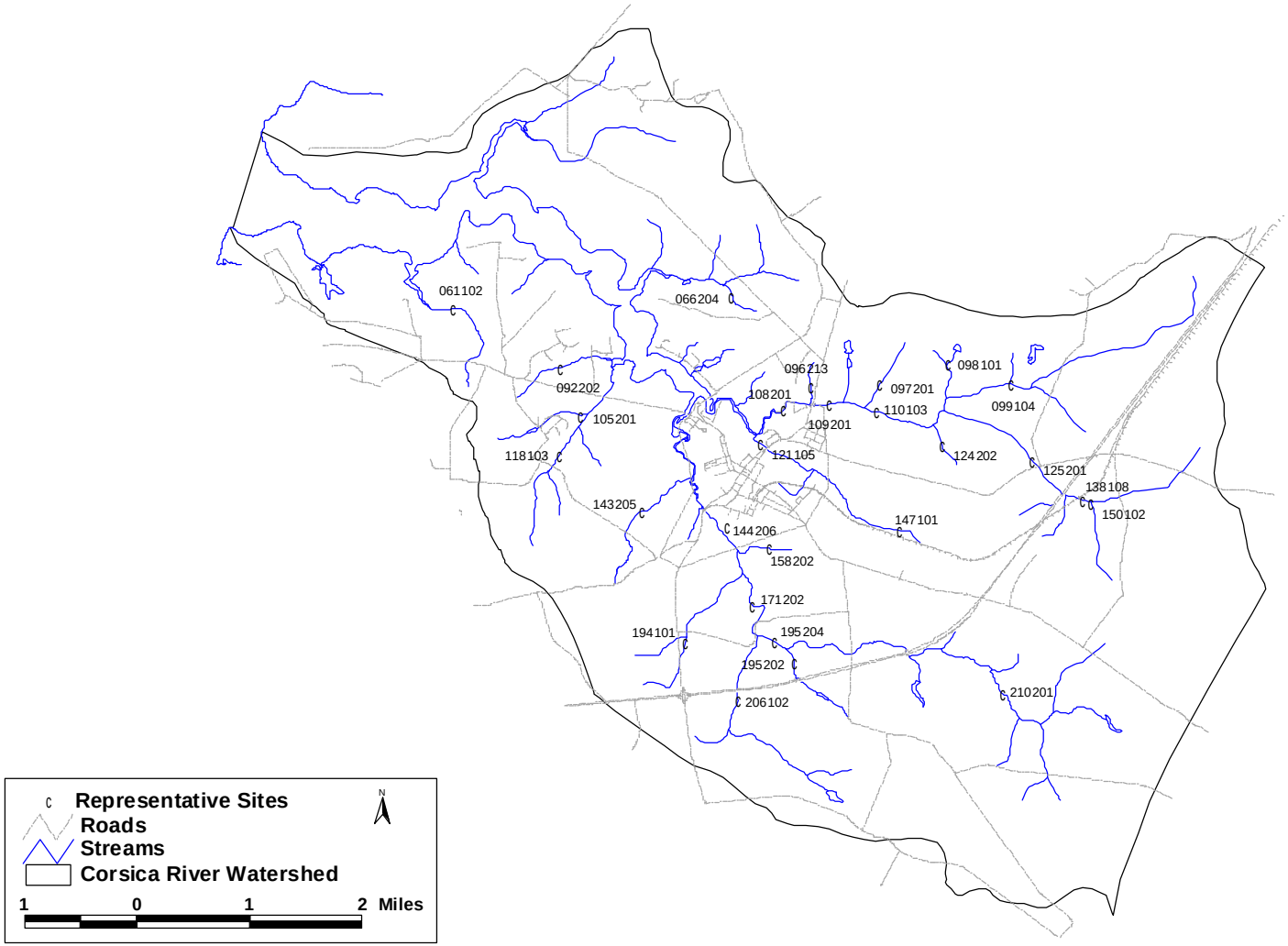


Figure 12: Corsica River Representative Site Locations.

SHORELINE SURVEY RESULTS

Altered Shoreline

Twenty-four altered shoreline sites were documented during the tidal survey. Altered shorelines are anywhere in the tidal area of a river where the bank of the river has been armored in order to protect it from erosion. Erosion can occur when shorelines are inadequately buffered, therefore altered shorelines being used to fix erosion problem sites are commonly found around inadequately buffered areas. Fourteen of twenty-four altered shoreline sites (58%) were documented at sites where inadequate buffers were found. The total amount of altered shorelines found adds up to 2.47 miles, or 9.89%, of the shoreline of the Corsica River. The majority of altered shoreline sites were rated to be moderate to minor in severity, but one was found to be very severe and one severe (Figure 13a). The location of the Corsica River's altered shoreline sites can be found in Figure 13b.

Altered shorelines in the Corsica include: rip-rap (12 sites), wood bulkhead (6 sites), a mix of rip-rap and bulkhead (4 sites), rip-rap and gravel (1 site), and a groin and broken concrete (1 site). Land uses above these sites were found to be lawn (6 sites), residential (6 sites), single home (5 sites), crop field (2 sites), unknown (2 sites), 1 boat landing, 1 emergent marsh, and 1 shrub and small tree site. Land use below was found to include open water (20 sites), beach (3 sites), and phragmites (1 site).

Site 034003 is a section of broken concrete extending for 2,500ft, with a crop field above and open water below. The site is rated very severe and is located on the southern shoreline and near the mouth of the Corsica River. Site 064002 is a wood bulkhead extending for 825ft. with lawn above and open water below. The site is located on the northern shore below the Alder Branch.

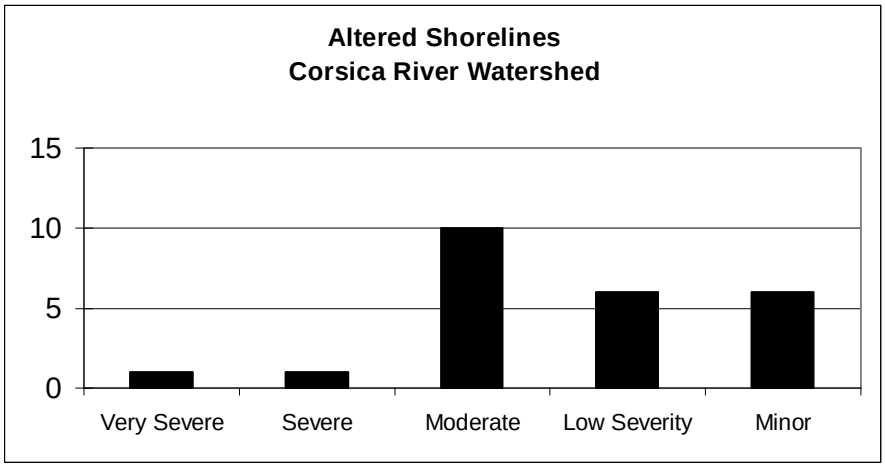


Figure 13a. Histograph showing the frequency of severity ratings given to altered shoreline sites during the Corsica River Tidal SCA survey.

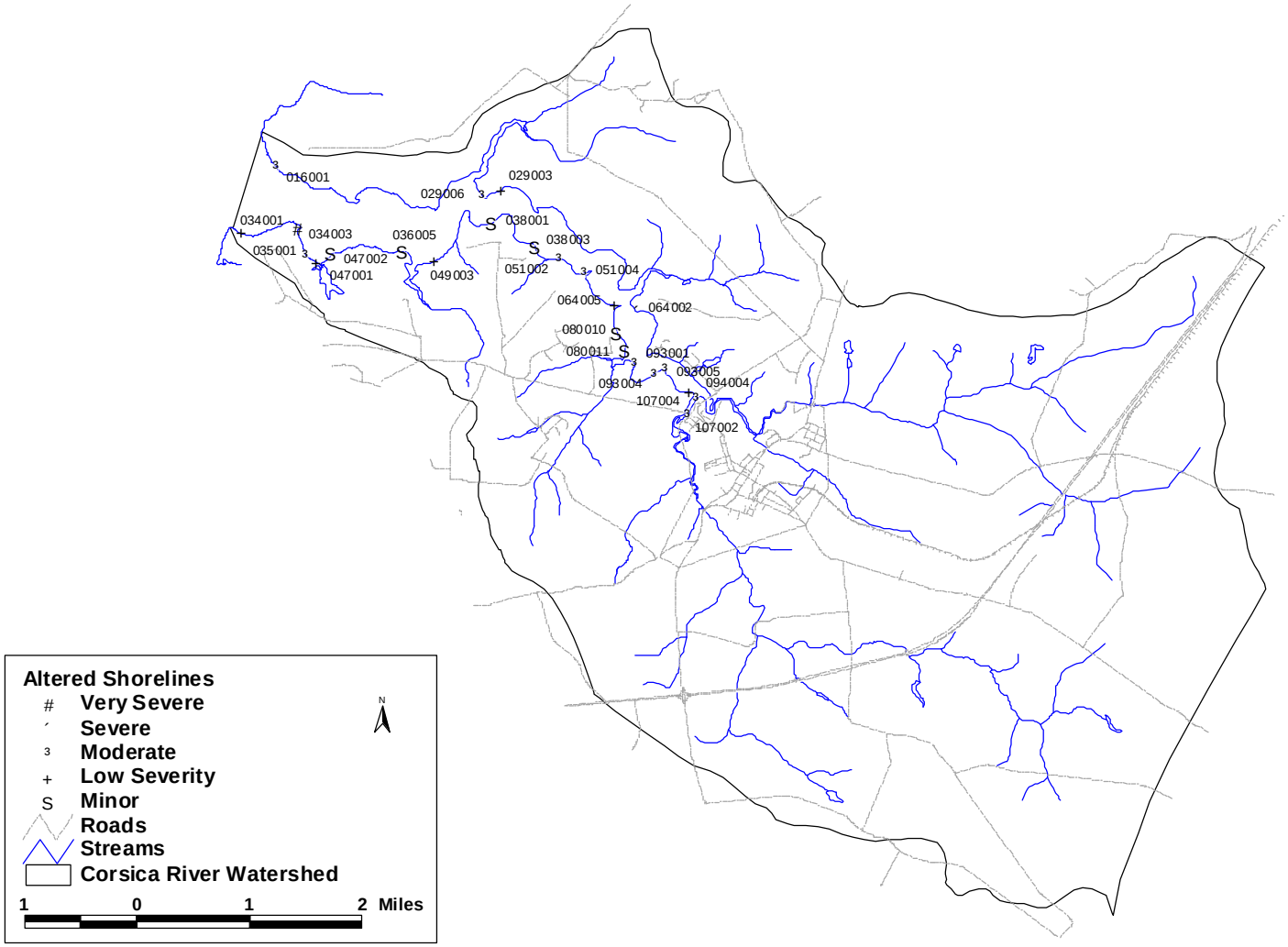


Figure 13b: Corsica River Altered Shoreline Locations.

Shoreline Inadequate Buffers

Shoreline inadequate buffer sites are considered inadequate in this survey when the forest buffer does not extend more than 50ft. beyond the bank of the tidal river. Forest buffers along the banks of tidal areas of a river greatly reduce erosion of a shoreline. Twenty inadequate buffer sites were identified along the banks of the tidal portion of the Corsica River. These sites total 24,705ft. (4.67 miles), and make up about 19% of the Corsica's total shoreline. The majority of sites identified by the survey were given severe to low severity ratings, as seen in Figure 14a. Three sites were given very severe ratings. The locations of the Shoreline Inadequate Buffers are shown in Figure 14b.

Land use above these sites were found to be residential communities (6 sites), crop fields (4 sites), lawn (2 sites), single homes (2 sites), 1 boat landing, 1 crop field/residential community, 1 sandy boat landing/lawn, and one site filled with shrubs and small trees. Land use below the identified inadequate buffers included: emergent marsh/phragmites (5 sites), emergent marsh (4 sites), open water (2 sites), open water/emergent marsh (2sites), 1 altered shoreline, and 1 beach. Sites were found to range from 230 to 5,430 feet in length. No sites were identified as having recently established buffers.

As stated before, three sites were given very severe ratings. Site 016002 is a 1,725ft. long site with a crop field above and open water below. This site is located on the North shore at the mouth of the Corsica River. Site 047003 has no buffer extending for 2,705ft., with a residential community located above, and open water below. This site is located on the South shore at Middle Quarter Cove. Site 107003 is 1,005ft. long with shrubs and small trees above, and emergent marsh below. This site is located on the western shore of the tidal portions of Mill Stream Branch. The six sites identified as severe include: 017001, 029004, 034002, 039002, 094001, and 094003. Information on these sites can be found in Appendixes A and B.

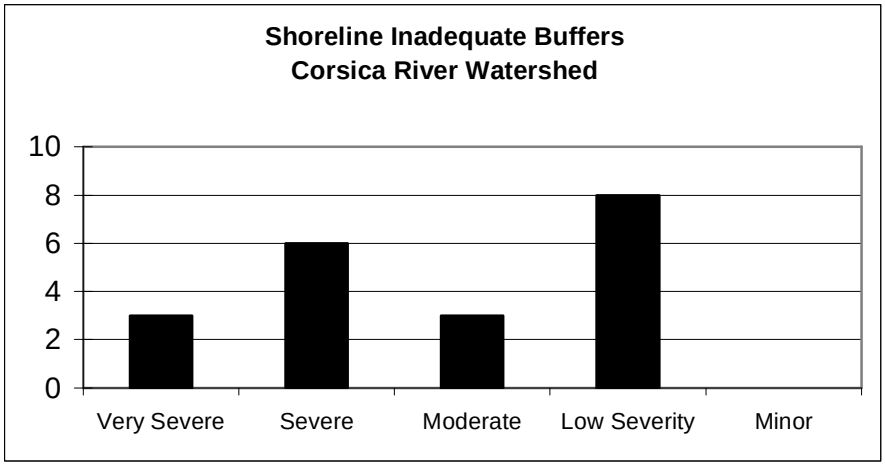


Figure 14a. Histograph showing the frequency of severity ratings given to inadequate buffer sites during the Corsica River Tidal SCA survey.

