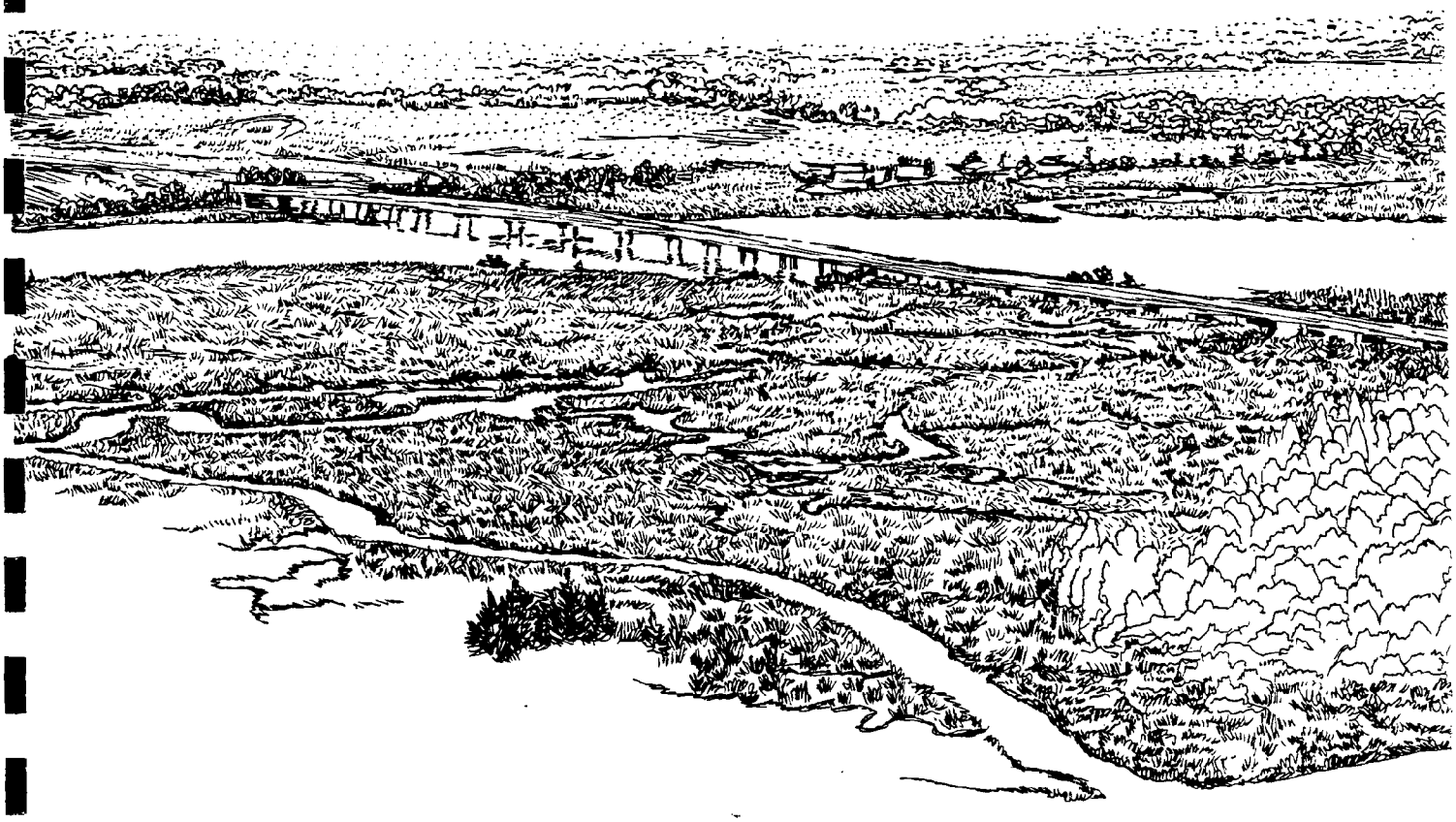
Grant No. NA27OZ0337-01

Task 3

Nanticoke River Watershed:

A Summary of Resource Characteristics and Enhancement Activities



Maryland Department of Natural Resources
Public Lands and Forestry
Greenways and Resource Planning

June, 1994

State of Maryland

The Honorable William Donald Schaefer, Governor

Department of Natural Resources

Torrey C. Brown, M.D., Secretary
Public Lands and Forestry
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On cover: Wetlands near the Route 50 bridge over the Nanticoke River - joining Wicomico and Dorchester Counties.

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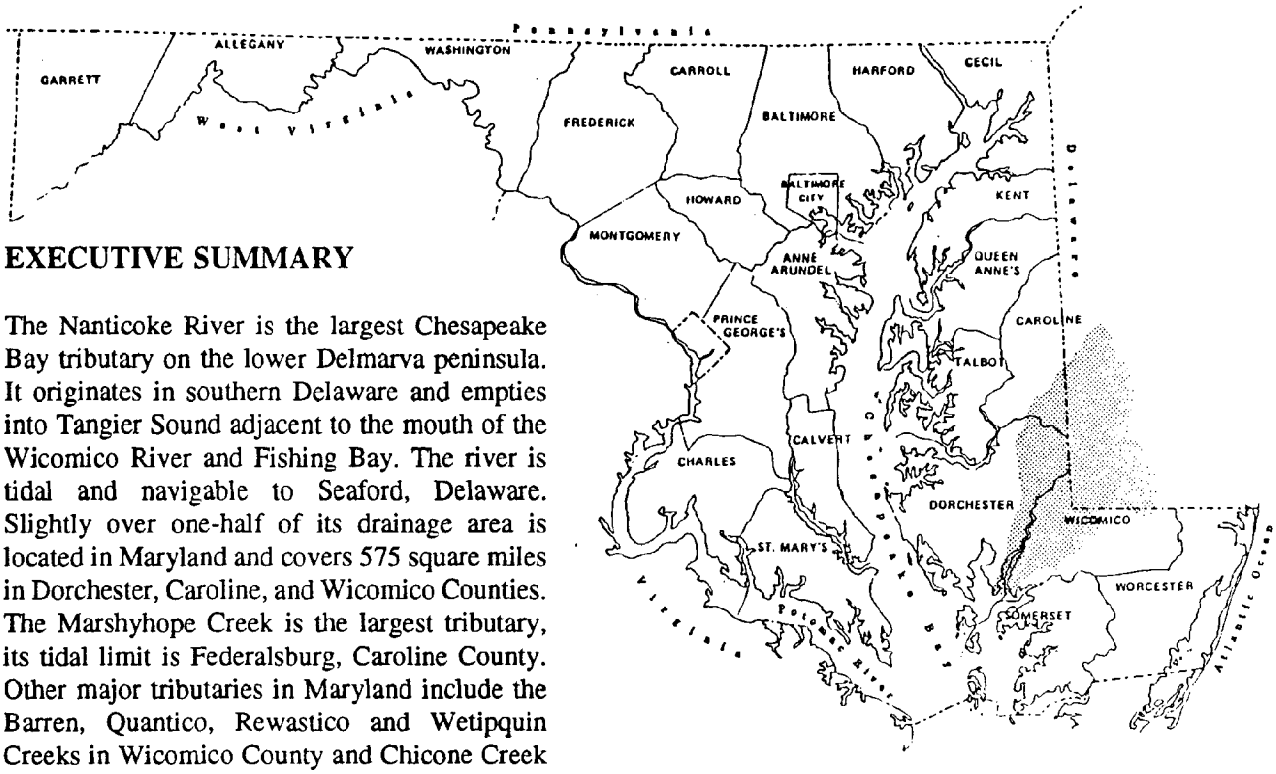


EXECUTIVE SUMMARY

The Nanticoke River is the largest Chesapeake Bay tributary on the lower Delmarva peninsula. It originates in southern Delaware and empties into Tangier Sound adjacent to the mouth of the Wicomico River and Fishing Bay. The river is tidal and navigable to Seaford, Delaware. Slightly over one-half of its drainage area is located in Maryland and covers 575 square miles in Dorchester, Caroline, and Wicomico Counties. The Marshyhope Creek is the largest tributary, its tidal limit is Federalsburg, Caroline County. Other major tributaries in Maryland include the Barren, Quantico, Rewastico and Wetipquin Creeks in Wicomico County and Chicone Creek in Dorchester County.

A series of smaller rivers flows into Fishing Bay. The Blackwater, the Little Blackwater, the Transquaking and the Chicamicomico, as well as numerous small creeks drain the vast tidal marshes that encompass the drainage area. Over 50,000 acres of tidal wetlands are located in this watershed, representing about one-quarter of the tidal wetlands in Maryland. Together, the Nanticoke and the Fishing Bay/Blackwater drainage areas form the area of study for this enhancement strategy. This watershed has been identified by Maryland and Delaware to be an excellent area in which to protect and enhance natural resources for recreation and conservation purposes.

This study provides an overview of the recreational and natural resource characteristics of the Nanticoke watershed. This document also identifies what living resources and recreational enhancement activities the Department was involved with at the time of the study. Living resource enhancement activities are efforts to protect and enhance terrestrial and aquatic habitats, water quality and other significant watershed characteristics. Recreational resource enhancement activities provide both passive and active recreational opportunities which integrate man into this environment.

The Resource and Watershed Characteristics, Section I, shows how physiographic features, living resources, cultural resources, and recreational opportunities are currently arranged in the watershed. This information can be used to identify future enhancement activities. Recent activities conducted by agencies of the Maryland Department of Natural Resources and other private and public agencies in the Nanticoke River Watershed study area are summarized in Section II, Agency Activity. The Greenways and Resource Planning Enhancement Activities, Section III, provides a brief description of site specific and regionally oriented enhancement activities which have been initiated as a result of this study.

Nanticoke River Watershed

I. RESOURCE AND WATERSHED CHARACTERISTICS

This section describes the individual components which influence the existing and potential character of the study area. The interplay of physiographic features and the living resources which have evolved within these parameters with current and historic uses are discussed and represented with Geographic Information Systems (GIS) maps to illustrate the existing character and potential enhancement of the area.

PHYSIOGRAPHY

This section describes the physical qualities of the watershed and how people have influenced and responded to these qualities. Soil and hydrologic characteristics are the primary determinants of land use suitability. The manipulations of these characteristics and the vegetative communities depict the current composition of the watershed.

Land Use

The Forest Cover and Agriculture map shows the relationship of agricultural lands to forested lands. This map indicates agriculture in the north, center, and east sections of the watershed and timber production along the east side of the river, and west section of the watershed. This distribution was, in part, created in response to the natural soil conditions in the watershed.

Current land uses in the Nanticoke watershed have a major effect on the character and viability of living and recreational resources. The major land uses include a mixture of forest land, agricultural land, and wetlands.

Commercial, suburban residential, institutional and industrial uses make up approximately 1.2% of the land use. The following table provides a breakdown of the major current land uses within the study area.

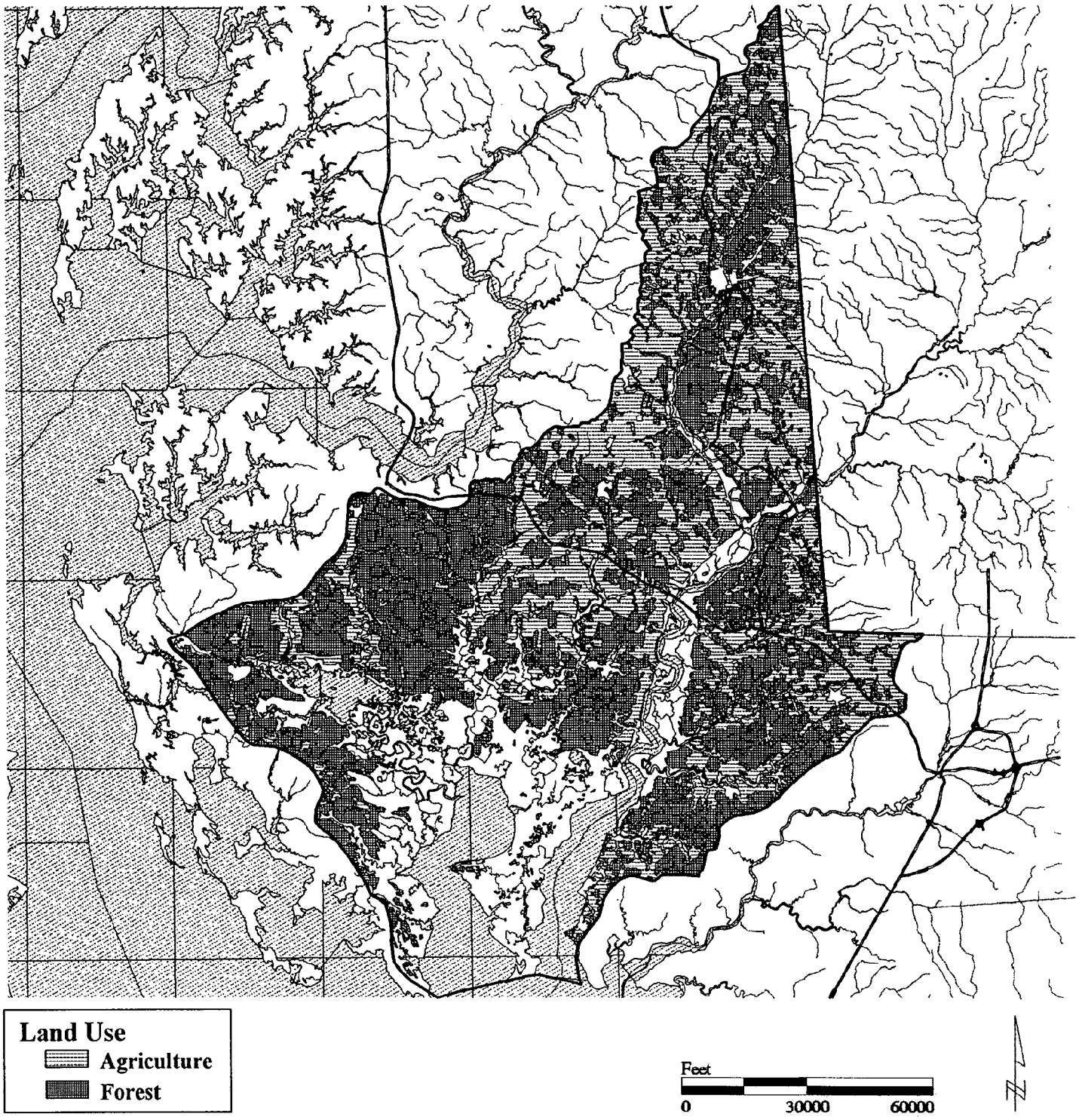
LAND USE	ACREAGE	% OF STUDY AREA
TOTAL IN STUDY AREA	**401,480**	
AGRICULTURE	116,167	**28.9**
FOREST	154,635	**38.5**
RESIDENTIAL	3,294	**0.8**
COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL LANDS	1,486	**0.4**
OPEN WATER	47,491	**11.8**
WETLANDS	74,974	**18.7**
OTHER	3,433	**0.9**

