MARYLAND
NATURAL
HERITAGE
PROGRAM

MANAGEMENT PLANS FOR SIGNIFICANT PLANT AND WILDLIFE HABITAT AREAS OF MARYLAND'S WESTERN SHORE: PRINCE GEORGES COUNTY

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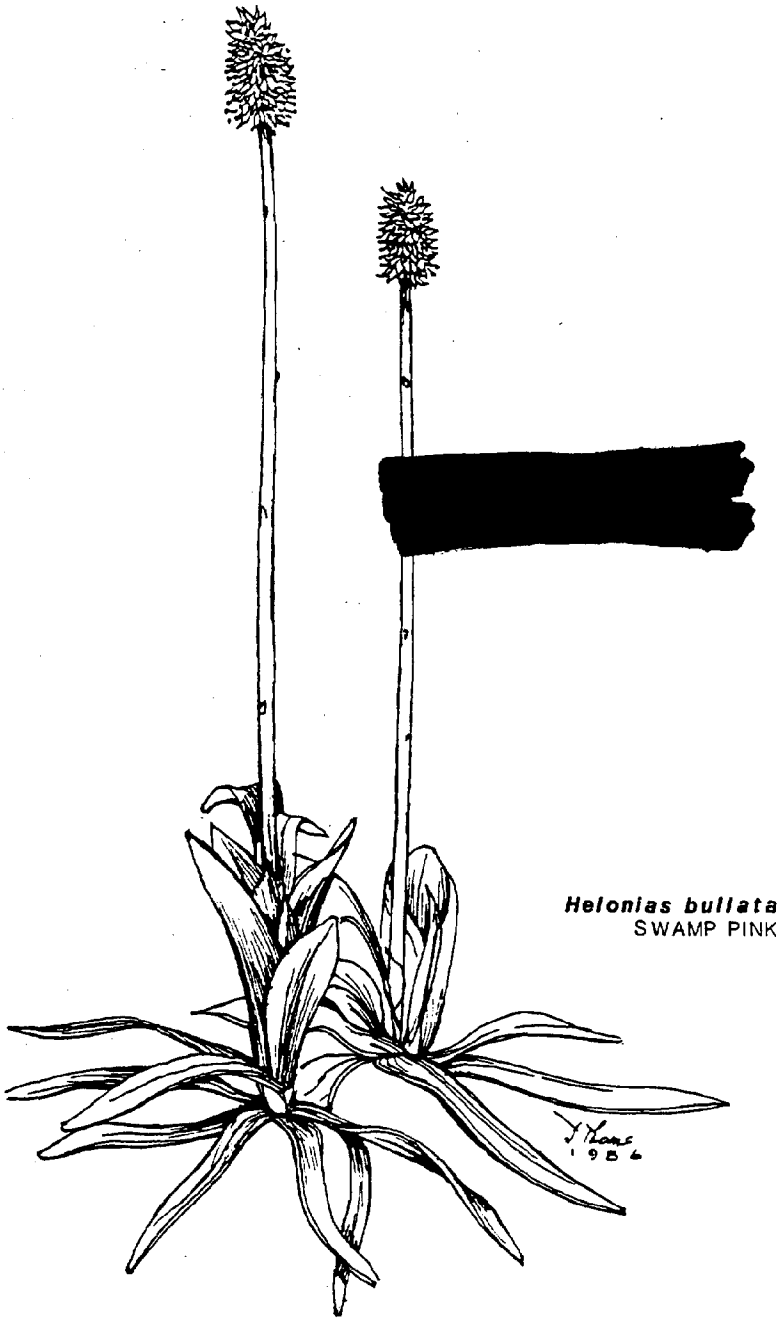

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MANAGEMENT PLANS FOR SIGNIFICANT PLANT AND WILDLIFE HABITAT AREAS OF MARYLAND'S WESTERN SHORE: PRINCE GEORGES COUNTY

FINAL REPORT

SUBMITTED TO:

Coastal Resources Division
Tidewater Administration

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Department of Natural Resources

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TABLE OF CONTENTS

INTRODUCTION..... 1

SECTION 1: Procedures of site selection, methods of protection implementation, and the long-term framework established by this project

Introduction..... 3
Site Identification..... 3
Field Inventory..... 5
Strategy for Selecting Significant Sites..... 5
Site Protection Implementation Methods..... 6
Long-Term Framework..... 9

SECTION 2: Protection Area Summaries

Introduction..... 10
County Map..... 12
Protection Area Summaries
Beck Woods..... 14
Beltsville Airport Bog..... 18
Beltsville Bottomland Forest..... 21
Beltsville Forest and Meadow..... 24
Beltsville Seasonal Ponds..... 28
Chews Lake..... 30
County Line Trail Seep..... 33
Fort Ravine..... 35
Johnson's Gully..... 37
Mockley Swamp..... 39
Patuxent Maple Swamp..... 41
Patuxent Wildlife Research Center..... 44

REFERENCES..... 47

APPENDIX A: Regulations under COMAR 08.03.08 Threatened and Endangered Species

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INTRODUCTION

In 1986 this project was initiated by the Coastal Resources Division of the Department of Natural Resources' Tidewater Administration. The task was designed to develop the information base and to determine the management mechanisms needed to implement an alternative approach to the State Critical Area Program for addressing the Federal Coastal Zone Management Act's requirement to designate Geographic Areas of Particular Concern (GAPC) and Areas for Preservation and Restoration (APR). Under the GAPC requirements, coastal states are to inventory and develop management measures to protect the integrity of "areas of unique, scarce, fragile or vulnerable natural habitat" and "areas of high natural productivity or essential habitat for living resources, including fish, wildlife, and endangered species and the various trophic levels in the food web critical to their well-being." Under the APR requirement, coastal states are to include in their Coastal Zone Management Programs "provisions for procedures whereby specific areas may be designated for the purpose of preserving or restoring them for their conservation, recreational, ecological or aesthetic values." This project covers the Coastal Plain Counties of Maryland excluding land within the Chesapeake Bay Critical Area.

To accomplish this task, a contract was awarded to the Maryland Natural Heritage Program, a division of the Forest, Park and Wildlife Service. The mission of the Natural Heritage Program is to identify and help preserve the biological and ecological diversity of Maryland. Since 1979, this program has been devoted to the collection of information about the State's rare, threatened, and endangered species and habitats. The program's extensive data base provided the basis for the identification of outstanding habitat examples on Maryland's Eastern and Western Shores.

By January 1987, the Coastal Resources Division and the Maryland Natural Heritage Program established specific objectives to accomplish the first phase of this project. These objectives were:

1. identify criteria for the selection of significant plant and wildlife habitat areas;

2. undertake field inventory of areas identified in existing studies and data files of the Maryland Natural Heritage Program that are likely to be of ecological significance, in order to identify species and habitats

associated with each site;

3. undertake field inventory of potentially significant habitats not previously identified in the database of the Maryland Natural Heritage Program in order to determine if rare species or habitats are associated with these sites;

4. determine threats to each area and determine management mechanisms for protecting the integrity of these areas;

5. determine protection boundaries for each site including needed buffer areas; and

6. collect other locational information needed in order to implement management mechanisms for each site.

These objectives combine to produce a protection package in which significant habitats (referred to as areas or sites) are assigned management mechanisms within a designated boundary. In accordance with the Natural Heritage Program's methodology, this area is then labeled a protection area.

In December 1987, the Natural Heritage Program reported on protection areas identified on Maryland's Eastern Shore from Kent County south. With financial assistance from the Coastal Resources Division, Baltimore and Harford Counties hired personnel in 1987 and 1988 to identify protection areas in their counties. In 1988, Prince Georges County funded a staff member (with financial assistance from the Coastal Resources Division) to identify protection areas on private property. Therefore, the Natural Heritage Program did not include Baltimore and Harford Counties in its survey and report of protection areas on the Western Shore, and focused only on public land in Prince Georges County.

Section 1 of this report provides a detailed description of the project methodology, scope of work, and the long-term framework established through the project. Section 2 provides Protection Area Summaries for significant habitat areas which have been identified. The Protection Area Summary contains information needed for site protection. A selection of applicable references follows Section 2. Appendix A contains a copy of the Department of Natural Resource's Regulations [COMAR 08.03.08] concerning the State's Threatened and Endangered Species.

SECTION 1

Procedures of Site Selection, Methods of Protection Implementation, and the Long-term Framework Established by this Project

INTRODUCTION:

This section provides all technical information on the project procedures from the planning stages, when habitat areas were selected for field survey, through the site visit, to the selection of the site for protection. Following this information, the report presents methods of implementing protection for selected sites. Finally, the long-term framework established by this project is discussed.

SITE IDENTIFICATION:

Sites identified for inventory were located throughout the Coastal Plain Counties excluding the Chesapeake Bay Critical Area. Significant plant and wildlife habitats were identified from the following categories of sites employing the methods described for each type.

1. Sites potentially inhabited by State Endangered or Threatened Species.

   Methods: Data concerning the habitat, phenology, and taxonomy of each listed species were gathered from regional floristic surveys and scientific literature. Sites were located by using the habitat data in conjunction with National Wetland Inventory maps, aerial infrared photographs, and county soil surveys. These sites were surveyed when the rare species potentially inhabiting the sites could be identified accurately.

