Corsica River

Watershed Restoration Action Strategy

Final Report

September 2004

Prepared by:
The Town of Centreville
101 Lawyers Row
Centreville, MD 21617

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In Cooperation with
Queen Anne's County Department of Planning and Zoning
Queen Anne Soil Conservation District
The Chester River Association
USDA NRCS

Prepared for
MD Department of Natural Resources
Coastal Zone Management Division

Financial Assistance provided by 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. NA17OZ2337

Acknowledgments

We would like to thank our diligent partner stakeholders, Katrina Tucker, Principal Planner with the Queen Anne's County Department of Planning and Zoning, Frank DiGialleonardo with Chester River Association (CRA), Dr. Eileen McClellan- the Chester River Keeper with CRA, Amy Owsley with the Eastern Shore Land Conservancy, Steve Spielman, District Manager, and Alison Putnam with Queen Anne Soil Conservation District (QASCD), Michael Whitehill designee from the Town of Centreville and Upper Eastern Shore Tributary Team chair, Sabrina Fite GIS specialist with McCrone, Inc., Loring Hawes representing the QA Co. Planning Commission, Bobby Wilson representing local agriculture, and Royden N. Powell, III as Town Manager for the Town of Centreville, for their many contributions, editing, and passion for this process. We would also like to thank the Department of Natural Resources Coastal Zone Management and Watershed Restoration Divisions for their invaluable contributions to the Corsica River Watershed Restoration Strategy, in particular, Danielle Lucid, Ken Shanks, Steve Czwartacki, Niles Primrose, Ken Yetman and Mitch Keiler.

GIS Data

Geographical information system data and associated layers produced in the development of this report were gracefully provided by: Maryland Department of Natural Resources, Queen Anne's County Department of Planning and Zoning. Additional descriptive layers were provided by McCrone, Inc.

Corsica River

Watershed Restoration Action Strategy
(WRAS)

STATEMENT OF PURPOSE AND COMMITMENT

The Corsica River Watershed Restoration Action Strategy, sponsored by the Town of Centreville and supported by wide and active stakeholder interests, sets forth a blueprint for the sustainable environmental health of the Corsica River. The WRAS is based upon a comprehensive and scientific assessment of the Corsica River Watershed. The Corsica has been designated as impaired under Maryland's Clean Water Action Plan since 1999, and given the highest priority for restoration. The WRAS science draws upon the historic data contributing to that designation, while updating and expanding that knowledge with a host of new data which describes and documents water quality, shoreline characteristics, development and farming impact, and a variety of impairments. These data show that considerable restoration is sorely needed. Moreover, they point to where, what, and how much.

By comprehensively assessing the River's present state and by reaching deeply into its future, this plan and its background studies chart a clear course towards watershed improvements. That course is made up of specific action strategies that include:

- Remedial field projects to repair eroding land,
- Thickening of inadequate buffers,
- Restoring fish migrations, cleaning-up dumping sites,
- Creating habitat corridor connections,
- Restoring submerged aquatic vegetation, and much more.

The WRAS also recommends bold initiatives that will be undertaken by local government to develop and adopt policy and programmatic changes that will:

- Create innovative stormwater management practices for low impact development;
- Put in place tighter enforcement controls on erosion and sedimentation;
- Achieve the maximum feasible reduction of nitrogen and phosphorous in the municipal wastewater stream;
- Create mechanisms to design, fund, construct, and maintain acres of filtering non-tidal wetlands on public lands; and
- Teach our citizens of the environmental danger of poorly maintained septic systems, over-fertilized lawns, eroding shorelines, and unbuffered streams.

With diligent application of the principles of this Action Strategy and implementation of its recommendations, the Corsica River one day will be de-listed as an impaired waterway. Accordingly, the principal stakeholder entities proclaim the following ethic and commitment:

WHEREAS the Corsica River is one of the most visited anchorages and safe harbors along the northeastern United States, with tranquil waters bearing recreational and commercial value, and a Town at its headwaters deriving great historical and cultural benefit from her tides; and,

WHEREAS the Corsica River watershed is stressed by the chemistry of urbanization from land, by tides, and from the air; and

WHEREAS the future of the Corsica River and its environs, including the management of rural growth and development, enhancement of its wildlife habitat and aquatic resources, definition of its urban growth boundaries, preservation and conservation of its commercially vital farmlands, and protection of the quality of life along its shores and tributaries is of foremost concern to the undersigned stakeholders;

THEREFORE IT IS HEREBY RESOLVED that the undersigned stakeholders agree to work in concert to implement the recommendations of the *Corsica River Watershed Restoration Action Strategy*, to take bold strides to change the direction of environmental planning and practice, thinking forward to a balanced watershed and working towards achieving it safely, and to engage every watershed citizen as a steward of the Strategy and the Watershed to achieve the goals set forth therein.

Signed:

The Town Council of Centreville
The Queen Anne's County Commissioners
The Chester River Association
The University of Maryland Cooperative Extension Service
The Queen Anne Soil Conservation District
The Eastern Shore Land Conservancy

Maryland Department of Natural Resources
Upper Eastern Shore Tributary Team

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Executive Summary

The Town of Centreville has identified the health of the Corsica River as a key component of its heritage and future. The Town's goal is to ensure that growth does not occur at the expense of the Corsica River. In 2002 the Town of Centreville, through a competitive process, applied for and received support from the Maryland Department of Natural Resources (DNR) to conduct a watershed assessment and develop a watershed plan, or Watershed Restoration Action Strategy (WRAS). The WRAS has identified impairments lying in multiple political jurisdictions, and provides guidance for implementation opportunities and the possible means to achieve water quality enhancement, expanded wildlife habitat, more sensitive land use conversions, and conservation. The Corsica WRAS is a strategy that, once implemented, would noticeably improve and protect the water quality and habitat of the watershed.

The support from DNR consisted of technical and financial assistance including: a one hundred mile stream corridor assessment that identified the stream and river corridor conditions and rated observed problems for severity, accessibility, and correctability, (Stream Corridor Assessment); an assessment of the water quality in the streams of the Corsica River watershed (Synoptic Survey); a compilation of available water quality and natural resources information and issues (Characterization); $40,000 in discretionary funding; and a DNR representative to provide assistance.

Under the leadership of the Town of Centreville, a stakeholders group was formed consisting of representatives from the Queen Anne's Soil Conservation District, the USDA-NRCS, the Chester River Association, the Eastern Shore Land Conservancy, the Queen Anne's County Planning Commission, Queen Anne's County Planning and Zoning, and DNR. The University of Maryland, the Alliance for the Chesapeake Bay, the Queen Anne's County Health Department, and local builder/developers also participated during grant development opportunities. Citizens and farmers were also represented. In the two-year project period, the stakeholders met eleven times to identify concerns, review data, apply for implementation grants, and make management decisions and recommendations that would, when implemented, restore and protect the water quality and habitat of the Corsica River watershed.

The Corsica WRAS Stakeholders developed 13 individual strategies to improve water quality and habitat in the Corsica watershed.

1. Target additional cover crop funding for this area,

2. Agriculture nutrient and sediment reducing buffers including tidal frontage of the Corsica River,

3. Demonstration projects for farmettes which focus on whole farm nutrient management and horse pasture management,

4. Household pollution reduction strategies for lawn fertilization and pet waste,

5. Permanent water quality monitoring in the main stem of the Corsica River,

6. Reestablishment of submerged aquatic vegetation,

7. Ordinances for low impact development,

8. Demonstration projects for native conservation landscaping,

9. An easement incentive program,

10. The creation of non-agricultural wetlands,

11. Septic system retrofits and comparative studies,

12. "EcoTeam" development to build volunteer capacity,

13. Oyster reef ecosystems establishment to historic areas

To perpetuate the conservation and restoration of the watershed, the Town of Centreville has considered programmatic initiatives in the form of policies and codes that will impact land-related issues into the future (a Town Greenbelt together with promotion of nutrient reducing septic systems near tidal waters or perennial streams in remote greenbelt locations, and advance the promotion of living shorelines). Additionally, in exploring conservation opportunities in the watershed, ESLC will consult with the WRAS data custodian to understand property information and work to complement WRAS priorities. The Chester River Association has accepted custodial responsibility for the Corsica WRAS information, and the Centreville Town Manager will be the responsible party for supporting and advancing the initiatives that forward the goals of the WRAS.

I. Introduction

In 1998, the State of Maryland developed the Clean Water Action Plan (CWAP Technical Workgroup, 1998) to identify and restore watersheds not meeting clean water and other natural resource goals, and to sustain healthy conditions in those watersheds that currently meet these goals. Development of this plan involved conducting a Unified Watershed Assessment, prioritization for restoration or protection, and developing strategies for restoration and protection. The initial Unified Watershed Assessment classified the Maryland 8-digit watersheds into the following categories:

- Category 1 - Watersheds not meeting clean water and other natural resource goals and needing restoration;
- Category 2 - Watersheds currently meeting goals that need preventive actions to sustain water quality and aquatic resources;
- Category 3 - Pristine or sensitive watersheds that need an extra level of protection; and
- Category 4 - Insufficient data

As a direct result of this effort the Corsica River Watershed (Maryland 8-digit watershed 02130507) was classified as a Category 1 watershed in need of restoration

The next step in the Clean Water Action Plan (CWAP) process was to assign restoration priorities to each watershed. Watersheds that failed to meet at least half of their goals (i.e., half of the evaluation indicators had values failing to meet Category 1 benchmarks) were considered Category 1 Priority Watersheds in need of restoration in the near term (e.g., within 2 years of CWAP publication). The Corsica River Watershed received a Category 1 Priority for restoration.

The final component in the CWAP is the development of Watershed Restoration Action Strategies (WRAS) for watersheds in need of restoration or protection. A WRAS is a comprehensive restoration strategy that addresses all aspects of watershed condition and water quality. The WRAS is led by the local government, in partnership with the State, and encourages public participation in the strategy development and implementation. On April 2, 2003, the Town of Centreville entered into a Memorandum of Understanding with the State of Maryland Department of Natural Resources to develop a WRAS for the entire Corsica River Watershed. This memorandum provided the Town with a pathway to apply for and receive grant monies to assist in the watershed assessment and planning, receive technical assistance from Maryland Department of Natural Resources (DNR), and develop the watershed restoration strategy. Consequential CWA influences are to State and local stormwater management codes, sewer and water regulations, and ultimately in local Comprehensive Land Use Plans. To move from existing planning methods to include watershed based perspective and protection, would require a significant shift in State and local policy, considerable resources, and added manpower. While such a shift may be appropriate, the WRAS Committee recognizes that the success of such an effort will depend on actions taken beyond the limits of the Corsica River Watershed. The same is not true for the Town of Centreville which lies in a separate political jurisdiction and lies solely within the watershed.

The Corsica River Watershed comprises 25,300 acres (40 square miles) which lie entirely within Maryland's Coastal Plain. Of this acreage, 2,441 acres lie within Queen Anne's County Critical Area, 21,452 acres lie in the County upland, and 1,406 acres lie within the Corporate Limits of the Town of Centreville (Approximately 1,395 acres of the above total lie within the tidal reaches of the Corsica River itself].

The primary goal of the Corsica River Watershed Restoration Action Strategy grant application was to:

> *Develop a WRAS that fully quantifies the existing water quality stressors, the existing stream conditions, and other natural resource impairments of the Corsica River Basin, which results in a watershed-wide master plan to reduce impairing nutrients, to restore and preserve habitat areas, to monitor nutrient reduction gains and habitat protection progress and pre-account for environmental impacts of growth consistent with and anticipated by, the Comprehensive Plans of The Town of Centreville and Queen Anne's County, and reflecting concomitant regulatory and programmatic changes initiated and adopted thereby*.

The WRAS recommends the ethic that growth or agricultural land conversion in the watershed not occur at the further expense of the environmental health of the Corsica River.

The WRAS results for the Corsica River Watershed comprise:

- Priority impairments with restoration and protection needs;
- Specific projects and strategies to remediate the identified impairments;
- Instruments for programmatic changes in the Code of the Town of Centreville; and
- Recommendations for Queen Anne's County consideration.

Public Involvement

The Town of Centreville, with cooperation from the Chester River Association and Queen Anne's County developed a strategy to garner public participation in the Corsica River WRAS development process. As the majority of the watershed's geo-mass lies in agricultural use and rural landscape, great care was exercised to ensure that the agricultural community was well represented. The Town had several goals for public involvement:

- To reach the broadest range of vested stakeholders, regardless of sophistication;
- To propose a meeting and venue schedule;
- To link the stakeholders to web-based data for their review and comment; and
- To develop a database from the WRAS stakeholders for potential participation in implementation strategies on WRAS identified work items.

The strategy included:

1) Identification of Stakeholder groups and/or individuals, and property owners
2) Compilation of a spreadsheet of Stakeholders
3) Formation of a Steering Committee
4) Sponsoring the kick-off meeting
5) Setup the e-mail information network
6) Develop the outreach strategy

Stakeholders Identification

A list of preliminary stakeholders was developed for the WRAS which included those most likely to be directly affected by the WRAS such as planning staff and politicians (Town and County), local land conservancy, private landowners in riparian and tidal interfaces, environmental activists, government agencies at the State level**,** representatives from agriculture, and the Tributary Teams. MdPropertyView **7** tax map property lines were overlaid on the new orthophotography (dated November 2003). A database search was run and a new database was established for the names, addresses, type of land use, etc., and mailings were sent to all landowners in the watershed whose property bordered an intermittent or perennial stream, and tidal waters of the Corsica River. This list is regarded as the property owner notification list for rights-of-entry, for future notifications of possible restoration projects, and for updates on the WRAS findings. Many of the individuals that signed onto the Strategy sent comments and encouragement with their responses, and these were recorded by the Town as well (see Appendix I for Property Owner Notification Letter).

The Stakeholder database was referenced to the DNR and MDP Technology Toolbox so that updates of property transfers within the watershed could be made and new owners notified of the WRAS initiatives. The databases thus prepared, with all layers highlighted, now serves multiple functions as will be later seen, such as quantifying buffer needs, initiating septic systems replacements, farm restoration projects, etc.

The Corsica River WRAS Steering Committee was established comprising members from each major constituency identified earlier. The Steering Committee kick-off meeting was held on March 4, 2003 at which meeting information was distributed about the WRAS process and a solicitation of input was made. The Steering Committee membership included: A voting member of the Town Council of The Town of Centreville , a voting member of the Queen Anne's County Planning Commission, staff from Queen Anne's County Department of Planning and Zoning, the Town Clerk, for administrative function, the local Nutrient Management Advisor from the University of MD Cooperative Extension Service, the Outreach and Education Coordinator from the Queen Anne's Soil Conservation District, a senior planner from the Eastern Shore Land Conservancy, the Chester River Association's Riverkeeper and several CRA Board members, a private citizen landowner with river frontage, two local independent farmer/operators, a commercial developer in the watershed, the Upper Eastern Shore Tributary Team, and QA CO. Farm Bureau. Advisors to the WRAS Steering Committee included the State of Maryland WRAS Program Manager, Assistant Secretary of the MD Department of Agriculture, with advisory contacts, DNR for Synoptic Survey and monitoring, DNR for Stream Corridor Assessment, McCrone, Inc. for GPS control and GIS specialist/databases, and Spectrum Mapping, LLC (formerly 3Di) orthophotography/remote sensing/SAV mapping.

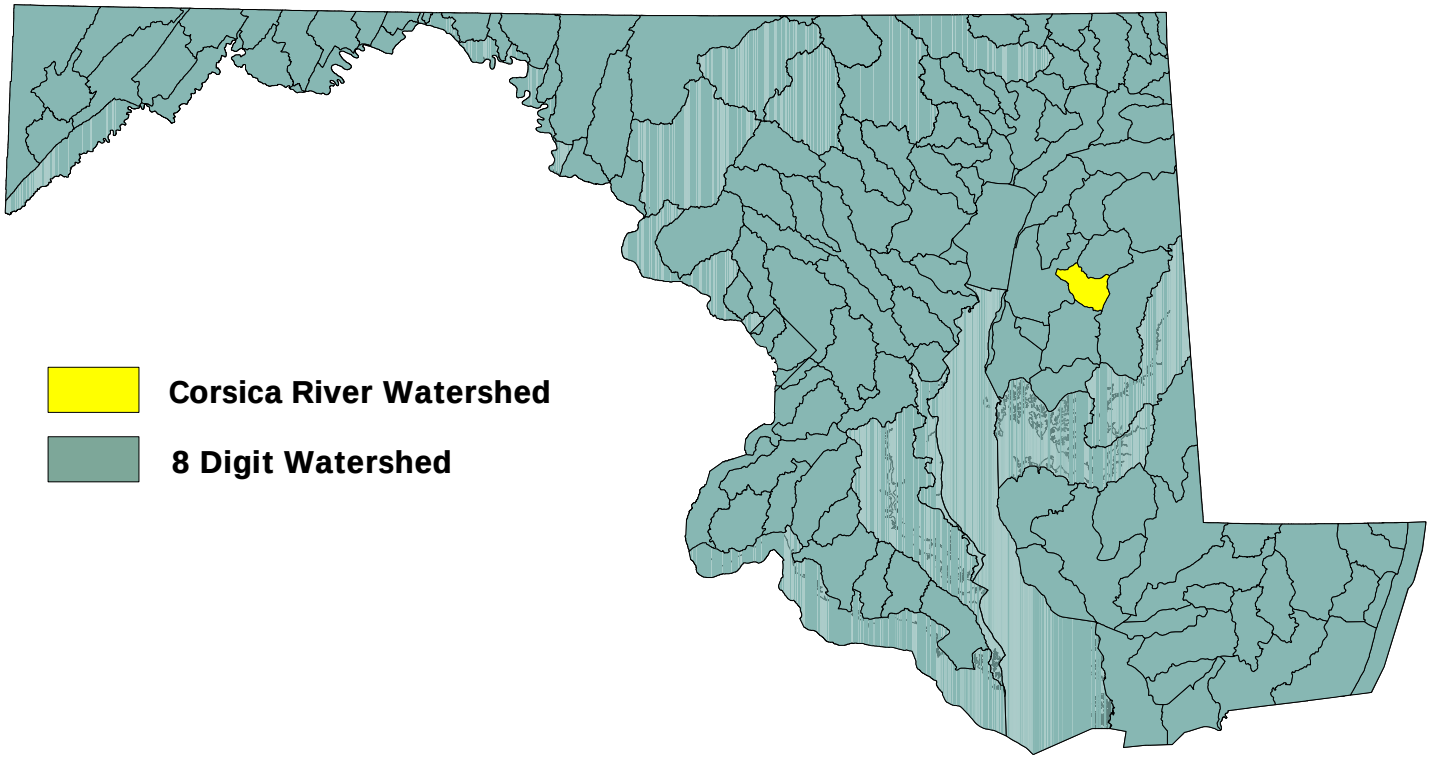
Upon completion of the synoptic survey and Stream Corridor Assessment (SCA), the Steering Committee meeting was held on July 18, 2003 to discuss methods, identify impairments and future projects. November 21, 2003 brought the group together again for a stream walk and a visit to the Centreville Wastewater Treatment Plants (old and new under construction). A list of stakeholder comments, goals, and interests is found as Appendix 4 of this report. A meeting was called for February 18, 2004 to review the final results and priorities for the final report.

During the spring of 2004 members of the Corsica River WRAS Steering Committee met in support of the development of two strong watershed initiatives: an EPA Watershed Initiatives Grant sponsored by the Corsica River Watershed Partnership, and a National Sea Grant Office Proposal. Each of these opportunities helped the Steering Committee solidify the specific Corsica River WRAS implementation needs, priorities, and funding sources.

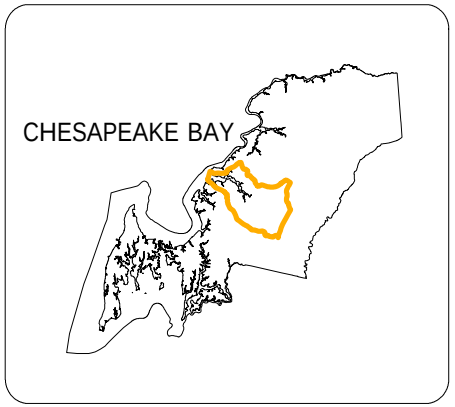
The Town of Centreville, working through the DNR WRAS Program Manager, set up a very effective e-mail and hard copy mail network and information is readily and instantly available to the WRAS Stakeholder groups. The Town also revived its local weekly newspaper bully pulpit, and has agreed to sponsor the Corsica Corner with space available to post ongoing calls for volunteers, progress of specific restoration projects, and to celebrate accomplishments of our strategies. The Town further agreed to sponsor outreach on Urban Nutrient Management (UNM) in the form of tri-fold information pieces and to adopt the UNM ethic and code.

CORSICA RIVER WRAS

Figure 1
MARYLAND'S WATERSHEDS



QUEEN ANNE'S COUNTY
MARYLAND



While small in size, the Corsica River Watershed is an important part of Maryland's Tributary Strategies.

II. Methods

Watershed Characterization

The Corsica River WRAS was envisioned to result in a user friendly, GIS driven, responsive and flexible, technical and pictorial product that made simple the abstraction of problem areas for inclusion in implementation grant applications and citizen volunteer driven restoration projects. The watershed is simply defined and comparatively small in area. The first step in developing the Corsica River WRAS was to capture the most current existing conditions in a photographic format. Using digital orthophotography (orthos) coupled with Maryland PropertyView**7**, ArcView**7**, and existing detailed topographical surveys of lands within the watershed, a mapping base was compiled which would later be used to identify and quantify watershed attributes like shore buffers, septic system locations, farmed wetlands, impervious areas, and the like. The orthos were intentionally compiled just before autumn leaf drop in order to capture the forest drip-line. Ground control was established by GPS and is permanent. This was done to ensure that subsequent over-flights to map on-going changes in the watershed could be performed inexpensively and with the high accuracy used in the original mapping. This data was compiled and segmented for use by the DNR and Maryland Conservation Corps (MCC) in the Stream Corridor Assessment. Additional GIS layers were provided by the Town and County. Information contained in the resulting Watershed Characterization is set forth in Table 1. The Watershed Characterization provides useful signposts used in developing the WRAS. The final print publication of the Corsica River Watershed Characterization appeared in May 2004 with electronic publication in Oct. 2003 at: http://dnr.maryland.gov/watersheds/surf/proj/wras.html

CORSICA RIVER WATERSHED
CHARACTERISTICS CONTENTS

TABLE 1

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Submerged Aquatic Vegetation
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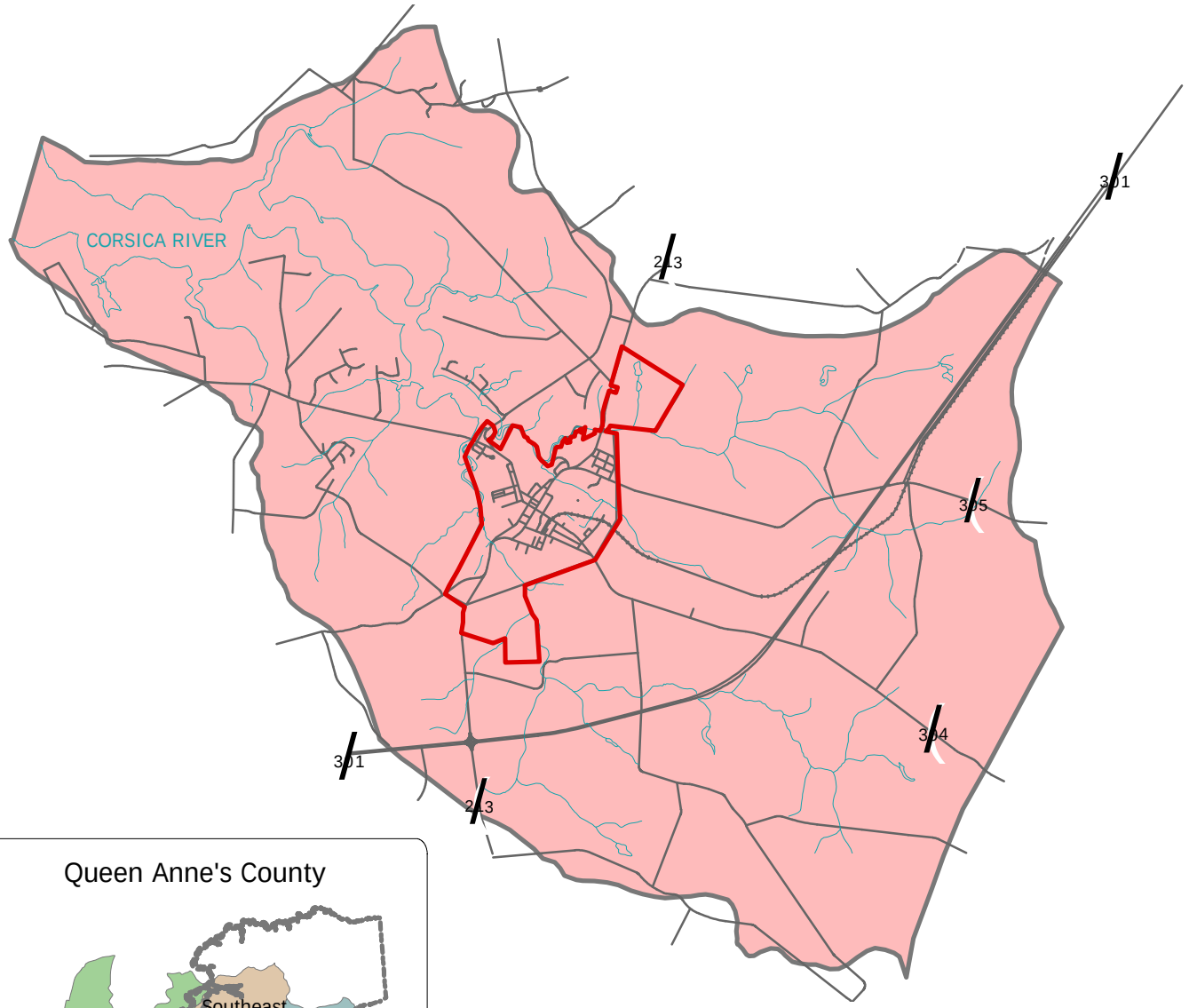
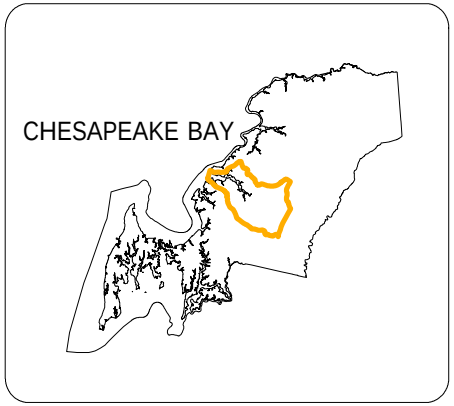
2003 Stream Assessments Conducted by DNR
Agricultural Conservation Programs
Marina Programs
Stream Buffer Restoration

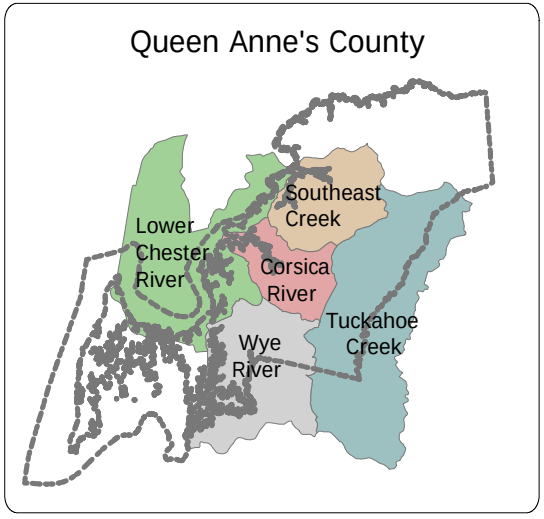
CORSICA RIVER WRAS

Figure 2
THE CORSICA RIVER WATERSHED



QUEEN ANNE'S COUNTY
MARYLAND





The Town of Centreville sits at the heart of the Corsica River Watershed at the confluence of the River's upper headwaters.

The Town of Centreville
Streams
Roads
Corsica River Watershed

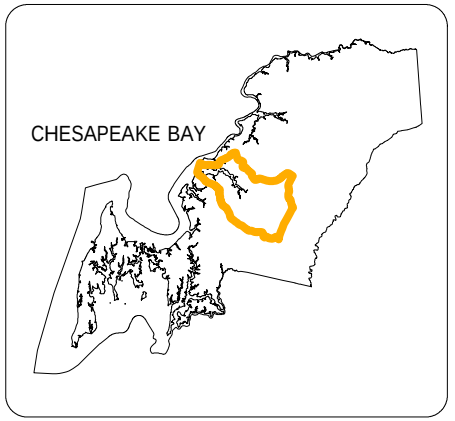
N

1 0 1 2 Miles

CORSICA RIVER WRAS

Figure 2a
CORSICA RIVER WRAS ROAD MAP

Queen Anne's County
Maryland



WRAS Boundary

N

4000 0 4000 8000 Feet

Current Conditions Assessment Methods

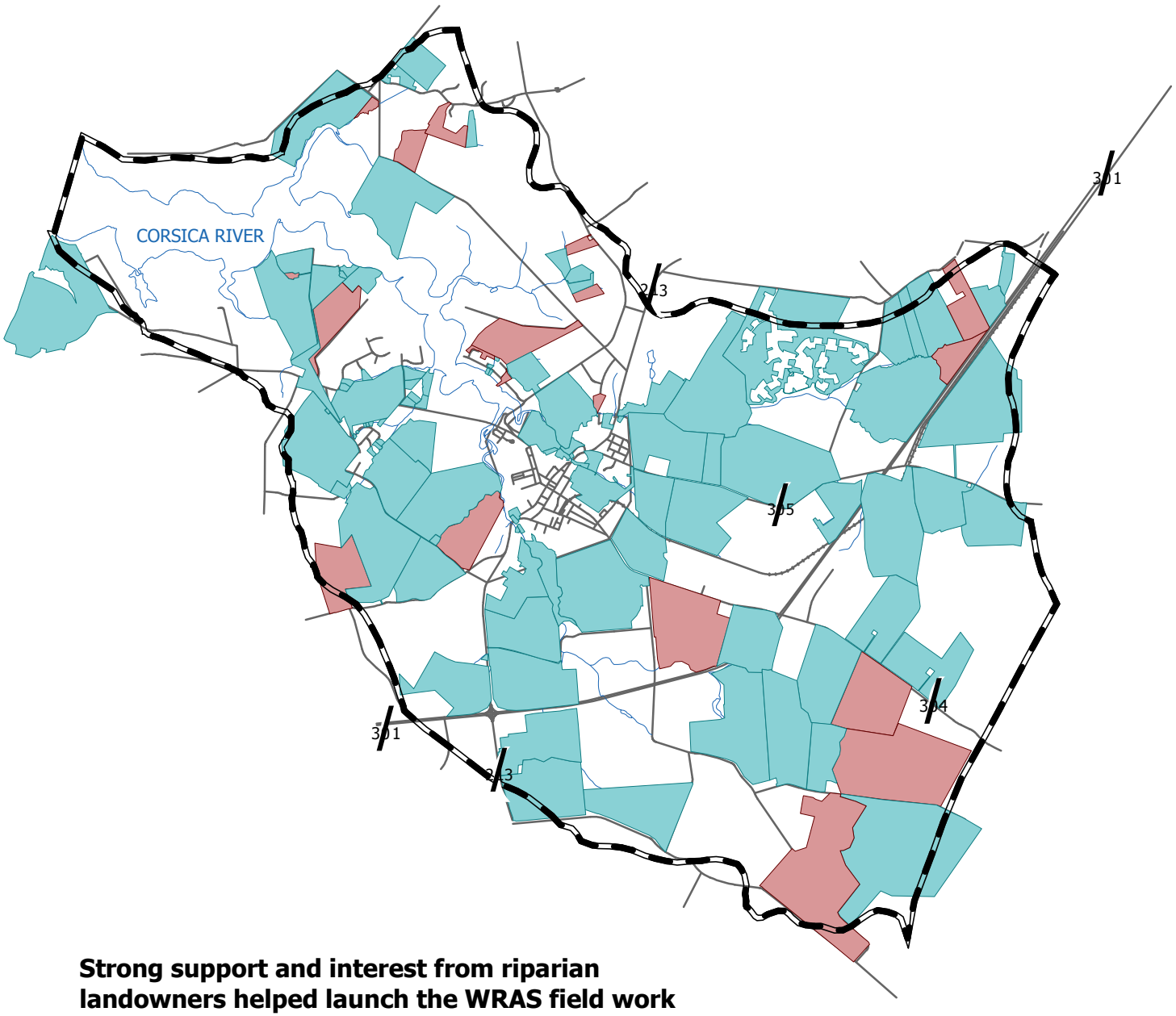
Several specific assessment protocols went into the developing the current conditions of the Corsica River Watershed:

Stream Corridor Assessment (SCA)

The Stream Corridor Assessment is one of the most valuable tools delivered by DNR to help assess the current environmental condition of each stream contributing to the tidal waters of the Corsica. Fortunately the 100 miles of allowable assessment allocated under the grant to the Corsica WRAS more than covered the total stream reaches in the entire watershed. Thus the SCA provided a total stream reach assessment which gives the Corsica River WRAS a broader coverage and every stream received hands-on field scrutiny. The Maryland Conservation Corps team, trained by Maryland DNR staff, executed the SCA protocol which sought to identify the following potential impairments, classify the degree of severity and rate the level of correction needed of each identified problem:

- Altered Shorelines
- Channel alterations
- Exposed pipes
- Erosion sites
- Fish barriers
- Inadequate stream buffers (riparian)
- Construction in or near stream
- Pipe outfalls
- Trash dumping sites
- Other unusual conditions observed (e.g., odors, scum, excessive algae, water color/clarity, red flock, sewage discharge, oil, and the like)

Prior to the launch of the on-site SCA work, the Town notified every landowner in the watershed adjacent to an intermittent or perennial stream and adjacent to the tidal waters of the Corsica River. Permission and Response cards were mailed, the results were compiled in a spreadsheet and individual parcels were mapped and color coded so that the DNR field chief would have a visual log of willing landowners to contact prior to his visits. This process was very successful and the overall response was such that, where permission was not granted, the landowner on the opposite side of the stream invariably granted permission so that virtually all stream reaches had right-of-entry access and permission.

