



MARYLAND RIVERS STUDY

Tributaries of the Chesapeake Bay



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MDNR



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MARYLAND RIVERS STUDY

Tributaries of the Chesapeake Bay



Restoring the Chesapeake

This Study describes the valuable resources of fifteen of Maryland's most important tributaries and it is part of the Department of Natural Resources's continuing effort to provide citizens with information to help them support the growth of Maryland's Scenic and Wild Rivers Program.

We are all responsible for the preservation of the Chesapeake Bay and each of us can help make a difference. Every river system leading to the Bay is important, and I would like to ask that you join Governor Schaefer's *One Million Marylanders for the Bay* program to show your commitment and support for the Bay clean-up.

Torrey C. Brown, M.D.
Secretary
Maryland Department
of Natural Resources

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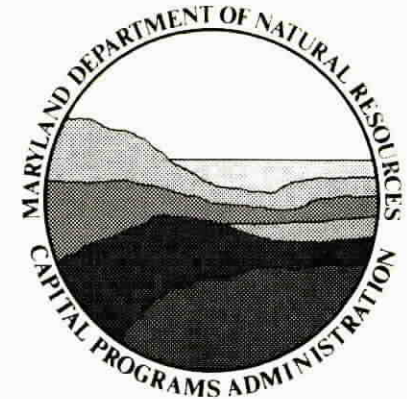
Prepared by

National Park Service
Division of Park and Resource Planning

and

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Scenic and Wild Rivers Program

1988



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PREFACE

The Maryland General Assembly passed the Chesapeake Bay Critical Areas Legislation in 1984 for purposes of protecting and preserving the unique and abundant resources of the Chesapeake Bay estuary. A 1000-foot buffer strip was established around the Bay, landward of all tidal waters, to provide immediate protection against the uncontrolled and unwise development of the Chesapeake's wetlands and shorelines. Various land-use activities within this area were restricted pending the development of local land-use management plans (called Critical Area Management Plans), which are aimed at addressing the conservation of various Bay resources specified by subsequently developed regulations (COMAR 14.15.). This, it was hoped, would signal a firm commitment by the State of Maryland to pool its local jurisdictional resources and address once and for all the severe problems that threaten the health and prosperity of the Bay.

Limiting land-use activities within a designated buffer or critical area is a crucial first step toward effecting a Bay cleanup. The management of this 1000-foot buffer will undoubtedly contribute to efforts to restore the Bay; however, only a comprehensive regional approach to land-use planning within the Bay's entire watershed can truly solve the complexity of environmental and ecological problems that confront the Bay. A mechanism must be identified that facilitates the wise use of resources within the Bay's watershed.

The Maryland Scenic and Wild Rivers Program maintains as a policy the preservation and protection of the natural values of Maryland's rivers, the enhancement of water quality, and the fulfillment of vital conservation purposes by the wise use of resources within watersheds. The magnitude of the conservation intent of the Chesapeake Bay Critical Areas Legislation and ensuing regulations prompted the Maryland Scenic Rivers Program to change its priorities. The Program's legally defined policies and objectives were designed to allow for participation in the Bay cleanup effort. The mandated charge for the Program to inventory all rivers, portions of rivers, and related shorelines in the State to determine eligibility for inclusion in the Maryland Scenic

and Wild River System was concentrated on those waterways that are tributaries to the Chesapeake Bay.

This document is a summary of that tributary rivers inventory study. It was conducted jointly by the U.S. National Park Service's State and Local Rivers Conservation and Assistance Program and the Maryland Department of Natural Resources' Scenic and Wild Rivers Program; and is the third in a series of river inventories produced by the Scenic Rivers Program that attempts to determine which rivers within the State are worthy of "scenic" or "wild" river status, and should be included in the State River System as mandated by law (S8-402[f]).

The states of Virginia, Pennsylvania, West Virginia, Delaware, New York, and the District of Columbia have all pledged to respond regionally and participate in the effort to clean up and protect the Chesapeake Bay. Within the Maryland state government, only the Maryland Scenic and Wild Rivers Program is designed to comprehensively address watershed planning in conjunction with local governing jurisdictions. This "scenic river planning" approach provides an innovative and creative means through which important river conservation can be developed and implemented, and the Bay cleanup effort assisted.

If the cleanup of the Bay is to ever be realized, then efforts must be initiated to identify those watersheds that are relatively undeveloped, that provide significant habitat, volumes of fresh clean water, and important recreational and aesthetic benefits. Those river systems must be permanently protected.

This philosophy is the goal of the Scenic Rivers Program and it is a start to saving for future generations the beauty and heritage that is Maryland's . . . and Maryland's Chesapeake Bay.



INTRODUCTION

The Maryland Scenic and Wild Rivers Act of 1968 as amended in 1984 called for the development of a Scenic and Wild Rivers System. This system was designed to protect the water quality and assure the wise use of Maryland's river resources possessing outstanding ecologic, historic, agricultural, fish, wildlife, recreational and other values of present and potential benefit to the citizens of the State. The legislation designates initial components of the State's Scenic and Wild Rivers System and also states that in addition to the rivers already designated:

"... the Department shall inventory and study every other river and related shoreline in the State and identify rivers and their shorelines or portions of them eligible for inclusion into the system as either a scenic or wild river."

In response to this directive, there have been three studies conducted which have inventoried a total of forty-nine rivers. The first study, Scenic Rivers in Maryland, was prepared in 1970 by the Maryland Department of State Planning in cooperation with the Scenic and Wild Rivers Review Board. Subsequently, in 1971, five rivers—the Patuxent, Pocomoke, Youghiogheny, Severn, and Wicomico (including Zekiah Swamp), were recommended and adopted as either wild and/or scenic, and became the initial components of the Maryland Wild and Scenic Rivers System. Added later were Deer Creek,

the Monocacy and Anacostia Rivers, and those areas of the Potomac in Frederick and Montgomery Counties.

A second study, prepared in 1984, assessed 25 rivers. It was conducted at the request of the State with staff assistance provided by the U.S. Department of the Interior, National Park Service Mid-Atlantic Regional Office, State and Local River Conservation Assistance Program. This assistance is provided under Section 11 of the National Wild and Scenic Rivers Act (Public Law 90-542, as amended).

Seven rivers were found to merit consideration for inclusion into the Maryland Scenic and Wild Rivers System as a result of the 1984 study. They are the Chester River, Choptank River, Blackwater River, Nanticoke River, Patapsco River, Marshyhope Creek, and the Chicamacomico River.

This third study assessed the remaining 15 tributaries to the Chesapeake Bay. The purpose of this effort was to identify, describe and assess the natural, cultural and recreational river related resources to establish a list of rivers which qualify for scenic or wild designation under the provisions of the Maryland Scenic and Wild Rivers Act. This study found eight rivers; the Susquehanna River, Miles River, Broad Creek, Tred Avon River, Manokin River, Bush River and Harris Creek; that merit consideration for inclusion in the Maryland Scenic and Wild Rivers System.



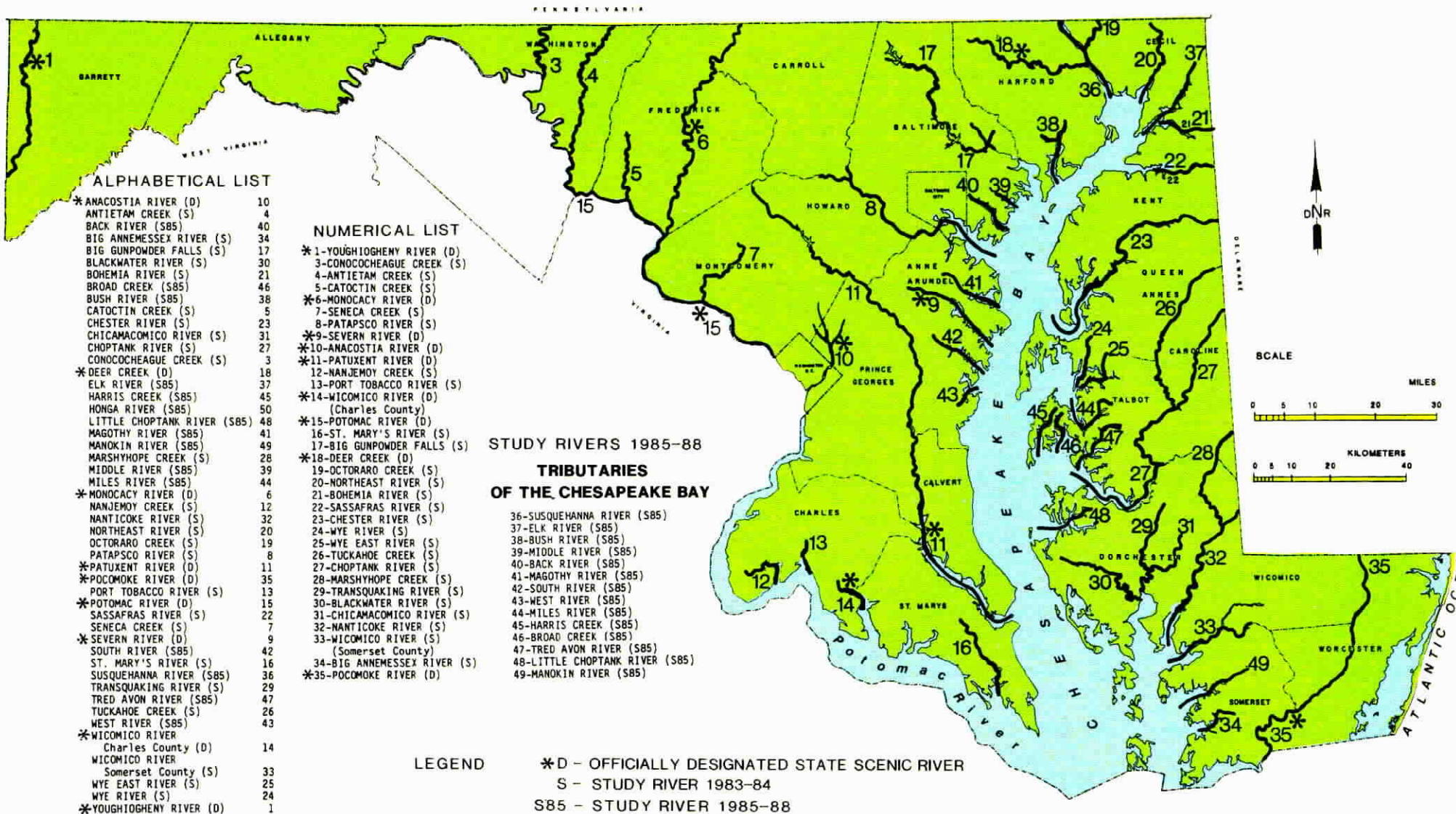
The 1984 Maryland Rivers Study recommended seven rivers for inclusion in the Maryland Scenic and Wild Rivers System, pictured above, left to right, top to bottom, are riverscapes from the Chester, Choptank, Blackwater, Nanticoke, Patapsco Rivers, Marshyhope Creek, and the Chicamacomico River



(Opposite): Riverscape scenes of the nine rivers composing the Scenic and Wild Rivers System (Left to right, top to bottom): Patuxent, Pocomoke, Youghiogheny, Severn, Wicomico, Deer Creek, Monocacy, Anacostia, and Potomac

THE MARYLAND SCENIC & WILD RIVERS PROGRAM

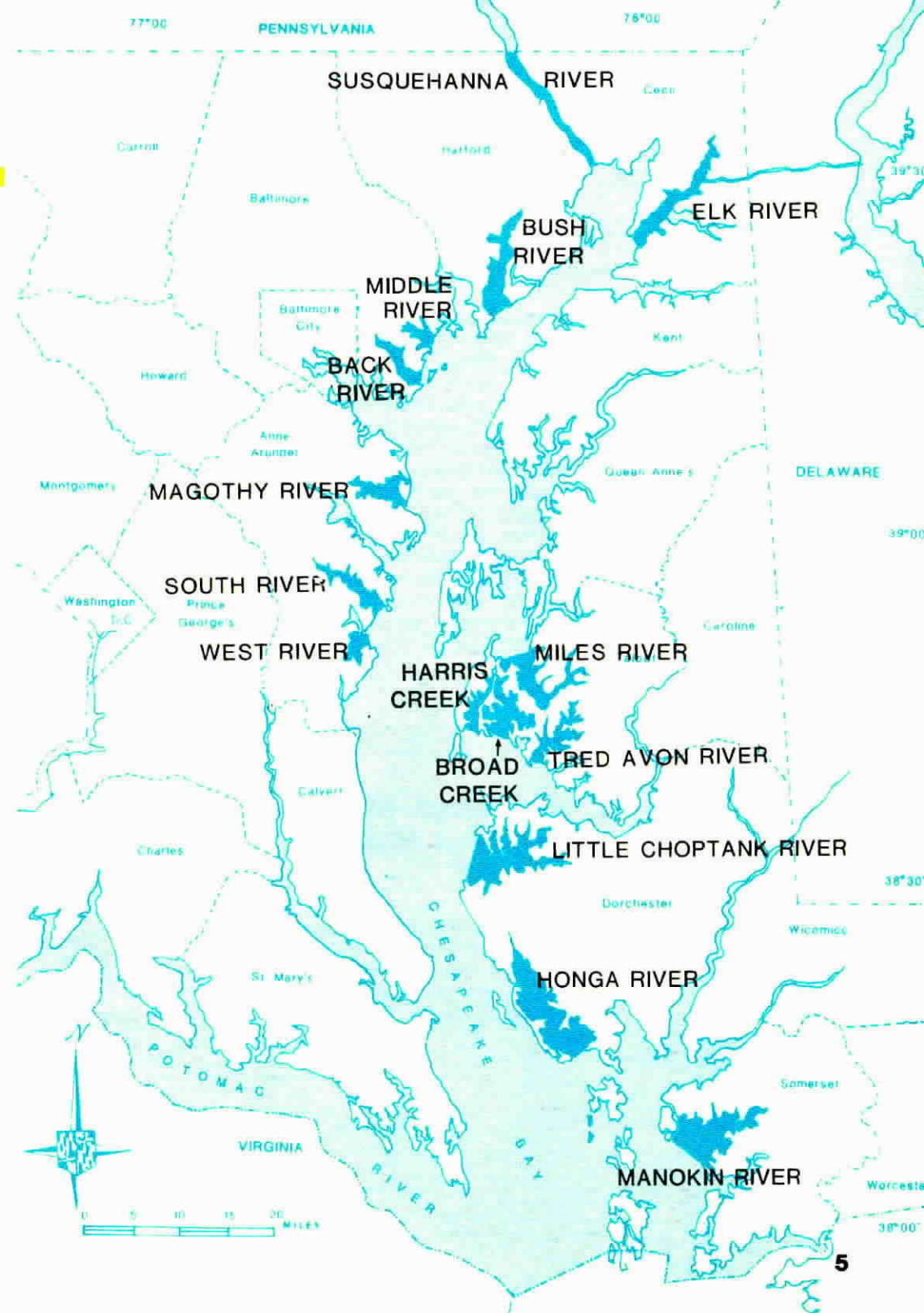
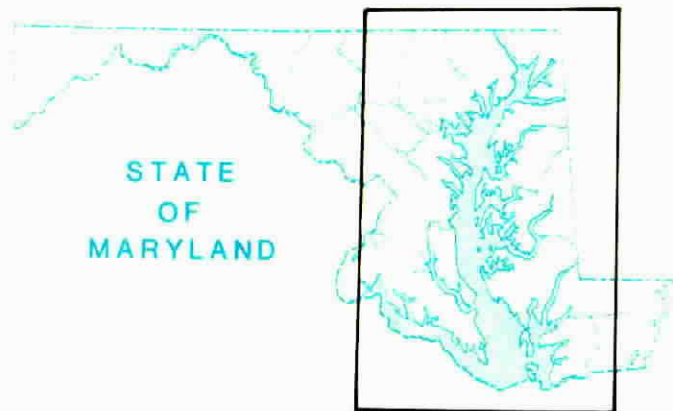
Designated and Study Rivers, 1983-1988



LOCATION MAP

Study Rivers 1985-88

Tributaries of the Chesapeake Bay



MARYLAND RIVERS STUDY METHOD

1. Why were the 15 inventoried rivers selected?

The Chesapeake Bay, the largest estuary in the world, is a valuable national as well as regional water resource. During recent years, multi-governmental agencies and others have combined efforts to restore the ecological vitality of the Bay. Since the tributaries that flow into the Chesapeake have a significant impact on its ecological, scenic and recreational well being, the Maryland Scenic and Wild Rivers Program determined that this river study should complete the assessment process for all the Bay tributaries. Fifteen other major tributaries of the Bay were previously examined by the two earlier studies.

2. How much of a river corridor was included in this study?

The area extending approximately ¼ mile from the shoreline on both sides of each river was studied. Research and documentation of resource information was limited to the river mainstem.

3. What kind of information was collected for each river?

The most up-to-date resource information was made available by federal, state and local government agencies and private sources. The natural, cultural and recreational resource categories were chosen to best reflect the intent of the Maryland Scenic and Wild Rivers Act. This Act notes that rivers and streams which fall into the following descriptions are eligible for inclusion in the Scenic and Wild Rivers System.

1. Trout streams and wetland areas the Department of Natural Resources designates.
2. Spawning and propagation areas the Department of Natural Resources outlines.
3. Streams and rivers with scenic and aesthetic value of statewide significance the Department of Natural Resources outlines.
4. Existing or proposed public land adjacent to the rivers and streams in the state.
5. Sections of any river or stream where no development exists on either side of the river or stream for a distance of one-quarter mile from the mean high water line of the river or stream.
6. Sections of any river or stream where limited development exists but is compatible with the wise use of the resources.

7. Sections where encroachment is imminent and would lead to degradation of the river or stream, to some form of pollution, or adversely affect the intent of this subtitle.

8. Sections of any river or stream important as food production areas, areas supporting migratory waterfowl, and spawning areas for shellfish.

Based on the above descriptions and other information in the Scenic and Wild Rivers Act, the following river data categories were used for the purposes of this study. These data categories were used as the basis for evaluating the rivers.

RIVER DATA CATEGORIES

NATURAL

- water quality
- upland vegetation
- wildlife
- wetlands
- fisheries
- agricultural lands
- undeveloped lands

CULTURAL

- historic resources
- archeological resources

RECREATIONAL

- public lands
- recreational boating

Questions and Answers

4. How was the information collected?

The information was collected by:

- Researching information from government agency reports and inventories
- Interviewing river resource experts
- Conducting resource surveys

5. How were the rivers evaluated and assessed?

The objective of the study was to determine which rivers should receive priority attention under the Maryland Scenic and Wild Rivers Program. In order to achieve this objective, resources of importance to the program were identified and evaluated. For each category, comparable information, which is identified in the resource category sections, was collected for each river. The data was then reviewed by the study participants and an evaluation system was developed to determine which rivers were most significant in each category. The criteria used varied depending on the type of data, but in general, an attempt was made to recognize the comparative

level of resource significance and the importance of the resources as they relate to the river and the state.

The next step involved combining resource category information for all the study rivers to determine which rivers were most significant. All resource categories were given equal value. By identifying the number of high ratings given to each river, it became apparent that certain rivers had more outstanding resources than others. The matrix in the River Resource Assessment Findings section summarizes the findings of the evaluation process. Based on the composite of the resource values, each river was placed into one of three significance groups. These groups represent a hierarchy of the cumulative resource values.

6. How will this study be used?

The report is intended for use by the State of Maryland's Scenic and Wild Rivers Program staff in determining where efforts in river conservation should be focused, and it will also serve as a basis for making recommendations to the Scenic and Wild Rivers Review Board regarding rivers to be nominated for designation into the State rivers system.

Possible other uses of the study are to:

1. Provide a focus for state efforts to effect federal/state/local consistency for river related programs and planning.
2. Identify resource planning priorities for:
 - State, regional, and local river management planning
 - Federal, state, and local government technical assistance
 - Fiscal investment and allocation
 - Facility development and land acquisition
3. Provide a framework for river conservation and development legislation.
4. Provide a framework for federal and state environmental impact review studies.
5. Provide a framework for river resource conflict avoidance and mitigation activities.
6. Provide a focus for private river conservation efforts.
7. Provide input to and coordinate the application and consistency of a variety of existing state programs and regulations.



Situated at the mouth of the Susquehanna River, the Concord Point Lighthouse, Havre de Grace, Harford County, was constructed in 1827 and has been in almost continuous use to this day. It has been recorded on the National Register of Historic Places nomination form, is operated by the U.S. Coast Guard, and is located on a small public park on the river bank. (Information courtesy Maryland Historical Trust, Annapolis. Photo Josephine Thoms)

RESOURCE CATEGORY EVALUATIONS AND FINDINGS

The Following Section Details the Assessment Process and Findings for Each of the River-related Resource Categories

NATURAL

- Water Quality
- Upland Vegetation
- Wetlands
- Wildlife
- Fisheries
- Agricultural Lands
- Undeveloped Lands

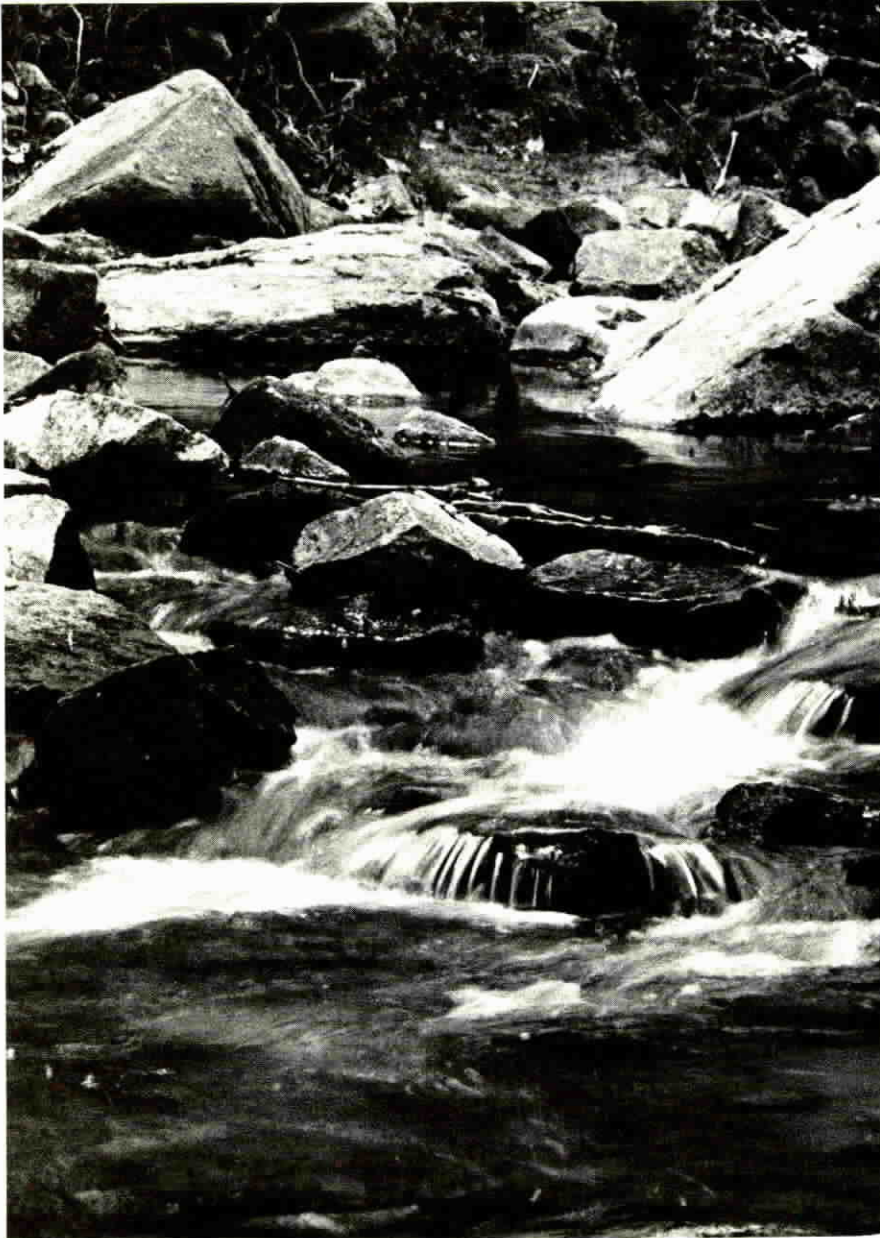
CULTURAL

- Historic Resources
- Archeological Resources

RECREATIONAL

- Public Lands
- Recreational Boating

Water Quality



Description

One of the policies of the State, contained within the Scenic and Wild Rivers Act, is to enhance the water quality of its rivers. Water of good quality supports food chains, is necessary for safe recreational use, and is critical to the maintenance of human health. Furthermore, the biological health of the Chesapeake Bay depends on the water quality of its 100,000 miles of tributaries.

The surface water quality of Maryland's rivers is defined by the chemical, physical, biological and bacteriological conditions of the water and the manner in which these conditions affect the State's designated uses. These water quality parameters indicate whether the State's waters are generally suitable for aquatic life, human consumption and recreational use. Other designated uses defined within the State's stream classifica-

tion system include shellfish harvesting waters, natural trout waters and recreational trout waters. Good water quality supports designated uses or meets water quality goals.

Water quality degradation, on the other hand, can have noticeable impacts on the aquatic environment. These can include: bacterial contamination making waters unsafe for contact recreation (swimming) and for shellfish harvesting; oxygen depletion causing fish mortality if too much dissolved oxygen is consumed in the oxidation of organic wastes; harmful growths of algae and other aquatic plants occurring due to excessive discharges of nutrients such as nitrogen and phosphorus; and excessive levels of suspended solids destroying aquatic habitats through sedimentation causing direct damage to fish and shellfish as well as aesthetic degradation.

A clear feeder stream, Rock Run near its confluence with the Susquehanna River.

Evaluation Criteria

The water quality evaluations reflect the conditions of the State's waters based on the Maryland Water Quality Inventory prepared by the Department of Health and Mental Hygiene in 1984.

The criteria for fishable and swimmable waters include the following:

1. **Bacteriological**—There may not be any sources of pathogenic or harmful organisms in sufficient quantities to constitute a public health hazard. A public health hazard will be presumed:
 - (i) If the fecal coliform density exceeds a log mean of 200 per 100 ml, based on a minimum of not less than five samples taken over any 30-day period; or
 - (ii) If 10 percent of the total number of samples taken during any 30-day period exceed 400 per 100 ml.
2. **Dissolved Oxygen**—The dissolved oxygen concentration may not be less than 5.0 mg/liter at any time.
3. **Temperature**—(Thermal)
 - (i) The maximum temperature outside the mixing zone may not exceed 90°F (32°C) or the ambient temperature of the surface waters, whichever is greater.
 - (ii) A thermal barrier that adversely affects aquatic life may not be established.
4. **pH**—(Hydrogen Concentration) Normal pH values may not be less than 6.5 or greater than 8.5.
5. **Suspended Solids**—(Turbidity)
 - (i) Suspended solids may not exceed levels detrimental to aquatic life.
 - (ii) Turbidity in the surface water resulting from any discharge may not exceed 150 units at any time or 50 units as a monthly average. Units may be measured in Nephelometer Turbidity Units, Formazin Turbidity Units or Jackson Turbidity Units.
6. **Nutrients**—Levels may not exceed those detrimental to aquatic life.

Data and Evaluation Process

The six chemical evaluation criteria were rated by the Maryland Department of Mental Health and Hygiene using the measures of scope, trend and severity. By giving each of these measures a point value of one through four, a simple water quality index is formed which permits comparisons of water quality among the selected rivers.

Scope refers to percentage of the river experiencing adverse environmental effects and is expressed as:

Points

- 4 - none
- 3 - localized (less than 25% of the river)
- 2 - moderate (25 to 75% of the river)
- 1 - widespread (greater than 75% of the river)

Trend refers to the river water quality tendency toward improvement or toward a worsening level and is expressed as:

Points

- 4 - improving
- 3 - stable (water quality remains the same)
- 2 - increasing (source of pollution is increasing, however, there is no discernible improvement or degradation in the segment)
- 1 - degrading (worsening water quality)

Severity is an estimate of the degree of impact that pollution creates within the river and is expressed as:

Points

- 4 - little or none
- 3 - minor (pollution is minimal)
- 2 - moderate (severe degradation is intermittent or degradation is less than severe)
- 1 - major (streams do not support designated uses and often experience severe degradation)

Using this numerical index the highest possible cumulative score for the scope, trend and severity of each river was 11. It should be noted that the best score for "trend" is 3 which reflects a "stable water quality." By multiplying the cumulative points of scope, trend and severity by 6, which is the number of chemical evaluations, the total score for each river is obtained. The maximum score of 66 points represents excellent water quality. Therefore, the greatest value was given to those rivers having the highest numerical score reflecting the best water quality.

Water Quality

| RIVER | LEGEND | TEMPERATURE SIGNIFI-CANCE PTS. | TOTAL PTS. | DISSOLVED OXYGEN SIGNIFI-CANCE PTS. | TOTAL PTS. | BACTERIA SIGNIFI-CANCE PTS. | TOTAL PTS. | pH SIGNIFI-CANCE PTS. | TOTAL PTS. | SUSPENDED SOLIDS SIGNIFI-CANCE PTS. | TOTAL PTS. | NUTRIENT SIGNIFI-CANCE PTS. | TOTAL PTS. | COMBINED TOTAL POINTS |
|------------------------------|----------|--------------------------------|------------|-------------------------------------|------------|-----------------------------|------------|-----------------------|------------|-------------------------------------|------------|-----------------------------|------------|-----------------------|
| Susquehanna Lower River Area | Scope | 4 | 11 | 3 | 9 | 3 | 9 | 4 | 11 | 2 | 8 | 2 | 8 | 56 |
| | Trend | 3 | | 3 | | 3 | | 3 | | 3 | | | | |
| | Severity | 4 | | 3 | | 3 | | 4 | | 3 | | | | |
| Elk Upper Mainstream | Scope | 4 | 11 | 3 | 9 | 3 | 9 | 4 | 11 | 2 | 8 | 3 | 8 | 56** |
| | Trend | 3 | | 3 | | 3 | | 3 | | 3 | | | | |
| | Severity | 4 | | 3 | | 3 | | 4 | | 2 | | | | |
| Elk Lower Mainstream | Scope | 4 | 11 | 4 | 11 | 3 | 9 | 4 | 11 | 4 | 11 | 4 | 11 | 64** |
| | Trend | 3 | | 3 | | 3 | | 3 | | 3 | | | | |
| | Severity | 4 | | 4 | | 3 | | 4 | | 4 | | | | |
| Miles | Scope | 4 | 11 | 4 | 11 | 3 | 10 | 4 | 11 | 4 | 11 | 4 | 11 | 65 |
| | Trend | 3 | | 3 | | 4 | | 3 | | 3 | | | | |
| | Severity | 4 | | 4 | | 3 | | 4 | | 4 | | | | |
| Harris* | Scope | 4 | 11 | 4 | 11 | 3 | 9 | 4 | 11 | 4 | 11 | 4 | 11 | 64 |
| | Trend | 3 | | 3 | | 3 | | 3 | | 3 | | | | |
| | Severity | 4 | | 4 | | 3 | | 4 | | 4 | | | | |
| Broad* | Scope | 4 | 11 | 4 | 11 | 3 | 9 | 4 | 11 | 4 | 11 | 4 | 11 | 64 |
| | Trend | 3 | | 3 | | 3 | | 3 | | 3 | | | | |
| | Severity | 4 | | 4 | | 3 | | 4 | | 4 | | | | |
| Tred Avon* | Scope | 4 | 11 | 4 | 11 | 3 | 9 | 4 | 11 | 4 | 11 | 4 | 11 | 64 |
| | Trend | 3 | | 3 | | 3 | | 3 | | 3 | | | | |
| | Severity | 4 | | 4 | | 3 | | 4 | | 4 | | | | |
| Little Choptank | Scope | 4 | 11 | 4 | 11 | 3 | 9 | 4 | 11 | 4 | 11 | 4 | 11 | 64 |
| | Trend | 3 | | 3 | | 3 | | 3 | | 3 | | | | |
| | Severity | 4 | | 4 | | 3 | | 4 | | 4 | | | | |
| Honga | Scope | 4 | 11 | 4 | 11 | 3 | 9 | 4 | 11 | 4 | 11 | 4 | 11 | 64 |
| | Trend | 3 | | 3 | | 3 | | 3 | | 3 | | | | |
| | Severity | 4 | | 4 | | 3 | | 4 | | 4 | | | | |
| Manokin | Scope | 4 | 11 | 4 | 11 | 3 | 9 | 4 | 11 | 4 | 11 | 4 | 11 | 64 |
| | Trend | 3 | | 3 | | 3 | | 3 | | 3 | | | | |
| | Severity | 4 | | 4 | | 3 | | 4 | | 4 | | | | |
| West | Scope | 4 | 11 | 4 | 11 | 3 | 9 | 4 | 11 | 2 | 8 | 2 | 8 | 58 |
| | Trend | 3 | | 3 | | 3 | | 3 | | 3 | | | | |
| | Severity | 4 | | 4 | | 3 | | 4 | | 3 | | | | |
| South | Scope | 4 | 11 | 4 | 11 | 3 | 8 | 4 | 11 | 2 | 8 | 2 | 7 | 56 |
| | Trend | 3 | | 3 | | 2 | | 3 | | 3 | | | | |
| | Severity | 4 | | 4 | | 2 | | 4 | | 2 | | | | |
| Magothy | Scope | 4 | 11 | 3 | 7 | 3 | 8 | 4 | 11 | 2 | 8 | 2 | 7 | 52 |
| | Trend | 3 | | 3 | | 2 | | 3 | | 3 | | | | |
| | Severity | 4 | | 1 | | 2 | | 4 | | 2 | | | | |
| Back | Scope | 4 | 11 | 3 | 7 | 2 | 7 | 4 | 11 | 2 | 7 | 3 | 7 | 50 |
| | Trend | 3 | | 3 | | 2 | | 3 | | 2 | | | | |
| | Severity | 4 | | 1 | | 2 | | 4 | | 1 | | | | |
| Middle | Scope | 4 | 11 | 4 | 11 | 3 | 9 | 4 | 11 | 2 | 8 | 2 | 8 | 58 |
| | Trend | 3 | | 3 | | 3 | | 3 | | 3 | | | | |
| | Severity | 4 | | 4 | | 3 | | 4 | | 3 | | | | |
| Bush | Scope | 4 | 11 | 4 | 11 | 3 | 9 | 4 | 11 | 2 | 8 | 2 | 8 | 58 |
| | Trend | 3 | | 3 | | 3 | | 3 | | 3 | | | | |
| | Severity | 4 | | 4 | | 3 | | 4 | | 3 | | | | |

* Water quality based on river basin.