2. Sites with historical occurrences (reported prior to 1980) of species determined to be rare by the Natural Heritage Program and found in their publication, Threatened and Endangered Plants and Animals of Maryland (Norden et al., 1984).

   Methods: For each species, data were gathered concerning habitat, phenology, and taxonomy. Many of the historical records provided only general locations for rare species. For these records,

more specific locations for survey were selected based upon habitat data supplemented by National Wetland Inventory maps, aerial infrared photographs, and county soil surveys. The field staff surveyed sites when the rare species could be accurately identified if found.

3. Non-tidal wetlands.

Methods: National Wetland Inventory maps and aerial infrared photographs were used to locate non-tidal wetlands. Particular attention was given to wetlands in State Parks, Forests and Wildlife Management Areas. Based upon the findings of "The Functional Assessment of Non-tidal Wetlands," a report completed for the Coastal Resources Division by the Maryland Natural Heritage Program (Bartgis 1986), these wetlands were assigned priorities for survey. High and intermediate priority wetlands listed below were candidates for intensive survey.

a. Non-tidal Wetland Complex, i.e., two or more contiguous wetland communities with one of the following traits:

   i. For complexes under 10 acres, presence of at least two wetland communities;

   ii. For 10- to 100-acre complexes, presence of at least four wetland communities; or

   iii. For complexes greater than 100 acres, presence of at least six communities.

b. Seasonal Ponds: wetlands occurring mainly on Pocomoke soils in centripetally-drained, seasonally flooded basins dominated by Walter's Sedge or Twigrush.

c. Bogs: highly acidic wetlands characterized by highly organic soils and/or sphagnum.

d. Palustrine Forested Deciduous Wetlands (PFO1) with at least one of the following characteristics:

   i. Seeps

   ii. Vernal pools

   iii. Well-developed stratification

e. Palustrine Forested Evergreen Wetlands (PFO4) dominated by Bald Cypress or Atlantic White Cedar.

FIELD INVENTORY:

Observations and data were collected in the field concerning the general character of each site, the degree of unnatural disturbance, and, if present, the condition of the rare species populations. Prior to surveying sites on private land, permission was obtained from landowners.

First, the natural features of each site were described, noting the dominant vegetation, aquatic features, physical relief, and natural disturbances (such as insect defoliation or trees felled by high winds). A list of the common plant species was developed and unique communities were identified and mapped.

When rare species were found, the size and extent of their populations were estimated. Staff members also estimated the proportion of the population that was flowering and fruiting, and marked the population on the general map of the site. The microhabitats of the rare species were described. If a population was large, voucher specimens of the rare species were collected and deposited with the Natural Heritage Program. Small populations of rare species were photographed for verification. If rare species were absent from historical locations, the habitat was assessed to determine if it could still support the species or if the habitat had been altered such that the species could no longer survive.

Finally, the habitat integrity of each site was assessed. Staff members recorded unnatural disturbances and their current and potential future effects on the habitat. For example, the presence of ditches in non-tidal wetlands was reported, and the effects of the ditches on wetland hydrology and vegetation were reviewed. Threats to the integrity of the habitat were discussed. Current and potential future uses of surrounding land were considered. In light of these threats, staff members recommended management activities intended to maintain the habitat and sustain the populations of rare species.

STRATEGY FOR SELECTING SIGNIFICANT SITES:

The selection of ecologically significant sites for protection was based on the following criteria which were assessed during the field inventory:

1. Site contains species that are considered by the Maryland Natural Heritage Program as Rare, Threatened or Endangered in Maryland (see Norden, et al, 1984). Many of these species are listed in the revised Department of Natural Resource's Regulations under COMAR 08.03.08.

2. Site contains one or more rare or ecologically unique natural communities.

3. Overall ecologic integrity of the site is high. Unnatural disturbances must be minimal or must be such that their effects simulate natural forces of disturbance.

4. Human-induced threats which could lead to the loss of the rare species or habitat(s) must be minimal.

5. Regulation and monitoring must be feasible so that activities (both on-site and nearby) can be limited to those that do not negatively impact the rare species and natural habitat(s). Required buffer zones must be available to ensure site protection.

6. Ecologic, scenic, or historic values other than those related to rare species and habitat protection may be present.

SITE PROTECTION IMPLEMENTATION METHODS:

Protection may be implemented in a variety of ways depending upon ecological significance of the site, type of ownership (public vs. private), seriousness of threats, degree of management required, and landowner preference. The various options confer varying degrees of protection security and of landowner control. They range from designations that afford no legal protection to acquisition by a conservation organization. The following list describes the available options and the degree of protection that they provide. Because the significance and consequences of each mechanism vary, some sites may be protected by a combination of methods.

Natural area protection may be accomplished by several types of organizations. Federal, State, and local governments (at the County as well as the municipal levels) have specific tools and mechanisms by which they may set aside or regulate land for conservation purposes. In addition, there are private organizations that can either protect lands on their own or

facilitate the efforts of the public sector. Many of the protection mechanisms listed below may be implemented by any of the aforementioned conservation organizations, while others may only be available to certain agencies or organizations.

The following methods afford protection to rare species habitat by outlining and assigning management responsibilities to a particular party:

1. Voluntary management agreement - landowner informally agrees to protect the rare species and habitat by not disturbing the site.

2. Registration - landowner signs a written, nonbinding agreement with the State's Department of Natural Resources, a county government, The Nature Conservancy, or another private conservation organization, officially recognizing the ecological significance of the site. Management needs are outlined and the landowner agrees to perform specified tasks to protect rare species and habitat.

3. Legally binding protection agreement - landowner enters a legally binding management agreement or leases the land to a conservation organization for management purposes. Conservation easements granted by the Maryland Environmental Trust, local government, and other private trusts (including The Nature Conservancy) impose certain land-use restrictions while conferring tax benefits to the landowner.

4. Zoning - the site may be zoned or rezoned as a conservation area in which land-use is restricted. Development may be highly regulated or prohibited. Such protection is usually accomplished on a county level through local ordinances.

5. Bequest or Right of First Refusal - landowner agrees to will land or give right of first refusal for acquisition to a State, county, or private conservation organization at some undetermined time in the future.

6. Acquisition - landowner conveys property to a conservation organization or public agency. The transfer may be a donation, a bargain sale (i.e., below market value) or a fee simple (i.e., full market value) transaction. The first two types of transaction confer tax benefits to the landowner. All rights to the land belong to the buyer and

management is directed toward the protection of rare species and habitat(s). In some cases, acquisition may occur with the retention of a life estate for the owner. This allows the landowner to continue to live on and have restricted use of the property until death, at which time the buyer obtains full control.

The following methods are designations which afford no current protection but which serve to acknowledge the ecological significance of a site and which may be used to stimulate further protection efforts:

1. National Registry of Natural Landmarks - land which is determined to be a nationally significant example of the Nation's natural heritage may be designated a National Natural Landmark by the Secretary of the Interior.

2. Sensitive Management Areas - land within the State Park System which is considered in need of special protection because of its unique and fragile physiography, flora, and fauna may be designated a "Sensitive Management Area" and is reserved for only those activities compatible with preservation.

3. Maryland Wildlands Preservation System - land which has retained its wilderness character or which has rare species or similar features of interest worthy of preservation for use of present and future residents of the State may be termed "wildland."

4. Natural Heritage Area - land which meets all three of the criteria listed in the revised Regulations under COMAR 08.03.08 Threatened and Endangered Species may be designated a Natural Heritage Area subject to the approval of the Secretary of Natural Resources.

Information provided in the Protection Area Summaries of this report is used to assess the degree of protection needed.

LONG-TERM FRAMEWORK:

This project provides a foundation for tasks to begin in 1989. These tasks, described below, involve the further identification and protection of significant habitats within the coastal zone.

In 1989 the focus of this project will be the protection of significant habitats identified in 1987 and 1988. Efforts were initiated in 1988 to protect significant habitats imminently threatened by development or other human-induced habitat alterations. These efforts will be expanded in 1989 to include additional significant habitats of highest priority for protection. Substantial effort will be required to protect each site, and this task should continue into the 1990s.

Next year the methodology developed in this project will be used to continue to identify significant plant and wildlife habitats in the Coastal Plain of Maryland. Protection Area Summaries identical in format to those prepared in 1987 and 1988 will be completed for significant habitats. These sites will be candidates for protection within the framework of this project.

SECTION 2

Protection Area Summaries

INTRODUCTION:

The remainder of this report contains site-specific protection information for all selected areas. Each of these areas is reviewed in a Protection Area Summary (PAS) that describes the protection area, its values, and its protection needs. The PAS is composed of several parts, each of which is discussed below. Format and content are best understood with the insight provided in this section.

Protection Area Name - An identifying name has been assigned to each protection area. This is usually based on the site's location and/or habitat type.

County - The county in which the protection area is located is given.

USGS Quad(s) - Identifies the United States Geological Survey topographic map(s) on which the protection area occurs.

SUMMARY OF ECOLOGICAL SIGNIFICANCE - States the major reasons for protecting the site. The features of greatest ecological significance are described, such as the presence of rare species or unique habitat.