(figures provided by Maryland Office of Planning, 1990)

Towns historically developed where fastland allowed access to navigable waterways. These locations are uncommon in the study area as evidenced by the few widely-scattered waterfront towns. Railroad alignments, now mostly abandoned, supported other rural towns. These towns have adapted to other economic opportunities. Several small residential subdivisions are concentrated west of Salisbury and around Federalsburg and others are scattered throughout the watershed. Residential development pressure is increasing due to the availability of waterfront property and the increasing urban economic opportunities in the region. The general inaccessibility of the Nanticoke River has limited the amount of shoreline recreational/resort development, which is currently concentrated on the lower Wicomico County side of the river at Bivalve and Nanticoke. Most new development adjacent to the river must comply with the State Forest Conservation Act, the State's Tidal and Nontidal Wetlands Acts, section 404 of the Federal Clean Water Act as well as State and County Chesapeake Bay Critical Area programs.

Shoreline structures on the Nanticoke at Vienna.

DATA SOURCE: Maryland Office of Planning



Nanticoke River Watershed

Forest Cover and Agriculture

Forests

The Forest Cover and Agriculture map shows the distribution of existing forests. These forests are further divided into deciduous hardwood stands, pine stands and mixed forest areas. Conservation of existing natural diversity requires that examples of various forest community types will be available to maintain long term health of the forest and related natural resources for the enjoyment of future generations.

Based on the 1993 State Forest Inventory, forest cover of several types comprises 247 square miles, or 43%, of the land in the study area. This percentage is greater than that listed for 1990 (39.9%). Wood products and wildlife habitat are among the principle benefits of the forest. Forests also provide substantial water quality protection values to surface waters, by moderating runoff and trapping nutrient pollutants. The study area includes pine, hardwood, and mixed pine and hardwood forest types. Some forest areas are regenerating after harvest. Included in the forest inventory are large areas of forested wetlands.

Loblolly pine is the principal timber tree in the study area. The continued presence and expansion of the forest land base in the watershed can be largely attributed to the existence of an economic incentive for private landowners to retain forests. As a result, economic pressures exist to maintain or enhance the loblolly pine component of the privately owned forests. Public forest land ownership or private landowners incentive programs may be required to meet diversity goals if natural diversity is found to be threatened. The loblolly pine is susceptible to insect infestations, particularly southern pine beetle, while the hardwood forests are subject to defoliation from gypsy moth.

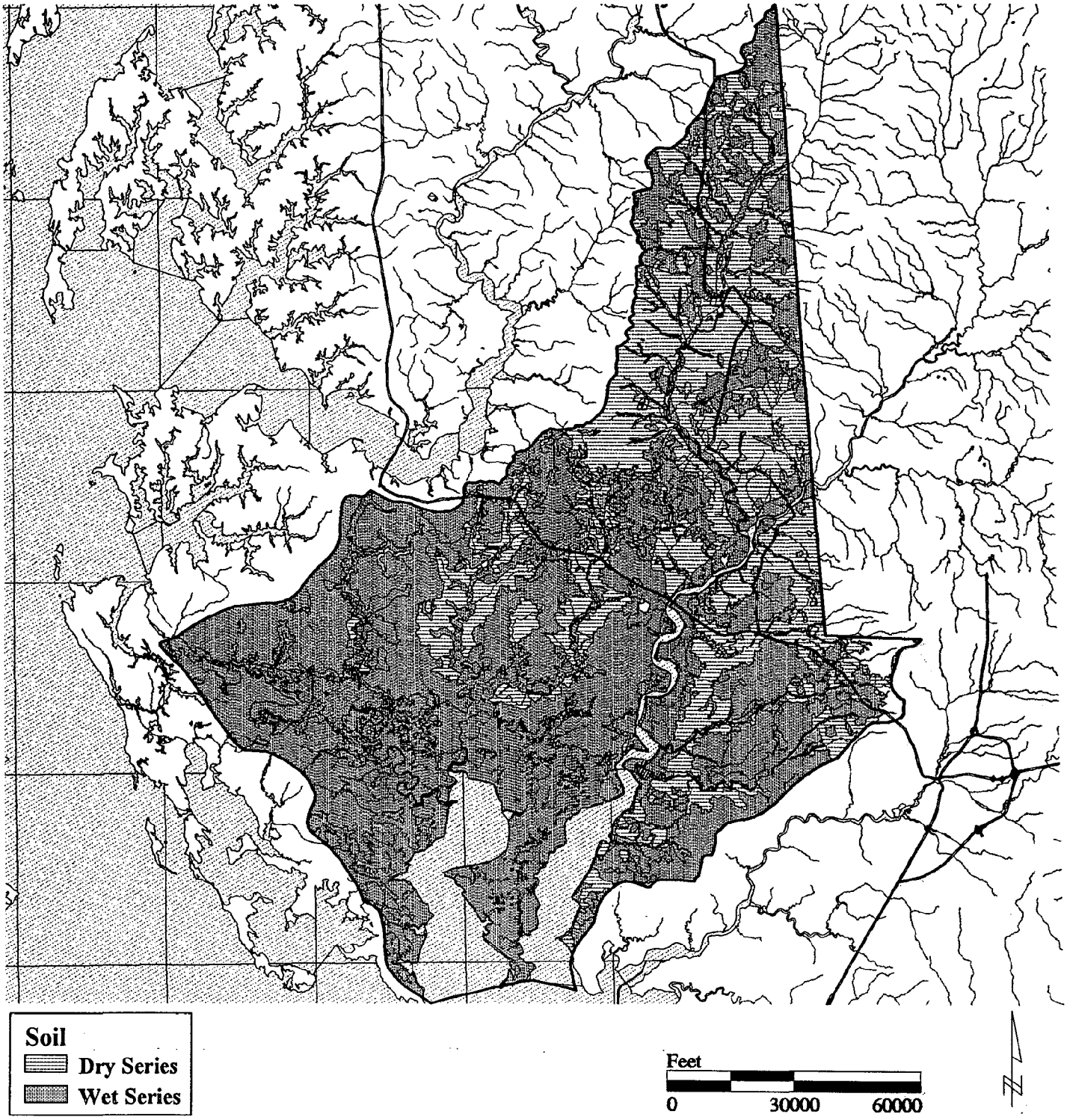
Soils

Soils have been characterized into two general categories based on hydrology: dry soils and wet soils. The dry soil conditions constitute where agriculture has developed. The remaining dry soils that contain forest are some of the best growing sites for native stands of pine and many of these stands are extensively managed for forest products. The forest on the wet soils generally contain bottomland hardwood and loblolly pine stands. Atlantic White Cedar has historically occurred and continues to occur in scattered stands on the wetter sites. Many of the pine stands on the very wet soils along the marsh edge are stunted and very slow growing.

Land uses are in large part dictated by the character of the soils. The majority of the lower watershed's soils are poorly drained with large areas of swamp and marsh that are subject to tidal flooding, except for some large areas of very sandy soils in Wicomico County. Poor drainage limits the agricultural value of soils and drainage ditches have been constructed and maintained to alleviate this condition.

The upper watershed has mostly well drained soils with some areas of excessively drained sandy soils. Some of the areas of sandy soil are of limited use for agriculture due to drought and low fertility. Agricultural land use includes farm yards, orchards, pasture and cropland. Row-cropped corn and soy bean is planted extensively for use as feed for poultry, which is one of the largest components of the agricultural economy.

DATA SOURCE: Maryland Office of Planning



Nanticoke River Watershed

Soils

Wetlands

The Wetland map shows the distribution of forested wetland and open marsh. Wetlands are afforded a degree of protection from development. Timber harvests in wetlands require the implementation of Best Management Practices along with the development of a Forest Harvest Plan (Critical Area) that details protection of stream buffers, wetlands and endangered species.

The study area contains the Maryland portion of the Chesapeake Bay's largest assemblage of tidal and nontidal wetlands, including forested, shrub/scrub and open marsh; combined, they comprise over 16% of the land area. Wetlands are highly valuable resources which provide water quality enhancement, flood protection, wildlife habitat, flood control and other functions. There is a progression from brackish marshes to freshwater tidal marshes, freshwater tidal shrub swamps and, finally, freshwater forested swamps in the tidal and non-tidal reaches of the study area. Wetlands are principally floodplain swamps and seasonally flooded forests above the tidal limits.

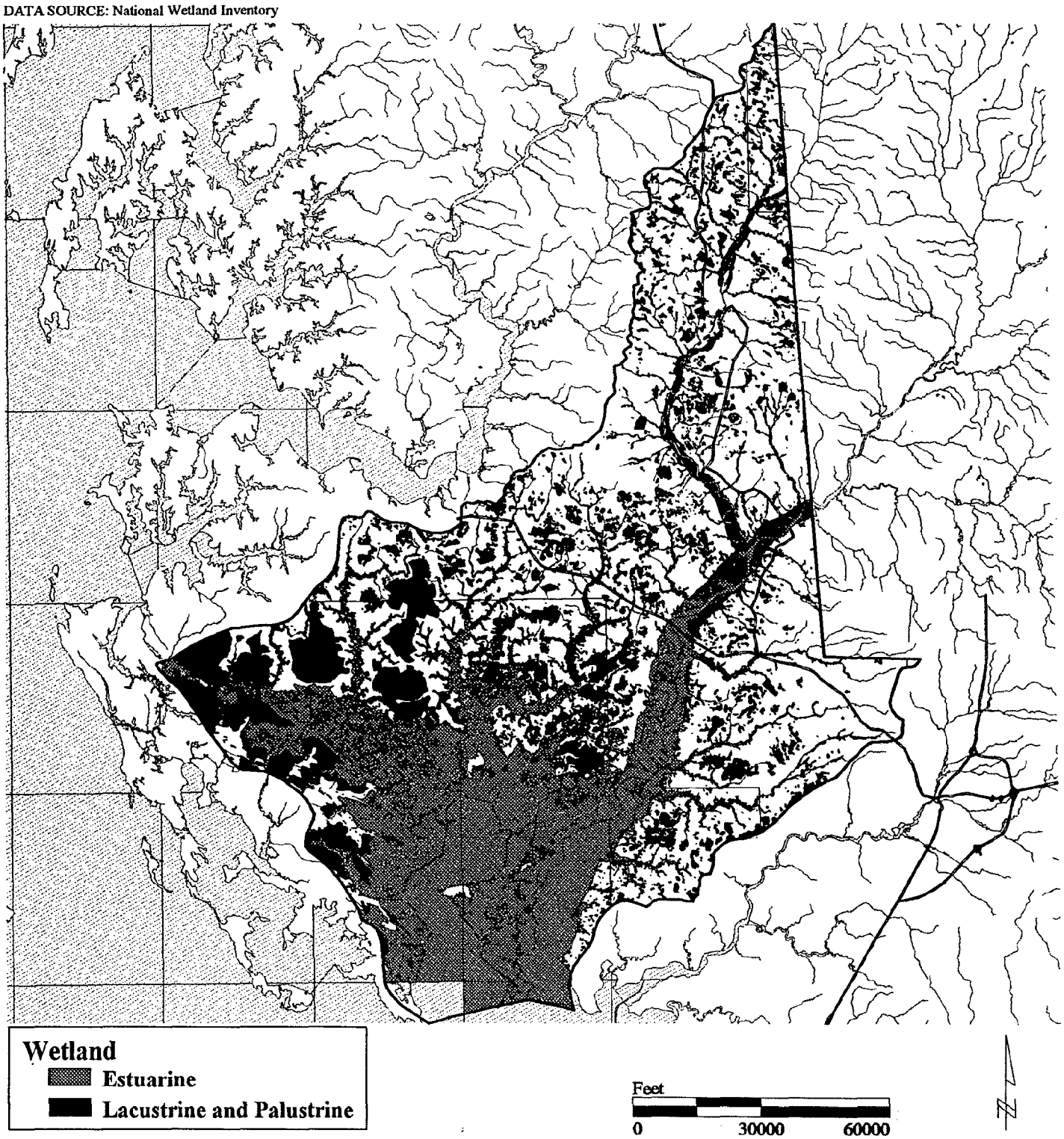
Wetlands are afforded some protection from development under State and Federal wetland regulations. However, natural occurrences such as the rising of relative sea level, and certain forestry and agricultural operations influence these resources.