**Average combined point total for Upper and Lower Mainstem of Elk River is 60.

Resource Significance Value

Highly Significant: 61-66 combined total points reflects excellent water quality

Significant: 56-60 combined total points reflects good water quality

Less Significant: 18-55 combined total points reflects moderate to poor water quality

Significance Groupings

Highly Significant

Miles River
Harris Creek
Broad Creek
Tred Avon River
Little Choptank River
Honga River
Manokin River

Significant

Susquehanna River
Elk River
West River
South River
Middle River
Bush River

Less Significant

Magothy River
Back River

Upland Vegetation



Description

Upland plant communities in river corridors rely upon a more well drained water regime than wetlands and usually occur in higher elevations. Upland vegetation comprises all natural plants and plant communities including trees, shrubs, grasses, and herbs which have not been subject to cultivation. Riverine corridors provide a diversity of habitats for many plants and plant communities which are worthy of recognition and conservation because of their special importance.

Natural upland vegetation communities along Chesapeake Bay area rivers are distinguished by their striking beauty as well as their importance to the survival of a healthy ecosystem. Forests and vegetative cover adjacent to rivers improve the quality of waters entering the rivers by filtering nutrients and sediments. The diversity of plant life found along these river corridors provides food and habitat for wildlife.

Some plant species or plant communities are rare or uncommon to the State of Maryland; some are uncommon regionally. Others only occur where their restricted habitat requirements exist. Some plant species are in peril of imminent extinction unless their threatened or endangered status is recognized and efforts are made to protect them.

Upland vegetation along the west bank of the Susquehanna River, Harford County

Evaluation Criteria

The upland vegetation category was evaluated by the following criteria:

1. The greatest percentage of river corridor with forests extending 100 feet deep or more from the river's edge, as shown on the most current United States Geological Survey Maps.
2. Rivers with upland plant species identified by the Maryland Natural Heritage Program to be in danger of extinction, or unusual in occurrence either regionally or in the State of Maryland.

Data and Evaluation Process

In addition to the percentage of the river corridor with forests extending 100 feet deep or more from the river's edge, the geographic location was considered. The Susquehanna River is located in the Piedmont physiographic province where river shorelines tend to have steep slopes that are forested. All the other study rivers occur in the Coastal Plain physiographic province where river shorelines tend to be less steep and have more marsh-like edges. Acknowledging these geographic factors, river shorelines with forested edges of 50% or greater are considered to be highly significant, 20 to 29% significant and 1 to 19% less significant.

Information on rare and endangered upland plants was provided by the Maryland Natural Heritage Program which evaluated the species according to its immediate threat of extinction and the extent of known population oc-

Upland Vegetation

currences in Maryland. Plants with regional concern are considered to be significant and plants with state concern are considered to be less significant. The information provided by the Maryland Natural Heritage Program favors, in some cases, those rivers that have been more thoroughly surveyed.

UPLAND VEGETATION

| River | Percentage of River Corridor with Forested Edge | Number of Maryland Natural Heritage Program Rare or Endangered Upland Plants | |
|--------------------|---|--|--------------------------|
| | | Species of Regional Concern | Species of State Concern |
| 1. Susquehanna | 51 | 3 | 7 |
| 2. Elk | 18 | * | 2 |
| 3. Miles | 4 | * | 1 |
| 4. Harris Creek | 21 | * | 0 |
| 5. Broad Creek | 30 | * | 0 |
| 6. Tred Avon | 3 | * | 1 |
| 7. Little Choptank | 3 | * | 1 |
| 8. Honga | 3 | * | 0 |
| 9. Manokin | 17 | * | 0 |
| 10. West | 16 | * | 3 |
| 11. South | 13 | 1 | 1 |
| 12. Magothy | 14 | * | 2 |
| 13. Back | 9 | * | 1 |
| 14. Middle | 0 | * | 0 |
| 15. Bush | 10 | * | 1 |

* = no known occurrences

Resource Significance Value

Highly Significant: Rivers having 50% or more forested edge, and occurrences of threatened upland plants of regional concern and more than three occurrences of threatened upland plants of State concern.

Significant: Rivers having 20% or more forested edge, occurrences of threatened upland plants of regional concern, or at least three occurrences of threatened upland plants of State concern.

Less Significant: Rivers having less than 20% forested edge, and no occurrences of threatened upland plants of regional concern and less than three occurrences of threatened upland plants of State concern.

Significance Groupings

Highly Significant
Susquehanna River

Significant
South River
Harris Creek
Broad Creek
West River

Less Significant
Elk River
Miles River
Tred Avon River
Little Choptank River
Honga River
Manokin River
Back River
Magothy River
Middle River
Bush River

Wetlands

Description

Wetlands are transitional lands between terrestrial and aquatic ecosystems where the water table is usually at or near the surface or the land is covered by shallow water. Wetlands of the Chesapeake Bay tributaries can be grouped into three main associations: tidal wetlands, which are predominantly saltwater brackish systems; and non-tidal wetlands and submerged aquatic vegetation communities which are rooted in estuary and river beds. Within these groupings are various wetland classes that includes marshes, swamps, bogs and tidal flats. A characteristic of many Chesapeake Bay tributaries is the great diversity of wetland classes in close proximity to each other. These tributaries tend to be short in length from mouth to headwaters.

Wetlands are critical to the unique set of ecosystems in the Chesapeake Bay tributaries for wildlife and plant community habitat, water quality and natural flood control. Many wetland classes provide essential breeding, nesting, and feeding habitat as well as sanctuary for many species of wildlife, waterfowl and shore-birds. Essential habitat, cover, and food reservoirs for many fish and shellfish species are created when certain vegetation and water flow patterns coexist. In Maryland, many significant native plants and plant communities rely on the very specific land and water habitat compositions that occur in wetlands. Wetlands also maintain high water quality by filtering water flows, and trapping silt and organic matter. They play an important role in flood control by absorbing flood waters and releasing them slowly. Additionally, wetlands stabilize adjacent lands by preventing

erosion and protecting the shores from wave energy.

The intrinsic beauty of wetlands is enhanced when associated with views of river shorelines. Indeed, wetlands are a landscape feature that is an inseparable characteristic of the Chesapeake Bay area.

Evaluation Criteria

The wetlands category was evaluated by the following criteria.

1. Rivers with the highest estimated percentage of wetlands in the river corridor as shown on the U.S. Fish and Wildlife Service National Wetland Inventory maps.
2. Rivers with the greatest diversity of wetland classes as shown on the U.S. Fish and Wildlife Service National Wetland Inventory maps.
3. Rivers that possess the greatest amount of submerged aquatic vegetation, a type of wetland plant that has significantly declined in the Chesapeake Bay area and is an important factor in maintaining water quality, fisheries habitat and food sources for wildlife. These locations are identified by the *Distribution of Submerged Aquatic Vegetation* in the Chesapeake Bay and Tributaries, a 1985 study prepared in cooperation by federal and state agencies and representatives of the academic community.
4. Rivers with wetland plant species that are considered to be near extinction or unusual in occurrence either nationally, regionally or statewide by the Maryland Natural Heritage Program.



A wet meadow in the Broad Creek watershed, Talbot County.

Data and Evaluation Process

To determine which rivers have significant percentages of wetland shorelines, a land use study prepared in 1981 by the Coastal Resources Division, Maryland DNR, provided information to establish a baseline average. This study found that the average percentage of wetland shorelines on a Chesapeake Bay tributary is approximately 25%. Rivers exceeding this average, with 25% to 66% were considered to be significant, while rivers with averages of 66% or greater were considered to be highly significant.

To evaluate rivers according to the diversity of wetland classes, significance was given to those corridors

with the greater number. Those rivers with 22 to 33 wetland classes were considered to be highly significant and those rivers with 12 to 21 wetland classes were considered to be significant.

To evaluate rivers with submerged aquatic vegetation (SAV), significance was given to those with the greatest total area. Rivers with large acreages of SAV, 250 to 437 acres, were considered to be highly significant; rivers with 100 to 249 acres of SAV were considered to be significant; and rivers with 99 acres or less of SAV were considered to be less significant.

To determine which rivers harbored rare or endangered wetland species, information was provided by the Maryland Natural Heritage Program, which

Wetlands

evaluated species according to threat of extinction and the extent of population occurrences in Maryland. Information from this Program shows that most rare or endangered plant species within the study river corridors occur in wetland habitats. Rivers with wetland species of global or national concern were considered to be highly significant, rivers with wetland species of regional concern were considered to be significant, and rivers with wetland species of state concern are considered to be less significant. The information provided by the Maryland Natural Heritage Program, in some cases, favors those rivers that have been more thoroughly surveyed.

Resource Significance Value

Highly Significant: Rivers with either a high percentage of wetlands in the corridor, a great diversity of wetland types, large amounts of submerged aquatic vegetation, or the presence of threatened wetland species of global or national concern.

Significant: Rivers with either a substantial percentage of wetlands in the corridor, a considerable diversity of wetlands types, substantial amount of

submerged aquatic vegetation, or the presence of wetlands species of regional concern.

Less Significant: Rivers with a moderate percentage of wetlands in the corridor, a moderate diversity of wetland types, moderate amount of submerged aquatic vegetation, and the presence of threatened wetland species of state concern.

WETLANDS

| River | Percentage of Wetlands in River Corridor | Number of Wetland Classes | Acres of Submerged Aquatic Vegetation | Number of MD National Heritage Program Rare or Endangered Wetland Species | | | |
|-----------------|--|---------------------------|---------------------------------------|---|------------------|------------------|---------------|
| | | | | Global Concern | National Concern | Regional Concern | State Concern |
| Susquehanna | 5 | 26 | 299.5 | * | 1 | 3 | 9 |
| Elk | 20 | 33 | 81.0 | 1 | 1 | 1 | 3 |
| Miles | 15 | 25 | 194.8 | * | * | * | * |
| Harris Creek | 20 | 17 | 376.3 | * | * | * | * |
| Broad Creek | 15 | 12 | 436.1 | * | * | * | * |
| Tred Avon | 10 | 24 | 271.5 | * | * | * | * |
| Little Choptank | 25 | 21 | 153.9 | * | * | * | * |
| Honga | 95 | 14 | 299.8 | * | * | * | * |
| Manokin | 70 | 14 | 113.3 | * | 1 | * | * |
| West | 5 | 3 | -- | * | * | * | * |
| South | 5 | 11 | -- | * | * | * | * |
| Magothy | 10 | 17 | -- | * | * | * | * |
| Back | 10 | 15 | -- | * | * | * | * |
| Middle | 5 | 8 | 183.7 | * | * | * | * |
| Bush | 20 | 16 | -- | 1 | * | * | * |

* = No known occurrences

Significance Groupings

Highly Significant
 Susquehanna River
 Elk River
 Miles River
 Harris Creek
 Broad Creek
 Tred Avon River
 Honga River
 Manokin River
 Bush River

Significant
 Little Choptank River
 Magothy River
 Back River
 Middle River

Less Significant
 West River
 South River

Wildlife

Wildlife comprises all creatures that are undomesticated and live in a natural state including mammals, reptiles, amphibians and both migratory and resident birds. The presence of wildlife along riverine corridors is a result of the suitability and availability of habitats that provide food and shelter. An important characteristic of wildlife of the Chesapeake Bay area is the abundance of waterfowl, with a major portion of North American ducks, geese, and swans migrating down the Atlantic flyway to seek winter habitat and feed on waterways, marshes and harvested cornfields.

Wildlife is valued for its essential role in the functions of a healthy ecosystem. Certain species become significant when they or their habitats become endangered or threatened by extinction. Many river corridors along the Chesapeake Bay provide winter nesting and feeding habitat for the federally endangered American Bald Eagle. Other federally endangered species which use these river corridors include the Peregrine Falcon, the Delmarva Fox Squirrel, and sea turtle species. Their dependency on these habitats is important to recognize. Other wildlife species are significant because they are rare or uncommon in occurrence within State of Maryland or a larger habitat region. Many Atlantic flyway species are unique because of their exceptionally high occurrence in the Chesapeake Bay area. However, populations of Black Ducks and Canvasbacks, historically abundant waterfowl of the Chesapeake Bay, have declined during recent decades because of hunting and loss of aquatic grass feed.

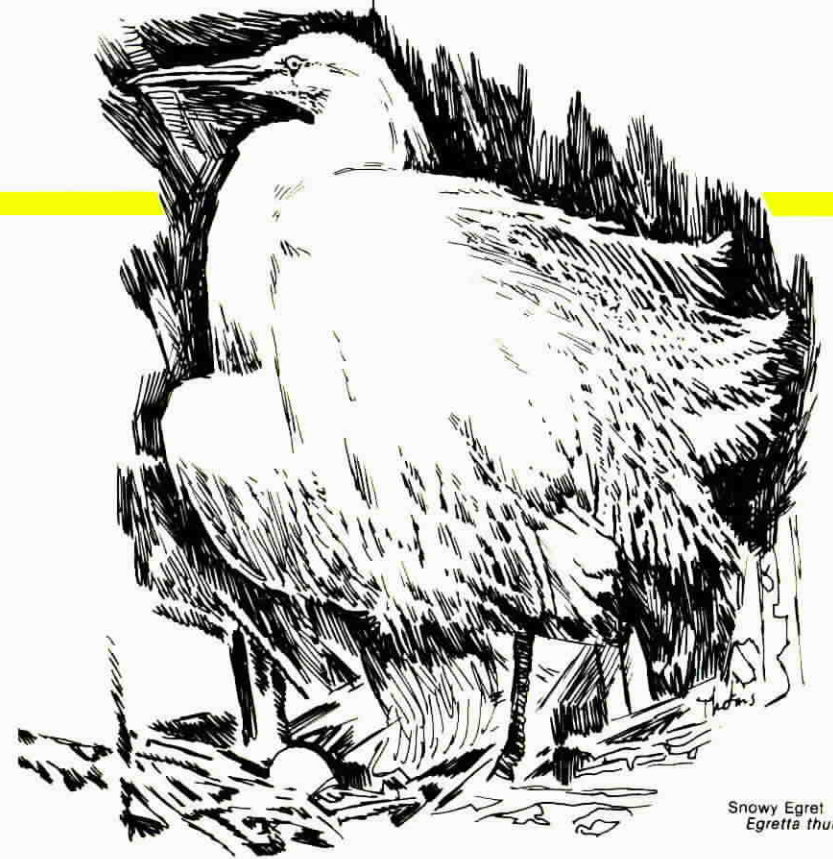
In addition to the importance of wildlife as a vital part of the Chesapeake Bay ecosystems, they

have significant aesthetic value to recreationists and residents. While wildlife is essential to the natural food chain, it is also an important part of the recreation experience for hikers, nature photographers, bird watchers and hunters. Indeed, many shore birds such as Egrets and Herons, wintering ducks and swans are an inseparable trademark of the Bay area. Many residents look forward to the noisy arrival of Canada Geese which heralds the coming of fall. In addition to aesthetic qualities, many wintering ducks and geese are popular for hunting. An estimated \$40 million annual economy is sustained by tourism associated with recreational hunting.

Evaluation Criteria

The following criteria were used to evaluate the wildlife values of rivers:

1. Any wildlife species that is endangered or threatened with extinction and is recognized by the U.S. Secretary of the Interior to be in peril of elimination and thereby merits protection under the Federal Endangered Species Act. These species are also recognized by the Secretary of the Maryland Department of Natural Resources as being in peril of elimination and thereby merit statewide protection.
2. Any wildlife species that are considered to be in danger of extinction or unusual in occurrence by the Maryland Natural Heritage Program.
3. Those rivers that provide habitat to waterfowl species whose population decline has been to such an extent as to require management attention by the U.S. Fish and Wildlife



Snowy Egret
Egretta thula

Service and the Maryland Department of Natural Resources. The population counts are provided by the Midwinter Waterfowl Inventory, prepared in cooperation with Forest, Park and Wildlife Service, DNR and U.S. Fish and Wildlife Service. The inventory identifies the annual population average from 1976 to 1985.

4. Those rivers with large populations of waterfowl species that are important for recreational hunting. These species include Mallard, Black Duck, Gadwall, Widgeon, Pintail, Redhead, Canvasback, Scaup, Goldeneye, Bufflehead, Ruddy Duck, Scoter, Oldsquaw, Coot and Merganser. The population counts were provided by the Midwinter Waterfowl Inventory which identifies the annual average from 1976 to 1985.

Data and Evaluation Process

For the evaluation of rivers with federally endangered wildlife, the number of species was considered in addition to large concentrations and the quality of habitats. In the Chesapeake Bay area, important habitats are American Bald Eagle nesting territories because they represent a convergence of all their habitat requirements in one location. Rivers considered to be highly significant have two or more endangered species, or one species with unusually large populations. Rivers considered to be significant have one endangered species and habitats of importance (American Bald Eagle nesting territories). Rivers considered to be less significant have occurrences of one endangered species.

Wildlife

Another determinant for evaluating significant wildlife in the study river corridors was information provided by the Maryland Natural Heritage Program. This program evaluates species according to threat of extinction or the extent of population occurrences of global, national, regional or statewide range. The information provided by this program favors, in some cases, those rivers that have been most thoroughly surveyed. Rivers with wildlife species of global or national concern are considered to be highly significant. Rivers with wildlife of regional concern are considered to be significant while rivers with wildlife of state concern are considered to be less significant.

To evaluate the river corridors with waterfowl in need of management attention, the Black Duck and Canvasback population counts were determined. These counts were taken from the Midwinter Waterfowl Inventory survey areas. In cases where there is more than one study river in a survey area, the population counts were divided into percentages as assessed by the DNR field surveyor. Greatest significance was given to rivers providing habitat to the largest populations. Rivers with Black Duck populations of 900 to 1,400 or rivers with Canvasback populations of 3,000 to 4,500 were considered to be highly significant. Rivers with Black Duck populations of 460 to 899 or Canvasback populations of 1,500 to 2,999 were considered to be significant.

To evaluate river corridors for recreationally hunted waterfowl species, population counts were taken from the Inventory survey areas. In cases where there is more than one study river in a survey area, the population counts were divided into the percentages as

| River | Federal Endangered Wildlife Species | | | | Maryland Natural Heritage Program Rare and Endangered Species | Waterfowl Populations in Decline and in Need of Management Attention | | Recreational Hunting Waterfowl Populations |
|--------------------|---|------------------|-----------------------|------------|---|--|-------------------------------|--|
| | Bald Eagle | Peregrine Falcon | Delmarva Fox Squirrel | Sea Turtle | Species of State Concern | Black Duck Population Numbers | Canvasback Population Numbers | Population Numbers |
| 1. Susquehanna | (large concentrations 20) | | | | | 100 | 0 | 8,000 |
| 2. Elk | winter | | | | | 40 | 0 | 7,380 |
| 3. Miles | two nesting territories | | upland habitat | | | 200 | 500 | 21,000 |
| 4. Harris Creek | feeding | | | | | 450 | 1,000 | 14,200 |
| 5. Broad Creek | feeding | | | | | 450 | 1,000 | 14,200 |
| 6. Tred Avon | nesting territories | | upland habitat | | | 900 | 2,000 | 28,400 |
| 7. Little Choptank | one nesting territory | | | | | 600 | 1,000 | 11,600 |
| 8. Honga | two nesting territories | | upland habitat | | | 500 | 1,100 | 3,200 |
| 9. Manokin | one nesting territory | feeding | | summer | | 1,400 | 1,000 | 8,300 |
| 10. West | feeding | | | | | 40 | 2,520 | 2,720 |
| 11. South | two nesting territories | | | | | 60 | 3,780 | 4,080 |
| 12. Magothy | | feeding | | | | 100 | 4,500 | 3,200 |
| 13. Back | | feeding | | | least tern | 233 | 733 | 1,560 |
| 14. Middle | | feeding | | | | 233 | 733 | 1,560 |
| 15. Bush | one nesting territory (large concentrations 90) | | | | | 233 | 733 | 1,560 |

assessed by the DNR field surveyor. Significance was given to those river corridors with the highest population counts. Those rivers with populations of at least 14,266 or greater were considered to be highly significant. Those with populations of at least 7,133 to 14,265 were considered to be significant.

Highly Significant: Those rivers with either the presence of at least two or a large occurrence of one federally endangered species, possessing threatened wildlife species recognized by the Maryland Natural Heritage Program as having global or national concern, exceptionally large populations of Canvasback or Black Ducks, or outstanding populations of recreationally hunted waterfowl species.

Significant: Those rivers with the presence of critical habitat areas and one federally endangered species, threatened wildlife species recognized

by the Maryland Natural Heritage Program as having regional concern, large populations of Canvasback or Black Ducks or considerable populations of recreationally hunted waterfowl species.

Less Significant: Those rivers with the presence of one federally endangered species, possessing threatened wildlife species recognized by the Maryland Natural Heritage Program as having state concern, moderate populations of Canvasback or Black Ducks or moderate populations of recreationally hunted waterfowl species.

WILDLIFE

Significance Groupings

Highly Significant

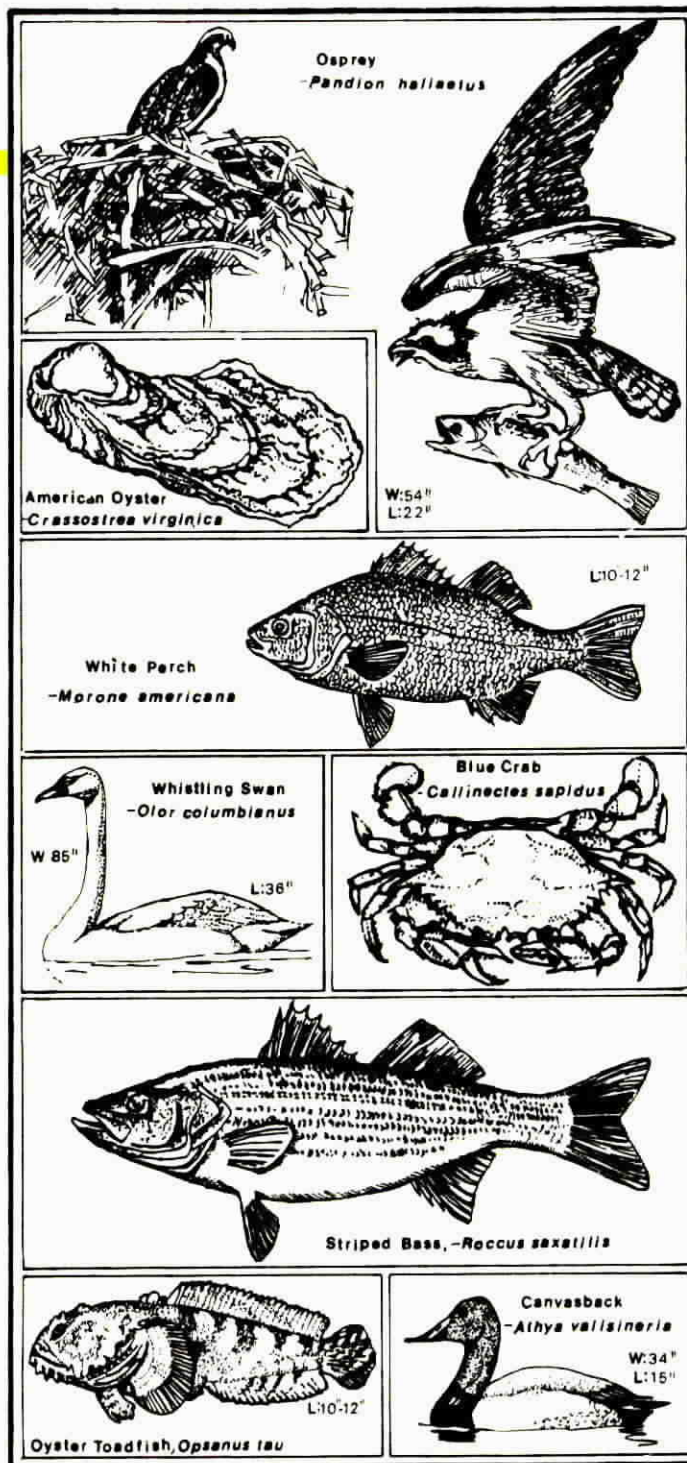
Susquehanna River
Miles River
Tred Avon River
Honga River
Manokin River
South River
Magothy River
Bush River

Significant

Elk River
Harris Creek
Broad Creek
Little Choptank River
West River

Less Significant

Back River
Middle River



Fisheries

The Chesapeake Bay is the world's largest estuary and is a richly concentrated reservoir of finfish and shellfish which depend upon its diverse range of aquatic environments. Such environments are affected by the sea tides and the consequential variations of salinity. Many tributaries provide a diversity of habitats critical to fish that are in danger of extinction or rare in occurrences. Additionally, the rivers have reproduction habitats that are essential for fish that require those specific conditions. Fishes in the Bay area support a thriving commercial economy as well as provide recreational fishing opportunities.

Finfish in the Bay use a wide range of habitats and often change their feeding habits and migrate to different aquatic environments during different periods of their life cycle. Many of these finfish are migratory and require both freshwater as well as saltwater environments. Anadromous fish, such as Herring and Shad, spawn in freshwater but live in ocean saltwater. Semi-anadromous fish, such as White Perch, spawn in tidal freshwater and after spawning move into higher estuarine waters having greater salinity. Catadromous fish, such as the American Eel, have a reverse pattern and migrate from freshwater to open saltwater in order to spawn.

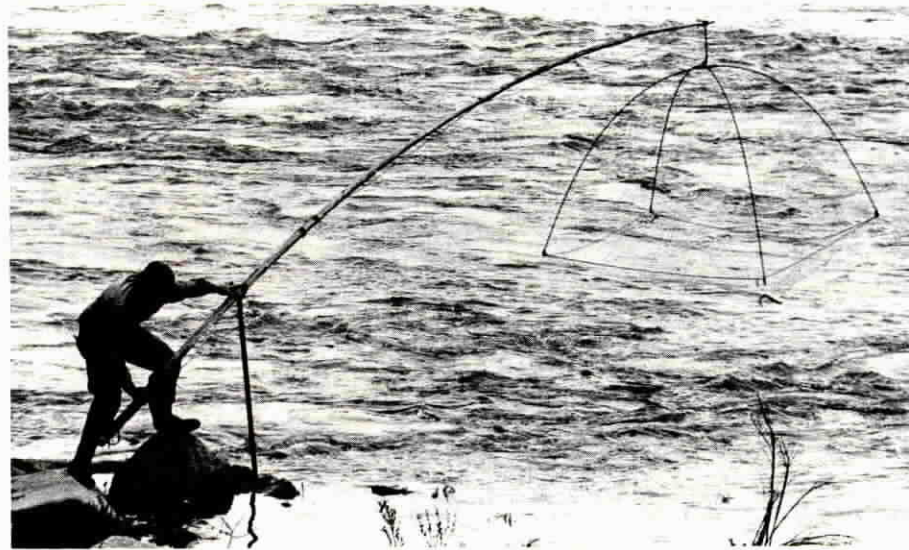
Shellfish that are important to the Bay area, American Oysters, Blue Crabs, Hard and Softshell Clams, require various saline aquatic environments. Oyster beds occur from brackish estuarine waters to high salinity waters. Blue Crabs are found in great numbers in the brackish waters of the tributaries. Softshell Clams, which frequently share Oyster habitats, are also found in various salinities whereas

Fisheries

Hard Shell Clams seek only highly saline waters.

From the commercial perspective, fisheries resources of the Bay tributaries are valuable to the region as well as the nation. The Bay area provides as much as 1/4 of the nation's Oyster catch, 1/2 of the nation's Soft-shell Clam catch and 2/3 of the nation's Blue Crab catch. This shellfish harvest generates an annual economy of \$160 million. Additionally, local watermen for many generations have been supported by these resources and have formed their lifestyles around harvesting them.

Sportfishing activities range from weekend leisure fishing from bridges and docks to organized charter boat cruises. In fact, 60% of sportfishing activities in the Bay area is from boats. Recreational sportsmen seek Bluefish, Weakfish, Spot, Shad, Croaker and, until the 1985 moratorium, Striped Bass, in quantities that are equal to or exceed that of the commercial harvest. Sport fishermen support a local economy of \$90 million annually.



Fishing for shad and herring in the Susquehanna River.

Evaluation Criteria

The study rivers were evaluated for their fisheries resources by the following criteria.

1. Rivers that provide habitat to fish species which have been determined to be threatened, rare, or endangered by the Secretary of the Interior, the Secretary of the Maryland Department of Natural Resources and the Maryland Natural Heritage Program, DNR.
2. Rivers that possess spawning propagation habitats for those finfish and shellfish that require specific conditions in the Chesapeake Bay tributaries. These are oysters and anadromous fish. Natural oyster reproduction areas were identified by the total acreage within each river as shown on the most updated maps prepared by the DNR Department of Tidewater Fisheries. Rivers providing habitat to the greatest diversity of anadromous fish are identified by the DNR Tidewater Administration, Fisheries Resource Division statistics.
3. Those rivers offering recreational fishing opportunities by possessing the greatest number of sportfish species and ample boating access. Important recreation tidewater fish were identified by the 1980 Maryland Saltwater Sport Fishing Survey and their presence in the tributaries was documented by the DNR Tidewater Administration, Fisheries Resource Division statistics. Rivers with important freshwater fish were identified by the 1982 Freshwater Sportfishing Guide. Those rivers with ample boating access from public ramps and piers as identified in "A Guide to Public Piers and Boat Ramps on Maryland Waters" prepared by the DNR Tidewater Administration.