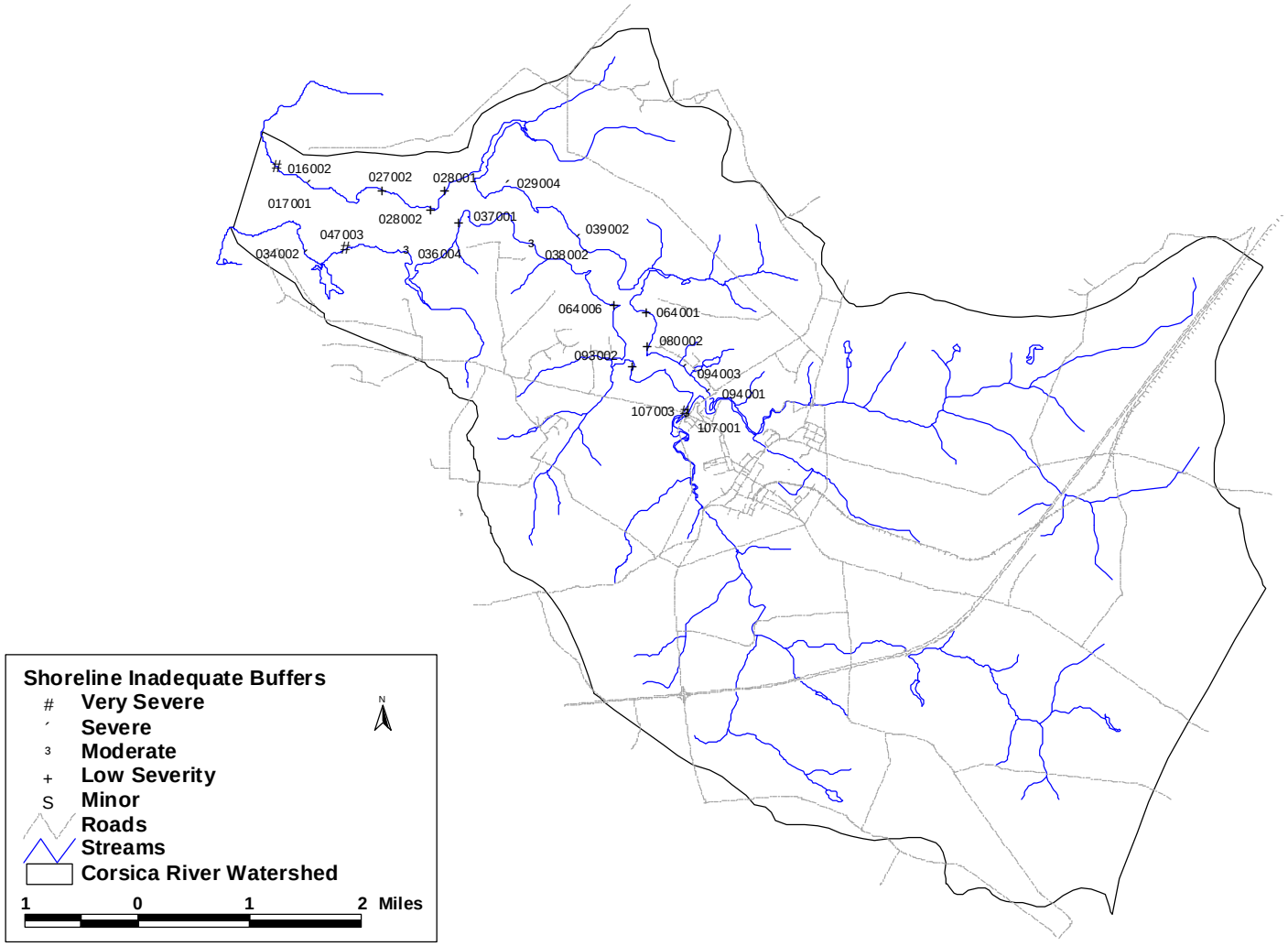


Figure 14b: Corsica River Altered Shoreline Locations.

Shoreline Erosion Sites

Shoreline erosion in tidal areas is mostly due to natural causes such the location of a bank in a high-energy area. Erosion of a shoreline can provide sand and gravel to the river-bed, which can provide habitat for many water-dwelling creatures including oysters. Erosion can also produce siltation, which can be a detriment to water-dwelling creatures by drowning them, in a sense, with an overload of silt. Historically oysters have been present in the Corsica River. Today there are "no oyster beds or oyster leases designated by DNR in the Corsica River." (Shanks, 2003). It has not been proven why there are no oysters occurring in the Corsica River today, but sedimentation due to erosion could be a factor. More study of the Corsica River Watershed's sedimentation would be needed to determine where the majority of the sedimentation is coming from.

Seven shoreline erosion sites were identified during the Corsica River survey. The majority of these sites (5 of 7) were rated low severity to minor (Figure 15a). One site was rated severe and one moderate. Length of the erosion sites documented ranged from 125 to 1,420 feet, and height 1.5 to 15 feet. Five of the sites were located on the Northern banks of the river, and 2 on the Southern. Land use above the documented sites included: crop fields (4 sites), forest (2 sites), and lawn/shrubs & small trees/single home (1 site). Land use below included: beach (4 sites), open water (2 sites), and emergent marsh/rip-rap. Shoreline geometry of the sites were documented as straight (4 sites), cove (2 sites), and meander/irregular (1 site).

Site 049002 is a severely rated site located just upriver from Tilghman Cove on the Southern bank of the river. This site was found to be 10ft tall, 1,420 ft long with lawn, shrubs & small trees, and a single home above the site, and an emergent marsh and rip-rap below the erosion. The site is located at a meandering irregular part of the river and is posing a threat to the house located 100ft away.. It was also noted that the erosion does not look active. Site 038002 is a moderately rated 690ft long, 15ft high erosion site located on the Southern bank of the Corsica River just downstream from Miller Creek. This site was found to have forest above and open water below, and is located on a section of the river in a cove. The location of all the shoreline erosion sites can be found in Figure 15b.

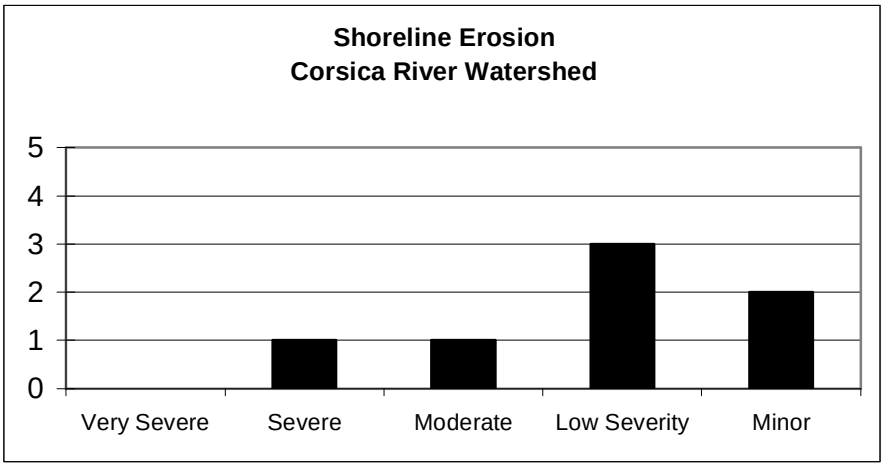


Figure 15a. Histograph showing the frequency of severity ratings given to shoreline erosion sites during the Corsica River Tidal SCA survey.

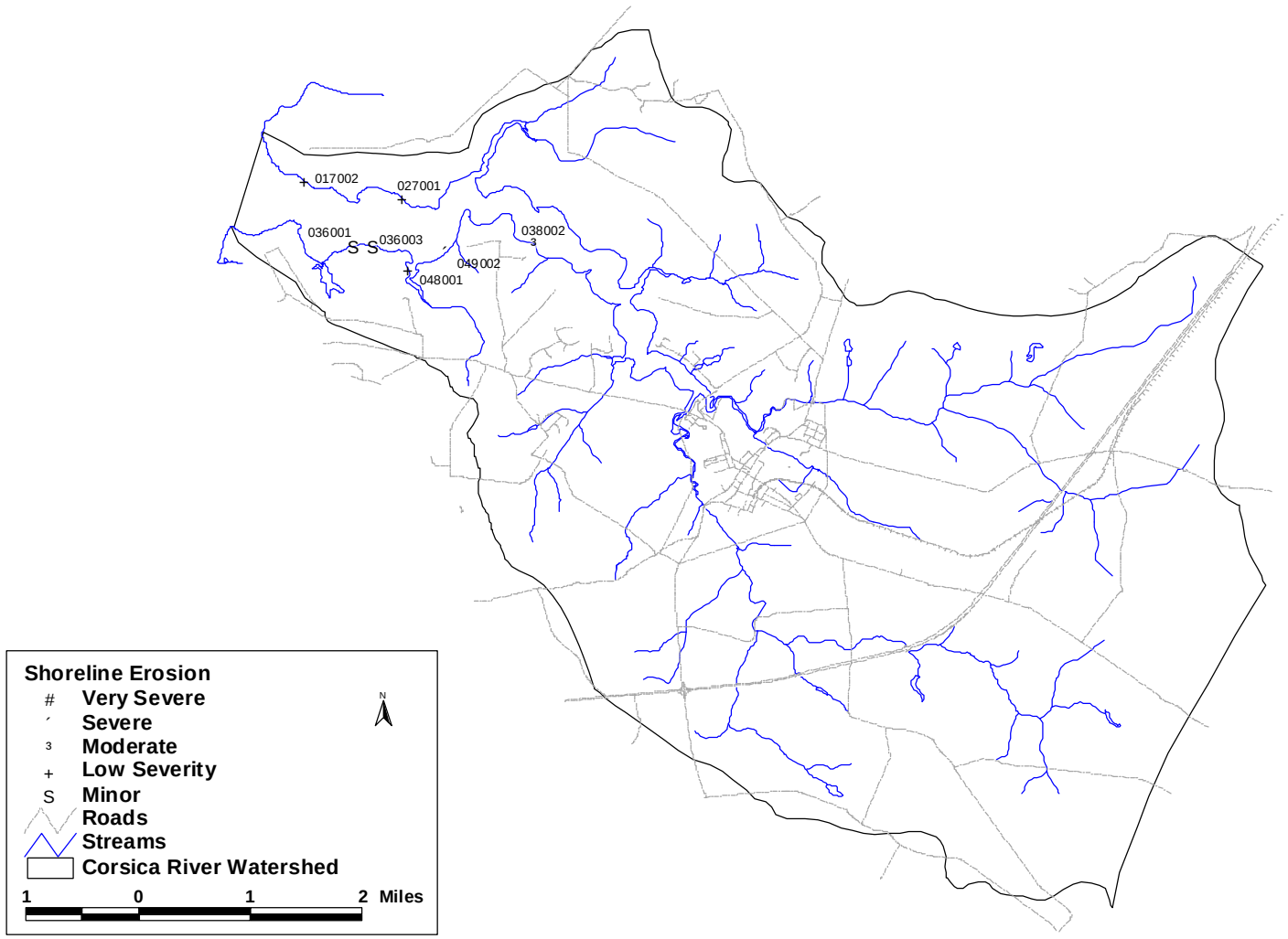


Figure 15b: Corsica River Shoreline Erosion Locations.

DISCUSSION

One of the main objectives of the Corsica River Stream Corridor Assessment and Shoreline Surveys was to quickly survey the River's stream network and shoreline to identify the location of potential environmental problems. The surveys were completed in the spring/summer of 2003, and over 48 miles of streams were walked, and 24.4 miles of shoreline were surveyed by boat. During the surveys 247 potential environmental problems were identified in the non-tidal streams and 49 potential problems were identified along the tidal shoreline. The most common environmental concern seen during the non-tidal SCA survey was erosion sites, which were reported at 57 sites. Other potential environmental problems identified during the SCA survey include: 56 pipe outfalls, 52 fish barriers, 34 inadequate buffers, 20 channel alterations, 11 unusual conditions, 8 trash dumping sites, 5 exposed pipes, and 4 in/near stream construction sites. During the tidal Shoreline Survey, 24 altered shorelines, 18 shoreline inadequate buffers, and 7 shoreline erosion sites were identified.

Erosion sites were the most common problems observed in the Corsica River stream survey. This is typical in a suburban area in which a lot of development occurs. Although storm water management measures are put into place, this often does not adequately control runoff and results in excessive stream bank erosion in the receiving stream. Erosion can also be caused by the absence of adequate forest buffers along a stream corridor. This is another common problem in the Corsica River watershed. Forest buffers along streams can greatly reduce the amount of erosion, and therefore greatly reduce the amount of sediment and nutrients flowing downstream. Pipe outfalls are another common problem in a suburban environment. These pipes are normally stormwater outfall pipes. Pipe outfalls can discharge harmful pollutants to the stream, especially in areas with older communities that were built before stormwater management requirements were in affect. Erosion sites can be related with the number of stormwater pipes discharging directly in the stream. During storm events run-off will be concentrated into stormwater management pipes. When the resulting water goes into the stream it is usually traveling at a high velocity. This high velocity will scour the stream even in areas where there is an adequate forest buffer, while some of the more minor erosion problems, especially in areas that also had inadequate buffers, may be cured with buffer plantings. The more severe erosion problems will probably require more costly engineering solutions both to stabilize the stream's banks and to control upstream runoff, which ultimately is causing the stream to become unstable.