Large areas of low tidal marsh, especially in the Blackwater drainage, are suffering from erosion because of rising sea level and cropping by the exotic nutria. These activities create open water landward of the existing marshes by accretion, thus converting forested wetlands to marsh.

saltmarsh cordgrass

big cordgrass

nutria

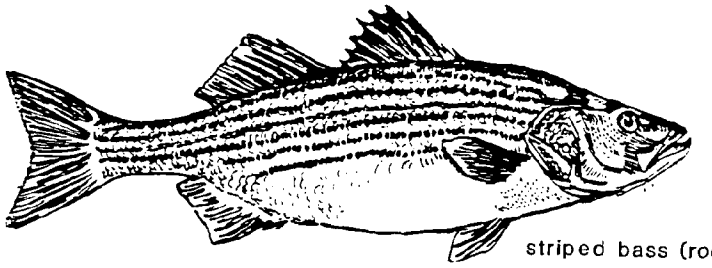


Nanticoke River Watershed

Wetlands

LIVING RESOURCES

The interaction between land and water has created an area with diverse natural conditions. The watershed contains abundance and diversity of life. Some of these living resources have historically and continue to be used for recreation and economic viability. There is also a great diversity and quantity of species which have not historically been used by people but which are gaining cultural and recreational significance. The Wildlife map generalizes the areas where indicator species frequently occur. The salinity gradient is also indicated since this is one of the primary environmental factors which determines the range of plant and animal species.



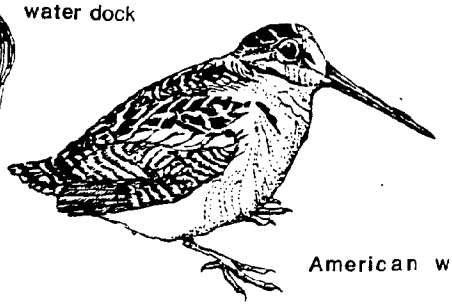
striped bass (rockfish)

hightide bush

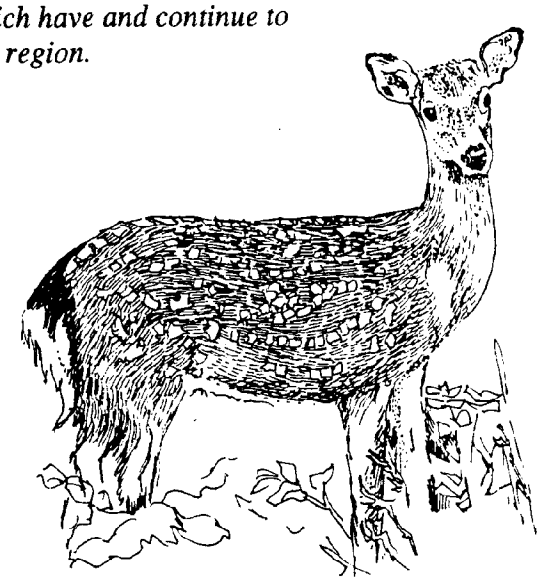
water dock

FLORA AND FAUNA

There is a diversity and quantity of habitats provided in the watershed. Some species concentrate in the area during certain seasons, while others have adapted to the unique physical condition which have and continue to influence the region.



American woodcock



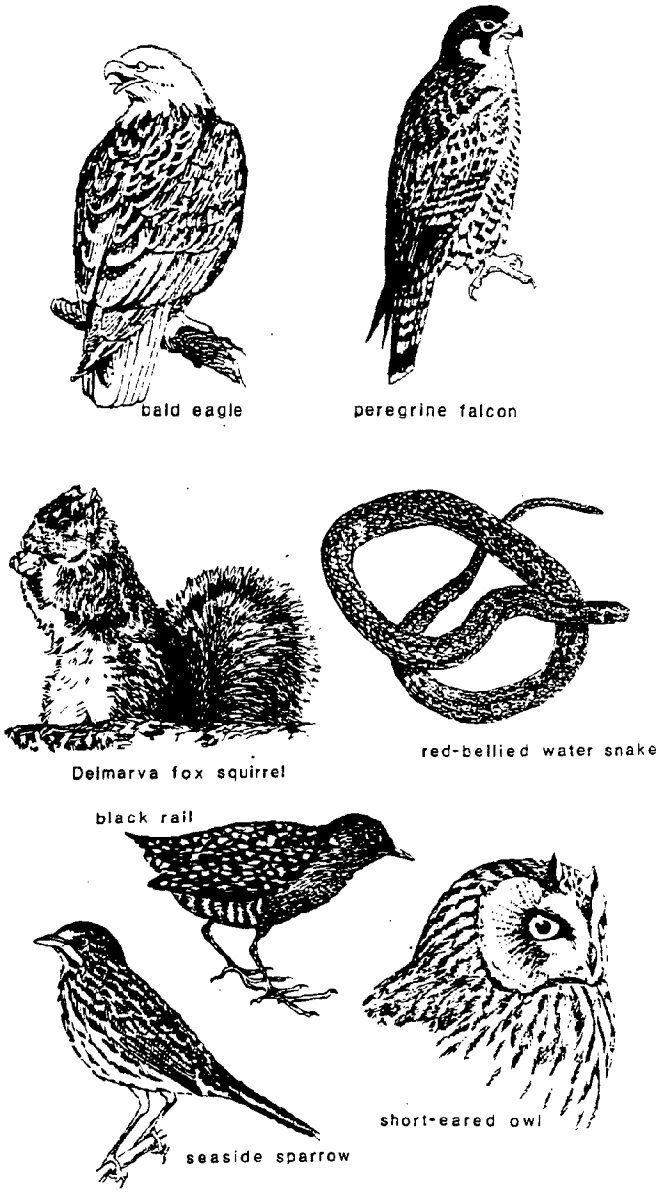
sika deer

Rare, Threatened and Endangered, and Non-Game Species

The diversity of terrestrial and wetland habitats within the Nanticoke watershed provides suitable habitats for a number of rare, threatened or endangered plant and animal species. The principal animal species are the bald eagle, peregrine falcon, Delmarva fox squirrel, black rail, and several species of forest interior nesting birds. Management activities for some of these species are carried out by the DNR on Wildlife Management Areas, by the U.S. Fish & Wildlife Service at the Blackwater National Wildlife Refuge, and by many private landowners.

Forest interior nesting birds, particularly neotropical migratory species, have been declining due to forest fragmentation as well as loss of tropical winter habitat. The Delmarva fox squirrel's low population is attributed to its habitat requirement of mature forest. Restoration efforts to reestablish this species in areas it formerly inhabited are on-going. The bald eagle and osprey have increased in numbers after the banning of DDT in the early 1970's. The peregrine is increasing primarily as a result of ongoing efforts to reintroduce this bird of prey to the eastern United States. Other rare animal species present include the seaside sparrow, black rail and short-eared owl. The black rail is a secretive inhabitant of high tidal marshes. Originally thought to be very rare, it is found to be more common, although its habitat requirements are not well known.

The DNR's Maryland Natural Heritage Program has identified sites where concentrations of rare plants and animals require special protection efforts. Other select areas have been identified through on-going research and field work. This data is being used to target future protection efforts by the Department and other conservation organizations.



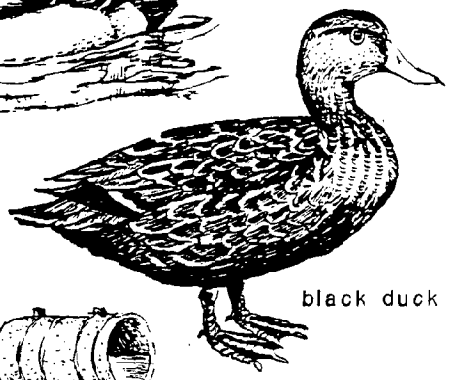
Migratory Game Birds

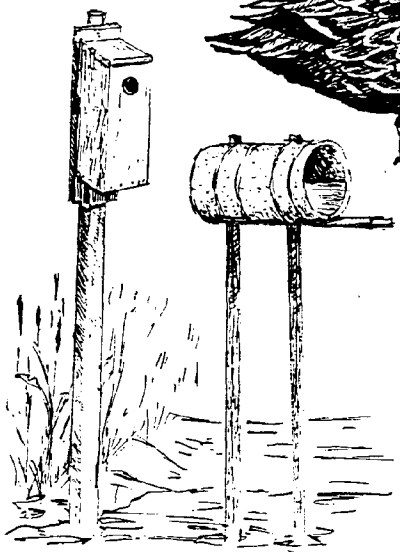
Mallards, black duck, wood duck, and Canada geese are the principal species which breed in the watershed. The study area is better known as a migratory, wintering and breeding habitat. These species appear to benefit from protection and the creation of nesting/brood habitat. Historical waterfowl staging and concentration areas have been mapped by the DNR's Wildlife Division. These concentration areas include the entirety of Fishing Bay and most of the lower Nanticoke River. The management activities at Blackwater National Wildlife Refuge and on DNR Wildlife Management Areas benefit many of the waterfowl species.

The 1990 The Blackwater - Nanticoke Focus Area Plan (1990) was developed as part of the Atlantic Coast Joint Venture. This plan was prepared by the Wildlife Division to implement the North American Waterfowl Management Plan. This is a commitment between the United States, Canada and Mexico to protect and increase migratory waterfowl populations.

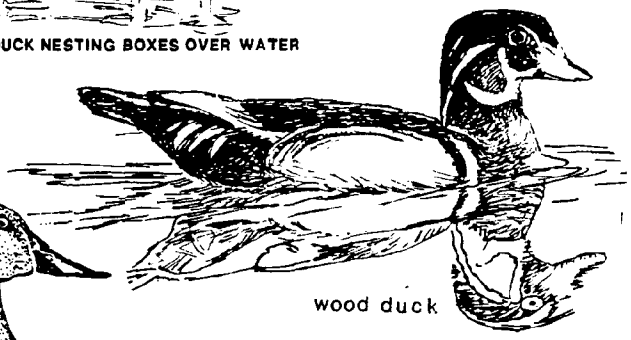
The decline of submerged aquatic vegetation (SAV) has reduced the quality of habitat for diving species such as canvasback and redhead ducks; however, SAV are reestablishing themselves in certain places.

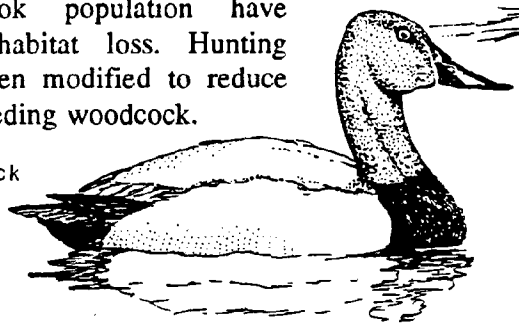
Feral, non-migratory mallards are believed to be hybridizing with native black ducks; however, there is no real evidence that this is related to the past decline in black duck numbers. Black duck populations have recently stabilized. Extensive wood duck habitat is present in the wooded swamps that border the upper Nanticoke and Marshyhope Creek. The placement of nesting boxes has provided the opportunity for increasing nest success of wood ducks. Dump nesting, however, continues to impact recruitment. American woodcook population have declined due to habitat loss. Hunting regulations have been modified to reduce harvest on local breeding woodcock.