Data and Evaluation Process

Those rivers providing habitat to rare and endangered species were identified. Any study rivers with the presence of federally endangered species were considered to be highly significant. The remaining study rivers each have the presence of fish recognized to be rare and endangered by the Secretary of the Maryland Department of Natural Resources and were considered to be significant. Any rivers with the presence of fish species recognized by the Maryland Natural Heritage Program were considered to be significant.

To assess the rivers with natural oyster beds, those with at least 16,000 acres were considered to be highly significant and rivers with 1,312 to 15,999 acres were considered to be significant. To assess the rivers that provide spawning habitat to anadromous fish, value was given to those that provide propagation areas to the greatest diversity of these species. Rivers providing spawning habitat to at least 5 to 6 anadromous fish species are considered to be highly significant, and those providing spawning habitat to 3 to 4 species were considered to be significant.

To assess rivers that are important for recreational fishing, the diversity of sportfishing species and the availability of boat access was identified. Those rivers with as many as 8 sportfishing species or at least 6 boat ramps or piers were considered to be highly significant. Any rivers with as many as 7 sportfishing species or 3 to 5 boat ramps or piers were considered to be significant.

Fisheries

| RIVER | THREATENED, RARE AND ENDANGERED SPECIES | | | SPAWNING AND PROPAGATION AREAS | | RECREATIONAL FISHING | |
|-----------------|---|--|---------------------------|--|-----------------------------------|--------------------------------|----------------------------------|
| | Federal | Sec. of the Dept. of Natural Resources | Maryland Heritage Program | Number of Acres of Natural Oyster Bars | Number of Anadromous Fish Species | Number of Sportfishing Species | Number of Public Piers and Ramps |
| Susquehanna | 1 | 3 | 2 | 0 | 6 | 8 | 10 |
| Elk | 0 | 2 | 1 | 0 | 4 | 4 | 4 |
| Miles | 0 | 1 | 0 | 2,148 | 2 | 6 | 5 |
| Harris Creek | 0 | 1 | 0 | 1,312 | 0 | 8 | 5 |
| Broad Creek | 0 | 1 | 0 | 4,062 | 0 | 8 | 6 |
| Tred Avon | 0 | 1 | 0 | 4,145 | 1 | 8 | 5 |
| Little Choptank | 0 | 1 | 0 | 3,263 | 1 | 5 | 4 |
| Honga | 0 | 1 | 0 | 16,272 | 1 | 6 | 4 |
| Manokin | 0 | 1 | 0 | 4,422 | 2 | 4 | 5 |
| West | 0 | 1 | 0 | 0 | 2 | 5 | 1 |
| South | 0 | 1 | 0 | 568 | 3 | 5 | 1 |
| Magothy | 0 | 1 | 0 | 0 | 3 | 4 | 0 |
| Back | 0 | 1 | 0 | 0 | 2 | 7 | 4 |
| Middle | 0 | 1 | 0 | 0 | 2 | 6 | 1 |
| Bush | 0 | 1 | 0 | 0 | 3 | 8 | 5 |

* Species derived from Lower Choptank River statistics provided by the DNR Fisheries Division.

Resource Significance Value

Highly Significant: Those rivers with either the presence of federally endangered fish species, exceptional amounts of natural oyster bars, great diversity of anadromous fish species, or excellent recreational fishing opportunities.

Significant: Those rivers with either the presence of endangered fish species recognized by the Secretary of the Maryland Department of Natural Resources, large amounts of natural oyster bars, a substantial diversity of anadromous fish species, or good recreational fishing opportunities.

Less Significant: Those rivers with either moderate amounts or no occurrences of threatened fish species recognized by the Maryland Natural Heritage Program, moderate amounts of natural oyster bars, a moderate number of anadromous fish species, and moderate recreational fishing opportunities.

Significance Groupings

Highly Significant

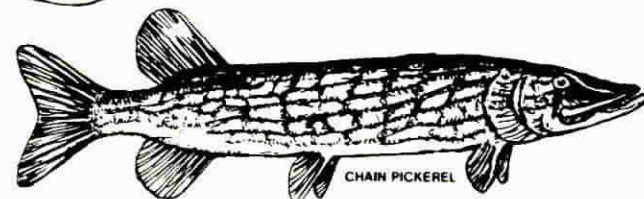
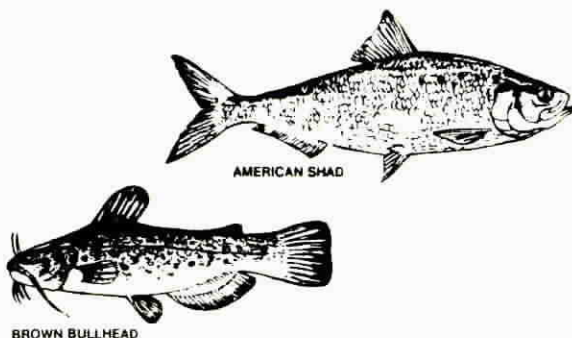
Susquehanna River
Harris Creek
Broad Creek
Tred Avon River
Honga River
Bush River

Significant

Elk River
Miles River
Little Choptank River
Manokin River
West River
South River
Magothy River
Middle River
Back River

Less Significant

none



Agricultural Lands

Agricultural lands within a river corridor are an important environmental resource needed for food production, which in turn provides an important socioeconomic base for local communities. Farm operations along river corridors are a key element in the retention of open space, cultural and scenic resources. Vistas of fallow, planted or harvested farm fields and green pastures with grazing livestock make a significant contribution to a pleasurable experience for the river user. Agricultural lands under best management practices are important for soil conservation. Additionally, farmlands contribute to the diversity of vegetation and wildlife habitat.

Agricultural lands are those lands used for the production and management of crops, livestock, and trees. This study considers those prime and unique farmlands as defined by the U.S. Soil Conservation Service that are not wetlands or have been lost to urban development. Additionally, it considers the amount of farmland in each river corridor in active agricultural use. "Prime" farmlands have few limitations that restrict agricultural use. They contain the best combination of soil quality, growing season and moisture supply needed to economically produce sustained high yields of crops when the land is treated and managed according to acceptable farming methods. "Unique" farmland is land other than prime farmland that is used for the production of specific high value food and fiber crops. It has the special combination of soil quality, location, growing season and moisture supply needed to economically produce sustained high quality and/or high yields of a specific crop when treated and managed according to acceptable farming methods. Examples

of such crops are citrus, tree nuts, cranberries, fruit, tobacco, and vegetables.

Many Chesapeake Bay tributary corridors had substantial amounts of prime and unique soils which are no longer available due to urban or residential development. For example, the Magothy River corridor was comprised of approximately 91% prime and unique soils. Today, due to construction and development, only an estimated 13% remains available for crop production.

Evaluation Criteria

Agricultural lands within the river corridor were evaluated by the following criteria:

1. Those river corridors with the greatest percentage of prime and unique open space soils being used or potentially available for farming were identified by the most updated county soil survey maps prepared by the U.S. Soil Conservation Service. To determine their present availability for farmland use, these maps were cross referenced with the National Wetland Inventory maps and Maryland Department of State Planning Land Use maps.
2. Those rivers with the largest estimated percentage of present agricultural land use within the river corridors as shown on the county land use maps prepared for the Maryland Department of State Planning in 1981.

Data and Evaluation Process

River values for the agricultural lands resource were determined by first estimating the percentage of open space prime and unique farmland soils in each river corridor. These two percentages were then added to yield a total. Resource significance values was given to those rivers with the highest percentage of open space prime and unique soils. Rivers with percentages of 25 percent or greater were considered to be highly significant. Rivers with percentages of 15 percent or greater were considered to be signifi-

cant and rivers with percentages less than 14 percent were considered to be less significant.

The percentage of active agricultural land use within each study river corridor was estimated and value was given to those river corridors with the greatest amount. A river with 45% or greater of its corridor being farmed was considered to be highly significant and any corridor with 20% to 44% was considered to be significant.

| River | Estimated percentage of open space prime farmland in river corridor | Estimated percentage of open space unique farmland in river corridor | Combined percentage of estimated open space prime and unique farmland in river corridor | Estimated percentage of current agricultural land use |
|-----------------|---|--|---|---|
| Susquehanna | 28 | 0 | 28 | 15 |
| Elk | 18 | 5 | 23 | 27 |
| Miles | 50 | 2 | 52 | 51 |
| Harris Creek | 20 | 1 | 21 | 70 |
| Broad Creek | 7 | 0 | 7 | 45 |
| Tred Avon | 45 | 1 | 46 | 54 |
| Little Choptank | 15 | 0 | 15 | 35 |
| Honga | 1 | 0 | 1 | 10 |
| Manokin | 38 | 5 | 43 | 23 |
| West | 2 | 0 | 2 | 18 |
| South | 4 | 10 | 14 | 8 |
| Magothy | 1 | 12 | 13 | 4 |
| Back | 25 | 2 | 27 | 7 |
| Middle | 18 | 1 | 19 | 3 |
| Bush | 3* | 1* | 4* | 5* |

* Soil types not recorded within the Aberdeen Proving Ground portion of river corridor.

Undeveloped Lands

Resource Significance Value

Highly Significant: Those river corridors with at least 25% or more open space prime and unique farmland soils or at least 45% of the corridor presently in agricultural use.

Significant: Those river corridors with at least 15% or more open space prime and unique farmland soils or at least 20% of the corridor presently in agricultural use.

Less Significant: Those river corridors with less than 14% open space prime and unique farmland soils or less than 20% of the corridor presently in agricultural use.

AGRICULTURAL LANDS

Significance Groupings

Highly Significant
Susquehanna River
Miles River
Broad Creek
Harris Creek
Tred Avon River
Manokin River
Back River

Significant
Elk River
Little Choptank River
Middle River

Less Significant
Honga River
West River
South River
Magothy River
Bush River



Maryland's rivers possess outstanding natural, cultural and recreational resources. Inappropriate riverside development can adversely impact these resources and their value. The undeveloped segments provide essential habitat for fish, wildlife and plants. These areas are critical to the quality of the Chesapeake Bay area environment.

The Maryland Scenic and Wild Rivers Act defines a scenic river as a free-flowing river whose related shorelines are predominantly forested, agricultural, grassland, marshland or swamp-land with a minimum of development for at least two miles of river length. A wild river is a free-flowing river with related shorelines which are unde-

veloped, inaccessible except by trail or predominantly primitive in a natural state for at least four miles of river length.

The Nationwide Rivers Inventory conducted by the National Park Service identifies potential wild, scenic and recreational rivers or river segments which may qualify for inclusion in the National Wild and Scenic Rivers System. These rivers or river segments must be at least 5 miles in length, free-flowing, generally undeveloped, and adjacent to or within a related land area that possesses an outstandingly remarkable geologic, ecologic, cultural, historic, scenic, botanical, recreation or other similar value.

Aerial view of Deer Creek, Susquehanna River watershed, showing agricultural land and an undeveloped protective wooded area along the Creek

Undeveloped Lands

LAND USE DEVELOPMENT FEATURES

Evaluation Criteria

Rivers were evaluated for their undeveloped lands according to the following criteria.

1. Those rivers with the longest segments of river corridor having land uses compatible with river resources. This was based on an assessment of U.S. Geological Survey maps, using the Nationwide Rivers Inventory criteria.
2. Those river corridors with the lowest development point index based on information from the most recent U.S. Geological Survey topographic maps using the Nationwide Rivers Inventory criteria.

Data and Evaluation Process

Based on an examination of U.S. Geological Survey maps sections of the river corridors were immediately disqualified for not meeting the minimum requirements of the National Wild and Scenic Rivers Act. These eliminated segments exhibit land uses considered to be inappropriate for wild, scenic, and undeveloped rivers, (for example a major airport, a major landfill, a major railroad yard, etc. would not meet national criteria). The percentage of qualifying river miles was then determined.

Each river segment was measured on the map and divided into one-mile intervals beginning with the downstream segment boundary. The study river corridor was defined as contiguous lands within one quarter mile of each river bank, and was also delineated on the map. All land use development within

the river corridor was recorded for each mile interval, and numerical values were assigned to the various land uses. Development having a greater impact on natural values (i.e., bridge crossings, parallel railroads and powerlines, and small towns) was given more points than lower impact development (i.e., footpaths and unpaved roads).

After the land use development features for the river segment were identified, the numerical scores for each one mile interval were tabulated. By totalling all interval scores, and dividing through by the number of intervals (river miles), an average mile by mile index of the river's corridor development was calculated. This average is referred to as the development point index. The higher the number, the greater the degree of development.

Standards for inclusion into the Nationwide Rivers Inventory system require that rivers have development index averages of 100 points or less. For the purposes of this study, those rivers with a development index average of 50 points or less were considered to be highly significant, and rivers with a development index average of 50 to 100 points were considered to be significant.

| | |
|---|----|
| Primitive road ending | 1 |
| Footbridge gauging station | 2 |
| Primitive road parallel (trail) | 3 |
| Small dock, unpaved road ending (plain) | 4 |
| Orchards, farms, dwellings, cemetery | 5 |
| Abandoned rail line right-of-way | 6 |
| Outfalls | 7 |
| Railroad ending, powerline ending | 8 |
| Fire tower, outbuildings, schools | 10 |
| Unpaved road, light duty bridge (plain) | 10 |
| Paved road ending (red) | 10 |
| Paved boat ramp | 10 |
| Campground | 10 |
| Picnic area | 10 |
| Unpaved road parallel (plain) | 10 |
| Pipeline and powerline crossing | 15 |
| Railroad bridge | 18 |
| Paved road parallel (red) | 20 |
| Pipeline parallel | 25 |
| Powerline parallel | 25 |
| Waterstorage tank | 25 |
| Bulkhead | 25 |
| Rip rap | 25 |
| Small tributary reservoir | 25 |
| Gravel pits | 25 |
| Developed recreation area | 30 |
| Marina (site check) | 30 |
| Country club | 30 |
| Swimming pool | 30 |
| Radio tower | 35 |
| Power substation | 35 |
| Paved road bridge (4 lanes) | 40 |
| Sewage plant | 40 |
| Apartment building | 40 |
| Hospital (site check) | 40 |
| Village (up to 499 pop) | 40 |
| Dam (small) | 40 |



Undeveloped Lands



| River | Length of River in Miles | Qualifying River Miles | Percentage of Qualified River Miles as They Relate to Total River Miles | Total Land Use Impact Points River Miles | Development Index Average for Qualified River Miles |
|-----------------|--------------------------|------------------------|---|--|---|
| Susquehanna | 15 | 9 | 60 | 1,099 | 122 |
| Elk | 29 | 21 | 72 | 2,497 | 119 |
| Miles | 19 | 18 | 95 | 1,633 | 90.7 |
| Harris Creek | 10 | 10 | 100 | 1,080 | 108 |
| Broad Creek | 8 | 8 | 100 | 695 | 87 |
| Tred Avon | 12 | 8 | 60 | 790 | 99 |
| Little Choptank | 9 | 9 | 100 | 319 | 35 |
| Honga | 15 | 15 | 100 | 386 | 26 |
| Manokin | 18 | 17 | 94 | 721 | 42 |
| West | 3 | 0 | 0 | * | * |
| South | 10 | 0 | 0 | * | * |
| Magothy | 8 | 0 | 0 | * | * |
| Back | 8 | 4 | 50 | 594 | 149 |
| Middle | 5 | 0 | 0 | * | * |
| Bush | 11 | 1 | 9 | 27 | 27 |

* = Total river disqualified due to high land use impacts on natural resources within each corridor mile.

Significance Groupings

Highly Significant
 Little Choptank River
 Honga River
 Manokin River

Significant
 Miles River
 Broad Creek

Less Significant
 Susquehanna River
 Elk River
 West River
 South River
 Magothy River
 Back River
 Middle River
 Bush River
 Harris Creek
 Tred Avon River

Resource Significance Value

Highly Significant: Those river corridors having 90% or more qualifying river miles and a development index average of 50 points or less.

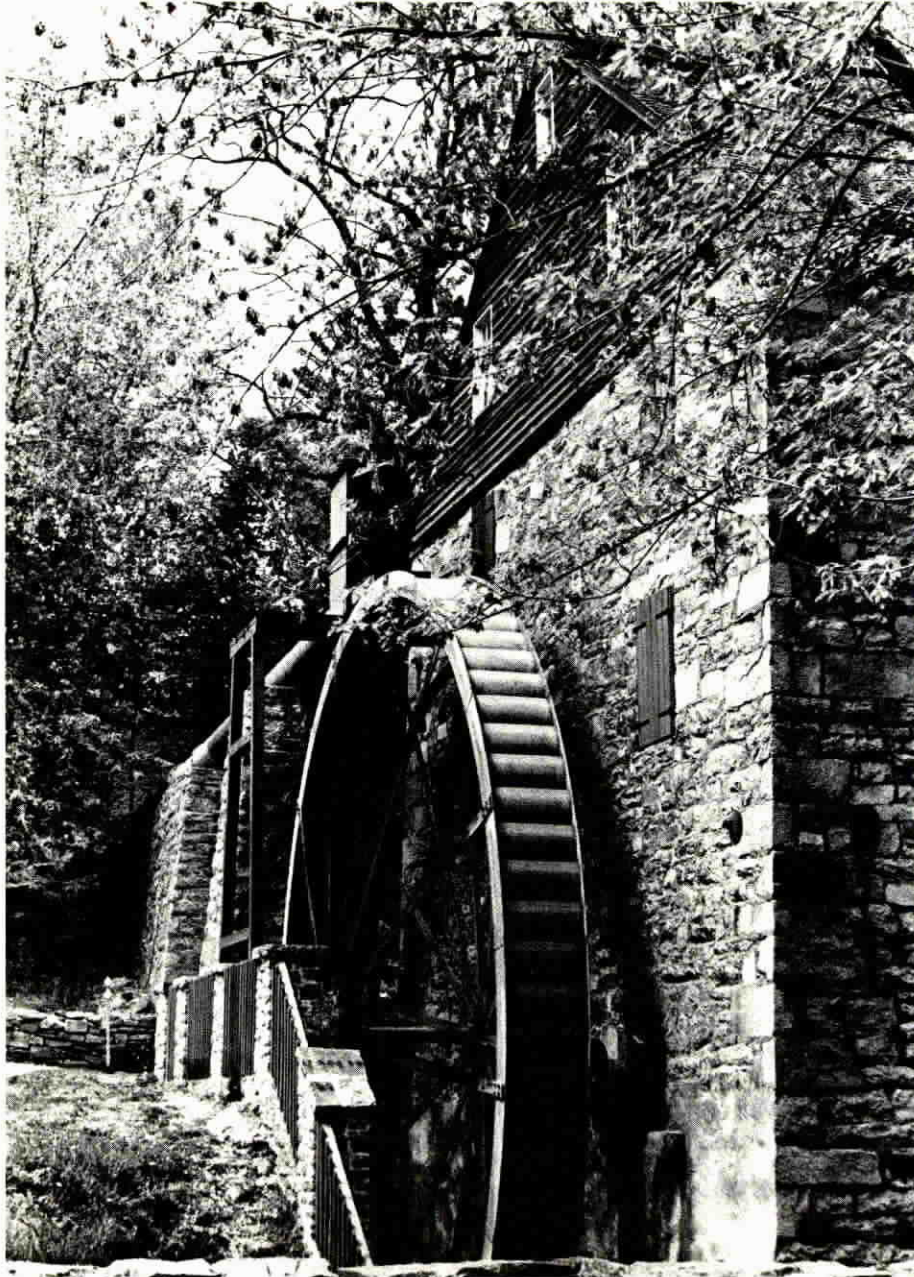
Significant: Those river corridors having 90% or more qualifying river miles

and a development index average of 50 to 100 points.

Less Significant: Those river corridors having 89% or less qualifying river miles and/or a development index average of 100 points or greater.

Undeveloped forested areas along river corridors contribute to scenic beauty and good water quality.

Historic Resources



The Chesapeake Bay tributaries are inherently rich with historic resources. These resources, including houses, churches and inns, provide expressions of past times. Knowledge of these resources enhances an appreciation for historic aesthetic values of the Bay area. With this appreciation, the adaptive reuse of historic buildings contributes to the quality of life associated with the area. Additionally, vernacular architecture is an important indicator of past indigenous lifestyles. These vernacular resources provide a continuity with the once common designs and traditions that are now becoming rare.

The study river corridors have many kinds of historic resources. Historic buildings demonstrate distinctive characteristics and design values of historic periods. Engineering structures such as bridges show important advancements in methods of construction. Historic districts are areas which have a concentration of buildings, sites and structures which are linked through historic events and architectural styles. To commemorate events of historic significance, parks are established. The Chesapeake Bay tributaries have many historic resources of significance that are designated on the National Register of Historic Properties. The Maryland Historical Trust, the state Historic Preservation Office in Maryland, has determined that many additional sites are also worthy of such recognition.

The water-powered grist mill at Rock Run on the banks of the Susquehanna River was built in 1794 and restored in the 1970's.

Evaluation Criteria

The river corridors were evaluated for their historic resources based upon the following criteria.

1. River corridors with the greatest number of historic sites listed on the Maryland Inventory of Historic Properties, a list maintained by the Maryland Historical Trust. These sites have been designated by national, state, county and local preservation agencies.
2. River corridors with a high number of sites listed on the National Register of Historic Places and sites determined as eligible to be listed on the Register by the Secretary of the Interior and the Maryland Historical Trust.
3. Any river corridors with sites recognized as a National Historic Landmark by the Secretary of the Interior.
4. River corridors with the highest potential for possessing undiscovered historic sites, as indicated by survey results provided by the Maryland Historical Trust.

Historic Resources

Data and Evaluation Process

The number of recorded sites within each river corridor was identified, with value given to the highest number. Rivers with 25 or more recorded sites were considered to be highly significant, rivers with 10 to 24 sites were considered to be significant. Any rivers with at least 10 sites that are either listed on the National Register of Historic Places or determined as eligible for the register by the Secretary of the Interior and the Maryland Historical Trust were considered to be highly significant. Additionally, any rivers with National Historic Landmarks were considered to be highly significant. Rivers with survey evaluations of high potential for unknown historic sites were considered to be significant.

Resource Significance Value

Highly Significant: Those rivers with 25 or more sites listed on the Maryland Inventory of Historic Properties, at least 10 sites listed on or considered eligible for the National Register of Historic Places, or with National Historic Landmarks.

Significant: Those rivers with at least 10 sites listed on the Maryland Inventory of Historic Properties, and rivers with a high potential for undiscovered historic sites.

Less Significant: Those rivers with 9 or less sites listed on the Maryland Inventory of Historic Properties.

| River | Total number of sites listed on the Maryland Inventory of Historic Properties* | Total historic sites listed on or eligible for the National Register of Historic Places | Total National Landmark Sites | Potential for identification of undiscovered historic sites |
|-----------------|--|---|-------------------------------|---|
| Susquehanna | 53 | 7 | 0 | low |
| Elk | 31 | 4 | 0 | low |
| Miles | 36 | 17 | 0 | high |
| Harris Creek | 24 | 13 | 0 | high |
| Broad Creek | 19 | 4 | 0 | high |
| Tred Avon | 38 | 8 | 0 | high |
| Little Choptank | 55 | 1 | 0 | high |
| Honga | 13 | 0 | 0 | high |
| Manokin | 24 | 8 | 0 | high |
| West | 13 | 3 | 1 | high |
| South | 13 | 2 | 1 | high |
| Magothy | 15 | 0 | 0 | low |
| Back | 1 | 0 | 0 | low |
| Middle | 1 | 0 | 0 | low |
| Bush | 30 | 1 | 0 | high |

* This Inventory is composed of sites which have been designated by national, state, county or local preservation agencies.



Carter-Archer Mansion in the Rock Run Historic Area, Susquehanna State Park, Hartford County

Significance Groupings

Highly Significant
 Susquehanna River
 Elk River
 Miles River
 Harris River
 Tred Avon River
 Little Choptank River
 West River
 Bush River

Significant
 Broad Creek
 Honga River
 Manokin River
 Magothy River
 South River

Less Significant
 Back River
 Middle River

Archeological Resources

River shoreline areas in Maryland are particularly rich locations for a variety of archeological resources. Throughout many cultural periods, the Bay area tributaries and their shorelines have been used extensively. Their abundant and diversified natural resources have made these river corridors highly desirable for settlement, transportation routes, trade and industry. Based on archeological predictive modeling research conducted in the Bay area, all the study rivers have been found to have a high potential for prehistoric and historic sites, including underwater sites, in addition to the many that have been recorded.

Archeological resources are above ground monuments and below ground remains from past cultures. These resources include not only those situated on land but also those which are submerged under rivers. Archeological sites in Maryland date from the prehistoric Paleo-Indian period (10,000 B.C. to 7,500 B.C.) through the six subsequent periods ending with the arrival of European settlers. The excavation and preservation of these artifacts and cultural remains from these periods provide information about past lifestyles.

All archeological resources have value

because, by their nature and placement in the ground, they are non-renewable. Significant sites are those that are associated with important events or persons, or embody distinctive methods of construction or artistic values.

Evaluation Criteria

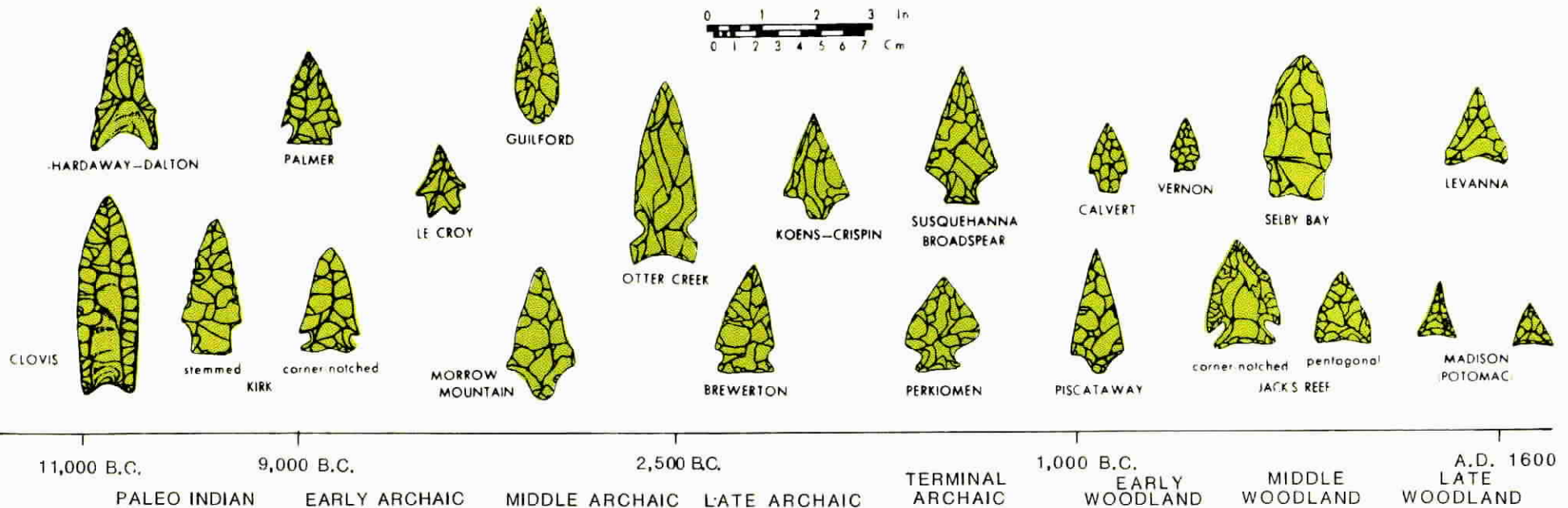
Rivers with archeological resources were evaluated by the following criteria:

1. Rivers with the highest number of recorded archeological sites as noted on the Maryland Inventory of

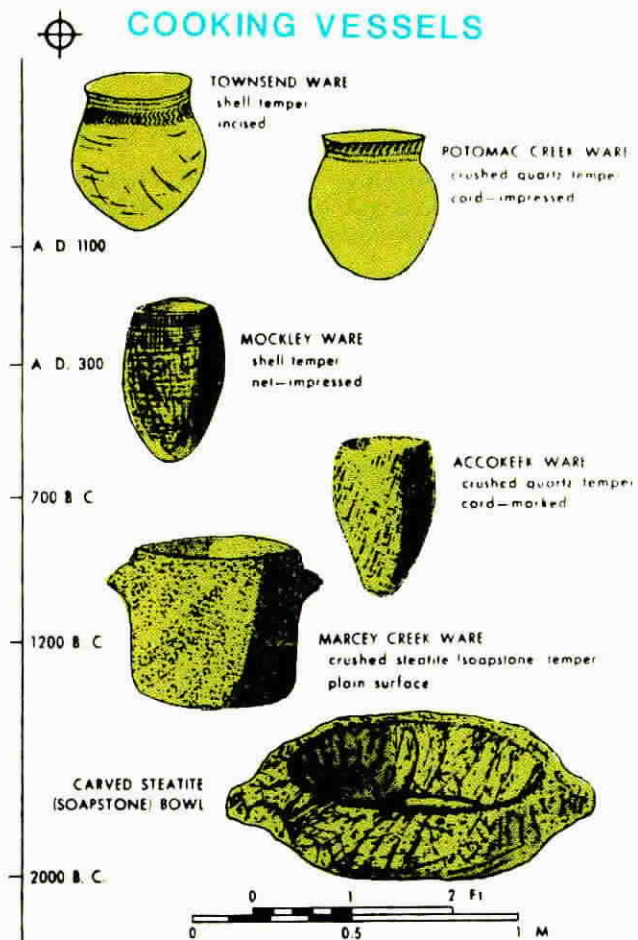
Historic Properties which is composed of places of state, county and local significance.

2. Rivers with archeological sites listed on the National Register of Historic Places.
3. Rivers that have not received comprehensive survey coverage maintain a high potential for undiscovered archeological resources. Therefore, the rivers were evaluated according to the degree of survey coverage based on information provided by the Maryland Historical Trust.

SOME CHARACTERISTIC ARTIFACTS OF INDIAN CULTURES IN MARYLAND



Archeological Resources



| River | Total Number of Archeological Sites listed on the Maryland Inventory of Historic Properties | Number of Sites Listed on the National Register of Historic Places | Degree of Archeological Site Survey Coverage |
|-----------------|---|--|--|
| Susquehanna | 10 | 1 | minimal |
| Elk | 22 | 0 | minimal |
| Miles | 10 | 0 | minimal |
| Harris Creek | 14 | 0 | minimal |
| Broad Creek | 12 | 0 | minimal |
| Tred Avon | 29 | 0 | minimal |
| Little Choptank | 8 | 0 | none |
| Honga | 5 | 0 | none |
| Manokin | 26 | 0 | minimal |
| West | 40 | 0 | minimal |
| South | 83 | 0 | comprehensive |
| Magothy | 19 | 0 | none |
| Back | 5 | 0 | minimal |
| Middle | 7 | 0 | none |
| Bush | 26 | 0 | none |

Data and Evaluation Process

The number of recorded sites and the degree of survey coverage for each river corridor was identified and evaluated. Rivers with the greatest number of recorded sites, from 26 to 83, were considered to be highly significant, those rivers with 12 to 25 sites or having sites listed on the Na-

tional Register of Historic Places were considered to be significant. Rivers which have not been comprehensively surveyed have a high potential for undiscovered archeological resources. Therefore, those study rivers which lack survey coverage were determined to be significant.

Resource Significance Value

Highly Significant: Those rivers with at least 26 recorded archeological sites, and any degree of survey coverage.