During the shoreline survey of the Corsica River, numerous altered shorelines were found corresponding with inadequate buffers. In a suburban setting along a shoreline, residents often remove the forest buffer to enhance their water view. This, in turn, leads to more shoreline erosion, which causes them to alter their shorelines to prevent erosion and land loss. Many natural ways of altering a shoreline, such as living shorelines etc., are now replacing the bulkhead and rip-rap techniques. These alternative methods of armoring shorelines offer a natural solution to shoreline loss, and could be applied in the Corsica River, especially in places where there is low energy in water movement and less of a chance for extreme erosion to occur. Overall, results of the Corsica River Shoreline found that approximately 23% of the total shoreline was affected by altered shorelines, inadequate buffers or shoreline erosion.

As mentioned earlier, the Maryland Department of Natural Resources has formed a partnership with the Town of Centreville, and Queen Anne's County to develop a Watershed

Restoration Action Strategy (WRAS) for the Corsica River watershed. Results from this survey will be combined with other 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. Information on the Corsica River Watershed Action Strategy can be found on DNR's website (www.dnr.state.md.us/watersheds/surf/proj/wras.html).

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APPENDIX A:
Problem Sites by Site Number

Problem	Site	Severity	Correctability	Acccess	Northing	Easting
Channel Alteration	073101	5	2	2	487287.82387	156123.77684
Channel Alteration	085104	5	2	3	483884.96860	155256.75871
Channel Alteration	100101	4	2	2	485297.58040	154959.96681
Channel Alteration	100104	4	4	2	485434.93591	155048.05143
Channel Alteration	109204	4	5	1	481837.71375	154449.93078
Channel Alteration	117202	5	4	2	477751.91570	154018.01081
Channel Alteration	121118	4	5	1	481187.34509	153766.30546
Channel Alteration	128102	5	3	2	487367.26279	153809.65183
Channel Alteration	130103	5	2	2	478192.90268	153111.59794
Channel Alteration	138201	4	4	1	485399.99783	153119.04678
Channel Alteration	139102	5	3	2	487010.82643	153331.23324
Channel Alteration	146102	4	4	2	482433.42518	152757.45932
Channel Alteration	193102	5	4	2	479489.29487	150662.74766
Channel Alteration	194104	4	3	2	479918.58060	150457.90953
Channel Alteration	199204	5	3	3	484785.57570	150666.21545
Channel Alteration	206105	4	5	2	480749.04959	150155.54965
Channel Alteration	206109	4	4	2	480956.30969	150727.15354
Channel Alteration	215103	5	3	2	480148.63176	149443.95244
Channel Alteration	217202	5	2	1	482323.52410	149761.97047
Channel Alteration	229202	5	2	1	484471.80212	149013.25564
Erosion Site	005102	4	2	2	478529.14942	159149.92792
Erosion Site	005104	4	2	2	478375.87775	159049.30406
Erosion Site	021102	4	2	2	478220.80562	158157.00528
Erosion Site	021103	1	2	2	478273.85936	158123.11526
Erosion Site	053201	4	2	3	480439.58079	156724.06656
Erosion Site	054102	3	2	3	481145.57043	156458.41790
Erosion Site	054103	3	3	3	481124.88756	156564.19650
Erosion Site	054104	3	3	3	480919.82028	156401.58302
Erosion Site	054106	4	3	3	480745.14165	156370.18865
Erosion Site	061101	2	2	4	476500.01639	155890.60424
Erosion Site	066202	3	3	3	480949.81592	155900.85595
Erosion Site	066203	2	2	4	480729.10702	155993.84047
Erosion Site	085105	4	3	3	483610.59651	155230.05301
Erosion Site	091201	5	2	3	477709.59768	154632.09540
Erosion Site	091203	2	2	2	477850.18451	154818.62293
Erosion Site	096212	4	3	3	481788.46828	154855.08679
Erosion Site	098103	5	1	3	483733.35956	155079.96659
Erosion Site	098104	2	3	4	483753.32419	155047.58784
Erosion Site	099101	4	3	2	484302.08562	154708.40466
Erosion Site	099103	4	2	2	484668.03869	154773.41570
Erosion Site	099105	4	1	2	485019.91836	154807.82206
Erosion Site	099106	4	2	2	484684.12656	155093.02272
Erosion Site	105202	4	2	2	478349.00138	154346.73956
Erosion Site	109102	2	4	3	482281.46437	154501.75225
Erosion Site	109202	4	1	5	482269.42632	154494.40496
Erosion Site	109203	2	3	2	481746.18972	154456.85558
Erosion Site	110101	2	2	3	483316.67297	154160.36175
Erosion Site	110201	2	3	4	482696.02919	154569.12030
Erosion Site	111101	4	2	3	483870.57703	154569.18926
Erosion Site	111103	4	2	3	484074.33006	154588.12496

Problem	Site	Severity	Correctability	Acccess	Northing	Easting
Erosion Site	118101	2	2	2	478159.23888	153590.06877
Erosion Site	118105	4	4	4	478708.10938	153647.81715
Erosion Site	121101	4	3	2	481026.28102	153905.92573
Erosion Site	124201	2	4	3	483889.97068	153555.86769
Erosion Site	129101	4	2	1	477882.11667	153108.39204
Erosion Site	133101	3	4	2	481475.87685	153155.90222
Erosion Site	134103	4	3	2	481598.03592	153087.12637
Erosion Site	134105	3	4	2	481749.48384	153322.25860
Erosion Site	138101	2	3	3	486131.51896	153051.48787
Erosion Site	138106	5	3	2	485629.61252	153040.56525
Erosion Site	138202	1	5	4	485411.67441	153108.35173
Erosion Site	139107	5	2	2	486678.79610	153173.24097
Erosion Site	143202	2	5	1	479164.76660	152541.59946
Erosion Site	144102	4	2	3	480140.45043	152631.48987
Erosion Site	146103	2	3	4	482417.43865	152773.14909
Erosion Site	149201	2	2	4	484805.08461	152791.35282
Erosion Site	150101	3	3	3	485841.35072	152928.78478
Erosion Site	156203	2	2	2	479179.05176	152097.33346
Erosion Site	158201	4	1	3	480920.17596	152281.56874
Erosion Site	160102	1	4	2	483366.03291	152370.47068
Erosion Site	163101	5	3	3	485924.41110	152378.63760
Erosion Site	170102	4	3	3	480472.35699	151498.21801
Erosion Site	182101	4	3	3	480164.88646	151278.92325
Erosion Site	195201	2	3	3	481569.20548	150501.19237
Erosion Site	195205	2	3	4	481428.66325	150781.71866
Erosion Site	198201	4	2	2	483699.98804	150783.73714
Erosion Site	207203	4	2	2	481810.62734	150157.90711
Exposed Pipe	021101	5	2	1	478239.88615	158132.56387
Exposed Pipe	112201	4	2	1	484317.61174	154166.98508
Exposed Pipe	121108	2	5	2	481178.64790	153786.71702
Exposed Pipe	121112	5	5	1	481184.23289	153782.99174
Exposed Pipe	144201	5	2	1	480313.86628	152827.11030
Fish Barrier	005101	4	2	1	478770.25428	159282.06226
Fish Barrier	005103	5	2	3	478575.65894	159174.79344
Fish Barrier	040102	5	3	3	479480.36381	157251.36329
Fish Barrier	053202	4	4	1	480441.65214	156732.66560
Fish Barrier	054101	4	4	2	481438.31008	156382.62197
Fish Barrier	054105	4	5	1	480775.60641	156379.71510
Fish Barrier	066201	5	1	2	480987.80798	155883.63173
Fish Barrier	079201	5	2	3	478499.32914	155142.76585
Fish Barrier	085101	5	5	2	483889.51952	155268.71386
Fish Barrier	088101	5	2	3	486532.78685	155345.44749
Fish Barrier	090101	4	2	1	476903.64548	155101.77473
Fish Barrier	092201	5	3	4	478180.46928	155002.50281
Fish Barrier	096204	5	1	2	481839.95030	155068.08876
Fish Barrier	096208	4	5	3	481786.03240	154877.45511
Fish Barrier	104201	4	4	2	477908.10928	154090.85355
Fish Barrier	105204	4	3	1	477965.67950	154145.88673
Fish Barrier	109205	5	2	3	481933.18245	154442.74100
Fish Barrier	109206	5	1	3	481926.46100	154442.09927

Problem	Site	Severity	Correctability	Acccess	Northing	Easting
Fish Barrier	110104	4	2	5	482615.42540	154378.81525
Fish Barrier	111201	5	2	2	484310.01600	154169.59672
Fish Barrier	111203	5	1	4	484053.62220	154242.97391
Fish Barrier	121122	1	5	1	481198.98324	153758.09972
Fish Barrier	121123	5	1	2	481253.61428	153732.37394
Fish Barrier	121125	4	4	3	481453.54657	153670.08859
Fish Barrier	124203	5	5	3	483689.26141	153870.71291
Fish Barrier	124205	5	1	3	483838.30340	153654.20971
Fish Barrier	125202	5	2	2	484716.00439	153947.90678
Fish Barrier	129102	5	2	2	477907.62738	153361.31128
Fish Barrier	137202	4	3	1	485090.38638	153490.90179
Fish Barrier	139101	5	1	2	487037.29723	153367.93963
Fish Barrier	139104	5	3	2	486955.26572	153248.95480
Fish Barrier	139105	4	4	2	486995.23985	153265.89299
Fish Barrier	139108	5	2	3	486645.87975	153168.00465
Fish Barrier	143201	4	4	1	479163.13255	152536.24479
Fish Barrier	144105	5	2	2	480246.68188	152895.05697
Fish Barrier	144107	5	3	2	480253.15597	152903.53964
Fish Barrier	147102	5	1	3	482985.59450	152566.20147
Fish Barrier	150108	5	1	2	485297.52613	152536.03606
Fish Barrier	156202	4	4	2	479173.47609	152086.42188
Fish Barrier	158203	4	4	3	481253.39382	152275.24228
Fish Barrier	163102	5	3	3	485937.86600	152318.88851
Fish Barrier	171201	5	2	4	480865.02475	151871.17491
Fish Barrier	182103	5	2	3	480277.79344	151342.93451
Fish Barrier	182109	4	4	1	479943.89318	150938.14681
Fish Barrier	186201	5	5	1	483868.90499	151017.70172
Fish Barrier	194105	4	5	2	479913.97047	150434.38291
Fish Barrier	195203	5	3	4	481557.74075	150656.12988
Fish Barrier	207202	4	4	2	481873.47191	150123.78135
Fish Barrier	207205	4	5	1	481682.64027	150270.79430
Fish Barrier	208101	4	5	2	483313.31089	150116.09552
Fish Barrier	215101	4	4	2	480361.54215	149340.76443
Fish Barrier	234101	4	5	2	482124.32777	148566.92680
In/Near Stream Construction	096101	1	--	--	482352.23314	155054.82387
In/Near Stream Construction	097203	5	--	--	482956.75727	154998.51581
In/Near Stream Construction	121103	4	--	--	481074.35753	153855.21934
In/Near Stream Construction	182105	3	--	--	480113.76770	151236.19807
Inadequate Buffer	073102	4	2	2	487324.48360	156253.91220
Inadequate Buffer	085103	4	2	3	483889.69823	155269.16929
Inadequate Buffer	090102	2	3	2	476914.31444	154718.51721
Inadequate Buffer	096201	5	2	2	481848.41354	155079.27142
Inadequate Buffer	096205	5	2	3	481784.37189	154918.26414
Inadequate Buffer	097202	5	2	4	482957.37972	154999.72108
Inadequate Buffer	098102	4	2	3	483560.29680	155269.22311
Inadequate Buffer	110102	5	1	4	482874.47408	154313.59861
Inadequate Buffer	111102	5	3	3	483914.75464	154572.59562
Inadequate Buffer	113101	5	2	1	485299.83808	154547.37726
Inadequate Buffer	117201	2	3	2	477567.10596	153974.92825
Inadequate Buffer	121102	4	4	2	481262.90854	153728.41608