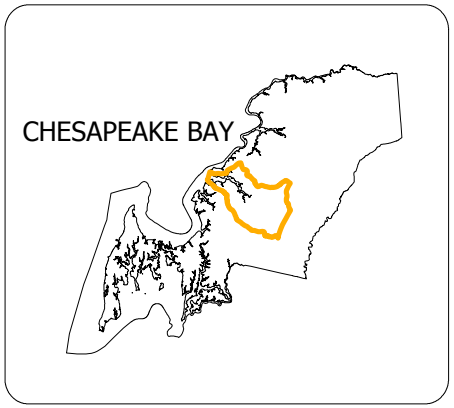


Strong support and interest from riparian landowners helped launch the WRAS field work

CORSICA RIVER WRAS

Figure 3
RIGHT OF ENTRY MAP

QUEEN ANNE'S COUNTY
MARYLAND



Responses

- **Entry granted**
- **Entry not granted**
- **No response or right of entry not required**
- **Streams**
- **Roads**
- **Watershed Boundary**

N

4000 0 4000 8000 Feet

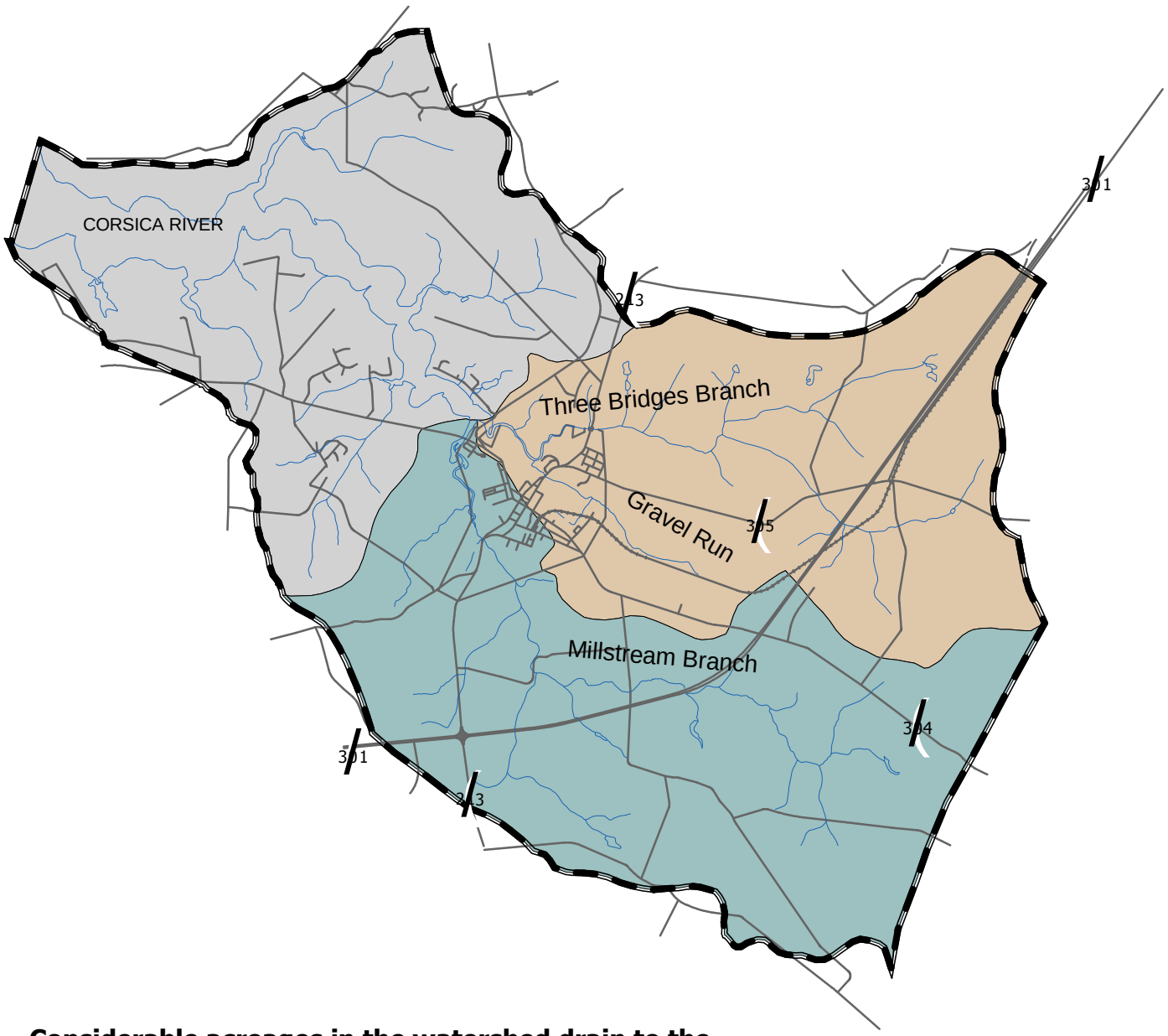
The primary Sub-watersheds in the Corsica River Basin are depicted below:

TABLE 2

Subwatersheds in the Corsica River Watershed DNR and MDP 2000 Data				
Number 02130507 - XXXX	Name "12 Digit" Subwatershed	Area in Acres		Description
02130507	**Corsica River**	With Water	Land Only	
0395	Corsica Direct Drainage	8,382	7,053	All tributary areas that drain directly to the estuarine portion of the Corsica River
0396	Mill Stream Branch	9,384	9,560	Includes south and west portions of Centreville
0397	Three Bridges Branch and Gravel Run	7,533	7,491	Includes north and east portions of Centreville
02130507	**Corsica River Watershed**	**25,299**	**24,104**	**Entire "8-digit" watershed**

Field Maps

Digitally prepared field maps were annotated with identified areas of concern and numbered photographs of the observed problem areas were keyed to the maps for pin-pointing in the GIS geo-reference. Severity and ease of problem remediation as well as physical accessibility were also noted. This field data is now linked to the GIS and complete information on the SCA methodology, including descriptive information for each problem type, definitions of levels of severity, correctability, and accessibility can now be found in the "Stream Corridor Assessment-Survey Protocols" available on-line at Maryland DNR web site http://www.dnr.state.md.us/streams/pubs/other.html

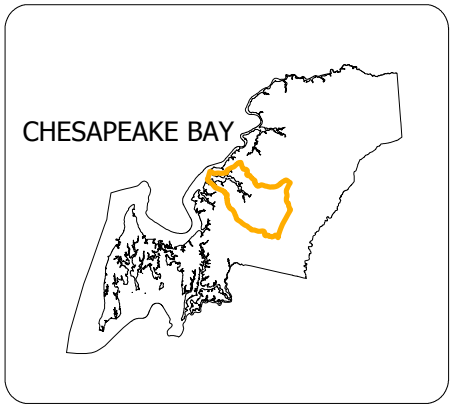


Considerable acreages in the watershed drain to the Three Bridges Branch, Gravel Run, and Millstream Branch Perennial freshwater streams

CORSICA RIVER WRAS

Figure 4
SUB-WATERSHEDS

QUEEN ANNE'S COUNTY
MARYLAND



Sub-watersheds

- **Corsica Direct Drainage**
- **Millstream Branch**
- **Three Bridges Branch and Gravel Run**
- **Streams**
- **Roads**
- **Watershed Boundary**

N

4000 0 4000 8000 Feet

Synoptic Surveys

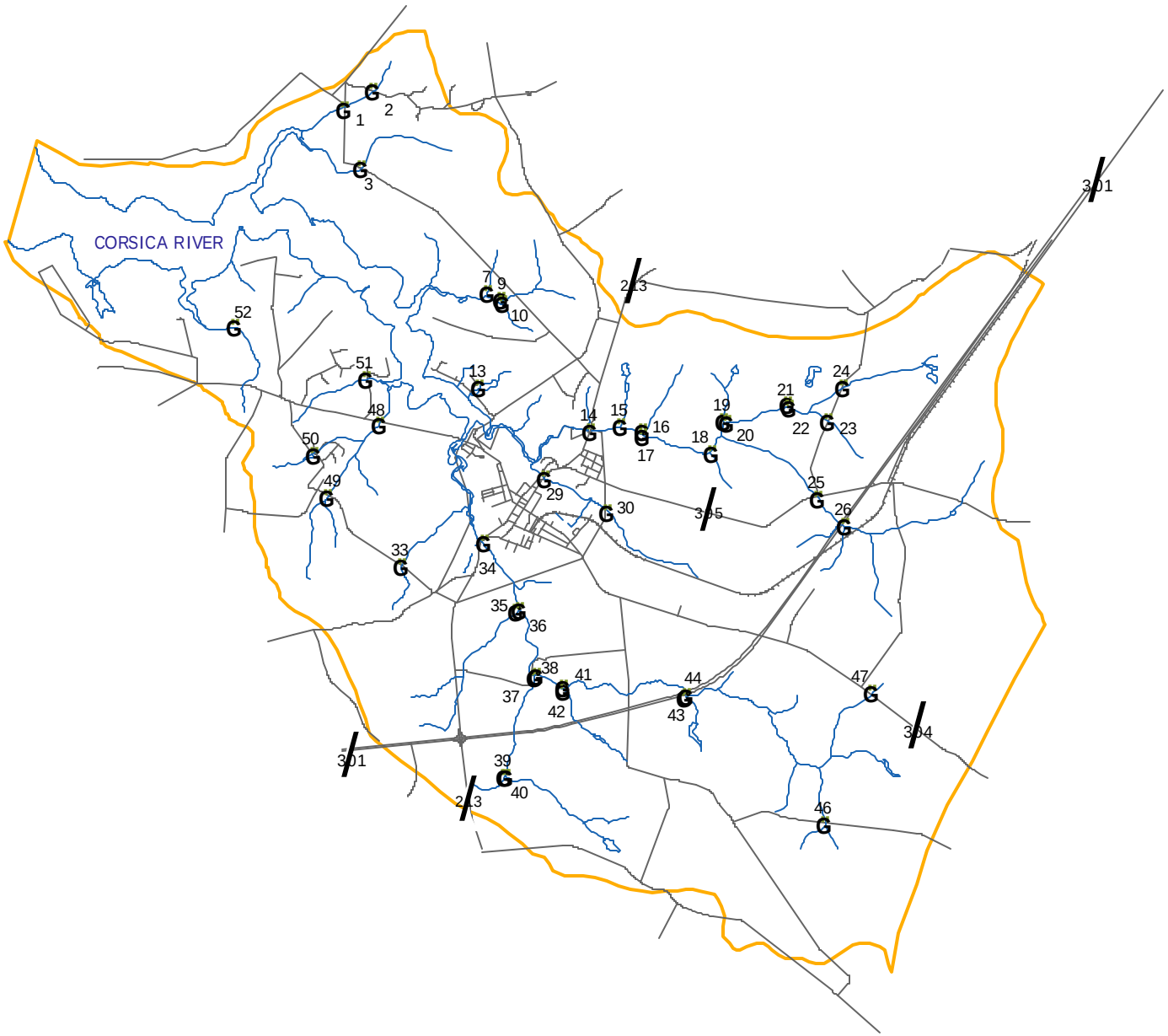
The capacity of streams to support a diversity of aquatic life depends on the quality and availability of habitat as well as the physical and chemical characteristics of its water quality. A nutrient synoptic survey was conducted during April 2003 in the Corsica River Watershed as part of the Corsica WRAS. Fifty-one (51) Baseflow grab sample sites were established throughout the watershed distributed to reach each of the 12-digit Sub-watersheds. Water quality sampling, benthic macroinvertebrate sampling, and fish sampling occurred in April using established DNR sampling protocols and complete details of the synoptic survey may be found at the Maryland DNR website.

Nutrient synoptic sampling was scheduled for early spring to coincide with the period of maximum nitrogen concentrations in the free-flowing fresh water streams. The major proportion of nitrogen compounds are carried dissolved in the groundwater rather than in surface run-off. The higher nitrogen concentrations in the late winter and early spring reflect the higher proportion of nitrogen-rich shallow groundwater present in the base flow at this time of year. Nitrogen concentrations are reduced in summer as the proportion of shallow groundwater is reduced through plant uptake, and replaced by deeper groundwater that may have lower nitrate concentrations, or has been denitrified through interaction with anoxic conditions in the soils below the streambed. Point sources can also contribute to in-stream nitrate concentrations.

Orthophosphate is generally transported bound to suspended sediments in the water column. In-stream orthophosphate concentrations can also be produced through mobilization of sediment bound phosphorous in anoxic water column and/or sediment conditions, sediment in surface run-off from areas having had surface applied phosphorous, groundwater from phosphorous saturated soils, and point source discharges.

CORSICA RIVER WRAS

Figure 5
SYNOPTIC NUTRIENT SAMPLE SITES



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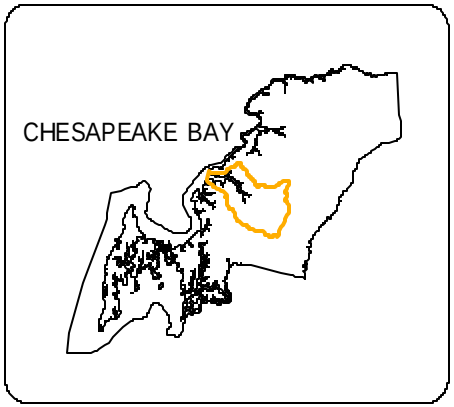
MARYLAND



- G Synoptic Site
- Streams
- Roads
- Watershed Boundary

N

1 0 1 2 Miles

Table 3
Synoptic Nutrient Sample Site Locations

SITE_#	LOCATION	SAMPLE TYPE	LATITUDE	LONGITUDE	NOTES
1	North Fork Emory Cr. at Spaniards Neck Rd.	N,F	39.09555	76.09426	
2	North Fork Emory Cr. at Coon Box Rd.	N	39.98060	76.09003	
3	South Fork Emory Cr. at Spaniards Neck Rd.	N,B,F	39.88150	76.09132	
7	UT to Corsica at Spaniards Neck Rd.	N	39.07470	76.07041	perched culvert
9	UT to Corsica at Spaniards Neck Rd.	N	39.07118	76.07005	perched culvert
10	UT to Corsica at Spaniards Neck Rd.	N	39.07118	76.07005	
13	UT to Corsica at Quail Run Dr.	N			
14	Three Bridges Branch at Rt 213	N,B	39.05419	76.05343	
15	UT to Three Bridges Br. at confluence	N	39.05459	76.04919	
16	UT to Three Bridges Br.at confluence	N	39.05401	76.04707	
17	Three Bridges Br.	N	39.05401	76.04707	
18	UT to Three Bridges Br.at confluence	N	39.05260	76.03207	
19	UT to Three Bridges Br.at confluence	N	39.05440	76.03250	
20	UT to Three Bridges Br. at confluence	N	39.05436	76.03280	
21	UT to Three Bridges Br. at confluence	N	39.05679	76.02257	
22	UT to Three Bridges Br. at confluence	N	39.05679	76.02257	
23	UT to Three Bridges Br. at Tanyard Rd.	N			
24	UT to Three Bridges Br. at Tanyard Rd.	N			
25	Three Bridges Br. at Rt 300	N			
26	Three Bridges Br. at Rt 301	N	39.04175	76.01283	
28	Grays Cr. at Rt 213	N			
29	Grays Cr. behind detention center	N	39.04336	76.05263	perched culvert
32	UT to Millstream Br. at Hibernia Rd.	N			
33	Millstream Br. above Rt 213	N	39.38380	76.70500	
34	UT to Millstream Br at confluence	N			
35	Millstreasm Br. at confluence	N,B,F			
36	UT to Millstream Br. at Taylor Mill Rd.	N			
37	Millstream Br. at Taylor Mill Rd	N			
39	UT to Millstream Br. at Rt 301	N	39.01500	76.06726	
40	UT to Millstream Br. at confluence	N			
41	Millstream Br at confluence	N			
42	UT to Millstream Br at Rt 301	N			

SITE_#	LOCATION	SAMPLE TYPE	LATITUDE	LONGITUDE	NOTES
43	Millstream Br. at Rt 301	N,B,F			
45	Millstream Br. at Little Eagle Rd.	N			
46	Millstream Br. at Rt 304	N			
47	UT to Corsica at Rt 304	N,F			
48	UT to Corsica at Hibernia Rd.	N			perched culvert
49	UT to UT at Brownsville Rd.	N			perched culvert
50	Earle Cr at Fort Point Rd.	N			perched culvert
51	UT to Tilghman Cove	N	39.05765	76.11498	

*N = nutrients
F = Fish
B = benthic

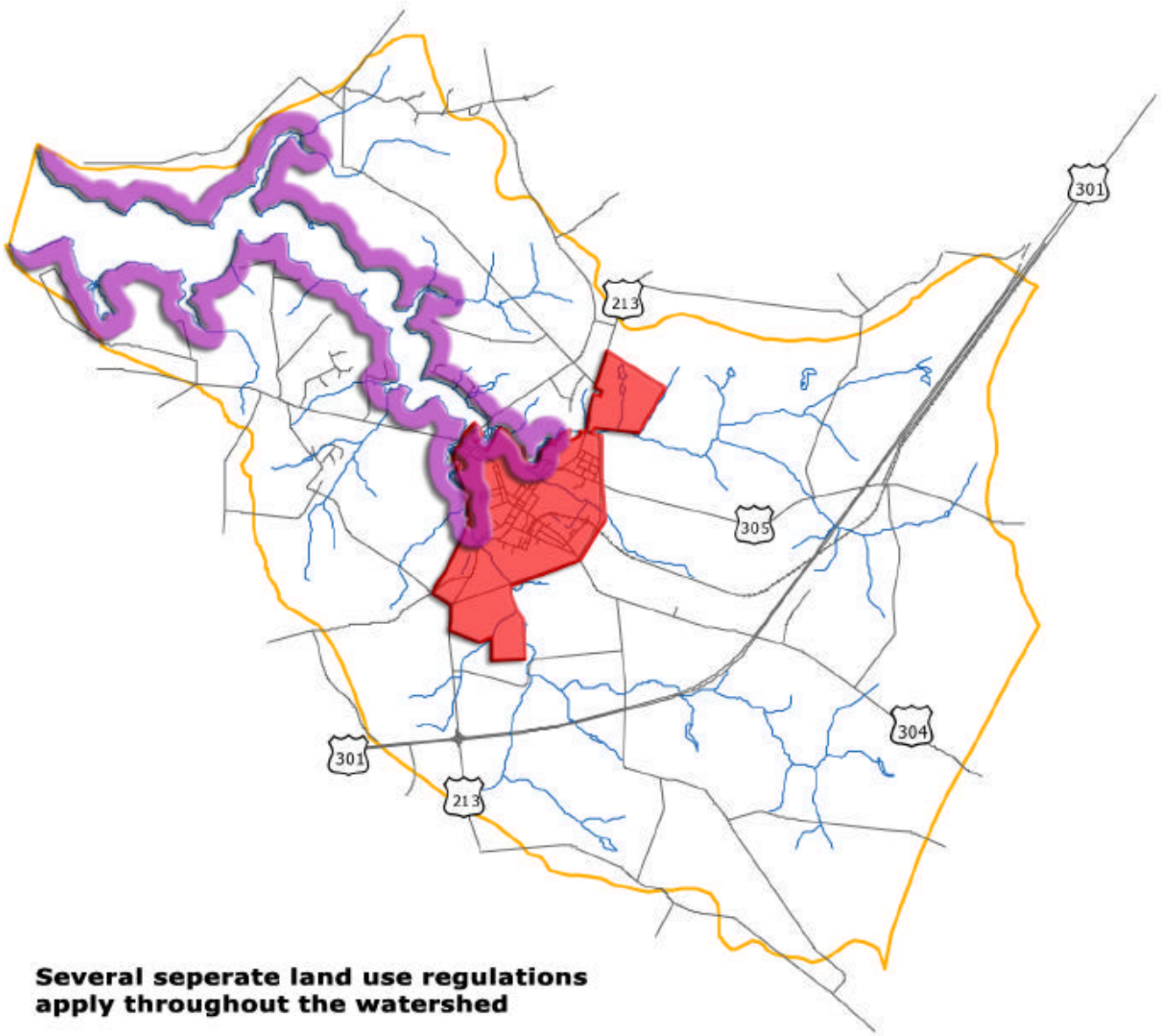
Water Chemistry Sampling

Sampling sites were selected and pinpointed in the GIS base. The contributing drainage areas (used to calculate nutrient yields per unit area) were determined from a digitized watershed map using ArcView® software. Synoptic water chemistry samples were collected in early spring throughout the watershed. Sampling was halted for a minimum of 24 hours after rainfall events totaling more than 0.25 inches. Grab samples of whole water (500 ml) were collected just below the water surface at mid-stream and filtered using a 0.45 micron pore size (Gelman GF/C) filter. The samples were stored on ice and frozen on the day of collection. Filtered samples were analyzed by the Nutrient Analytical Services Laboratory at the University of Maryland's Chesapeake Biological Laboratory (CBL) for dissolved inorganic nitrogen (NO_3, NO_2), and dissolved inorganic phosphorous (PO_4). All analyses were conducted in accordance with U.S. Environmental Protection Agency (EPA) protocols. Stream discharge measurements were taken at the time of all chemistry samples. Water temperature, dissolved oxygen, pH, and conductivity were measured in the field with a Hydrolab Surveyor II® at selected sites at the time of water quality collections. Watershed areas used to calculate nutrient yields were determined from a digitized watershed map using ArcView® software.

Where sites are nested in a watershed, the mapped concentration data for the downstream site is shown only for the area between the sites. Yield calculations for a downstream site are based on the entire area upstream of the site, but are mapped showing just the area between sites. The downstream sites therefore illustrate the cumulative impact from all upstream activities. This is particularly important in the Corsica River Watershed in light of the fact that the upstream areas in Subwatersheds 0396 and 0397 flow to confluence with the tidal Corsica within the Town of Centreville.

CORSICA RIVER WRAS

Figure 6
CRITICAL AREA



Several seperate land use regulations apply throughout the watershed

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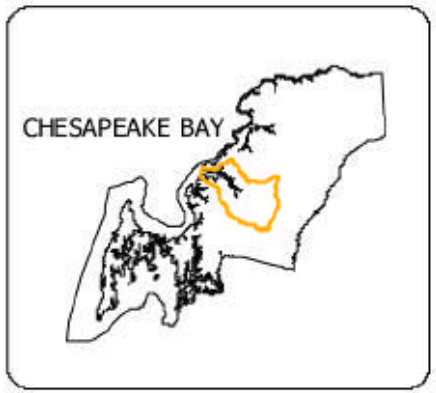


The Town of Centreville
+/- 1406 acres

Critical Area
+/- 2441 acres

N

1 0 1 2 Miles

Benthic Macroinvertebrate Sampling

Aquatic macroinvertebrates were collected at the time of water chemistry samples during the spring to be within the Maryland Biological Stream Survey (MBSS) spring index period. Macroinvertebrate collections were made over a $2m^2$ area of the best available habitat using a 0.3m wide dip net with a mesh size of 500 microns. The best available habitats include: gravel riffles, snags, submerged vegetation and root mats. Habitats were sampled in the proportion to their occurrence at the station. Samples were composited in a sieve bucket, fine sediments washed out, and large debris rinsed and discarded. The remaining sample was preserved in 70% ethanol and returned to the laboratory for sub-sampling. Sub-sampling was done using a gridded tray. Grids were chosen at random until the 100^{th} organism had been completed. Organisms were identified to genus, recorded on a bench sheet, and archived for future reference. *Insitu* water quality data (dissolved oxygen, pH, conductivity, temperature) were collected during each sampling episode with a Hydrolab Surveyor II®. A macroinvertebrate index of biotic integrity (IBI) (MD DNR, 1998) was calculated to facilitate ranking of site quality.

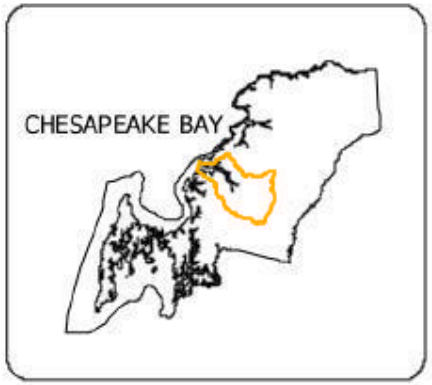
Fish Sampling

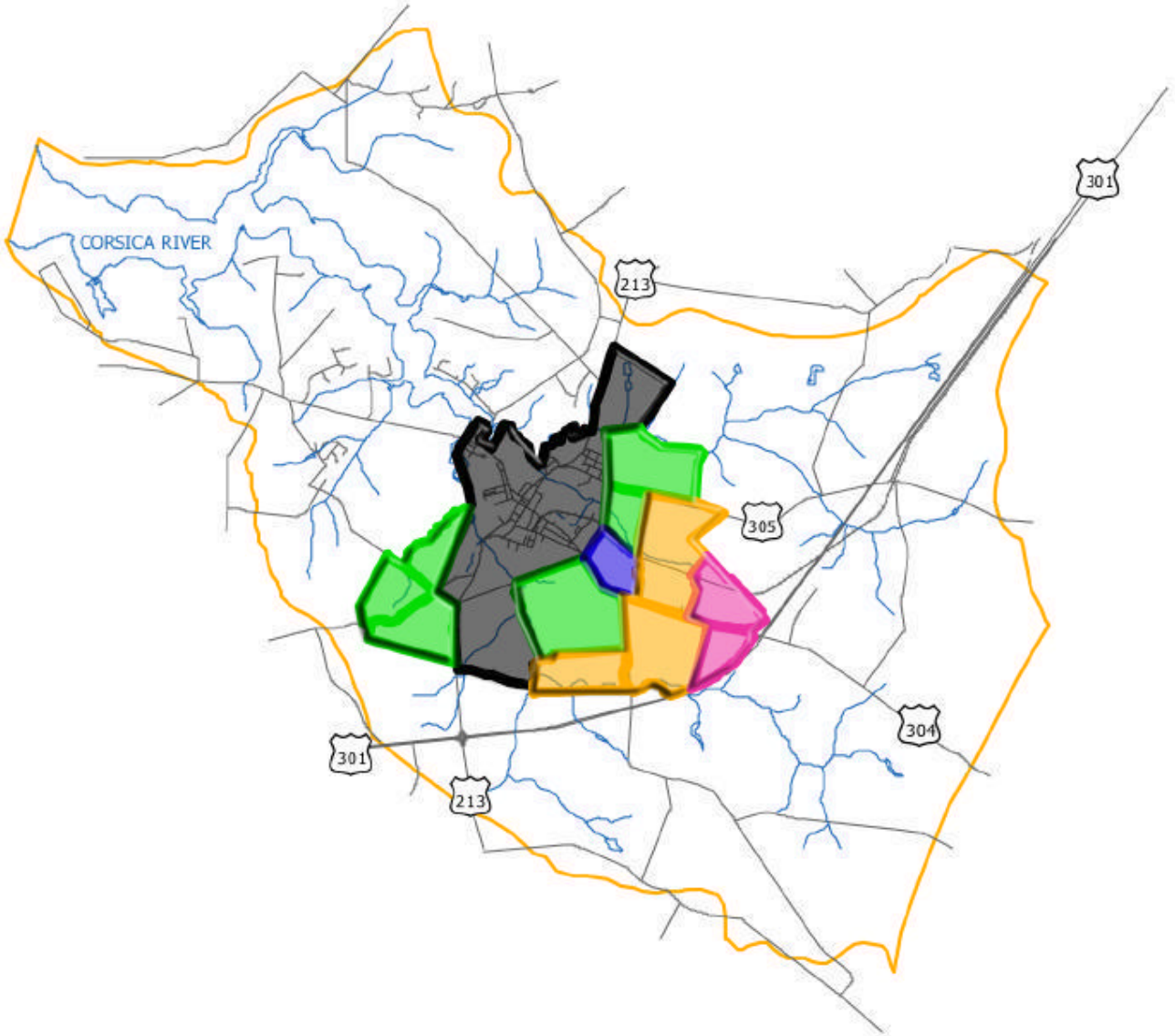
Fish were sampled during the summer of 2003 to coincide with the MBSS index period for fish sampling. Backpack electroshockers were used for two passes through a 75-meter reach of stream with block nets at each end of the reach. All species were enumerated and weighed to obtain taxa richness and biomass estimates.