Significant: Those rivers with at least 12 recorded archeological sites, a National Register of Historic Places site, or no survey coverage.

Less Significant: Those rivers with 11 or less recorded archeological sites, and have minimal survey coverage.

Significance Groupings

Highly Significant

Tred Avon River
Manokin River
West River
South River
Bush River

Significant

Susquehanna River
Elk River
Harris Creek
Broad Creek
Little Choptank River
Honga River
Magothy River
Middle River
Back River

Less Significant

Miles River

Public Lands



Public lands along a river corridor indicate, in many instances, the presence of significant natural or cultural resources. Public ownership helps conserve these resources, provides for public use and represents an initial investment in conservation. Public lands are those lands which are owned by a government entity that the public has access to. They include:

PARKS—These are land areas set aside and designed to serve the neighborhood, community, municipal, county, state, regional and national public for passive and active recreation.

WILDLIFE MANAGEMENT AREA—These are natural land areas where wildlife populations are regulated to achieve recreation, conservation, environmental or scientific goals.

WILDLIFE REFUGE—These are aquatic and/or land areas designated for the protection and

propagation of fish and wildlife. Outdoor recreation facilities and activities which do not interfere with the primary purpose of the refuge are permitted.

RESEARCH INSTITUTION—This is a land area set aside for the purpose of scientific investigation of natural resource phenomenon.

Evaluation Criteria

Public lands were inventoried in each river corridor. They were then evaluated for significance by estimating their land percentage within each corridor.

The sources for identifying these public lands are the Maryland Recreational Inventory prepared by the Department of State Planning in 1985, county government public land inventories, and the Maryland Department of Highway county maps.

Data and Evaluation Process

The greatest value was given to those rivers having the highest percentage of their corridor publicly owned. For the purpose of this study, a river corridor which comprises 60% or more of public land is considered to be highly significant. In many cases, public lands extended beyond the quarter mile corridor. For total public land acreage, refer to the inventory located in the appendix.

Resource Significance Value

Highly Significant: 60% to 100% reflects a highly significant amount of public lands within the river corridor.

Significant: 10 to 59% reflects a significant amount of public lands within the river corridor.

Less Significant: 0 to 9% reflects a less significant amount of public lands within the river corridor.

| River | Estimated Percentage of Public Lands within River Corridor |
|-----------------|--|
| Susquehanna | 33 |
| Elk | 15 |
| Miles | 5 |
| Harris Creek | 4 |
| Broad Creek | 1 |
| Tred Avon | 4 |
| Little Choptank | 0 |
| Honga | 1 |
| Manokin | 25 |
| West | 12 |
| South | 8 |
| Magothy | 0 |
| Back | 8 |
| Middle | 10 |
| Bush | 5 |

Photo above left: Typical class in environmental education sponsored by The Smithsonian Environmental Research Center, an independent Federal Agency with lands on the Rhode and West Rivers, Edgewater, Anne Arundel County.

Recreational Boating

PUBLIC LANDS

Significance Groupings

Highly Significant
none

Significant
Susquehanna River
Elk River
Manokin River
West River
Middle River

Less Significant
Miles River
Bush River
Harris Creek
Tred Avon River
Honga River
Broad Creek
Little Choptank River
South River
Back River
Magothy River



The Chesapeake Bay and its tributaries are important for recreational boating as they provide a variety of water related opportunities to many people. The Bay waterways are readily available to large metropolitan areas such as Washington, D.C. and Baltimore, where city dwellers can find ample access to waters providing scenic landscapes. Additionally, the lifestyle and income of many local residents relies heavily on boating activities. Docking, mooring and related trades support a thriving tourist economy in this region.

The Bay and its tributaries provide diversified conditions for various types of boating craft. Bay rivers suitable for motorized boats are navigable to any vessel with an engine, including runabouts which are small open boats and cruisers which have cabins and are as large as 50 feet in length. These waterways are also navigable to a variety of sailing craft, including small portable boats which may be carried on top of a car or large schooners, sloops and auxiliary engine sailboats. River areas which are suitable for canoeing are predominately tidewater, and waters which are navigable to shallow draft boats such as skiffs, johnboats, rowboats and similar craft are often used for leisure fishing.

A popular recreational boating access point is Sandy Point State Park, Anne Arundel County

Recreational Boating

Evaluation Criteria

The following criteria were used to evaluate recreational boating on the study tributaries of the Chesapeake Bay.

- Access** represents the number and location of launching ramps, the condition of the roads leading to the launching ramps, parking facilities, mooring and docking facilities for non-trailerable boats and the cruising time to reach open Bay waters.

—**Abundant access** to the river exists if there are at least six public launching ramps, piers or other access points on the river shoreline, tributaries, or coves.

—**Moderate access** to the river exists if there are at least three to five launching ramps, piers or other access points on the river shoreline, tributaries or coves.

—**Limited access** to the river exists if there are two or less launching ramps, piers or other access points on the river shoreline, tributaries or coves.

- Boating suitability** reflects the presence of navigational requirements for various types of boats. All boats have a fixed depth requirement: canoes require the least amount of draft or water displacement and fixed keel sailboats the most. The surface area of a body of water in both configuration and condition affects the boating suitability. The types of boats considered for this study were motorized, sailing, canoeing, rowing, windsurfer and related craft.

—**High suitability rivers** are those accommodating five to six boat types.

—**Moderate suitability rivers** are those accommodating three to four boat types.

—**Low suitability rivers** are those accommodating one to two boat types.

- Capacity** for further recreation reflects the ability to increase current boating levels without creating congestion.

—**Moderate capacity rivers** are those which have low use levels and no restricted or congested areas.

—**Slight capacity rivers** are those which have high use levels and no restricted or congested areas.

—**Overuse capacity rivers** are those which have high use levels and areas of congestion or restrictions such as a drawbridge.

- Quality** of river boating experience based on the visual setting.

—**Outstanding experiences** occur where landforms, vegetation patterns, and water features combine to create a diverse landscape, providing river users with scenery that is spectacular or not common on other rivers in the region. Buildings, roads and other structures are present and add favorably to the visual quality of the river.

—**Moderate experiences** occur where landforms, vegetation patterns and water features along the river combine to create harmonious visual settings. Buildings, roads

RECREATIONAL BOATING SURVEY RESULTS

| River | Access Criteria | | | Boating Suitability | | | Capacity for Further Recreation | | | Quality of Boating Experience | | | Opportunity for Associated Recreational Activity | | | Economic Importance | | |
|-----------------|-----------------|------|-------|---------------------|------|-----|---------------------------------|--------|------|-------------------------------|------|-----|--|-------|---------|---------------------|------|-----|
| | abun. | mod. | limit | high | mod. | low | mod. | slight | over | outstan. | mod. | low | exce. | aver. | limited | high | med. | low |
| Susquehanna | X | | | X | | | | X | | X | | | | X | | | | X |
| ETk | | X | | X | | | X | | | | X | | X | | | X | | |
| Miles | | X | | X | | | | | X | | X | | | X | | X | | |
| Harris Creek | | X | | X | | | X | | | X | | | | | X | | | X |
| Broad Creek | X | | | X | | | X | | | X | | | | | X | | | X |
| Tred Avon | | X | | X | | | X | | | X | | | X | | | X | | |
| Little Choptank | | X | | X | | | X | | | | X | | | | X | | | X |
| Honga | | X | | X | | | X | | | | | X | | | X | | | X |
| Manokin | | X | | X | | | X | | | | X | | | | X | | | X |
| West | | | X | X | | | | X | | | X | | X | | | X | | |
| South | | | X | X | | | | X | | | X | | | | X | | X | |
| Magothy | | | X | X | | | X | | | | X | | | X | | X | | |
| Back | X | | | | X | | | X | | | | X | | | X | | X | |
| Middle | | | X | X | | | | | X | | X | | | | X | | X | |
| Bush | | X | | X | | | X | | | | X | | | X | | | | X |

Recreational Boating



Water skiing is a popular sport on many Chesapeake Bay tributaries.

RECREATIONAL SURVEY RESULTS
Frequency of Criteria Value Groups

| River | High | Medium | Low |
|-----------------|------|--------|-----|
| Susquehanna | 3 | 3 | 0 |
| Elk | 4 | 2 | 0 |
| Miles | 2 | 3 | 1 |
| Harris Creek | 2 | 3 | 1 |
| Broad Creek | 3 | 2 | 1 |
| Tred Avon | 5 | 1 | 0 |
| Little Choptank | 1 | 4 | 1 |
| Honga | 2 | 1 | 3 |
| Manokin | 1 | 3 | 2 |
| West | 3 | 2 | 1 |
| South | 2 | 2 | 2 |
| Magothy | 3 | 2 | 1 |
| Back | 2 | 1 | 3 |
| Middle | 1 | 2 | 3 |
| Bush | 2 | 3 | 1 |

and other structures are present and do not intrude on the visual quality of the river.

—**Low experience** areas occur where landforms, vegetation patterns and water features combine to create settings lacking visual harmony. Buildings, roads and other structures are present and intrude on the visual quality of the river.

5. **Associated recreational activities** reflect the number of opportunities for other recreation pursuits while boating.

—**Excellent opportunities** are the presence of more than one overnight anchorage or camping facility, swimming areas, picnic areas and noted fishing areas.

—**Average opportunities** are the presence of one overnight anchorage or camping facility, a swimming area, picnic area and a fishing area.

—**Limited opportunities** exist where other recreational activities are non-existent or overcrowded.

6. **Economic importance** reflects the amount of dollars generated for the local economy through the provision of boating services such as equipment, storage, repair, fuel and marine supplies.

—**High importance** occurs where boating activities contribute a significant percentage of revenue to the local economy.

—**Medium importance** occurs where the dollars generated are a relatively moderate percentage of the total local economy.

—**Low importance** occurs where boating activities contribute to a moderate percentage of the local economy.

Data and Evaluation Process

A survey using the six criteria was developed and distributed to the DNR Marine Police Captains who patrol the 15 study rivers. Using the survey, the Marine Police evaluated each river.

On the survey, each criteria was divided into three evaluation groups—high, medium and low. Those value groups that occurred most frequently for each river determined their category resource significance value. In the event of equal numerical occurrences within the value groups, a final significance determination was made by using the firsthand knowledge of the Marine Police Captains.

Resource Significance Value

Highly Significant: Rivers with 3 or more criteria evaluated as being high.

Significant: Rivers with 3 or more criteria evaluated as being medium.

Less Significant: Rivers with 3 or more criteria evaluated as being low.

Significance Groupings

Highly Significant
Susquehanna River
Elk River
Broad Creek
Tred Avon River
West River
South River
Magothy River

Significant
Miles River
Harris Creek
Little Choptank River
Manokin River
Bush River

Less Significant
Honga River
Back River
Middle River

MARYLAND SCENIC AND WILD RIVERS VALUE MATRIX



| RIVER/CREEK | RESOURCE CATEGORIES | | | | | | | | | | |
|-----------------|---------------------|-------------------|----------|----------|-----------|--------------------|-------------------|----------------------|-------------------------|--------------|----------------------|
| | NATURAL | | | | | | | CULTURAL | | RECREATIONAL | |
| | WATER QUALITY | UPLAND VEGETATION | WETLANDS | WILDLIFE | FISHERIES | AGRICULTURAL LANDS | UNDEVELOPED LANDS | HISTORICAL RESOURCES | ARCHEOLOGICAL RESOURCES | PUBLIC LANDS | RECREATIONAL BOATING |
| SUSQUEHANNA | ● | ● | ● | ● | ● | ● | ○ | ● | ● | ● | ● |
| ELK | ● | ○ | ● | ● | ● | ● | ○ | ● | ● | ● | ● |
| MILES | ● | ○ | ● | ● | ● | ● | ● | ● | ○ | ○ | ● |
| HARRIS CREEK | ● | ● | ● | ● | ● | ● | ○ | ● | ● | ○ | ● |
| BROAD CREEK | ● | ● | ● | ● | ● | ● | ● | ● | ● | ○ | ● |
| TRED AVON | ● | ○ | ● | ○ | ● | ● | ○ | ● | ● | ○ | ● |
| LITTLE CHOPTANK | ● | ○ | ● | ● | ● | ● | ● | ● | ● | ○ | ● |
| HONGA | ● | ○ | ● | ● | ● | ○ | ● | ● | ● | ○ | ○ |
| MANOKIN | ● | ○ | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| WEST | ● | ● | ○ | ● | ● | ○ | ○ | ● | ● | ● | ● |
| SOUTH | ● | ● | ○ | ● | ● | ○ | ○ | ● | ● | ○ | ● |
| MAGOTHY | ○ | ○ | ● | ● | ● | ○ | ○ | ● | ● | ○ | ● |
| BACK | ○ | ○ | ● | ○ | ● | ● | ○ | ○ | ● | ○ | ○ |
| MIDDLE | ● | ○ | ● | ○ | ● | ● | ○ | ○ | ● | ● | ○ |
| BUSH | ● | ○ | ● | ● | ● | ○ | ○ | ● | ● | ○ | ● |

LEGEND

HIGHLY SIGNIFICANT



SIGNIFICANT



LESS SIGNIFICANT



RIVER RESOURCE ASSESSMENT FINDINGS

RIVERS WITH GREATER THAN STATEWIDE SIGNIFICANCE

Three rivers and their related corridors were found to possess an outstanding cumulative resource value as represented by six or more natural, cultural or recreational resource categories assessed as being highly significant. This cumulative resource value is unique in the Northeastern United States and of greater than statewide significance. These rivers are:

Susquehanna River
Tred Avon River
Manokin River

RIVERS WITH STATEWIDE SIGNIFICANCE

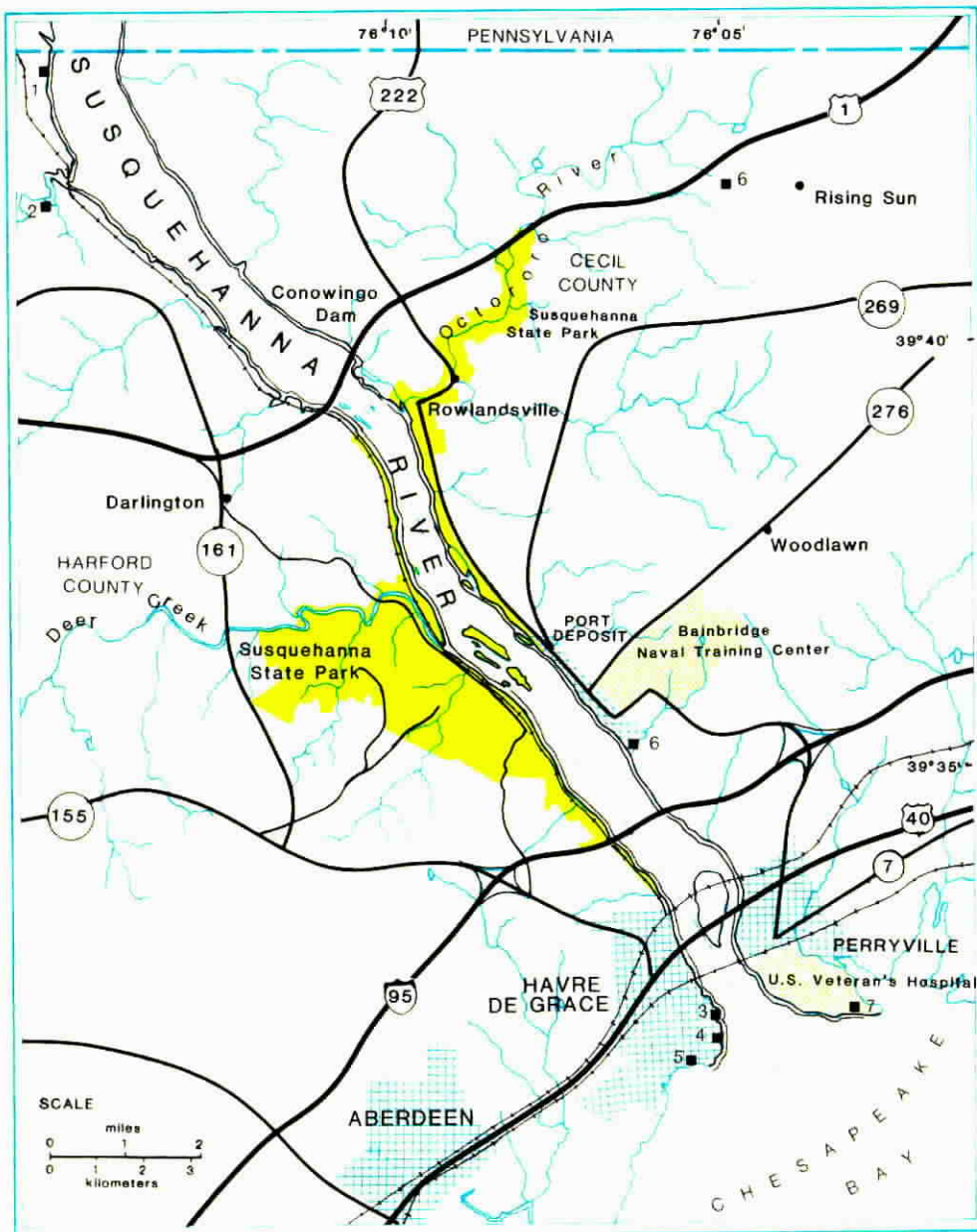
Five rivers and their related corridors were found to possess a considerable cumulative resource value represented by four to five natural, cultural or recreational resource categories assessed as being highly significant. These rivers have a cumulative resource value which is exceptional within the state of Maryland. These rivers are:

Miles River
Harris Creek
Broad Creek
Honga River
Bush River

RIVERS WITH REGIONAL SIGNIFICANCE

Seven rivers and their related corridors were found to possess a cumulative resource value represented by three or less natural, cultural or recreational resource categories assessed as being highly significant. These rivers were assessed as having a cumulative resource value which is of regional and/or local significance. These rivers are:

Elk River
Little Choptank River
West River
South River
Magothy River
Back River
Middle River



SUSQUEHANNA RIVER

The Susquehanna River is the largest freshwater stream on the eastern seaboard of the United States. Draining from upstate New York, through Pennsylvania, the final 15 miles of this 450 mile long river are in Maryland. One of the major tributaries of the Susquehanna is Deer Creek, which is designated recreational trout water and is part of the Maryland Scenic and Wild Rivers System. Another major feature along the river is the Susquehanna State Park. This 2,525 acre park is notable for its many historic buildings as well as distinctive natural and scenic qualities.

endangered wetland plant species of national concern, the Virginia Mallow, occurs as well as several other species of regional concern, which include the Glade Fern, Valerian, Purple Cress, Brome-like Sedge, Rough Cyperus, and Virginia Mountain-mint. Numerous locally rare wetland species of state concern occur including the Aster-like Boltonia, Sweet-scented Indian-plantain, Tall Tickseed, Fringed-tip Closed Gentian, Climbing Fern, Thread-like Naiad, Red Headgrass, Veined Skullcap, Snowy Campion, Clingman's Hedge Nettle, Leatherleaf Meadowrue, and Golden Seal.

SIGNIFICANT AND HIGHLY SIGNIFICANT RESOURCE VALUES

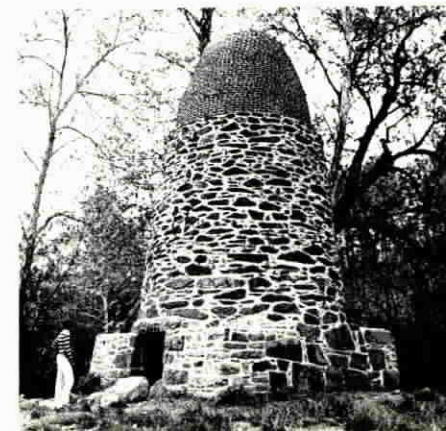
NATURAL

Wildlife: The river corridor provides habitat for the American Bald Eagle, a federal and State endangered species. As many as 20 have been observed wintering on the river banks during one season.

Water Quality: Significant. The overall water quality for fishable and swimmable waters is good. The temperature and the pH are excellent for supporting aquatic life.

Wetlands: The Susquehanna has an abundant amount of submerged aquatic vegetation, 299.5 acres within the Maryland segment. The river also has a great diversity of wetland community types, with 26 different classes identified. Along the river the State

Upland Vegetation: As much as 51% of the river edge has forest cover at least 100' deep. The Lobed Spleenwort and the Long-beaked Arrowhead are rare and endangered species of regional concern. Other rare and endangered upland vegetation species of state concern include the Short's Rockcress, Indian Paintbrush, Nyctelea, White Trout Lily, the Small Purple-fringed Orchis, Trailing Switchwort, Northern Dropseed, and Nodding Pagonia.



The Stafford Iron Furnace—an historic restoration in Susquehanna State Park.

SUSQUEHANNA RIVER

COUNTY AND MUNICIPAL PUBLIC LANDS

- 1 - LINE BRIDGE PARK
- 2 - BROAD CREEK PUBLIC LANDING
- 3 - JEAN ROBERTS PARK
- 4 - CONGRESS STREET PARK
- 5 - TYDINGS PARK
- 6 - STUBB'S HILL PARK
- 7 - (UNNAMED) PARK LAND

HARFORD AND CECIL COUNTIES



RIVERS WITH GREATER THAN STATEWIDE SIGNIFICANCE

Fisheries: The Susquehanna provides a habitat for the Shortnose Sturgeon, which is federally designated rare and endangered fish species. The river also has Striped Bass, American Shad and the Hickory Shad which are designated by State law as being threatened species. Logperch and Atlantic Sturgeon, also found in the Susquehanna, have been determined to be rare or endangered at the state level. The river is important for recreational fishing with 8 species popular for sportfishing and abundant boating access from 10 public piers and ramps.

Agricultural Lands: Within the Susquehanna River corridor, 28% of the open space soils are classified as prime and unique for farming.

Undeveloped Lands: Nine river miles or 60% of the river corridor is land that has not been heavily impacted by development. Three of these undeveloped miles, from Port Deposit to the confluence of Octoraro Creek, are on the Nationwide Rivers Inventory. Rivers on that inventory meet into the National Wild and Scenic Rivers System.

CULTURAL

Historic Resources: The Susquehanna River corridor has 53 sites listed on the Maryland Inventory of Historic Properties. One of these sites, the Concord Point Lighthouse, is listed on the National Register of Historic Places. The remaining 52 sites listed on the inventory are designated as having either state or local significance.

Archeological Sites: There are presently 12 known archeological sites recorded along the Susquehanna River. One of these, Snow Hill/Cedar Hollow

site, is listed on the National Register of Historic Places. This site consists of the archeological remains of a 19th century black community. Six sites date to prehistoric time periods, and reflect occupation throughout the Archaic and Woodland Periods. In addition, prehistoric petroglyphs have been recovered from the Susquehanna River. These unique rock carvings reportedly date to circa A.D. 900-1500. Five sites date from the 18th to 19th centuries and include domestic and industrial sites. The remaining site, Gar-

rett/Palmer Island, reflects occupation from Archaic through historic time periods. In addition to the known sites, there are four unconfirmed prehistoric sites and isolated finds identified along the river.

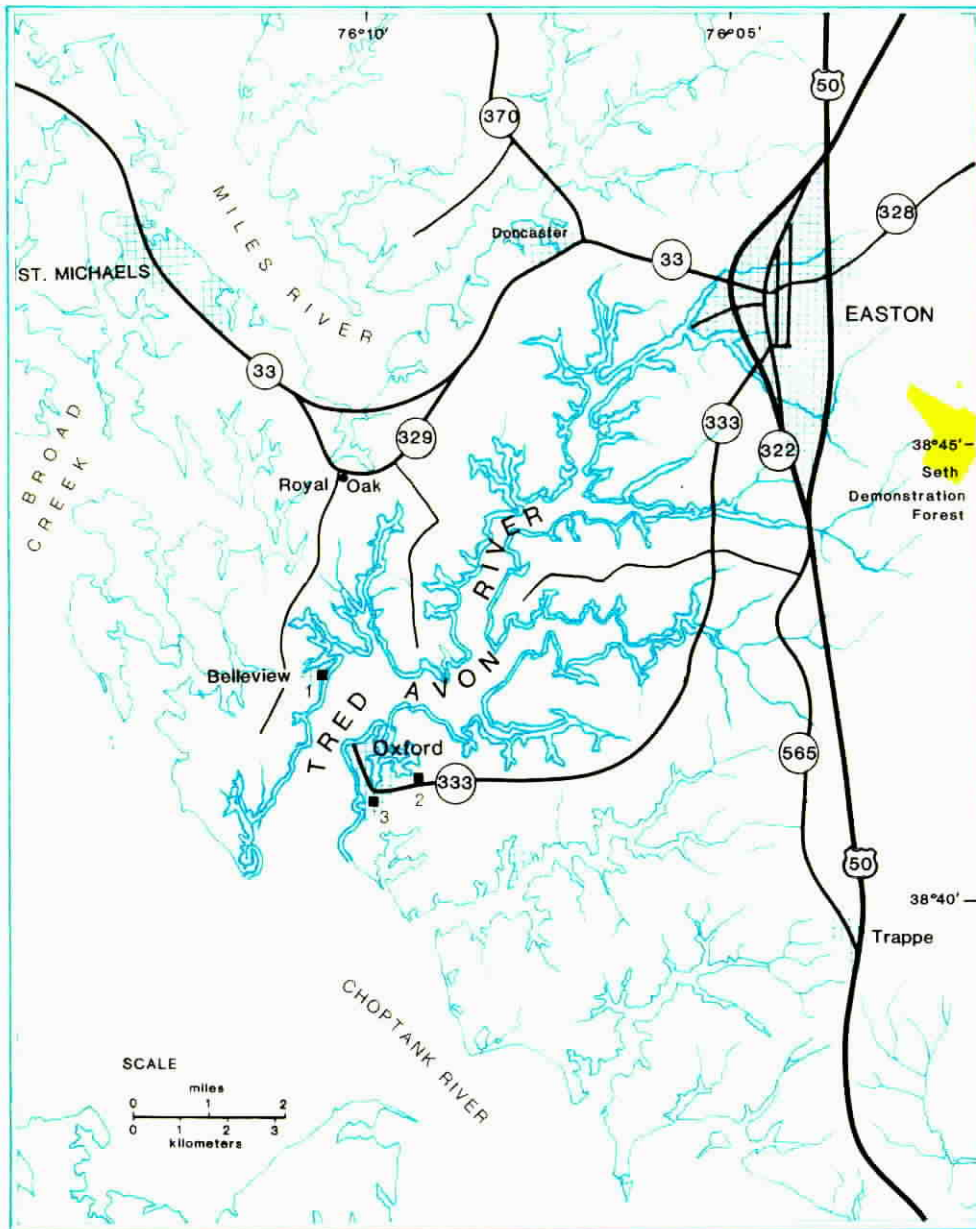
RECREATIONAL

Public Lands: There are eight river-related public parks and boat landings which comprise approximately 33% of the river corridor.

Boating: The Susquehanna is excellent for recreational boating providing excellent access from 10 public ramps and piers and is navigable by a wide range of boat types.



View of the Susquehanna River looking south from Susquehanna State Park in Harford County



TRED AVON RIVER

TALBOT COUNTY

■ COUNTY AND MUNICIPAL PUBLIC LANDS

- 1 - BELLEVUE PARK
- 2 - OXFORD PARK
- 3 - CAUSEWAY PARK



Maryland Department of Natural Resources
Capital Programs Administration
Land Planning Services
Wild and Scenic Rivers Program

National Park Service
Mid-Atlantic Regional Office
Division of Park and Resource Planning

TRED AVON RIVER

Historic records show that the Tred Avon River was originally spelled Third Haven because it provided watermen a third haven from the Bay. Even today, the Tred Avon River is considered to be excellent for boating. The prime land use along the corridor is agriculture. Many of the estate farmhouses are well known historic resources.

This winding 12-mile-long river provides refuge to exceptionally large populations of Canvasback Ducks, whose overall populations have declined in the Bay area. Waterfowl types that are popular for recreational hunting, such as Mallard, Scoter and Canada Goose, winter along the Tred Avon in large populations.

SIGNIFICANT AND HIGHLY SIGNIFICANT RESOURCE VALUES

NATURAL

Water Quality: Highly Significant. The overall water quality is very good. Dissolved oxygen, suspended solids, nutrient levels, temperature, and pH are exceptional for supporting aquatic life.

Upland Vegetation: The Tred Avon River corridor provides a habitat for the long-leaved rushgrass, a species of State concern.

Wetlands: The river corridor has a great diversity of wetlands, with 24 different community types. The river also supports 271.5 acres of submerged aquatic vegetation.

Wildlife: In addition to providing wintering habitat for the American Bald Eagle, a federally and State endangered species, the river corridor provides summer nesting territory. The Tred Avon also has an upland habitat used by the Delmarva Fox Squirrel, another federal and State endangered species. The corridor has outstanding populations of wintering waterfowl, with as many as 30,000 game species of birds. Additionally, the river has exceptionally large populations of wintering Canvasback Ducks (24,450) and Black Ducks (900). (Black Ducks had been historically abundant in the Bay area, but their populations have drastically declined during recent decades.)

Fisheries: Recreational fishing in the Tred Avon River is good with eight popular game fish species and adequate boating access. The river also offers habitat to Striped Bass, a fish species which is designated by State law as threatened with extinction in Maryland. Additionally, the river has an abundance of natural oyster bars, covering as many as 3,263 acres of the river bed.

Agricultural Lands: An important value of the river corridor is the large amount (54%) of land currently used for agriculture. Of the corridor's open space soils, 45% are classified as prime and unique for farming.

Undeveloped Lands: About 33% of the river corridor has not been heavily impacted by development.

RIVERS WITH GREATER THAN STATEWIDE SIGNIFICANCE

CULTURAL

Historic Resources: The corridor is rich with historic resources. Thirty-eight sites are listed on the Maryland Inventory of Historic Properties of which eight of these structures, including lighthouses and inns, are listed on the National Register of Historic Places. The remaining 30 sites listed on the Inventory are designated as having either State or local significance.