Problem	Site	Severity	Correctability	Acccess	Northing	Easting
Inadequate Buffer	121124	4	1	2	481349.21194	153702.73266
Inadequate Buffer	124206	5	2	2	483897.55786	153550.62599
Inadequate Buffer	128101	1	4	2	487369.54969	153814.12273
Inadequate Buffer	130102	2	2	2	478222.79815	152794.94403
Inadequate Buffer	138109	5	3	2	485461.14302	153037.43576
Inadequate Buffer	139103	5	2	2	486996.30934	153311.30662
Inadequate Buffer	143203	4	3	1	479166.60471	152547.61648
Inadequate Buffer	144103	5	3	2	480184.04887	152746.67198
Inadequate Buffer	144203	4	2	1	480301.12875	152836.68228
Inadequate Buffer	146101	4	4	2	482465.02387	152743.78275
Inadequate Buffer	149205	2	3	2	484800.83813	152788.55550
Inadequate Buffer	156201	2	3	1	479013.28862	151747.93218
Inadequate Buffer	158204	5	3	3	481536.83336	152271.47535
Inadequate Buffer	182104	5	3	2	480103.26105	151224.57895
Inadequate Buffer	182106	5	3	2	480081.71151	151196.94661
Inadequate Buffer	193103	1	3	2	479295.80977	150655.91982
Inadequate Buffer	194103	5	3	2	479910.38751	150416.56457
Inadequate Buffer	199203	2	3	3	484786.76284	150675.58065
Inadequate Buffer	207204	3	3	2	481865.35368	150126.34970
Inadequate Buffer	215102	3	3	2	480147.51220	149445.15135
Inadequate Buffer	217201	2	3	1	482359.83447	149747.72904
Inadequate Buffer	229201	2	3	1	484471.84670	149013.27146
Pipe Outfall	040101	5	-1	-1	479483.26009	157248.73150
Pipe Outfall	091202	5	2	1	477844.31021	154810.97688
Pipe Outfall	096203	5	4	2	481839.94970	155068.08890
Pipe Outfall	096207	3	5	3	481786.03256	154877.45531
Pipe Outfall	096209	5	5	3	481786.05155	154877.29187
Pipe Outfall	096210	4	5	3	481787.62512	154862.86962
Pipe Outfall	096211	1	5	3	481788.21078	154857.41229
Pipe Outfall	100102	5	5	1	485395.98637	155022.68176
Pipe Outfall	100103	5	4	2	485414.67845	155034.65720
Pipe Outfall	100105	4	4	2	485407.33470	155050.82185
Pipe Outfall	111202	4	3	2	484277.62667	154190.05956
Pipe Outfall	121104	1	5	2	481068.59905	153880.49039
Pipe Outfall	121106	1	5	2	481156.88489	153826.07639
Pipe Outfall	121109	4	5	1	481178.74730	153786.72460
Pipe Outfall	121110	4	5	1	481180.86041	153776.90362
Pipe Outfall	121111	2	5	1	481180.74662	153773.35774
Pipe Outfall	121114	5	5	1	481187.70607	153764.96156
Pipe Outfall	121115	5	5	1	481188.22981	153764.49247
Pipe Outfall	121116	3	5	1	481188.99038	153763.86853
Pipe Outfall	121117	4	5	1	481190.01509	153763.18539
Pipe Outfall	121119	4	5	1	481192.19574	153761.51804
Pipe Outfall	121120	3	5	1	481192.85078	153760.79268
Pipe Outfall	121121	3	5	1	481193.63905	153760.21905
Pipe Outfall	124204	4	5	3	483821.91685	153665.51560
Pipe Outfall	130101	4	2	2	478175.40670	153211.20163
Pipe Outfall	134104	4	2	2	481703.64932	153227.97724
Pipe Outfall	138102	5	3	1	485452.25160	153083.51439
Pipe Outfall	138103	5	3	1	485452.71235	153087.04681

Problem	Site	Severity	Correctability	Acccess	Northing	Easting
Pipe Outfall	138104	5	3	1	485453.86422	153090.69440
Pipe Outfall	138105	4	3	1	485457.43503	153089.69611
Pipe Outfall	140101	4	2	1	487114.29652	153436.88241
Pipe Outfall	143204	3	2	1	479182.42111	152576.51581
Pipe Outfall	144101	5	4	3	480118.54595	152552.52660
Pipe Outfall	144202	5	1	1	480318.11165	152822.73859
Pipe Outfall	144204	5	1	1	480324.26042	152816.03461
Pipe Outfall	149206	4	3	2	484882.20185	152877.73864
Pipe Outfall	150104	4	3	2	485846.87261	152836.83080
Pipe Outfall	160101	4	3	2	483370.99782	152366.50225
Pipe Outfall	160103	5	3	2	483329.78600	152399.76904
Pipe Outfall	170101	4	5	3	480526.45034	151764.40211
Pipe Outfall	182102	3	3	3	480311.16169	151362.78179
Pipe Outfall	182110	5	3	1	479922.61351	150937.79724
Pipe Outfall	182111	5	2	1	479924.17455	150931.57447
Pipe Outfall	194106	5	3	2	479950.91161	150430.17428
Pipe Outfall	196201	4	3	1	482408.11451	150696.63380
Pipe Outfall	206101	3	2	2	480704.94953	149837.47906
Pipe Outfall	206103	4	5	2	480735.28201	150099.27664
Pipe Outfall	206104	4	5	2	480744.95276	150110.85034
Pipe Outfall	206106	4	5	2	480752.43533	150131.06977
Pipe Outfall	206107	4	5	2	480751.74456	150141.09704
Pipe Outfall	206108	4	3	2	480749.70717	150170.25039
Pipe Outfall	207201	5	1	2	481926.08138	150141.61419
Pipe Outfall	207206	5	1	1	481668.74784	150291.22983
Pipe Outfall	207207	3	2	1	481650.06571	150313.49101
Pipe Outfall	207208	4	2	1	481649.17946	150314.83651
Pipe Outfall	234102	3	3	3	481938.66438	148702.03169
Representative Site	061102	--	--	--	476699.13954	155910.28329
Representative Site	066204	--	--	--	480683.47909	156091.42470
Representative Site	092202	--	--	--	478228.58245	155012.18268
Representative Site	096213	--	--	--	481810.89766	154732.25149
Representative Site	097201	--	--	--	482802.25687	154763.28284
Representative Site	098101	--	--	--	483773.84281	155074.24367
Representative Site	099104	--	--	--	484674.84306	154770.41926
Representative Site	105201	--	--	--	478524.73839	154295.66973
Representative Site	108201	--	--	--	481422.89825	154385.68906
Representative Site	109201	--	--	--	482072.30713	154458.40691
Representative Site	110103	--	--	--	482764.06015	154346.13296
Representative Site	118103	--	--	--	478210.90370	153688.27080
Representative Site	121105	--	--	--	481093.07816	153857.96788
Representative Site	124202	--	--	--	483692.89856	153837.80861
Representative Site	125201	--	--	--	484978.32469	153605.26453
Representative Site	138108	--	--	--	485694.60430	153013.05876
Representative Site	143205	--	--	--	479394.32962	152856.01866
Representative Site	144206	--	--	--	480613.87293	152611.23631
Representative Site	147101	--	--	--	483077.80889	152552.71073
Representative Site	150102	--	--	--	485827.11168	152963.09461
Representative Site	158202	--	--	--	481219.20091	152281.83747
Representative Site	171202	--	--	--	480981.31061	151416.17918

Problem	Site	Severity	Correctability	Acccess	Northing	Easting
Representative Site	194101	--	--	--	480024.78537	150865.81047
Representative Site	195202	--	--	--	481571.64596	150558.72460
Representative Site	195204	--	--	--	481291.10952	150880.36038
Representative Site	206102	--	--	--	480770.19414	149983.40412
Representative Site	210201	--	--	--	484560.51160	150080.30749
Trash Dumping	096202	5	2	2	481848.41601	155079.27283
Trash Dumping	099102	5	1	3	484526.17571	154742.25165
Trash Dumping	105203	4	1	2	478018.32403	154203.75820
Trash Dumping	105205	4	2	2	477949.38694	154130.65821
Trash Dumping	118102	4	2	2	478192.70640	153652.42451
Trash Dumping	144106	3	4	2	480225.45082	152877.98282
Trash Dumping	144205	4	4	3	480594.82591	152621.86625
Trash Dumping	147103	5	3	3	482628.41650	152666.22627
Unusual Condition	085102	3	3	2	483888.17699	155265.17081
Unusual Condition	098105	4	3	3	483810.03459	154954.49780
Unusual Condition	109101	4	4	3	482306.36301	154558.37359
Unusual Condition	118104	5	3	3	478558.32935	153918.38196
Unusual Condition	121107	2	2	2	481165.78395	153810.35795
Unusual Condition	134101	4	3	2	482043.08906	153330.56767
Unusual Condition	134106	3	3	2	481813.72029	153398.73723
Unusual Condition	139106	3	3	2	486952.56292	153251.14922
Unusual Condition	143206	3	4	3	479398.68913	152855.82597
Unusual Condition	150106	4	2	3	485434.27468	152805.75886
Unusual Condition	220201	4	4	1	484674.61487	149348.19627
Comment	038002	0	--	--	477737.32284	156898.74493
Altered Shoreline	016001	3	2	3	474178.70793	158047.62014
Altered Shoreline	029003	4	2	3	477390.31124	157695.65326
Altered Shoreline	029006	3	3	3	477115.60795	157604.61384
Altered Shoreline	034001	4	3	2	473668.90735	157040.17680
Altered Shoreline	034003	1	3	3	474476.87613	157097.94288
Altered Shoreline	035001	3	3	2	474585.68430	156712.81583
Altered Shoreline	036005	5	2	2	475977.28700	156770.46714
Altered Shoreline	038001	5	2	2	477248.48689	157195.91174
Altered Shoreline	038003	5	3	2	477872.17593	156837.43350
Altered Shoreline	047001	4	3	3	474761.41531	156595.51895
Altered Shoreline	047002	5	3	3	474956.68063	156727.41673
Altered Shoreline	049003	4	3	2	476439.49332	156626.79199
Altered Shoreline	051002	3	3	2	478217.97536	156649.86997
Altered Shoreline	051004	3	4	3	478581.75995	156445.85055
Altered Shoreline	064002	2	2	2	479327.76271	155858.17122
Altered Shoreline	064005	4	3	2	479006.87763	155956.28889
Altered Shoreline	080010	5	1	2	479037.49880	155536.64247
Altered Shoreline	080011	5	2	2	479152.53838	155279.28035
Altered Shoreline	093001	3	3	2	479284.85637	155076.47693
Altered Shoreline	093004	3	3	2	479568.85781	154919.35142
Altered Shoreline	093005	3	3	2	479736.44958	154986.40237
Altered Shoreline	094004	4	3	2	480081.65642	154642.82653
Altered Shoreline	107002	3	3	1	480048.57949	154307.25123
Altered Shoreline	107004	3	3	1	480178.48578	154545.19123
Shoreline erosion	017002	4	1	3	474578.00745	157816.85271

Problem	Site	Severity	Correctability	Acccess	Northing	Easting
Shoreline erosion	027001	4	--	3	475969.66940	157557.75070
Shoreline erosion	036001	5	--	3	475267.79078	156827.67809
Shoreline erosion	036003	5	3	4	475554.65889	156834.23250
Shoreline erosion	038002	3	3	3	477841.44123	156877.68512
Shoreline erosion	048001	4	4	3	476057.06359	156471.62307
Shoreline erosion	049002	2	4	3	476589.73311	156731.02826
Shoreline inadequate buffer	016002	1	2	3	474174.47275	158050.78193
Shoreline inadequate buffer	017001	2	1	3	474651.92618	157749.89092
Shoreline inadequate buffer	027001	4	1	3	475690.31378	157692.55199
Shoreline inadequate buffer	028001	4	2	3	476599.00102	157680.65639
Shoreline inadequate buffer	028002	4	1	3	476402.06840	157414.89578
Shoreline inadequate buffer	029004	2	1	2	477494.22871	157749.94691
Shoreline inadequate buffer	034002	2	2	3	474622.38567	156679.50257
Shoreline inadequate buffer	036004	3	3	2	476036.22510	156759.45200
Shoreline inadequate buffer	037001	4	1	2	476795.99421	157206.78317
Shoreline inadequate buffer	038002	3	1	2	477842.06046	156877.07345
Shoreline inadequate buffer	039002	2	2	3	478515.57155	156924.85487
Shoreline inadequate buffer	047003	1	--	--	475160.89808	156800.95177
Shoreline inadequate buffer	064001	4	2	2	479480.15191	155849.49762
Shoreline inadequate buffer	064006	4	1	2	479011.77686	155955.49950
Shoreline inadequate buffer	080002	4	2	2	479494.89559	155327.48620
Shoreline inadequate buffer	093002	4	1	2	479282.77601	155024.40749
Shoreline inadequate buffer	094001	2	2	2	480384.14590	154589.24704
Shoreline inadequate buffer	094003	2	2	2	480039.91311	154978.45661
Shoreline inadequate buffer	107001	3	4	1	480048.57436	154307.26353
Shoreline inadequate buffer	107003	1	1	2	480018.54885	154319.81035

APPENDIX B:
Problem Sites by Category

Problem	Site	Date	Type	BottomWidth(ft)	Length(ft)	Sedimentation	Veg in Channel	Road Crossing	LengthAbove(ft)	LengthBelow(ft)	Severity	Correctability	Access	Northing	Easting
Channel Alteration	073101	06/25/2003	Earth Channel	2	800	Yes	Yes	Below	0	8	5	2	2	487287.82387	156123.77684
Channel Alteration	085104	05/12/2003	Earth Channel	1.5	700	Yes	Yes	No	0	0	5	2	3	483884.96860	155256.75871
Channel Alteration	100101	06/09/2003	Corrugated Pipe	10	20	Yes	No	Both	8	8	4	2	2	485297.58040	154959.96681
Channel Alteration	100104	06/09/2003	Rip-rap	5	100	No	Yes	Below	0	40	4	4	2	485434.93591	155048.05143
Channel Alteration	109204	06/03/2003	Concrete	2	30		No	Both	3	3	4	5	1	481837.71375	154449.93078
Channel Alteration	117202	06/24/2003	Earth Channel	1.5	600	Yes	No	No	0	0	5	4	2	477751.91570	154018.01081
Channel Alteration	121118	05/28/2003	Concrete	2	100	Yes	Yes	Above	75	0	4	5	1	481187.34509	153766.30546
Channel Alteration	128102	06/11/2003	Earth Channel	2	500	No	Yes	No	0	0	5	3	2	487367.26279	153809.65183
Channel Alteration	130103	06/24/2003	Earth Channel	3	5	No	Yes	No	0	0	5	2	2	478192.90268	153111.59794
Channel Alteration	138201	06/09/2003	Concrete	8	170	Yes	No	Both	15	15	4	4	1	485399.99783	153119.04678
Channel Alteration	139102	06/11/2003	Earth Channel	3	250	Yes	No	No	0	0	5	3	2	487010.82643	153331.23324
Channel Alteration	146102	06/03/2003	Rip-rap	3	300	Yes	No	No	0	0	4	4	2	482433.42518	152757.45932
Channel Alteration	193102	06/17/2003	Earth Channel	3	700	Yes	Yes	No	0	0	5	4	2	479489.29487	150662.74766
Channel Alteration	194104	06/17/2003	Gabion	3	30	No	No	No	0	0	4	3	2	479918.58060	150457.90953
Channel Alteration	199204	06/11/2003	Earth Channel	1.5	600	Yes	Yes	No	0	0	5	3	3	484785.57570	150666.21545
Channel Alteration	206105	06/12/2003	Concrete	12	150	Yes	Yes	Both	15	15	4	5	2	480749.04959	150155.54965
Channel Alteration	206109	06/12/2003	Metal Pipe	6	30	No	No	Both	5	5	4	4	2	480956.30969	150727.15354
Channel Alteration	215103	06/12/2003	Earth Channel	2	300	Yes	No	No	0	0	5	3	2	480148.63176	149443.95244
Channel Alteration	217202	06/17/2003	Earth Channel	1.5	800	Yes	Yes	No	0	0	5	2	1	482323.52410	149761.97047
Channel Alteration	229202	06/11/2003	Earth Channel	2	0	Yes	Yes	No	0	0	5	2	1	484471.80212	149013.25564