OTHER SIGNIFICANCE AND VALUES - This section describes other important aspects of the protection area.

The value of the protection area to wildlife and for ecosystem maintenance may be discussed. In setting aside rare species habitat (which includes additional buffer land), a safe haven is provided for wildlife and for the perpetuation of the natural processes that sustain the ecosystem.

Many of the proposed protection areas are adjacent to or part of designated management areas. They may overlap with or abut State Forests or Parks, State Scenic Rivers, Natural Heritage Areas or Nature Conservancy preserves. By increasing the size and/or protection of these areas, their ecologic and scenic values may be enhanced.

THREATS AND MANAGEMENT NEEDS - Both potential and current threats to the rare species or to the natural habitat are described. These are generally related to human-induced habitat alterations, such as forest cutting, hydrologic alteration, vehicular traffic, or powerline maintenance practices. In some cases, however,

there are natural threats such as insect infestation or natural succession.

Specific management recommendations are then given. Voluntary management agreements are often suggested. In some cases, monitoring of rare species populations is recommended. Such studies are needed in order to learn more about the demographics and ecological requirements of the rare plants and to provide warnings of serious population declines.

BOUNDARY RECOMMENDATIONS - The proposed protection area is delineated by a line termed the protection area boundary. The habitats to be included within this boundary are described and the reasons for their inclusion are given. Within this boundary the threats listed in the previous section should be avoided to protect the significant habitat and rare species. Land within the Chesapeake Bay Critical Area is not included within the boundaries of the protection areas.

Within the protection area boundary, a buffer has been placed around the core rare species habitat. This zone consists of adjacent land needed to protect the critical habitat from the impacts of land use in surrounding areas. When the critical habitat is a wetland, lands which drain into it are included as buffer. Surrounding forest may be designated for many reasons. These include maintaining canopy cover to prevent the invasion of weedy or non-native species, stabilizing soils to prevent sedimentation of waterways, filtering out chemicals or excess nutrients, and maintaining hydrology.

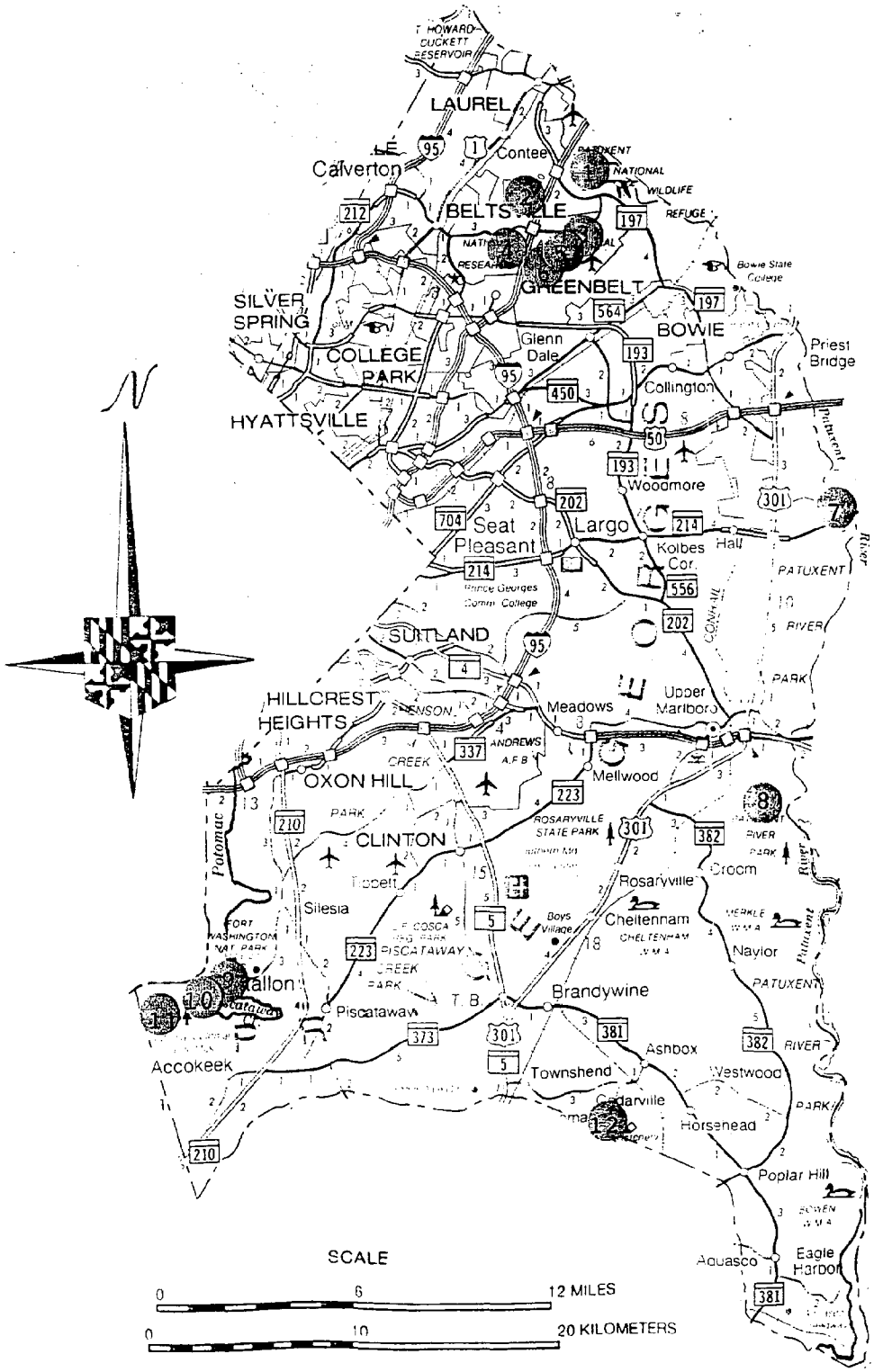
The delineation of buffers varies depending on the type of habitat, surrounding land use, habitat requirements of the rare species, local hydrology, and possible future threats. Reasonable and effective buffers were determined after careful consideration of these factors.

Maps (with a scale of 1:24000) and additional information concerning boundary locations are available from the Natural Heritage Program.

SITE DESCRIPTION SUMMARY - Finally, a general description of the protection area is given. Each natural community is discussed and its relationship to surrounding communities is described. Often the hydrologic regime of the community and the range of seasonal variability of water table depth are provided. Dominant trees, shrubs, and herbaceous plants are listed.

Note: Common names for species are used throughout the Protection Area Summary except when no common name is available. When a specific species is named, the common name is capitalized.

PRINCE GEORGE'S COUNTY



= Locations of Protection Areas of significant habitat. Sites are numbered in order from north to south. (See page 13 for Protection Area names corresponding to numbers given above.)

PRINCE GEORGES COUNTY: Protection Area Locations

Protection Area	Site # on County Map
Beck Woods	6
Beltsville Airport Bog	3
Beltsville Bottomland Forest	4
Beltsville Forest and Meadow	5
Beltsville Seasonal Ponds	2
Chews Lake	8
County Line Trail Seep	12
Fort Ravine	9
Johnson's Gully	11
Mockley Swamp	10
Patuxent Maple Swamp	7
Patuxent Wildlife Research Center	1

Site # on County Map	Protection Area
1	Patuxent Wildlife Research Center
2	Beltsville Seasonal Ponds
3	Beltsville Airport Bog
4	Beltsville Bottomland Forest
5	Beltsville Forest and Meadow
6	Beck Woods
7	Patuxent Maple Swamp
8	Chews Lake
9	Fort Ravine
10	Mockley Swamp
11	Johnson's Gully
12	County Line Trail Seep

PROTECTION AREA SUMMARY

Protection Area Name: Beck Woods

County: Prince Georges USGS Quad: Laurel

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

The pine-oak forests of Beck Woods are consistently the location of one of the highest densities of Neotropical migrants in the breeding bird censuses conducted in the mid-Atlantic region. Many of these species are forest interior breeding birds which require large tracts of mature, well-stratified, unfragmented forest for breeding success. This site is important because it is one component of a very large, relatively contiguous forest comprising lands under the jurisdiction of several federal agencies. Agriculture and residential and commercial development have made such large forest systems exceedingly rare in the Piedmont and Coastal Plain of the mid-Atlantic states. The upland forest in this protection area has been designated by the Beltsville Agricultural Research Center as a research forest. Although it was logged earlier in the century, the forest is lush and the soil is well developed because it has never been plowed. Maintenance of the area in a natural state is critical for the protection of forest interior breeding birds and other wildlife that require large tracts of forest. The success of ongoing ecological studies in the research forest depends upon the absence of artificial disturbances. By examining the natural processes that sustain the undisturbed forest ecosystem, scientists are able to assess the effects of human-induced changes to the forests of this region.

Beck Woods Protection Area contains one rare herbaceous plant species which grows in the drawdown area of the large lake in the northern portion of the site.