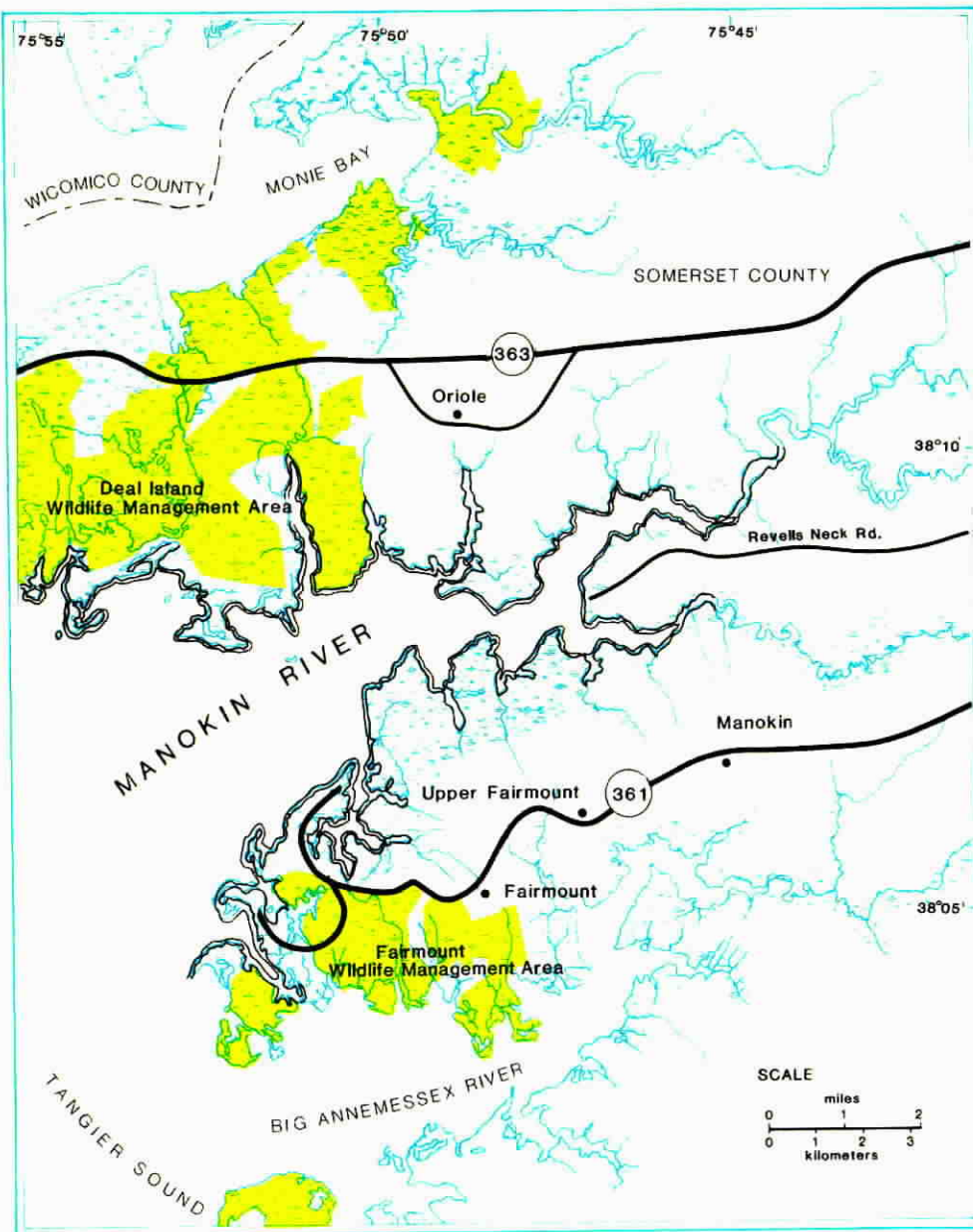
Archeological Resources: Twenty-nine known archeological sites are presently recorded along the Tred Avon River. Of these sites 26 represent prehistoric occupation and include one Archaic, one Archaic through Woodland, and 24 undetermined prehistoric period sites. There is one site which reflects prehistoric and historic occupation. The remaining two sites date to the 18th and 19th centuries. In addition, there are four unconfirmed prehistoric sites/isolated finds located along the river.

RECREATIONAL

Boating: The Tred Avon has outstanding opportunities for recreational boating. It is navigable by many types of boats and has good access from five public ramps and piers. The river is free of boating congestion and has many associated recreational opportunities such as swimming, camping, fishing and picnicking areas available to the public. Recreational boating and the associated facilities support an important part of the local economy.



The Oxford Ferry crossing the Tred Avon River from ferry slip in Bellevue, Talbot County.

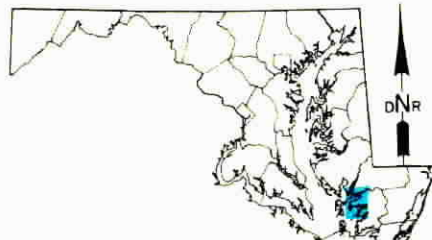


MANOKIN RIVER

Maryland Department
of Natural Resources
Capital Programs Administration
Land Planning Services
Wild and Scenic Rivers Program

National Park Service
Mid-Atlantic Regional Office
Division of Park and Resource Planning

SOMERSET COUNTY



MANOKIN RIVER

This 18-mile river mainstem remains mostly in a natural state. Wetlands account for as much as 70% of the corridor. Within and adjacent to the lower river corridor are the State Wildlife Management Areas of Deal Island and Fairmont, comprising a total of 15,615 acres. This river, with very good water quality, is as narrow as 30 feet in the upper reaches and becomes as wide as four miles at the mouth. Within the upper third of the corridor, the majority of soils are prime and unique for agricultural purposes and are currently under cultivation.

SIGNIFICANT AND HIGHLY SIGNIFICANT RESOURCE VALUES

NATURAL

Water Quality: Highly Significant. The overall water quality is very good. Dissolved oxygen suspended solids, nutrient levels, temperature, and pH are exceptional for supporting aquatic life.

Wetlands: An outstanding resource of the river is the abundance of wetlands. As much as 70% of the corridor is wetlands with 14 different community types. Additionally, habitat for the sensitive joint-vetch, a threatened wetlands species of national concern is present. There are only 12 sites throughout the world where this wetland species can be found. The river also supports 113.3 acres of submerged aquatic vegetation.



Sensitive-joint Vetch
Aeschynomene virginica



Manokin River, beach and wetlands from Raccoon Point, Revells Neck, Somerset County.

RIVERS WITH GREATER THAN STATEWIDE SIGNIFICANCE

Wildlife: In addition to providing winter habitat for the American Bald Eagle, a State and federally endangered species, the river corridor has summer nesting territory. The river corridor provides upland habitat for the Delmarva Fox Squirrel and summer habitat to the Sea Turtle, both federally endangered species. The Manokin River provides a habitat for populations of wintering Black Ducks (1,900), a species that has been historically abundant in the Bay area but whose populations have declined during recent decades. The corridor also has large populations (10,300) of wintering waterfowl, such as Mallard, Bufflehead, and Canada Goose, which can be legally hunted.

Fisheries: The river bed is covered by 4,422 acres of natural oyster bars. The river offers habitat to Striped Bass, a fish species recognized by State law as being threatened with extinction.

Agricultural Lands: Agricultural land use in the Manokin River corridor is highly concentrated along the upper third of the mainstem. Of all open space soils, 43% within the corridor are classified as excellent for farmlands. Twenty-three percent of the corridor is currently under agricultural use.

Undeveloped Lands: Seventeen miles upstream from the mouth of the river is an area that has not been heavily impacted by development. This river segment is eligible to be listed on the Nationwide Inventory. Rivers on that inventory meet the minimum criteria for further study and/or potential inclusion into the National Wild and Scenic Rivers System.

CULTURAL

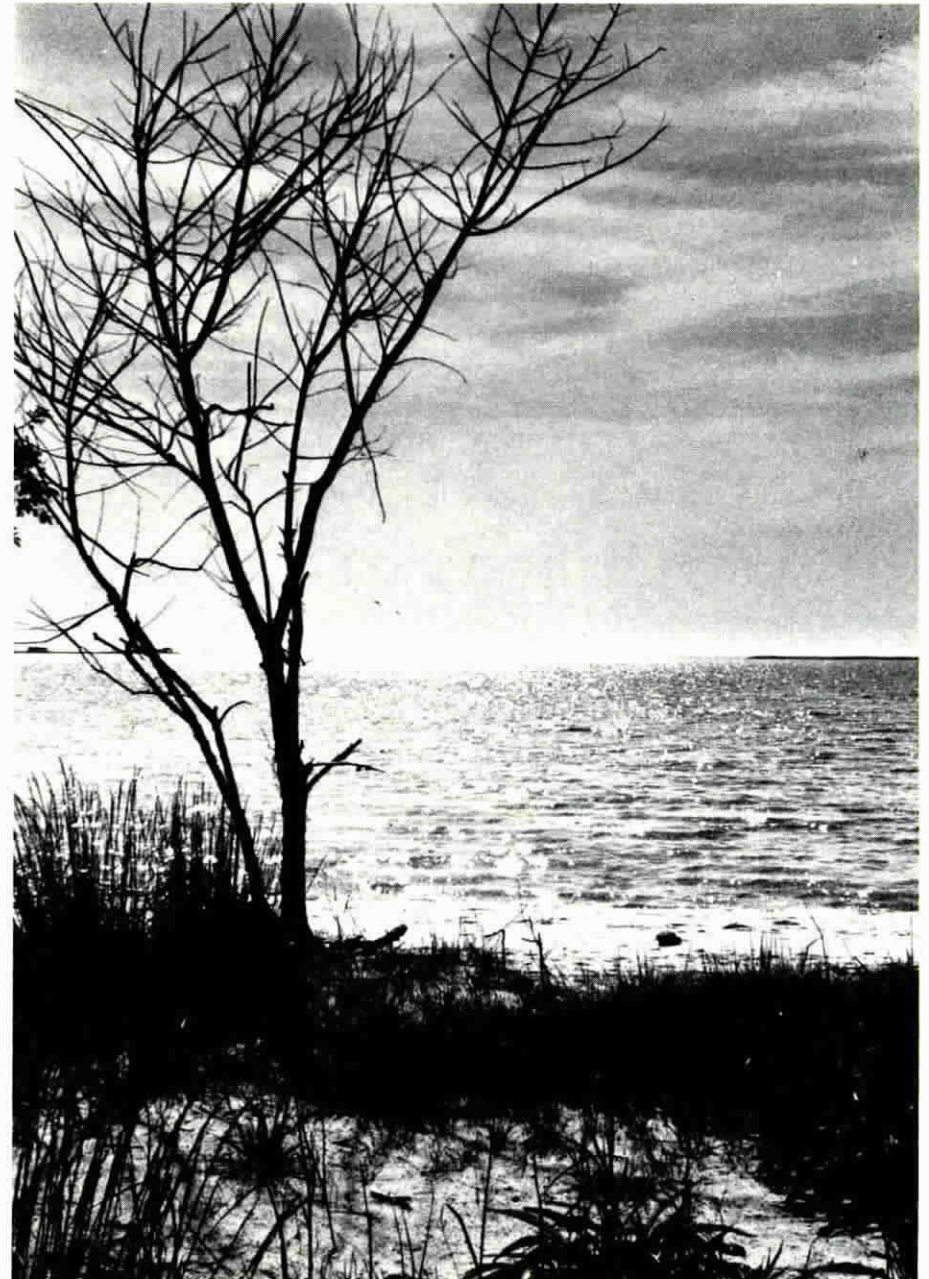
Historic Resources: The corridor has 24 historic sites listed on the Maryland Inventory of Historic Properties. Eight of these sites are listed on the National Register of Historic Places. The remaining 16 listed on the Inventory are designated as having state or local significance.

Archeological Resources: There are 26 known archeological sites recorded along the Manokin River. Twenty-two of those sites reflect prehistoric occupation and include the following: eight Archaic Period, four Archaic through Woodland Periods, six Woodland Period, and four undetermined prehistoric periods. One site contains prehistoric and historic components and the remaining three sites date to the 18th and 19th centuries.

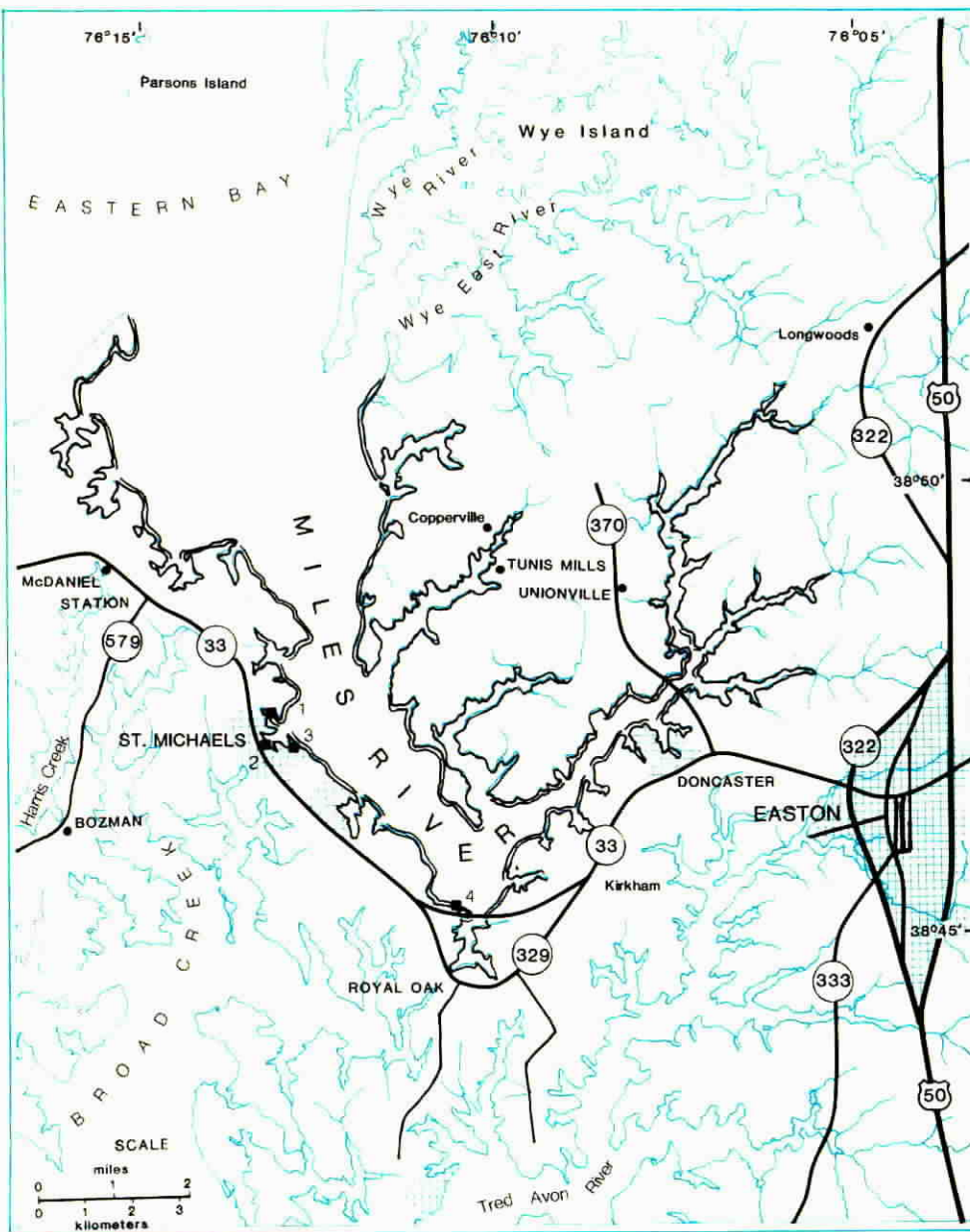
RECREATIONAL

Boating: The Manokin River, with scenic shoreline landscapes is free of boating congestion and good for recreational boating with five points of access from public ramps and piers.

Public Lands: Twenty-five percent of the river corridor is publicly owned lands which are set aside as wildlife refuges.



View of Manokin River confluence with Chesapeake Bay on the horizon.



MILES RIVER

■ COUNTY AND MUNICIPAL PUBLIC LANDS

- 1 - MILL STREET PARK
- 2 - MUSKRAT PARK
- 3 - ST. MICHAEL'S PUBLIC WHARF
- 4 - OAK CREEK PARK



MILES RIVER

The Miles River mainstem is 19 miles long and has good water quality. The river is narrow towards the upper reaches becoming as wide as one mile at the mouth. The corridor, with farming as the primary land use, is known for its scenic rural landscapes. Over half of the river corridor is rich with prime and unique agricultural soils.

The town of St. Michaels, which is located adjacent to the river, has been historically known for boat building. St. Michaels is also noteworthy for its unusual combination of large waterfront estates and weathered fishing docks and boats. The river corridor reflects the rich heritage of the Eastern Shore. As many as 17 buildings are listed on or considered eligible for the National Register of Historic Places.

SIGNIFICANT AND HIGHLY SIGNIFICANT RESOURCE VALUES

NATURAL

Water Quality: Highly Significant. The overall quality of water is very good. Dissolved oxygen, suspended soils, nutrient levels, temperature, and the pH are excellent for supporting aquatic life.

Upland Vegetation: The corridor is the habitat of the upland vegetation species Common's Panicgrass, a threatened species of State concern.

Wetlands: Wetlands are an important resource of the Miles River, which has the notable diversity of 25 different community types. Submerged aquatic vegetation is substantial, covering 194.8 acres of the river bed.

Wildlife: In addition to providing wintering habitat for the American Bald Eagle, a State and federally endangered species, the Miles River corridor has two nesting territories. The river corridor also provides upland habitat for the Delmarva Fox Squirrel, another State and federal endangered species. The corridor has 18,800 annually wintering Canvasback Ducks, a species historically abundant in the Bay area, but whose population has drastically declined during recent decades. The corridor also has 20,600 annually wintering waterfowl such as the Canada Goose which can be legally hunted.

Fisheries: The river provides habitat to Striped Bass, which is recognized by the State of Maryland as being threatened with extinction. Additionally, 2,148 acres of the river bed is comprised of natural oyster bars.

Agricultural Lands: Within the river corridor, agricultural lands are an important resource. Of all open space soils, 52% are classified as excellent for agriculture. Farmlands constitute 51% of the current land uses.

Undeveloped Lands: About 95% of the corridor has not been heavily impacted by development.

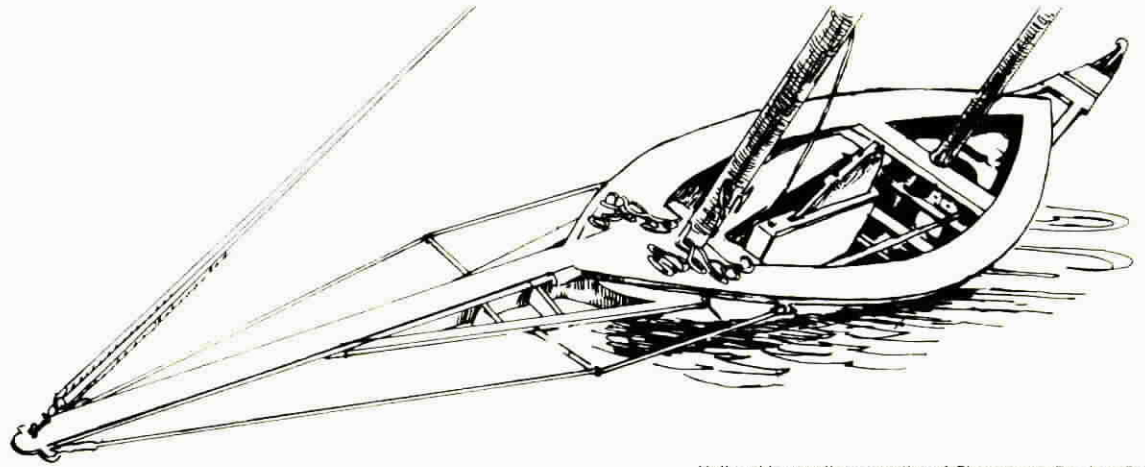
RECREATIONAL

Boating: The Miles River has good recreational boating opportunities because the river channel is deep enough to be navigable by many types of boats. Boating access is good with five public ramps and piers. Recreational boating facilities serve as an important local source of income.

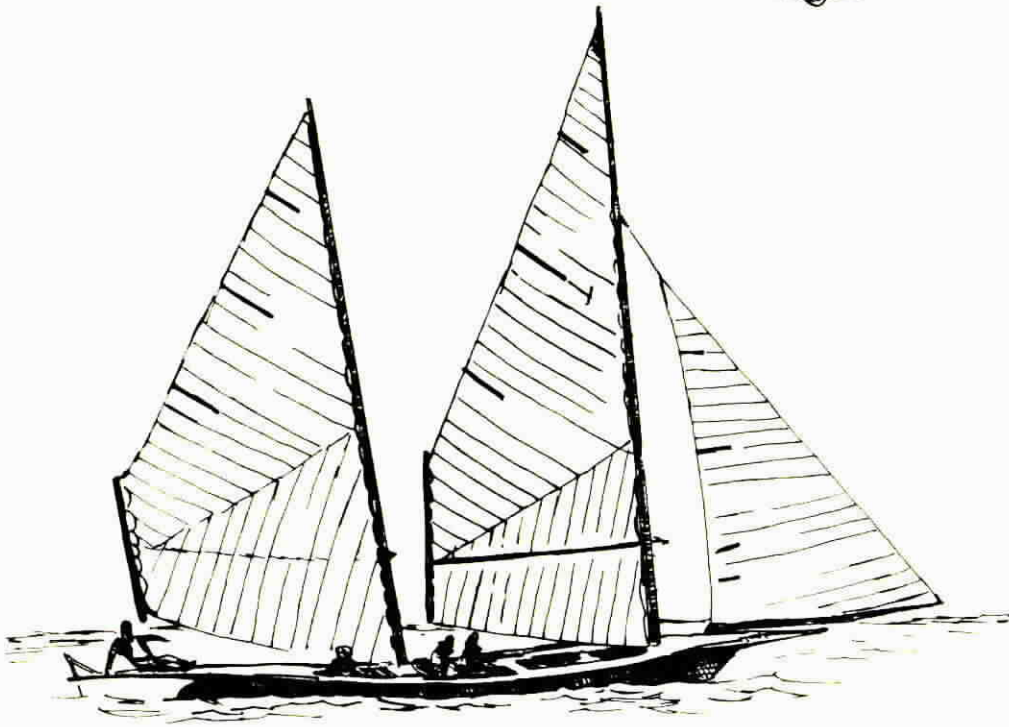
RIVERS OF STATEWIDE SIGNIFICANCE

CULTURAL

Historic Resources: The corridor is rich with historic resources, of these 36 are listed on the Maryland Inventory of Historic Properties. The corridor has an exceptionally large number of historic sites which are listed on the National Register of Historic Places. Seven of the structures are inns and churches; 10 are log canoes, which are a watercraft indigenous to the area. The remaining 18 sites listed on the Inventory are designated as having State or local significance.



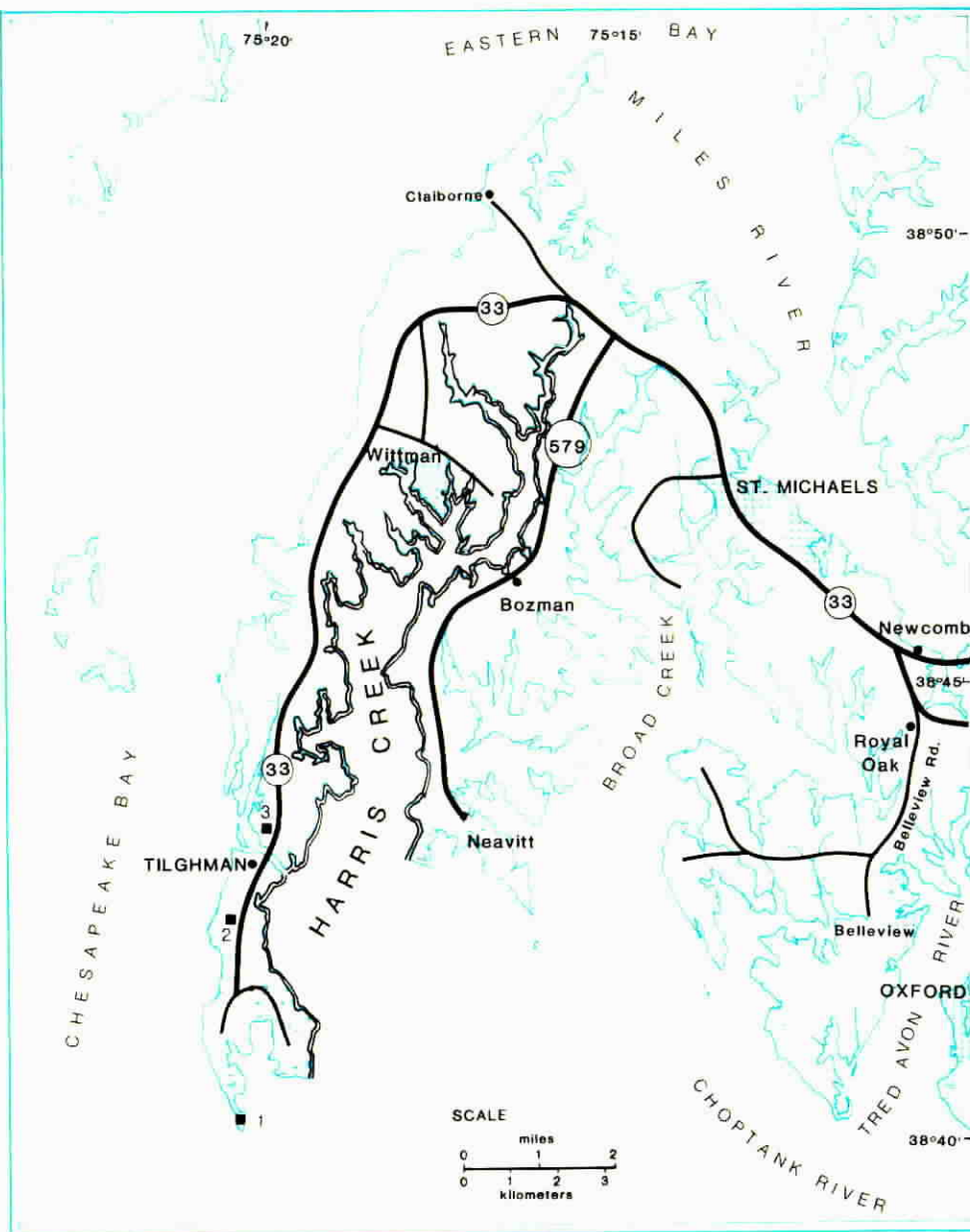
Hull and bowsprit perspective of Chesapeake Bay Log Canoe



Sail pattern of Chesapeake Bay Log Canoe



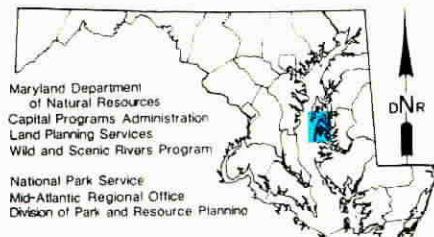
The Miles River, St. Michael's harbor.



HARRIS CREEK

■ COUNTY AND MUNICIPAL PUBLIC LANDS

- 1 - BLACK WALNUT POINT PARK
- 2 - DOGWOOD HARBOR
- 3 - COAST GUARD PARK



HARRIS CREEK

The winding 10-mile river mainstem of Harris Creek, edged with many coves and inlets, is relatively undeveloped. The creek's corridor is known for its scenic and rural landscape. Over 70% of the corridor is currently farmed. Tilghman Island, which is located at the mouth of the river, is a waterman's community with active commercial fishing docks. Of the many historic structures along the river, 13 are listed on or considered to be eligible for the National Register of Historic Places.

SIGNIFICANT AND HIGHLY SIGNIFICANT RESOURCE VALUES

NATURAL

Water Quality: Highly Significant. The overall water quality is very good. Dissolved oxygen, suspended solids, nutrient levels, temperature, and the pH are exceptional for supporting aquatic life.

Upland Vegetation: Twenty-one percent of the river edge has forest cover at least 100 feet deep, which can improve the quality of waters entering the river by filtering out nutrients and sediments.

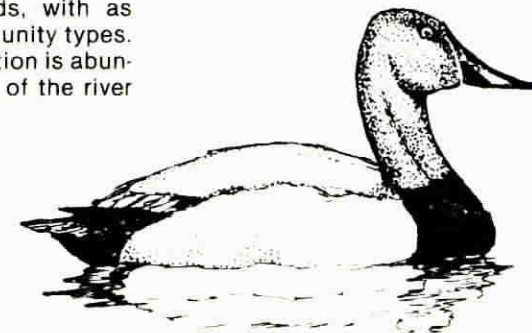
Wetlands: The river corridor has a great diversity of wetlands, with as many as 17 different community types. Submerged aquatic vegetation is abundant, covering 376.3 acres of the river bed.

Fisheries: The river offers habitat to Striped Bass, a fish species which is recognized by State law as being threatened with extinction. Additionally, 1,312 acres of the river bed are comprised of natural oyster bars. Recreational fishing in Harris Creek is good with a diversity of sportfish species and adequate boating access.

Agricultural Lands: An outstanding value of the river corridor is the extensive amount (70%) of current agricultural land use. Of the corridor's open space soils, 21% are classified as prime and unique for farming.

Undeveloped Lands: The river corridor has not been heavily impacted by development.

Wildlife: The corridor provides wintering habitat for the American Bald Eagle, a State and federally endangered species. The corridor also offers habitat for 12,225 annually wintering canvasback ducks, a species historically abundant in the Bay area, but whose populations have drastically declined during recent decades. The corridor also provides habitat to 15,025 annually wintering waterfowl such as Mallard and Scoter which can be legally hunted.



Canvasback - *Aythya valisineria*

RIVERS OF STATEWIDE SIGNIFICANCE

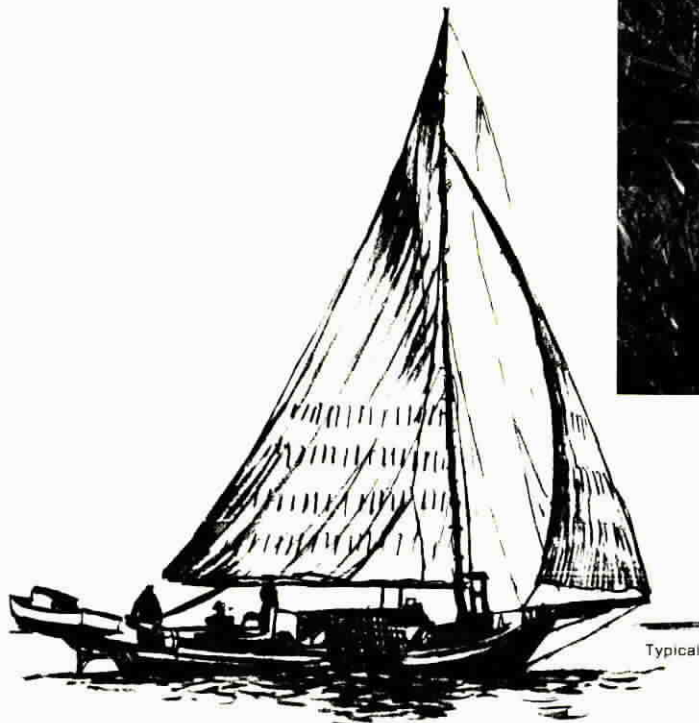
CULTURAL

Historic Resources: The corridor is rich with historic resources, with 24 sites listed on the Maryland Inventory of Historic Properties. The river has as many as 13 boats, skipjacks and log canoes listed on the Natural Register of Historic Places. Skipjacks and log canoes are boat types indigenous to the Chesapeake Bay region. The remaining 11 sites listed on the inventory are designated as having either state or local significance.

Archeological Resources: Harris Creek presently has 14 known archeological sites. All the sites date to prehistoric periods and include one Woodland Period and thirteen undetermined Prehistoric Period sites.