Problem	Site	Date	Location of Pipe	Type	Diameter(in)	Length(ft)	Purpose	Discharge	Color	Odor	Severity	Correctability	Access	Northing	Easting
Exposed Pipe	021101	06/24/2003	Across Bottom of Stream	Smooth Metal	3	8	Unknown	No			5	2	1	478239.88615	158132.56387
Exposed Pipe	112201	06/09/2003	Along Stream Bank	Plastic	2	300	Unknown	No			4	2	1	484317.61174	154166.98508
Exposed Pipe	121108	05/28/2003	Across Bottom of Stream	Concrete	36	12	Sewage	No			2	5	2	481178.64790	153786.71702
Exposed Pipe	121112	05/28/2003	Along Stream Bank	Smooth Metal	6	15	Unknown	No			5	5	1	481184.23289	153782.99174
Exposed Pipe	144201	06/12/2003	Along Bottom of Bridge	Smooth Metal	8	30	Unknown	No			5	2	1	480313.86628	152827.11030

Problem	Site	Date	Type	Possible Cause	Length(ft)	Height(ft)	Landuseright	Landuseleft	Threat to Infrastructure?	Severity	Correctability	Access	Northing	Easting
Erosion Site	005102	06/25/2003	Widening	Bend at Steep Slope	900	3	Forest	Forest	No	4	2	2	478529.14942	159149.92792
Erosion Site	005104	06/25/2003	Widening	Bend at Steep Slope	100	6	Forest	Forest	No	4	2	2	478375.87775	159049.30406
Erosion Site	021102	06/25/2003	Widening	Bend at Steep Slope	15	5	Forest	Forest	No	4	2	2	478220.80562	158157.00528
Erosion Site	021103	06/25/2003	Widening	Natural	1037	4	Forest	Forest	No	1	2	2	478273.85936	158123.11526
Erosion Site	053201	07/01/2003	Downcutting	Below Road Crossing	620	2	Crop Field	Forest	No	4	2	3	480439.58079	156724.06656
Erosion Site	054102	07/01/2003	Widening	Bend at Steep Slope	470	4	Crop Field	Crop Field	No	3	2	3	481145.57043	156458.41790
Erosion Site	054103	07/01/2003	Widening	Bend at Steep Slope	300	4	Crop Field	Crop Field	No	3	3	3	481124.88756	156564.19650
Erosion Site	054104	07/01/2003	Widening	Bend at Steep Slope	475	4	Crop Field	Crop Field	No	3	3	3	480919.82028	156401.58302
Erosion Site	054106	07/01/2003	Widening	Bend at Steep Slope	260	5	Crop Field	Crop Field	No	4	3	3	480745.14165	156370.18865
Erosion Site	061101	06/24/2003	Widening	Bend at Steep Slope	4380	1	Forest	Forest	No	2	2	4	476500.01639	155890.60424
Erosion Site	066202	07/01/2003	Downcutting	Bend at Steep Slope	700	4	Forest	Forest	No	3	3	3	480949.81592	155900.85595
Erosion Site	066203	07/07/2003	Downcutting	Bend at Steep Slope	1000	1.5	Forest	Forest	No	2	2	4	480729.10702	155993.84047
Erosion Site	085105	05/12/2003	Widening	Unknown	400	3	Crop Field	Crop Field	No	4	3	3	483610.59651	155230.05301
Erosion Site	091201	06/24/2003	Downcutting	Bend at Steep Slope	140	2	Forest	Forest	No	5	2	3	477709.59768	154632.09540
Erosion Site	091203	06/24/2003	Downcutting	Bend at Steep Slope	3200	1	Forest	Forest	No	2	2	2	477850.18451	154818.62293
Erosion Site	096212	06/03/2003	Widening	Bend at Steep Slope	770	3	Forest	Forest	No	4	3	3	481788.46828	154855.08679
Erosion Site	098103	05/12/2003	Headcutting	Instream Debris	120	3	Crop Field	Crop Field	No	5	1	3	483733.35956	155079.96659
Erosion Site	098104	05/12/2003	Widening	Bend at Steep Slope	1720	2	Forest	Forest	No	2	3	4	483753.32419	155047.58784
Erosion Site	099101	06/09/2003	Widening	Bend at Steep Slope	75	12	Crop Field	Forest	No	4	3	2	484302.08562	154708.40466
Erosion Site	099103	06/09/2003	Widening	Bend at Steep Slope	50	5	Crop Field	Forest	No	4	2	2	484668.03869	154773.41570
Erosion Site	099105	06/09/2003	Widening	Bend at Steep Slope	20	4	Crop Field	Forest	No	4	1	2	485019.91836	154807.82206
Erosion Site	099106	06/25/2003	Widening	Bend at Steep Slope	25	4	Forest	Forest	No	4	2	2	484684.12656	155093.02272
Erosion Site	105202	06/24/2003	Widening	Bend at Steep Slope	800	2	Forest	Lawn	No	4	2	2	478349.00138	154346.73956
Erosion Site	109102	05/27/2003	Widening	Land Use Change Upstream	1720	3	Forest	Forest	No	2	4	3	482281.46437	154501.75225
Erosion Site	109202	06/03/2003	Widening	Bend at Steep Slope	310	2	Forest	Forest	No	4	1	5	482269.42632	154494.40496
Erosion Site	109203	06/03/2003	Widening	Bend at Steep Slope	1480	2	Forest	Forest	No	2	3	2	481746.18972	154456.85558
Erosion Site	110101	05/27/2003	Widening	Bend at Steep Slope	1390	1	Forest	Forest	No	2	2	3	483316.67297	154160.36175
Erosion Site	110201	06/03/2003	Widening	Bend at Steep Slope	3080	2	Forest	Forest	No	2	3	4	482696.02919	154569.12030
Erosion Site	111101	06/09/2003	Widening	Bend at Steep Slope	50	5	Pasture	Forest	No	4	2	3	483870.57703	154569.18926
Erosion Site	111103	06/09/2003	Widening	Bend at Steep Slope	50	10	Crop Field	Forest	No	4	2	3	484074.33006	154588.12496
Erosion Site	118101	06/24/2003	Widening	Natural	2060	2.5	Lawn	Forest	No	2	2	2	478159.23888	153590.06877
Erosion Site	118105	06/24/2003	Widening	Bend at Steep Slope	20	5	Forest	Forest	No	4	4	4	478708.10938	153647.81715
Erosion Site	121101	05/28/2003	Widening	Land Use Change Upstream	600	3	Pasture	Pasture	No	4	3	2	481026.28102	153905.92573
Erosion Site	124201	06/09/2003	Widening	Bend at Steep Slope	2280	2	Forest	Forest	No	2	4	3	483889.97068	153555.86769
Erosion Site	129101	06/24/2003	Widening	Natural	430	2	Pasture	Crop Field	No	4	2	1	477882.11667	153108.39204
Erosion Site	133101	06/03/2003	Widening	Bend at Steep Slope	375	5	Forest	Forest	No	3	4	2	481475.87685	153155.90222

Problem	Site	Date	Type	Possible Cause	Length(ft)	Height(ft)	Landuseright	Landuseleft	Threat to Infrastructure?	Severity	Correctability	Access	Northing	Easting
Erosion Site	134103	06/03/2003	Widening	Natural	500	2	Forest	Forest	No	4	3	2	481598.03592	153087.12637
Erosion Site	134105	06/03/2003	Widening	Bend at Steep Slope	570	4	Forest	Forest	No	3	4	2	481749.48384	153322.25860
Erosion Site	138101	06/11/2003	Widening	Bend at Steep Slope	1725	3	Crop Field	Crop Field	No	2	3	3	486131.51896	153051.48787
Erosion Site	138106	06/11/2003	Widening	Bend at Steep Slope	290	3	Crop Field	Crop Field	No	5	3	2	485629.61252	153040.56525
Erosion Site	138202	06/09/2003	Widening	Below Channelization	7230	4	Forest	Forest	No	1	5	4	485411.67441	153108.35173
Erosion Site	139107	06/11/2003	Widening	Natural	30	3	Crop Field	Crop Field	No	5	2	2	486678.79610	153173.24097
Erosion Site	143202	06/17/2003	Widening	Below Road Crossing	4600	3	Forest	Forest	No	2	5	1	479164.76660	152541.59946
Erosion Site	144102	06/17/2003	Widening	Bend at Steep Slope	45	5	Crop Field	Crop Field	No	4	2	3	480140.45043	152631.48987
Erosion Site	146103	06/03/2003	Widening	Bend at Steep Slope	3060	2	Forest	Forest	No	2	3	4	482417.43865	152773.14909
Erosion Site	149201	06/09/2003	Widening	Land Use Change Upstream	1715	1	Forest	Forest	No	2	2	4	484805.08461	152791.35282
Erosion Site	150101	06/11/2003	Widening	Bend at Steep Slope	480	4	Crop Field	Crop Field	No	3	3	3	485841.35072	152928.78478
Erosion Site	156203	06/17/2003	Widening	Below Road Crossing	1630	2	Pasture	Pasture	No	2	2	2	479179.05176	152097.33346
Erosion Site	158201	06/12/2003	Downcutting	Bend at Steep Slope	500	1	Forest	Forest	No	4	1	3	480920.17596	152281.56874
Erosion Site	160102	06/03/2003	Widening	Below Road Crossing	3430	4	Crop Field	Forest	No	1	4	2	483366.03291	152370.47068
Erosion Site	163101	06/11/2003	Widening	Natural	230	3	Crop Field	Crop Field	No	5	3	3	485924.41110	152378.63760
Erosion Site	170102	06/17/2003	Widening	Natural	545	2	Crop Field	Crop Field	No	4	3	3	480472.35699	151498.21801
Erosion Site	182101	06/17/2003	Widening	Bend at Steep Slope	550	3	Crop Field	Crop Field	No	4	3	3	480164.88646	151278.92325
Erosion Site	195201	06/17/2003	Widening	Below Road Crossing	1000	1	Forest	Forest	No	2	3	3	481569.20548	150501.19237
Erosion Site	195205	06/17/2003	Widening	Below Road Crossing	3700	1	Forest	Forest	No	2	3	4	481428.66325	150781.71866
Erosion Site	198201	06/11/2003	Widening	Bend at Steep Slope	500	1	Forest	Forest	No	4	2	2	483699.98804	150783.73714
Erosion Site	207203	06/17/2003	Widening	Below Road Crossing	560	1	Forest	Forest	No	4	2	2	481810.62734	150157.90711