OTHER VALUES AND SIGNIFICANCE:

The northern portion of Beck Woods Protection Area contains a high quality wetland that provides feeding and breeding habitat for amphibians, migratory songbirds, and waterfowl. Large forested wetlands have become rare due to clearing and drainage for development, agriculture, and logging. Such wetlands are increasingly valued for their role in maintaining the quality of the rivers they feed and, ultimately, the Chesapeake Bay.

From herbarium records, two additional rare wetland plant species are known to have occurred in the general vicinity of

Beck Woods. With further survey, these species may be relocated here. Other rare species not identifiable at the time of the recent survey may also be found in the rich wetlands at this site.

THREATS AND MANAGEMENT NEEDS:

Threats

The major threat to this site is the potential for land use decisions that would destroy the significant habitat or increase forest fragmentation. The role of this site in supporting species that are sensitive to fragmentation is dependent upon the existence of nearby tracts of forest and the forested corridors that connect them. Destruction of the adjacent forests would reduce the long-term suitability of this site for forest interior birds. Fragmentation of the forest would cause increased nest predation and brood parasitism of the forest interior species and thus reduce the reproductive success of these birds. Further forest fragmentation will significantly reduce the value of this forest for the study of natural ecological processes that sustain the forest.

The increase in available sunlight and the soil disturbance created by the clearing of trees promote the growth of non-native, weedy species. These weedy species penetrate the edges of the remaining forest and may exclude native species. For example, weedy species are abundant along the powerline that crosses this site.

Clearing of trees within the watershed of the wetland would alter the quantity and quality of water flowing into the wetland, and change the species composition of the wetland.

Management Needs

No clearing, logging, or building should be permitted within the protection area. Voluntary protection should be sought from landowners of the streams and slopes that feed the swamp forest in order to protect the quality of the wetland. The remaining large parcels of forest in this region should be maintained in a forested condition. Forest corridors between large tracts should also be maintained.

Motor vehicle traffic on the dirt road that traverses the upland forest should be minimized, and the road should not be widened.

If the powerline opening must be maintained, this should be accomplished through selective removal of woody species or by the application of foliar herbicides to trees only. The use of heavy

machinery in the protection area should be minimized. The powerline opening should be kept as narrow as possible to reduce edge effect. The penetration of non-native, weedy species into the forest should be monitored. Control measures may be recommended after further observation.

Pesticides that may be harmful to birds should not be used within the protection area.

BOUNDARY RECOMMENDATIONS:

The protection area boundary encompasses the upland pine-oak forest, the rare species habitat, and the wetland complex. It extends west to a roadway bordered by agricultural fields and south to the edge of U.S.D.A. property. The southern boundary may be extended in the future after survey of the adjacent property. On the north and east the boundary extends to the edge of developed lands and to a paved roadway.

SITE DESCRIPTION SUMMARY:

The upland portion of this 274 acre protection area contains a middle-aged forest dominated by Pitch Pine, Virginia Pine, and mixed oaks. Understory species include Black Gum, Sweet Gum, Beech, and Sassafras. A dense shrub layer of Highbush Blueberry covers a large portion of the upland forest, and large populations of several species of clubmoss carpet much of the slopes. A narrow dirt road that crosses the forest from east to west scarcely interrupts the forest canopy. The grassy wind-rowed powerline, which runs in a north-south direction, is much wider. East of the powerline the forest is younger but dominated by hardwoods, especially Red Oak and White Oak, with a subcanopy of Red Maple and Sweet Gum.

To the north, near the lake, the upland forest gives way to more mesic species such as Water Oak, River Birch and Red Maple. St. John's-wort, ludwigia, Three-way Sedge, and a rare sedge grow in the large drawdown area of the lake, which was exposed at the time of our field survey. Upstream from the lake, above an old beaver dam, a wide emergent marsh of Weak-stalked Clubrush is dissected by two small streams. White Water Lily grows in the open water channels. Hardwood swamps bordering the marsh contain a diverse array of wetland species under a canopy of Red Maple, Willow Oak, and Sweet Bay. Rice Cut-grass, Broad-leaved Arrowhead, Cinnamon Fern, and numerous sedges occur in the herbaceous layer. Farther upstream a broad shrub swamp dominated by Red Maple and Buttonbush lies between the two branches of the stream. The soil is deep and mucky, and two species of

carnivorous bladderworts grow in small open pools between hummocks of Buttonbush and Fetterbush.

Prepared by: Judith L. Robertson

Date: December 1988

PROTECTION AREA SUMMARY

Protection Area Name: Beltsville Airport Bog

County: Prince Georges USGS Quad: Laurel

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

The central feature of this protection area is a large wetland complex with an open canopy. The complex includes a large shrub bog with narrow open water channels that wind between hummocks of sphagnum moss, sedges, and shrubs. This wetland is remarkably diverse and includes unusual species such as Poison Sumac. Large, unforested non-tidal wetlands such as this are uncommon in Maryland, particularly near the Piedmont/Coastal Plain interface. Many of our non-tidal wetlands have been lost due to draining and filling for agriculture and urban development. Such wetlands are increasingly valued for their important role in maintaining the quality of the rivers they feed and, ultimately, the Chesapeake Bay.

Two rare plant species are found in the bog. One is a small herbaceous species found only in swamps and bogs. The other is a rare sedge that is known from only four other locations in Maryland. The wet meadow at one end of this site supports Maryland's only population of a rare insect species.

OTHER VALUES AND SIGNIFICANCE:

Two additional rare plant species were reported historically from the vicinity of Beltsville Airport Bog and may still grow at this site. Portions of the bog are virtually impenetrable and may harbor additional rare species that were not observed during the field survey.

Dense, shrub-dominated and forested non-tidal wetlands provide excellent habitat for birds and other wildlife. These wetlands, particularly the freshwater, emergent marsh upstream from the bog, provide excellent habitat for amphibians. The entire ecosystem is important not only for its unusual habitats, but because it is part of a large, contiguous forest needed to ensure adequate acreage for the survival of species requiring large, forested territories.

THREATS AND MANAGEMENT NEEDS:

Threats

The most serious threat to this wetland is development of the upland watershed. The forest is largely undisturbed for one-quarter mile above the bog, but it was recently cleared above that point. Recent grading has altered the configuration of the land bordering a portion of the bog on the east, leaving a level upland field with a steep bank dropping down to the wetland. A drain pipe from the regraded research complex empties directly into the wetland. Such alterations affect the quality, quantity, and path of water entering the wetland. They also allow the invasion of non-native, disturbance-tolerant plants that may exclude native plants.

Management Needs

No logging or clearing of the forest should be conducted within the protection area. Already trees have been cleared up to the eastern edge of the forested wetland that borders the shrub bog.

Any plans for activities in or near the protection area should be designed to prevent a decline in the quality or change in the quantity of water entering the bog or feeder streams. The water level of the wetlands should be monitored. The hydrological effects of the forest clearing within the watershed to the east and north of the shrub bog should be examined. North of Powder Mill Road, a minimum of 50 ft. of forested buffer should be maintained on each side of the stream that directly feeds the bog.

Agencies whose lands affect the bog should be alerted of its proximity and significance.

BOUNDARY RECOMMENDATIONS:

The recommended boundary includes the rare species habitats, the shrub bog, the emergent marsh, and a forested buffer around these wetlands and the streams that feed them. The forested buffer is widest to the west where the habitat is least disturbed. Where alterations have taken place, a 50 ft. buffer is recommended along streams that feed the wetlands in order to protect water quality.

SITE DESCRIPTION SUMMARY:

This 163 acre protection area contains a wetland complex with two large non-forested wetlands. Upstream, within a Beech-

oak forest is a 200 ft. X 100 ft. freshwater marsh which floods in the spring to form a large pond. It is dominated by mannagrass, Rice Cut-grass, and other grasses and sedges. Wetland trees and shrubs surround the marsh and Southern Pond Lily grows in the water channels. Approximately one-quarter mile below the marsh the stream crosses under the entrance road to an agricultural research facility.

Approximately one-half mile below the marsh is a complex of wooded swamps, mesic woods, and thickets surrounding a large central shrub swamp with numerous sphaguous, bog-like openings. Sweet Pepperbush, Red Maple (under 25 ft. tall), and Tussock Sedge are dominant, with sphagnum moss carpeting many of the thick organic hummocks between water channels. Numerous additional wetland species are also present, including Fetterbush, Maleberry, Poison Sumac, and the two rare species. Additional rare species are likely to be found when the bog is searched at different times in the growing season.

The forest west of the bog is dominated by mixed oaks, Virginia Pine, and Pitch Pine. East of the bog, a narrow band of forested wetland lies between the bog and the graded, mowed grounds of research facilities. A powerline and roadway interrupt the mesic forests south of the bog. Just downstream from the road, mesic old fields along the stream provide habitat for a rare insect species.

Prepared by: Judith L. Robertson

Date: December 1988

PROTECTION AREA SUMMARY

Protection Area Name: Beltsville Bottomland Forest

County: Prince Georges USGS Quads: Beltsville, Laurel

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

This protection area is an important example of a bottomland deciduous forest large enough to support the entire array of native bottomland bird species expected in this type of habitat. Smaller tracts of similar habitat usually harbor far fewer species of breeding birds. Several species that breed at this site, such as the Kentucky Warbler, Louisiana Waterthrush, and Barred Owl, are forest interior breeding birds. These species require large tracts of forest and, in some cases, relatively mature trees in order to successfully reproduce. Numerous other neotropical migrant birds use this forest during spring migration for feeding and nesting habitat.