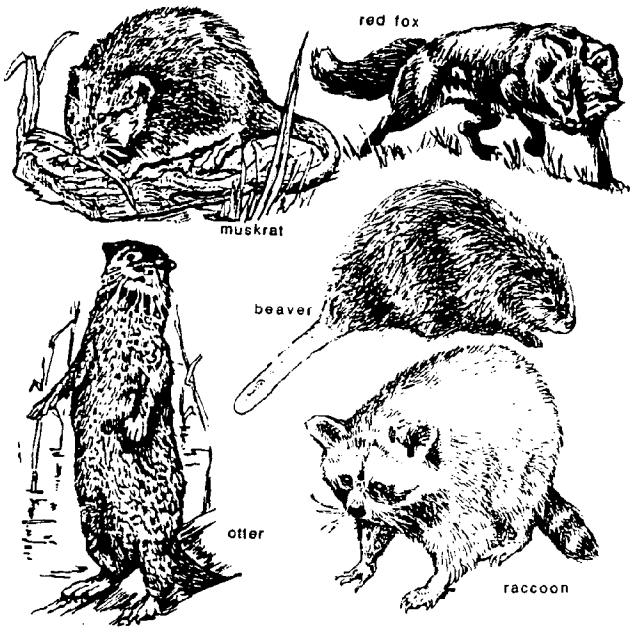
WOOD DUCK NESTING BOXES OVER WATER





Furbearers

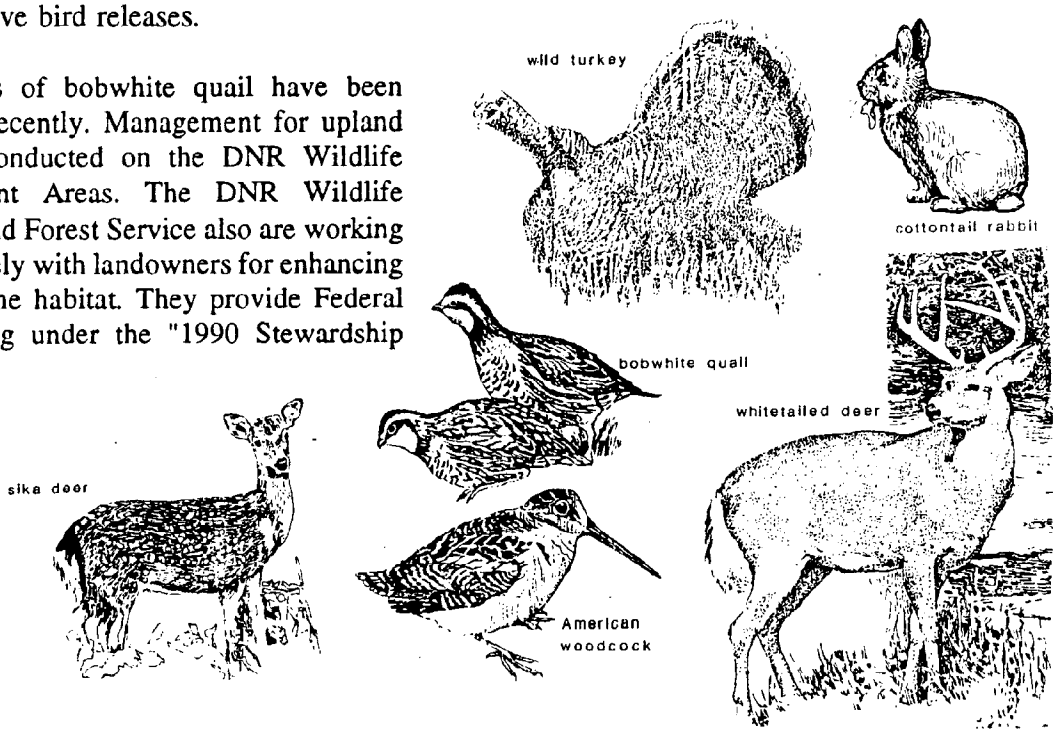
The extensive wetland habitats support healthy populations of native muskrat, red and gray fox, beaver, otter and raccoon as well as the exotic nutria. These species provide a fur harvest which is a regionally important source of income.



The nutria, imported from South America in the 1930's and 1940's for captive fur production, was accidentally released into the wild and has since established large populations in local wetland habitats. The nutria competes for habitat with native species, particularly muskrat. The main problem with nutria is not competition, but habitat degradation. Large nutria populations are believed to be responsible for marsh, dike, farm pond and agricultural crop damage. Their behavior degrades habitat for many other species.

Upland Game

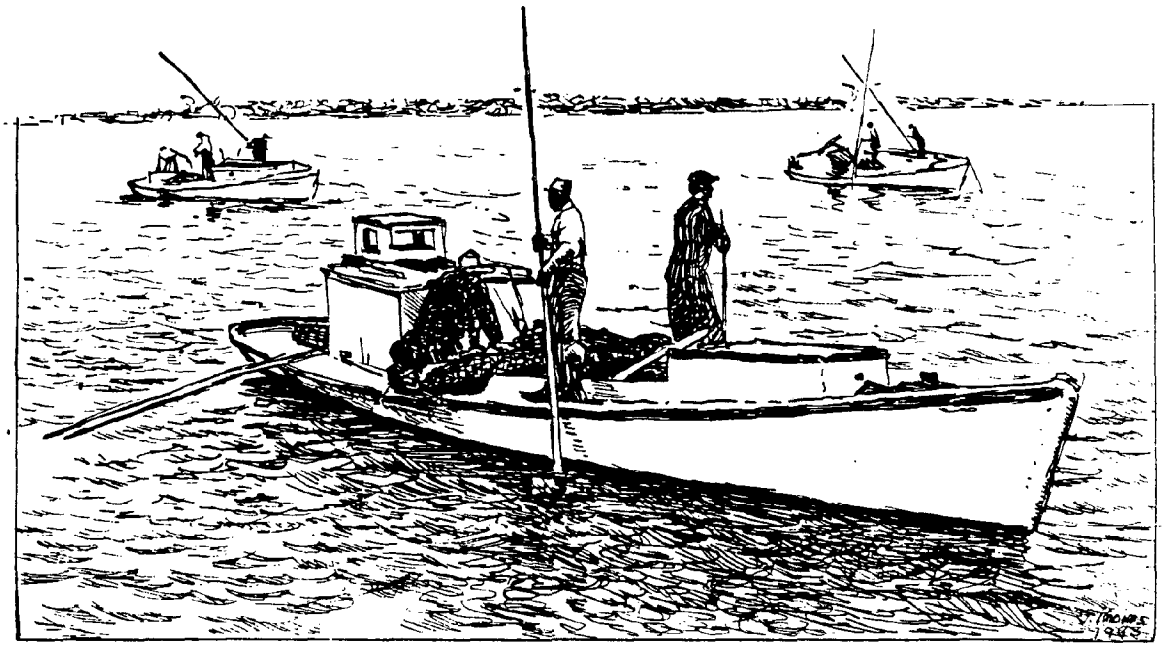
Healthy populations of native gray squirrel, cottontail rabbit, whitetailed deer and turkey provide recreational opportunities for hunting and wildlife observation. Exotic sika deer occur mainly in Dorchester County, in the marshes west of the Nanticoke River and also provide opportunities for hunting. Wild turkey populations have greatly benefitted from management activities including live bird releases.



Populations of bobwhite quail have been declining recently. Management for upland game is conducted on the DNR Wildlife Management Areas. The DNR Wildlife Division and Forest Service also are working cooperatively with landowners for enhancing upland game habitat. They provide Federal cost sharing under the "1990 Stewardship Program."

AQUATIC RESOURCES

The Nanticoke River and Blackwater/Fishing Bay watersheds contain a diversity of estuarine aquatic habitats ranging from brackish water to tidal freshwater to nontidal freshwater. The surface water and species inhabiting them have suffered from degradation. A variety of factors have contributed to the decline: habitat disturbance, acid precipitation, over-harvesting, blockages to fish migration, point and non-point source pollution and disease. Most aquatic organisms of economic and recreational significance exhibit cyclical variation in population, but the trend for most species is downward. There are, however, still viable commercial fisheries.

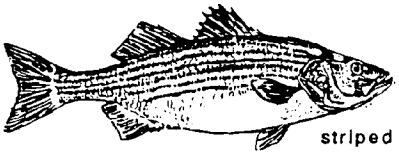


Oyster harvesting with hand tongs.

Submerged Aquatic Vegetation (SAV)

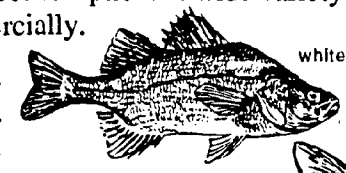
SAV are considered indicator species for water quality and provide important habitat for many animal species. Historically there were well-established SAV beds in the lower Nanticoke and outer Fishing Bay. SAV has disappeared in the Nanticoke and almost all of Fishing Bay since 1970 based on U.S. Environmental Protection Agency/Virginia Institute of Marine Sciences surveys. This survey also indicates a significant reduction in waterfowl and shellfish populations. Water quality improvements are necessary before SAV can be expected to increase by significant amounts.

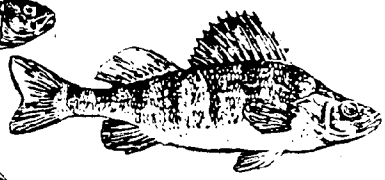
Finfish

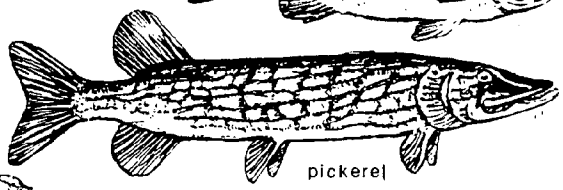

striped bass (rockfish)

Resident and transient fish species provide both recreational and commercial fisheries. The principal recreational species are: white and yellow perch, pickerel, catfish, and largemouth bass in the upper portions of the watershed, and bluefish, sea trout and striped bass (rockfish) in more saline habitats. White perch, catfish and, formerly, rockfish comprise the majority of the commercial catch. A specialized commercial fishery also exists for American eels which are sold as crabbing and fishing bait and exported for consumption. A wide variety of other finfish species also occur but are not generally sold commercially.

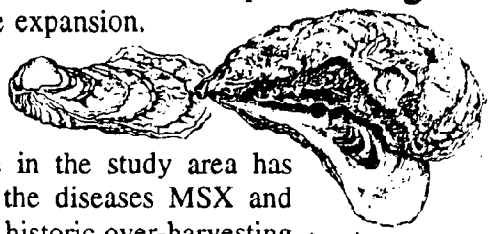
Extensive research is being conducted on the Nanticoke due to the serious decline of its striped bass spawning success. The Delmarva Power Corporation's Vienna Generating Plant is located near the center of the striped bass spawning area in the Nanticoke and is proposed for expansion. Concerns about further impacting spawning success have led to additional studies as part of the review for the expansion.


white perch


yellow perch

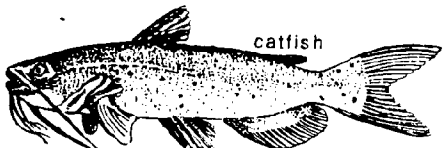

pickerel

Oyster

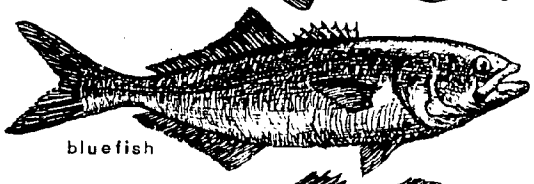

American oyster

The oyster resource in the study area has been decimated by the diseases MSX and Dermo as well as by historic over-harvesting and water quality degradation. Public oyster bars, natural oyster bars and private leases currently produce few marketable size oysters.