Problem	Site	Date	Blockage	Type	Reason	Drop(ln)	Depth(ln)	Severity	Correctability	Access	Northing	Easting
Fish Barrier	005101	6/24/03	Partial	Pipe Crossing	Too Shallow		1	4	2	1	478770.25428	159282.06226
Fish Barrier	005103	6/25/03	Temporary	Natural Falls	Too High	24		5	2	3	478575.65894	159174.79344
Fish Barrier	040102	7/1/03	Total	Natural Falls	Too High	24		5	3	3	479480.36381	157251.36329
Fish Barrier	053202	7/1/03	Total	Road Crossing	Too High	36		4	4	1	480441.65214	156732.66560
Fish Barrier	054101	7/1/03	Total	Road Crossing	Too High	6		4	4	2	481438.31008	156382.62197
Fish Barrier	054105	7/1/03	Total	Road Crossing	Too High	12		4	5	1	480775.60641	156379.71510
Fish Barrier	066201	7/1/03	Total	Natural Falls	Too High	30		5	1	2	480987.80798	155883.63173
Fish Barrier	079201	6/24/03	Temporary	Natural Falls	Too High	4		5	2	3	478499.32914	155142.76585
Fish Barrier	085101	5/12/03	Total	Instream Pond	Too High	120		5	5	2	483889.51952	155268.71386
Fish Barrier	088101	6/9/03	Temporary	Natural Falls	Too High	12		5	2	3	486532.78685	155345.44749
Fish Barrier	090101	6/24/03	Total	Road Crossing	Too High	6		4	2	1	476903.64548	155101.77473
Fish Barrier	092201	6/24/03	Total	Natural Falls	Too High	8		5	3	4	478180.46928	155002.50281
Fish Barrier	096204	6/3/03	Temporary	Natural Falls	Too High	6		5	1	2	481839.95030	155068.08876
Fish Barrier	096208	6/3/03	Total	Pipe Crossing	Too High	144		4	5	3	481786.03240	154877.45511
Fish Barrier	104201	6/24/03	Total	Road Crossing	Too High	12		4	4	2	477908.10928	154090.85355
Fish Barrier	105204	6/24/03	Total	Road Crossing	Too High	10		4	3	1	477965.67950	154145.88673
Fish Barrier	109205	6/3/03	Total	Natural Falls	Too High	12		5	2	3	481933.18245	154442.74100
Fish Barrier	109206	6/3/03	Total	Beaver Dam	Too High	24		5	1	3	481926.46100	154442.09927
Fish Barrier	110104	5/27/03	Temporary	Beaver Dam	Too High	12		4	2	5	482615.42540	154378.81525
Fish Barrier	111201	6/9/03	Partial	Natural Falls	Too High	3		5	2	2	484310.01600	154169.59672
Fish Barrier	111203	6/9/03	Temporary	Natural Falls	Too High	6		5	1	4	484053.62220	154242.97391
Fish Barrier	121122	5/28/03	Total	Dam	Too High	60		1	5	1	481198.98324	153758.09972
Fish Barrier	121123	5/28/03	Temporary	Beaver Dam	Too High	3		5	1	2	481253.61428	153732.37394
Fish Barrier	121125	5/28/03	Temporary	Beaver Dam	Too High	12		4	4	3	481453.54657	153670.08859
Fish Barrier	124203	6/9/03	Temporary	Natural Falls	Too High	8		5	5	3	483689.26141	153870.71291
Fish Barrier	124205	6/9/03	Temporary	Natural Falls	Too High	4		5	1	3	483838.30340	153654.20971
Fish Barrier	125202	6/9/03	Partial	Natural Falls	Too High	5		5	2	2	484716.00439	153947.90678
Fish Barrier	129102	6/24/03	Temporary	Natural Falls	Too High	24		5	2	2	477907.62738	153361.31128
Fish Barrier	137202	6/9/03	Total	Road Crossing	Too High	8		4	3	1	485090.38638	153490.90179
Fish Barrier	139101	6/11/03	Temporary	Natural Falls	Too High	6		5	1	2	487037.29723	153367.93963
Fish Barrier	139104	6/11/03	Total	Instream Pond	Too High	18		5	3	2	486955.26572	153248.95480
Fish Barrier	139105	6/11/03	Total	Instream Pond	Too High	36		4	4	2	486995.23985	153265.89299
Fish Barrier	139108	6/11/03	Temporary	Natural Falls	Too High	2		5	2	3	486645.87975	153168.00465

Problem	Site	Date	Blockage	Type	Reason	Drop(In)	Depth(In)	Severity	Correctability	Access	Northing	Easting
Fish Barrier	143201	6/17/03	Total	Road Crossing	Too High	18		4	4	1	479163.13255	152536.24479
Fish Barrier	144105	6/17/03	Partial	Natural Falls	Too High	18		5	2	2	480246.68188	152895.05697
Fish Barrier	144107	6/17/03	Partial	Natural Falls	Too High	24		5	3	2	480253.15597	152903.53964
Fish Barrier	147102	6/3/03	Temporary	Natural Falls	Too High	8		5	1	3	482985.59450	152566.20147
Fish Barrier	150108	6/11/03	Temporary	Natural Falls	Too High	12		5	1	2	485297.52613	152536.03606
Fish Barrier	156202	6/17/03	Total	Road Crossing	Too High	48		4	4	2	479173.47609	152086.42188
Fish Barrier	158203	6/12/03	Total	Pipe Crossing	Too High	12		4	4	3	481253.39382	152275.24228
Fish Barrier	163102	6/11/03	Temporary	Natural Falls	Too High	12		5	3	3	485937.86600	152318.88851
Fish Barrier	171201	6/12/03	Temporary	Beaver Dam	Too High	8		5	2	4	480865.02475	151871.17491
Fish Barrier	182103	6/17/03	Temporary	Natural Falls	Too High	8		5	2	3	480277.79344	151342.93451
Fish Barrier	182109	6/17/03	Total	Road Crossing	Too High	24		4	4	1	479943.89318	150938.14681
Fish Barrier	186201	6/11/03	Temporary	Natural Falls	Too High	18		5	5	1	483868.90499	151017.70172
Fish Barrier	194105	6/17/03	Total	Instream Pond	Too High	60		4	5	2	479913.97047	150434.38291
Fish Barrier	195203	6/17/03	Total	Natural Falls	Too High	12		5	3	4	481557.74075	150656.12988
Fish Barrier	207202	6/17/03	Total	Road Crossing	Too High	12		4	4	2	481873.47191	150123.78135
Fish Barrier	207205	6/17/03	Total	Channelized	Too Shallow		0.5	4	5	1	481682.64027	150270.79430
Fish Barrier	208101	6/17/03	Total	Instream Pond	Too High	60		4	5	2	483313.31089	150116.09552
Fish Barrier	215101	6/12/03	Total	Instream Pond	Too High	36		4	4	2	480361.54215	149340.76443
Fish Barrier	234101	6/12/03	Total	Instream Pond	Too High	60		4	5	2	482124.32777	148566.92680

Problem	Site	Date	Sides	Unshaded	WidthLeft(ft)	WidthRight(ft)	LengthLeft(ft)	LengthRight(ft)	LandUseLeft	LandUseRight	Recentlyestablished	Livestock	Livestock Type	Severity	Correctability	Access	Wetland	Northing	Easting
Inadequate Buffer	073102	06/24/2003	Both	Both	2	2	670	670	Crop Field	Crop Field	No	No		4	2	2	5	487324.48360	156253.91220
Inadequate Buffer	085103	05/12/2003	Both	Neither	20	20	770	770	Shrubs & Small Trees	Shrubs & Small Trees	Yes	No		4	2	3	2	483889.69823	155269.16929
Inadequate Buffer	090102	06/24/2003	Both	Neither	5	5	1350	1350	Crop Field	Crop Field	No	No		2	3	2	5	476914.31444	154718.51721
Inadequate Buffer	096201	06/03/2003	Right	Neither		10		115	Forest	Lawn	No	No		5	2	2	5	481848.41354	155079.27142
Inadequate Buffer	096205	06/03/2003	Left	Left	20		110		Lawn	Forest	No	No		5	2	3	3	481784.37189	154918.26414
Inadequate Buffer	097202	06/03/2003	Right	Neither		10		70	Forest	Construction Site	No	No		5	2	4	5	482957.37972	154999.72108
Inadequate Buffer	098102	05/12/2003	Right	Neither		15		860	Forest	Crop Field	No	No		4	2	3	3	483560.29680	155269.22311
Inadequate Buffer	110102	05/27/2003	Right	Neither		15		300	Forest	Crop Field	No	No		5	1	4	4	482874.47408	154313.59861
Inadequate Buffer	111102	06/09/2003	Left	Neither	30		115		Crop Field	Forest	No	No		5	3	3	4	483914.75464	154572.59562
Inadequate Buffer	113101	06/25/2003	Both	Both	15	0	180	180	Crop Field	Lawn	No	No		5	2	1	5	485299.83808	154547.37726
Inadequate Buffer	117201	06/24/2003	Both	Both	2	2	1175	1175	Crop Field	Crop Field	No	No		2	3	2	5	477567.10596	153974.92825
Inadequate Buffer	121102	05/28/2003	Both	Both	10	10	980	400	Pasture	Pasture	No	No		4	4	2	4	481262.90854	153728.41608
Inadequate Buffer	121124	05/28/2003	Right	Neither		10		270	Forest	Lawn	No	No		4	1	2	5	481349.21194	153702.73266
Inadequate Buffer	124206	06/09/2003	Both	Neither	20	20	300	300	Crop Field	Crop Field	No	No		5	2	2	4	483897.55786	153550.62599
Inadequate Buffer	128101	06/11/2003	Both	Both	0	0	1615	1615	Crop Field	Crop Field	No	No		1	4	2	2	487369.54969	153814.12273
Inadequate Buffer	130102	06/24/2003	Both	Both	3	7	1000	1000	Crop Field	Crop Field	No	No		2	2	2	5	478222.79815	152794.94403
Inadequate Buffer	138109	06/11/2003	Both	Both	0	0	150	150	Crop Field	Crop Field	No	No		5	3	2	4	485461.14302	153037.43576
Inadequate Buffer	139103	06/11/2003	Right	Neither		15		260	Crop Field	Crop Field	No	No		5	2	2	3	486996.30934	153311.30662
Inadequate Buffer	143203	06/17/2003	Both	Neither	10	10	340	340	Lawn	Lawn	No	No		4	3	1	3	479166.60471	152547.61648
Inadequate Buffer	144103	06/17/2003	Right	Neither		15		130	Crop Field	Lawn	No	No		5	3	2	3	480184.04887	152746.67198
Inadequate Buffer	144203	06/12/2003	Both	Both	10	10	350	350	Shrubs & Small Trees	Shrubs & Small Trees	No	No		4	2	1	4	480301.12875	152836.68228
Inadequate Buffer	146101	06/03/2003	Left	Left	0		140		Railroad Track	Forest	No	No		4	4	2	5	482465.02387	152743.78275
Inadequate Buffer	149205	06/09/2003	Both	Neither	6	6	850	850	Crop Field	Crop Field	No	No		2	3	2	4	484800.83813	152788.55550
Inadequate Buffer	156201	06/17/2003	Both	Neither	3	3	870	870	Pasture	Pasture	No	No		2	3	1	3	479013.28862	151747.93218
Inadequate Buffer	158204	06/12/2003	Both	Neither	15	15	850	850	Crop Field	Crop Field	No	No		5	3	3	4	481536.83336	152271.47535
Inadequate Buffer	182104	06/17/2003	Right	Right		0		75	Crop Field	Crop Field	No	No		5	3	2	4	480103.26105	151224.57895
Inadequate Buffer	182106	06/17/2003	Both	Both	0	0	85	90	Lawn	Lawn	No	No		5	3	2	3	480081.71151	151196.94661
Inadequate Buffer	193103	06/17/2003	Both	Both	0	0	1575	1575	Crop Field	Crop Field	No	No		1	3	2	2	479295.80977	150655.91982
Inadequate Buffer	194103	03/17/2003	Both	Neither	20	30	105	105	Crop Field	Crop Field	No	No		5	3	2	2	479910.38751	150416.56457
Inadequate Buffer	199203	06/11/2003	Both	Both	10	10	1220	1220	Crop Field	Crop Field	No	No		2	3	3	4	484786.76284	150675.58065
Inadequate Buffer	207204	06/17/2003	Right	Neither		10		975	Forest	Crop Field	No	No		3	3	2	3	481865.35368	150126.34970
Inadequate Buffer	215102	06/12/2003	Both	Both	0	0	785	785	Crop Field	Pasture	No	Yes	Horses	3	3	2	3	480147.51220	149445.15135
Inadequate Buffer	217201	06/17/2003	Both	Both	1	1	1050	1050	Crop Field	Crop Field	No	No		2	3	1	3	482359.83447	149747.72904
Inadequate Buffer	229201	06/11/2003	Both	Both	10	10	2165	2165	Crop Field	Crop Field	No	No		2	3	1	4	484471.84670	149013.27146

Problem	Site	Date	Type of Activity	Sediment Control	Why, if inadequate	Excess Sediment?	Length	Company	Location	Severity	Northing	Easting
In/Near Stream Construction	096101	05/27/2003	Residential Development	Adequate		Yes	1700	David A. Bramble, Inc.	Tributary off Three Bridges Branch	1	482352.23314	155054.82387
In/Near Stream Construction	097203	06/03/2003	Residential Development	Adequate		No	1800	Barkers	Tributary of Three Bridges Branch	5	482956.75727	154998.51581
In/Near Stream Construction	121103	05/28/2003	Residential Development	Adequate		No	500	Unknown	Gravel Run under 213 Dam	4	481074.35753	153855.21934
In/Near Stream Construction	182105	06/17/2003	Logging	Inadequate	No Controls Present	Yes	150	Unknown		3	480113.76770	151236.19807