CORSICA RIVER WRAS

Figure 7
THE TOWN OF CENTREVILLE GROWTH PLAN
(June 1998)

QUEEN ANNE'S COUNTY
MARYLAND





- County Planned Business
- County Planned Unit Development
- Town Public
- Town Planned
- Town of Centreville
- Streams
- Roads
- Watershed Boundary

N

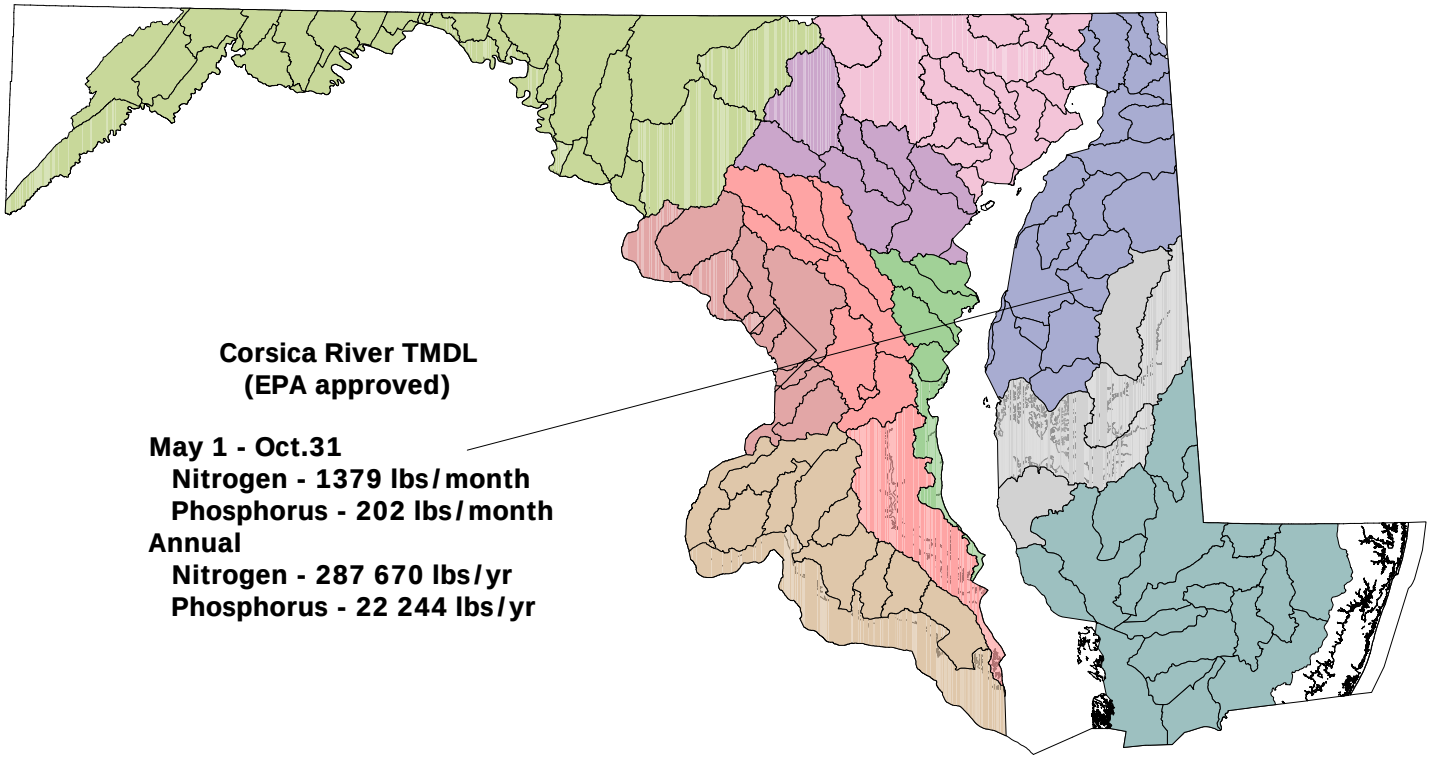
1 0 1 Miles

The current Growth Plan for the area was co-authored and adopted by the Town of Centreville and Queen Anne's County Commissioners

CORSICA RIVER WRAS

Figure 8

Maryland Tributary Teams (w/Corsica River TMDL)



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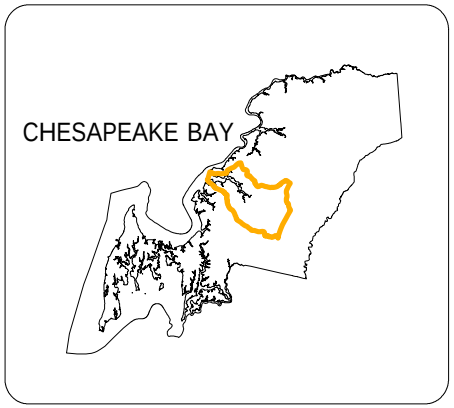
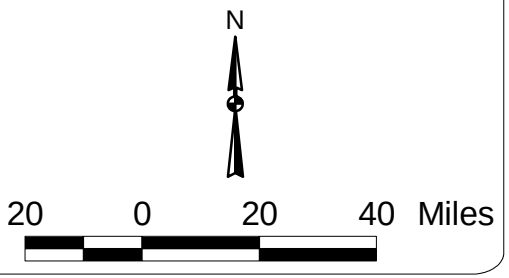
MARYLAND



TRIBUTARY TEAM AREAS

- Choptank River
- Lower Eastern Shore
- Lower Potomac River
- Lower Western Shore
- Middle Potomac River
- Patapsco-Back River
- Patuxent River
- Upper Eastern Shore
- Upper Potomac River
- Upper Western Shore



Ten Tributary Teams serve Maryland's Chesapeake Bay basin with the mission to help achieve the nutrient reduction goals agreed to in the Chesapeake 2000 Agreement and restore living resources in the bay and its tributaries.

Total Maximum Daily Loads of Nitrogen and Phosphorous for Corsica River

On April 9, 2000 the EPA approved the Total Maximum Daily Loads (TMDLs) established by the Maryland Department of the Environment (MDE) for the Corsica River for phosphorous and nitrogen. A TMDL reflects the total pollutant loading of the impairing substance a water body can receive and still meet water quality standards. The Corsica River was first identified on the 1996 303(d) list submitted to EPA by the Maryland Department of the Environment. Impairments from Maryland's 303(d) list are:

- Nutrients in the tidal portions of the River
- Fecal Coliform
- Sediment
- Biological Impairment (a stretch of Gravel Run is listed based on poor ratings for fish and benthic organisms population and/or habitat)
- Toxics- PCBs, Dieldrin, Methylmercury and Fish Consumption Advisory. The presence of PCBs may relate to the fact that the Former Centreville Electric Plant (now the Centreville Police Department Building and Public Works grounds) was located directly on the Gravel Run

The Corsica was listed as being impaired by nutrients with established TMDLs for phosphorous and nitrogen. The TMDL may be found in its complete form on the MDE website at http://www.mde.state.md.us/programs/waterprograms/tmdl/approvedfinaltmdl/tmdl_corsica.asp

Abstractions from this report are made here to inform the reader of the breadth of available information on the Corsica. Specific attention is drawn to the Point Source and Nonpoint Source Technical Memoranda, the Appendix A and submitted comments found on the above captioned web pages.

On the nonpoint source side, the TMDL technical memorandum cited above, suggests the allocation of implementation strategy efforts may be prioritized on the basis of land use. Nutrient pollution or over-enrichment problems may arise from numerous sources including all types of land use and from the atmosphere as well. Adding to the problem, dredging done to improve occluded navigation channels and from near-shore clamming operations causes the resuspension of legacy sediments and their attached nutrients in the water column. Tidal influences from the Chester River mainstem further complicate the sampling and water quality monitoring as well. Residential land can be an important contributor of nutrients depending on fertilizer use, extent of lawn area, and status of septic systems. Farmers apply nutrients using different approaches, so nutrients entering waterways from crop land vary greatly depending on conservation practices. Typically, streams and other surface waters receive relatively small amounts of nutrients from forest land and relatively high amounts from land uses that involve land disturbance and application of fertilizer. The Corsica River Watershed Management Strategy amplifies this discussion in later pages relative to nutrients and sedimentation problems.

The Corsica River is impaired by nutrients, nitrogen and phosphorous, which cause excessive algal blooms and can cause "exceedances" of the dissolved oxygen standard. The water quality goal of the Corsica River TMDLs is to reduce high chlorophyll-a concentrations (a surrogate for algal blooms), and maintain dissolved oxygen standards at levels where designated uses of the Corsica River will be met. The TMDL was determined using the WASP5 water quality model. Total loading caps for nitrogen and phosphorous entering the Corsica River are established for both the low flow conditions and for annual loads. The TMDL evaluation of the pointsource of the Centreville WWTP assumed that the discharge would be extended from the existing stream location at a point at the Watson Road Bridge. This was never done as spray irrigation was selected over added direct discharge. Seasonal variations are important factors as the new Centreville WWTP utilizes land application of effluent instead of the current confined stream discharge method.

The currently established low flow TMDL for nitrogen is **1,379** lbs/month, and the low flow for phosphorous is **202** lbs/month. These TMDLs apply during the period of May 1- October 31, and will be implemented through NPDES permits. The annual TMDL for nitrogen is **286,670** lbs/yr, and the annual TMDL for phosphorous load **22,244** lbs/yr.

III. Corsica River Management Strategy
Results of the Stream Corridor Assessment and Synoptic Survey

Overall Watershed Conditions

Stream Corridor Assessment/ Synoptic Survey

It is the intent of the Town and its WRAS partners that the WRAS be presented in a simple and comprehensible manner. The results of the Stream Corridor Assessment (SCA) and associated ranking of impairment severity may be seen on the following Tables and Figures. These are included to demonstrate how these data can be particularized for study and for future restoration implementation plans and grant applications. Each of these assessment tools may be further studied by merging the orthophoto layer with the exact location of the impairment under study. Add to this the database result for the applicable landowner, photos taken in the field of the impairment, soils layers, accessibility from streets or granted right-of-way, etc.

Severity, correctability, and access ratings have been provided on all Figure 9 plates and all Table 3 impairment rankings. To help prioritize future restoration work, all problem sites are evaluated and scored by field crews on a scale of one to five for three separate areas: problem severity, correctability and accessibility. These scores are subjective and based on the field crew's evaluation at the time of the survey. While the Maryland Conservation Corps (MCC) members receive a week of training on how to do the survey, the overall experience of individual Corps members is usually limited. Often they do not have the background to provide a definitive evaluation of the severity or correctability of a particular problem. The rating should therefore be viewed as the field team's opinion of the worst problem within a specific problem category and which problems they believed would be the easiest to correct. The scores provide a starting point for more detailed follow-up evaluations by individuals that are more experienced dealing with specific problem categories. This is initially done by reviewing the data and photographs collected by the field teams and can involve follow-up field visits as well. As additional information about a specific problem site is obtained, the site's severity, correctability, and/or accessibility ratings can change. While the criteria for rating problem severity, correctability, and access can vary among different problem categories, the general guidelines used by survey teams to assign these values are as follows:

Severity Rating

The severity rating is a rating on how bad a specific problem is relative to other problems in the same problem category. It is used to answer questions such as, where do the field crews believe the worst erosion problems were, or where was the largest section of stream with an inadequate buffer. In general, the scoring is based on the overall impression of the survey team of the severity of the problem.

Rating of 1 is for the most severe problems that appear to have direct and wide-reaching impact on the streams aquatic resources.

Rating of 3 is for moderately severe problems that appear to be having some adverse impacts at a specific site.

Rating of 5 is for minor problems that do not appear to be having a significant impact on the stream and aquatic resources.

Correctability Rating

Correctability ratings provide a relative measure on how easily the field teams believe it would be to correct a specific problem. The correctability rating can be helpful in determining which problems to initially examine when developing a restoration plan for a drainage basin. One restoration strategy would be to initially target the severest problems that are the easiest to fix. The correctability rating can also be useful in identifying simple projects that can be done by volunteers, as opposed to projects that require more significant engineering efforts.

Rating of 1 is for minor problems that could be corrected quickly and easily using hand labor, with a minimum amount of planning.

Rating of 3 is for moderate size problems that may require a small piece of equipment, such as a backhoe, and some planning to correct.

Rating of 5 is for major restoration problems that would require a large expensive effort to correct. These projects would usually require heavy equipment, significant amount of funding ($100,000.00 or more), and construction could take a month or more.

Accessibility Rating

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

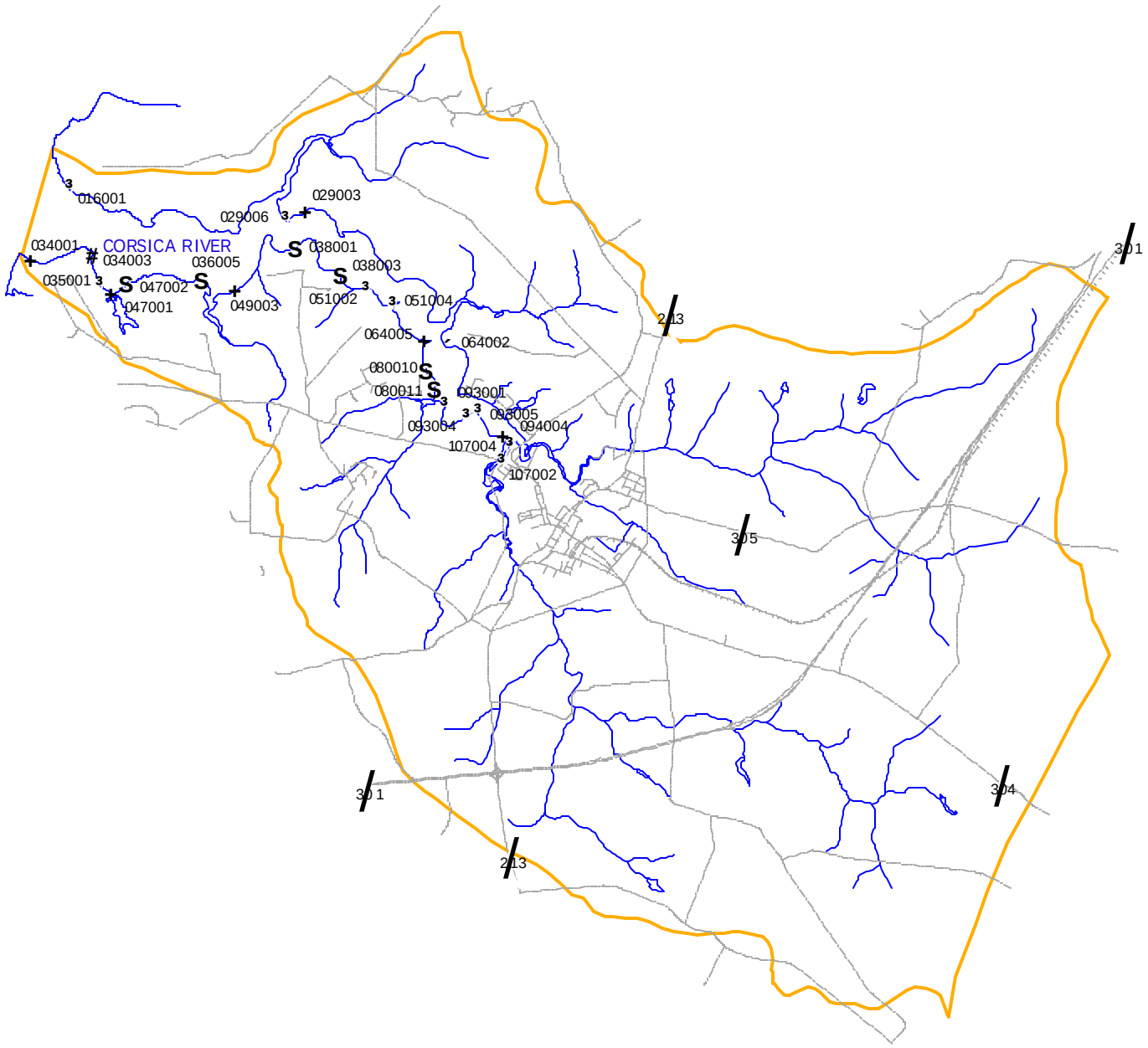
Rating of 1 is for a site that is easily accessible by both car or on foot. Examples would include a problem in an open area inside a public park where there is sufficient room to park near the site. If heavy equipment was needed, it could easily access the site using existing roads or trails.

Rating of 3 is for sites that are easily accessible by foot but not easily accessible by a vehicle. Examples would include a stream section that could be reached by crossing a large field or a site that was accessible only by 4-wheel drive vehicles.

Rating of 5 is for sites that are difficult to reach both on foot and by a vehicle. Examples would include a site on private land where there are no roads or trails nearby. To reach the site it would be necessary to hike over a mile. If equipment were needed to do the restoration work, an access road would need to be built over a long distance through rough terrain.

CORSICA RIVER WATERSHED
SCA SURVEY RESULTS

Figure 9a
ALTERED SHORELINES



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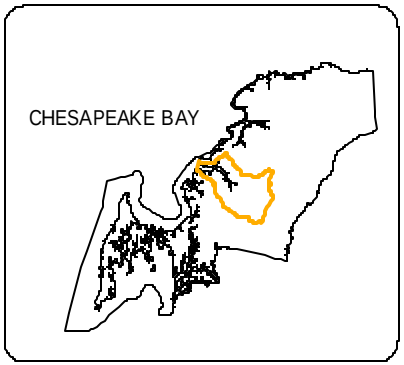


Altered Shorelines

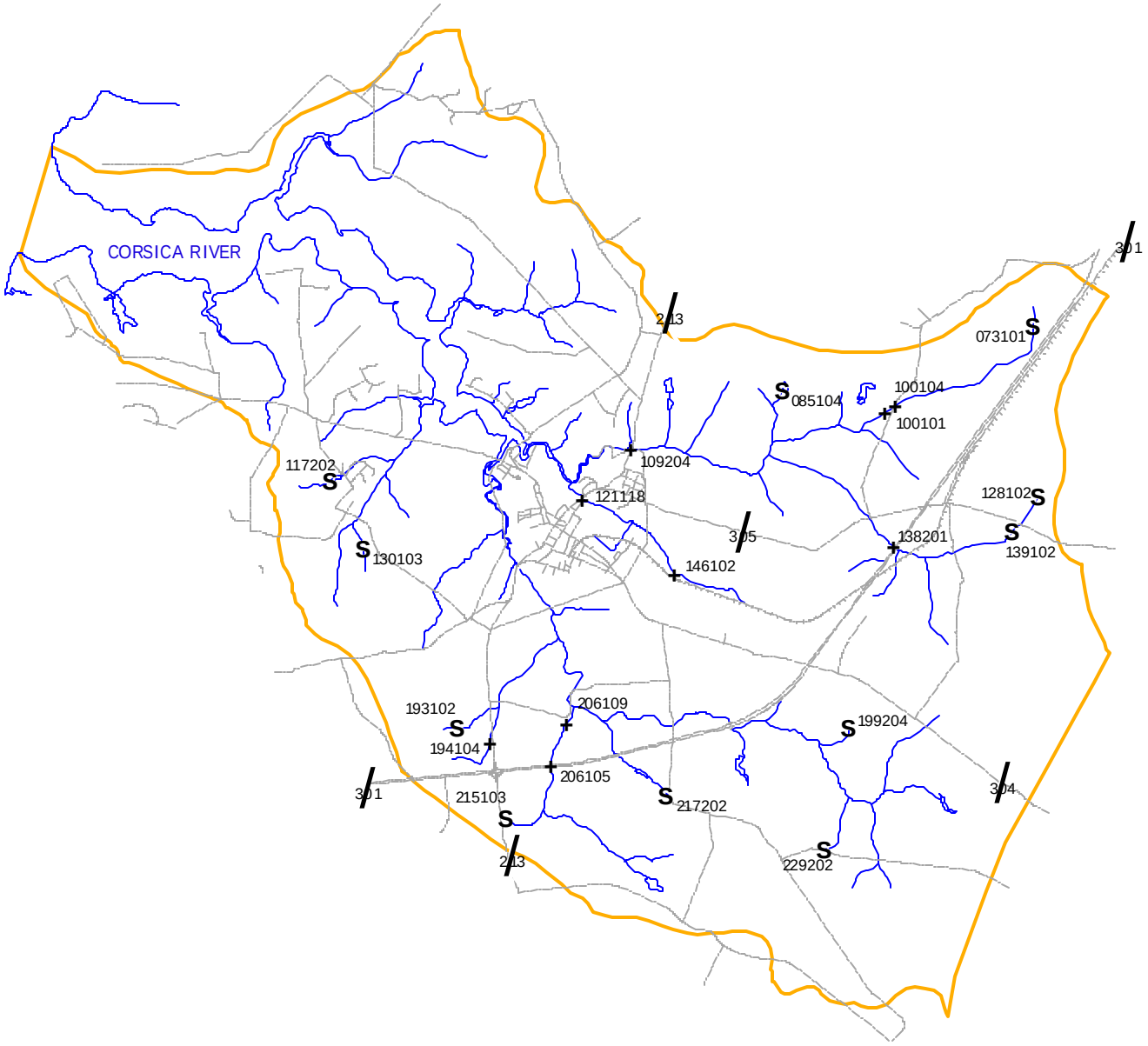
- # Very Severe
- ´ Severe
- 3 Moderate
- \+ Low Severity
- S Minor
- Roads
- Streams
- Watershed Boundary

N

1 0 1 Miles

Table 3a - Altered Shorelines

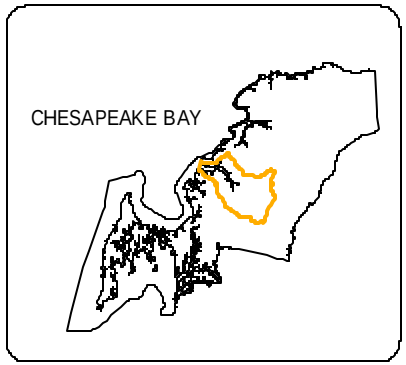
Problem	Site	Date	Photo	Survey	Type	Length (ft)	Land Use A	Land Use B	Severity	Correctability	Access
Altered Shore	034003	10/6/2003	181-18	CR	Groin & broken con	2500	Crop field	Open wate	1	3	3
Altered Shore	064002	10/6/2003		CR	Wood bulkhead	825	Lawn	Open wate	2	2	2
Altered Shore	016001	10/6/2003	172-17	CR	Rip-rap	1700		Open wate	3	2	3
Altered Shore	029006	10/6/2003		CR	Rip-rap	730	Single home	Phramites	3	3	3
Altered Shore	035001	10/6/2003	200	CR	Wood bulkhead	275	Lawn	Open wate	3	3	2
Altered Shore	051002	10/6/2003	274-27	CR	Mix of bulkhead &	530	Residential	Open wate	3	3	2
Altered Shore	051004	10/6/2003	281	CR	Wood bulkhead	440	Residential	Open wate	3	4	3
Altered Shore	093001	10/6/2003	307	CR	Wood bulkhead	400	Lawn	Open wate	3	3	2
Altered Shore	093004	10/6/2003	313	CR	Mix of bulkhead &	130	Single home	Open wate	3	3	2
Altered Shore	093005	10/6/2003	314	CR	Rip-rap	490	Single home	Open wate	3	3	2
Altered Shore	107002	10/6/2003		CR	Mix of bulkhead &	700	Boat landing	Open wate	3	3	1
Altered Shore	107004	10/6/2003		CR	Mix of bulkhead &	410	Marsh emergent	Open wate	3	3	1
Altered Shore	029003	10/6/2003		CR	Rip-rap	550	Single home	Beach	4	2	3
Altered Shore	034001	10/6/2003	180	CR	Rip-rap	600	Crop field	Open wate	4	3	2
Altered Shore	047001	10/6/2003		CR	Rip-rap	545	Lawn	Open wate	4	3	3
Altered Shore	049003	10/6/2003	217	CR	Rip-rap	640			4	3	2
Altered Shore	064005	10/6/2003	289	CR	Rip-rap & gravel	205	Residential	Open wate	4	3	2
Altered Shore	094004	10/6/2003		CR	Rip-rap	420	Single home	Open wate	4	3	2
Altered Shore	036005	10/6/2003		CR	Rip-rap	260	Lawn	Beach	5	2	2
Altered Shore	038001	10/6/2003	255	CR	Wood bulkhead	50	Lawn	Beach	5	2	2
Altered Shore	038003	10/6/2003	219	CR	Wood bulkhead	115	Residential	Open wate	5	3	2
Altered Shore	047002	10/6/2003		CR	Rip-rap	190	Shrubs & small	Open wate	5	3	3
Altered Shore	080010	10/6/2003		CR	Rip-rap	150	Residential	Open wate	5	1	2
Altered Shore	080011	10/6/2003	303	CR	Rip-rap	200	Residential	Open wate	5	2	2



CORSICA RIVER WATERSHED
SCA SURVEY RESULTS

Figure 9b
CHANNEL ALTERATIONS

QUEEN ANNE'S COUNTY
MARYLAND



Channel Alterations

- # Very Severe
- ´ Severe
- ³ Moderate
- \+ Low Severity
- S Minor
- Roads
- Streams
- Watershed Boundary

N

1 0 1 Miles

Table 3b - Channel Alterations

Problem	Site	Date	Type	BottomWidth(ft)	Length(ft)	Sedimentation	Veg in Channel	Road Crossing	LengthAbove(ft)	LengthBelow(ft)	Severity	Correctability	Access
Channel Alteration	100101	06/09/2003	Corrugated Pipe	10	20	Yes	No	Both	8	8	4	2	2
Channel Alteration	100104	06/09/2003	Rip-rap	5	100	No	Yes	Below	0	40	4	4	2
Channel Alteration	109204	06/03/2003	Concrete	2	30		No	Both	3	3	4	5	1
Channel Alteration	121118	05/28/2003	Concrete	2	100	Yes	Yes	Above	75	0	4	5	1
Channel Alteration	138201	06/09/2003	Concrete	8	170	Yes	No	Both	15	15	4	4	1
Channel Alteration	146102	06/03/2003	Rip-rap	3	300	Yes	No	No	0	0	4	4	2
Channel Alteration	194104	06/17/2003	Gabion	3	30	No	No	No	0	0	4	3	2
Channel Alteration	206105	06/12/2003	Concrete	12	150	Yes	Yes	Both	15	15	4	5	2
Channel Alteration	206109	06/12/2003	Metal Pipe	6	30	No	No	Both	5	5	4	4	2
Channel Alteration	073101	06/25/2003	Earth Channel	2	800	Yes	Yes	Below	0	8	5	2	2
Channel Alteration	085104	05/12/2003	Earth Channel	1.5	700	Yes	Yes	No	0	0	5	2	3
Channel Alteration	117202	06/24/2003	Earth Channel	1.5	600	Yes	No	No	0	0	5	4	2
Channel Alteration	128102	06/11/2003	Earth Channel	2	500	No	Yes	No	0	0	5	3	2
Channel Alteration	130103	06/24/2003	Earth Channel	3	5	No	Yes	No	0	0	5	2	2
Channel Alteration	139102	06/11/2003	Earth Channel	3	250	Yes	No	No	0	0	5	3	2
Channel Alteration	193102	06/17/2003	Earth Channel	3	700	Yes	Yes	No	0	0	5	4	2
Channel Alteration	199204	06/11/2003	Earth Channel	1.5	600	Yes	Yes	No	0	0	5	3	3
Channel Alteration	215103	06/12/2003	Earth Channel	2	300	Yes	No	No	0	0	5	3	2
Channel Alteration	217202	06/17/2003	Earth Channel	1.5	800	Yes	Yes	No	0	0	5	2	1
Channel Alteration	229202	06/11/2003	Earth Channel	2	0	Yes	Yes	No	0	0	5	2	1

CORSICA RIVER WATERSHED SCA SURVEY RESULTS

Figure 9c
EXPOSED PIPES

112201

112201

CORSICA RIVER

021101

121108

121112

144201

112201

213

305

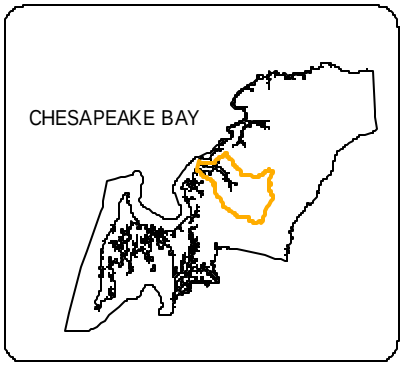
301

304

213

301

QUEEN ANNE'S COUNTY
MARYLAND



Exposed Pipes

- # Very Severe
- ´ Severe
- ³ Moderate
- \+ Low Severity
- S Minor

Roads

Streams

Watershed Boundary

N

1 0 1 Miles

Table 3c - Exposed Pipes

Problem	Site	Date	Location of Pipe	Type	Diameter(in)	Length(ft)	Purpose	Discharge	Color	Odor	Severity	Correctability	Access
Exposed Pipe	021101	06/24/2003	Exposed Across Bottom of Stream	Metal	3	8	Unknown	No			5	2	1
Exposed Pipe	112201	06/09/2003	Exposed Along Stream Bank	Plastic	2	300	Unknown	No			4	2	1
Exposed Pipe	121112	05/28/2003	Exposed Along Stream Bank	Metal	6	15	Unknown	No			5	5	1
Exposed Pipe	144201	06/12/2003	Exposed Along Bottom of Bridge	Metal	8	30	Unknown	No			5	2	1

CORSICA RIVER WATERSHED
SCA SURVEY RESULTS

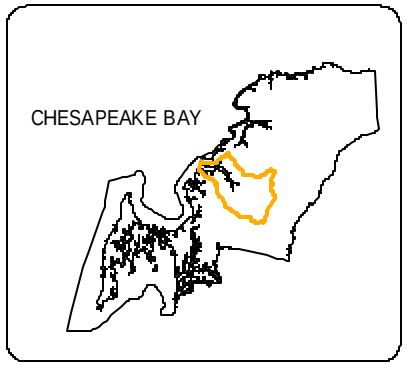
Figure 9d
EROSION SITES

021103

160102

138202

QUEEN ANNE'S COUNTY
MARYLAND



Erosion Sites

- # Very Severe
- Severe
- 3 Moderate
- \+ Low Severity
- S Minor
- Roads
- Streams
- Watershed Boundary

N

1 0 1 Miles

Table 3d - Erosion Sites

Problem	Site	Date	Type	Possible Cause	Length(ft)	Height(ft)	Landuseright	Landuseleft	Infrastructure Threatened?	Describe	Severity	Correctability	Access
Erosion Site	021103	06/25/2003	Widening	Natural	1037	4	Forest	Forest	No		1	2	2
Erosion Site	138202	06/09/2003	Widening	Below Channelization	7230	4	Forest	Forest	No		1	5	4
Erosion Site	160102	06/03/2003	Widening	Below Road Crossing	3430	4	Crop Field	Forest	No		1	4	2
Erosion Site	061101	06/24/2003	Widening	Bend at Steep Slope	4380	1	Forest	Forest	No		2	2	4
Erosion Site	066203	07/07/2003	Downcutting	Bend at Steep Slope	1000	1.5	Forest	Forest	No		2	2	4
Erosion Site	091203	06/24/2003	Downcutting	Bend at Steep Slope	3200	1	Forest	Forest	No		2	2	2
Erosion Site	098104	05/12/2003	Widening	Bend at Steep Slope	1720	2	Forest	Forest	No		2	3	4
Erosion Site	109102	05/27/2003	Widening	Land Use Change Upstream	1720	3	Forest	Forest	No		2	4	3
Erosion Site	109203	06/03/2003	Widening	Bend at Steep Slope	1480	2	Forest	Forest	No		2	3	2
Erosion Site	110101	05/27/2003	Widening	Bend at Steep Slope	1390	1	Forest	Forest	No		2	2	3
Erosion Site	110201	06/03/2003	Widening	Bend at Steep Slope	3080	2	Forest	Forest	No		2	3	4
Erosion Site	118101	06/24/2003	Widening	Natural	2060	2.5	Lawn	Forest	No		2	2	2
Erosion Site	124201	06/09/2003	Widening	Bend at Steep Slope	2280	2	Forest	Forest	No		2	4	3
Erosion Site	138101	06/11/2003	Widening	Bend at Steep Slope	1725	3	Crop Field	Crop Field	No		2	3	3
Erosion Site	143202	06/17/2003	Widening	Below Road Crossing	4600	3	Forest	Forest	No		2	5	1
Erosion Site	146103	06/03/2003	Widening	Bend at Steep Slope	3060	2	Forest	Forest	No		2	3	4
Erosion Site	149201	06/09/2003	Widening	Land Use Change Upstream	1715	1	Forest	Forest	No		2	2	4
Erosion Site	156203	06/17/2003	Widening	Below Road Crossing	1630	2	Pasture	Pasture	No		2	2	2
Erosion Site	195201	06/17/2003	Widening	Below Road Crossing	1000	1	Forest	Forest	No		2	3	3
Erosion Site	195205	06/17/2003	Widening	Below Road Crossing	3700	1	Forest	Forest	No		2	3	4
Erosion Site	054102	07/01/2003	Widening	Bend at Steep Slope	470	4	Crop Field	Crop Field	No		3	2	3
Erosion Site	054103	07/01/2003	Widening	Bend at Steep Slope	300	4	Crop Field	Crop Field	No		3	3	3
Erosion Site	054104	07/01/2003	Widening	Bend at Steep Slope	475	4	Crop Field	Crop Field	No		3	3	3
Erosion Site	066202	07/01/2003	Downcutting	Bend at Steep Slope	700	4	Forest	Forest	No		3	3	3
Erosion Site	133101	06/03/2003	Widening	Bend at Steep Slope	375	5	Forest	Forest	No		3	4	2
Erosion Site	134105	06/03/2003	Widening	Bend at Steep Slope	570	4	Forest	Forest	No		3	4	2
Erosion Site	150101	06/11/2003	Widening	Bend at Steep Slope	480	4	Crop Field	Crop Field	No		3	3	3
Erosion Site	005102	06/25/2003	Widening	Bend at Steep Slope	900	3	Forest	Forest	No		4	2	2