Oyster harvests were relatively low during the late 1960's and early 1970's but were higher in the late 1970's with a peak around 1979. Harvests have declined since that time.


catfish

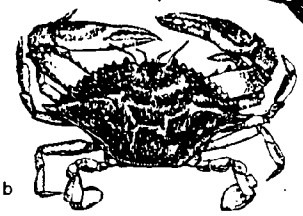
largemouth bass

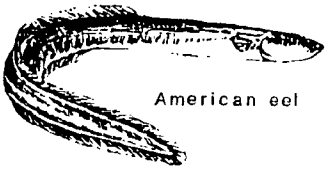

bluefish

sea trout

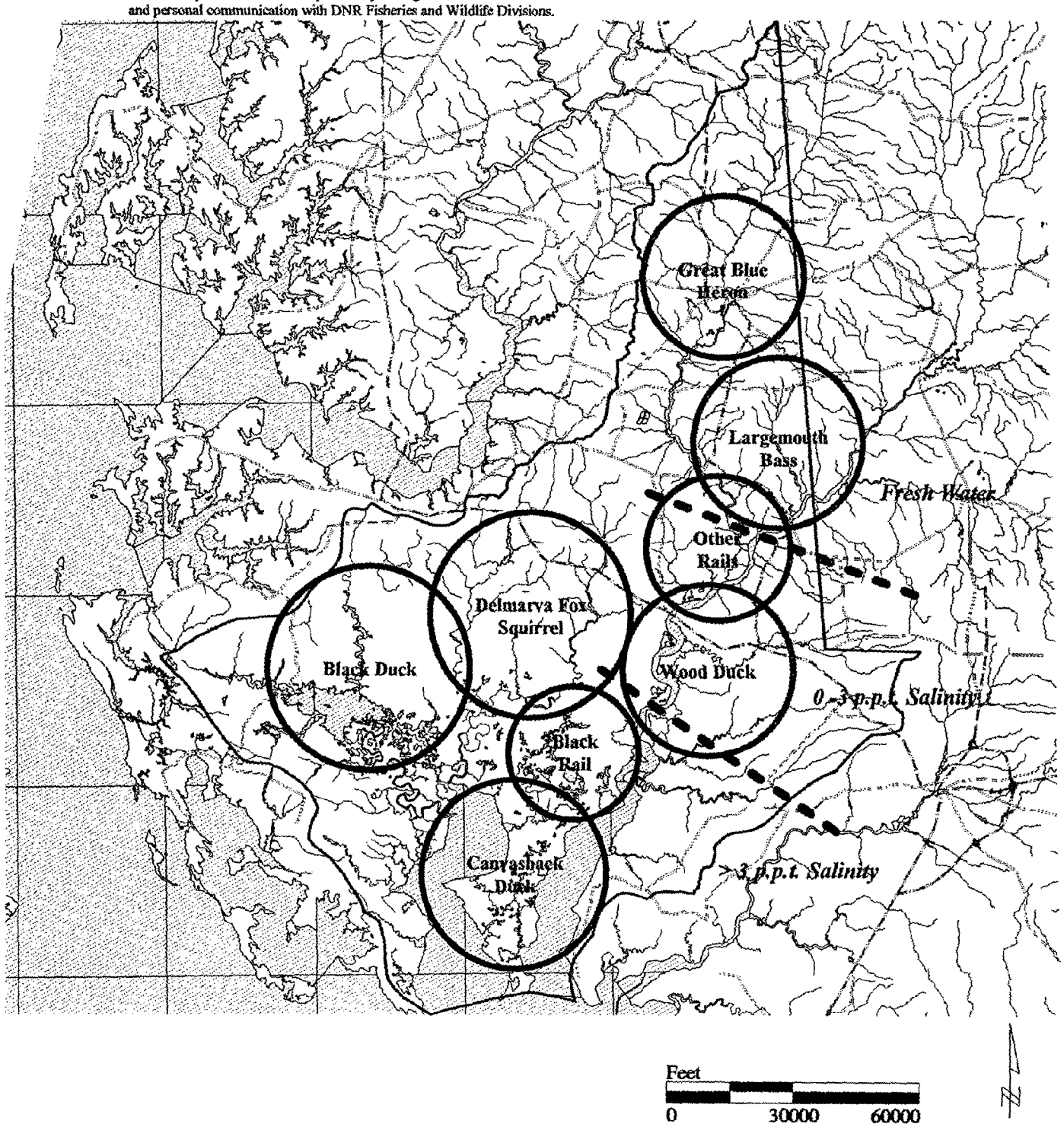
Blue Crab

Blue crabs are found throughout the lower portions of the river system. Annual harvests fluctuate for the blue crab. The crab is now the most viable commercial fishery.


blue crab


American eel

SOURCE: "Habitat Requirements for Chesapeake Bay Living Resources"
and personal communication with DNR Fisheries and Wildlife Divisions.



Nanticoke River Watershed

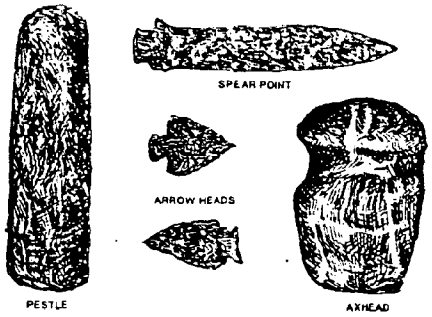
Wildlife

CULTURAL RESOURCES

Cultural resources are sites, structures, deposits and other evidence of historic human occupation. They are divided into two primary types in this region. Archaeological sites pertain to places where evidence of native American habitation is deposited. Historical structures are remains of European-American habitation.

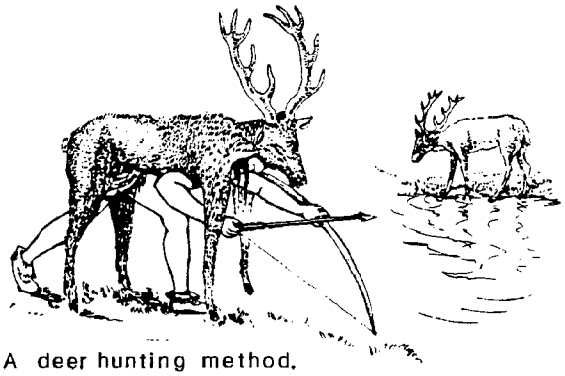
ARCHAEOLOGICAL RESOURCES

Evidence of intensive native American habitation can be found along the river systems in the watershed. The Nanticoke Indian tribe established a network of villages and encampments which persisted until the area was absorbed by European inhabitants. Evidence of their presence is revealed primarily by piles of discarded oyster shell called shell middens. There are also deposits which contain stone tools and pottery. (Locations of sites are not depicted.)



Stone implements made by Maryland Indians.

Approximately 25% of Maryland's inventoried archeological sites are located on the Eastern Shore. These sites include European-Indian contact sites and free black (underground railroad) sites. Approximately 305 sites lie within the Nanticoke Watershed. Early archeological research of the Eastern Shore has historically been performed by amateur archaeologists. Identification of many of the known sites has occurred since the formation of the Northeast, Mid-Shore and Lower Delmarva chapters of the Archaeological Society of Maryland.



A deer hunting method.

Very little archeological work had been done in Caroline County prior to the founding of the Upper Delmarva Regional Preservation Center in 1981. Mr. Joe Reinhart, a local amateur archaeologist, initially discovered a number of prehistoric sites in the county. The Regional Preservation Center has since increased the number of inventoried sites to 83. Most of the research in Caroline County has been limited to prehistoric sites.

A 1980 study of Dorchester County's artifact collection has resulted in an overview of the county's pre-history. Other studies by the center have included a record of free black populations for the earliest colonial period until the post Civil War era, and research of the European-Indian culture contact period, which resulted in the discovery of a village site, one of the few known in the Mid-Atlantic region. A total of 166 archeological sites were recorded as of 1986.

There were 76 inventoried archeological sites recorded in Wicomico County in 1986. Most of this research has focused on the prehistoric period.

HISTORIC STRUCTURES

Standing structures and sites of historic European habitation are found in the watershed. The most significant and best preserved of these sites are inventoried by various history societies. Historic structures included on the National Register are located on the Historic Standing Structures map.

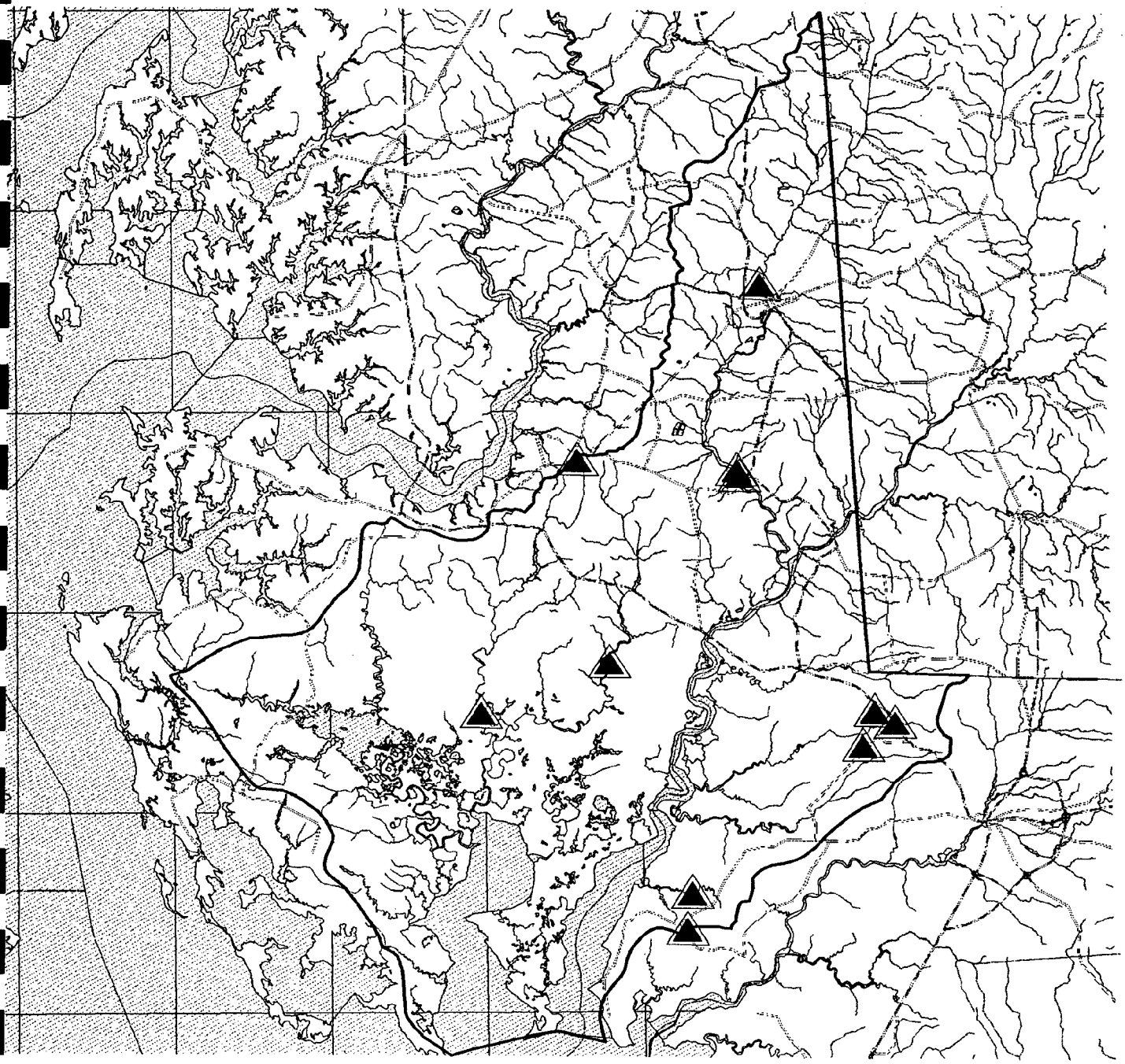
Approximately 4.5% of the Maryland Historic Trust inventoried historical structures are in Caroline, Dorchester and Wicomico Counties.

Caroline County contains 284 inventoried listings and there are an estimated total of 4,098 pre-1940 properties in the county.

The Dorchester County inventory contains 735 inventoried listings with 17 of these sites listed on the National Register of Historic Places. There are an estimated 5,579 pre-1940 properties in this county. There is a survey focusing primarily on pre-Civil War structures with major work being done in Cambridge and Vienna. The southern portion of the county has not been studied as extensively as the northern portion.

There are 152 inventoried sites listed in Wicomico County including 14 properties listed on the National Register of Historic Places. There are an estimated 6,688 pre-1940 properties in the county.

Historic structures along the shores of the Nanticoke River in Vienna.



Historic Structure ▲

Feet
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Nanticoke River Watershed