Problem	Site	Date	Outfall Type	Pipe Type	Location of Pipe	Diameter (in)	Channel Width	Purpose	Discharge	Color	Odor	Severity	Correctability	Access	Northing	Easting
Pipe Outfall	040101	07/01/2003	unknown	Concrete Channel	Left Bank	12	0	Unknown	No			5	-1	-1	479483.26009	157248.73150
Pipe Outfall	091202	06/24/2003	Stormwater	Earth Channel	Left Bank	0	1	Stormwater	No			5	2	1	477844.31021	154810.97688
Pipe Outfall	096203	06/03/2003	Stormwater	Corrugated Metal	Left Bank	18	0	Stormwater	No			5	4	2	481839.94970	155068.08890
Pipe Outfall	096207	06/03/2003	Dam Outfall	Corrugated Metal	Head of Stream	18	0	Dam Outfall	Yes	Clear	None	3	5	3	481786.03256	154877.45531
Pipe Outfall	096209	06/03/2003	Stormwater	Concrete Pipe	Left Bank	8	0	Stormwater	No			5	5	3	481786.05155	154877.29187
Pipe Outfall	096210	06/03/2003	Stormwater	Plastic	Right Bank	18	0	Stormwater	Yes	Clear	None	4	5	3	481787.62512	154862.86962
Pipe Outfall	096211	06/03/2003	unknown	Plastic	Right Bank	6	2	Unknown	Yes	Medium Brown	None	1	5	3	481788.21078	154857.41229
Pipe Outfall	100102	06/09/2003	Stormwater	Corrugated Metal	Left Bank	36	10	Stormwater	No			5	5	1	485395.98637	155022.68176
Pipe Outfall	100103	06/09/2003	Stormwater	Corrugated Metal	Left Bank	36	8	Stormwater	No			5	4	2	485414.67845	155034.65720
Pipe Outfall	100105	06/09/2003	Stormwater	Corrugated Metal	Right Bank	18	2	Stormwater	Yes	Clear	None	4	4	2	485407.33470	155050.82185
Pipe Outfall	111202	06/09/2003	Stormwater	Plastic	Right Bank	36	1	Stormwater	Yes	Clear	None	4	3	2	484277.62667	154190.05956
Pipe Outfall	121104	05/28/2003	Sewage Overflow	Smooth Metal Pipe	Left Bank	12	0	Sewage	No			1	5	2	481068.59905	153880.49039
Pipe Outfall	121106	05/28/2003	Stormwater	Corrugated Metal	Left Bank	18	4	Stormwater	Yes	Medium Brown	Musky	1	5	2	481156.88489	153826.07639
Pipe Outfall	121109	05/28/2003	Stormwater	Concrete Channel	Left Bank	0	6	Stormwater	Yes	Clear	None	4	5	1	481178.74730	153786.72460
Pipe Outfall	121110	05/28/2003	Stormwater	Concrete Channel	Left Bank	24	0	Stormwater	Yes	Clear	None	4	5	1	481180.86041	153776.90362
Pipe Outfall	121111	05/28/2003	Stormwater	Concrete Pipe	both sides	4	0	Stormwater	Yes	Medium Brown	None	2	5	1	481180.74662	153773.35774
Pipe Outfall	121114	05/28/2003	Stormwater	Concrete Channel	Left Bank	0	2	Stormwater	No			5	5	1	481187.70607	153764.96156
Pipe Outfall	121115	05/28/2003	Stormwater	Smooth Metal Pipe	Left Bank	18	0	Stormwater	No			5	5	1	481188.22981	153764.49247
Pipe Outfall	121116	05/28/2003	Stormwater	Plastic	Both Sides	4	0	Stormwater	Yes	Medium Brown	None	3	5	1	481188.99038	153763.86853
Pipe Outfall	121117	05/28/2003	Stormwater	Plastic	Right Bank	18	0	Stormwater	Yes	Clear	None	4	5	1	481190.01509	153763.18539
Pipe Outfall	121119	05/28/2003	Pumping Station	Smooth Metal Pipe	Left Bank	6	0	Stormwater	Yes	Clear	None	4	5	1	481192.19574	153761.51804
Pipe Outfall	121120	05/28/2003	Dam Outfall	Smooth Metal Pipe	Head of Stream	8	0	Dam Outfall	Yes	Clear	None	3	5	1	481192.85078	153760.79268
Pipe Outfall	121121	05/28/2003	Dam Outfalls	Smooth Metal Pipe	Head of Stream	12	0	Dam Outfall	Yes	Clear	None	3	5	1	481193.63905	153760.21905
Pipe Outfall	124204	06/09/2003	Stormwater	Corrugated Metal	Right Bank	24	0	Stormwater	Yes	Clear	None	4	5	3	483821.91685	153665.51560
Pipe Outfall	130101	06/24/2003	Agricultural	Concrete Channel	Right Bank	36	3	Stormwater	Yes	Clear	None	4	2	2	478175.40670	153211.20163
Pipe Outfall	134104	06/03/2003	Stormwater	Terra Cotta	Left Bank	6	10	Stormwater	Yes	Clear	None	4	2	2	481703.64932	153227.97724
Pipe Outfall	138102	06/11/2003	Stormwater	Concrete Channel	Right Bank	0	3	Stormwater	No			5	3	1	485452.25160	153083.51439
Pipe Outfall	138103	06/11/2003	Stormwater	Smooth Metal Pipe	Right Bank	4	0	Stormwater	No			5	3	1	485452.71235	153087.04681
Pipe Outfall	138104	06/11/2003	Stormwater	Smooth Metal Pipe	Left Bank	5	0	Stormwater	No			5	3	1	485453.86422	153090.69440
Pipe Outfall	138105	06/11/2003	Stormwater	Smooth Metal Pipe	Left Bank	5	0	Water Supply	Yes	Clear	None	4	3	1	485457.43503	153089.69611
Pipe Outfall	140101	06/11/2003	Stormwater	Concrete Channel	Left Bank	18	2	Stormwater	Yes	Clear	None	4	2	1	487114.29652	153436.88241
Pipe Outfall	143204	06/17/2003	Unknown	Plastic	Left Bank	4	0	Unknown	Yes	Clear	None	3	2	1	479182.42111	152576.51581
Pipe Outfall	144101	06/17/2003	Unknown	Corrugated Metal	Right Bank	12	3	Unknown	No			5	4	3	480118.54595	152552.52660
Pipe Outfall	144202	06/12/2003	Stormwater	Terra Cotta	Left Bank	18	0	Stormwater	No			5	1	1	480318.11165	152822.73859
Pipe Outfall	144204	06/12/2003	Coming From Back of Restaurant	Plastic	Left Bank	1	0	Unknown	No			5	1	1	480324.26042	152816.03461
Pipe Outfall	149206	06/09/2003	Stormwater	Plastic	Left Bank	8	1	Stormwater	Yes	Clear	None	4	3	2	484882.20185	152877.73864
Pipe Outfall	150104	06/11/2003	Stormwater	Concrete Channel	Right Bank	24	3	Stormwater	No			4	3	2	485846.87261	152836.83080
Pipe Outfall	160101	06/03/2003	Stormwater	Concrete Pipe	Head of Stream	18	3	Stormwater	Yes	Clear	None	4	3	2	483370.99782	152366.50225
Pipe Outfall	160103	06/03/2003	Stormwater	Concrete Pipe	Left Bank	18	2	Stormwater	No			5	3	2	483329.78600	152399.76904
Pipe Outfall	170101	06/17/2003	Stormwater	Plastic	Left Bank	36	8	Sewage	Yes	Clear	None	4	5	3	480526.45034	151764.40211
Pipe Outfall	182102	06/17/2003	Unknown	Terra Cotta	Left Bank	6	0	Unknown	Yes	Clear	None	3	3	3	480311.16169	151362.78179
Pipe Outfall	182110	06/17/2003	Stormwater	Corrugated Metal	Left Bank	12	1.5	Stormwater	No			5	3	1	479922.61351	150937.79724
Pipe Outfall	182111	06/17/2003	Stormwater	Earth Channel	Right Bank	0	1.5	Stormwater	No			5	2	1	479924.17455	150931.57447
Pipe Outfall	194106	06/17/2003	Stormwater	Concrete Channel	Right Bank	36	4	Stormwater	No			5	3	2	479950.91161	150430.17428

Problem	Site	Date	Outfall Type	Pipe Type	Location of Pipe	Diameter (in)	Channel Width	Purpose	Discharge	Color	Odor	Severity	Correctability	Access	Northing	Easting
Pipe Outfall	196201	06/17/2003	Stormwater	Corrugated Metal	Left Bank	18	3	Stormwater	Yes	Clear	None	4	3	1	482408.11451	150696.63380
Pipe Outfall	206101	06/12/2003	Agricultural	Concrete Channel	Left Bank	8	0	Unknown	Yes	Clear	None	3	2	2	480704.94953	149837.47906
Pipe Outfall	206103	06/12/2003	Stormwater	Smooth Metal Pipe	Left Bank	6	0	Stormwater	Yes	Clear	None	4	5	2	480735.28201	150099.27664
Pipe Outfall	206104	06/12/2003	Stormwater	Smooth Metal Pipe	Left Bank	6	0	Stormwater	Yes	Clear	None	4	5	2	480744.95276	150110.85034
Pipe Outfall	206106	06/12/2003	Stormwater	Plastic	Above Stream	12	0	Stormwater	Yes	Clear	None	4	5	2	480752.43533	150131.06977
Pipe Outfall	206107	06/12/2003	Stormwater	Corrugated Metal	Left Bank	16	0	Stormwater	Yes	Clear	None	4	5	2	480751.74456	150141.09704
Pipe Outfall	206108	06/12/2003	Stormwater	Earth Channel	Right Bank	0	4	Stormwater	Yes	Clear	None	4	3	2	480749.70717	150170.25039
Pipe Outfall	207201	06/17/2003	Agricultural	Smooth Metal Pipe	Right Bank	12	0	Water Supply	No			5	1	2	481926.08138	150141.61419
Pipe Outfall	207206	06/17/2003	Stormwater	Corrugated Metal	Left Bank	18		Stormwater	No			5	1	1	481668.74784	150291.22983
Pipe Outfall	207207	06/17/2003	Stormwater	Smooth Metal Pipe	Left Bank	4	0	Stormwater	Yes	Medium Brown	None	3	2	1	481650.06571	150313.49101
Pipe Outfall	207208	06/17/2003	Stormwater	Concrete Channel	Left Bank	0	4	Stormwater	Yes	Clear	None	4	2	1	481649.17946	150314.83651
Pipe Outfall	234102	06/12/2003	Agricultural	Corrugated Metal	Left Bank	8	2	Drainage-Crop	Yes	Clear	None	3	3	3	481938.66438	148702.03169

Problem	Site	Date	Substrate	Embeddedness	Shelter for Fish	Channel Alteration	Sediment Deposition	Velocity/Depth	Flow	Vegetation	Bank Condition	Riparian Vegetation	Width Riffle	Width Run	Width Pool	Depth Riffle	Depth Run	Depth Pool	Bottom Type	Northing	Easting
Representative Site	061102	6/24/03	Marginal	Suboptimal	Optimal	Optimal	Marginal	Suboptimal	Marginal	Optimal	Suboptimal	Optimal	20	16	3	3	4	5	Gravel	476699.13954	155910.28329
Representative Site	066204	7/1/03	Poor	Suboptimal	Poor	Optimal	Marginal	Marginal	Marginal	Suboptimal	Marginal	Optimal	18	30	0	1	3	0	Silts	480683.47909	156091.42470
Representative Site	092202	6/24/03	Marginal	Suboptimal	Suboptimal	Optimal	Suboptimal	Marginal	Suboptimal	Optimal	Marginal	Optimal	18	12	12	3	5	7	Gravel	478228.58245	155012.18268
Representative Site	096213	6/3/03	Marginal	Suboptimal	Marginal	Optimal	Marginal	Suboptimal	Marginal	Optimal	Marginal	Optimal	24	36	12	2	5	8	Gravel	481810.89766	154732.25149
Representative Site	097201	6/3/03	Marginal	Suboptimal	Suboptimal	Optimal	Marginal	Optimal	Suboptimal	Optimal	Marginal	Optimal	48	24	24	2	5	10	Gravel	482802.25687	154763.28284
Representative Site	098101	5/12/03	Marginal	Marginal	Suboptimal	Suboptimal	Marginal	Suboptimal	Marginal	Optimal	Suboptimal	Optimal	12	30	42	1	6	8	Silts	483773.84281	155074.24367
Representative Site	099104	6/9/03	Optimal	Suboptimal	Optimal	Optimal	Suboptimal	Suboptimal	Suboptimal	Optimal	Optimal	Optimal	72	36	24	2	8	18	Sands	484674.84306	154770.41926
Representative Site	105201	6/24/03	Poor	Poor	Suboptimal	Optimal	Marginal	Marginal	Suboptimal	Suboptimal	Suboptimal	Suboptimal	6	0	4	3	0	5	Sands	478524.73839	154295.66973
Representative Site	108201	6/3/03	Poor	Poor	Suboptimal	Optimal	Marginal	Suboptimal	Suboptimal	Optimal	Marginal	Optimal	0	8	48	0	8	30	Silts	481422.89825	154385.68906
Representative Site	109201	6/3/03	Poor	Marginal	Optimal	Optimal	Marginal	Suboptimal	Suboptimal	Optimal	Optimal	Optimal	0	84	48	0	48	24	Silts	482072.30713	154458.40691
Representative Site	110103	5/27/03	Poor	Poor	Suboptimal	Optimal	Marginal	Suboptimal	Suboptimal	Optimal	Optimal	Suboptimal	0	120	60	0	42	48	Silts	482764.06015	154346.13296
Representative Site	118103	6/24/03	Suboptimal	Suboptimal	Marginal	Optimal	Suboptimal	Suboptimal	Suboptimal	Optimal	Marginal	Suboptimal	28	32	60	6	2	14	Silts	478210.90370	153688.27080
Representative Site	121105	5/28/03	Marginal	Marginal	Marginal	Optimal	Suboptimal	Suboptimal	Suboptimal	Marginal	Marginal	Marginal	72	36	108	6	8	24	Gravel	481093.07816	153857.96788
Representative Site	124202	6/9/03	Marginal	Suboptimal	Marginal	Optimal	Marginal	Optimal	Marginal	Suboptimal	Marginal	Optimal	12	24	18	2	6	12	Gravel	483692.89856	153837.80861
Representative Site	125201	6/9/03	Marginal	Suboptimal	Optimal	Optimal	Marginal	Optimal	Suboptimal	Suboptimal	Marginal	Optimal	36	60	12	2	18	36	Sands	484978.32469	153605.26453
Representative Site	138108	6/11/03	Marginal	Marginal	Suboptimal	Suboptimal	Marginal	Optimal	Marginal	Suboptimal	Suboptimal	Optimal	12	36	36	3	8	12	Sands	485694.60430	153013.05876
Representative Site	143205	6/17/03	Marginal	Suboptimal	Suboptimal	Optimal	Marginal	Optimal	Marginal	Suboptimal	Marginal	Optimal	48	36	18	2	12	18	Gravel	479394.32962	152856.01866
Representative Site	144206	6/12/03	Poor	Poor	Suboptimal	Optimal	Suboptimal	Suboptimal	Optimal	Optimal	Optimal	Optimal	36	84	36	12	36	48	Silts	480613.87293	152611.23631
Representative Site	147101	6/3/03	Suboptimal	Marginal	Suboptimal	Optimal	Marginal	Suboptimal	Marginal	Suboptimal	Marginal	Suboptimal	24	18	36	2	9	14	Gravel	483077.80889	152552.71073
Representative Site	150102	6/11/03	Suboptimal	Marginal	Optimal	Marginal	Marginal	Suboptimal	Marginal	Marginal	Marginal	Optimal	24	36	48	2	10	18	Silts	485827.11168	152963.09461
Representative Site	158202	6/12/03	Marginal	Marginal	Suboptimal	Optimal	Suboptimal	Marginal	Optimal	Optimal	Suboptimal	Optimal	12	18	0	3	4	0	Sands	481219.20091	152281.83747
Representative Site	171202	6/12/03	Poor	Marginal	Suboptimal	Poor	Suboptimal	Suboptimal	Optimal	Optimal	Optimal	Optimal	18	96	36	6	48	60	Silts	480981.31061	151416.17918
Representative Site	194101	6/17/03	Optimal	Optimal	Optimal	Optimal	Suboptimal	Suboptimal	Optimal	Optimal	Suboptimal	Optimal	36	24	48	2	5	9	Gravel	480024.78537	150865.81047
Representative Site	195202	6/17/03	Marginal	Suboptimal	Marginal	Optimal	Marginal	Optimal	Suboptimal	Suboptimal	Suboptimal	Suboptimal	24	30	14	3	12	14	Sands	481571.64596	150558.72460
Representative Site	195204	6/17/03	Marginal	Suboptimal	Optimal	Optimal	Suboptimal	Optimal	Optimal	Optimal	Suboptimal	Optimal	36	96	18	6	18	24	Gravel	481291.10952	150880.36038
Representative Site	206102	6/12/03	Optimal	Suboptimal	Suboptimal	Optimal	Suboptimal	Suboptimal	Optimal	Suboptimal	Suboptimal	Optimal	48	48	24	2	6	12	Gravel	480770.19414	149983.40412
Representative Site	210201	6/11/03	Marginal	Marginal	Suboptimal	Optimal	Marginal	Optimal	Optimal	Optimal	Suboptimal	Optimal	36	48	24	6	18	24	Silts	484560.51160	150080.30749