Table 3d - Erosion Sites

Problem	Site	Date	Type	Possible Cause	Length(ft)	Height(ft)	Landuseright	Landuseleft	Infrastructure Threatened?	Describe	Severity	Correctability	Access
Erosion Site	005104	06/25/2003	Widening	Bend at Steep Slope	100	6	Forest	Forest	No		4	2	2
Erosion Site	021102	06/25/2003	Widening	Bend at Steep Slope	15	5	Forest	Forest	No		4	2	2
Erosion Site	053201	07/01/2003	Downcutting	Below Road Crossing	620	2	Crop Field	Forest	No		4	2	3
Erosion Site	054106	07/01/2003	Widening	Bend at Steep Slope	260	5	Crop Field	Crop Field	No		4	3	3
Erosion Site	085105	05/12/2003	Widening	Unknown	400	3	Crop Field	Crop Field	No		4	3	3
Erosion Site	096212	06/03/2003	Widening	Bend at Steep Slope	770	3	Forest	Forest	No		4	3	3
Erosion Site	099101	06/09/2003	Widening	Bend at Steep Slope	75	12	Crop Field	Forest	No		4	3	2
Erosion Site	099103	06/09/2003	Widening	Bend at Steep Slope	50	5	Crop Field	Forest	No		4	2	2
Erosion Site	099105	06/09/2003	Widening	Bend at Steep Slope	20	4	Crop Field	Forest	No		4	1	2
Erosion Site	099106	06/25/2003	Widening	Bend at Steep Slope	25	4	Forest	Forest	No		4	2	2
Erosion Site	105202	06/24/2003	Widening	Bend at Steep Slope	800	2	Forest	Lawn	No		4	2	2
Erosion Site	109202	06/03/2003	Widening	Bend at Steep Slope	310	2	Forest	Forest	No		4	1	5
Erosion Site	111101	06/09/2003	Widening	Bend at Steep Slope	50	5	Pasture	Forest	No		4	2	3
Erosion Site	111103	06/09/2003	Widening	Bend at Steep Slope	50	10	Crop Field	Forest	No		4	2	3
Erosion Site	118105	06/24/2003	Widening	Bend at Steep Slope	20	5	Forest	Forest	No		4	4	4
Erosion Site	121101	05/28/2003	Widening	Land Use Change Upstream	600	3	Pasture	Pasture	No		4	3	2
Erosion Site	129101	06/24/2003	Widening	Natural	430	2	Pasture	Crop Field	No		4	2	1
Erosion Site	134103	06/03/2003	Widening	Natural	500	2	Forest	Forest	No		4	3	2
Erosion Site	144102	06/17/2003	Widening	Bend at Steep Slope	45	5	Crop Field	Crop Field	No		4	2	3
Erosion Site	158201	06/12/2003	Downcutting	Bend at Steep Slope	500	1	Forest	Forest	No		4	1	3
Erosion Site	170102	06/17/2003	Widening	Natural	545	2	Crop Field	Crop Field	No		4	3	3
Erosion Site	182101	06/17/2003	Widening	Bend at Steep Slope	550	3	Crop Field	Crop Field	No		4	3	3
Erosion Site	198201	06/11/2003	Widening	Bend at Steep Slope	500	1	Forest	Forest	No		4	2	2
Erosion Site	207203	06/17/2003	Widening	Below Road Crossing	560	1	Forest	Forest	No		4	2	2
Erosion Site	091201	06/24/2003	Downcutting	Bend at Steep Slope	140	2	Forest	Forest	No		5	2	3
Erosion Site	098103	05/12/2003	Headcutting	Instream Debris	120	3	Crop Field	Crop Field	No		5	1	3
Erosion Site	138106	06/11/2003	Widening	Bend at Steep Slope	290	3	Crop Field	Crop Field	No		5	3	2
Erosion Site	139107	06/11/2003	Widening	Natural	30	3	Crop Field	Crop Field	No		5	2	2

Table 3d - Erosion Sites

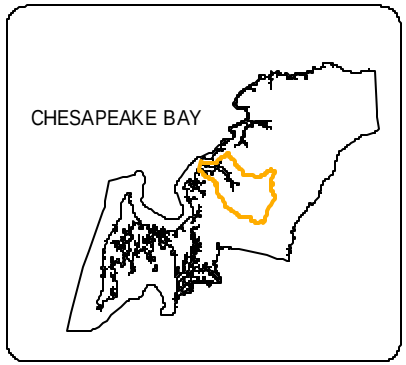
Problem	Site	Date	Type	Possible Cause	Length(ft)	Height(ft)	Landuseright	Landuseleft	Infrastructure Threatened?	Describe	Severity	Correctability	Access
Erosion Site	163101	06/11/2003	Widening	Natural	230	3	Crop Field	Crop Field	No		5	3	3
Erosion Site	017002	10/6/2003									4	1	3
Erosion Site	027001	10/6/2003									4		3
Erosion Site	036001	10/6/2003									5		3
Erosion Site	036003	10/6/2003									5	3	4
Erosion Site	038002	10/6/2003									3	3	3
Erosion Site	048001	10/6/2003									4	4	3
Erosion Site	049002	10/6/2003									2	4	3

121122

CORSICA RIVER WATERSHED
SCA SURVEY RESULTS

Figure 9e
FISH BARRIERS

QUEEN ANNE'S COUNTY
MARYLAND



Fish Barriers

- # Very Severe
- ´ Severe
- 3 Moderate
- \+ Low Severity
- S Minor

Roads
Streams
Watershed Boundary

N

1 0 1 Miles

Table 3e - Fish Barriers

Problem	Site	Date	Blockage	Type	Reason	Drop(ln)		Depth(ln)	Severity	Correctability	Access
Fish Barrier	147102	06/03/2003	Temporary	Natural Falls	Too High	8		5	1	3	
Fish Barrier	139108	06/11/2003	Temporary	Natural Falls	Too High	2		5	2	3	
Fish Barrier	121123	05/28/2003	Temporary	Beaver Dam	Too High	3		5	1	2	
Fish Barrier	111201	06/09/2003	Partial	Natural Falls	Too High	3		5	2	2	
Fish Barrier	079201	06/24/2003	Temporary	Natural Falls	Too High	4		5	2	3	
Fish Barrier	124205	06/09/2003	Temporary	Natural Falls	Too High	4		5	1	3	
Fish Barrier	125202	06/09/2003	Partial	Natural Falls	Too High	5		5	2	2	
Fish Barrier	096204	06/03/2003	Temporary	Natural Falls	Too High	6		5	1	2	
Fish Barrier	111203	06/09/2003	Temporary	Natural Falls	Too High	6		5	1	4	
Fish Barrier	139101	06/11/2003	Temporary	Natural Falls	Too High	6		5	1	2	
Fish Barrier	054101	07/01/2003	Total	Road Crossing	Too High	6		4	4	2	
Fish Barrier	090101	06/24/2003	Total	Road Crossing	Too High	6		4	2	1	
Fish Barrier	171201	06/12/2003	Temporary	Beaver Dam	Too High	8		5	2	4	
Fish Barrier	124203	06/09/2003	Temporary	Natural Falls	Too High	8		5	5	3	
Fish Barrier	182103	06/17/2003	Temporary	Natural Falls	Too High	8		5	2	3	
Fish Barrier	092201	06/24/2003	Total	Natural Falls	Too High	8		5	3	4	
Fish Barrier	137202	06/09/2003	Total	Road Crossing	Too High	8		3	3	1	
Fish Barrier	105204	06/24/2003	Total	Road Crossing	Too High	10		4	3	1	
Fish Barrier	110104	05/27/2003	Temporary	Beaver Dam	Too High	12		4	2	5	
Fish Barrier	121125	05/28/2003	Temporary	Beaver Dam	Too High	12		4	4	3	
Fish Barrier	088101	06/09/2003	Temporary	Natural Falls	Too High	12		5	2	3	
Fish Barrier	150108	06/11/2003	Temporary	Natural Falls	Too High	12		5	1	2	
Fish Barrier	163102	06/11/2003	Temporary	Natural Falls	Too High	12		5	3	3	
Fish Barrier	109205	06/03/2003	Total	Natural Falls	Too High	12		5	2	3	
Fish Barrier	195203	06/17/2003	Total	Natural Falls	Too High	12		5	3	4	
Fish Barrier	158203	06/12/2003	Total	Pipe Crossing	Too High	12		4	4	3	
Fish Barrier	054105	07/01/2003	Total	Road Crossing	Too High	12		4	5	1	
Fish Barrier	104201	06/24/2003	Total	Road Crossing	Too High	12		4	4	2	
Fish Barrier	207202	06/17/2003	Total	Road Crossing	Too High	12		4	4	2	
Fish Barrier	139104	06/11/2003	Total	Instream Pond	Too High	18		5	3	2	
Fish Barrier	144105	06/17/2003	Partial	Natural Falls	Too High	18		5	2	2	

Table 3e - Fish Barriers

Problem	Site	Date	Blockage	Type	Reason	Drop(ft)	Depth(ft)	Severity	Correctability	Access
Fish Barrier	186201	06/11/2003	Temporary	Natural Falls	Too High	18		5	5	1
Fish Barrier	143201	06/17/2003	Total	Road Crossing	Too High	18		4	4	1
Fish Barrier	109206	06/03/2003	Total	Beaver Dam	Too High	24		5	1	3
Fish Barrier	144107	06/17/2003	Partial	Natural Falls	Too High	24		5	3	2
Fish Barrier	040102	07/01/2003	Total	Natural Falls	Too High	24		5	3	3
Fish Barrier	182109	06/17/2003	Total	Road Crossing	Too High	24		4	4	1
Fish Barrier	066201	07/01/2003	Total	Natural Falls	Too High	30		5	1	2
Fish Barrier	215101	06/12/2003	Total	Instream Pond	Too High	36		4	4	2
Fish Barrier	053202	07/01/2003	Total	Road Crossing	Too High	36		4	4	1
Fish Barrier	139105	06/11/2003	Total	Instream Pond	Too High	36		4	4	2
Fish Barrier	156202	06/17/2003	Total	Road Crossing	Too High	48		4	4	2
Fish Barrier	121122	05/28/2003	Total	Dam	Too High	60		1	5	1
Fish Barrier	194105	06/17/2003	Total	Instream Pond	Too High	60		4	5	2
Fish Barrier	208101	06/17/2003	Total	Instream Pond	Too High	60		4	5	2
Fish Barrier	234101	06/12/2003	Total	Instream Pond	Too High	60		4	5	2
Fish Barrier	085101	05/12/2003	Total	Instream Pond	Too High	120		5	5	2
Fish Barrier	096208	06/03/2003	Total	Pipe Crossing	Too High	144		4	5	3
Fish Barrier	207205	06/17/2003	Total	Channelized	Too Shallow		0.5	4	5	1
Fish Barrier	005103	06/25/2003	Temporary	Natural Falls	Too High	24		5	2	3
Fish Barrier	129102	06/24/2003	Temporary	Natural Falls	Too High	24		5	2	2
Fish Barrier	005101	06/24/2003	Partial	Pipe Crossing	Too Shallow		1	4	2	1

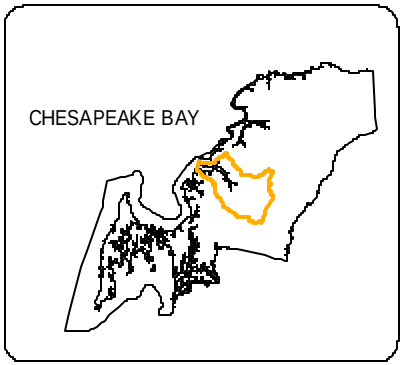
CORSICA RIVER WATERSHED
SCA SURVEY RESULTS

Figure 9f
INADEQUATE BUFFERS

128101

193103

QUEEN ANNE'S COUNTY
MARYLAND



Inadequate Buffers

- # **Very Severe**
- ´ **Severe**
- 3 **Moderate**
- \+ **Low Severity**
- S **Minor**

Roads
Streams
Watershed Boundary

N

1 0 1 Miles

Table 3f - Inadequate Buffers

Problem	Site	Date	Sides	Unshaded	WidthLeft(ft)	WidthRight(ft)	LengthLeft(ft)	LengthRight(ft)	LandUseLeft	LandUseRight	RecentlyEstablished	Livestock	Livestock Type	Severity	Correctability	Access	Wetland
Inadequate Buffer	229201	06/11/2003	Both	Both	10	10	2165	2165	Crop Field	Crop Field	No	No		2	3	1	4
Inadequate Buffer	073102	06/24/2003	Both	Both	2	2	670	670	Crop Field	Crop Field	No	No		4	2	2	5
Inadequate Buffer	085103	05/12/2003	Both	Neither	20	20	770	770	Shrubs & Small Trees	Shrubs & Small Trees	Yes	No		4	2	3	2
Inadequate Buffer	090102	06/24/2003	Both	Neither	5	5	1350	1350	Crop Field	Crop Field	No	No		2	3	2	5
Inadequate Buffer	096201	06/03/2003	Right	Neither		10		115	Forest	Lawn	No	No		5	2	2	5
Inadequate Buffer	096205	06/03/2003	Left	Left	20		110		Lawn	Forest	No	No		5	2	3	3
Inadequate Buffer	097202	06/03/2003	Right	Neither		10		70	Forest	Construction Site	No	No		5	2	4	5
Inadequate Buffer	098102	05/12/2003	Right	Neither		15		860	Forest	Crop Field	No	No		4	2	3	3
Inadequate Buffer	110102	05/27/2003	Right	Neither		15		300	Forest	Crop Field	No	No		5	1	4	4
Inadequate Buffer	111102	06/09/2003	Left	Neither	30		115		Crop Field	Forest	No	No		5	3	3	4
Inadequate Buffer	113101	06/25/2003	Both	Both	15	0	180	180	Crop Field	Lawn	No	No		5	2	1	5
Inadequate Buffer	117201	06/24/2003	Both	Both	2	2	1175	1175	Crop Field	Crop Field	No	No		2	3	2	5
Inadequate Buffer	121102	05/28/2003	Both	Both	10	10	980	400	Pasture	Pasture	No	No		4	4	2	4
Inadequate Buffer	121124	05/28/2003	Right	Neither		10		270	Forest	Lawn	No	No		4	1	2	5
Inadequate Buffer	124206	06/09/2003	Both	Neither	20	20	300	300	Crop Field	Crop Field	No	No		5	2	2	4
Inadequate Buffer	128101	06/11/2003	Both	Both	0	0	1615	1615	Crop Field	Crop Field	No	No		1	4	2	2
Inadequate Buffer	130102	06/24/2003	Both	Both	3	7	1000	1000	Crop Field	Crop Field	No	No		2	2	2	5
Inadequate Buffer	138109	06/11/2003	Both	Both	0	0	150	150	Crop Field	Crop Field	No	No		5	3	2	4
Inadequate Buffer	139103	06/11/2003	Right	Neither		15		260	Crop Field	Crop Field	No	No		5	2	2	3
Inadequate Buffer	143203	06/17/2003	Both	Neither	10	10	340	340	Lawn	Lawn	No	No		4	3	1	3
Inadequate Buffer	144103	06/17/2003	Right	Neither		15		130	Crop Field	Lawn	No	No		5	3	2	3
Inadequate Buffer	144203	06/12/2003	Both	Both	10	10	350	350	Shrubs & Small Trees	Shrubs & Small Trees	No	No		4	2	1	4
Inadequate Buffer	146101	06/03/2003	Left	Left	0		140		Railroad Track	Forest	No	No		4	4	2	5
Inadequate Buffer	149205	06/09/2003	Both	Neither	6	6	850	850	Crop Field	Crop Field	No	No		2	3	2	4
Inadequate Buffer	156201	06/17/2003	Both	Neither	3	3	870	870	Pasture	Pasture	No	No		2	3	1	3
Inadequate Buffer	158204	06/12/2003	Both	Neither	15	15	850	850	Crop Field	Crop Field	No	No		5	3	3	4
Inadequate Buffer	182104	06/17/2003	Right	Right		0		75	Crop Field	Crop Field	No	No		5	3	2	4
Inadequate Buffer	182106	06/17/2003	Both	Both	0	0	85	90	Lawn	Lawn	No	No		5	3	2	3
Inadequate Buffer	193103	06/17/2003	Both	Both	0	0	1575	1575	Crop Field	Crop Field	No	No		1	3	2	2

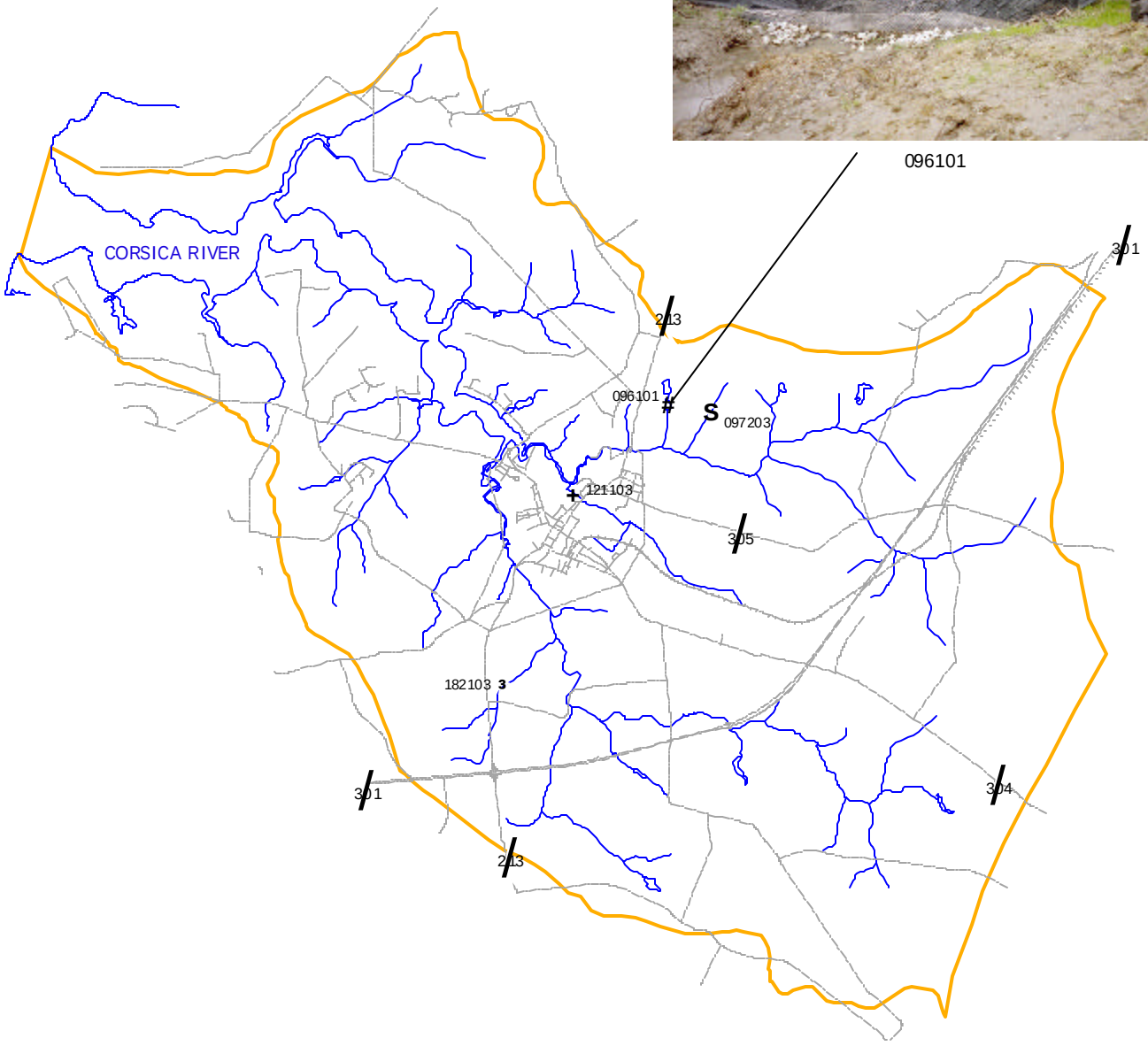
Table 3f - Inadequate Buffers

Problem	Site	Date	Sides	Unshaded	WidthLeft(ft)	WidthRight(ft)	LengthLeft(ft)	LengthRight(ft)	LandUseLeft	LandUseRight	RecentlyEstablished	Livestock	Livestock Type	Severity	Correctability	Access	Wetland
Inadequate Buffer	194103	03/17/2003	Both	Neither	20	30	105	105	Crop Field	Crop Field	No	No		5	3	2	2
Inadequate Buffer	199203	06/11/2003	Both	Both	10	10	1220	1220	Crop Field	Crop Field	No	No		2	3	3	4
Inadequate Buffer	207204	06/17/2003	Right	Neither		10		975	Forest	Crop Field	No	No		3	3	2	3
Inadequate Buffer	215102	06/12/2003	Both	Both	0	0	785	785	Crop Field	Pasture	No	Yes	Horses	3	3	2	3
Inadequate Buffer	217201	06/17/2003	Both	Both	1	1	1050	1050	Crop Field	Crop Field	No	No		2	3	1	3
Inadequate buffer	016002	10/6/2003												1	2	3	3
Inadequate buffer	017001	10/6/2003												2	1	3	1
Inadequate buffer	027002	10/6/2003												4	1	3	3
Inadequate buffer	028001	10/6/2003												4	2	3	1
Inadequate buffer	028002	10/6/2003												4	1	3	1
Inadequate buffer	029004	10/6/2003												2	1	2	1
Inadequate buffer	034002	10/6/2003												2	2	3	3
Inadequate buffer	036004	10/6/2003												3	3	2	2
Inadequate buffer	037001	10/6/2003												4	1	2	2
Inadequate buffer	038002	10/6/2003												3	1	2	2
Inadequate buffer	039002	10/6/2003												2	2	3	2
Inadequate buffer	047003	10/6/2003												1			
Inadequate buffer	064001	10/6/2003												4	2	2	3
Inadequate buffer	064006	10/6/2003												4	1	2	4
Inadequate buffer	080002	10/6/2003												4	2	2	3
Inadequate buffer	093002	10/6/2003												4	1	2	3
Inadequate buffer	094001	10/6/2003												2	2	2	2
Inadequate buffer	094003	10/6/2003												2	2	2	2
Inadequate buffer	107001	10/6/2003												3	4	1	2
Inadequate buffer	107003	10/6/2003												1	1	2	3

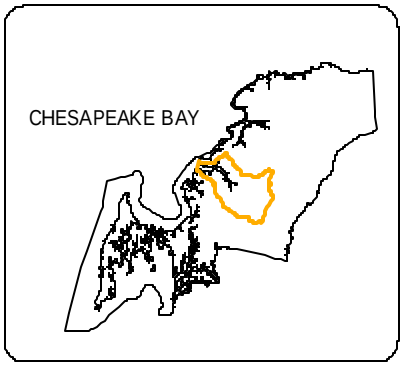
CORSICA RIVER WATERSHED
SCA SURVEY RESULTS

Figure 9g
IN/NEAR STREAM CONSTRUCTION

096101



QUEEN ANNE'S COUNTY
MARYLAND



In/Near Stream Construction

- # **Very Severe**
- ´ **Severe**
- 3 **Moderate**
- \+ **Low Severity**
- S **Minor**

Roads
Streams
Watershed Boundary

N

1 0 1 Miles

Table 3g - In/Near Stream Construction

Problem	Site	Date	Type of Activity	Sediment Control	Why, if inadequate	Excess Sediment?	Length	Company	Location	Severity
In/Near Stream Construction	096101	05/27/2003	Development	Adequate		Yes	1700	Inc.	Head of Tributary off Three Bridges Branch	1
In/Near Stream Construction	097203	06/03/2003	Development	Adequate		No	1800	Barkers	Tributary of Three Bridges Branch	5
In/Near Stream Construction	121103	05/28/2003	Development	Adequate		No	500	Unknown	Gravel Run under 213 Dam	4
In/Near Stream Construction	182105	06/17/2003	Logging	Inadequate	Present	Yes	150	Unknown		3

CORSICA RIVER WATERSHED SCA SURVEY RESULTS

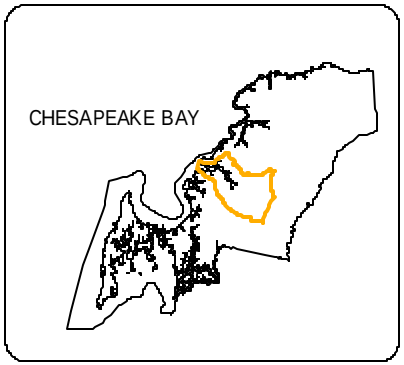
Figure 9h
PIPE OUTFALL

096211

121104

121106

QUEEN ANNE'S COUNTY
MARYLAND



Pipe Outfalls

- # **Very Severe**
- ´ **Severe**
- ³ **Moderate**
- \+ **Low Severity**
- S **Minor**

Roads

Streams

Watershed Boundary

N

1 0 1 Miles

Table 3h - Pipe Outfalls

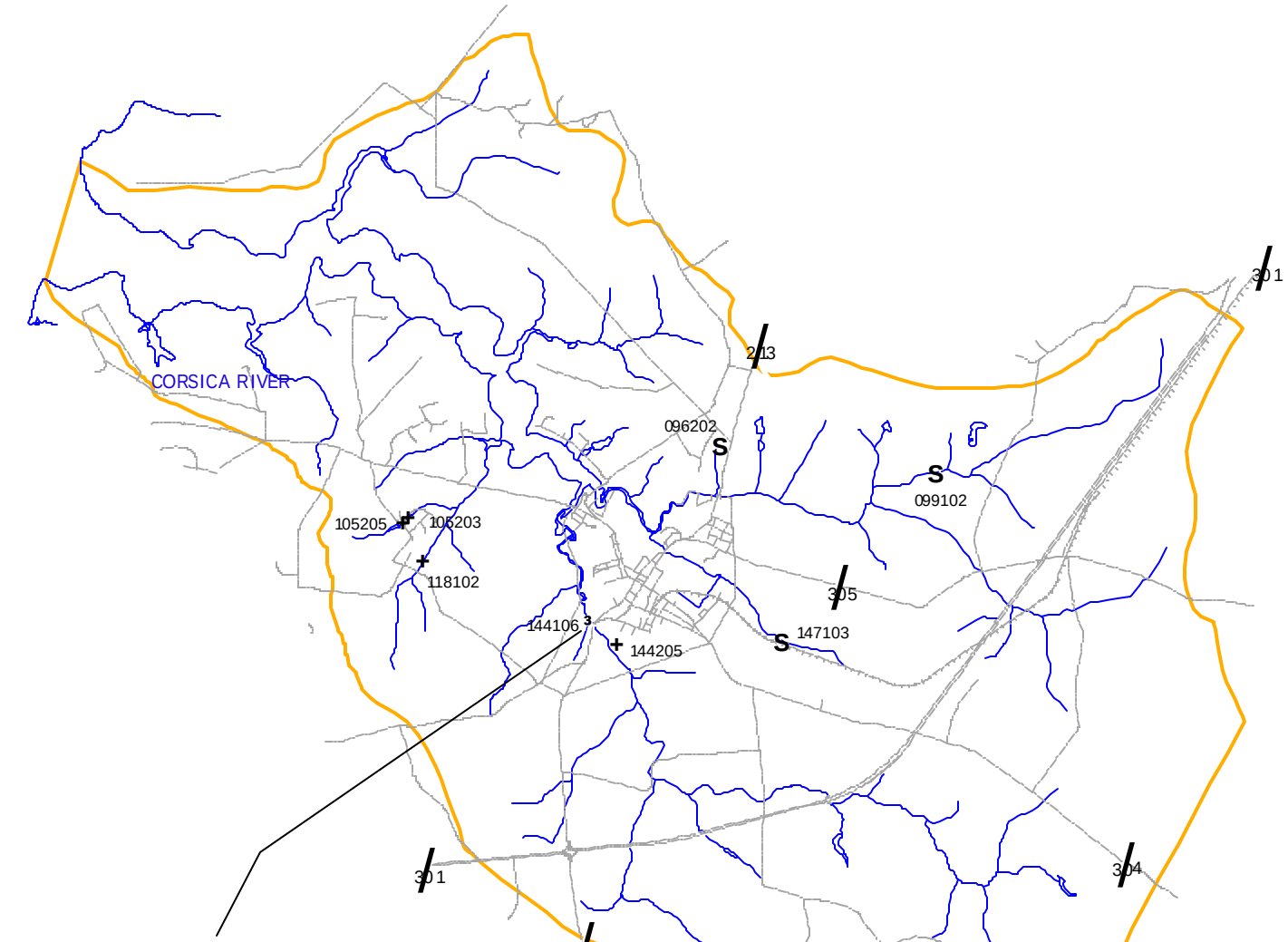
Problem	Site	Date	Outfall Type	Pipe Type	Location of Pipe	Diameter (in)	Channel Width	Purpose	Discharge	Color	Odor	Severity	Correctability	Access
Pipe Outfall	040101	07/01/2003	unknown	Concrete Channel	Left Bank	12	0	Unknown	No			5	-1	-1
Pipe Outfall	121109	05/28/2003	Stormwater	Concrete Channel	Left Bank	0	6	Stormwater	Yes	Clear	None	4	5	1
Pipe Outfall	121110	05/28/2003	Stormwater	Concrete Channel	Left Bank	24	0	Stormwater	Yes	Clear	None	4	5	1
Pipe Outfall	121114	05/28/2003	Stormwater	Concrete Channel	Left Bank	0	2	Stormwater	No			5	5	1
Pipe Outfall	130101	06/24/2003	Agricultural	Concrete Channel	Right Bank	36	3	Stormwater	Yes	Clear	None	4	2	2
Pipe Outfall	138102	06/11/2003	Stormwater	Concrete Channel	Right Bank	0	3	Stormwater	No			5	3	1
Pipe Outfall	140101	06/11/2003	Stormwater	Concrete Channel	Left Bank	18	2	Stormwater	Yes	Clear	None	4	2	1
Pipe Outfall	150104	06/11/2003	Stormwater	Concrete Channel	Right Bank	24	3	Stormwater	No			4	3	2
Pipe Outfall	194106	06/17/2003	Stormwater	Concrete Channel	Right Bank	36	4	Stormwater	No			5	3	2
Pipe Outfall	206101	06/12/2003	Agricultural	Concrete Channel	Left Bank	8	0	Unknown	Yes	Clear	None	3	2	2
Pipe Outfall	207208	06/17/2003	Stormwater	Concrete Channel	Left Bank	0	4	Stormwater	Yes	Clear	None	4	2	1
Pipe Outfall	096209	06/03/2003	Stormwater	Concrete Pipe	Left Bank	8	0	Stormwater	No			5	5	3
Pipe Outfall	121111	05/28/2003	Stormwater	Concrete Pipe	both sides	4	0	Stormwater	Yes	Medium Brown	None	2	5	1
Pipe Outfall	160101	06/03/2003	Stormwater	Concrete Pipe	Stream	18	3	Stormwater	Yes	Clear	None	4	3	2
Pipe Outfall	160103	06/03/2003	Stormwater	Concrete Pipe	Left Bank	18	2	Stormwater	No			5	3	2
Pipe Outfall	096203	06/03/2003	Stormwater	Corrugated Metal	Left Bank	18	0	Stormwater	No			5	4	2
Pipe Outfall	096207	06/03/2003	Dam Outfall	Corrugated Metal	Stream	18	0	Dam Outfall	Yes	Clear	None	3	5	3
Pipe Outfall	100102	06/09/2003	Stormwater	Corrugated Metal	Left Bank	36	10	Stormwater	No			5	5	1
Pipe Outfall	100103	06/09/2003	Stormwater	Corrugated Metal	Left Bank	36	8	Stormwater	No			5	4	2
Pipe Outfall	100105	06/09/2003	Stormwater	Corrugated Metal	Right Bank	18	2	Stormwater	Yes	Clear	None	4	4	2
Pipe Outfall	121106	05/28/2003	Stormwater	Corrugated Metal	Left Bank	18	4	Stormwater	Yes	Medium Brown	Musky	1	5	2
Pipe Outfall	124204	06/09/2003	Stormwater	Corrugated Metal	Right Bank	24	0	Stormwater	Yes	Clear	None	4	5	3
Pipe Outfall	144101	06/17/2003	Unknown	Corrugated Metal	Right Bank	12	3	Unknown	No			5	4	3
Pipe Outfall	182110	06/17/2003	Stormwater	Corrugated Metal	Left Bank	12	1.5	Stormwater	No			5	3	1
Pipe Outfall	196201	06/17/2003	Stormwater	Corrugated Metal	Left Bank	18	3	Stormwater	Yes	Clear	None	4	3	1
Pipe Outfall	206107	06/12/2003	Stormwater	Corrugated Metal	Left Bank	16	0	Stormwater	Yes	Clear	None	4	5	2
Pipe Outfall	207206	06/17/2003	Stormwater	Corrugated Metal	Left Bank	18		Stormwater	No			5	1	1
Pipe Outfall	234102	06/12/2003	Agricultural	Corrugated Metal	Left Bank	8	2	Drainage-Crop	Yes	Clear	None	3	3	3
Pipe Outfall	091202	06/24/2003	Stormwater	Earth Channel	Left Bank	0	1	Stormwater	No			5	2	1
Pipe Outfall	182111	06/17/2003	Stormwater	Earth Channel	Right Bank	0	1.5	Stormwater	No			5	2	1
Pipe Outfall	206108	06/12/2003	Stormwater	Earth Channel	Right Bank	0	4	Stormwater	Yes	Clear	None	4	3	2
Pipe Outfall	096210	06/03/2003	Stormwater	Plastic	Right Bank	18	0	Stormwater	Yes	Clear	None	4	5	3
Pipe Outfall	096211	06/03/2003	unknown	Plastic	Right Bank	6	2	Unknown	Yes	Medium Brown	None	1	5	3
Pipe Outfall	111202	06/09/2003	Stormwater	Plastic	Right Bank	36	1	Stormwater	Yes	Clear	None	4	3	2
Pipe Outfall	121116	05/28/2003	Stormwater	Plastic	Both Sides	4	0	Stormwater	Yes	Medium Brown	None	3	5	1