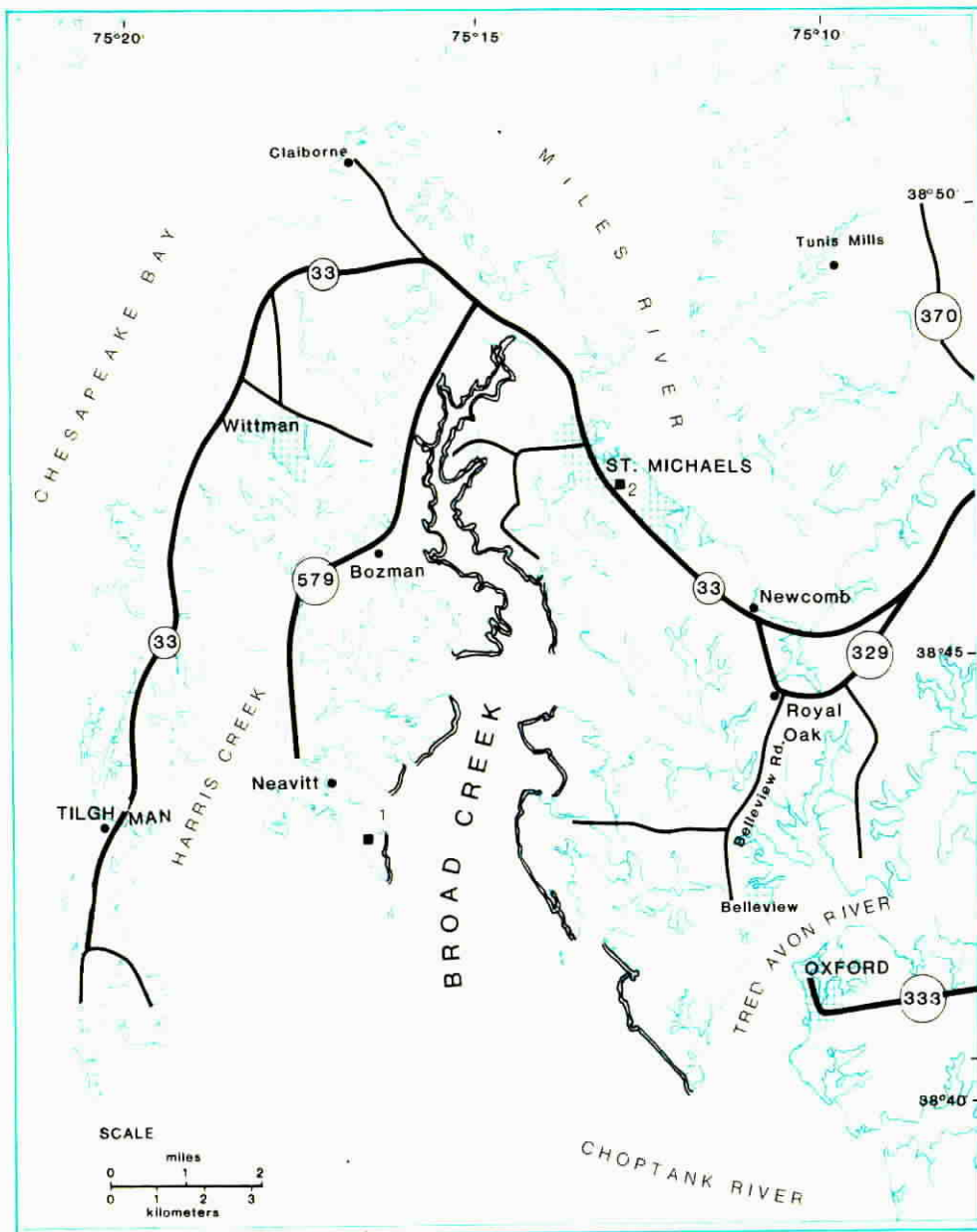
Looking south from the eastern riverbank of Harris Creek, south of Bozman, Talbot County



Typical Chesapeake Bay Skipjack

RECREATIONAL

Boating: Lack of boating congestion and scenic rural landscapes provide good recreational boating opportunities. Boating access to the river is good with five ramps and piers available to the public.



BROAD CREEK

TALBOT COUNTY

■ COUNTY AND MUNICIPAL PUBLIC LANDS

1 - BROAD CREEK LANDING



BROAD CREEK

The scenic Broad Creek corridor has been relatively untouched by development and maintains a landscape of forests and farmlands. The winding eight mile river mainstem is very narrow at the headwaters and widens to over one mile across near the mouth. Its clean water supports 437 acres of submerged aquatic vegetation and many varieties of fish sought after by recreational fishermen.

SIGNIFICANT AND HIGHLY SIGNIFICANT RESOURCE VALUES

NATURAL

Water Quality: Highly Significant. The overall water quality is very good. Dissolved oxygen, suspended solids, nutrient levels, temperature, and pH are exceptional for supporting aquatic life.

Upland Vegetation: Thirty percent of the river edge has forest cover at least 100 feet deep, which improves the quality of waters entering the river by filtering nutrients and sediments.

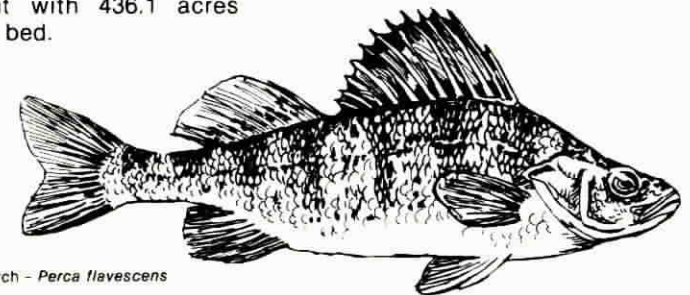
Wetlands: The river corridor has a diversity of wetlands, with 12 different community types recognized. Submerged aquatic vegetation is exceptionally abundant with 436.1 acres covering the river bed.

Wildlife: The corridor provides feeding habitat for the wintering American Bald Eagle, a State and federally endangered species. The corridor offers habitat for 12,225 annually wintering Canvasback Ducks, a species historically abundant in the Bay area but whose population has drastically declined recent decades. The corridor also has 15,025 annually wintering waterfowl, such as Mallard and Scoter, which can be legally hunted.

Fisheries: The river offers habitat to Striped Bass, a fish species which is recognized by State law as being threatened with extinction. The river is popular for recreational fishing with at least eight types of fish popular to sportsmen. The river contains approximately 4,062 acres of natural oyster bars.

Agricultural Lands: An important value of the river corridor is the amount of current agricultural land use which is estimated at 45%.

Undeveloped Lands: The river corridor has not been heavily impacted by development.



Yellow Perch - *Perca flavescens*

RIVERS OF STATEWIDE SIGNIFICANCE

CULTURAL

Historic Resources: The corridor has 19 historic resources listed on the Maryland Inventory of Historic Properties. Three of these, which include houses and inns, are listed on the National Register of Historic Places. The remaining 16 sites listed on the inventory are designated as having either State or local significance.

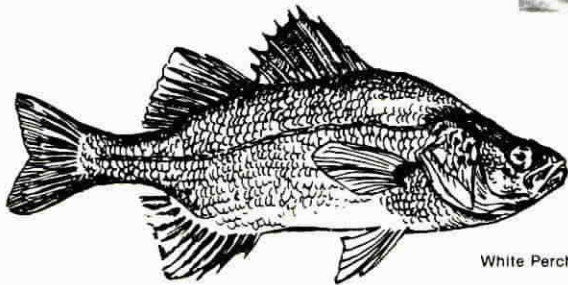
Archeological Resources: The Broad Creek shoreline presently includes 12 known archeological sites which date to undetermined prehistoric periods.

RECREATIONAL

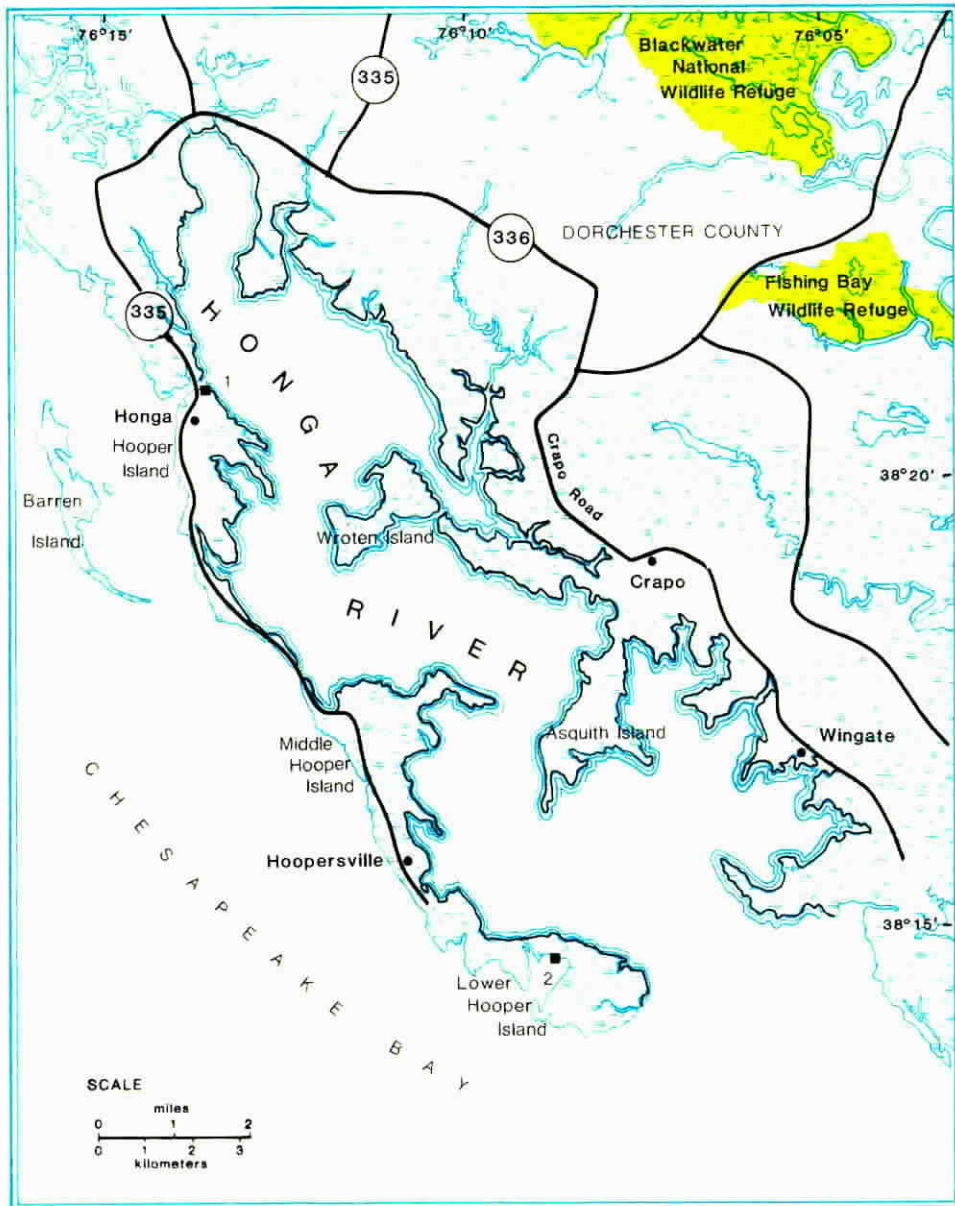
Boating: Broad Creek, noted for its scenic landscapes, has abundant boating access from six public ramps and piers and is also free of boating congestion.



View of Broad Creek on horizon, from Ball's Creek in Neavitt, Talbot County.



White Perch - *Morone americana*



HONGA RIVER

A row of three bridged islands separate the Honga River from the Chesapeake Bay and from its western shore. The 15-mile-long river mainstem with an average width of one-and-a-half miles has very good water quality. Since the corridor is 95% wetlands, there has been very little development. The river bottom is primarily made up of natural oyster bars which provide an outstanding annual harvest of this shellfish.

SIGNIFICANT AND HIGHLY SIGNIFICANT RESOURCE VALUES

NATURAL

Water Quality: Highly Significant. The overall water quality is very good. Dissolved oxygen, suspended solids, nutrient levels, temperature, and the pH are exceptional for supporting aquatic life.

Wetlands: An outstanding resource of the river is the abundance of wetlands, comprising an estimated 95% of the corridor. There are 14 different wetland community types and as much as 299.8 acres of submerged aquatic vegetation.



HONGA RIVER

■ COUNTY AND MUNICIPAL PUBLIC LANDS

- 1 - TYLER'S COVE
- 2 - MUDDY HOOK COVE

DORCHESTER COUNTY



RIVERS OF STATEWIDE SIGNIFICANCE

Wildlife: In addition to providing winter habitat to American Bald Eagles, a State and federally endangered species, the river corridor has two nesting territories. The Honga River corridor also has upland habitat used by the Delmarva Fox Squirrel, another State and federally endangered species. The corridor provides habitat to substantial populations of wintering Black Ducks (500), a species that was historically abundant in the Bay area whose populations have drastically declined during recent decades. Additionally, the corridor has noteworthy populations of wintering waterfowl (4,600), such as Mallard, Bufflehead and Canada Goose, which can be legally hunted.

Fisheries: The river bed is covered with an exceptional amount of natural oyster bars (16,272 acres).

Undeveloped Lands: The river corridor has not been heavily impacted by development. The 15 mile river, from the headwaters to the confluence with the Bay, is eligible to be listed on the Nationwide Inventory. Rivers on this list meet the minimum criteria for further study and/or potential inclusion into the National Wild and Scenic Rivers System.

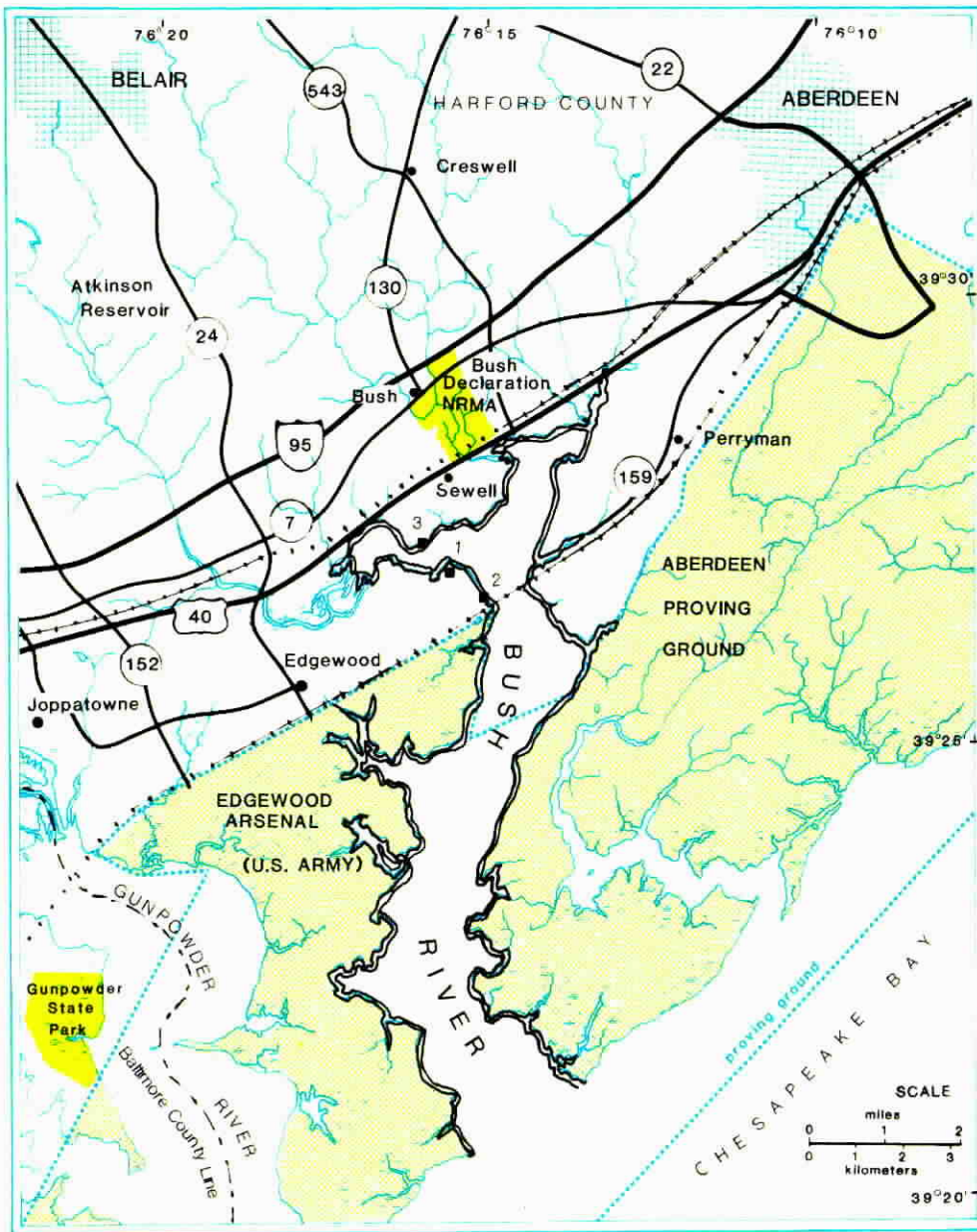
CULTURAL

Historic Resources: The corridor has 13 historic sites listed on the Maryland Inventory of Historic Properties as having State or local significance.



The Honga River, looking southeast near the Route 335 drawbridge to Hooper Island, Dorchester County.

Archeological Resources: The Honga River corridor presently has five known archeological sites. Two sites date to undetermined prehistoric periods, one site reflects prehistoric and historic occupation, and one site dates to the 19th century.



BUSH RIVER

■ COUNTY AND MUNICIPAL PUBLIC LANDS

- 1 - FLYING POINT PARK
- 2 - WILLOUGHBY BEACH PUBLIC LANDING
- 3 - WILLIAM LONGLEY PARK

HARFORD COUNTY



BUSH RIVER

SIGNIFICANT AND HIGHLY SIGNIFICANT RESOURCE VALUES

NATURAL

More than half of the corridor along this 11 mile river mainstem is forested. The first five miles from the mouth of the river is the restricted Federal Government Reservation of Aberdeen Proving Ground. Within this area, as many as 90 American Bald Eagles winter annually. Otter Point Creek, a major tributary to the Bush River, has a 400-acre marsh noted for its diversity of vegetation, and wintering ducks and other birds.

Water Quality: Significant. The overall water quality of the river is good. Dissolved oxygen, suspended solid levels, and temperature are excellent for supporting aquatic life.

Upland Vegetation: The river corridor is the habitat of Toothed Sedge, an upland species, that is recognized by the State of Maryland as a rare species of State concern.

Wetlands: The Bush River provides a natural environment to the Maryland Bur-marigold, a threatened wetland species of global concern. The river corridor has a diversity of wetlands, with 16 different community types.

Wildlife: In addition to providing winter habitat to large populations of American Bald Eagles, a State and federally endangered species, the river corridor has two nesting territories.

Fisheries: The Bush River provides a natural environment to Striped Bass, a fish species which is recognized by State law as being threatened with extinction. The river is also good for recreational fishing with as many as eight species popular to anglers.

Undeveloped Lands: The river corridor is relatively undeveloped. It should be noted, however, that it does flow through the Aberdeen Proving Ground, which because of its sensitive military purpose, cannot be surveyed.



American Bald Eagle
Haliaeetus leucocephalus

RIVERS OF STATEWIDE SIGNIFICANCE

CULTURAL

Historic Resources: The corridor has 30 historic sites listed on the Maryland Inventory of Historic Properties. These sites include mills, schoolhouses, farms, and toll houses. Sophia's Dairy is listed on the National Register of Historic Places. The remaining 29 sites listed on the Inventory are designated as having either State or local significance.

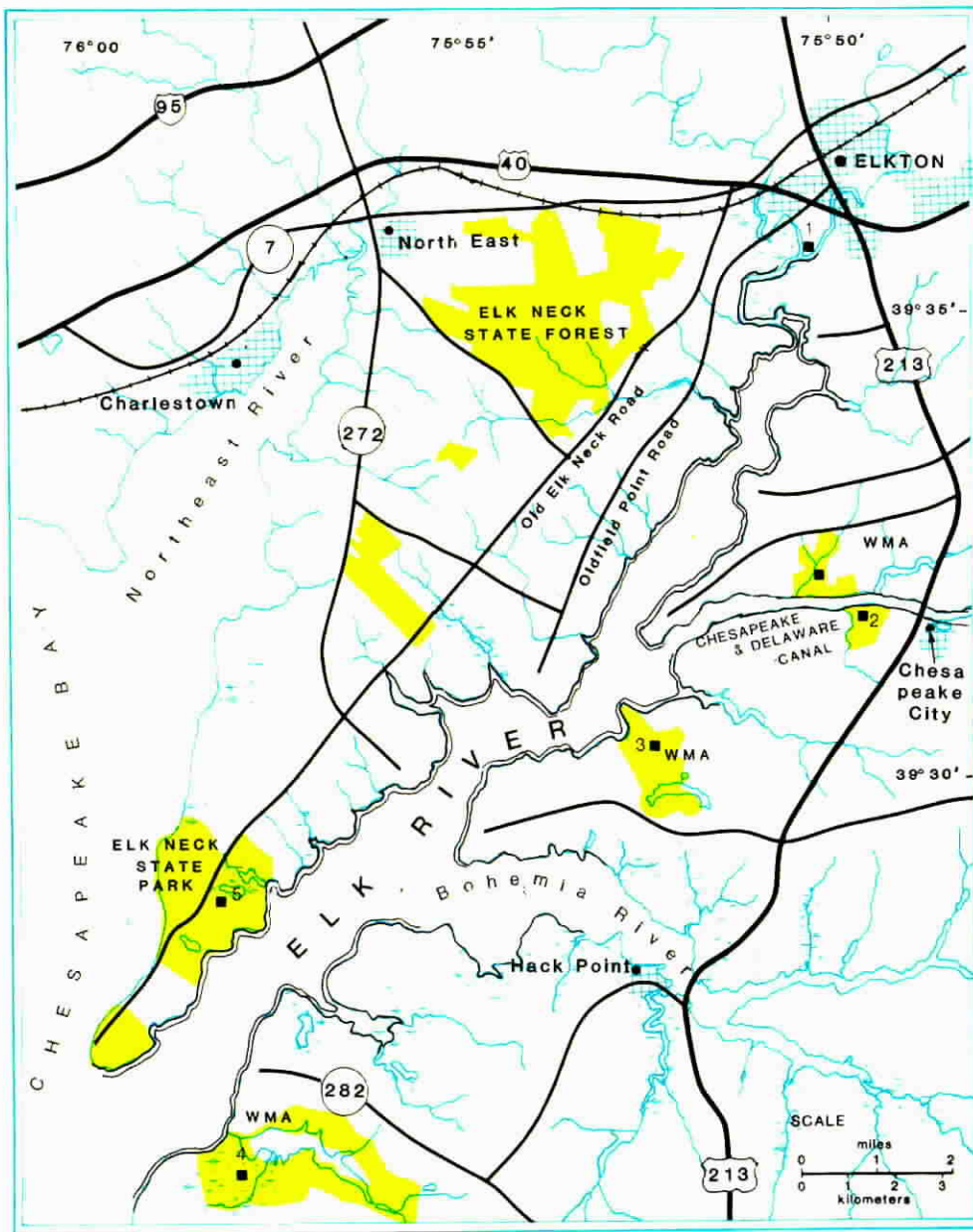
Archeological Resources: The Bush River presently contains 26 known archeological sites. Twenty sites date to prehistoric periods and include one Archaic, one Archaic and Woodland, one Woodland, and 17 undetermined prehistoric period sites. Four sites include prehistoric and historic period components. The remaining two sites date to historic periods, one 17th-18th century town site, and one 19th century site. In addition, there are six unconfirmed prehistoric sites/isolated finds identified along the river.

RECREATIONAL

Boating: The Bush River has good opportunities for recreational boating as it is navigable by many types of boats and free of congestion.



View of the Bush River and wooded western shore from near the Amtrak railroad crossing

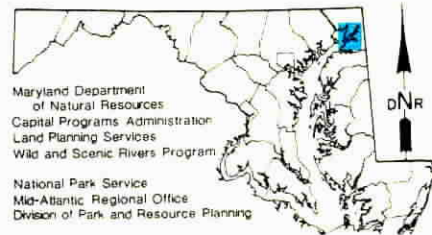


ELK RIVER

■ COUNTY AND MUNICIPAL PUBLIC LANDS

- 1 - HOLLINGSWORTH MANOR PARK
- 2 - V. S. RESERVATION
- 3 - COURTHOUSE POINT COOPERATIVE WILDLIFE MANAGEMENT AREA
- 4 - STEMMERS RUN COOPERATIVE WILDLIFE MANAGEMENT AREA
- 5 - ELK NECK STATE PARK

CECIL COUNTY



ELK RIVER

The Elk River, though located at the upper reaches of the Chesapeake Bay, is influenced by ocean tides. The river, which is approximately one mile wide, begins at the confluence of the Little Elk and Big Elk Creeks and flows to the Bay. An important ecologic feature of the river is the great diversity of wetland community types it harbors.

Land use along the river shows agricultural and forest lands interspersed with residential and urban development. The historic Chesapeake and Delaware Canal was built in 1824 to link the Delaware River and the Chesapeake Bay through the Elk River. Another prominent feature along the river is Elk Neck State Park, with 2,050 acres set aside for recreational use and wildlife management.

Upland Vegetation: The Elk River is the habitat of two rare and endangered species of state concern, the Single-headed Pussytoes and the Downy Willowherb.

Wetlands: The river has an outstanding diversity of wetlands with 33 plant community types. The Elk River also provides habitat to a rare and endangered wetland species of global concern, the Parker's Pipewort. The Maryland Bur-marigold, a species of national concern, and the Northern Willowherb, a species of regional concern, occur within the river corridor. The Vetchling, Mudwort, and Shining Willow, species of State concern, also occur here.

SIGNIFICANT AND HIGHLY SIGNIFICANT RESOURCE VALUES

NATURAL

Water Quality: Significant. The water quality of the river is good with the temperature and pH being excellent for supporting aquatic life.

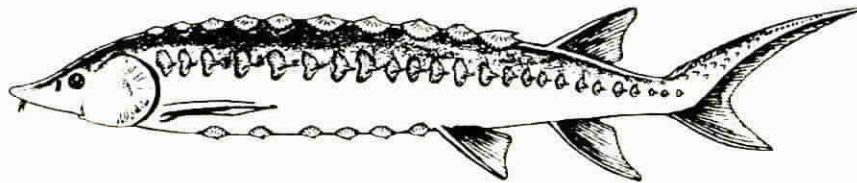


Maryland Bur-Marigold
Bidens bidentoides

RIVERS WITH REGIONAL SIGNIFICANCE

Wildlife: The river provides wintering habitat for the American Bald Eagle, a State and federally endangered species. The corridor also provides habitat for 18,100 annually wintering Canvasback Ducks, a species whose population has been historically abundant in the Bay area, but has drastically declined during recent decades.

Fisheries: Shortnose Sturgeon, a federal candidate endangered species, is found in the Elk River. Striped Bass and American Shad, fish which are designated by State law as being threatened with extinction, are also found in the river. Logperch, a rare species of State concern, is another resident species.



Shortnose Sturgeon – *Acipenser brevirostrum*

Agricultural Lands: As much as 27% of the corridor is currently being farmed. Additionally, 23% of all open space soils in the corridor are classified as excellent for agricultural use.

Undeveloped Lands: About 72% of the corridor has not been heavily impacted by land use development.

CULTURAL

Historic Resources: The river corridor, with many important historic resources, has 31 sites listed on the Maryland Inventory of Historic Properties. Three of these, the Mitchell House, Holly House and Elk Landing, are listed on the National Register of

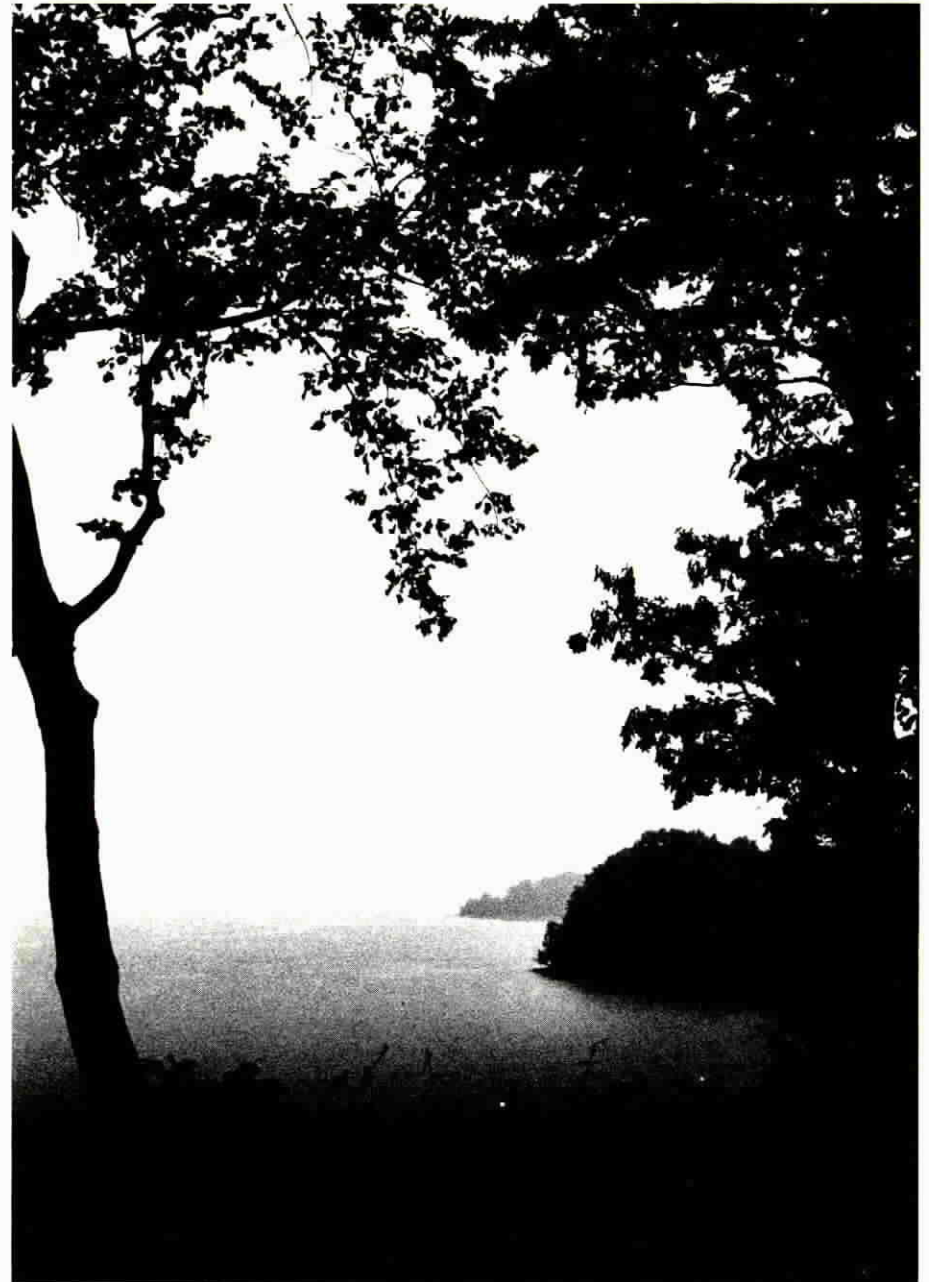
Historic Places. The remaining 28 sites listed on the Inventory are designated as having either State or local significance.

Archeological Resources: There are 22 known archeological sites identified along the Elk River. Eighteen sites date to prehistoric periods and include seven Archaic sites, three sites occupied from Archaic through Woodland periods, one Woodland site, and seven sites of undetermined prehistoric period. Four historic sites are presently recorded along the river. These include one 17th century site, one 18th century site, and two War of 1812 forts, Fort Defiance and Fort Hollingsworth.

RECREATIONAL

Public Lands: Fifteen percent of the corridor is publicly owned land and is used for recreational purposes and wildlife management.

Boating: The Elk River has excellent recreational boating opportunities because it is navigable by many types of boats. It is free of congestion and has associated recreational opportunities such as swimming, camping, fishing and picnic areas which are available to the public. Recreational boating and the associated facilities are an important part of the local economy.



View of the Elk River and Chesapeake Bay from the high bluffs at Elk Neck State Park



LITTLE CHOPTANK RIVER

DORCHESTER COUNTY



Maryland Department
of Natural Resources
Capital Programs Administration
Land Planning Services
Wild and Scenic Rivers Program

National Park Service
Mid-Atlantic Regional Office
Division of Park and Resource Planning

LITTLE CHOPTANK RIVER

The Little Choptank River corridor landscape is a sequence of water inlets, tributaries and coves. This nine mile river, with a mouth almost five miles wide, has very good water quality. Relatively inaccessible by roads, it has not been impacted by development and more than 51% remains forested. Many of the structures within the corridor such as lighthouses, churches and houses have been designated as historically significant.

SIGNIFICANT AND HIGHLY SIGNIFICANT RESOURCE VALUES

NATURAL

Water Quality: Highly Significant. The quality of water is very good. Dissolved oxygen, suspended solids, nutrient levels, temperature, and pH are exceptional for supporting aquatic life.