A large portion of this protection area is designated by the Beltsville Agricultural Research Center as a Research Forest. This site is especially important because it is part of a very large, relatively contiguous forest in the Beltsville-Laurel area, comprising lands owned by several federal agencies. Such large forest systems have become extremely rare in central Maryland due to forest conversion for agriculture and residential and commercial purposes.

OTHER VALUES AND SIGNIFICANCE:

This protection area contains a broad floodplain forest which borders a hardwood swamp forest at one end of the site. Such habitats provide important breeding sites for amphibians and reptiles. In addition, such non-tidal wetlands are increasingly valued for their important role in maintaining the health of the rivers they feed and, ultimately, the Chesapeake Bay.

THREATS AND MANAGEMENT NEEDS:

Threats

Removal of the forest vegetation for the construction of buildings or the enlargement of adjacent fields or roads is a potential threat to drier portions of the site. Even if the bottomland forest were not destroyed, alteration of the narrow belt of upland forest would be detrimental to both the flora and

fauna. Increased sunlight near the clearing would allow the encroachment of weedy, non-native vegetation and may result in the exclusion of native vegetation. Non-native species are already abundant in some portions of the site. Narrowing of the forest would also promote undesirable edge effects, such as brood parasitism and nest predation, through more of the forest. These edge effects gradually eliminate the forest interior species.

Because this site does not include the tributaries that supply water to the wetlands it protects, water quality and the native vegetation could be threatened by pollution upstream. A decline in water quality would also threaten the wildlife that feed here.

Finally, isolation of this riparian forest would threaten the long term maintenance of its forest interior breeding bird populations, which are dependent not only on protection of this site, but also of large forested tracts in the nearby area, and the forested corridors that connect them.

Management Needs

No logging, forest clearing, or removal of fallen trees or snags should be permitted within the protection area.

Forested buffers should be maintained on feeder streams to protect water quality. No point-source influx of pollutants should be permitted.

Adjacent tracts of forest interior bird habitat should be maintained in a natural state. Forested corridors that connect this site to those areas should also be protected.

BOUNDARY RECOMMENDATIONS:

The proposed boundary includes the bottomland bird habitat along approximately 1 mile of a major stream. Also within the protection area are smaller adjacent riparian forested tracts that serve as buffer and as corridors linking this protection area to nearby forests that support forest interior species. The protection area extends uphill a short way to the forest edge, where it abuts roads and agricultural fields.

SITE DESCRIPTION SUMMARY:

This 600 acre protection area contains a broad bottomland deciduous forest. Red Maple is the dominant tree species in most of the wettest areas along the stream, where River Birch is also common. Mixed hardwoods (oaks, Red Maple, and Sweet Gum) dominate slightly higher ground. Groundberry covers the floor of

large areas of the broad marshy floodplain, accompanied by numerous wetland shrubs and herbaceous species. The slopes above the floodplain are dominated by Red Oak and Willow Oak, with Club moss and numerous ferns carpeting the forest floor.

Prepared by: Judith L. Robertson

Date: November 1988

PROTECTION AREA SUMMARY

Protection Area Name: Beltsville Forest and Meadow

County: Prince Georges USGS Quad: Laurel

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Several factors make this protection area very important as habitat for forest interior breeding birds, as the site of major ecological research studies, and as habitat for rare plant species. As one of the largest forested areas at the Beltsville Agricultural Research Center, this protection area is an essential part of a large, interconnected forest comprising lands owned by several federal agencies. Forest interior breeding birds are species which require relatively large, unfragmented tracts of undeveloped forest for successful reproduction. Many are neotropical migrants, which form a majority of the territorial bird species in large eastern forests but decrease dramatically when forest stands are reduced to small, isolated woodlots. Small forest patches have a high ratio of edge to interior, and edge effects, including trampling, nest predation, and brood parasitism impact neotropical migrants disproportionately for several reasons. Many migrant species place their nests on or near the ground. In addition, these birds have a relatively low reproductive rate, typically producing just one small brood per year. The large, contiguous forests that neotropical migrants require have become increasingly rare on the Upper Coastal Plain of Maryland due to clearing for agriculture and for residential and commercial development.

Beltsville Forest and Meadow Protection Area is especially unusual because it contains a large area of upland deciduous forest. Such lands are desirable for farmland and construction sites, so the remaining forests in Central Maryland tend to be along streams or in wetlands. This site has been selected for a number of significant ecological research projects. The forest was censused for a major study which documented the importance of large forest size and the value of forested corridors to neotropical migrant bird species. It is also the site of long-term gypsy moth research. Most of the protection area has been designated by the Beltsville Agricultural Research Center as a Research Forest. The forest provides a laboratory for studies of plants and animals in their natural habitats.

Although the presence of a powerline right-of-way through the protection area is not ideal for forest interior bird species, it does create several unusual habitats which support three plant species that are rare in Maryland. In the upland

portion of the site, the powerline clearings mimic a dry meadow habitat more common in the state in pre-colonial times when natural fires were not suppressed. Two rare native plants grow in the sandy, sterile soil and bright sunlight of this unusual habitat. Where the powerline crosses a non-tidal wetland near one end of the site, it creates two small bog-like openings, one of which contains a rare carnivorous plant.

OTHER VALUES AND SIGNIFICANCE:

Both forest and meadow habitats at this site provide excellent habitat not only for birds, but for many types of wildlife such as insects, amphibians, and large mammals.

Non-tidal wetlands such as the swamp in the southeastern portion of this site are increasingly valued for their role in maintaining the water quality of the rivers they feed and, ultimately, the Chesapeake Bay.

From herbarium records, an additional rare plant species is known to have occurred in wetlands in the vicinity of this site. With additional fieldwork, this species may be found still growing here.

THREATS AND MANAGEMENT NEEDS:

Threats

Clearing for agriculture or building construction would eliminate important upland habitat. Loss of nearby forested tracts and the corridors connecting them with this protection area would be detrimental to forest interior birds and other wildlife at this site. These animals depend on the large forest system of which this site is a part.

At the southeastern corner of the site, old machinery, wire, and trash lie in the forest adjacent to a wetland, and may cause pollution of its waters.

There is also evidence of recent bulldozer activity in an area approximately 30 ft. x 20 ft., near the wetland opening that contains a rare plant. Excavation may disrupt the hydrology of the wetland. Any clearing of the forest canopy promotes the invasion of sun-loving non-native vegetation that may take over areas occupied previously by native vegetation.

The use of mowing to keep powerlines open threatens species which would flower and fruit at the time of mowing or soon thereafter. Heavy equipment used to mow the powerline may also damage plants by compacting the soil. The powerline also creates

an undesirable "edge effect", increasing the levels of nest predation and brood parasitism on forest interior birds.

Management Needs

No removal of forest vegetation should be conducted within the protection area boundary. Adjacent forested tracts and the forest corridors that connect them should be maintained in a natural state.

No new trash should be dumped within the protection area boundaries or near streams that enter the protection area. Existing light trash should be removed. Major articles should be examined to determine whether potential pollution, or the effects of the heavy machinery required to remove them, would constitute the greater threat. The use of heavy machinery should be minimized. Earth moving equipment should not be used within the site, especially near the wetland.

The effect of increased sunlight from the existing powerline is probably unavoidable, but it should be limited to the powerline; no unnecessary clearings should be maintained. The growth of native and, especially, rare species can be promoted by mowing after fruiting and before germination of the plants. Mowing should not occur when forest interior birds are breeding. If possible, powerline maintenance by selective hand removal of tree species would be preferable to mowing. The powerline opening should be kept as narrow as possible.

BOUNDARY RECOMMENDATIONS:

The boundary includes the rare species habitat, adjacent potential habitat, forest interior breeding bird habitat, and a forested buffer along streams. Primary habitat is located in the southern portion of the site, where the southern boundary is a road and eastern and western boundaries are agricultural fields. On the north, a wooded buffer borders three branches of a stream. Two of these forested streams serve as corridors connecting this protection area to adjacent forested tracts also recommended for protection.

SITE DESCRIPTION SUMMARY:

Two branches of a creek flow from east to west through this 472 acre protection area. The major forested portion of the site surrounds the more southern of the two branches. Adjacent to the creek, the bottomland forest is composed of Red Maple with large patches of New York and Cinnamon Ferns on the forest floor. Black Gum, Spicebush, Sweet Pepperbush, and greenbrier are also common. Downstream, the latter two species form large, dense

thickets along the stream, and the canopy is relatively open. Slightly uphill, American Holly is common, pines and oaks increase in abundance, and numerous Lady Ferns grow on the forest floor. The upland forest is dominated by mixed oaks, especially Red and Black Oaks, with Virginia and Pitch Pines common in some stands. The understory is dominated by Highbush Blueberry.

A powerline right-of-way crosses the southern portion of the site, creating a dry, sandy, meadow-like habitat along much of its length. Numerous grasses, sedges, and herbaceous meadow species grow here, including two rare plants.