Table 3h - Pipe Outfalls

Problem	Site	Date	Outfall Type	Pipe Type	Location of Pipe	Diameter (in)	Channel Width	Purpose	Discharge	Color	Odor	Severity	Correctability	Access
Pipe Outfall	121117	05/28/2003	Stormwater	Plastic	Right Bank	18	0	Stormwater	Yes	Clear	None	4	5	1
Pipe Outfall	143204	06/17/2003	Unknown	Plastic	Left Bank	4	0	Unknown	Yes	Clear	None	3	2	1
Pipe Outfall	144204	06/12/2003	Restaurant	Plastic	Left Bank	1	0	Unknown	No			5	1	1
Pipe Outfall	149206	06/09/2003	Stormwater	Plastic	Left Bank	8	1	Stormwater	Yes	Clear	None	4	3	2
Pipe Outfall	170101	06/17/2003	Stormwater	Plastic	Left Bank	36	8	Sewage	Yes	Clear	None	4	5	3
Pipe Outfall	206106	06/12/2003	Stormwater	Plastic	Above Stream	12	0	Stormwater	Yes	Clear	None	4	5	2
Pipe Outfall	121104	05/28/2003	Sewage Overflow	Pipe	Left Bank	12	0	Sewage	No			1	5	2
Pipe Outfall	121115	05/28/2003	Stormwater	Pipe	Left Bank	18	0	Stormwater	No			5	5	1
Pipe Outfall	121119	05/28/2003	Pumping Station	Pipe	Left Bank	6	0	Stormwater	Yes	Clear	None	4	5	1
Pipe Outfall	121120	05/28/2003	Dam Outfall	Pipe	Stream	8	0	Dam Outfall	Yes	Clear	None	3	5	1
Pipe Outfall	121121	05/28/2003	Dam Outfalls	Pipe	Stream	12	0	Dam Outfall	Yes	Clear	None	3	5	1
Pipe Outfall	138103	06/11/2003	Stormwater	Pipe	Right Bank	4	0	Stormwater	No			5	3	1
Pipe Outfall	138104	06/11/2003	Stormwater	Pipe	Left Bank	5	0	Stormwater	No			5	3	1
Pipe Outfall	138105	06/11/2003	Stormwater	Pipe	Left Bank	5	0	Water Supply	Yes	Clear	None	4	3	1
Pipe Outfall	206103	06/12/2003	Stormwater	Pipe	Left Bank	6	0	Stormwater	Yes	Clear	None	4	5	2
Pipe Outfall	206104	06/12/2003	Stormwater	Pipe	Left Bank	6	0	Stormwater	Yes	Clear	None	4	5	2
Pipe Outfall	207201	06/17/2003	Agricultural	Pipe	Right Bank	12	0	Water Supply	No			5	1	2
Pipe Outfall	207207	06/17/2003	Stormwater	Pipe	Left Bank	4	0	Stormwater	Yes	Medium Brown	None	3	2	1
Pipe Outfall	144202	06/12/2003	Stormwater	Terra Cotta	Left Bank	18	0	Stormwater	No			5	1	1
Pipe Outfall	182102	06/17/2003	Unknown	Terra Cotta	Left Bank	6	0	Unknown	Yes	Clear	None	3	3	3
Pipe Outfall	134104	06/03/2003	Stormwater	Terra Cotta	Left Bank	6	10	Stormwater	Yes	Clear	None	4	2	2

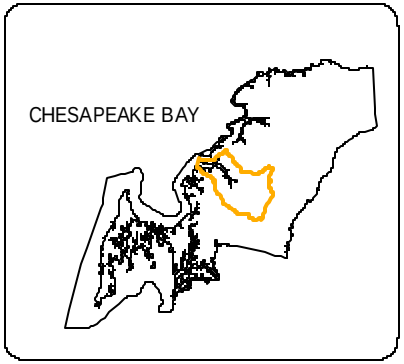
CORSICA RIVER WATERSHED
SCA SURVEY RESULTS

Figure 9i
TRASH DUMPING



144106

QUEEN ANNE'S COUNTY
MARYLAND



Trash Dumping

- # Very Severe
- ´ Severe
- 3 Moderate
- \+ Low Severity
- S Minor
- Roads
- Streams
- Watershed Boundary

N

1 0 1 Miles

Table 3i - Trash Dumping

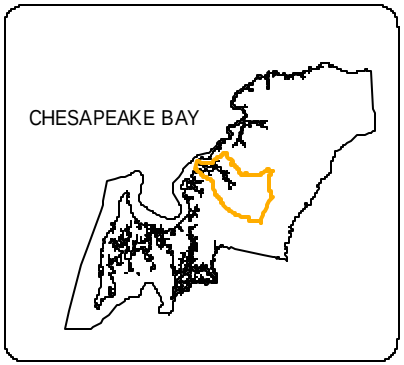
Problem	Site	Date	Type	Truckloads	Other measure	Extent	Volunteer Project?	Owner Type		Owner Name	Severity	Correctability	Access
Trash Dumping	144106	06/17/2003	Cars/Buses	30	40-50 Cars, junkyard	Large Area	No	Private		3	4	2	
Trash Dumping	105203	06/24/2003	Residential	1		Single Site	Yes	Private		4	1	2	
Trash Dumping	105205	06/24/2003	Industrial	2		Single Site	No	Unknown		4	2	2	
Trash Dumping	118102	06/24/2003	Residential	1		Single Site	Yes	Private		4	2	2	
Trash Dumping	144205	06/12/2003	Tires	3		Single Site	No	Unknown		4	4	3	
Trash Dumping	096202	06/03/2003	Construction	3		Large Area	Yes	Unknown		5	2	2	
Trash Dumping	099102	06/09/2003	Lumber/Building Materials	1		Single Site	Yes	Private		5	1	3	
Trash Dumping	147103	06/03/2003	Lumber	1		Single Site	Yes	Private		5	3	3	

CORSICA RIVER WATERSHED SCA SURVEY RESULTS

Figure 9j UNUSUAL CONDITIONS / COMMENTS

121107

QUEEN ANNE'S COUNTY
MARYLAND



Unusual Conditions/Comments

- $ Comment
- # Very Severe
- ´ Severe
- ³ Moderate
- \+ Low Severity
- S Minor
- Roads
- Streams
- Watershed Boundary

N

1 0 1 Miles

Table 3j - Unusual Conditions

Problem	Site	Date	Type	Description	Potential Cause	Severity	Correctability	Access
Unusual Condition	121107	05/28/2003	Abnormal Seep From Bank	Musky Smelling Seep 3ft long, 10 inches side	Land Use Change Upstream	2	2	2
Unusual Condition	085102	05/12/2003	Red Flock	Red Flock In Stream below instream pond	utrification in pond	3	3	2
Unusual Condition	134106	06/03/2003	Red Flock	Excessive Red Flock Present	Iron Oxides	3	3	2
Unusual Condition	139106	06/11/2003	Channel Discharging into Stream	Dark Brown Discharge in Channel entering stream	Unknown	3	3	2
Unusual Condition	143206	06/17/2003	Orange Substance Leaking from Bank	Orange Substance leaking from bank in many different places along section of bank	Runoff from field	3	4	3
Unusual Condition	098105	05/12/2003	Black Organic Material	Stream has large amount of black organic material present		4	3	3
Unusual Condition	109101	05/27/2003	Excessive Sediment	Whole Tributary w/excessive sediment from upstream construction	Upstream Construction	4	4	3
Unusual Condition	134101	06/03/2003	Red Flock	Discharge from Bank	Runoff	4	3	2
Unusual Condition	150106	06/11/2003	Water Color/Clarity	Water dark brown/red in color - darkens as you proceed upstream	Runoff	4	2	3
Unusual Condition	220201	06/11/2003	Red Flock		Field Drainage	4	4	1
Unusual Condition	118104	06/24/2003	Scum	Orange Scum Washing into Stream	Farm	5	3	3
Unusual Condition	038002	10/06/2003	SE Healing over w/ trees and toe protection			0		

TABLE 3k

Summary of Stream Corridor Impairment Remediation Costs Total for Impairment Remediation		
Altered Shorelines	13055 lf @ $215/lf	$2,806825.00 $714,875.00 (sev./mod. Only)
Channel Alterations	6,185/lf @ $65.00/lf	$402,025.00 $60,450.00 (mod. Only)
Exposed Pipes	4 occurrences @ $1,000.00/site	$4,000.00
Erosion Sites	64,312 lf @ $40.00/lf	$2,572,480.00 $467,880.00 (sev./mod. Only)
Fish Barriers	52 occurrences @ $1,500.00/site	$78,000.00 (1 sev. @ Gravel Run Dam $175,00.00)
Inadequate Buffers	54 occurrences (see Implementation Initiatives)	
In-Stream Construction	4 sites @ $0.00/site	Enforcement of approved BMPs
Pipe Outfalls	56 sites @ $3,200.00/site	$179,200.00
Trash Dumping	42 truckloads @ $375.00/load	$15,750.00
Unusual Conditions ("Hot Spots")	12 sites	As needed, per site

*Cost estimates used above are taken from The Technical reference for Maryland's Tributary Strategies October 2002 and from local engineering estimating practices.

Additional Concerns

Particular note is made of certain impairment categories for which the WRAS Steering Committee requests further programmatic protections be provided by the appropriate government entities. These are: channel alterations, construction in or near stream and stream bank erosion sites. Site locations of several large on-going land development projects include, but are not limited to, Northbrook, Symphony Village, Providence Farm (all in the Town of Centreville), and Corsica River Estates, Three Creeks, Hopelands, Claiborne Fields (all in the County). These projects all have approved sediment and erosion control plans in place. Inspection and Maintenance Agreements by the County and MDE relative to those provisions and those for Storm Water Management are in place as well. The Town and its WRAS partners have included specific proposals for increased oversight of these developments and their construction practices within the Watershed. The emphasis on this stems in part from the conclusions in the Corsica River Watershed Characterization which suggest that the disappearance of oysters in the River may have been due to sedimentation and that sedimentation/suspended solids are a listed impairment on Maryland's 303(d) list.

IV. Implementation Strategies and Recommendations

Summary of prioritized findings from all the Methods employed in the WRAS data collection (to ground truth or monitor the Corsica River Watershed condition and move forward with implementation projects) are as follows:

1. **Nutrient Uptake** in the nonpoint source (NPS) contributors is deemed our highest overall priority as agricultural practices contributed 86% of the NPS Nitrogen and 84% of the NPS Phosphorous according to the Watershed Characterization and the MDE TMDL. Many of the farmers in The Corsica River Watershed voluntarily implement management systems that address nutrient run-off and infiltration, erosion and sediment control, and animal waste utilization. All farms in the Maryland Agricultural Land Preservation Fund (MALPF) program have been assessed by USDA-NRCS using the *Resource Inventory for Conservation Planning Field Evaluation* protocol. This assessment and the required nutrient management plans in process throughout the watershed are certainly a start. Best Management Practices (BMPs) identified in the Soil Conservation and Water Quality Plans for implementation on individual farms within the watershed include grassed waterways, riparian herbaceous and riparian forested buffers, conservation cover, cover crops, shallow water wildlife areas and grade stabilization structures. Of the above, while all are important, the WRAS Steering Committee has identified the Cover Crop opportunity as a primary means to improve the nutrient reductions from Agricultural land uses. The funding for the Maryland Cover Crop Program has gone quickly statewide and the WRAS seeks to target additional funding to this program. To that end, the WRAS Committee supports the following initiative:

   CORSICA RIVER COVER CROP – DEMONSTRATION PROGRAM

   Project Area:

   Corsica River Watershed

   Sponsors: Queen Anne's SCD Office
   505 Railroad Avenue, Suite 3
   Centreville, Maryland 21617

   Preamble

   The Queen Anne's Soil Conservation District established a voluntary Winter Cover Crop program in the Corsica River watershed. Targeting in this area is necessary because of WRAS priorities and the Corsica River TMDL focus on nutrient reduction. Maryland's current cover crop program is funding limited and will not meet the goals of the nutrient reduction needed to meet the TMDL.

   The Corsica River Cover Crop Program will contain requirements already familiar to local agricultural producers including: provisions for a limited sign-up period, requirements for a nutrient management plan, no commercial fertilization, program guidelines that establish crop species and planting dates, spot checks by the local SCD staff and a required spring kill down or suppression.

Because cover crop planting dates continue to be an issue, this demonstration will pro-rate cost-share in accordance with nutrient uptake potential, i.e., producers will receive $30/acre for cover crops planted by October 1, 2004 and $15/acre for cover crops planted by November 1, 2004. The Corsica River Cover Crop program will be run by the local Soil Conservation District with administrative assistance provided by the Maryland Department of Agriculture through staffing and will be subject to all of its regulations and procedures.

The Queen Anne's County Cooperative Extension endorses this program as both cost effective and beneficial to the water quality in the Chesapeake Bay. Proposed nitrogen and phosphorus reductions from this practice with 3,000 acres under management are estimated at 21,000 lbs. and 570 lbs. respectively.

This project addresses the goals outlined by the WRAS which call for the restoration of the Corsica River watershed based on a watershed plan and having a direct relationship to a TMDL.

Funding: $90,000
Source of funding: As yet unidentified grants

Project History/Background

The Corsica River, a tributary of the Chester River, is located in Queen Anne's County, Maryland. The Corsica River is approximately 6.5 miles in length. The watershed of the Corsica River has an area of approximately 25,000 acres or 40 square miles. The predominant land use, based on 1994 Maryland Office of Planning information, is agricultural (15,600 acres or 62%). Watersheds, and the implementation of agricultural best management practices (BMPs) makes a significant contribution to nutrient reductions in these watersheds. Implementation of nutrient management plans, new animal waste management systems, conservation tillage, Soil Conservation and Water Quality Plans (SCWQPs) and treatment of lands with high erosion potential all contribute to nutrient reduction. However, further actions are necessary in order to address conditions in watersheds as identified under the Watershed Restoration Plan and the TMDL goals.

Annual cover crops are highly effective in managing nutrients and sediments when planted in the early fall following the harvest of corn, soybeans, vegetables or tobacco. Cover crops reduce the leaching of excess crop nutrients from the root zone and valuable erosion protection.

Cover crops have long been recognized as one of the most effective practices to reduce nitrate leaching losses. As noted in the November 1997 *Blue Ribbon Report, the Citizens Pfiesteria Action Commission* headed by The Honorable Harry Hughes:

> The Commission heard testimony from Dr. Russell B. Brinsfield. He pointed out that nitrate leaching losses occur even when all crop yield goals are met and all best management practices and a nutrient management plan are implemented. Dr. Brinsfield estimates that the utilization of cereal grain cover crops can reduce nitrate leaching losses by 60% following a corn or soybean crop. The Commission strongly encourages the regular use of cover crops as a best management practice.

> The Commission strongly recommends that the State implement a continuing cover crop program designed specifically to limit nitrate leaching and to prevent nutrients from entering the Bay and its tributaries. The Commission anticipates a meaningful level of support of a program designed to meet the specific goal of nutrient reduction. Participants in the program should not be permitted to assist crop growth by adding nutrients from organic or commercial fertilizer.

This voluntary project will build upon the State's current cover crop initiative that is inadequate to address the needs based upon C2K funding analysis. Maryland provides 1.5 to 2.5 million annually for state wide cover crops. Evaluation of the need to meet the commitments in the current round of Tributary Strategies suggest that up to 19.5 million will be needed annually to meet the cover crop goals. Through this 319 initiative the agricultural agencies of Queen Anne's County will implement a voluntary enrollment cover crop program targeted for maximum water quality benefits in the Corsica River. The implementation and benefits are proportionate to and dependent upon adequate grant funding levels.

Previous work has focused on the Monocacy Basin in Western Maryland. However, new FY2003 grant program guidance requires a focus on only those watersheds with a watershed restoration plan and a draft or final TMDL.

The Corsica River Cover Crop Program will include aerial seeding of cover crops in order to address implementation barriers caused by limited fall planting dates. Cooperators will be provided the opportunity to sign up and apply cover crops under this program. For those not interested in aerial seeding but interested in applying cover crops, a more traditional crop application program will also be available. This program will contain many requirements already familiar to local agricultural producers including: provisions for a limited sign up period, requirements for a nutrient management plan, no commercial fertilizer application, program guidelines that establish crop species and planting dates, spot checks by the local SCD staff and a required spring kill down or suppression. Because cover crop planting dates continue to be an issue, this demonstration will pro-rate cost-share in accordance with nutrient uptake potential, i.e., producers could receive $30/acre for cover crops planted by October 1, 2004 and $15/acre for cover crop planted by November 1, 2004. The Corsica River Cover Crop program will administratively follow the Maryland Agricultural Cost Share Program (MACS) cover crop program offered on the Eastern Shore and will be subject to all of its regulations and procedures.

Local Soil Conservation Districts' personnel will be responsible for delivery, sign up, administration, and certification.

We expect program sign up to exceed the funds available. The program would continue to sign up acreage beyond the available funds as "stand by contracts" if they agree to follow program guidelines.

Goals and Objectives

Goal

The project will promote a voluntary best management practice to improve the water quality in the Corsica River.

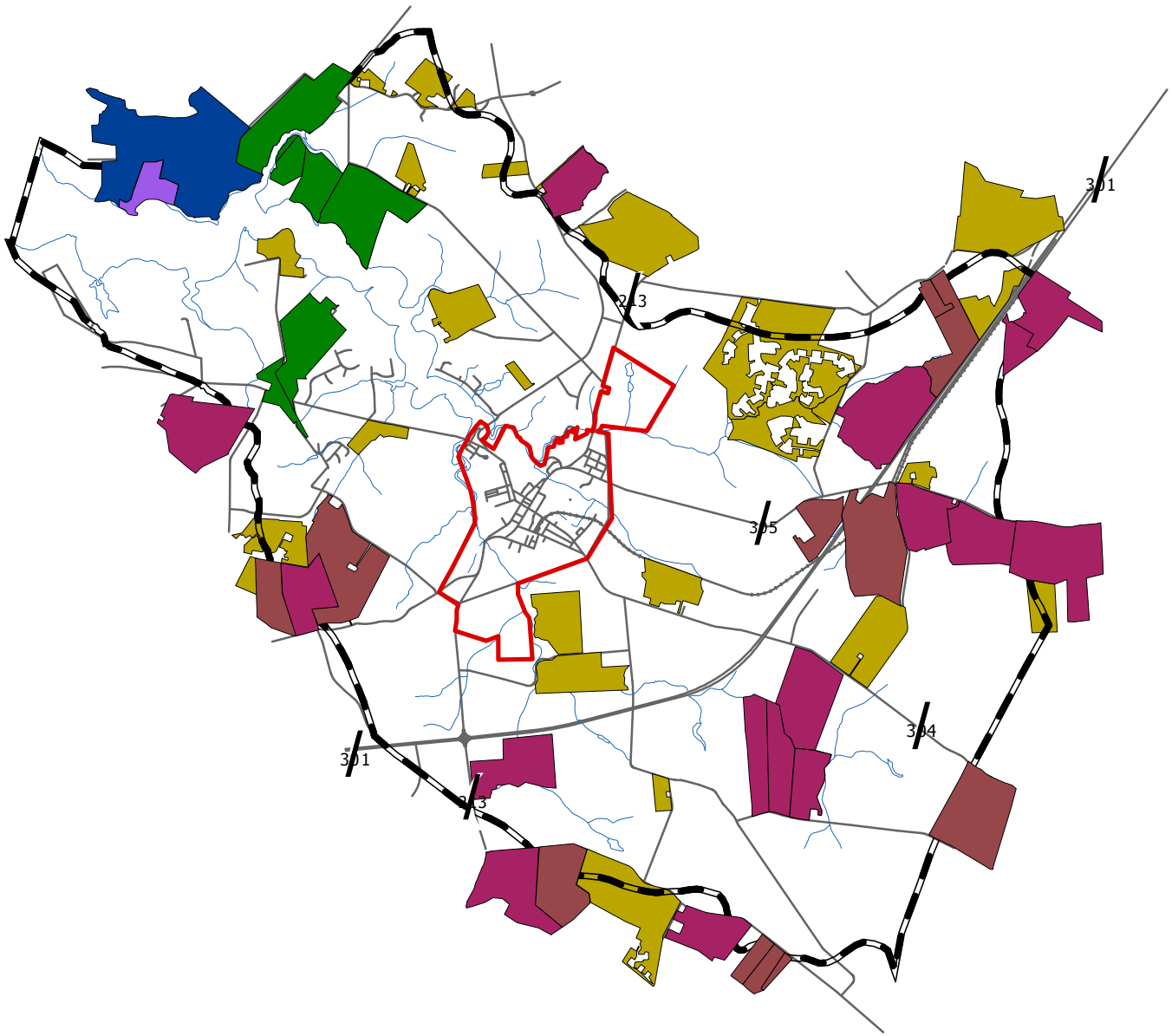
Objectives

1. Promote a watershed based cover crop program within the region by way of publications and outreach through the Cooperative Extension, Soil Conservation District and local print and broadcast media.

2. Install cover crops on over 3,000 acres of cropland.

Measurable Environmental Results

The proposed cover crop program will target 3,000 acres under management. Based upon Chesapeake Bay Program and Maryland's Tributary Strategies, the reduction efficiency of this practice is estimated at 21,000 lbs. for nitrogen and 570 lbs. for phosphorus. In addition, cover crops provide valuable erosion protection on the moderately sloped lands.



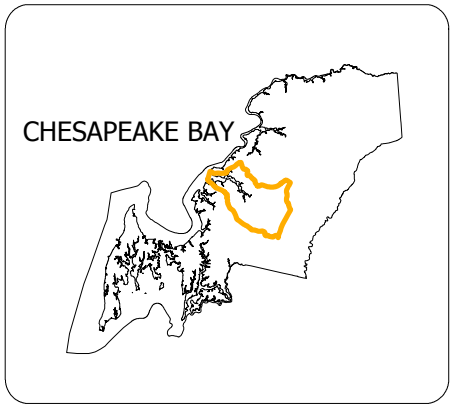
While considerable acreage in the watershed is currently conserved, a strategic plan is needed to link easements, open space, and conserved lands

CORSICA RIVER WRAS

Figure 10

CONSERVED OR PROTECTED LANDS

QUEEN ANNE'S COUNTY
MARYLAND



- **Private Conservation**
- **Deed Restricted Open Space**
- **MET (Maryland Environmental Trust Easment)**
- **County Parks**
- **Agricultural Districts (MALPF)**
- **Agricultural Easement (MALPF)**
- **Town of Centreville**
- **Streams**
- **Roads**
- **WRAS Boundary**

N

4000 0 4000 8000 Feet

2. **AG Nutrient and Sediment Reducing Buffers** are important permanent measures for water quality and habitat enhancement in the Watershed. To best actualize the benefits of these buffers, they should be at least 100 feet wide - 50 feet on either side of an intermittent stream and a full 100 feet wide on each side of a perennial or *blueline stream* and the same for Critical Area's standard shore buffer. The WRAS Committee further recommends that through outreach efforts and a pilot program, Wildlife Habitat Incentive Program (WHIP) grants through Natural Resource Conservation Service (NRCS) be sought along the tidal frontage of the Corsica River. This is a gap closer between the agricultural buffer practices and currently required buffers for new developments. (See figure 9).

In Maryland, the Conservation Reserve Enhancement Program (CREP) offers additional incentives to encourage landowners to implement practices that will help reduce sediment and nutrients in the Chesapeake Bay and will improve wildlife habitat. CREP is seeking to enroll 16,000 acres of highly erodible cropland into grass and/or tree plantings, establish 77,000 acres of riparian buffer habitat, provide 5,000 acres of water and wetland habitat, and restore 2,000 acres of habitat for declining species.

Like the original conservation reserve program (CRP), land must be owned or leased for at least one year before it can be enrolled in CREP. Land must also meet cropping history and/or other eligibility requirements. Enrollment is on a continuous basis, allowing landowners to join the program at any time rather than waiting for specific sign-up periods.

The USDA Farm Service Agency (FSA) provides an annual land rental payment, including a CREP special incentive payment, plus cost-share of up to 50 percent of the eligible costs to plant grasses or trees on highly erodible cropland, establish vegetated buffers along streams, restore wetlands, provide shallow water areas for wildlife, and restore habitat for rare and declining species. The Maryland Department of Agriculture, through the Maryland Agricultural Water Quality Cost Share (MACS) program, offers additional cost-share (up to 37.5 percent of eligible costs) for practices that will provide significant benefits for water quality.

The U.S. Environmental Protection Agency's Chesapeake Bay Program has established ambitious goals to reduce nutrients entering the Chesapeake Bay and its tributaries by 2010 while increasing habitat and restoring wetlands. When fully implemented, CREP will help to achieve Maryland's water quality goals by:

- Reducing an estimated 5,750 tons of nitrogen and 550 tons of phosphorus from entering Maryland waterways each year.
- Reducing the amount of sediment entering the Bay and its tributaries by approximately 200,000 tons annually.

- Establishing and enhancing 93,000 acres of riparian buffers, 5000 acres of wetland habitat and 2000 acres of habitat for declining, threatened or endangered species including the bald eagle, Eastern bog turtle, dwarf wedge mussel, glassy darter and harparella, a nearly extinct aquatic plant that grows only where suitable water quality conditions are present.

Queen Anne's County as a whole currently has in inventory:

- 8000 acres of grass buffer
- 440 acres of forested buffer
- 655 acres of wetland restoration
- 121 acres of shallow water areas designed for waterfowl

The goal of this initiative is to add 100 acres in the Corsica River Watershed @ $170/acre for 15 years (sign-up). Above that, we include in the costs one review person for 2 years at $50,000/year and supplies of $5,000. As yet unidentified grants are to fund this initiative. In addition, supplemental budget requests to the State legislature are recommended. The Nutrient Reduction Efficiency of CREP in the Upper Eastern Shore is 43% for nitrogen and 53% for phosphorous. Therefore, assuming low till for a more conservative agricultural practice on the average, conversion from arable to buffered lands should yield a reduction of 1000 ac. X 21.3685lbs/ac x 0.43= 9,188.46 lbs/acre of nitrogen; and 1000 ac. X 1.4951lbs/ac. X 0.53 = 792.40 lbs

3. **Whole Farm Nutrient Management and Horse Pasture Management** are areas the WRAS Committee recommends in the form of demonstration projects designed for farmettes of ten acres or less. This is an area which can fall through the regulatory cracks but could result in both ecological and farm owner benefits. Unlike larger animal waste management systems, some of the nutrient reduction is acknowledged to be found on waste in pasture land as well as animal confinement runoff control. This demonstration site employs techniques for manure storage and treatment as well as entrapment and treatment of surface run-off. There are fifty (50) voluntary demonstration acres in the Corsica River Watershed set aside for a maximum of five such farmette conversion projects proposed for $ 25,000 each with an anticipated nutrient reduction of 14%. An example of the reduction calculation is as follows: 10 acres x 2282.4784 lbs/ac. x 0.14 = 3,195.47 x 5 (conversions) = 15,977 lbs of nitrogen and 10 acres x 277.7539 lbs/ac. x 0.14 = 388.85 lbs/ac. x 5 (conversions) = 1,944.28 lbs.
Funding source is from grants and existing USDA NRCS programs.

4. **Household Pollution Reduction** strategy involves the Town of Centreville sponsorship of an outreach program to promulgate Urban Nutrient Management pieces on lawn fertilization and pet waste control. Specific Code implementation is hereinafter discussed. It is important to remember that this WRAS is intended to leave no sector of the watershed citizenry uninvolved in the overall effort to improve the watershed. There are approximately 3,700 people in the watershed whose ecological behaviors must be affected.