Upland Vegetation: The corridor is the habitat of Koehne's Ammannia, a rare species of State concern.

Wetlands: Wetlands are an important resource of the Little Choptank River. Twenty-five percent of the corridor is comprised of 21 different community types. Submerged aquatic vegetation is substantial, covering 153.9 acres of the river bed.

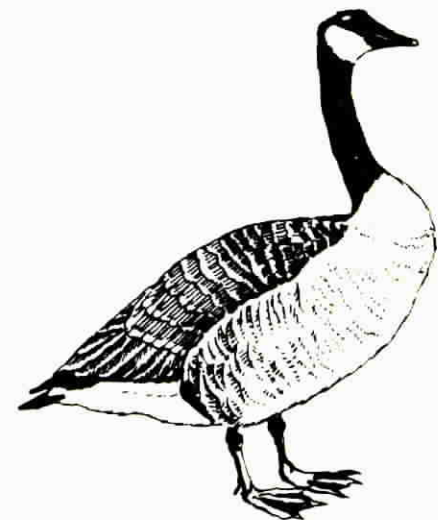
Wildlife: In addition to providing wintering habitat for the American Bald Eagle, a State and federally endangered species, the river corridor has one nesting territory. Populations of wintering Canvasback Ducks (8,400) and Black Ducks (600) are species that were historically abundant in the Bay area, but whose populations have drastically declined during recent decades. The corridor also has large populations of wintering waterfowl

(12,200), such as Mallard and Canada Goose, which can be legally hunted.

Fisheries: The river bed is covered by 3,263 acres of natural oyster bars. The river offers habitat to Striped Bass, a fish species designated by State law as threatened with extinction.

Agricultural Lands: As much as 35% of the river corridor is currently being farmed. Of all open space soils, 15% within the corridor are classified as excellent for agricultural use.

Undeveloped Lands: The entire river, from the headwaters to the confluence with the Bay, is an outstanding example of an undeveloped river and is listed on the Nationwide Inventory. Rivers on this list meet the minimum criteria for further study and/or potential inclusion into the National Wild and Scenic Rivers System.



Canada Goose
Branta canadensis

RIVERS WITH REGIONAL SIGNIFICANCE

CULTURAL

Historic Resources: The corridor is rich with historic resources, with 55 sites listed on the Maryland Inventory of Historic Properties. One of these sites, Dale's Right, is listed on the National Register of Historic Places. The remaining 54 sites listed on the inventory are designated as having either State or local significance.

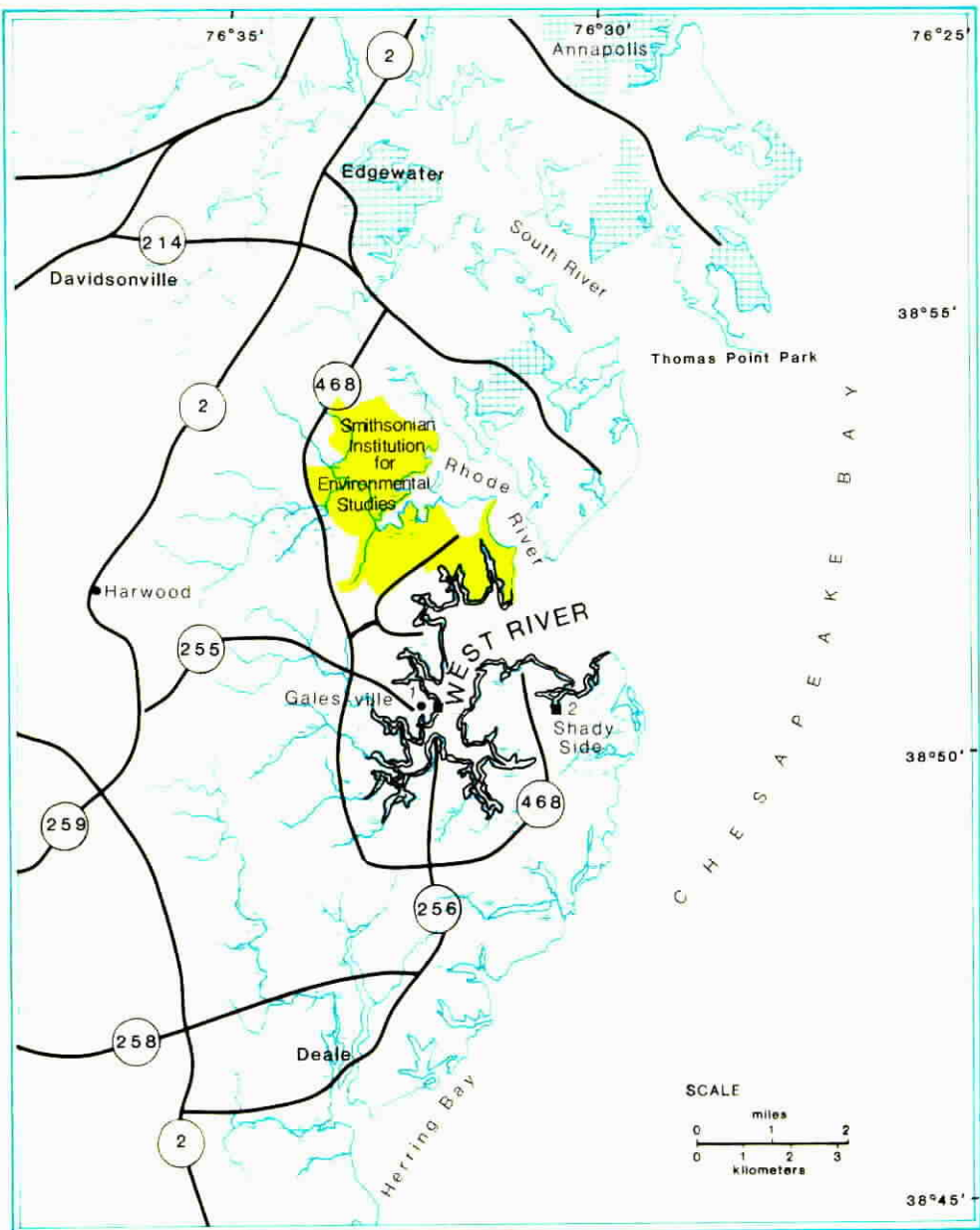
Archeological Resources: There are only eight known archeological sites presently recorded along the Little Choptank River. Four of these sites date to prehistoric periods and include one Woodland Period and three undetermined prehistoric period sites. One site contains prehistoric and 19th century historic occupations. The remaining three sites date to the 18th and 19th centuries.

RECREATIONAL

Boating: The Little Choptank River, with its scenic shoreline landscape, is good for recreational boating. It offers a minimum of boating congestion, good access from four public ramps and piers, and is navigable by many types of boats. Recreational boating and the associated facilities are an important part of the local economy.



The Little Choptank River near Town Point, Dorchester County



WEST RIVER

■ COUNTY AND MUNICIPAL PUBLIC LANDS

- 1 - GALESVILLE WHARF
- 2 - SHADYSIDE WHARF

ANNE ARUNDEL COUNTY



WEST RIVER

This three mile river mainstem, located several miles south of Annapolis, has a rich history represented by the presence of Tulip Hill, a National Historic Landmark. There are as many as 40 known archeological sites within the corridor. Almost half of the corridor is residential with as much as 30% remaining forested. Located on the river is a portion of the Smithsonian Institution Center for Environmental Studies, with 2,600 acres of land set aside for natural resource research.

SIGNIFICANT AND HIGHLY SIGNIFICANT RESOURCE VALUES

NATURAL

Water Quality: Significant. The overall water quality is good. Dissolved oxygen, suspended solids, and temperature being excellent for supporting aquatic life.

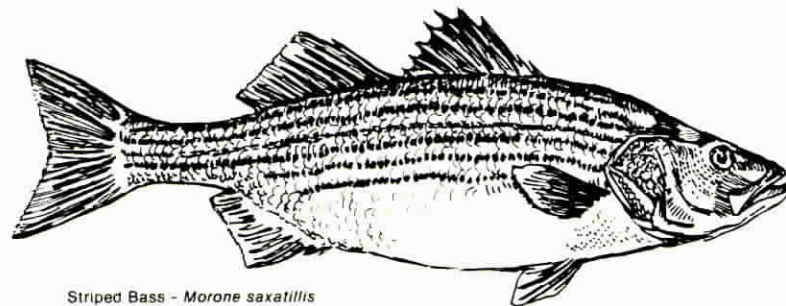
Upland Vegetation: The corridor is the habitat of the Matted Spikerush, Whorled Water-pennywort, and Narrow-leaved Horse-gentian, which are rare species of State concern.

Wildlife: The corridor provides winter feeding ground to the American Bald Eagle, a State and federally endangered species.

Fisheries: The West River provides habitat to Striped Bass, a fish species which is designated by State law as threatened with extinction.

CULTURAL

Historic Resources: The historic significance of Tulip Hill, located in the river corridor, is recognized through National Historic Landmark designation. The corridor also has 13 historic resources that are listed on the Maryland Inventory of Historic Properties. In addition to Tulip Hill, two other sites, Cedar Park and Norman's Retreat, are listed on the National Register of Historic Places. The remaining 10 sites listed on the Inventory are designated as having either State or local significance.



Striped Bass - *Morone saxatilis*

RIVERS WITH REGIONAL SIGNIFICANCE

Archeological Resources: There are currently 40 known archeological sites recorded along the West River. Thirty-two sites date to prehistoric periods and include one Archaic, one Archaic through Woodland, two Woodland, and 29 undetermined prehistoric period sites. Three historic sites are also identified, one 19th century and two of undetermined historic date. In addition, the study area includes three unconfirmed prehistoric sites/isolated finds.

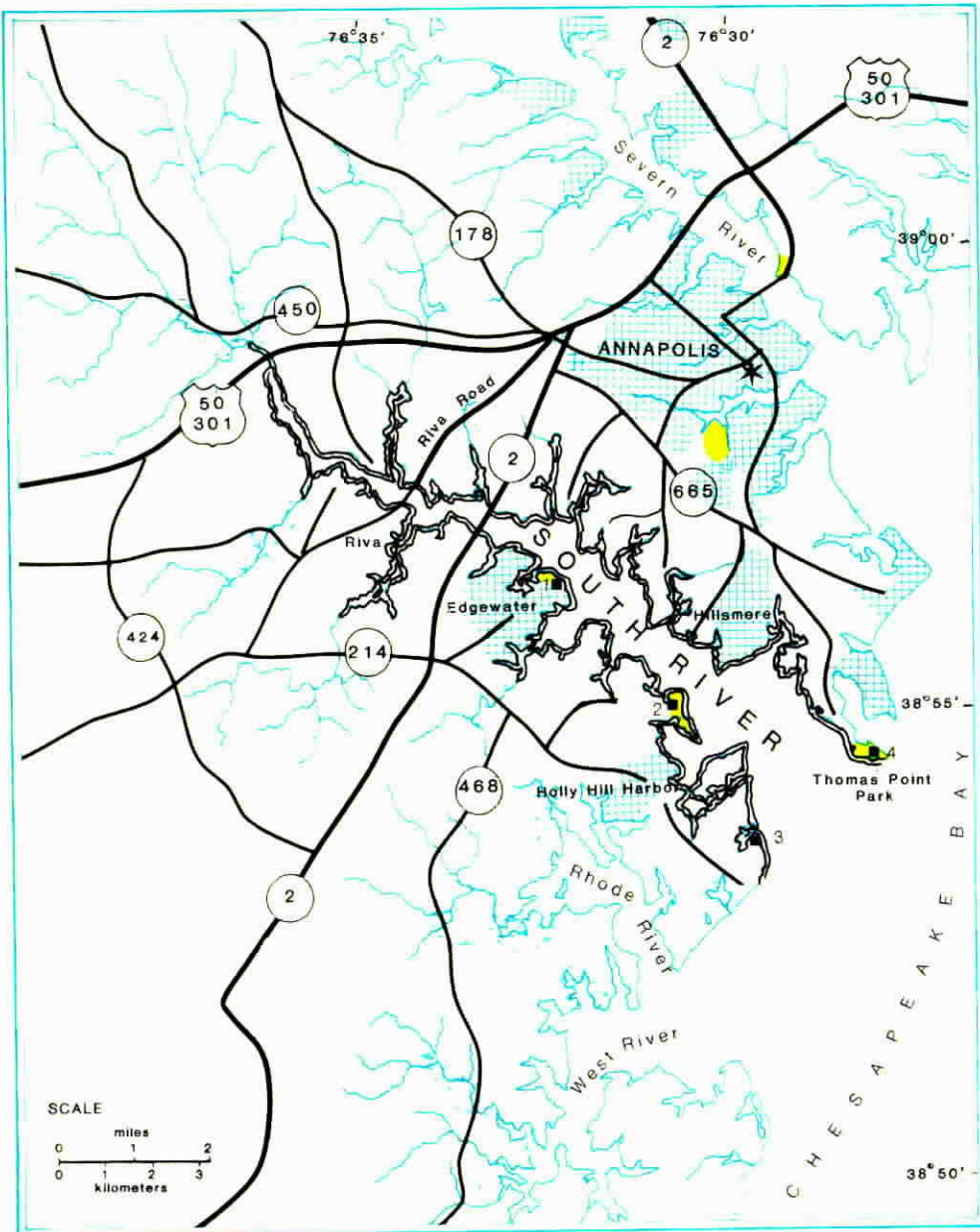
RECREATIONAL

Public Lands: Twelve percent of the river corridor is publicly owned and includes a portion of the Smithsonian Institution Center for Environmental Studies.

Boating: The West River has good opportunities for recreational boating. It is navigable by many types of boats while remaining free of boating congestion. The river has many recreational opportunities associated with boating, such as swimming and fishing areas available to the public. Facilities for recreational boating are an important source of local income.



View of West River from Shadyside, Anne Arundel County.



SOUTH RIVER

■ COUNTY AND MUNICIPAL PUBLIC LANDS

- 1 - LONDONTOWN PUBLIC HOUSE
- 2 - SOUTH RIVER FARM
- 3 - MAYO BEACH PARK
- 4 - THOMAS POINT PARK

ANNE ARUNDEL COUNTY



SOUTH RIVER

SIGNIFICANT AND HIGHLY SIGNIFICANT RESOURCE VALUES

NATURAL

Because of its proximity to Annapolis, residential development is the primary land use on the South River corridor. However, as much as 40% of the corridor remains forested. This 10-mile river mainstem is one of the most heavily used rivers for recreational boating in Maryland. With a rich history, the river has as many as 83 known archeological sites.

Water Quality: Significant. The overall water quality is good. Dissolved oxygen, suspended solid levels, and temperature are excellent for supporting aquatic life.

Upland Vegetation: The corridor is the habitat of Potato Dandelion, a rare species of regional concern, and the Long-leaved Rushgrass, a rare species of State concern.

Wildlife: In addition to providing winter habitat for the American Bald Eagle, a State and federally endangered species, the river corridor has two nesting territories.

Fisheries: The South River provides a natural environment for Striped Bass, a fish species designated by State law as being threatened with extinction.



Long-leaved Rushgrass
Sporobolus asper

Potato Dandelion
Krigia dandelion

RIVERS WITH REGIONAL SIGNIFICANCE

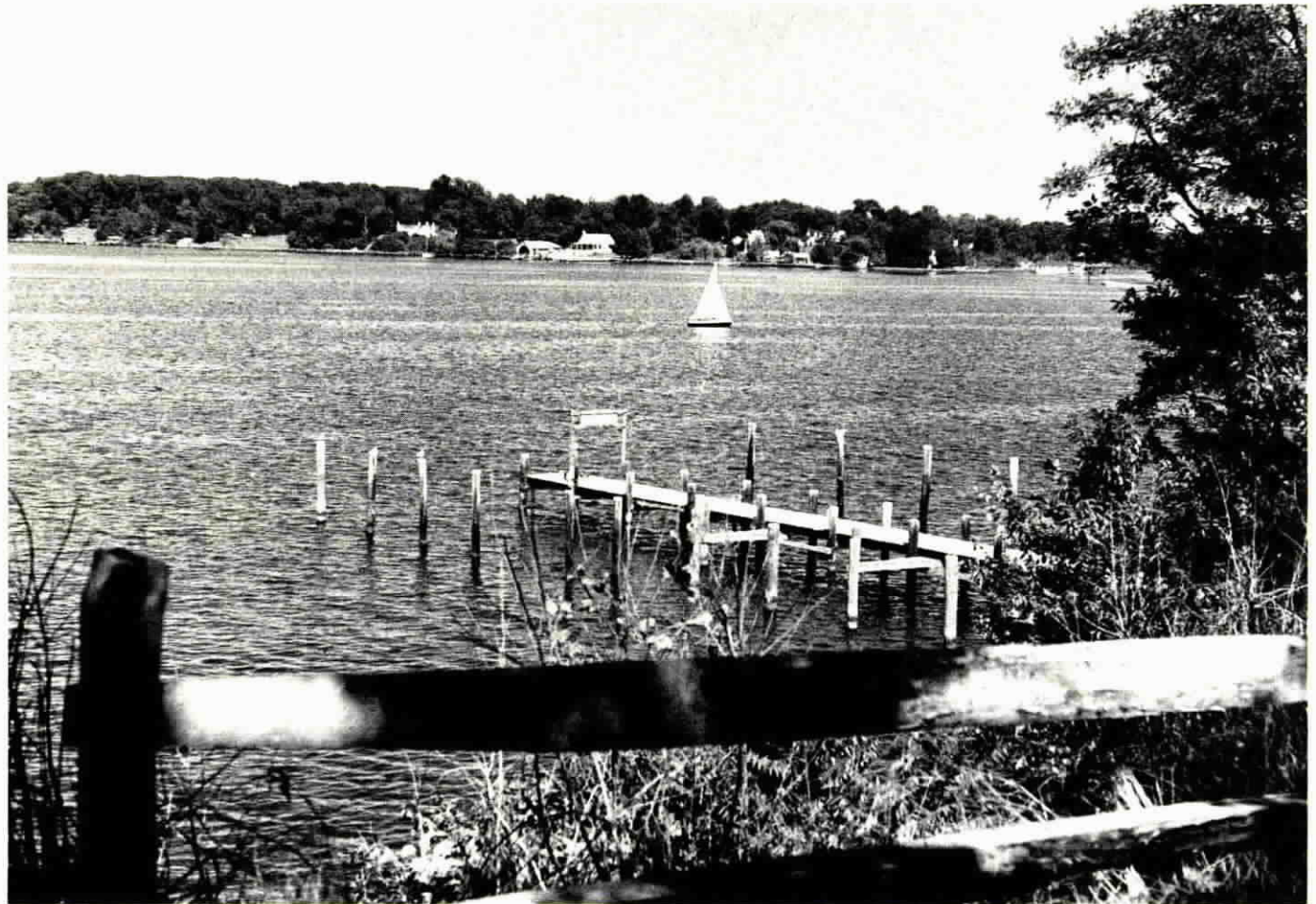
CULTURAL

Historic Resources: The historic significance of Londontown Publik House, located in the river corridor, is recognized through its National Historic Landmark designation. The corridor also has 13 other historic resources that are listed on the Maryland Inventory of Historic Properties. In addition to the Londontown Publik House, the Thomas Point Lighthouse is listed on the National Register of Historic Places. The remaining 11 sites listed on the Inventory are designated as having either State or local significance.

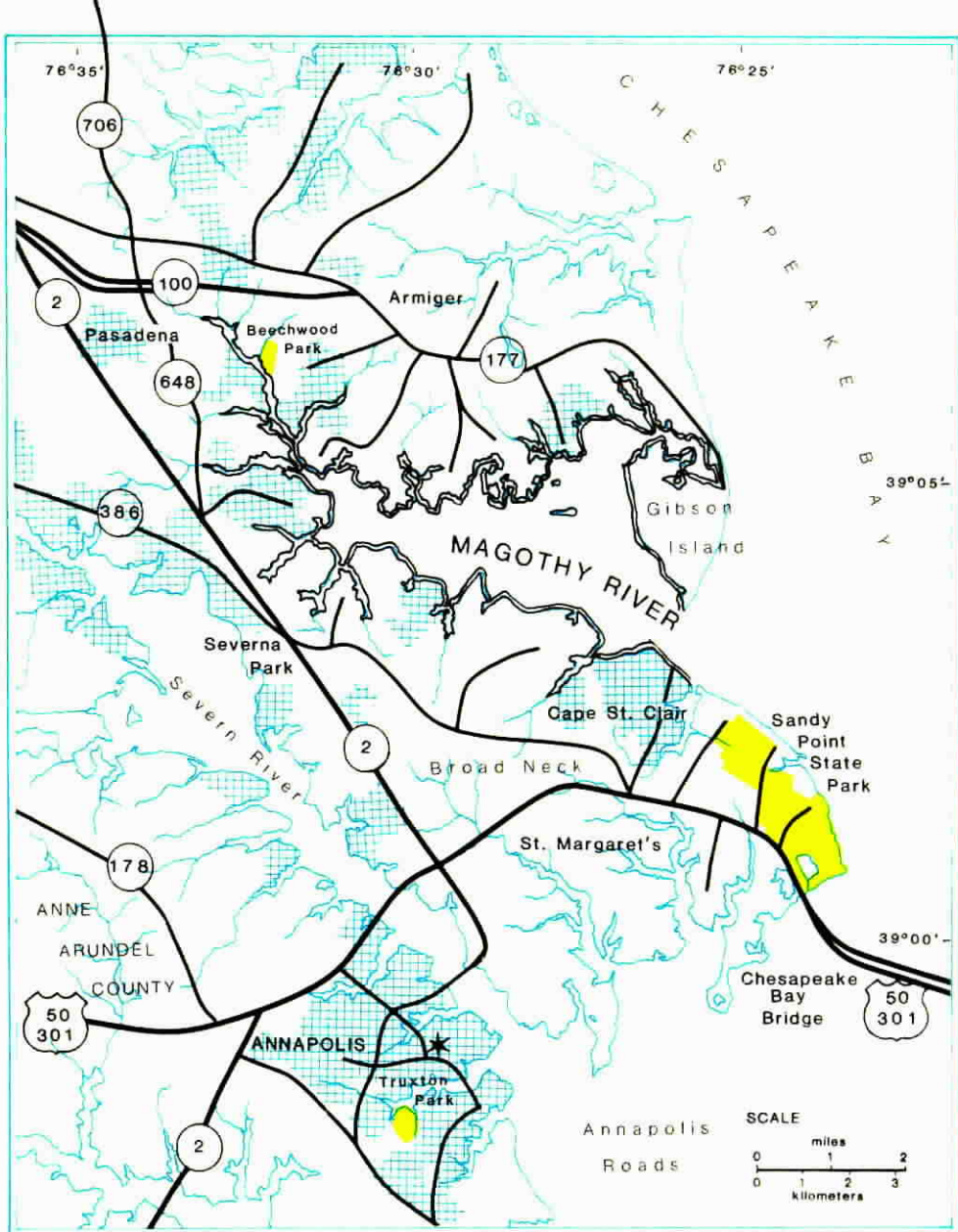
Archeological Resources: The South River contains 83 known archeological sites recorded along its shoreline. Sixty-eight sites date to prehistoric time periods and include two Archaic, one Archaic and Woodland, 35 Woodland, and 30 undetermined prehistoric period sites. There are four sites that include prehistoric and historic period components. The remaining 11 sites date to historic periods and include five 17th century, three 18th-19th century, and three undetermined historic period sites. In addition, there are two unconfirmed prehistoric sites/isolated finds recorded along the South River.

RECREATIONAL

Boating: The South River, which is navigable by many types of boats while remaining free of congestion, has good opportunities for recreational boating. Additionally, recreational boating related facilities provide an important source of local income.

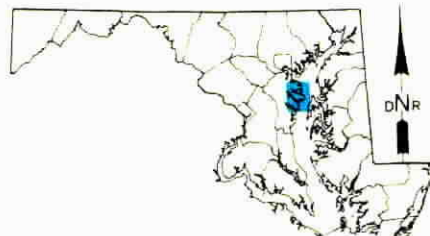


The South River from near the London Town Publik House, Edgewater, Anne Arundel County.



MAGOTHY RIVER

ANNE ARUNDEL COUNTY



Maryland Department
of Natural Resources
Capital Programs Administration
Land Planning Services
Wild and Scenic Rivers Program

National Park Service
Mid-Atlantic Regional Office
Division of Park and Resource Planning

MAGOTHY RIVER

The land use for this eight-mile river mainstem, located close to Annapolis, is primarily residential. The Magothy River is also heavily used for recreational boating.

SIGNIFICANT AND HIGHLY SIGNIFICANT RESOURCE VALUES

NATURAL

Upland Vegetation: The corridor provides a natural environment to the Giant Cane and Whorled Water-pennywort, which are designated as threatened species of State concern, and the Whorled Water-pennywort is a rare species of State concern.

Wetlands: The river corridor has a substantial diversity of wetlands, with 17 plant community types identified.

Wildlife: The corridor provides feeding habitat for the wintering Peregrine Falcon, a State and federally endangered species.

Fisheries: The river offers a natural environment to Striped Bass, a fish species which is designated by State law as being threatened with extinction.



Beach on the shores of the Magothy; Chesapeake Bay on the horizon

RIVERS WITH REGIONAL SIGNIFICANCE

CULTURAL

Historic Resources: The corridor has 15 historic resources listed on the Maryland Inventory of Historic Properties as having State or local significance.

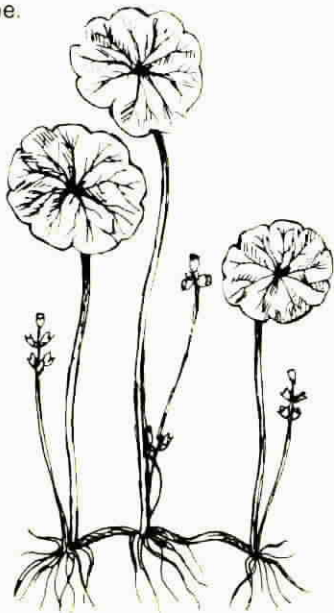
Archeological Resources: The Magothy River presently has 19 known archeological sites recorded along its shoreline. Eighteen of these sites date to prehistoric time periods and include seven Woodland and 11 undetermined period sites. The remaining site dates to the early 20th century. In addition, there is one unconfirmed prehistoric site/isolated find located along the river.

RECREATIONAL

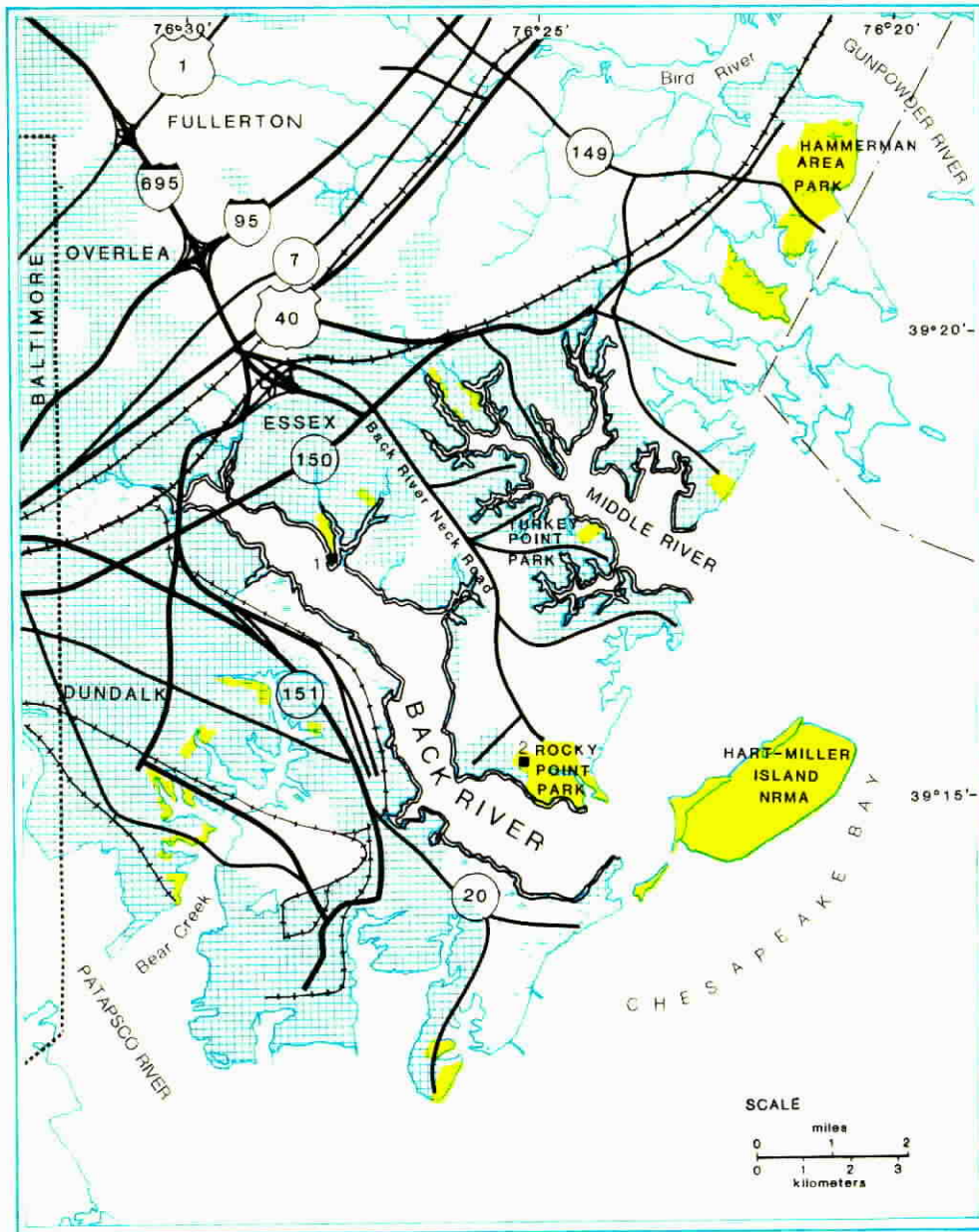
Boating: The Magothy River has good opportunities for recreational boating, and is navigable by many types of boats while remaining free of congestion. Facilities for recreational boating are an important source of local income.



Headwaters of the Magothy River, in northern Anne Arundel County



Whorled Water-pennywort—*Hydrocotyle verticillata*

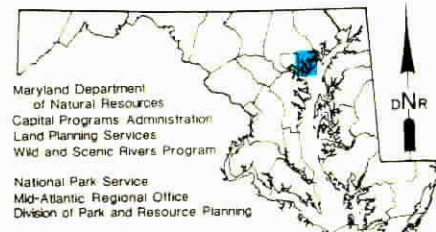


BACK RIVER

■ COUNTY AND MUNICIPAL PUBLIC LANDS

- 1 - COX'S POINT PARK
- 2 - ROCKY POINT PARK

BALTIMORE COUNTY



BACK RIVER

Since the Back River is located near Baltimore, the primary land use of the surrounding river corridor is urban and residential. However, one of the largest undisturbed marshes remaining in the eastern part of the State, Black Marsh is located on this eight-mile river mainstem. Additionally, the river is heavily used for recreational boating.

SIGNIFICANT AND HIGHLY SIGNIFICANT RESOURCE VALUES

NATURAL

Upland Vegetation: The corridor provides a natural environment to White-bracted Boneset, a threatened species of State concern.

Wetlands: The river corridor has a substantial diversity of wetlands, with 15 different community types identified.

Wildlife: The Peregrine Falcon, a State and federally endangered species, is provided winter feeding habitat in this corridor. Additionally, the river corridor provides habitat suitable for Least Tern, a bird which has been identified as a rare and endangered species of State concern.

Fisheries: The river offers a natural environment to Striped Bass, a fish species which is designated by State law as being threatened with extinction. The river is good for recreational fishing with as many as seven types of fish popular to anglers.