Problem	Site	Date	Type	Truckloads	Other measure	Extent	Volunteer Project?	Owner Type	Owner Name	Severity	Correctability	Access	Northing	Easting
Trash Dumping	096202	06/03/2003	Construction	3		Large Area	Yes	Unknown		5	2	2	481848.41601	155079.27283
Trash Dumping	099102	06/09/2003	Lumber/Building Materials	1		Single Site	Yes	Private		5	1	3	484526.17571	154742.25165
Trash Dumping	105203	06/24/2003	Residential	1		Single Site	Yes	Private		4	1	2	478018.32403	154203.75820
Trash Dumping	105205	06/24/2003	Industrial	2		Single Site	No	Unknown		4	2	2	477949.38694	154130.65821
Trash Dumping	118102	06/24/2003	Residential	1		Single Site	Yes	Private		4	2	2	478192.70640	153652.42451
Trash Dumping	144106	06/17/2003	Cars/Buses	30	40-50 Cars, junkyard	Large Area	No	Private		3	4	2	480225.45082	152877.98282
Trash Dumping	144205	06/12/2003	Tires	3		Single Site	No	Unknown		4	4	3	480594.82591	152621.86625
Trash Dumping	147103	06/03/2003	Lumber	1		Single Site	Yes	Private		5	3	3	482628.41650	152666.22627

Problem	Site	Date	Type	Description	Potential Cause	Severity	Correctability	Access	Northing	Easting
Comment	038002	10/06/2003	SE Healing over w/ trees and toe protection			0			477737.32284	156898.74493
Unusual Condition	085102	05/12/2003	Red Flock	Red Flock In Stream below instream pond		3	3	2	483888.17699	155265.17081
Unusual Condition	098105	05/12/2003	Black Organic Material	Stream has large amount of black organic material present		4	3	3	483810.03459	154954.49780
Unusual Condition	109101	05/27/2003	Excessive Sediment	Whole Tributary w/excessive sediment from upstream construction	Upstream Construction	4	4	3	482306.36301	154558.37359
Unusual Condition	118104	06/24/2003	Scum	Orange Scum Washing into Stream		5	3	3	478558.32935	153918.38196
Unusual Condition	121107	05/28/2003	Orange Substance Leaking from Bank	Musky Smelling Seep 3ft long, 10 inches wide	Land Use Change Upstream	2	2	2	481165.78395	153810.35795
Unusual Condition	134101	06/03/2003	Red Flock	Discharge from Bank	Runoff	4	3	2	482043.08906	153330.56767
Unusual Condition	134106	06/03/2003	Red Flock	Excessive Red Flock Present	Iron Oxides	3	3	2	481813.72029	153398.73723
Unusual Condition	139106	06/11/2003	Channel Discharging into Stream	Dark Brown Discharge in Channel entering stream	Unknown	3	3	2	486952.56292	153251.14922
Unusual Condition	143206	06/17/2003	Orange Substance Leaking from Bank	section of bank	Runoff from field	3	4	3	479398.68913	152855.82597
Unusual Condition	150106	06/11/2003	Water Color/Clarity	Water dark brown/red in color - darkens as you proceed upstream	Runoff	4	2	3	485434.27468	152805.75886
Unusual Condition	220201	06/11/2003	Red Flock		Field Drainage	4	4	1	484674.61487	149348.19627

Problem	Site	Date	Photo	Type	Length (ft)	Land use above	Land use below	Severity	Correctability	Access	Northing	Easting
Altered Shoreline	016001	10/6/2003	172-173	Rip-rap	1700		Open water	3	2	3	474178.70793	158047.62014
Altered Shoreline	029003	10/6/2003		Rip-rap	550	Single home	Beach	4	2	3	477390.31124	157695.65326
Altered Shoreline	029006	10/6/2003		Rip-rap	730	Single home	Phramites	3	3	3	477115.60795	157604.61384
Altered Shoreline	034001	10/6/2003	180	Rip-rap	600	Crop field	Open water	4	3	2	473668.90735	157040.17680
Altered Shoreline	034003	10/6/2003	181-187	Groin & broken concrete	2500	Crop field	Open water	1	3	3	474476.87613	157097.94288
Altered Shoreline	035001	10/6/2003	200	Wood bulkhead	275	Lawn	Open water	3	3	2	474585.68430	156712.81583
Altered Shoreline	036005	10/6/2003		Rip-rap	260	Lawn	Beach	5	2	2	475977.28700	156770.46714
Altered Shoreline	038001	10/6/2003	255	Wood bulkhead	50	Lawn	Beach	5	2	2	477248.48689	157195.91174
Altered Shoreline	038003	10/6/2003	219	Wood bulkhead	115	Residential	Open water	5	3	2	477872.17593	156837.43350
Altered Shoreline	047001	10/6/2003		Rip-rap	545	Lawn	Open water	4	3	3	474761.41531	156595.51895
Altered Shoreline	047002	10/6/2003		Rip-rap	190	Shrubs & small trees	Open water	5	3	3	474956.68063	156727.41673
Altered Shoreline	049003	10/6/2003	217	Rip-rap	640			4	3	2	476439.49332	156626.79199
Altered Shoreline	051002	10/6/2003	274-275	Mix of bulkhead & rip-rap	530	Residential	Open water	3	3	2	478217.97536	156649.86997
Altered Shoreline	051004	10/6/2003	281	Wood bulkhead	440	Residential	Open water	3	4	3	478581.75995	156445.85055
Altered Shoreline	064002	10/6/2003		Wood bulkhead	825	Lawn	Open water	2	2	2	479327.76271	155858.17122
Altered Shoreline	064005	10/6/2003	289	Rip-rap & gravel	205	Residential	Open water	4	3	2	479006.87763	155956.28889
Altered Shoreline	080010	10/6/2003		Rip-rap	150	Residential	Open water	5	1	2	479037.49880	155536.64247
Altered Shoreline	080011	10/6/2003	303	Rip-rap	200	Residential	Open water	5	2	2	479152.53838	155279.28035
Altered Shoreline	093001	10/6/2003	307	Wood bulkhead	400	Lawn	Open water	3	3	2	479284.85637	155076.47693
Altered Shoreline	093004	10/6/2003	313	Mix of bulkhead & rip-rap	130	Single home	Open water	3	3	2	479568.85781	154919.35142
Altered Shoreline	093005	10/6/2003	314	Rip-rap	490	Single home	Open water	3	3	2	479736.44958	154986.40237
Altered Shoreline	094004	10/6/2003		Rip-rap	420	Single home	Open water	4	3	2	480081.65642	154642.82653
Altered Shoreline	107002	10/6/2003		Mix of bulkhead & rip-rap	700	Boat landing	Open water	3	3	1	480048.57949	154307.25123
Altered Shoreline	107004	10/6/2003		Mix of bulkhead & rip-rap	410	Marsh emergent	Open water	3	3	1	480178.48578	154545.19123

Problem	Site	Date	Photo	Location (bank)	Length (ft)	Height (ft)	Land use above	Land use below	Threat to Infrastructure?	Shoreline geometry	Severity		Correctability	Access	Northing	Easting
Shoreline erosion	017002	10/6/2003	163-164	North	475	2	Crop field	Beach	No	Straight	4	1	3		474578.00745	157816.85271
Shoreline erosion	027001	10/6/2003	146	North	410	1.5	Forest	Beach	No	Cove	4		3		475969.66940	157557.75070
Shoreline erosion	036001	10/6/2003	212	South	125	2.5	Crop field	Beach	No	Straight	5		3		475267.79078	156827.67809
Shoreline erosion	036003	10/6/2003	216	South	130	3		Beach	No	Straight	5	3	4		475554.65889	156834.23250
Shoreline erosion	038002	10/6/2003	266-268	South	690	15	Forest	Open water	No	Cove	3	3	3		477841.44123	156877.68512
Shoreline erosion	048001	10/6/2003	238	South	380	12	Crop field	Open water	No	Straight	4	4	3		476057.06359	156471.62307
Shoreline erosion	049002	10/6/2003	218	South	1420	10	Lawn/Shrubs & small trees/Single home	Emergent marsh/rip-rap	1 ft from house, but not active	Meander/Irregular	2	4	3		476589.73311	156731.02826

Problem	Site	Date	Photo	Buffer width (ft)	Buffer length (ft)	Land use above	Land use below	Recently established?	Livestock?	Severity	Correctability	Access	Weland potential	Northing	Easting
Shoreline inadequate buffer	016002	10/6/2003	175	0	1725	Crop field	Open water	No		1	2	3	3	474174.47275	158050.78193
Shoreline inadequate buffer	017001	10/6/2003	164-165	5	1350	Crop field	Open water/Emergent marsh	No		2	1	3	1	474651.92618	157749.89092
Shoreline inadequate buffer	027001	10/6/2003		10	535	Residential community	Emergent marsh	No		4	1	3	3	475690.31378	157692.55199
Shoreline inadequate buffer	028001	10/6/2003	135-137	50	690	Crop field	Emergent marsh	No		4	2	3	1	476599.00102	157680.65639
Shoreline inadequate buffer	028002	10/6/2003		0	230	Sandy boat landing/Lawn	Open water	No		4	1	3	1	476402.06840	157414.89578
Shoreline inadequate buffer	029004	10/6/2003		10	2240		Emergent marsh/Phragmites	No		2	1	2	1	477494.22871	157749.94691
Shoreline inadequate buffer	034002	10/6/2003	181, 184-201	20	5430	Crop field/Residential community	Altered shoreline	No		2	2	3	3	474622.38567	156679.50257
Shoreline inadequate buffer	036004	10/6/2003		0	685	Lawn	Open water	No		3	3	2	2	476036.22510	156759.45200
Shoreline inadequate buffer	037001	10/6/2003	248	20	950		Emergent marsh/Phragmites	No		4	1	2	2	476795.99421	157206.78317
Shoreline inadequate buffer	038002	10/6/2003	255	0	690	Lawn	Beach	No		3	1	2	2	477842.06046	156877.07345
Shoreline inadequate buffer	039002	10/6/2003	80-82	50	1150	Crop field	Emergent marsh/Phragmites	No		2	2	3	2	478515.57155	156924.85487
Shoreline inadequate buffer	047003	10/6/2003	201	0	2075	Residential community	Open water	No		1				475160.89808	156800.95177
Shoreline inadequate buffer	064001	10/6/2003		5	535	Single home	Open water/Emergent marsh	No		4	2	2	3	479480.15191	155849.49762
Shoreline inadequate buffer	064006	10/6/2003	289	15	360	Residential community	Open water	No		4	1	2	4	479011.77686	155955.49950
Shoreline inadequate buffer	080002	10/6/2003		10	760	Residential community	Emergent marsh	No		4	2	2	3	479494.89559	155327.48620
Shoreline inadequate buffer	093002	10/6/2003		50	400	Single home	Open water	No		4	1	2	3	479282.77601	155024.40749
Shoreline inadequate buffer	094001	10/6/2003	24-26	10	1300	Residential community	Emergent marsh/Phragmites	No		2	2	2	2	480384.14590	154589.24704
Shoreline inadequate buffer	094003	10/6/2003	28-33	5	1875	Residential community	Emergent marsh/Phragmites	No		2	2	2	2	480039.91311	154978.45661
Shoreline inadequate buffer	107001	10/6/2003		0	720	Boat landing	Open water	No		3	4	1	2	480048.57436	154307.26353
Shoreline inadequate buffer	107003	10/6/2003		0	1005	Shrubs & small trees	Emergent marsh	No		1	1	2	3	480018.54885	154319.81035