Brochures describing how to reduce nutrient loads coming from lawns and residences will be prepared for each property owner in the watershed. The estimated cost to develop, print and mail approximately 4,000 brochures is $3,000.00. Funding for this project is through the Upper Eastern Shore Tributary Team and Strategies program. The brochures will be developed through the Queen Anne=s County Master Gardner program of the University of Maryland Extension Service. The target date for having the brochures distributed is March 2005 (development by 11/15, review and printing by 2/1, distribution by 3/15). The metric will be an average of 1/3 acre of lawn per residence x 1201 households (in the Town of Centreville) = 400 acres in lawn at $1.74/ac/yr or $696. The total loading reduction goals for each element are as follows: N-17%, P-22%. The estimated cost for implementation of this BMP includes soil testing and tracking by house to house survey. The estimated nutrient reduction is a follows: 400 acres x 9.3315 lbs/ac x 0.17 = 634.54 lbs. for nitrogen and 400 acres x 1.3399 lbs/ac. x 0.22 = 117.91 lbs. We will assume that 50% of brochure recipients will achieve these goals by June 2005; 75% by June 2006 and 90% by June 2007. Progress will be monitored by phone surveys of a sample of brochure recipients. Survey Sampling will be conducted in December 2006, and December 2007 by QAC Extension Service/MG program.

In addition, steps will be taken to reduce nutrient applications by commercial lawn services. Ordinances will be proposed for the Town which will expressly prohibit fertilizer application by contractors more than twice per year and with an application rate determined in total lbs per acre established by U of MD Cooperative Extension Service specifically for the Town. Letters will be prepared and sent to each nursery and vendor of lawn maintenance products in the watershed and boundary areas requesting that they review their inventories of fertilizer and lawn care products to make sure that products labeled primarily for correcting lawn problems like crabgrass, weeds, fungus etc have minimal amounts of fertilizer included and that products that are mainly comprised of fertilizer are labeled as such. No specific metric will be applied to these actions as they are meant to supplement the principle action directed to residents as outlined in the previous paragraph.

5. **Main Stem of the Corsica River: Water Quality Monitoring** is crucial to our understanding of both existing conditions and the highly anticipated improvements in water quality as WRAS implementation strategies mature. It is imperative that monitoring be permanent, that the findings be scientifically unassailable, and that such progress in water quality improvements be heralded. Acquisition and deployment of buoys and data collection are the keys to this strategy. Sufficient funding is crucial to the success of this strategy.

Main stem of the Corsica River: Water quality monitoring. CRA is eager to work in partnership with MD DNR and University of Maryland to develop a water quality monitoring program that will integrate continuous monitoring technology (supplied by DNR) with citizen monitoring using bioindicators (isotopic analysis of which will be provided by University of Maryland and can be used to track pollution sources). Cost estimate = $345,434. Project entirely dependent on grant funding; no grant sources currently identified.

Milestones: 1 month after funds received – recruit participants, 3 months after funds received, train participants, citizen monitoring ongoing for months 3 – 24. Educational component: citizens hopefully will see improvements in water quality over time and be able to relate this to WRAS implementation.

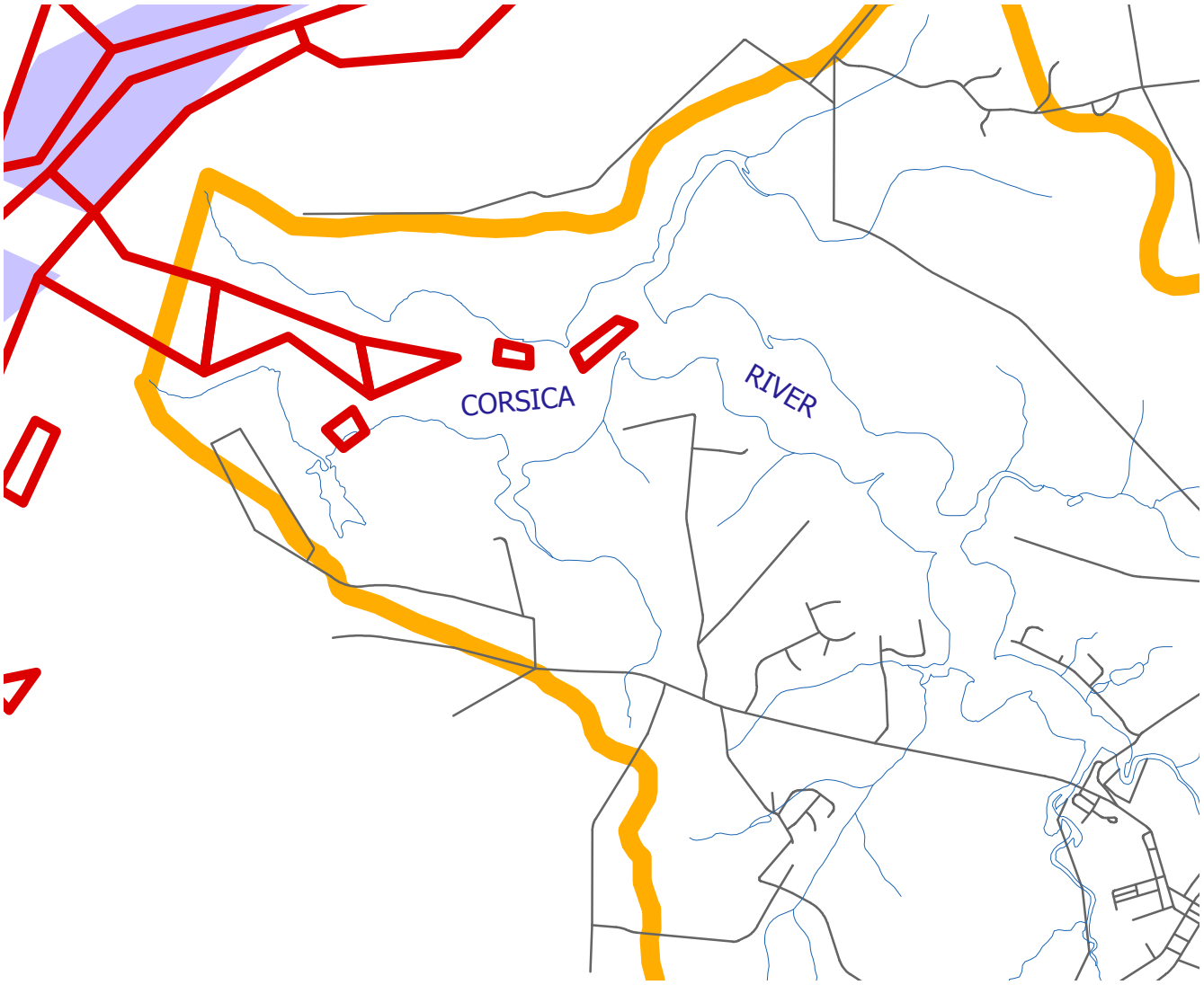
6. **Submerged Aquatic Vegetation (SAV) Reestablishment** is deemed important by the WRAS Partners as it constitutes an ongoing measure of water clarity, and chemical quality. While SAVs may be the canary in the coal mine, its survival will give a very visible and measurable means to gauge watershed improvement. This is also an area which engages a growing corps of volunteers and students in the restoration process.

With the new Centreville WWTP having come on line, a concerted effort will be made starting in 2005 to dramatically increase the planting and seeding of underwater grasses in the Corsica. An on-the-water survey of historic and prospective grass planting sites in the River was completed in the first quarter of 2004, in concert with Underwater Grass experts from UMD Horn Point Center. Some plants were grown and planted by Chester River Association in early June 2004 and are currently being monitored for survival and growth. Growth during the summer of 2004 has been sustained, significant, and very promising. Funds and sources for massive plantings and seedings of underwater grasses at surveyed sites throughout the mainstem of the Corsica will be sought through grants and continued cooperation with CRA, University of MD Center for Environmental and Estuarine Studies at Horn Point, and the Chesapeake Bay Trust (CBT). The goal is to begin this large-scale program in the summer of 2005 and to sustain it until grasses show a persistent ability to regenerate at all historic and prospective sites in the River.

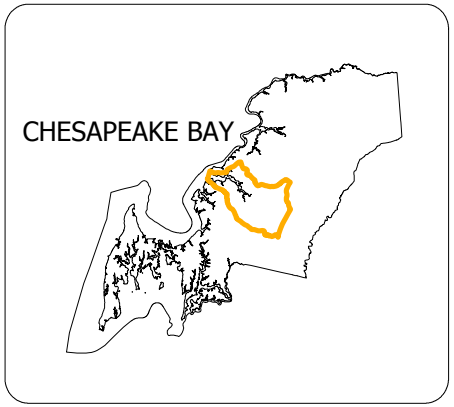
A total of $48,000 will be sought to implement this program over two years. CBT grants and other as yet unidentified grants will be pursued for this strategy. The metric will be square feet of SAV planted in early summer and measured against square feet of SAV surviving in late summer/early fall. There will be no direct nutrient load reduction associated with this strategy. However, water clarity and reduced turbidity will be associated indicators of success, along with overall habitat improvement as identified by DNR and through citizen monitoring. Funding proposal will be developed and submitted by CRA by 11/15/04 for funds to begin large-scale plantings in June 2005 with a similar cycle for 2006. CRA will work closely with Horn Point and DNR technical assistance and to identify funding sources. CRA will continue to work closely with the CBF and VIMS in surveying and reporting SAV in the Corsica and surrounding areas. As the lead for SAV restoration in the watershed, CRA will also continue the educational outreach component of this program through citizen participation in growing grasses for plantings.

CORSICA RIVER WRAS

Figure 11
Historic Shellfish Beds



QUEEN ANNE'S COUNTY
MARYLAND



Historic Oyster Beds (circa 1910)
Current Oyster Beds
Streams
Roads
WRAS Boundary

N

2000 0 2000 4000 Feet

Historic oyster bed locations give us clues to the habitat preferences and survivability of our future oyster populations

7. **Low Impact Development Technique in Ordinance Form**
Water Quality Protection Regulation

The Town of Centreville will produce and adopt the ***Centreville Water Quality Protection Regulation*** and associated ***Centreville Water Quality Design Manual***. This ordinance and manual is to supercede the existing Queen Anne=s County Stormwater Management Ordinance currently regulating such activities within the Town. This new regulation and design manual is being modeled after the Huntersville, NC low impact development ordinance which may be found in complete detail at http://www.charmeck.nc.us/Departments/LUESA/Water+and+Land+Resources/Programs/Water+Quality/Huntersville+Ordinance/Home.htm
The Prince George=s County Maryland Low Impact Development Design Strategies and the MDE Model Stormwater Management Ordinance (2000) must be used to ensure that volumetric or quantity management objectives of the State of Maryland are integrated into the final Town code. The WRAS Committee is aware that this ordinance can only have effect within the incorporated Town and that efforts should be made to establish a similar ethic in the County portions of the watershed to the degree possible. Because the vast majority of the impervious area in the watershed is found within the Town and its growth area, LIDs will make a significant contribution to development and urban-driven nutrient and sediment reductions.

The first step in the implementation process after the adoption of the above anticipated code will be the design and construction of regional urban stormwater management facilities on publicly owned lands along the Millstream and along Gravel Run. These facilities are in addition to the marsh creation opportunities that exist at each of these sites. At the very least, mechanical trash removal and water quality improvements will be implemented. Partial funding is in place through the fee-in-lieu escrow account for stormwater management previously established by the Town. The cost to develop the required code and have it published and promulgated is $37,000. The Town will provide funding for this ordinance from its general fund. This cost includes pilot demonstration sites that clearly show the design and application of LID techniques and practices. The goal reduction is 33% for nitrogen and 46% for phosphorous improvement over existing untreated lands. A calculation for Centreville is as follows: 996 acres (urban impervious) x 8.1184bls/ac. x 0.33 = 2668.36lbs of nitrogen and 996 acres x 0.5145 lbs/ac. x 0.46 = 235.72 lbs. of phosphorous.

8. **A Native Conservation Landscaping Demonstration Project** was deemed of value as it is coupled with an outreach effort to engage a minimum of 200 citizen participants. Potential sites for this project are to be selected using the full capability of the GIS system developed by the WRAS. This item evolved in the context of an extreme make-over which would take a highly impaired site into an environmental limelight.

Native Conservation Landscaping Project. Project relies on volunteers to participate in high-profile "makeover" of a public site to demonstrate the value of Bay-friendly landscaping. This includes an education and outreach component (media coverage and on-site educational materials). Success measured by # of citizen participants and CRA-sponsored tracking of subsequent referrals to landscape consultants. Estimated cost = $78,410. The Town of Centreville will work with its stakeholders to designate public

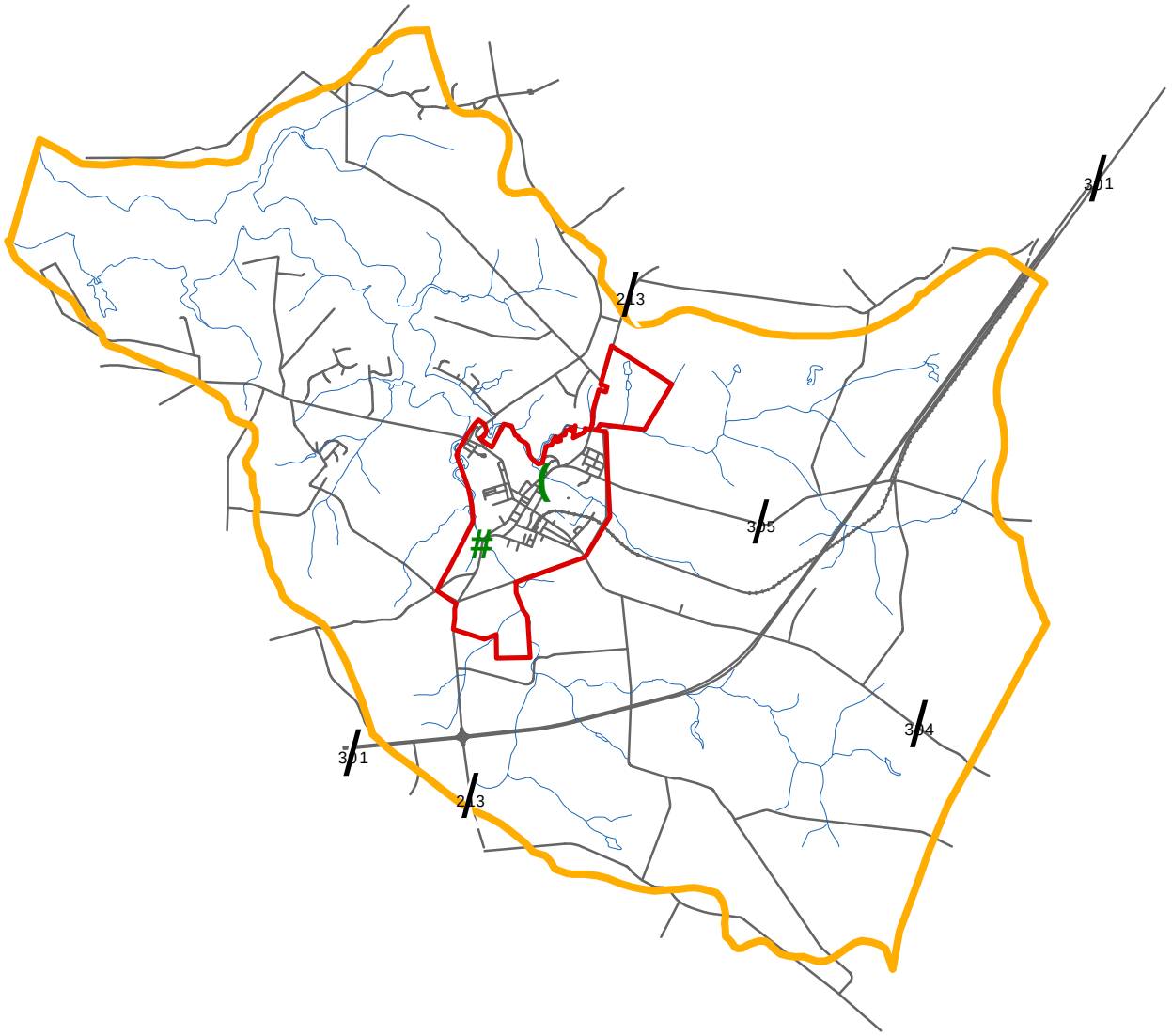
lands for this project at the Millstream and Gravel Run Public Parks. Project entirely dependent on grant funding; no grant sources currently identified. Anticipated pollution reduction: phosphorus and suspended sediments reduction per acre of Bayscape of approximately 70%, anticipated acreage of "makeover" site and subsequent homeowner efforts = 2 acres. Milestones: 2 months after funds received, site identified; 3 months after grant received, participants recruited media alerted and site design begun; 4 months after grant received (and/or during appropriate planting period) plants ordered and planted; 6 months after grant received follow-up with participants to encourage home projects. Educational component: citizens will learn how to reduce pollution by using native plants which require fewer chemicals, and will understand the role of raingardens in retaining and filtering stormwater runoff.

Residential Buffer Planting and Conservation Landscaping. The Buffer Gap analysis from the WRAS SCA will be used to identify and prioritize residential areas in need of increased buffer plantings and conservation landscaping. The total linear frontage of residential buffer gaps in the Corsica watershed is estimated at 23,898 linear ft. The goal is to cover 90% of these gaps with conservation landscaping to a depth of at least 100 ft from mean high tide within two years of the completion of the WRAS (by Fall 2006 with interim goal of 45% by Fall 2005) Vegetation appropriate for this purpose will consist of a variety of tidal water grasses and proceed upland to various native shrubs and trees. Sources for plants have been established through joint CRA/DNR Watershed efforts (e.g., grow out stations) but will need reinforcement and enlargement to meet the supply needs to close the identified Corsica buffer gaps.

Workshops will be held for target communities throughout the watershed, working through CRA, DNR Watershed Services, QAC SCD, Queen Anne's County local agents for the U of MD Cooperative Extension Service and Master Gardeners (QAC ES/MG), the QA Soil Conservation District, and UES TribTeam. Property owner volunteers will be enlisted through these workshops and other more focused targeting efforts to participate in buffer plantings on their property. Incentives will include the supply of plants, landscape design assistance, spraying of invasives, and volunteer assistance with plantings. The total cost of grasses, trees, shrubs and replacement grow-out stock and supplies for the two-year program is $75,000. Grants will be sought through the Chesapeake Bay Trust and the alliance for the Chesapeake Bay as well as other sources with continuing funding and existing delivery systems in place.

Records will be kept by SCD of linear feet of shoreline buffers treated through this program.

9. **An Easements Incentive Program** for acquisition of development rights within the watershed is contemplated which would boost the rate of conservancy in the Corsica River Watershed. Methods to finance these acquisitions will be discussed in Chapter V part 3 of this report.



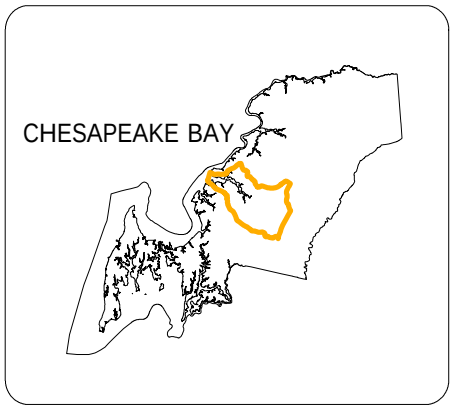
Regional stormwater management designed with low impact development techniques is proposed for the town

CORSICA RIVER WRAS

Figure 12

REGIONAL STORMWATER MANAGEMENT BASIN AREAS

QUEEN ANNE'S COUNTY
MARYLAND



- # SWM Basin Area
- Town of Centreville
- Streams
- Roads
- WRAS Boundary

N

4000 0 4000 8000 Feet

The WRAS Committee has a strong partner in the Eastern Shore Land Conservancy. The WRAS Steering Committee suggested that information be gathered during the opening process of purchasing easements in the Watershed which would give the Conservators a field survey of the environmental condition of the acquisition. Similar to the USDA-NRCS farm plan (see Appendix II), this request for information supplement, will alert interested parties of opportunities to remedy impairments identified through the WRAS and to implement agricultural BMPs that will go with the land into the future.

This program will be coupled with a Town of Centreville Comprehensive Land Use Plan that establishes an Urban Growth Boundary around the Town and a platted Greenbelt within the Town limits into which priority funding would be funneled by the Town for easement acquisition.

10. Creation of Non-Agricultural Wetlands is deemed a valuable means of effecting human behavior changes resulting in stronger watershed stewardship. The Corsica River Watershed has an identified need for conversion (or more accurately, reversion) of hydric soils to their original pre-historic wetland condition. If a demonstration project can be accomplished which results in a suburban wetland landscape that is attractive, easily accessed by the public and affordable, the WRAS believes great downstream benefit will found. Wetlands and wetland marshes are very effective at removing nitrogen.

The WRAS has demonstrated opportunities to restore nontidal wetlands on landowner properties. The Chester River Association in partnership with DNR and The Alliance for Chesapeake Bay will seek to identify 2 wetland restoration sites and engage up to 100 citizens in marsh planting and restoration. The Town will assist in locating these sites on public lands within the Town boundary and make safe and easy access to them for educational purposes. Estimated cost = $22,000. Project entirely dependent on grant funding; no grant sources currently identified. Anticipated pollution reduction: nitrogen reduction per acre of emergent marsh = 42%, and phosphorus reduction per acre of nontidal wetlands = 55%, anticipated acreage of wetlands restored = 1 acre. Milestones: 2 months after grant received, sites identified; 4 months after grant received, participants recruited and plants ordered; 6 months after grant received (or appropriate planting season) marsh plantings occur; 12 months after grant received wetland condition assessed.

The restoration of wetland habitat in the Corsica watershed is recognized as an important attribute in restoring water quality. The Corsica watershed is estimated to have a historic wetland loss of 4,192 acres (Unified Watershed Assessment 1998). Most of this historic loss occurred in the upper headwater tributaries of the Three Bridges and Mill Stream sub-basins. Conversion of wetlands was a common agricultural practice in the region until 1985. Today those converted wetlands are valuable high production cropland. A network of lateral collectors (farm ditches) and grass swales has altered the pre-colonial landscape and watershed hydrology.

As part of the action strategy to restore water quality to the Corsica Watershed it is recognized that restoration of upper headwater prior converted wetlands can play an important role in sequestering nutrients and sediments. Most of the opportunities for wetland restoration are on agricultural lands and farmland converted to low density

development. Furthermore, the cost of conversion of agricultural land to wetland is a loss to the farmer in terms of the economic value of the land. Agricultural programs that promote best management practices (BMPs) can offset the cost of converting drained hydric soils back to wetland through rental agreements. It is recognized that the restoration of wetlands should be done on a voluntary basis and that there are other conservation practices that may achieve similar results.

There may be additional opportunities to restore wetlands in the urban environment. These wetland restoration opportunities are down stream in the watershed and at or near the tidal interface with the Corsica River. These areas include both tidal and nontidal systems where public land inside the Centreville municipal limits is adjacent to the fresh water tributaries and the main stem of the Corsica River. The Town of Centreville holds seventy (70) acres encompassing the acreage of the original normal pool of the mill pond located east of Maryland Route 213. This area may be considered for a wetland restoration project. The Town also holds six (6) acreages of public land immediately upstream of Maryland Route 213 encompassing the existing pond in Gravel Run. Both these areas are potential restoration sites that tie into the Town's regional urban stormwater management construction goal cited in item seven (7) above. Additionally, landowners along the tidal waters of the Corsica who are concerned with erosion and habitat loss may adopt a Living Shoreline approaches to restore tidal fringe marsh.

11. Septic System Retrofits are believed to be a critical priority in the Corsica River Watershed strategy as this comprises a large part of the non-agricultural nonpoint source nutrient contribution to the Corsica. There are existing systems that are installed in marginal soils, some are very poorly (if ever) maintained, some lie within 300 feet of a tributary stream or the edge of tidal water, and employ ancient technology not capable of any significant nutrient reduction. Many innovative systems are now commercially available some of which are currently pre-qualified for installation in Queen Anne's County by the Queen Anne's County Environmental Health Department.

The overall goal of this strategy is reduce nutrients from septics throughout the watershed, particularly those within the 300 foot critical area. Conventional systems that are permitted in the County emit 40 - 60 mg/l of nitrogen (estimated N content in what flows from the whole septic system into the groundwater). The goal is to reduce this to about 20-25 mg/l. [For the purposes of this initiative, 80-100 gallons per day per capita is used to determine total annual flow and 705 existing systems are included in the strategy. Using data from MdPropertyView®, total parcels in the watershed = 2142 minus 1201 in the Town of Centreville (on public sewer and water) – 236 unimproved parcels = 705.] Therefore, clearly it will be a long time before this can be done for the majority of systems in the watershed, maybe never. However, the WRAS program will begin efforts towards this goal in a voluntary program led by the Upper Eastern Shore Tributary Team (UESTT).

The program is one of education of existing and new septic system owners and getting them to voluntarily adopt improvements to their current systems. These improvements include regular pumping of solids (1-3 years depending on size and usage), adding "risers" for better access and identification, adding plastic baffles to existing tanks, adding filters to prevent the entry of solids to drainfields. In addition to the cost of

educational pamphlets, some financial assistance to make improvements to systems might also be pursued if the need can be demonstrated through citizen response. The cost for this portion is, 705 systems x $125 = $88,125 for a three year coverage span. Funding will be pursued through MDE grants.

We also plan to work closely with QAC Health Department to work cooperatively with owners with failing septic systems that are clearly discharging into the waterways of the Corsica to immediately remedy those problems.

Measures will include number of new BNR systems installed, percentage of new systems that are BNR vs Conventional, number of conventional systems with improved features and maintenance, number of offending failed systems corrected or eliminated. The QAC Health Department will have records reflecting this data which the UES Tributary Team will periodically review to monitor progress. The total cost for this is 705 x $5500 = $3,877,500 + $141,000/yr. in maintenance ($200 per connection per year spaced over time). Anticipated nutrient reduction is 365x2.8ppux80gpdcx8.34lbs/galx 60mmg/l÷ 1m +40.91 say 41 lbs per unit or 28,905 pounds of nitrogen per watershed year. Funding through the Maryland Department of the Environment will be sought.

Working with the Queen Anne's County Health Department, the WRAS Committee will forge a plan to retrofit and test selected septic systems through a voluntary agreement with the homeowners in an effort to document in an unequivocal manner the benefits of system maintenance and replacement of technologies. This plan will call for both installation and long term water quality testing. The WRAS stakeholders believe there may be a significant benefit derived through extended drain field life expectancy. In the rural landscape of the Corsica River Watershed, individual systems will prevail well into the future. A WRAS Committee recommendation is that voluntary installation of innovative denitrification systems should be encouraged in new development or replacements with particular attention to those systems located within 300 feet of a perennial stream or tide water.

12. **EcoTeams** offer an opportunity within the watershed, and beyond, to coalesce a growing environmentally concerned citizenry into function teams to plan and implement workshops, school education programs and to measure and track homeowner behavioral change over time. The Chester River Association will be the leader of this initiative which is intended to build volunteer capacity and voice for future implementation of WRAS projects.

Urban and suburban homeowners will be recruited to participate in local teams which "adopt" their local waterway through monitoring and stream cleanup projects. In addition, participants will learn homeowner BMPs for river protection and restoration and will use journals and workbooks to track their progress in implementing these BMPs. Teams will provide peer support groups and volunteer coaches to encourage individual participants and provide learning resources. A pre- and post- project survey will track the program's effectiveness in inducing behavior change. Estimated cost = $93,500. A grant has been submitted to fund the initial stages of this work. Anticipated pollution reduction: phosphorus reduction per household = 10 lbs., anticipated number of households participating = 50. Milestones: 1 month after grant received educational materials, log books etc. developed; 2 months after grant received design

and send out homeowner survey; 4 months after grant received participants recruited; 5 months after grant received begin series of homeowner education workshops and hold first EcoTeam meetings, distribute workbooks etc; 6 months after grant received and monthly through month 18, host EcoTeam meetings; month 18 send out post-survey to measure behavior change. The CRA will champion this initiative and grant funding through DNR and EPA- Watershed Initiatives grant will be sought as a capacity builder.

13. **Turbidity Reduction** in the Corsica River can occur through the reintroduction of oyster reef ecosystems. The WRAS suggests that the historic shellfish areas, shown on Figure 14, should be formally set aside in Sanctuary, seeded, and monitored as to viability. To defend the scope of this project the WRAS Committee suggests that clam dredging be suspended in and near these historic locations. Turbidity in the Corsica and the Chester River mainstem will be measured and indexed along with the chemistry suggested in #5 above. The estimated cost is $14,500/acre and the WRAS estimates a total 80 acre opportunity for $1,160,000 or increments thereof as water quality over survivability is assessed over time. For The WRAS phase one, assume a first phase of 10 acres at 14,500 = $145,000. Chester River Association will champion this project and funding will be sought through Maryland Fisheries and other research funding sources. This project will proceed when water quality data suggests survivability may be sustainable.

    In addition, Chester River Association will continue its long-term monitoring program, Chester Testers, which maintains a site on the Corsica River, and its newly-initiated testing of the effluent from the Town of Centreville wastewater treatment plant.

The strategies discussed above are not intended to limit the power of the WRAS to espouse and support any project deemed of value to the health of the Corsica River. As a starting place, these initiatives touch the core of impairments that can, if remedied, have significant and early impact on the health of the river. Many other initiatives are difficult to quantify in terms of specific nutrient reduction but have great value to the long term and sustainable water quality. Outreach is one such example. These future initiatives will be pursued within the comprehensive context of the WRAS and result in ongoing updates to the WRAS databases.

TABLE 4 Implementation Strategies

Implementation Strategies & Recommendations	Party responsible for meeting management objective	Schedule	Measurable indicators/ performance measures	Monitoring and party responsible for monitoring	Public involvement, outreach, or education component	Innovations or additional leverage or benefit
1. Market and early planting incentive, commodity, small grain, cover crop. Goal: 3000 demonstration acres.	Queen Anne's County Soil Conservation District (QA SCD).	Outreach: Fall 2004. Implementation: 2005 to 2007. Monitoring: 2005 to 2007.	Pounds of nutrients reduced. Number of farmers and number of acres enrolled. Quarterly reports and tracking of acreages enrolled.	Paired watershed study: Maryland Department of Natural Resources. Ground water test wells: University of Maryland Cooperative Extension.	QA SCD aggressive enroll-ment initiative. Presentation of data results to public, other watersheds, and MD DNR WRAS web site.	Pro-rated early planting incentive: $17/acre early planting, $12/per acre later planting. Provides financial incentive to farmers to plant cover crops earlier to achieve greater nutrient uptake.
3. Demonstration, whole farm nutrient and horse pasture management for farmettes of less than 10 acres each. Goal: 50 demonstration acres.	QA County SCD, the Chester River Association, and the Alliance for the Chesapeake Bay.	Outreach: Fall 2004. Implementation: 2005 to 2007. Tier I BMP's in 2005, Tier II BMP's in 2006. Monitoring: 2005 to 2007.	Reduction in concentration of sediment, nutrients, bacteria in surface and ground water. Number of demonstration BMP's. Quarterly reports and tracking of farmette acreage enrolled.	Paired watershed study. Pre and post sampling: Maryland Department of Natural Resources. Ground water test wells: University of Maryland Cooperative Extension.	QA SCD enrollment initiative. Presentation of results to public, other Maryland/Bay watersheds, and MD DNR WRAS web site.	A "gap" closer. Demonstrates small farmette management techniques. Currently, these farmettes fall outside of traditional nutrient management programs.
2. Agriculture nutrient and sediment reducing stream buffers. Goal: 30 demonstration acres.	Queen Anne's County Soil Conservation District.	Outreach: Fall 2004. Implementation: 2005 to 2007. 15 acres by 2005. 15 acres by 2006. Monitoring: 2005 to 2007.	Number of acres buffered. Change in concentration of nutrient and sediment levels in surface waters. Quarterly reports tracking numbers of acres enrolled.	Tracking of buffered acres: Queen Anne's County Soil Conservation District: Paired watershed study. Pre and post sampling for nutrients and sediment: Maryland Department of Natural Resources.	QA SCD aggressive enrollment initiative. Presentation of results to public, other MD/Bay watersheds, and MD DNR WRAS web site.	A "gap" closer. Demonstrates buffer development and management techniques. Currently, these unbuffered areas fall outside of traditional buffer program criteria.