Historic Standing Structures

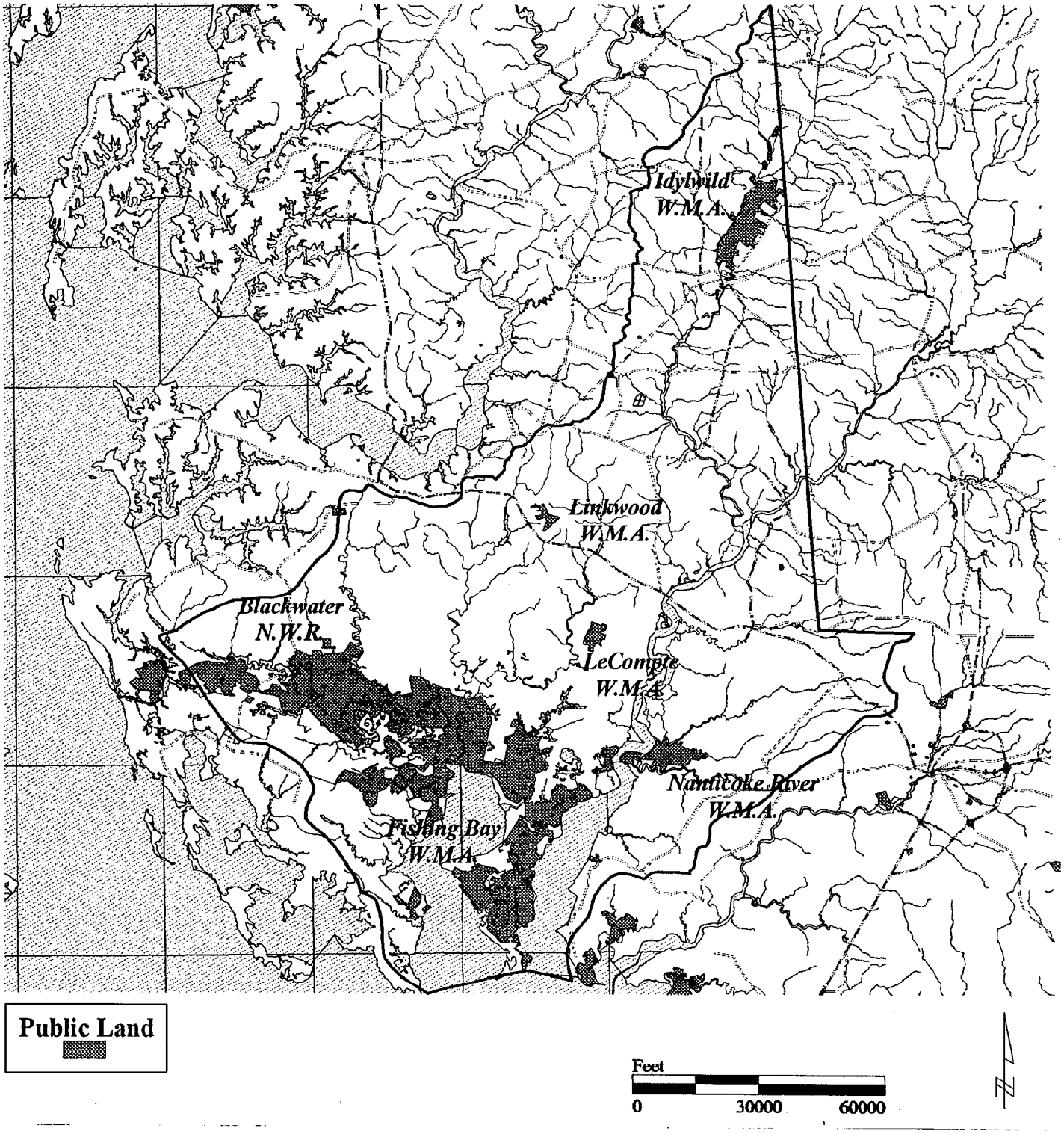
RECREATIONAL OPPORTUNITIES

Recreation in the watershed is primarily resource based, such as hunting and fishing. These activities are important to the local economy. Sportsmen are drawn to the watershed from throughout the Mid-Atlantic region to experience one of the premier waterfowl and deer hunting areas on the East Coast. Recreation provides customers for food, gas, sporting goods, guide services and lodging establishments, as well as providing income for those who lease their land to hunters. Waterfowl hunting revenues have decreased with the waterfowl population decline and the subsequent reduction in seasons and limits. Ecotourism, conversely, is increasing and supplies customers for the local bed and breakfast industries. Bicycling, canoeing and hiking are also popular due to the relatively flat topography and scenic quality which typify the watershed. Recreational boating and high-speed bass boating is also increasing and may have impacts on living resources. Recreation is provided on both public and private lands and public waterways.

PUBLIC LANDS

The Public Lands map shows federal, state and county owned lands available for public use.

Boating on Big Marsh Creek.



Nanticoke River Watershed

Public Land

State Lands

The largest public landowner in the study area is the DNR with five Wildlife Management Areas (WMA's): Fishing Bay (21,256 acres), Idylwild (2,639 acres), LeCompte (485 acres), Linkwood (313 acres) and Nanticoke River (1688 acres). State Program Open Space funds are used for acquisition, as well as Federal funds and shared projects with local conservancy and land trust organizations. These State lands also form part of a large corridor or greenway extending outside of the study area that includes Ellis Bay, Taylors Island, Deal Island, Fairmount, Cedar Island Wildlife Management Areas and Janes Island State Park near Crisfield.

These parcels are managed for wildlife with an emphasis on game species and are open to the public for hunting and fishing in season and all year for wildlife observation and nature study. They do not, however, provide facilities.

Federal Lands

The Blackwater National Wildlife Refuge is 20,090 acres and is the only Federally protected area in the study area. The Blackwater Refuge is noted for its winter concentrations of eagles and waterfowl, and extensive management efforts have been undertaken there, including construction and operation of a series of impoundments. The Refuge is also an important destination for tourists in Dorchester County. The wildlife drive allows people to observe wildlife from their automobiles. Views over the pristine marsh are also provided from hiking trails.

County and Local Parks

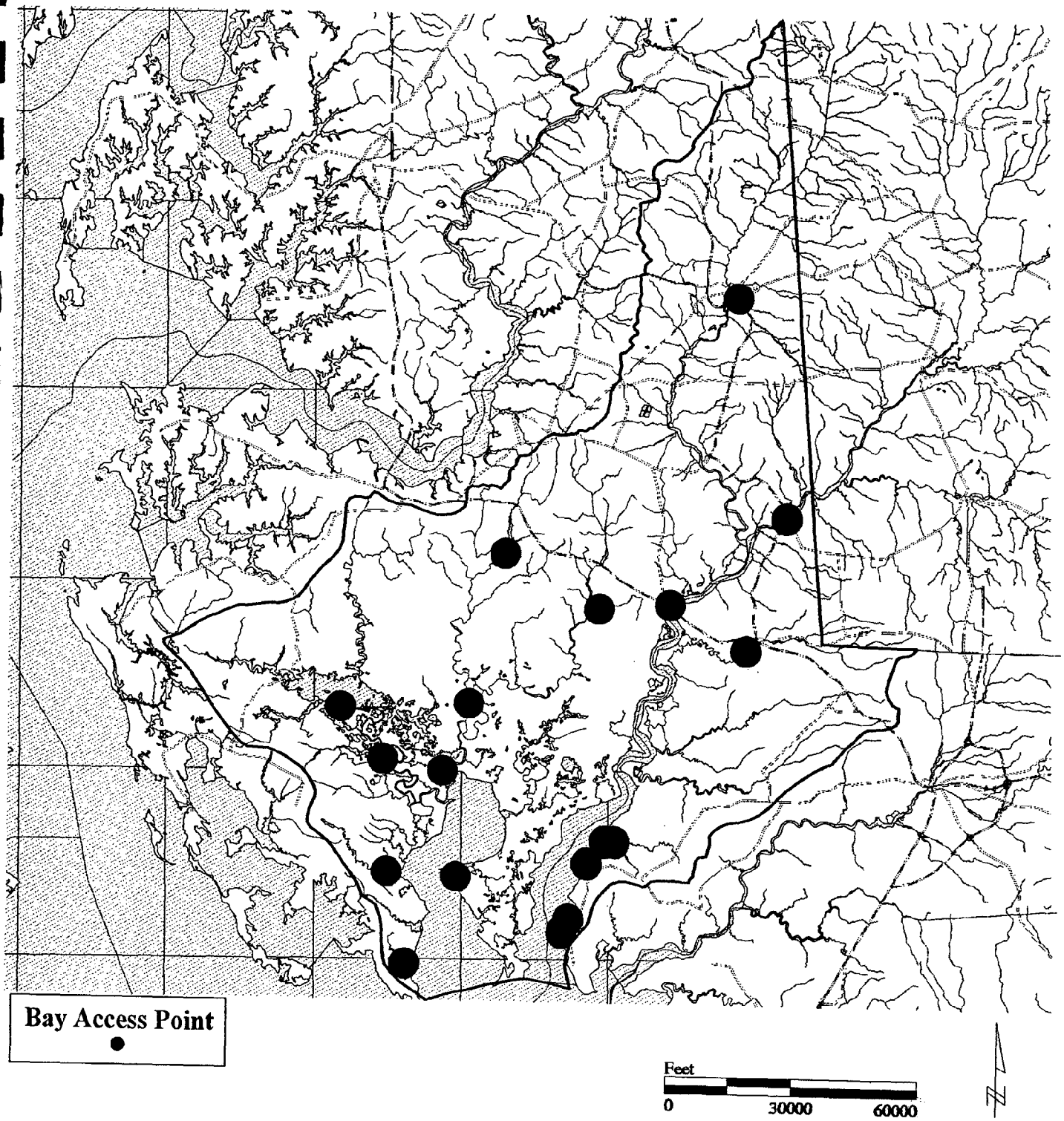
Eight county parks are located within the watershed; four in Caroline, three in Wicomico and one in Dorchester County. These parks offer various recreational opportunities including boat launching facilities, hiking and picnicking. Active recreational facilities are also located in these parks and at local public schools and playgrounds.

Shoreline Access

The Bay Access map indicates locations where public waterfront or boat launching facilities are availible.

Shoreline access is limited by the extensive marsh fringes which typify the watershed. Boating access points are mostly small facilities in the towns or where bridges cross certain tributaries. Eleven public ramps exist within the watershed, most of which are located in the lower portions of the study area. The DNR's Boating Administration provides funding assistance to local governments for boat ramps, harbors and sanitary pump-out facilities, and shore erosion control projects for local governments and private landowners. County and municipal governments in the coastal zone are also eligible for funding of low cost construction/acquisition projects under Section 306A of the Coastal Zone Management Act through Program Open Space.

Fishing and car-top boating access frequently occurs where a bridge crosses or abuts a tributary. There are no special facilities at these popularly used locations.



Nanticoke River Watershed

Bay Access

Private Lands and Facilities

Many privately owned lands and riparian rights are leased for hunting. Overnight facilities are also provided by private entrepreneurs.

Campgrounds and Bed and Breakfasts

There are two Boy Scout camps, Camp Nanticoke and Camp Merrill. Environmental education is an important goal of the Boy Scouts at their camps. There is a commercial campground located on the lower Nanticoke River near Tyaskin.

Vienna has a small waterfront bed and breakfast industry. The historic buildings and nearby ecotourism opportunities are popular attractions. There are also bed and breakfasts in Hurlock and along the Marshyhope Creek.

Conservation Easements

Easements provide public benefit in the form of environmental protection but usually do not provide public access. There are currently two DNR easements in the watershed through the Maryland Environmental Trust: Tudor Farms (2,532.5 acres) and the Burnett property (25.5 acres)

Wetland vegetation along Nanticoke waterfront in Vienna bed and breakfast area.

II. AGENCY ACTIVITIES

SELECTED AGENCY ACTIVITIES
LIVING RESOURCES

Agency	Projects	Status	Comments
Greenways & Resource Planning (GRP)	Nanticoke River Watershed: A Summary of Resource Characteristics and Enhancement Activities	Completed	- Provides a brief description of site specific and regionally oriented enhancement activities which have been initiated as a result of this study - Information can be used to identify future enhancement activities
	Resource planning projects with local governments & other DNR agencies/private organizations	On-going	- Coordinate local Greenways plans with DNR public lands planning and mapping. - Provide technical assistance to local governments, organizations for enhancement projects
	Marshyhope Creek Waterfront Park/Federalsburg	FY 95	- Technical assistance project with POS, Boating Administration, Chesapeake Bay Trust, Md Dept. of the Environment, and ISTEA committee to stabilize a 4500' shoreline with wetland plantings and 200 landscape trees
	Delmarva Power & Light fly ash dump impoundment +1000 acres	Conceptual/ preliminary review	- Effort to explore the feasibility of an impoundment at the abandoned fly ash dump across from DP&L Vienna Power Plant; interagency discussions with Wildlife, Wetlands, Power Plant Siting, POS
	Acquisition mapping for DNR lands	Finalizing	- GIS maps of public lands including the subject watershed
Program Open Space (POS)	Land acquisition for DNR; assist local governments with their acquisition, development funds	On-going	- Coordinate DNR land acquisition throughout the watershed - Guide local government with the funding of acquisition and development projects
	Agricultural easements land preservation program	On-going	- Joint effort with Md Department of Agriculture - Acquisition program designed to purchase development rights in order to keep land in agriculture
Forest Service	State Forest Inventory	FY 93-94	- GIS mapping of current Forest Inventory in the watershed
	Identification of reforestation opportunities	FY 93-94	- Joint effort with Coastal and Watershed Resources - Inventory and mapping of areas suitable reforestation opportunities within the 100' tidal buffer & 300' riparian corridor
	Reforestation Program	On-going	- Provide assistance to landowners in reforesting harvested woodlands and old farm fields. Seedlings provided by state nursery at cost. State and federal cost share programs available to landowners that pay 50% to 65% of the reforestation expense.
	Administration of State Forest Conservation Act	On-going	- Guide local government and land owners in the implementation of the Forest Conservation Act
	Stewardship Program	On-going	- Joint effort with public agencies and private organizations to help private property owners to prepare management plans that take an integrated approach to natural resource management tailored to the landowner objectives and to manage for multiple benefits including timber, wildlife... - Federal funds
	Faulkner Branch Acidity Study	FY 93 Spawning Season	- Study/analysis of the pH levels in Faulkner Branch. Emphasis placed on pH levels after rainfall events