In the southeastern corner of the site is a forested non-tidal wetland dominated by Red Maple, Sweet Bay, and Black Gum. Wetland ferns and sedges, such as Cinnamon Fern and Long Sedge, are abundant in the wet, organic soil. Where the powerline crosses the wetland, it has created two boggy, sphagnous openings. In the easternmost of these, the soil has not been disturbed for quite some time. A small pool is surrounded by a tiny bog of sphagnum moss, Loose-headed Beakrush, Yelloweyed-grass, Marsh St. John's-wort, and a rare carnivorous plant. Sweet Bay and Red Maple, stunted from past cutting, border the boggy opening.

Prepared by: Judith L. Robertson

Date: December 1988

PROTECTION AREA SUMMARY

Protection Area Name: Beltsville Seasonal Ponds

County: Prince Georges USGS Quad: Laurel

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

This protection area contains two small seasonal ponds. No streams feed or drain the ponds. This type of wetland normally fills with water during winter and early spring, and gradually dries during the summer.

This habitat is uncommon in Maryland; many such ponds have been destroyed by draining, ditching, or filing, for agriculture or residential and commercial development. Seasonal ponds are especially rare in the upper Coastal Plain, occurring more commonly on the Eastern Shore. They provide ideal habitat for an unusual group of plants known as "drawdown" species, which flourish in the moist soil exposed when the water recedes in late summer.

A rare herbaceous drawdown species is abundant in one of these ponds. It grows under a canopy of Buttonbush and in several openings between shrubs.

OTHER VALUES AND SIGNIFICANCE:

The seasonal ponds offer feeding and breeding habitat for migratory songbirds and for amphibians. These ponds are the site of ecological studies of large, unusual salamanders that breed here.

Additional rare plant species may occur at this site. The flora and fauna of seasonal ponds vary seasonally and annually with water level. Several visits are required to develop a complete list of species which inhabit this site.

THREATS AND MANAGEMENT NEEDS:

Threats

Alteration of the local groundwater hydrology is the greatest threat to the maintenance of these ponds, the rare species, and the fauna which use ponds. Species composition is maintained by the frequency and range of seasonal groundwater fluctuation. Drainage of the ponds, ditching of surrounding land or clearing of surrounding forests would all alter the current

groundwater regime. Such changes would eliminate the rare species and promote the invasion of other species. Hydrologic changes might also make the ponds unsuitable as breeding habitat for amphibians.

Management Needs

No ditching, draining or other alteration of the current groundwater regime should be permitted within the protectin area. Forest cover within the proposed boundary should be left intact.

BOUNDARY RECOMMENDATIONS:

The protection area boundary contains the seasonal ponds, including the rare species habitat. It also includes adjacent wetlands and a forested buffer required to protect the quantity and quality of water in the ponds.

SITE DESCRIPTION SUMMARY:

The focus of this 95 acre protection area is two small, centripetally-drained seasonal ponds. The center of southern pond is dominated by Buttonbush. Larger Bur-Marigold and a rare herbacous species dominate three openings among the shrubs. Immediately north and east of this pond is a forested wetland of Red Maple and Pin Oak, with an open understory.

The northern pond measures approximately 100 ft. in diameter and is dominated by scattered Pin Oaks, with Red Maple and Sweet Gum of secondary importance. River Birch is present, but most of these trees appear to be dying. The central portion of the pond is almost devoid of vegetation and appeared to have recently dried at the time of the late-summer survey. Mermaid Weed and knotweed are scattered in the very center of the pond where the soil is wettest. Along the periphery of the pond is a dense shrub layer of greenbrier, Southern Arrowwood, and Groundberry, as well as several large patches of Lady Fern.

The surrounding forest is dominated by Red Maple, Red Oak, and White Oak. Southwest of the southern pond is an old clearing now dominated by young pines. East of the ponds, a small stream flows south through a small swamp dominated by Red Maple with Southern Arrowwood, greenbrier and sedges.

Prepared by: Judith L. Robertson

Date: November 1988

PROTECTION AREA SUMMARY

Protection Area Name: Chews Lake

County: Prince Georges USGS Quad: Bristol

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

The mature floodplain forest that borders Chews Lake is composed of species that usually dominate riparian floodplain forests along rivers much larger than the streams that flow through the protection area. Sycamore, American Elm, and Box Elder dominate the forest canopy. The herbaceous layer is lush and includes many spring wildflowers. A long beaver dam maintains the water level in the lake. Other than beaver activity and a horse trail, there has been minimal recent disturbance to this forest.

Two rare plant species inhabit this unusual floodplain forest. This is the only known site in Maryland for one of these species. Further survey is needed to determine the size and vigor of this population. The other rare species is known from only one other site in the State. The population at Chews Lake is much larger than the other known population of this species; thousands of flowering plants carpet the floodplain. Because the potential habitat for these rare species is extensive and of high quality, this site offers an excellent opportunity to preserve these species in Maryland.

OTHER VALUES AND SIGNIFICANCE:

The floodplain and adjacent upland forest provide habitat for deer, beaver, and forest interior dwelling birds. The lake provides habitat for water dependent species of birds, amphibians, and reptiles. In addition, the broad floodplain forest absorbs floodwaters, thus reducing potential flooding and pollution downstream.

THREATS AND MANAGEMENT NEEDS:

Threats

Change in hydrology is the most evident threat to this floodplain forest. The upland north of Chews Lake has been cleared and paved. Runoff from this huge asphalt lot drains into an excavated pit, and any overflow from this pit is channeled directly into Chews Lake. Overflow of the pit and the subsequent flooding of Chews Lake and the rare species habitat could be

catastrophic. One of the rare species inhabiting this site is an annual that probably would not recover from such a flood. The pit is very large and is not likely to overflow; however, steps should be taken to prevent such a destructive flood.

Part of the spillway guiding runoff from the parking lot to the overflow pit has collapsed and the hillside is eroding. As the pit fills with the eroded soil and debris, the potential for a disastrous overflow increases. Of greater concern is the potential for runoff from the parking lot to further erode the spillway, bypass the pit, and flow directly into Chews Lake and the rare species habitat. It is likely that the impact of such a flood caused by a heavy storm would destroy the rare species populations.

Destructive changes to the hydrology of the rare species habitat may also occur as a result of clearing or changes in drainage patterns upstream along either of the two streams that flow through this site. A large increase or reduction in stream flow through this protection area would change the flooding regime and may eliminate the rare species.

A unmarked horse trail passes through the rare species populations. Trampling destroys the rare plants and increased use of the trail would further reduce the number of rare plants at this site.

Management Needs

The system for managing stormwater runoff from the asphalt lot should be reconstructed and well-maintained. The spillway should be rebuilt and the eroding slope should be stabilized. The excavated pit should be cleared of sediment periodically in order to prevent overflow into Chews Lake.

Plans to clear land or alter drainage upstream from the protection area should be reviewed for potential effects on the rare species habitat. Plans should be designed to prevent changes to the rare species habitat.

The horse trail should be routed to avoid the rare species' populations. Use of the horse trail should be monitored to assess the effects on the rare species habitat.

Beaver activity on the floodplain and adjacent upland should be monitored. Results of the monitoring may indicate that the size of the beaver population should be controlled in order to maintain the rare species' populations.

Trees should not be cut within the protection area. The sunny openings in the canopy encourage the establishment of non-native, weedy species that may outcompete the rare species.

BOUNDARY RECOMMENDATIONS:

The protection area includes the rare species' habitat, a forested buffer on adjacent uplands in order to protect water quality, and a forested buffer stretching approximately 1500 ft. upstream from the rare species populations in order to protect the hydrology of the rare species' habitat.

SITE DESCRIPTION SUMMARY:

A floodplain forest of Sycamore, American Elm, and Box Elder and uplands forested with oaks and Beech are included in the 167 acre protection area. The floodplain is broad and lushly carpeted with herbaceous species, including Spring-beauty, Jack-in-the-pulpit, Kidney-leaf Buttercup, Yellow Trout Lily, and two rare species. Two streams flow through the floodplain. A beaver dam on the northern stream maintains the water level of Chews Lake.

A steep slope rises from the northern side of Chews Lake. The adjacent upland was graded and paved. East of the lake is a large, plastic-lined pit that collects runoff from the paved lot. In the floodplain south of the lake is a horse trail oriented east-west through the site.

The uplands surrounding the floodplain are dry and support few herbaceous species. Beaver have cut many trees and shrubs in this forest and maintain an open understory.

Prepared by: Katharine A. McCarthy

Date: December 1988

PROTECTION AREA SUMMARY

Protection Area Name: County Line Trail Seep

Counties: Charles, Prince Georges USGS Quad: Brandywine

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

At least three hydrologically different wetland types occur within this mature Tulip Tree-Red Maple Forest. These wetlands provide habitat for diverse vegetation. The absence of non-native species in this forest is particularly significant. Seepage from adjacent gravelly slopes raises the water level locally in small depressions. These groundwater-fed wetlands are excellent examples of a community that is more common in the mountains. They have received little artificial disturbance recently, and the soil is rich in nutrients.