Implementation Strategies & Recommendations	Party responsible for meeting management objective	Schedule	Measurable indicators/ performance measures	Monitoring and party responsible for monitoring	Public involvement, outreach, or education component	Innovations or additional leverage or benefit
12. EcoTeams: Public awareness, education, involvement, and capacity building: 10. Suburban marsh (2 sites) and stream (2 sites) buffer projects (200 citizens). 8. Native conservation landscaping demonstration project (200 citizen participants). 4. Household pollution reduction, citizen survey, and behavior change projects (watershed – 3700 people).	Chester River Association, Alliance for the Chesapeake Bay, the Chesapeake Bay Conservation Landscaping Council, and the Queen Anne's County Soil Conservation District. .	Outreach planning: Fall 2004. EcoTeam recruitment: 2004 to 2005. Capacity building and educational initiatives: 2004 to 2006. Site selection, and project planning: Fall 2004. Implementation of Demonstration projects: Summer 2005. Monitoring: Fall 2005 to 2007.	Measuring/tracking homeowner behavior change as education process unfolds. Number of Eco-teams, number of active participants on EcoTeams, number of workshops, and meetings. Number of demonstration projects (marsh and stream acres buffered, homes landscaped). Pounds of fertilizers and pesticides reduced, gallons of water conserved in homes. Number of referrals to restoration consultants. Implementation of "Extreme" conservation landscape makeovers. EcoTeams workbook. Production of documentary.	Number of acres buffered, estimate of load reductions: Queen Anne's County Soil Conservation District. Behavior change measurements, participant involvement, household pollution reduced: Chester River Association and the Alliance for the Chesapeake Bay.	Public will be involved in: - neighborhood based EcoTeams. - education workshops - demonstration projects. Volunteer citizens participate to demonstrate "Extreme" conservation makeover for environmentally friendly landscaping. Citizen involvement in television documentary and homeowner behavior change program.	A "gap" closer. This project has the potential of reaching EVERY person in the watershed thus having a significant potential to affect water quality. Currently, these non-buffered areas fall outside of traditional buffer program criteria. Builds capacity to develop and manage buffers, reduce pollutants, affect behavior change in others. Demonstrates stream and marsh buffer development and management techniques in tidal areas.
7. Low Impact Development (LID), ordinance and code change research, development, and adoption. Will directly improve	Town of Centreville	Number of Public Roundtables. Code and Ordinance development: Fall 2004 to 2005.	Acres reduction of impervious surfaces within the town limits. Projected percent increase in vegetative buffer within town limits.	Projection of nutrients and sediments reduced as a result of code changes: Town of Centreville. Projection of percent change in watershed	Public inclusion in Roundtables to gather input and feedback.	Town of Centreville is at the headwaters of the Corsica. Innovative LID application (greenroofs, reduction of impervious surfaces, elimination of curb and gutter, swales, street narrowing, bio-

Implementation Strategies & Recommendations	Party responsible for meeting management objective	Schedule	Measurable indicators/ performance measures	Monitoring and party responsible for monitoring	Public involvement, outreach, or education component	Innovations or additional leverage or benefit
Corsica River's water quality and provide collateral flood control.		Adoption and implementation of code changes: 2005.	Projected utilization of LID techniques. Projected pounds of nutrients reduced from LID technique application.	imperviousness: Town of Centreville.		retention areas, rain gardens, etc.), will prevent water quality degradation as infill begins to occur in this designated growth area.
13. Chester River turbidity reduction and reintroduction of Oyster reef ecosystems. Note** This is contingent on survey. No funding is requested for this effort.	Shellfish Program, Fisheries Service, Maryland Department of Natural Resources.	Survey historic oyster beds for oyster suitability: Spring 2004. Convene and collaborate with County Oyster Committee to close an area as a sanctuary: Spring 2005. ** Plant oyster habitat and or seed, 2005. **	Survey of historic site. Measurement of site suitability. Pending suitability: oyster viability. Measurement of turbidity after oyster reef is established.	Survey, collaboration activities, habitat and seed planting: Shellfish Program, Fisheries Service, Maryland Department of Natural Resources.	Oyster gardening with citizen groups.	Historically oysters filtered the Chesapeake Bay water column in three days. Oysters can greatly affect turbidity, thus light, and thus the growth of beneficial submerged aquatic vegetation. The establishment of oysters in the Corsica River could play an innovative role in water quality (turbidity) improvement.
6. Submerged aquatic vegetation (SAV) reestablishment in Corsica River for water quality and ecosystem function improvement. Goal: One acre of historical SAV grounds.	Tidewater Ecosystem Assessment Service, Maryland Department of Natural Resources.	Test plots, public training, and ongoing monitoring: 2005. Utilize spatial water quality data to further delineate sites: 2005 to 2006. Plantings: 2005/2006.	Number of acres of submerged aquatic vegetation.	Test plot establishment, public training, public involvement, and monitoring: Tidewater Ecosystem Assessment Service, Maryland Department of Natural Resources and the Chester River Association.	Grasses in Classes Program in Corsica River watershed schools. Public assistance in monitoring. Eyes on the Bay Web Site, the Maryland DNR WRAS Web site, and other sites.	The use of spatial water quality data for restoration site selection will increase the likelihood of project success. The establishment of one acre of submerged aquatic vegetation (SAV) in the Corsica River will re-establish the historical component of ecosystem function and form and further improve water quality (clarity).
5. Main stem of	Tidewater	Buoy acquisition	Every 15 minutes: salinity,	Continuous monitoring	All data interactively	Measure success of

Implementation Strategies & Recommendations	Party responsible for meeting management objective	Schedule	Measurable indicators/ performance measures	Monitoring and party responsible for monitoring	Public involvement, outreach, or education component	Innovations or additional leverage or benefit
the Corsica River: Water quality monitoring.	Ecosystem Assessment Service, Maryland Department of Natural Resources.	and deployment: 2004. Viable data stream and link to Eyes on the Bay Web Site: 2004/2005.	dissolved oxygen, turbidity, pH, chlorophyll, temperature. Nutrient data will be collected every week.	every 15 minutes: salinity, d.o., turbidity, pH, chl, temperature. Weekly monitoring: nutrients. Tidewater Ecosystem Assessment Service, MD DNR.	displayed on the Eyes on the Bay Web Site.	cumulative land and water based management actions via temporally and spatially intensive monitoring station in Corsica River main stem.
9. Easements incentive program.$924/acre.Incentive bonus$1,848/ac.	Town of Centreville in partnership with conservation partners	Outreach and implementation: Fall 2004 to 2007.	Projected pounds nutrients reduced through change in land use and acreage conserved	Enrollment outreach and monitoring: Conservation easement holders.	Meetings with individual landowners.	Market incentive based plans.
11. Septic System Retrofits	Queen Anne's County Health Department & Upper Eastern Shore Trib. Team	Fall 2004 program discussions. Implementation 2005	Water quality samplings from completed systems	Queen Anne's County Health Department	Septic brochure and public workshops by Trib. Team & information promulgated by QAC P&Z	Establishes a tracking method for septic effluent, incentivizes system maintenance and broad public outreach.

*Cost estimates used above are taken from The Technical reference for Maryland's Tributary Strategies October 2002 and from local engineering estimating practices.

TABLE 5

Summary of Implementation Project Costs and Reductions			
Best Management Practice (BMP)	**Goal**	**Cost**	**Nutrient Reduction/Lbs.**
1. Nutrient Uptake	3,000 acres	$90,000.00	21,000 N, 570 P
2. AG Nutrient and Sediment Reducing Buffers	100 acres	($170/ac + staff) $67,000.00	9,188 N, 792 P
3. Whole Farm Nutrient Management and Horse Pasture Management	5 projects	($25,000.00/site) $125,00.00	15,977 N, 1,944 P
4. Household Pollution Reduction	400 acres	$3,696.00	634 N, 118P
5. Main Stem of the Corsica River: Water Quality Monitoring		$345,434.00	
6. Submerged Aquatic Vegetation (SAV) Reestablishment		$48,000.00	
7. Low Impact Development Technique in Ordinance Form		Ordinance $37,000.00/Regional BMPs $272,385.00	2,668 N, 236 P
8. Native Conservation Landscaping Demonstration Project		$78,410.00	Est. 70% Reduction
9. Easements Incentive Program	1,710 acres	($2,437.00 ac.) $4,167,270.00	
10. Creation of Non-Agricultural Wetlands		$22,000.00	
11. Septic System Retrofits		$141,000.00	28,905 N
12. EcoTeams		$93,500.00	
13. Turbidity Reduction		(cost for first 10 ac.) $145,000.00	
Total with All Programs, Complete		**$9,423,320.00**	
Total without Easements (9) and Total Septic Conversion (11)		**$1,378,550.00**	

V. Recommendations for Programmatic Change

Programmatic changes are perhaps the single most potent outcome of the Corsica River Watershed Restoration Strategy. It is here that the Town of Centreville and its neighboring Queen Anne's County can step beyond lip service to the environment and into a unique joint stewardship that transcends politics. Because the Town of Centreville is a separate political jurisdiction from Queen Anne's County with separate Codes and Laws, analysis of existing impairments needs to find a focus in the jurisdiction in which it occurs so that a cogent strategy can be developed to remedy each problem with a tailored programmatic change or inspection authority. The WRAS, above all, is not a political tool. It is an environmental tool. When issues like traffic, and growth, and quality of life, and economic development, and sense of place are measurably improved as a result of a true and vigorous dedication to the health of our Watershed, the real politics are not polemics for impact or power, but are rather in strong-willed changes in local and State codes and policies that shift watershed behaviors over time. There are many hammer handles in a single tree.

1. **The Town of Centreville** lies at the heart of the Corsica River Watershed and forms the confluence of the three major non-tidal Sub-watersheds. The Town is the sole point source contributor of nutrients to the Corsica River. The Town, as one of the State's Smart Growth Priority Funding Areas (PFAs) now known as "Priority Places", is the primary area for future growth in the watershed. The Town is the Seat of Government for Queen Anne's County. The Town has the most to gain from pro-active environmental stewardship and the most to lose for not pursuing the highest standards of environmental excellence. During the WRAS process several key pieces of proposed legislation have presented themselves that neatly and efficiently further overall WRAS implementation. These programmatic changes are:

- Ordinance to establish Sewer Allocation Management Plan
- Resolution to establish oversight and redundancy in monitoring of Sewerage, Water and Storm Drain infrastructure
- Development of Comprehensive Plan in cooperation with Queen Anne’s County that integrates the ethic and strategies of the WRAS throughout
- Ordinance for Stormwater Management and Water Quality Manual using LID techniques to the fullest (see strategy 7 above).
- Proclamation to establish the Centreville Wharf as a "Green Marina"
- Ordinance for sediment and erosion control inspection, and enforcement
- Ordinance for Urban Nutrient Management Plan
- CIP addition to include design and construction of regional stormwater management facilities on Town owned lands at the Millstream and Gravel Run

- Ordinance to establish an Urban Growth Boundary, the limits of which must be consistent with TMDL for a calculated maximum future conversion of agricultural land
- Ordinance establishing a "Greenbelt" together with a per unit assessment through the building permit process of impact fee for preservation targeted only to the greenbelt area

- Formal resolution to proceed with Wastewater Treatment Plant expansion to match Comprehensive Plan vision and to include Enhanced Nutrient Removal technology. (Formal resolution was adopted 8.12.04 authorizing the Town Manager to proceed with the search and negotiations for added spray field capacity).
- Ordinance setting the limits for phosphorous chemical commercial cleansers and TSP use within the Town
- Memorandum of Agreement to support the Implementation of the WRAS recommendations
- Promulgate ***Living Shorelines*** outreach piece and *UNR* tri-fold outreach pieces to all citizens and future building permit certificate of occupancy recipients.

2. **Queen Anne's County** government jurisdiction encompasses all of the land area outside of the Town of Centreville's corporate limits that is within the Corsica Watershed. This is virtually all the agricultural land within the watershed. The County's zoning and subdivision ordinance is codified in Title 18 of the County Code, and contains the regulations for any conversion of the land from agricultural to residential or other use of the lands that are not within the Town. The WRAS suggests the following recommendations for joint efforts between the County and the Town of Centreville:

- Enter an agreement with The Town of Centreville to jointly update the Town of Centreville's Community Plan for the area around the Town, which would become part of the County Comprehensive Plan
- Assist in disseminating the ***Living Shorelines*** outreach pieces and UNR tri-fold that is developed by the Town by displaying and distributing at County Offices
- Permit the placement of Watershed Boundary signs along County roads
- Include the WRAS keeper as a mandatory recipient of letters of notification sent to adjoining property owners in Title 18 -1-163(a)
- Consider a policy through the Queen Anne's County office of Environmental Health and the Queen Anne's County's Comprehensive Master Water and Sewer Plan to promote the use of nutrient reducing septic system technology on all new septic systems within the watershed with particular attention to systems within 300 feet of tidal water for new construction.

3. **Eastern Shore Land Conservancy** (ESLC) has agreed to the following programmatic and internal policy change:

- Add the WRAS data custodian to the list of the ESLC's standard **Research Request Form** recipients. This will enable ESLC to receive a list of documented impairments and remediation implementation strategies on subject parcels as part of their normal parcel investigation.
- Participate with the Town of Centreville and other conservation easement purchasers and trusts to target desirable easement outreach and acquisitions within the Centerville "Greenbelt."

Specifically, the following WRAS driven pilot easement incentive program:

Strategic Land Conservation Program—

Purpose: The watershed impairment addressed through this action is the threat posed by sprawl development to water quality, the land base needed to support agricultural economic viability, and the vitality and definition of the watershed's main growth center, Centreville.

This program would serve to provide a defined edge between town and rural lands of the watershed through a greenbelt. Specifically, the Town of Centreville would establish an urban growth boundary (UGB), and a platted greenbelt within the Town limits into which existing and new priority funding and incentives would be funneled by the Town of Centreville for easement acquisition and other land protection work.

The UGB could identify the extent to which Centreville envisions growing. The greenbelt then could serve to secure this perimeter by providing a buffer of lands protected from development (range from existing low density residential, to open space, to resource conservation, to agricultural land uses).

In addition to the Town's establishing the Centreville Greenbelt and making it a priority for funding, this Conservation Program should also include the development of an implementation toolbox of existing and new financing options and incentives by the Town of Centreville that are focused on providing protection of greenbelts lands. These options could range from agricultural land/open space fees adopted through annexation agreements, land banking process, inter-jurisdictional transfer of development rights program, fostering Town public sources of acquisition funding, Town easement tax incentives, and others as determined appropriate.

Monitoring/Evaluation:

- Town of Centreville to evaluate annual land protection priorities, budget and partnership needs related thereto.

Suggested Responsible Parties:

- Town of Centreville in coordination with Queen Anne's County: Jointly adopt an updated Town of Centreville Comprehensive Land Use Plan.
- Town of Centreville: Establish a definitive, platted greenbelt area within the Town Limits. Zoning in Town should then complement the intent of the greenbelt with such policies as restrictive residential zoning, agricultural/rural zoning, design guidelines for scenic protection for new development, and, if applicable, designation of greenbelt area as sending area for any related transfer of development rights program with Town acting as the receiving area.
- Town of Centreville: Establish policy of making greenbelt lands a priority for conservation funding
- Town of Centreville with its conservation partners: Establish the palette of existing and new financing options and incentives focused on providing protection of greenbelts lands.

4. **CRA** - The Chester River Association, in partnership with the Town of Centreville agrees to become custodian of the WRAS data sets as funding and expertise become available, to maintain the data and to respond to requests for information regarding impairments and implementation opportunities on parcels proposed for development in the County or Town and for conservancy candidates. Other duties of the WRAS keeper include finding and administering grants for waterway improvements and special projects, promote forums with the WRAS partners on watershed issues, etc. This initiative is intended to ensure that all the Chester River WRAS data is kept together with the intent to unify implementation efforts throughout the broader Chester River Basin.

VI. Conclusions

The Corsica River WRAS is truly unique in that it is the only WRAS sponsored by an incorporated municipality. The Town of Centreville has identified the health of the Corsica River as a key component to its heritage and its future. The Town believes that by taking a leadership role in the watershed restoration effort, precedent will be made for other towns across the state to seize control of their environmental destiny and open the way for detente between economic development and growth, and the preservation of a tangible quality of life and sense of place. It has always been the Town of Centreville's goal to ensure that no growth occur at the further expense of the environmental health of the Corsica River.

Recent notoriety surrounding operations and maintenance at Centreville's own superannuated wastewater facility, has brought to the fore the need for oversight and review of every facet of Town and County infrastructure that affects the health of the Corsica River.

The WRAS has identified impairments lying in both political jurisdictions and provides guidance to both on implementation opportunities and possible means to achieve water quality enhancement, expanded wildlife habitat, more sensitive land use conversions, and conservation.

The simple digital formats were used to build the working WRAS data skeleton. Added themes or digital layers have fleshed the bones of raw data allowing the WRAS partners to generate site specific portfolios of restoration projects for work parties, for funding searches, and for media outreach, to name a few. Data sets are available so that information mailings or newsletter events can be sent with ease. Special demographic or geographic property sets can be isolated for more efficient landowner notification if need, i.e., to all families residing within 300 feet of a riparian stream, or all citizens within the Critical Area, or all persons on a septic tank, or the taxpayer of the Town of Centreville, etc. Specific photographic maps can and will be created for the WRAS partners to keep the momentum of the WRAS alive. The Town of Centreville dedicates the open access to this data to the Corsica River and her many friends.

The stakeholders of the Corsica are many and varied. Their enthusiasm, energy, and urgency are unmatched. The Corsica River Watershed is the place where meaningful and immediate implementation can be made with the promise of timely and measurable environmental successes. The Town of Centreville and its stakeholder partners will continue to work cooperatively to fund required waterway improvements, execute crucial programmatic code and policy changes, and to assure that sustainable outreach efforts touch every watershed citizen.

VII. References

Clean Water Action Plan Technical Workgroup. 1998 Maryland Clean Water Action Plan Final 1998 report on Unifies Watershed Assessment , Watershed Prioritization and Plans for Restoration Action Strategies. Prepared by Clean Water Action Plan Technical Workgroup under the guidance of Maryland Bay Cabinet, Maryland State Conservationist, Representatives of local government, and Maryland's Tributary Teams. See

Maryland DNR. Oct. 2003 Corsica River Watershed Characterization. Prepared by Maryland Department of Natural Resources Watershed Services in partnership with the Town of Centreville and Queen Anne's County.
See

Yetman, K.T. 2001. Stream Corridor Assessment Survey: SCA Survey Protocols. Prepared by Watershed Restoration Division, Chesapeake and Coastal Watershed, Service, Maryland Department of Natural Resources.
See:

Maryland DNR. April, 2003. Report on Nutrient Synoptic Surveys in the Corsica River Watershed, Queen Anne's, Maryland, April 2003 as part of the Watershed Restoration Action Strategy. Prepared by Maryland DNR Watershed Services [Landscape and Watershed Analysis Nov. 2003. See

MDE April, 2000. Total Maximum Daily Loads of Nitrogen and Phosphorous for the Corsica River, (approved April 9,2000 by EPA). Prepared by Maryland Department of the Environment for Watershed Protection Division, U.S. Environmental Protection Agency, Region III
See: www.mde.state.md.us/tmdl

Maryland Department of Planning, 2003 edition. MarylandPropertyView® Prepared by: MDP -Planning Data Services Division. See

Maryland DNR, 2003 edition. DNR Technology Toolbox Prepared by, Maryland Department of Natural Resources, Chesapeake & Coastal Watershed Service, Geographic Information Services. See and

GLOSSARY

303(d) A section of the federal Clean Water Act requiring the states to report which waters of the state are considered impaired for the uses for which they have been designated, and the reasons for the impairment. Waters included in the "303(d)" list are candidates for having TMDLs developed for them.

319 A section of the federal Clean Water Act dealing with non-point sources of pollution. The number is often used alone as either a noun or an adjective to refer to some aspect of that section of the law, such as grants.

8-digit watershed Maryland has divided the state into 138 watersheds, each comprising an average of about 75 square miles, that are known as 8-digit watersheds because there are 8 numbers in the identification number each has been given. These nest into the 21 larger 6-digit watersheds in Maryland which are also called Tributary Basins or River Basins. Within the Chesapeake Bay drainage, 8-digit watersheds also nest into 10 Tributary Team Basins.

Anadromous fish Fish that live most of their lives in salt water but migrate upstream into fresh water to spawn.

Benthic Living on the bottom of a body of water.

CREP Conservation Reserve Enhancement Program, a program of MDA. CREP is a federal/state and private partnership which reimburses farmers at above normal rental rates for establishing riparian forest or grass buffers, planting permanent cover on sensitive agricultural lands and restoring wetlands for the health of the Chesapeake Bay.

CRP Conservation Reserve Program, a program of Farm Service Agency in cooperation with local Soil Conservation Districts. CRP encourages farmers to take highly erodible and other environmentally-sensitive farm land out of production for ten to fifteen years.

CWAP Clean Water Action Plan, promulgated by EPA in 1998. It mandates a statewide assessment of watershed conditions and provides for development of Watershed Restoration Action Strategies (WRASs) for priority watersheds deemed in need of restoration.

CZARA The Coastal Zone Reauthorization Amendments of 1990, intended to address coastal non-point source pollution. Section 6217 of CZARA established that each state with an approved Coastal Zone Management program must develop and submit a Coastal Non-Point Source program for joint EPA/NOAA approval in order to "develop and implement management measures for NPS pollution to restore and protect coastal waters."

CZMA Coastal Zone Management Act of 1972, establishing a program for states and territories to voluntarily develop comprehensive programs to protect and manage coastal resources (including the Great Lakes). Federal funding is available to states with approved programs.

Conservation Easement A legal document recorded in the local land records office that specifies conditions and/or restrictions on the use of and title to a parcel of land. Conservation easements run with the title of the land and typically restrict development and protect natural attributes of the parcel. Easements may stay in effect for a specified period of time, or they may run into perpetuity. (The majority of easements within the Corsica River Watershed are held in perpetuity with the exception of MALF)

DNR Department of Natural Resources (Maryland State)

EPA Environmental Protection Agency (United States)

Fish blockage An impediment, usually man-made, to the migration of fish in a stream, such as a dam or weir, or a culvert or other structure in the stream.

GIS Geographical Information System, a computerized method of capturing, storing, analyzing, manipulating and presenting geographical data.

MDA Maryland Department of Agriculture

MDE Maryland Department of the Environment

MDP Maryland Department of Planning

MET Maryland Environmental Trust, an organization that holds conservation easements on private lands and assists local land trusts to do similar land protection work.

NOAA National Oceanic and Atmospheric Administration, an agency of the U.S. Department of Commerce that, among other things, supports the Coastal Zone Management program, a source of funding for some local environmental activities, including restoration work.

NPS Non-Point Source, pollution that originates in the landscape that is not collected and discharged through an identifiable outlet.

NRCS Natural Resources Conservation Service, formerly the Soil Conservation Service, an agency of the U.S. Department of Agriculture that, through local Soil Conservation Districts, provides technical assistance to help farmers develop conservation systems suited to their land. NRCS participates as a partner in other community-based resource protection and restoration efforts.

Riparian Area 1. Land adjacent to a stream. 2. Riparian areas are transitional between terrestrial and aquatic ecosystems and are distinguished by gradients in biophysical conditions, ecological processes, and biota. They are areas through which surface and subsurface hydrology connect waterbodies with their adjacent uplands. They include those portions of terrestrial ecosystems that significantly influence exchanges of energy and matter with aquatic ecosystems (i.e., a zone of influence). Riparian areas are adjacent to perennial, intermittent, and ephemeral streams, lakes, and estuarine-marine shorelines. (National Research Council, *Riparian Areas: Functions and Strategies for Management*. Executive Summary page 3. 2002)

SAV Submerged Aquatic Vegetation, important shallow-water sea grasses that serve as a source of food and shelter for many species of fin- and shell-fish.

SCA[M] Stream Corridor Assessment is an activity carried out by DNR Watershed Services in support of WRAS development and other management needs, in which trained personnel walk up stream channels noting important physical features and possible sources of problems.

SCD Soil Conservation District is a county-based, self-governing body whose purpose is to provide technical assistance and advice to farmers and landowners on the installation of soil conservation practices and the management of farmland to prevent erosion.

Synoptic Survey A short-term sampling of water quality and analysis of those samples to measure selected water quality parameters. A synoptic survey as performed by DNR in support of watershed planning may be expanded to include additional types of assessment like benthic macroinvertebrate sampling or physical habitat assessment.

TMDL	Total Maximum Daily Load, a determination by MDE of the upper limit of one or more pollutants that can be added to a particular body of water beyond which water quality would be deemed impaired.
Tributary Teams	Geographically-focused groups, appointed by the Governor, oriented to each of the 10 major Chesapeake Bay tributary basins found in Maryland. The teams focus on policy, legislation, hands-on implementation of projects, and public education. Each basin has a plan, or Tributary Strategy.
Water Quality Standard	Surface water quality standards consist of two parts: (a) designated uses of each water body; and (b) water quality criteria necessary to support the designated uses. Designated uses of for all surface waters in Maryland (like shell fish harvesting or public water supply) are defined in regulation. Water quality criteria may be qualitative (like "no objectionable odors") or qualitative (toxic limitations or dissolved oxygen requirements).
Watershed	All the land that drains to an identified body of water or point on a stream.
WRAS	Watershed Restoration Action Strategy, a document outlining the condition of a designated watershed, identifying problems and committing to solutions of prioritized problems.

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Appendix 1

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The Town Council of Centreville

101 Lawyers Row
Centreville, Maryland 21617
410-758-1180
Fax 410-758-4741

Department of Police
Department of Streets
Department of Water and Sewer
Chesterfield Cemetery

March 21, 2003

440 BROWNSVILLE RD
CENTREVILLE MD 21617
Tax Map: 0044
Parcel: 0149

Dear EARLS CHAPEL CHURCH,

As fellow Corsica River Watershed residents, we write to invite you to join with the Town of Centreville and other watershed partners in an effort to inventory the condition of tributary perennial streams and shorelines in our forty square mile watershed. This field survey is to be performed as part of the Town's efforts to protect the natural resources within the Corsica River Watershed. Because these tributary waterways traverse your land, your help is crucial to our success. Since the Town of Centreville lies at the heart of this watershed, our future growth and present health are tightly tied to the water quality of the streams that run through the town and the tidal waters we front. The Town does not plan to grow and thrive at the further expense of water quality in the Corsica, and we hope you will join us in our efforts to improve the abundant river we share.

Our goal from this work is to develop a watershed plan, called a Watershed Restoration Action Strategy, for the Corsica River Watershed that identifies potential projects that will help us to protect and restore healthy stream ecosystems. Projects that could be recommended include: stream bank improvements, stream habitat restoration, enhanced wooded and grassed buffers, run-off management, stream road crossings improvements, low impact (environmentally sensitive) development strategies, land or rural preservation approaches, and enhanced nutrient reduction from our wastewater treatment plant. And, most particularly, we will identify possible sources of funding for these prioritized projects.

The first step in the program is to walk the streams; observing and noting various stream characteristics including natural areas, healthy ecological stream systems, as well as areas of erosion, poor buffers, fish blockages, or pipe out falls, and other points of environmental interest. Water samples will be taken for testing from 52 sites within the watershed, one of which may be along your stream frontage. Information regarding the overall health of the watershed will be compiled and presented at a public meeting in Centreville. Your participation in this meeting is welcomed and encouraged.

The Maryland Conservation Corps (part of the *AmeriCorps Program* to engage young volunteers) has been contracted by the Town of Centreville to perform the fieldwork for this baseline Stream Corridor Assessment. Your permission is requested to allow this team to visit your property as noted above by tax map and parcel. Each member of the trained team will be appropriately identified and will observe proper protocols and avoid any areas of your property which you may elect to restrict. It is anticipated that the crews will be in your area around the end of March. We will notify you and invite you to accompany the team on its visit if you like.

Permission to walk your property will allow this important phase of the project to move forward. Please expect a call from the Town Clerk or a Councilman seeking your specific permission and please be assured that we would never presume your permission until it is so confirmed. Please take this opportunity to reply with the enclosed postcard. Whether you grant us permission or not, your reply is greatly appreciated.

Your knowledge and current stewardship efforts are invaluable to us. We thank you for your support and hope you will join us for the watershed public meetings and events. During these meetings you will have an opportunity to meet with many of the partners participating in this effort including the Soil Conservation District, members of the farming community, the Eastern Shore Land Conservancy, Queen Anne's County, the Chester River Keeper, the Maryland Department of Natural Resources, and representatives from the development community. Please feel free to contact Danielle Lucid if you should have any questions, concerns or if you would like to be involved to a greater degree. She can be reached at 410-260-8726. You may also contact us at 410-758-1180 or 2237.

Sincerely,

Donna S. Turner
President

Michael O. Whitehill
Vice-President

Norman P. Pinder
Council Member

Appendix 2

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RESOURCE INVENTORY FOR CONSERVATION PLANNING

FIELD EVALUATION WORKSHEETS

Instructions

1. **Select the appropriate worksheet for each land use type in the planning area.**

   a. At a minimum, use one worksheet per land use, which may include one or more fields.

   b. In some cases, you may need to use more than one worksheet per land use if fields are large or conditions vary significantly from one field to another.

   c. Fields that are managed primarily as permanent hayland should be evaluated on a separate worksheet from fields managed primarily for pasture.

   d. For hayland that is in a regular rotation with cropland, evaluate it with cropland by using the "Cropland" worksheet.

2. **Assess the existing condition of resources in the planning area.**

   a. Inventory each land use in the planning area. Identify any concerns or problems affecting the use, management, and sustainability of soil, water, air, plant, and animal resources.

   b. Briefly note your observations on the appropriate worksheet. Each worksheet contains a list of planning concerns that are often associated with that land use. You may also identify additional concerns or problems—if so, make notes of them on the blank lines or in the margins of the worksheet.

   c. Also note whether there are any cultural resources or social and economic concerns that you may need to consider during the planning process.

   d. Use a copy of an aerial photo or plan map to mark field numbers and boundaries, slope lengths and percentages (for soil loss calculations), and the location of existing practices, buildings, specific problem areas (e.g., gullies), etc.