SELECTED AGENCY ACTIVITIES
LIVING RESOURCES

Agency	Projects	Status	Comments
Forest Service	Forest Pest Program	On-going	- Monitor the effects of southern pine beetle, assist landowners with recommendations for control of any infested areas; assist Md. Dept of Agriculture in the gypsy moth control program. Local Forestry Board oversees a cost share program where landowners whose property is infested can be sprayed.
	Buffer Incentive Program	On-going	- Provide grants to landowners ($500/acre) to reforest open fields. Land must be within 300' of a blue line stream or within the 100 year flood plain. - State funds
Maryland Environmental Trust	Local land assistance, Monitor/stewardship of existing conservation easements. Solicitation of new conservation easement donors	On-going	- Guide/assist in the donation of perpetual conservation easements to preserve farmland, forestland, waterfront, rare or unique natural areas, scenic, endangered species habitat, historic properties and other rural land
Chesapeake Bay Research & Monitoring	Biological Indicators Project	On-going	- Fish community sampling with beach seine and bottom trawls - Water quality parameters measured with Hydrolab Surveyor II
	Water quality monitoring buoy in Marshyhope Creek	FY 93 Spawning Season	- Experimental study & analysis of current water quality conditions in Marshyhope Creek
Tidal Fisheries Division	Striped Bass recruitment study & seminar	Completed/ final report pending	- Joint effort with Power Plant & Environmental Review
	Anadromous fish studies for Striped Bass, American Shad & Herring	FY 94	- Juvenile sampling and seines at fish sample stations; conducting a mark/recapture study at these points
	Fish Passage Program, Barren Creek	FY 93-94	- Work with private landowners in order to improve fish passage along Barren Creek
	Oyster bar charts	Completed	- Map location of Oyster Bars within watershed
	Oyster bar seeding	On-going	- Minor seeding program on the natural oyster bars that were hit the least by the MSX disease
	Fish studies for Striped Bass, American Shad, and Herring	On-going	
Power Plant & Environmental Review	Delmarva Power Corp. Vienna plant expansion	FY 93-94	- Currently reviewing proposal for expansion of the Vienna power plant
	Striped Bass recruitment study & seminar	Completed/ final report pending	- Joint effort with Chesapeake Bay Research & Monitoring
Water Resources Admin, Water & Wetlands Program	Wetlands & Waterways regulatory programs	On-going	- State regulatory program to protect tidal and nontidal wetlands throughout the State
	Water appropriation requests	On-going	- Review water appropriation requests and surface mining reclamation projects

SELECTED AGENCY ACTIVITIES
LIVING RESOURCES

Agency	Projects	Status	Comments
Water Resources Admin, Enforcement Services Program	Wetlands quarter quad mapping	Pending Funding	- Enforcement of regulated activities and mapping of wetland resources on a county by county basis
Natural Heritage Program	Natural Heritage Database	On-going	- Maintains database on Maryland rare & threatened species and natural communities. Inventory work currently in progress in the watershed
	Natural Areas Registry	On-going	- Currently working with timber companies and other private landowners to protect and re-establish areas of natural habitat; advises The Nature Conservancy on their protection efforts in the watershed.
Freshwater Fisheries Division	Largemouth Black Bass studies	FY 93	- Currently studying the Black Bass of Marshyhope Creek which is the principal spawning area for the bass in the watershed
Wildlife Division	Non-game & bald eagle surveys	On-going	- State-wide continual survey and mapping
	Phragmites control	On-going	- Currently conducted in disturbed areas (i.e. impoundments)
	Atlantic Coast Joint Venture/Nanticoke Blackwater Area Focus Plan	On-going	- Plan for the protection and enhancement of habitat and buffers, repair of existing tidal impoundments, nesting structures, and possible establishment of wildlife sanctuaries according to the Blackwater Area Focus Plan
	Green's Island Impoundment construction	Permit Review	- Renovations of this impoundment to improve habitat for waterfowl
	Mapping of waterfowl concentration areas on aerials and into GIS quads	On-going	- Survey and mapping - Maps provided to local planning agencies for resource protection and planning
Wildlife Division (continued)	Midwinter waterfowl trend information	On-going	- Used to determine trends in populations and changes in the distribution
	Big Marsh area study and habitat improvement	In Progress	
	Stewardship Program	On-going	- Joint effort with Forestry Service
	Nanticoke River WMA management plan	On-going	- Prepare management plan; part of the Statewide effort to re-write the management plans for all WMA's including Idylwild, Linkwood, Fishing Bay, Le Compte
	Delmarva fox squirrel	On-going	- Currently working with timber companies, landowners, and local government to conserve Delmarva Fox Squirrel habitat
Maryland Dept. of Agriculture	Mosquito control	On-going	- Components of this program on hold due to black rail concerns
	Agricultural land preservation program easements	On-going	- Joint effort with Program Open Space - Acquisition program designed to purchase development rights in order to keep land in active agriculture

SELECTED AGENCY ACTIVITIES
LIVING RESOURCES

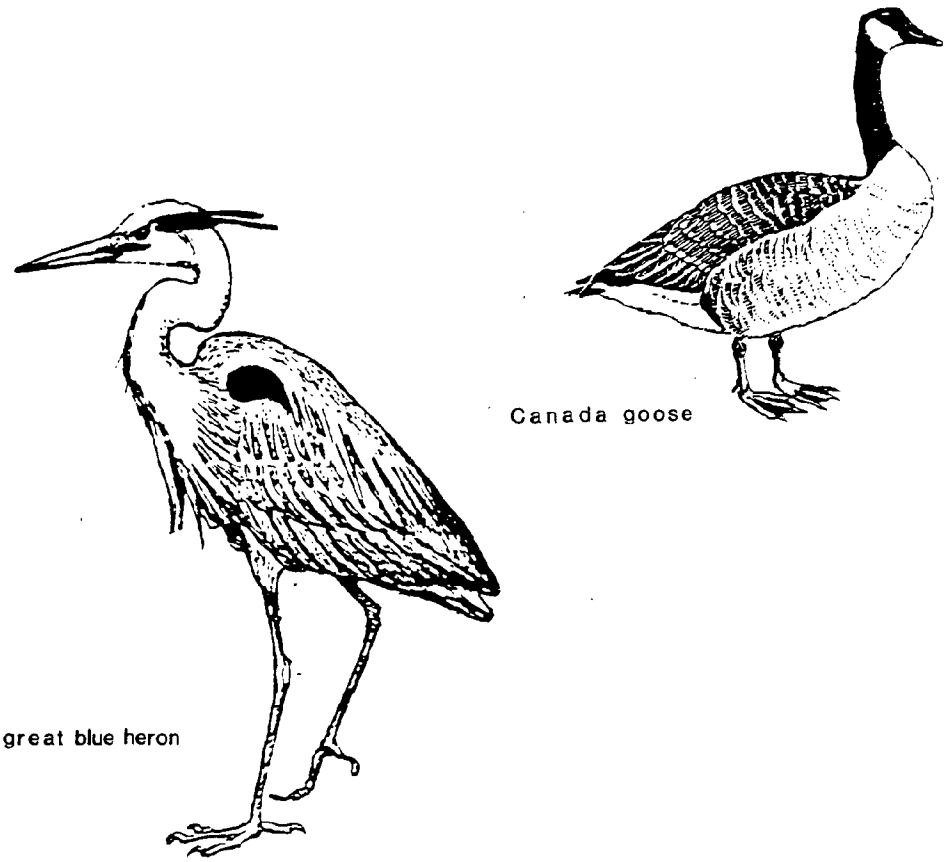
Agency	Projects	Status	Comments
Maryland Office of Planning	Maryland Growth Management Act implementation	On-going	- Assist local government in updating their comprehensive open space plans and compliance with Maryland's Growth Management Plan
Coastal & Watershed Resources	Identification of forest conservation and forestation opportunities in the watershed as part of a statewide effort	FY 93-94	- Joint effort with Forestry Service, Md Environmental Trust, Md Agricultural Land Preservation Foundation
	Updating & refining computerized maps and associate database	FY mid-94	- Inventory and mapping of suitable forest conservation and reforestation opportunities within the 100' tidal buffer & 300' riparian corridor
	Maryland Growth Management Act Implementation	On-going	- Assist local governments in updating their comprehensive plans and working on compliance with Maryland's Growth Management Plan
	Maryland's Chesapeake Bay Tributary Strategies	On-going	- Part of statewide effort to develop watershed plans for reducing nutrient pollution from point and non-point sources. The Nanticoke River is part of the Lower Eastern Shore Watershed.

SELECTED AGENCY ACTIVITIES
RECREATIONAL RESOURCES

Agency	Projects	Status	Comments
Greenways & Resource Planning (GRP)	Nanticoke River: A Summary of Resource Characteristics and Enhancement Activities	Completed	- Provides a brief description of site specific and regionally oriented enhancement activities which have been initiated as a result of this study - Information can be used to identify future enhancement activities
	Mapping	On-going	- Mapping the project boundary of Fishing Bay, 600' scale
	Federalsburg Hike & Bike Trail	FY 95	-Technical assistance project with the Town of Federalsburg. ISTEA approved funding for the trail along the Marshyhope Creek/part of the Marshyhope Waterfront Park project
Program Open Space (POS)	Acquisition of recreation areas	On-going	- Assist state agencies and local governments with funding requests for acquisition, development
Boating Administration (BOA)	Wetipquin Creek boat ramp improvement	FY 94	- Designed to provide better boating access for the public
	Bivalve harbor jetties	FY 94	- Engineering plans completed
	Vienna ramp permit acquisition	FY 92	- Designed to provide better boating access for the public
	Marine pump-out facilities at Nanticoke Harbor and Cedar Hill Park	FY 92	- Designed to provide convenient and safe pump-out facilities for the boating public
	Bivalve Wharf engineering project in Wicomico County	FY 93	- Grant provided by the Boating Administration to Wicomico County for the renovation and upgrading of Bivalve Wharf
	Breakwater for shore erosion control at Cedar Hill Park in Bivalve	FY 94	- Project to aid in the control of shore erosion in the Park
	Federalsburg, Marshyhope Creek	FY 94	- Project to control shoreline erosion
	Elliott Island Harbor improvements	On-going	- Grant provided to Dorchester County for Elliott Island Harbor improvements
Tidal Fisheries Division	Fish studies for Striped Bass, American Shad and Herring	On-going	- Statewide study including subject watershed
	Anadromous fish studies for Striped Bass, American Shad & Herring	Ongoing	- Juvenile sampling and seines at fish sample stations. Conducting a mark/recapture study at these points
	Boat ramp at Nanticoke River WMA	FY '95	- Planned to provide access to the marsh within the Nanticoke River WMA
Freshwater Fisheries Division	Fish pond stocking	FY 93	- Various stocking on an as needed basis
	Largemouth Black Bass studies	On-going	- Currently studying the Black Bass in Marshyhope Creek, which is the principal spawning area for the bass in the watershed

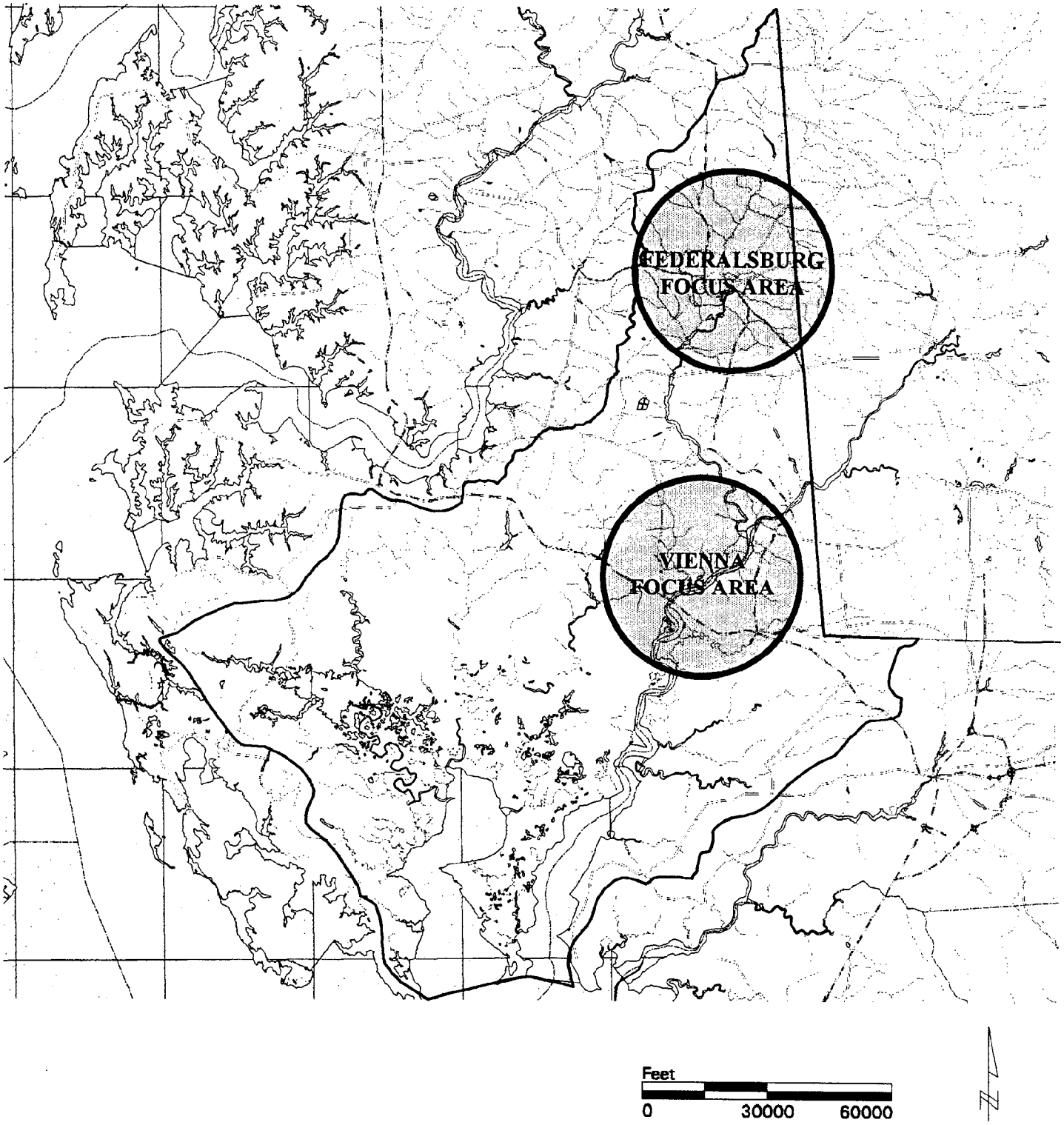
SELECTED AGENCY ACTIVITIES
RECREATION RESOURCES

Agency	Projects	Status	Comments
Freshwater Fisheries Division	Fish pond stocking	FY 93	- Various stocking on an as needed basis
	Largemouth Black Bass studies	On-going	- Currently studying the Black Bass in Marshyhope Creek, which is the principal spawning area for the bass in the watershed
Wildlife Division	Hunting, trapping, hiking, nature study, fishing, crabbing, photography, bird watching, boating/canoeing	Seasonal	- Hunting by permit on wildlife management areas