Two rare plant species inhabit the seepage wetlands. These are disjunct populations of both species; both plants usually occur in the mountains. This is Maryland's only known population of one species. The population appears to be stable and successfully reproducing.

OTHER VALUES AND SIGNIFICANCE:

The forested swamp and adjacent slope provide habitat for native and migratory songbirds. The swamp also provides habitat for amphibians and reptiles. Numerous deer inhabit the forest.

THREATS AND MANAGEMENTS NEEDS:

Threats

Hydrological change, either increasing or reducing the water level of the swamp, would destroy the rare species and alter the vegetative composition of the site. The rare species are intolerant of extended flooding but require very wet, boggy soil.

The clearing of trees on adjacent uplands and subsequent erosion would produce sedimentation of the wetland and may destroy the rare species. In addition, the cutting of trees on the upland or in the wetlands would increase the amount of sunlight available to shrubs and herbaceous species. This increase in sunlight would promote the establishment of non-native, weedy species and may exclude the rare, native species.

Management Needs

Any activities that would alter the hydrology of wetlands

within the protection area should not be permitted. Activities proposed near the protection area should be reviewed for potential effects on the rare species' habitat.

The cutting of trees and clearing of vegetation should not occur within the protection area.

The size and reproductive success of the rare species should be monitored regularly to assess the stability of the populations. Similar habitat in nearby wetlands should be surveyed for rare species. If more plants of these or other rare species are found, steps should be taken to protect those plants.

BOUNDARY RECOMMENDATIONS:

The population of the rare species and adjacent potential habitat are included within the protection area. Associated wetlands and uplands that drain into this habitat are included in order to protect the hydrology of the site. A forested buffer extending 100 feet west from the crest of the slope is recommended for the slope nearest to the rare species' populations. The purpose of this buffer is to protect the wetlands from sedimentation and the intrusion of non-native species that would occur if trees were cut.

SITE DESCRIPTION SUMMARY:

Two streams flow through the Tulip Tree-Red Maple Forest within this 87 acre protection area. Sweet Pepperbush and Southern Arrowood are abundant in the wetlands along the streams. Sedges and New York Fern are frequent near the streams. Small depressions fed by groundwater are scattered near the streams and are much wetter than surrounding wetlands. Sphagnum and Skunk Cabbage dominate those seepage wetlands. Ferns are abundant, including Cinnamon Fern, Netted Chain Fern, and Virginia Chain Fern. Red Maple is more abundant in these wetlands than in the surrounding forest. Nearby, oaks and American Holly inhabit the upland. Pine is abundant in the eastern portion of the protection area.

To the west of the protection area is a pine plantation. Dirt roads form the borders of the protection area to the south and east. The protection boundary follows a stream and a road to the north. Nearly all of the surrounding land is forested.

Prepared by: Katharine A. McCarthy

Date: November 1988

PROTECTION AREA SUMMARY

Protection Area Name: Fort Ravine

County: Prince Georges USGS Quad: Mount Vernon

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

The slopes and stream banks of this narrow ravine support an exceptional example of a mature, mesic, deciduous forest. Due to the clearing of land for agriculture, silviculture, and housing development, forests of similar age are extremely rare on the Upper Coastal Plain. Trees greater than two feet in diameter are scattered along the stream, and decaying, moss-covered logs straddle the ravine. The forest understory and herbaceous cover are well-developed. Spring wildflowers line the stream banks.

Along the stream banks and lower slopes are scattered patches of a rare plant species known from fewer than ten sites in Maryland. This species requires the deep shade and organic, neutral soil of a mature forest. The plant is found more commonly in the Piedmont and mountains, with few populations reported from the Coastal Plain in surrounding states.

OTHER VALUES AND SIGNIFICANCE:

The mature forest provides feeding and nesting habitat for migrating songbirds. A trail near the mouth of the stream provides access for hikers, birdwatchers, and nature photographers.

THREATS AND MANAGEMENT NEEDS:

Threats

The removal of trees from the ravine would eliminate the shady habitat required by the rare species. Increased sunlight on the forest floor would also promote the encroachment of non-native, weedy species. Tree removal would cause soil erosion and sedimentation of the stream, further damaging the rare species habitat.

The runoff of silt and sand from an eroded gully upstream covers the stream bottom and has buried herbaceous vegetation at the stream edge.

Management Needs

The removal of trees should not be permitted within the protection area in order to maintain the rare species habitat.

The runoff of sediment into the ravine should be reduced if possible. A cooperative effort should be initiated with the land manager in order to determine if erosion of the gully upstream can be reduced.

Trash should be removed from the north end of the ravine.

BOUNDARY RECOMMENDATIONS:

The protection area boundary includes the rare species habitat, adjacent steep slopes, and a forested buffer required to maintain the rare species habitat and reduce the impact of non-native, weedy species. Adjacent mature, deciduous forest is also included within the protection area because forests of similar age are very rare on the Coastal Plain of Maryland.

SITE DESCRIPTION SUMMARY:

This 32 acre protection area encompasses an unusually mature and undisturbed mesic, deciduous forest. A small, perennial stream has cut a steep, narrow ravine through the gravelly, sandy soil. Tulip Tree and Sycamore dominate the overstory near the stream, with dense patches of Touch-me-not and Urtica sp. at the edge of the stream. On the slopes of the ravine grow Tulip Tree, ash, and oaks. An unusually large Black Walnut grows on the lower slope. Pawpaw and Spicebush are abundant on the moist slopes and stream banks. On the dryer uplands, Vaccinium sp. is abundant.

Non-native, weedy species grow near the mouth of the stream, including Garlic Mustard, Japanese Honeysuckle, and Japanese Clematis. In adjacent ravines that have received more human disturbance, these and other weedy species are abundant.

Prepared by: Katharine A. McCarthy

Date: December 1988

PROTECTION AREA SUMMARY

Protection Area Name: Johnson's Gully

County: Prince Georges USGS Quad: Mount Vernon

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

This narrow, steep ravine supports a mesic, deciduous forest that is more characteristic of the Piedmont than the Upper Coastal Plain. A great diversity of herbaceous species, including numerous wildflowers, carpet the lower slopes and stream banks. This well-developed herbaceous cover, the presence of large, well-decayed logs, and the complex structure of the canopy indicate that the forest is mature. Due to clearing for commercial and residential development and agriculture, few mature forests exist on the Upper Coastal Plain. If left undisturbed, this will be an excellent example of an old growth forest.

Along the lower slope of the ravine grows a rare plant species that is known from fewer than ten sites in the State. This species more commonly inhabits the cooler forests of the mountains and Piedmont. The steep slopes of the ravine and the dense canopy produce a cool, shady habitat for this species far from its normal range.

OTHER VALUES AND SIGNIFICANCE:

The small stream and adjacent moist banks provide excellent habitat for invertebrates and amphibians. The mature forest provides feeding and nesting habitat for migratory songbirds. In addition, fossils have been found in the streambed, suggesting that this ravine may be important in revealing the biological history of this area.

THREATS AND MANAGEMENT NEEDS:

Threats

The rare plant species requires a moist, shady forest with soil high in organic content and nearly neutral in acidity. The removal of trees from the ravine would eliminate the rare species habitat by increasing the amount of sunlight penetrating to the forest floor and producing locally dryer soil conditions. In addition, the increase in sunlight would promote the growth of non-native, weedy species that could exclude the rare species. The weedy species are common at the north end of the ravine where the forest was more recently cut and there is little buffer from

adjacent fields. Soil erosion and stream sedimentation produced by tree removal would also be detrimental to the rare plant population.

Management Needs

In order to maintain the rare species' habitat, trees on the steep slopes of the ravine should not be cut. Only selective tree removal should be permitted on adjacent uplands within 50 feet of the steep slopes.

The size and reproductive success of the rare species population and the intrusion of weedy, non-native species should be monitored. If needed, a plan to control the spread of the weedy species should be implemented with the land manager.

BOUNDARY RECOMMENDATIONS:

The protection area incorporates the steep slopes of the ravine and a buffer of 50 feet along the adjacent uplands.

SITE DESCRIPTION SUMMARY:

Tulip Tree and Spicebush line the streambanks and lower slopes of the ravine in this 28 acre protection area. Ash, Ironwood, and Pawpaw form the forest understory. The mesic soil of the ravine bottom supports diverse herbaceous vegetation. A variety of ferns including Silvery Spleenwort, Maidenhair Fern, and Christmas Fern inhabit the streambanks and low slopes.

Oaks and Beech dominate the forest on the dryer, upper slopes. The understory and shrub layer are generally sparse. Blueberry occurs in scattered patches.

Near the mouth of the stream the ravine broadens and the slopes are more gentle. There is little forested buffer to the east, and non-native, weedy species thrive in this more open, sunnier section of the ravine. Japanese Honeysuckle and Ground Ivy carpet the stream banks.

Prepared by: Katharine A. McCarthy

Date: November 1988

PROTECTION AREA SUMMARY

Protection Area Name: Mockley Swamp

County: Prince Georges USGS Quad: Mount Vernon

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Freshwater tidal swamp and emergent marsh border riparian tidal flats in this unusual complex of wetlands. The sand spit projecting from the eastern tidal flats is a particularly unusual occurrence in this county. These various types of wetlands provide different habitats for a diversity of wetland vegetation.