Looking across the Back River at the Baltimore Sewage Treatment Works

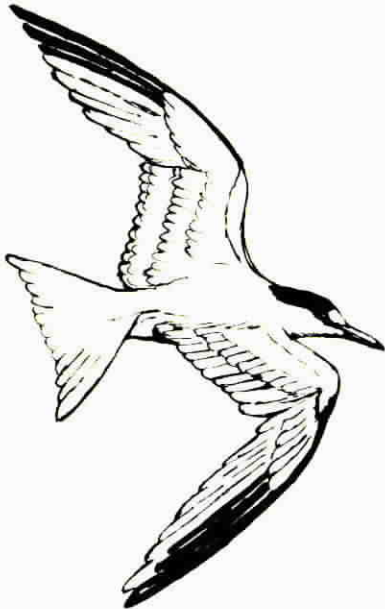
RIVERS WITH REGIONAL SIGNIFICANCE

Agricultural Lands: Of all open space soils, 27% of the corridor is classified as being excellent for agricultural use.

Undeveloped Lands: As much as 50% of the river corridor has not been heavily impacted by development.

CULTURAL

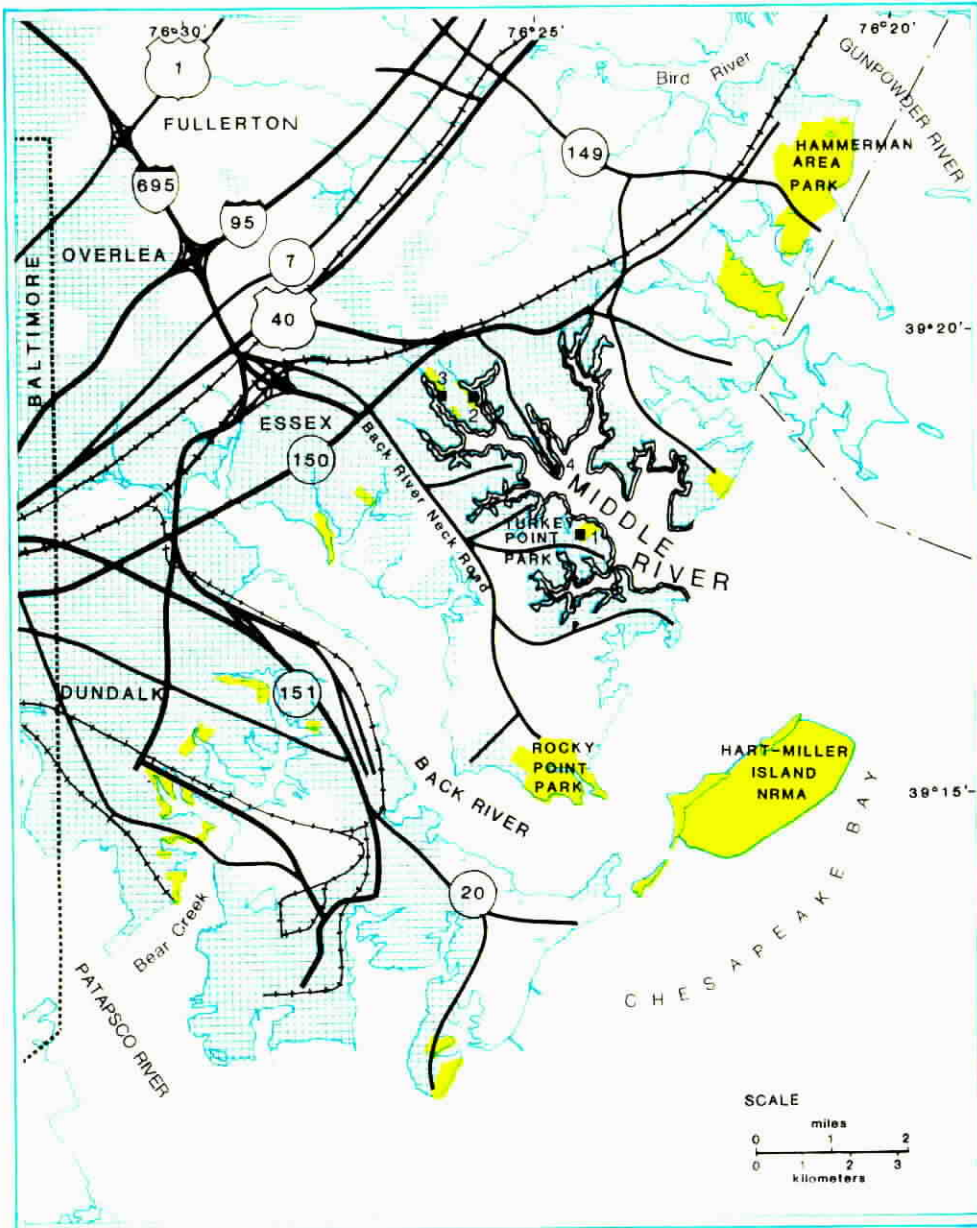
Archeological Resources: The Back River currently has only five archeological sites recorded along its shoreline. All five sites date to prehistoric periods and include two Archaic, one Archaic and Woodland, and two undetermined prehistoric period sites. In addition to the known sites, there are three unconfirmed prehistoric sites/isolated finds and one unconfirmed submerged vessel recorded in the river area.



Least Tern - *Sterna dougalli*



View of upper reaches of the Back River looking across at Wetherby Point.



MIDDLE RIVER

■ COUNTY AND MUNICIPAL PUBLIC LANDS

- 1 - TURKEY POINT PARK
- 2 - KINGSTON PARK
- 3 - MIDTHORNE PARK
- 4 - DARK HEAD CREEK PARK

BALTIMORE COUNTY



MIDDLE RIVER

The land use of this five-mile river mainstem, located near Baltimore, is primarily urban and residential. The river's shoreline is a landscape of piers and slips for recreational boats.

Agricultural Lands: Of all open space soils, 19% within the corridor are classified as being excellent for agricultural use.

CULTURAL

Archeological Resources: There are only seven known archeological sites presently recorded along the Middle River. Five sites date to prehistoric periods including two Archaic, one Woodland, and two Archaic-Woodland period sites. One site reflects prehistoric and historic occupations, and one site dates to an undetermined historic period.

SIGNIFICANT AND HIGHLY SIGNIFICANT RESOURCE VALUES

NATURAL

Water Quality: The overall water quality is good. Dissolved oxygen, suspended solid levels, and temperature are excellent for aquatic life.

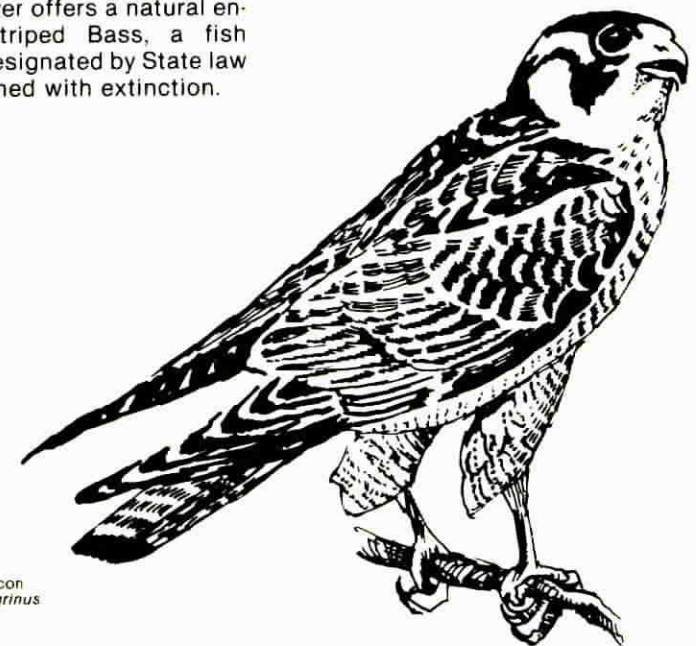
Wetlands: The river bed supports a large amount (183.3 acres) of submerged aquatic vegetation.

RECREATIONAL

Wildlife: This corridor provides feeding habitat for the Peregrine Falcon, a State and federally endangered species.

Public Lands: Ten percent of the river corridor is publically owned as waterfront parks.

Fisheries: The river offers a natural environment to Striped Bass, a fish species that is designated by State law as being threatened with extinction.

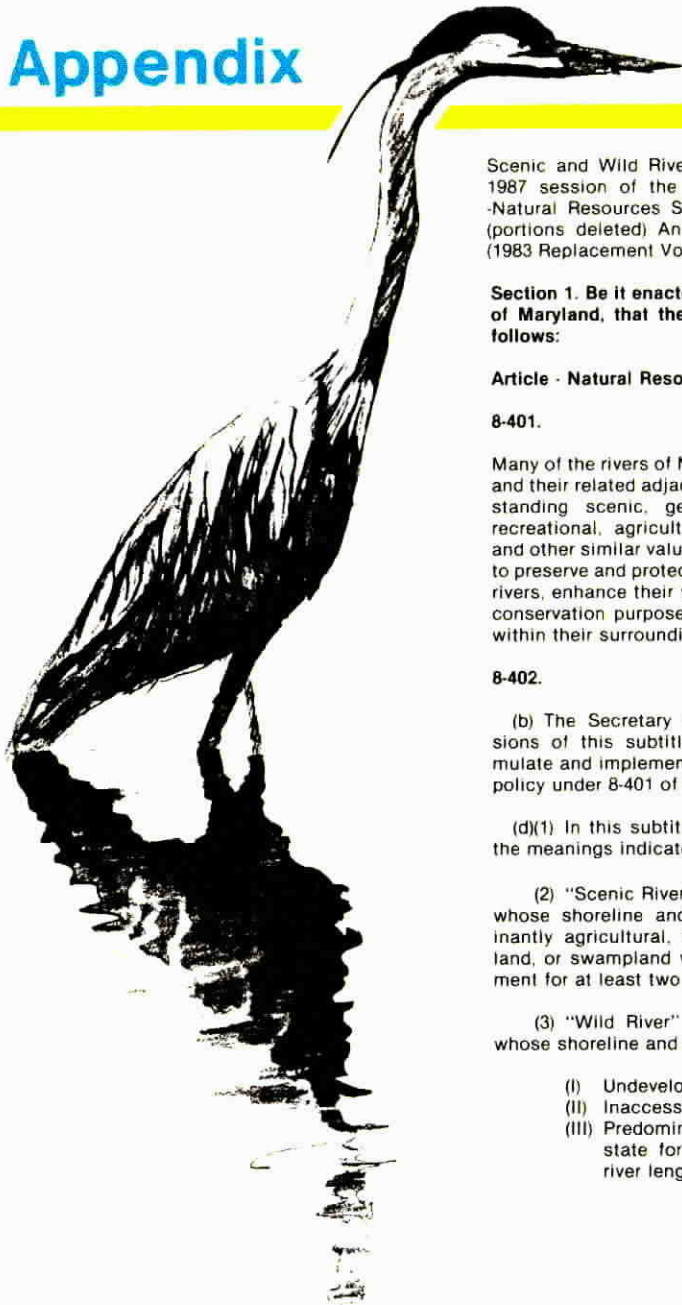


Peregrine Falcon
Falco peregrinus

RIVERS WITH REGIONAL SIGNIFICANCE



*View of the Middle River and Galloway Point from
Turkey Point Park, Baltimore County*



Scenic and Wild Rivers Act as amended in the 1987 session of the General Assembly Article -Natural Resources Section 8-401 through 8-407 (portions deleted) Annotated Code of Maryland (1983 Replacement Volume and 1983 Supplement)

Section 1. Be it enacted by the General Assembly of Maryland, that the laws of Maryland read as follows:

Article - Natural Resources

8-401.

Many of the rivers of Maryland or portions of them and their related adjacent land areas possess outstanding scenic, geologic, ecologic, historic, recreational, agricultural, fish, wildlife, cultural and other similar values. The policy of the State is to preserve and protect the natural values of these rivers, enhance their water quality and fulfill vital conservation purposes by wise use of resources within their surrounding environment....

8-402.

(b) The Secretary shall administer the provisions of this subtitle. The Secretary shall formulate and implement a program to carry out the policy under 8-401 of this subtitle.

(d)(1) In this subtitle the following words have the meanings indicated.

(2) "Scenic River" means a free-flowing river whose shoreline and related land are predominantly agricultural, forested, grassland, marshland, or swampland with a minimum of development for at least two miles of the river length.

(3) "Wild River" means a free-flowing river whose shoreline and related land are:

- (I) Undeveloped;
- (II) Inaccessible except by trail; or
- (III) Predominantly primitive in a natural state for at least four miles of the river length.

(f) By July 1, 1990, the Secretary shall inventory and study every other river and shoreline and related land in the State and identify the rivers and their related shorelines or portions of them that are eligible for inclusion into the Scenic and Wild Rivers Program as either a scenic or wild river. Upon completion of each inventory and study, the Secretary shall submit it, with any recommendations for additions to the scenic and wild rivers system, to the governing body of every county where the river is located, for their approval and recommendations, and to the next regular session of the General Assembly.

8-403.

(a)(1) There is a Scenic and Wild Rivers Review Board. The Board consists of the secretaries of The Departments of Natural Resources, State Planning, Agriculture, and The Environment....

(b) The Scenic and Wild Rivers Review Board shall:

- (1) Review:
 - (I) Any inventory, study, plan, rule, and regulation that is prepared under this subtitle; and
 - (II) The recommendations on the inventory, study, plan, rule, and regulation of the Secretary, any local governing body, or any local advisory board.
- (2) Recommend to the General Assembly
 - (I) Plans for the management of resources of the rivers, shorelines, and related lands that are included in the Scenic and Wild Rivers Program; and
 - (II) Studies for including additional rivers and tributaries in the Scenic and Wild Rivers Program.

(5) Appoint, with the advice and consent of the appropriate local governing body, a local Scenic and Wild River Advisory Board for each river that is included in the Scenic and Wild Rivers Program.

8-404.

The Scenic and Wild Rivers Review Board may recommend for inclusion in the Scenic and Wild Rivers Program rivers, streams, and portions of rivers, streams, and tributaries, and the related adjacent lands which fall within the following descriptions:

- (1) Trout streams and wetland areas;
- (2) Spawning and propagation areas;
- (3) Streams and rivers with scenic and aesthetic value of statewide significance;
- (4) Existing or proposed public land adjacent to the rivers and streams.
- (5) Sections of any river or stream where no development exists on either side of the river or stream for a distance of one-quarter mile from the mean high water line of the river or stream;
- (6) Sections of any river or stream where limited development exists but is compatible with the wise use of the resources;
- (7) Sections of any river or stream where encroachment is imminent and would lead to degradation of the river or stream, to some form of pollution, or adversely affect the intent of this subtitle; or
- (8) Sections of any river or stream that are important as food production areas; areas supporting migratory waterfowl, and spawning areas for shellfish.

8-407.

Every State unit shall recognize the intent of the Scenic and Wild Rivers Program and take whatever action is necessary to protect and enhance the scenic and wild qualities of the designated river....

Drawing by Lisa Marquart

The Great Blue Heron, *Ardea herodias*, is an avian species characteristic of all Chesapeake Bay estuaries that are not prohibitively developed

The Classification of the Surface Waters of the State, assigns all Maryland receiving waters to a use class and establishes water quality criteria based upon these uses. The concepts of suitability and capability for a water use as expressed in these classes are not based solely on existing conditions but include water uses to be made possible by anticipated improvements in water quality.

CLASS I Water Contact Recreation and Aquatic Life Waters which are suitable for:

- (1) Water contact sports;
- (2) Play and leisure time activities where the human body may come in direct contact with the surface;
- (3) The growth and propagation of fish (other than trout), other aquatic life, and wildlife;
- (4) Public water supply;
- (5) Agricultural water supply, and
- (6) Industrial water supply.

CLASS II Shellfish Harvesting Waters. Waters where shellfish are propagated, stored, or gathered for marketing purposes, including actual or potential areas for the harvesting of oysters, softshell clams, hardshell clams, and brackish water clams.

CLASS III Natural Trout Waters. Waters which have the potential for or are:

- (1) Suitable for the growth and propagation of trout, and
- (2) Capable of supporting natural trout populations and their associated food organisms.

CLASS IV Recreational Trout Waters. This classification includes cold or warm waters which have the potential for or are:

- (1) Capable of holding or supporting adult trout for put-and-take fishing, and
- (2) Managed as a special fishery by periodic stocking and seasonal catching.

| RIVER | CLASSIFICATION OF STREAM |
|-----------------|---|
| SUSQUEHANNA | Entire 15 mile mainstream (in Maryland) is Class I |
| ELK | Entire 14 mile mainstream is Class II, except for 1/3 mile segment above line from Bull Minnow Point to Courthouse Point which is Class I |
| MILES | Entire 19 mile mainstream is Class II |
| HARRIS CREEK | Entire 10 mile mainstream is Class II |
| BROAD CREEK | Entire 8 mile mainstream is Class II |
| TRED AVON | Entire 12 mile mainstream is Class II, except above Easton Point, where waters are Class I |
| LITTLE CHOPTANK | Entire 9 mile mainstream is Class II |
| HONGA | Entire 15 mile mainstream is Class II |
| MANOKIN | Entire 18 mile mainstream is Class II, except for 2-3/4 mile segment above confluence of Manokin River and Kings Creek which is Class I |
| WEST | Entire 3 mile mainstream is Class II |
| SOUTH | Entire 10 mile mainstream is Class II, except for 2 mile segment above Porter Point which is Class I |
| MAGOTHY | Entire 8 mile mainstream is Class II, except for 2-3/4 mile segment above Henderson Point which is Class I |
| BACK | Entire 8 mile mainstream is Class I |
| MIDDLE | Entire 4 mile mainstream is Class II, except for approximately 1/8 mile segment above line from Log Point to Turkey Point which is Class I |
| BUSH | Entire 11 mile mainstream is Class II, except for approximately 400' segment above line from Fairview Point to Chillbury Point which is Class I |

(Includes public lands which are totally or partially located in corridor)

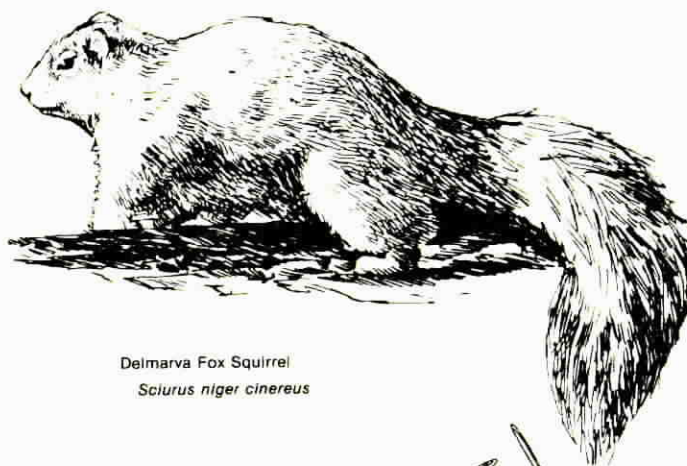
| RIVER | NAME OF PUBLIC LAND | TOTAL ACRES | COUNTY | OWNERSHIP | MILES OF SHORE | MILES OF BEACH |
|-----------------|--|-------------|---------------|--|----------------|----------------|
| SUSQUEHANNA | Tydings Park | 15.0 | Harford | Municipality | 3.2 | 0 |
| | Congress Street Park | 2.0 | Harford | Municipality | .5 | 0 |
| | Jean Roberts Park | .87 | Harford | Municipality | 0 | 0 |
| | Broad Creek Public Landing | .75 | Harford | County Maintained | 1.0 | 0 |
| | Line Bridge Landing | 1.0 | Harford | County | 0 | 0 |
| | Port Deposit Marine Park | 1.0 | Cecil | Municipality | .03 | 0 |
| | Perryville Community Park | 44.0 | Cecil | Municipality | 1.0 | 0 |
| | Susquehanna State Park | 2,525.0 | Harford/Cecil | State | 4.5 | No data |
| ELK | Hollingsworth Manor Park | 11.5 | Cecil | Municipality | 0 | 0 |
| | Elk Neck State Park | 2,050.0 | Cecil | State | 7.0 | .1 |
| | U.S. Reservation on C & D Canal | 1,445.0 | Cecil | Federal (leased to MD DNR) | 0 | 0 |
| | Courthouse Point Co-op Wildlife Management Area | 355.0 | Cecil | Federal (managed by MD FPW) MD DNR | .25 | 0 |
| | Stemmers Run Co-op Wildlife Management | 1,000.0 | Cecil | Federal (managed by MD FPW) MD DNR | .75 | .1 |
| MILES | Mill Street Park | .1 | Talbot | Municipality | 0 | 0 |
| | Muskrat Park | .75 | Talbot | Municipality | 0 | 0 |
| | St. Michael's Public Wharf | .1 | Talbot | County | .1 | 0 |
| | Oak Creek Park | 15.0 | Talbot | County | 0 | 0 |
| HARRIS CREEK | Black Walnut Point Park | 2.0 | Talbot | County | 0 | 0 |
| | Dogwood Harbor | 2.7 | Talbot | County | .25 | 0 |
| | Coast Guard Park | 6.7 | Talbot | County | 0 | 0 |
| BROAD CREEK | Broad Creek Landing | .75 | Talbot | County | 0 | 0 |
| TRED AVON | Bellevue Park | 7.0 | Talbot | County | .1 | 0 |
| | Oxford Wharf | 1.0 | Talbot | County | 1.0 | 0 |
| | Causeway Park | 7.0 | Talbot | County | 0 | 0 |
| LITTLE CHOPTANK | No Public Lands | 0 | Dorchester | — | 0 | 0 |

(Includes public lands which are totally or partially located in corridor)

| RIVER | NAME OF PUBLIC LAND | TOTAL ACRES | COUNTY | OWNERSHIP | MILES OF SHORE | MILES OF BEACH |
|----------------|--|-------------|--------------|-----------|----------------|----------------|
| HONGA | Muddy Hook Cove | .63 | Dorchester | County | .07 | 0 |
| | Tyler's Cove | 1.38 | Dorchester | County | .04 | 0 |
| MANOKIN | Rumbley Point Park | 1.0 | Somerset | County | .04 | 0 |
| | Racoon Point Recreation Area | 230.0 | Somerset | County | 1.0 | .25 |
| | Fairmount Wildlife Management Area | 3,883.0 | Somerset | State | 22.0 | 0 |
| | Deal Island Wildlife Management Area | 11,732.0 | -Somerset | State | 37.0 | 0 |
| WEST | Shadyside Wharf | .25 | Anne Arundel | County | .25 | 0 |
| | Galesville Wharf | 2.0 | Anne Arundel | County | 1.0 | 0 |
| | Smithsonian Institution for Environmental Studies | 2,600.0 | Anne Arundel | Federal | 15.0 | 0 |
| SOUTH | Mayo Beach Park | 26.0 | Anne Arundel | County | .3 | 0 |
| | South River Farm | 174.0 | Anne Arundel | County | 2.3 | .5 |
| | Londontown Public House | 21.0 | Anne Arundel | County | .3 | 0 |
| | Thomas Point Park | 44.0 | Anne Arundel | County | 2.5 | 0 |
| MAGOTHY | No Public Lands | .0 | Anne Arundel | | 0 | 0 |
| BACK | Cox's Point Park | 25.9 | Baltimore | County | .09 | 0 |
| | Rocky Point Park | 374.6 | Baltimore | County | 2.8 | .1 |
| MIDDLE | Turkey Point Park | 32.2 | Baltimore | County | .01 | 0 |
| | Kingston Park | 3.8 | Baltimore | County | 0 | 0 |
| | Midthorne Park | 7.2 | Baltimore | County | .02 | 0 |
| | Dark Head Creek Park | 10.5 | Baltimore | County | .03 | 0 |
| BUSH | Willoughby Beach Landing | 1.3 | Harford | County | .25 | 0 |
| | Flying Point Park | 16.0 | Harford | County | 1.0 | .6 |
| | William Longley Park | .5 | Harford | County | 0 | 0 |

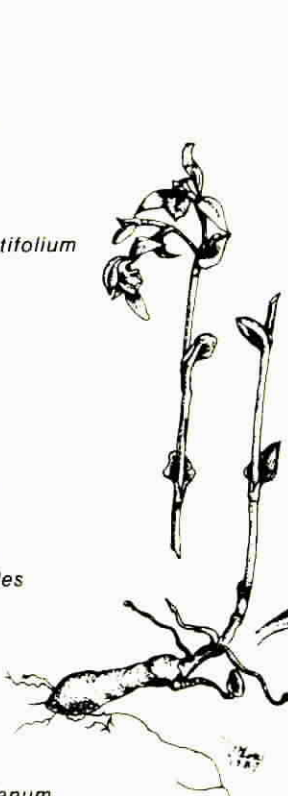
Appendix LIST OF GENUS AND SPECIES NAMES OF THREATENED AND SIGNIFICANT FLORA AND FAUNA

1. A festuca, *Festuca paradoxa*
2. A knotweed, *Polygonum robustius*
3. A ranunculus, *Ranunculus carolinianus*
4. A sedge, *Carex tenera*
5. Aster-like Boltonia, *Boltonia asteroides*
6. A Sweet-scented Indian-plantain, *Cacalia suaveolens*
7. A vetchling, *Lathyrus palustris*
8. Brome-like Sedge, *Carex bromides*
9. Climbing Fern, *Lygodium palmatum*
10. Clingman's Hedge Nettle, *Stachys clingmanii*
11. Common's Panicgrass, *Panicum commonsianum*
12. Downy Willowherb, *Epilobium strictum*
13. Fringed-tip Closed Gentian, *Gentiana andrewsii*
14. Giant Cane, *Arundinaria gigantea*
15. Glade Fern, *Athyrium pycnocarpon*
16. Goldenseal, *Hydrastis canadensis*
17. Indian Paintbrush, *Castilleja coccinea*
18. Koehne's Ammannia, *Ammannia teres*
19. Leatherleaf Meadowrue, *Thalictrum coriaceu*
20. Lobed Spleenwort, *Asplenium pinnatifidum*
21. Long-beaked Arrowhead, *Sagittaria longirostra*
22. Long-leaved Rushgrass, *Sporobolus asper*
23. Maryland Bur-marigold, *Bidens bidentoides*
24. Matted Spikerush, *Eleocharis intermedia*
25. Mudwort, *Limosella subulata*
26. Narrow-leaved Horse-gentian, *Triosteum angustifolium*
27. Nodding Pagonia, *Triphora trianthophora*
28. Northern Dropseed, *Sporobolus heterolepsis*
29. Northern Willowherb, *Epilobium ciliatom*
30. Nycetelea, *Ellisia nycetelea*
31. Parkers Pipewort, *Eriocaulon parkeri*
32. Potato Dandelion, *Krigia dandelion*
33. Purple Cress, *Cardamine douglassii*
34. Redheadgrass, *Potamogeton richardsoni*
35. Rough Cyperus, *Cyperus retrofractus*
36. Sensitive-joint Vetch, *Aeschynomene virginica*
37. Shining Willow, *Salix lucida*
38. Short's Rockcress, *Arabis shortii*
39. Single-headed Pussytoes, *Antennaria solitaria*
40. Small Purple-fringed Orchis, *Habenaria psyeodes*
41. Snowy Campion, *Silene nivea*
42. Tall Tickseed, *Coreopsis triptersis*
43. Thread-like Naiad, *Najas gracillima*
44. Toothed Sedge, *Cyperus dentatus*
45. Trailing Switchwort, *Stellaria alsine*
46. Valerian, *Valeriana pauciflora*
47. Veined Skullcap, *Scutellaria nervosa*
48. Virginia Mallow, *Sida hermaphrodita*
49. Virginia Mountain-mint, *Pycnanthemum virginianum*
50. White-bracted Boneset, *Eupatorium leucolepis*
51. White Trout Lily, *Erythorium albidum*
52. Whorled Water-pennywort, *Hydrocotyle verticillata*

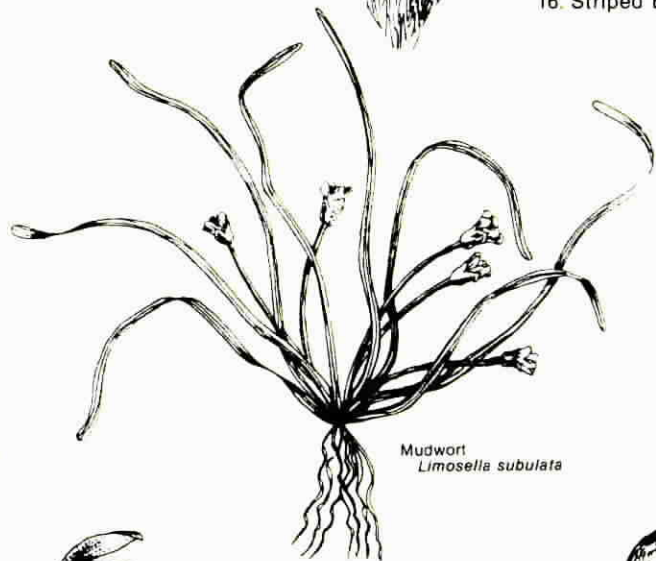


Delmarva Fox Squirrel
Sciurus niger cinereus

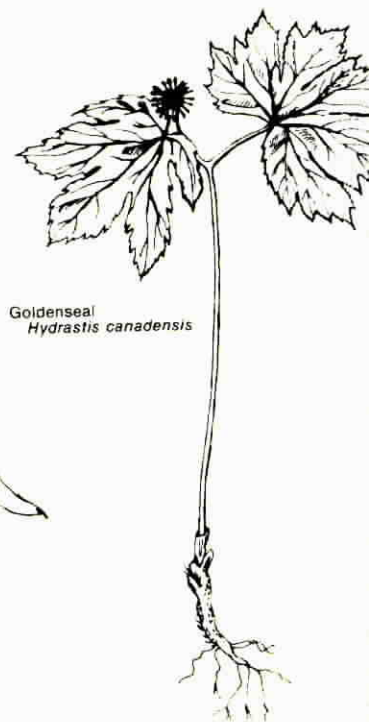
1. American Shad, *Alosa sapidissima*
2. Atlantic Sturgeon, *Acipenser oxyrinchus*
3. Bald Eagle, *Haliaeetus leucocephalus*
4. Black Duck, *Anas rubripes*
5. Bufflehead, *Bucephala albeola*
6. Canada Goose, *Branta canadensis*
7. Canvasback Duck, *Aythya valisineria*
8. Delmarva Fox Squirrel, *Sciurus niger cinereus*
9. Hickory Shad, *Alosa mediocris*
10. Least Tern, *Sterna dougallii*
11. Loggerch, *Percina caprodes*
12. Mallard, *Anas platyrhynchos*
13. Scoter, *Melanitta perspicillata*
14. Sea turtle species, *Chelonidae spp.*
15. Shortnose Sturgeon, *Acipenser brevirostrum*
16. Striped Bass, *Morone saxatilis*



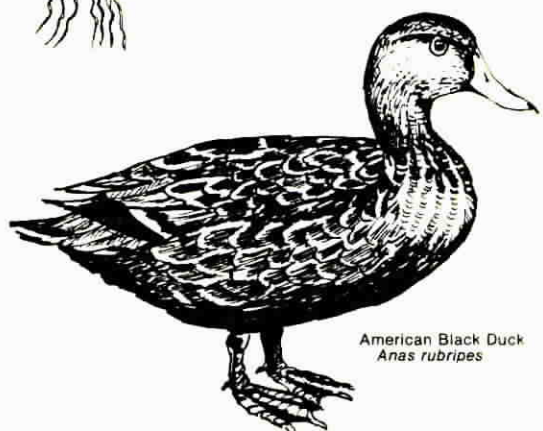
Nodding Pagonia
Triphora trianthophora



Mudwort
Limosella subulata



Goldenseal
Hydrastis canadensis



American Black Duck
Anas rubripes

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187 Maryland rivers study : 2
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1988

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