3. **When you have completed the planning process, file the field evaluation worksheets in the case file to provide supporting documentation for the conservation plan, and for future reference when working with the client.**

RESOURCE INVENTORY FOR CONSERVATION PLANNING
FIELD EVALUATION WORKSHEET

Cropland
(Includes Rotational Hayland)

Client Name:	**Address:**
Farm No./Tract No.:	**Total Cropland Acres:**
Evaluator:	**Date:**

PLANNING CONCERN	ASSESSMENT (LIST FIELD NUMBER(S):
General	
Crop rotation	
Soil	
Sheet and rill erosion	
Ephemeral erosion	
Gully erosion	
Off-site damage from sediment	
On-site damage from sediment	
Soil condition	
Other	
Nutrients	
Soil test	
Nutrient management plan	
Manure applications	
Manure testing	
Pests	
Weed infestations	
Pest Infestations	
Scouting	
Record keeping	
Other Features	
Sinkholes	
Drainage patterns	
Wet areas	
Cultural resources	

RESOURCE INVENTORY FOR CONSERVATION PLANNING
FIELD EVALUATION WORKSHEET

Pasture

Client Name:	**Address:**
Farm No./Tract No.:	**Total Pasture Acres:**
Evaluator:	**Date:**
Number & Type of Animals:	

PLANNING CONCERN	ASSESSMENT (LIST FIELD NUMBER(S):
Soil	
Erosion (sheet & rill; gully)	
Off-site damage from sediment	
On-site damage from sediment	
Predominant soil drainage class	
Streambank erosion	
Nutrients	
Soil test/Fertilizer management	
Livestock manure distribution	
Pasture Management	
Grazed acres	
Animal units & paddock size	
Livestock water distribution	
Season of grazing	
Duration/frequency of grazing	
Plant species composition	
Legume overseeding	
Fencing	
Pests	
Weed infestations	
Scouting	
Record keeping	
Other Features	
Sinkholes	
Drainage patterns	
Wet areas	
Trailing problems	

RESOURCE INVENTORY FOR CONSERVATION PLANNING
FIELD EVALUATION WORKSHEET
Permanent Hayland

Client Name:	**Address:**
Farm No./Tract No.:	**Total Permanent Hayland Acres:**
Evaluator:	**Date:**

PLANNING CONCERN	ASSESSMENT (LIST FIELD NUMBER(S):
General	
Predominant plant species	
Soil	
Sheet and rill erosion	
Ephemeral erosion	
Gully erosion	
Off-site damage from sediment	
On-site damage from sediment	
Soil condition	
Other	
Nutrients	
Soil test	
Nutrient management plan	
Manure applications	
Manure testing	
Pests	
Weed infestations	
Pest infestations	
Scouting	
Record keeping	
Other Features	
Sinkholes	
Drainage patterns	
Wet areas	

RESOURCE INVENTORY FOR CONSERVATION PLANNING
FIELD EVALUATION WORKSHEET

Farmstead

Client Name:	**Address:**
Farm No./Tract No.:	**Total Farmstead Acres:**
Evaluator:	**Date:**

PLANNING CONCERN	ASSESSMENT
Erosion	
Feedlot area	
Livestock travel lanes	
Waste storage	
Odors	
On-site composting	
Run-off	
Distance to receiving waters	
Septic system	
Sinkholes	
Wellhead protection concerns	
Other	

RESOURCE INVENTORY FOR CONSERVATION PLANNING
FIELD EVALUATION WORKSHEET
Woodland

Client Name:	**Address:**
Farm No./Tract No.:	**Total Woodland Acres:**
Evaluator:	**Date:**

PLANNING CONCERN	ASSESSMENT (LIST FIELD NUMBER(S):
Soil	
Gully erosion	
Sheet and rill erosion	
Off-site damage from sediment	
On-site damage from sediment	
Streambank erosion	
Livestock access	
Nutrient loading	
Stand Composition	
Species composition	
Age class	
Invasive species	
Management	
Forest management plan	
Harvest considerations	
Pest infestations	
Wildlife	
Plant species diversity	
Structural diversity	
Dead snags/den trees	
Extent of disturbance	
Frequency of disturbance	
Wet areas	

RESOURCE INVENTORY FOR CONSERVATION PLANNING
FIELD EVALUATION WORKSHEET
Natural Areas

Client Name:	**Address:**
Farm No./Tract No.:	**Total Natural Area Acres:**
Evaluator:	**Date:**

PLANNING CONCERN	ASSESSMENT (LIST FIELD NUMBER(S):
Soil	
Gully erosion	
Off-site damage from sediment	
On-site damage from sediment	
Streambank erosion	
Livestock access	
Nutrient loading	
Plant Community	
Species composition	
Invasive species	
Noxious weeds	
Pest infestations	
Wildlife	
Plant species diversity	
Structural diversity	
Extent of disturbance	
Frequency of disturbance	
Wet areas	
Management	
Habitat management plan	

600.5 Exhibits

Exhibit 1 **Sample Resource Checklist - Tailor to Meet State or Local Needs - Note: Items protected by Federal Law, Executive Order, etc., such as threatened and endangered species, cultural resources, and other items of like nature must remain on the checklist.**

Checklist of Resource Problems or Conditions

Soil Quality

Sheet/Rill Erosion; Ephemeral Gully Erosion; Classic Gully Erosion; Wind Erosion; Irrigation Induced Erosion; Mass Movement; Deposition; Streambank or Shoreline Erosion and Degradation; Phosphorus; Salinity; Contaminants; Compaction; Tilth; Crusting; Infiltration; Organic Matter; Other

Concern_____ Extent_____
Concern_____ Extent_____
Concern_____ Extent_____

Soil Quantity

Conversion of Agricultural Lands to Non-Agricultural Uses; Other

Concern_____ Extent_____
Concern_____ Extent_____
Concern_____ Extent_____

Water Quality (Surface Water)

Nutrients; Pesticides; Sedimentation; Animal Wastes; Salts; Loss of Riparian Vegetation; Loss of Wetlands; Streambank or Shoreline Erosion and Degradation; Water Temperature Extremes; Other

Concern_____ Extent_____
Concern_____ Extent_____
Concern_____ Extent_____

Animals - Wetlands

Impaired Water Quality from Agricultural or Non-Agricultural Sources; Loss of Wetlands / Loss of Adjacent Habitat; Loss of Plant Diversity; Threatened or Endangered Species; Sedimentation of Basins; Significant Hydrological Modification; Health; Other

Concern_____ Extent_____
Concern_____ Extent_____
Concern_____ Extent_____

Animals - Habitat Quality

Invasion of Non-Indigenous Plant or Animal Species; Loss or Fragmentation of Habitat; Inadequate Water Sources; Loss or Degradation of Forest, Grass Cover, or Riparian Habitat; Eutrophication of a Water Body; Water Temperature Extremes; Acid Rain; Other

Concern_____ Extent_____
Concern_____ Extent_____
Concern_____ Extent_____

Animals - Population

Loss of Diversity; Threatened or Endangered Species; Population Imbalance; Accumulation of Toxins; Health; Other

Concern_____ Extent_____
Concern_____ Extent_____
Concern_____ Extent_____

Human - Economics

Land; Labor; Capital; Management Level; Risk; Profitability; Other

Concern_____ Extent_____
Concern_____ Extent_____
Concern_____ Extent_____

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Appendix 3

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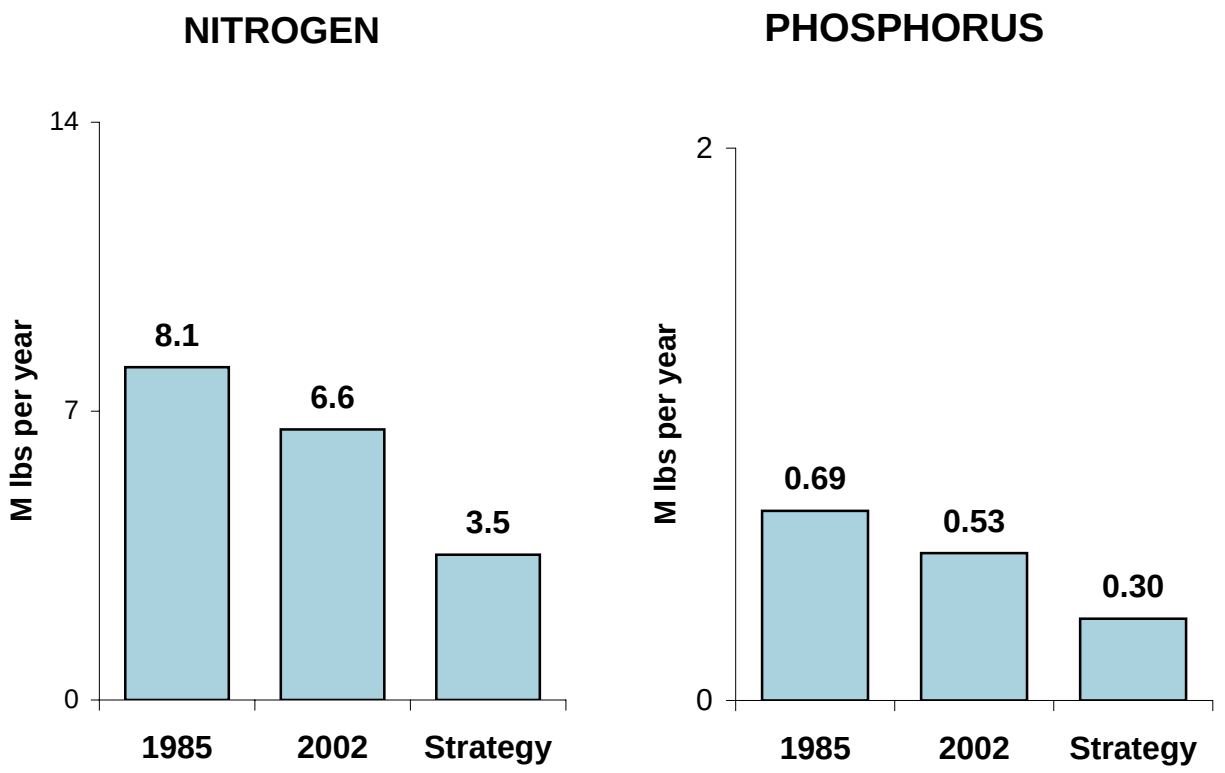
Table 1
Upper Eastern Shore Tributary Strategy

	NITROGEN (million pounds per year)			PHOSPHORUS (million pounds per year)		
Category	1985	2002	Strategy	1985	2002	Strategy
Agriculture	6.55	4.87	2.29	0.51	0.39	0.24
Resource Land	0.68	0.73	0.62	0.06	0.07	0.01
Point Source	0.22	0.31	0.19	0.05	0.03	0.02
Urban	0.62	0.65	0.41	0.06	0.05	0.03
Septic	0.24	0.27	0.15	0.00	0.00	0.00
Stormwater	0.38	0.38	0.26	0.06	0.05	0.03
Grand Total	**8.06**	**6.56**	**3.52**	**0.69**	**0.53**	**0.30**
	Goal: 3.52			Goal: 0.30		



NOTE: April 26, 2004, Strategy 6, includes 222,316 lbs/yr TN and 145,980 lb/yr TP reductions from Shore Erosion Control practices, subtracted from Mixed Open loads, and 300,000 lbs/yr TN reduction from Point Source loads.

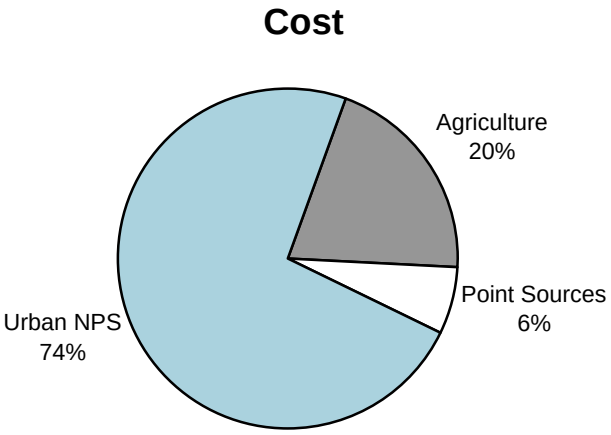
Table 2

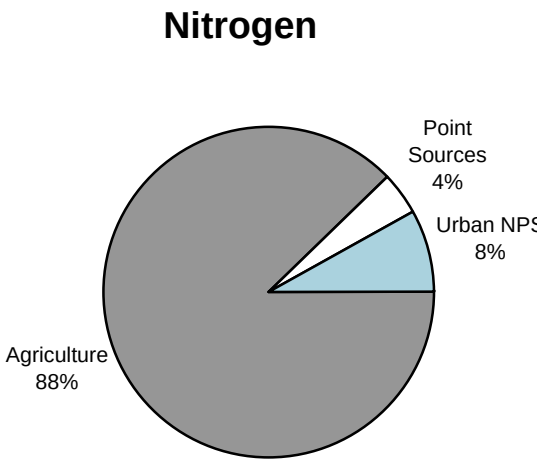
Upper Eastern Shore Tributary Strategy Best Management Practices

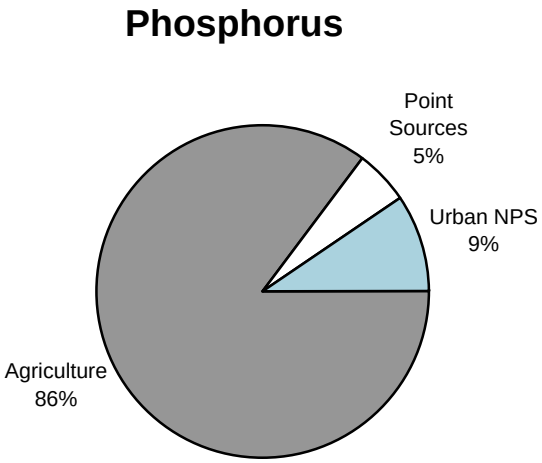
		Full Strategy 1985-2010	Remaining Strategy 2003-2010	
Best Management Practices	**Units**	**Units**	**Units**	**Costs (M$$)**
Agriculture				
Soil Conservation & Water Quality Plans	acres	252,862	138,306	$4.84
Conservation Tillage	acres/yr	152,047	151,587	$20.62
Cover Crops, Early	acres/yr	124,659	124,659	$39.89
Commodity Cover Crops, Early	acres/yr	31,165	31,165	$4.99
Alternative Crops	acres/yr	10,561	10,561	$2.11
Animal Waste Management - Livestock	systems	342	214	$13.60
Animal Waste Management - Poultry	systems	80	14	$0.37
Runoff Control	systems	148	116	$0.82
Nutrient Management	acres	252,862	155,161	$4.72
Precision Agriculture	acres	116,035	97,701	$10.94
Stream Protection With Fencing	acres	2,290	2,248	$0.22
Stream Protection Without Fencing	acres	1,411	525	$0.04
Retirement of Highly Erodible Land	acres	6,407	5,210	$0.63
Buffers Forested - Agriculture	acres	4,029	2,623	$2.62
Buffers Grassed - Agriculture	acres	14,162	13,598	$1.90
Tree Planting - Agriculture	acres	2,365	723	$0.44
Wetland - Agriculture	acres	3,414	2,542	$8.90
Horse Pasture Management	systems	285	285	$1.23
Alternative Manure Management	tons	7,297	7,297	$1.17
Ammonia Emmissions	systems	20	20	$0.26
Phytase Feed Additive	percent	32	16	*
Oyster Aquaculture	trays	0	0	$0.00
Urban				
Stormwater Management, New	acres	710	710	$2.48
Stormwater Management, Recent	acres	7,883	5,693	$19.93
Stormwater Management, Old	acres	13,812	13,812	$48.34
Stormwater Management, O&M	acres	22,404	2,527	$15.92
Erosion and Sediment Control	acres/yr	2,349	2,349	$108.99
Nutrient Management, Urban	acres	30,404	30,404	$0.19
Nutrient Management, Mixed	acres	90,409	90,409	$0.56
Buffers Forested, Urban	acres	184	151	$0.18
Tree Planting, Mixed Open	acres	58	38.77	$0.169
Tree Planting, Urban Pervious	acres	2,291	2,291	$9.98
Stream Restoration, Urban	linear feet	0	0	$0.00
Sprawl Reduction & Septics				
Sprawl Reduction	acres	1,396	1,396	$0.00
Enhanced Septic Denitrification	systems	25,203	25,203	$189.02
Enhanced Septic Denitrification O&M	systems	25,203	3,150	$34.02
Septic Connections	connections	3,797	311	$5.45
Point Sources				
WWTPs	BNR, ENR, plus 300,000 lbs/yr TN			$37.06
Shore Erosion Control				
Structural & Nonstructural, State	100,248 lbs/yr TN, 65,869 lb/yr TP			$0.00
Total Cost of Implementing Maryland's Tributary Strategy (Million $):				**$592.60**

Table 3
Upper Eastern Shore Strategy Summary Funding Analysis

	Total Cost	Nitrogen Reductions	Phosphorus Reductions
	Million $	Million lb/yr	
Agriculture	120.304	2.580	0.151
Point Sources	37.060	0.117	0.010
Urban NPS	435.234	0.239	0.017
Septics	228.500	0.125	0.000
Stormwater	206.735	0.114	0.017
TOTAL	$593	2.94	0.18







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Appendix 4

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Minutes
First Stakeholder Meeting for the Corsica River Watershed Action Strategy
March 4, 2003
Centreville Town Hall

Meeting Attendees:

Loring E. Hawes	QACo.Com.	410-758-1695	loringhawes@aol.com
Sabrina Fite	McCrone	410-758-2237	mccrone@dmv.com
Stephen Czwartacki	DNR	410-260-8981	sczwartacki@dnr.state.md.us
Royden N. Powell, III	MDA	410-841-5865	powellrn@dmv.com
Katrina Tucker	QAC	410-758-1255	ktucker@qac.org
Alison Putnam	QAC SCD	410-758-1671x121	alison.Putnam@md.usda.gov
Amy Owsley	ES Land Con.	410-827-9756	aowsley@eslc.org
Henry Covington Jr.	Farmer	410-758-2247	
Mark Sultenfuss	Farmer/WREC	410-827-7388	msulten@umd.edu
Eileen McLellan	Riverkeeper	410-708-3349	riverkeeper@chesterriverassociation.org
Deana Ashley	Clerk-Centrev.	410-758-1180	thallmgr@crosslink.net
Danielle Lucid	DNR	410-260-8726	dlucid@dnr.state.md.us
Mike Whitehill	McCrone/Cent.	410-758-2237	mccrone@dmv.com
Scott ---	Newspaper		

Invited but not attending today's meeting: Robert Wilson, Donald Dawkins, Henry Covington, Tom Pippen.

Mike Whitehill opened and welcomed all participants to the first meeting held for the Corsica River Watershed Action Strategy Stakeholders.

After brief introductions, Mike outlined his reasons for getting involved in watershed planning. He explained that the Town of Centreville was situated at the headwaters of the Corsica River and that, with the expected growth from the Town, the Corsica could be seriously impacted if growth and natural areas were not managed carefully. Mike indicated that in his opinion it was important to preserve land, form habitat corridors, and ensure that development occurred with the least impact. He said that everyone was going to have to share the burden of land protection and preservation. ("Everyone's ox will be gored"). Mike also discussed the wastewater treatment plant, the boundaries of the watershed, and the make-up of the population in the watershed. Mike said that there are 177 landowners in the watershed and that 101 of them were in the tidal areas (with septic systems).

Danielle Lucid from the Maryland Department of Natural Resources outlined the services that DNR provided to the Town of Centreville as a partner in the WRAS. The services included:

- a 100 mile stream corridor assessment,
- a research effort that would pull together and publish all the readily available data regarding this 8 digit watershed,

- a one time sampling of up to 80 sites to examine the water quality, fish species, and benthic community composition,
- and DNR would provide a part time coordinator to assist with the effort.

Danielle also outlined the required deliverables to be included in the final WRAS document or plan produced by the end of the process. Deliverables included:

- Participants agreed to assess all natural resources in the watershed
- Participants agreed to prioritize what they found to be important to protect or restore
- Participants must identify a number of prioritized, quantifiable, natural resource management goals
- Participants must include the public in both the development of the WRAS plan and as partners in the subsequent natural resource management goals
- The plan must include a monitoring strategy
- TMDLs that exist in the watershed must be addressed

Meeting participants then took turns to express their concerns or hopes for the watershed. Participants expressed the following ideas:

- Agriculture is an economic engine to be maintained
- Need to preserve agriculture
- Want to keep the rural nature of the area
- Education is important
- Need land protection for the agriculture industry
- Maintain the rural quality of life and agriculture enterprises
- Agriculture could change with market
- Cover crops are good, would like to show that agriculture has put forth great efforts towards water quality, they need credit for their work
- Need more emphasis on BMPs.
- Developers build and property taxes burden the home owners while the developers get rich
- Storm water / Chestertown runoff is a big problem
- Queen Anne's County needs to be involved and "sign-off" on the WRAS
- There is a need to manage growth, implement Low Impact Development, have a wildlife travel corridor, wetlands, maintain esthetics and quality of life, preserve natural landscapes
- Approach this from the global picture
- Should include component for cover crops
- Focus on nontidal wetlands and both big and small local hands on efforts
- The water quality must be saved
- The WRAS should be interjurisditional
- This is good for baseline info
- Need to look at sludge and excess irrigation
- Need to look at dredging landing, waterman, seafood, and recreational boaters
- Need more diversity in our stakeholders suggestions included:

- Water quality agency
- Commercial infrastructure
- Waterman (Clay Laramour was recommended)
- Recreation and parks
- Gunston School
- Other developers (W. Calvin Gray, Jr. was recommended)

Letter to landowners was reviewed. Attendees took time to review the draft letter to landowners seeking permission to walk the streams found on their properties. Suggestions were incorporated and revisions were made.

The "Charge to the Steering Committee" was reviewed. The participants seemed to think that the charge as stated was sufficient: "Through collaboration and in cooperation with other partners, provide recommendations that will help direct the development of the watershed plan for the Corsica River Watershed".

Members then discussed which days would be best for meeting in the future. Day time seemed to be the best time for most people, nearing the end of the day would accommodate most schedules, and targeting rainy days would be ideal for the farmers. Thursdays were not good and would be avoided. Future meetings will try to accommodate these needs. Stakeholders would meet about 5 times during the two-year development process (or when needed) and would be kept informed about the workgroup meetings in case they had an interest in attending.

Attendees were thanked for their participation and the meeting was adjourned.

Minutes
Corsica WRAS Stakeholders Meeting
Friday, July 18, 2003
9:00 a.m.
101 Lawyers Row
Centreville, Maryland

Attendance
Mike Whitehill, Niles Primrose, Ken Shanks, Ken Yetman, Sabrina Fite, Bill Jenkins, Frank Digialderado, Bob Wilson, Don Dawkins, Jenny Rhodes, Alison Putman, Katrina Tucker, Mitch Keiler, Deana Ashley, Loring Hawes, Susan Phelps Larcher.

Review of Stakeholder concerns
Danielle Lucid, DNR, reviewed the list of stakeholder concerns from the last meeting. These items, she indicated, must be kept in the forefront of everyone's minds as the work to develop a strategy moves forward. Two more concerns or visions for the watershed were added: the need for scenic byways, and the reduction of nitrogen and sedimentation.

The "Charge of the Steering Committee" was reviewed
Steering Committee Charge: "Through collaboration and in cooperation with other partners, provide recommendations that will help direct the development of the watershed plan for the Corsica River Watershed."

Ken Yetman discussed the preliminary results of the Stream Corridor Assessment
Ken Yetman, DNR, indicated that the SCAM revealed 58 erosion sites, 57 pipe outfalls (one with black discharge), 54 fish blockages (mostly logs), 34 sites with inadequate buffers, 8 trash dumping sites, 4 exposed pipes, 4 construction sites, and 11 unusual conditions (some with red flock). Over 300 photographs were taken. The team will produce the finished product by September. In mid-August the team will conduct the shoreline survey. Mike Whitehill indicated that at the completion of the data collection phase, he would like to invite all homeowner to join us as we review the data.

Niles Primrose, DNR, reviewed the Synoptic Survey data
Niles Primrose discussed the results of the Synoptic Survey. 51 sites were sampled. All sites were sampled for nutrients and 11 sites were also sampled for fishes and benthic organisms. Averages compared similarly to other agricultural watersheds. Some areas however had excessive (greater than 5 milligrams per liter nitrate and nitrite) concentrations. When adjusted for loadings, many areas were in excess of .3 kilograms per hectare per day. Phosphorus showed similar results. An anomaly, (low in pH values, and excessive conductivity), at one site was explained by an historical dredge deposition.

Ken Shanks, DNR, reviewed the contents of the draft Characterization report
Ken Shanks reviewed the contents of the draft Characterization and discussed how some of the data could be used to guide management decisions. Ken pointed out reasons that the watershed was considered for the WRAS (impairments for nutrients, fecal coliform

bacteria, sediment, biological limitations, and toxins such as PCB, dieldrin, and mythel mercury). These issues, he recommended, the group keep in mind as they develop the strategy. The TMDL also has "caps" for nutrients that should be addressed in the strategy as well. The watershed, dominated by agriculture, has significant associated activities that impact the watershed and which could, if enhanced for water quality protection, make a significant difference in the water quality of the tributaries. The fish spawning areas, historical oyster beds, and intermittent SAV near the mouth of the river are areas of noting as well. There are also four green infrastructure hubs in the watershed that could be considered. Ken said he would put the draft Characterization document on the web, per the group's request, and he would email the address to them.

Mike Whitehill discussed next steps

Mike Whitehill briefly discussed the low impact development regulations from North Carolina and his interest in modeling Centreville's codes after NC's very successful effort. This was, Mike indicated, a subject that would be discussed at greater length in the future. Mike also indicated again his desire to invite watershed residents to a larger meeting and present the findings to them.

Meeting Adjourned

Minutes
Corsica River Watershed Action Strategy
Data Review Meeting
November 21, 2003

Meeting Attendees:

*Loring E. Hawes	QACo.Com.	410-758-1695	loringhawes@aol.com
*Sabrina Fite	McCrone	410-758-2237	mccrone@dmv.com
*Stephen Czwartacki	DNR	410-260-8981	sczwartacki@dnr.state.md.us
*Royden N. Powell, III	MDA	410-841-5865	powellrn@dmv.com
*Katrina Tucker	QAC	410-758-1255	ktucker@qac.org
*Alison Putnam	QAC SCD	410-758-1671x121	alison.Putnam@md.usda.gov
*Amy Owsley	ES Land Con.	410-827-9756	aowsley@eslc.org
*Eileen McLellan	Riverkeeper	410-708-3349	riverkeeper@chesterriverassociation.org
*Danielle Lucid	DNR	410-260-8726	dlucid@dnr.state.md.us
*Mike Whitehill	McCrone/Cent.	410-758-2237	mccrone@dmv.com
*Niles Primrose	DNR	410-260-8804	nprimrose@dnr.state.md.us
*Frank DiGealleonardo			frankdig@friend.ly.net
*Ken Yetman	DNR	410-260-8812	kyetman@dnr.state.md.us
*Mitch Keiler	DNR	410-260-8806	mkeiler@dnr.state.md.us
*Bob Wilson		410 758-0882	

* Indicates that they signed in.

Invited but not attending today's meeting: Mark Sultenfuss Donald Dawkins, Henry Covington, Tom Pippen.

Welcome and introductions: The meeting opened with participants browsing maps and enjoying coffee and pumpkin pie. Participants were introduced and the group reviewed the visions that stakeholders expressed throughout the WRAS process. See last page.

The data review process: As a partner in the WRAS process, DNR provided to the Town of Centreville a Stream Corridor Assessment, a Synoptic survey, and a comprehensive assessment of the watershed, called a Characterization. The authors of these efforts worked as a team and brought together the data for review and consideration by the stakeholder group, in an iterative, interactive, GIS layered presentation. As a result of the all day process, management issues, concerns, and ideas, were identified by the group. (These management issues, concerns and ideas were subsequently developed into management objectives and submitted to EPA as the "Corsica Watershed Initiative Proposal").

The following were the management issues, concerns, and ideas found in the Corsica Watershed by the stakeholders in attendance:

Tidal portion –

- Fecal coliform
  - Septic systems
  - Point sources

- Sedimentation
  - Cropland
  - Construction
  - Bare Soil
  - Shore erosion
  - Stormwater

PCB and other toxics

- Centreville electric
- County “roads yard”
- Centreville wharf area spoils
- Dredging in general
- Agricultural chemical plant
- Fish advisory

Land preservation

- Resource based
- Agriculture
- Priority funding
- Protected lands
- Easements
- Ad districts
- MALP

SAV

- Monitor water quality, first year
- Establish in river, second year

Wetlands

- Identify buffer gaps
- Close gaps with program (to be developed)
- Tidal restoration
- Beneficial use of dredge spoil
- Identify wetlands in headstreams or agricultural areas
- Search for hydric soils/stream corridors/ w/inadequate buffers in ag areas
  - Sweeten pot
  - Use existing programs
  - Make awards

CREP (one of several discussions)

- Get map from SCD
  - Identify gaps
  - Target both CREP and EPA funds

Forest Area Set asides

Septic Areas (one of two discussions)

- From Synoptic Survey
  - Target red areas

Stormwater

- From Synoptic Survey
  - Habitat and benthic issues from road impacts
  - See 301/305 and other intersection crossings (both state and county roads)
  - Accelerate inspections, look for SHA funding

Dredge Spoil

Forested erosion sites

- See quantity flow
  - Agriculture – try for wetlands
  - Imperviousness – try to limit
  - Try for recharge
  - Road crossing and roads (stormwater)
  - Enhanced buffers
  - Key restoration
  - Grass waterways
- Specifically
  - See: Gravel Run impairments (in a pfa) – habitat survey/profile assmnt.
  - See: Inadequate buffer in head of stream leading to downstream erosion
  - See: Regional old town street (?) water system retrofits

Cover Crops

- Earlier planted cover crops
  - Increased incentives
  - Fly into standing crop
    - 15,000 acres
    - 5000 cover crops
- Headwater buffers
- NM plans
- Demonstration Crop Insurance
- Precision farming
- Intensive soil sampling
- Time-release fertilizers
- Assessing residual fall N

Farm tours and education efforts

Oysters

Sanctuaries

Review historic sites for suitability of replant
Review water quality
Plant oysters

Septic systems (riparian and tidal)

Search for failing systems, use MDE and dye tabs, include DNR, County Health Department, MDE, and developers.

Old systems

Monitor
Upgrade
Monitor

New systems

Monitor
Install
Monitor

Both systems

Monitor
Maintenance
Monitor

Urban stormwater

Storm septer
Regional facility
Urban nutrient management plans
Low Impact Development

Centreville takes authority

Education

Urban storm water retrofits, LID

Restoration

Gravel Run demonstration, pfa, trail, park, fish blockage removal "planning"

Green print

Fill in with buffers/ CREP
Easements

Appendix to the minutes:

Review of deliverables that must be included in the final WRAS document at the end of the process:

- Assessment of all natural resources in the watershed

- Identify what is important to protect or restore
- Identify many prioritized, quantifiable, natural resource management goals
- Participants must include the public in both the development of the WRAS plan and as partners in the subsequent natural resource management goals
- The plan must include a monitoring strategy
- TMDLs must be addressed

Review of participants concerns and hopes for the watershed

- Agriculture is an economic engine to be maintained
- Need to preserve agriculture
- Want to keep the rural nature of the area
- Education is important
- Need land protection for the agriculture industry
- Maintain the rural quality of life and agriculture enterprises
- Agriculture could change with market
- Cover crops are good, would like to show that agriculture has put forth great efforts towards water quality, they need credit for their work
- Need more emphasis on BMPs.
- Developers build and property taxes burden the home owners while the developers get rich
- Storm water / Chestertown runoff is a big problem
- Queen Anne's County needs to be involved and "sign-off" on the WRAS
- There is a need to manage growth, implement Low Impact Development, have a wildlife travel corridor, wetlands, maintain esthetics and quality of life, preserve natural landscapes
- Approach this from the global picture
- Should include component for cover crops
- Focus on nontidal wetlands and both big and small local hands on efforts
- The water quality must be saved
- The WRAS should be interjurisditional
- This is good for baseline info
- Need to look at sludge and excess irrigation
- Need to look at dredging landing, waterman, seafood, and recreational boaters
- Need more diversity in our stakeholders suggestions included:
    - Water quality agency
    - Commercial infrastructure
    - Waterman (Clay Laramour was recommended)
    - Recreation and parks
    - Gunston School
    - Other developers (W. Calvin Gray, Jr. was recommended)

Review of the "Charge to the Steering Committee": "Through collaboration and in cooperation with other partners, provide recommendations that will help direct the development of the watershed plan for the Corsica River Watershed".