III. GREENWAYS AND RESOURCE PLANNING ENHANCEMENT ACTIVITIES

During the development of this study, Greenways & Resource Planning (GRP) staff have witnessed an increasing level of public awareness and discussion about new initiatives undertaken by a variety of sponsors to protect and enhance resources associated with the Nanticoke River. GRP has offered technical assistance in the coordination of enhancement projects which are compatible with these initiatives which help promote river conservation. Technical assistance efforts have focused on the Federalsburg/Marshyhope Creek and Vienna areas. GRP has been directly involved with or has discussed the potential opportunities associated with the following enhancement initiatives:



Nanticoke River Watershed

Focus Areas

Federalsburg Focus Area

The Town of Federalsburg requested technical assistance to develop a waterfront park system along the dredge filled banks of the Marshyhope Creek. GRP staff devised a master plan, identified funding and technical assistance sources, facilitated interagency coordination and funding requisition, and developed schematic and detailed design documentation. The following are the individual components of the master plan.

Federalsburg Waterfront Non-structural Shoreline Erosion Control & Marsh Creation:

A 42,000 square foot spartina grass marsh creation project is proposed by the DNR Shore Erosion Control in Marina Park along the Marshyhope Creek to control erosion and provide tidal wetland habitat. GRP has prepared a design to unify the project with landscape elements.

SEC has requested funding from the Chesapeake Bay Implementation Grant.

Federalsburg Shoreline Buffer:

Native wetland shrub plantings along 2,500 feet of the Marshyhope Creek and its tributaries is proposed to complement the Shore Erosion Control project. Federalsburg has applied to the Chesapeake Bay Trust for funding.

DNR may also be asked to provide technical assistance for wildlife structures and to assist further in the coordination of efforts and the supervision of construction.

Federalsburg Wetland Mitigation:

The Water Resources Administration is actively pursuing mitigation sites in Caroline and Dorchester Counties. Federalsburg/Marshyhope Creek is suitable for non-tidal forested wetland mitigation. If the Federalsburg site is selected, GRP will initiate topographic analysis.

Federalsburg Waterfront Hike and Bike Trail:

Gravel trails and landscaping in the urban waterfront park create a scenic walkway along the Marshyhope Creek. The construction of the trail, landscaping, bridge, and marsh creation could offer economic opportunities. The Intermodal Surface Transportation Efficiency Act (ISTEA) committee has approved the grant application. The Department of Transportation is preparing a Memorandum of Understanding. When the contract is signed, the ISTEA contracts will be advertised. Implementation is scheduled for the Fall 1994.

Federalsburg has applied to the U.S. Forest Service to request a Small Business Grant for tree planting. The Town is considering presenting the concept to local groups and providing a forum to explore opportunities with local and state agencies and public/private organizations. If feasible, DNR could be requested to provide further technical assistance.

Federalsburg Mine-pond Reclamation Swimming Facility:

The current owner of two abandoned mine ponds adjacent to Marina Park has expressed interest in selling/donating the site. Caroline County representatives have been approached to determine their interest in management.

Federalsburg may wish to survey members of the local community to determine interest and support for the project. If feasible, DNR could be requested to provide further technical assistance.

Marshyhope Creek Canoe Access:

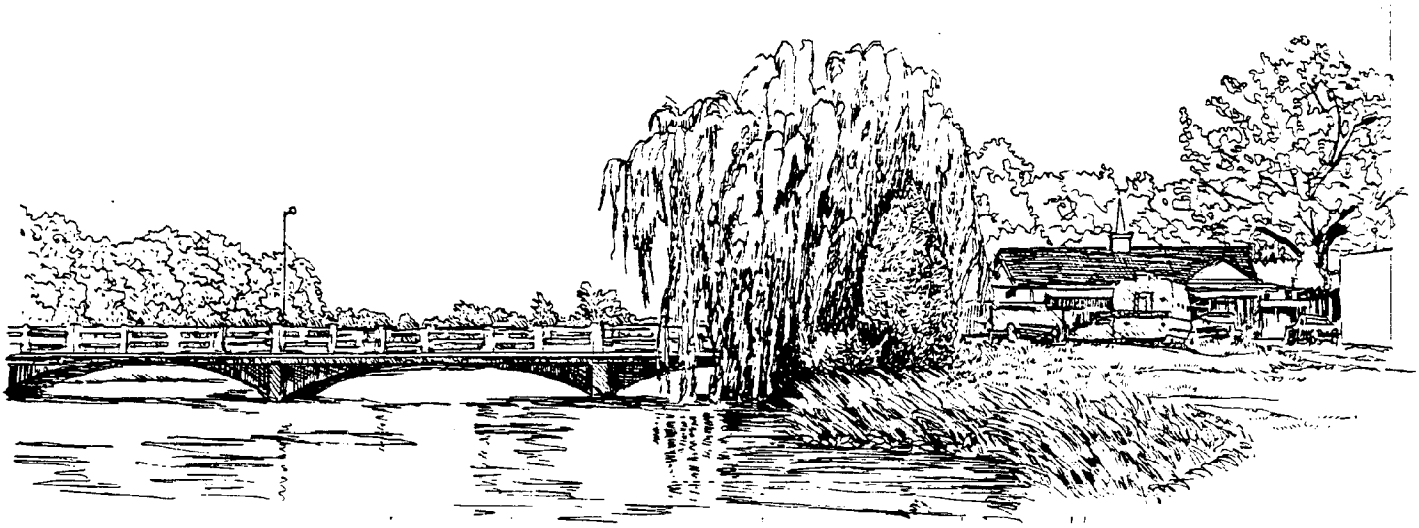
Federalsburg is exploring primitive canoe access points along the creek and has applied for funding. Dorchester County Department of Parks and Recreation is considering access at two bridge crossings.

GRP has made Boating Administration aware of the interest. Boating has agreed to explore the feasibility of implementing this component of the plan.

Federalsburg/Smithville Boating, Swimming, Biking, Outfitters, and Bait and Tackle Store:

Ecological restoration and recreational facility development projects are potential opportunities for small business ventures that are associated with fishing, canoeing, swimming, and cycling.

The Town has discussed the possibility of presenting the economic viability of the master plan to local groups, business community, etc. and providing a forum to explore opportunities with local and state agencies and public/private organizations. If feasible, DNR could be requested to provide further technical assistance.



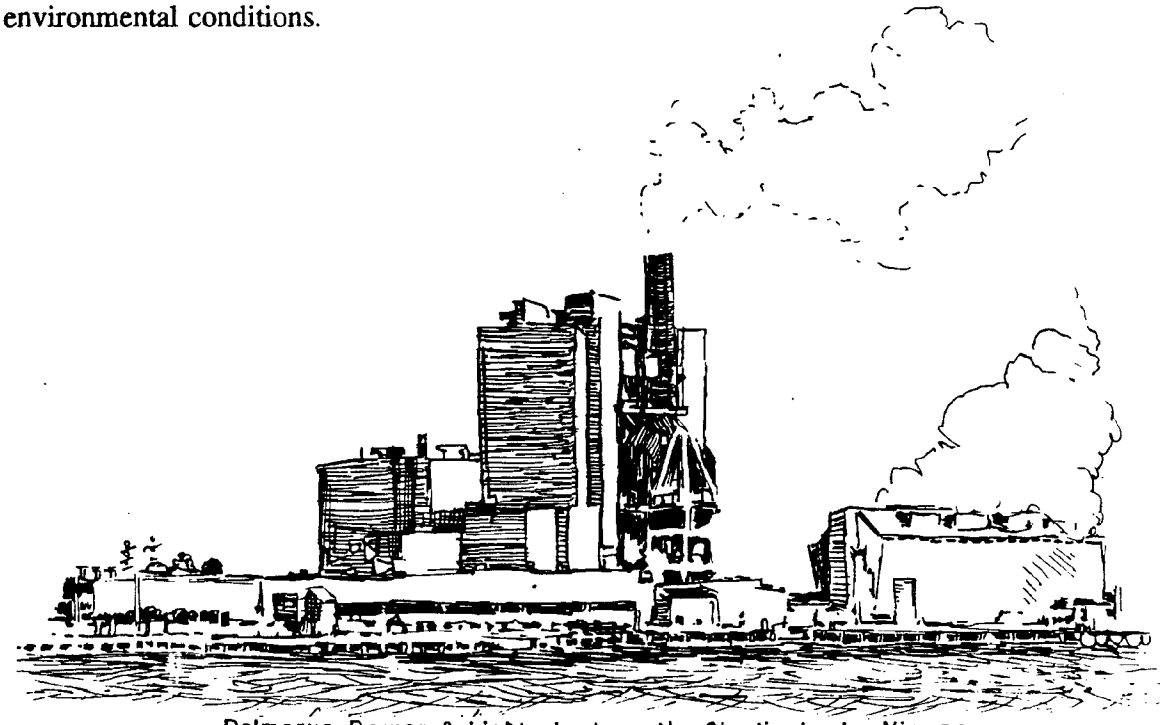
CENTRAL AVENUE, FEDERALSBURG - MARSHYHOPE CREEK

Vienna Focus Area

GRP was approached by the Vienna town government, Wicomico County Department of Parks and Recreation, and the Chesapeake Corporation with a variety of potential enhancement opportunities. The following activities have been initiated as a result of these investigations.

Vienna Marsh:

Greenways & Resource Planning is soliciting comments on the feasibility of converting the Delmarva Power & Light fly-ash dump to an impoundment for emergent marsh habitat restoration and waterfowl sanctuary. Staff has conducted a precursory review with many of the appropriate agencies of the Department. Preliminary tests need to be conducted to assess environmental conditions.



Delmarva Power & Light plant on the Nanticoke in Vienna.

Vienna-Hebron-Salisbury Rail-Trail:

The proposed rail-trail project will link the Nanticoke River to Salisbury via a joint effort with Delmarva Power & Light. DP&L is considering allowing access from Hebron to the Vienna Marsh along the power line right-of-way. Wicomico County owns the old Route 50 roadway through the marsh to the Nanticoke River.

DNR is sub-leasing the railroad right of way for conversion to a rail trail. Recreational facilities, such as an observation tower or fishing pier could be developed on the abandoned Route 50 alignment in the marsh across from Vienna. Program Open Space and Greenways and Resource Planning are providing technical assistance.

Vienna Ecotourism Outfitter, Bed & Breakfast, and Tour Guide Service:

The Town of Vienna has potential opportunities for the private sector/business community to respond to the increased ecotourism trend in the area. There is an abandoned Coast Guard building in Town which, if supported by the Federal government, has the potential to be converted into a facility that could support economic development. The Town may wish to consider improving the existing boating facilities.

Nanticoke River/Marshyhope Creek Public/Private Partnerships:

Private landowners can promote, provide and enhance greenways opportunities throughout the Watershed. Chesapeake Corporation has expressed interest in converting formerly harvested areas along the Nanticoke River and Marshyhope Creek into a public use forest and nature interpretation area. The site has potential for opportunities for public access, canoe access, nature and interpretative trails and non-consumptive wildlife use.

Greenways & Resource Planning has agreed to provide technical assistance and to coordinate, if requested, participation in educational forums to discuss stewardship objectives.

Scenic, Historical and Natural Features Driving Tour:

Greenways & Resource Planning is exploring sites of natural features, scenic areas and historic interest to prepare a brochure for a scenic drive for the Eastern Region. A segment of the drive identifies sites within the Nanticoke Watershed that represent significant destination points for a family drive.

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