Three rare plant species inhabit this wetland complex. Two of these species are known from just one other site in Maryland. The population of one rare species is large and the plants appear to be reproducing successfully; the other known population of this species is very small. Although only a few individuals of the other two rare species were found, it is likely that further survey would reveal more plants.

OTHER VALUES AND SIGNIFICANCE:

The wetland complex provides excellent feeding, breeding, and nesting habitat for waterfowl and waterbirds. Otter have been reported from this area. It is likely that additional rare species inhabit these wetlands, particularly the tidal swamp and emergent swamp.

THREATS AND MANAGEMENT NEEDS:

Threats

There do not appear to be any immediate threats to this protection area. Should land management priorities change, the following actions would threaten this area. Development of the shoreline of this wetland complex for recreation or other purposes would be detrimental to the rare species. Alteration of the hydrology of the wetlands may eliminate the rare species. The construction of shore stabilization structures would destroy the populations of rare species.

Management Needs

Shoreline development activities and the construction of shore stabilization structures should not be permitted within the protection area. Activities that would alter the hydrology of the wetlands, such as draining or filling, should not occur

within the protection area. The cutting of trees should not be permitted along the shoreline and within the wetlands of the protection area.

Further survey is needed to determine the extent of the rare species' population. The size and reproductive success of these populations should be monitored.

BOUNDARY RECOMMENDATIONS:

The rare species' habitats and adjacent wetlands are included within the protection area. A 100 ft. buffer is included along the shoreline in order to protect the rare species' habitat.

SITE DESCRIPTION SUMMARY:

The various wetland habitats in proximity support unusually diverse wetland vegetation within this 29 acre protection area. These wetlands form the tip of a peninsula surrounded by fresh tidal water. Ash, Pawpaw, willow, Box Elder, and Spicebush dominate the freshwater tidal swamps close to the water. Red Maple and Sweet Gum are more abundant further inland. Ash and willow grow on the intertidal sand flats. The tidal marsh is dominated by grasses with scattered coneflowers, beggar-ticks, and other wildflowers. Cat-tail and Southern Pond Lily are abundant on the tidal mud flats. Hydrilla and water-milfoil inhabit the tidal water along the peninsula.

Cultivated fields border the protection area. Adjacent to the forested swamps is an abandoned field that is reverting to forest. A narrow, dirt road follows the edge of the upland and separates the swamps from the abandoned field.

Prepared by: Katharine A. McCarthy

Date: November 1988

PROTECTION AREA SUMMARY

Protection Area Name: Patuxent Maple Swamp

County: Anne Arundel, Prince Georges USGS Quad: Bowie

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

This Red Maple Bottomland Forest is an excellent example of a palustrine floodplain forest. Occasional scouring by floodwater of the Patuxent River maintains an open understory. Patches of shrubs occur on slightly elevated areas and herbaceous openings form in the depressions and channels that retain floodwaters longer. These natural herbaceous openings are unique to floodplain forests; they do not occur in other palustrine, non-tidal wetlands of the Upper Coastal Plain. Among the unusual herbaceous species that inhabit these openings are two species that are rare in Maryland. One species is known from just two other sites in the State. This is the only known population in Maryland of the other rare species.

At the west end of the protection area, temporary pools in the Red Maple-Sweet Gum Forest provide habitat for a rare crustacean.

OTHER VALUES AND SIGNIFICANCE:

The various types of forested wetlands along this section of the Patuxent River provide excellent habitat for resident and migratory songbirds. In addition, several woodpeckers were observed during both visits to this area.

The natural herbaceous openings attract deer and other wildlife.

The forested wetlands along the Patuxent River absorb floodwater during storms and thus reduce the impacts of flooding downstream.

THREATS AND MANAGEMENT NEEDS:

Threats

Regular flooding of this forest is essential to maintain the herbaceous openings inhabited by the rare species. Activities that reduce or eliminate flooding will eliminate the populations of rare species.

Clearing of trees within the swamp forest or on the adjacent uplands would promote the growth of non-native weedy vegetation to the exclusion of the rare species.

A decline in water quality of the Patuxent River upstream from the protection area may be detrimental to the rare species.

Management Needs

Proposals for the clearing or development of land within the watershed upstream should be reviewed for potential effects on the quality and quantity of water in this section of the Patuxent River.

Logging or clearing of the forest should not occur within the protection area.

If nature trails are constructed they should be routed to avoid the non-tidal wetlands.

The rare herbaceous species as well as the weedy, non-native species (particularly Moneywort) should be monitored to determine their reproductive success. It may be necessary to remove Moneywort by hand if this species encroaches on the populations of rare species.

Further survey is needed to determine the extent of the rare species populations.

BOUNDARY RECOMMENDATIONS:

The protection area boundary includes the rare species habitat, adjacent wetlands and potential habitat, and a forested buffer required to maintain the population of rare species.

SITE DESCRIPTION SUMMARY:

Although Red Maple dominates this section of the Patuxent River floodplain, a variety of bottomland hardwood species inhabit this 47 acre wetland, including Sweet Gum, River Birch, Sycamore, Ironwood, and ash. Spicebush and arrow-wood dominate the shrub canopy. Lizard's Tail, False Nettle, and knotweed are the most abundant herbaceous species.

Deposits of silt on the leaves of shrubs and herbs indicate that the wetland is flooded in at least one foot of water during and shortly after periods of heavy rain.

Gravel was mined from the uplands on both sides of the Patuxent. The western section of the protection area includes a

large, shallow pit that is now covered by herbaceous vegetation, predominantly Water Purslane.

The forested buffer includes previously cleared land that is reverting to Virginia Pine. In addition, a forested wetland of Sweet Gum and Red Maple occurs in the western portion of the protection area.

Prepared by: Katharine A. McCarthy

Date: November 1988

PROTECTION AREA SUMMARY

Protection Area Name: Patuxent Wildlife Research Center

County: Anne Arundel, Prince Georges USGS Quad: Laurel

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

The Research Center includes over 3000 acres of nearly contiguous forest. A large portion of this forest (probably more than one third of the area) is mature upland forest. Approximately 700 acres of mature bottomland forest border the Patuxent River within the Research Center. These forests in association with adjacent forests on Fort Meade, the U.S. Department of Agriculture Research Center, and other federally-owned lands, constitute one of the largest remaining contiguous tracts of forest in the Baltimore-Washington metropolitan area. As commercial and residential development merge formerly distinct metropolitan areas of the mid-Atlantic states, the forests that remain are usually small, isolated patches. These small patches cannot support many of the plants and animals native to this region that require extensive forests or are intolerant of frequent disturbance. The forests of the Wildlife Research Center and adjacent Federal properties offer the best available opportunity to conserve the native plants and wildlife of this region that will not survive in small, isolated forests.

Approximately 3000 acres of forest at the Wildlife Research Center are designated as Research Natural Areas by the U.S. Fish and Wildlife Service. The Society of American Foresters identified the Research Center's bottomland forest as one of nearly 400 natural areas in their national inventory of mature forests. The Society's inventory of natural areas was initiated because these relatively undisturbed forests provide a vital educational resource. The extensive tracts of forest provide a laboratory for studies of plants and animals in their natural habitats and for studies of the ecological processes that sustain the forests. The forest ecosystems remain essentially intact; for example, they include species of forest interior dwelling birds such as neotropical migratory species that are unable to survive in smaller forests. At least one rare plant species inhabits this area. Only by understanding the natural processes that sustain these extensive, relatively undisturbed forests, can scientists assess the effects of human-induced changes to forests of this region.

OTHER VALUES AND SIGNIFICANCE:

There are several historical reports of rare species at the Wildlife Research Center. The forests were not searched for

these species during the field surveys conducted for this report. However, it is likely that the rare species survive because there has been very little disturbance to the habitats from which they were reported. Further survey of the forest is needed to confirm the presence of these rare species.

THREATS AND MANAGEMENT NEEDS:

Threats

Fragmentation of the forests is the greatest threat to the forested complex of Federal lands that includes the Wildlife Research Center. Residential and commercial development surrounds the forests. There will be continual pressure to expand the roads that cross through the forests and to build new roads. The expansion of the two lane roads would reduce the habitat quality of the forests for species such as forest interior dwelling birds that require extensive, contiguous forest. In addition, the wider road would create a greater barrier to the movement of wildlife through the Wildlife Research Center.

Forest edges along roadsides and other clearings provide habitat for species of plants and wildlife that exclude the forest interior species. For example, many forest interior dwelling birds are neotropical migrants that nest on or near the ground and usually produce just one brood per year. Near forest edges, these forest interior birds are highly vulnerable to nest predation and brood parasitism by cowbirds and other species that inhabit the forest edges. Non-native weedy plants establish along the sunny forest edges and invade the forest interior. The shade-loving forest interior plants are gradually excluded by these weedy species. These changes created by fragmentation of the forest substantially reduce the value of the forest as a laboratory to study natural ecological processes. The ecosystem loses important components as these changes occur, and the natural processes are altered.

A decline in the water quality or change in the stream flow of the Patuxent River may alter the vegetation composition of the mature bottomland forest.

The large deer population of the Wildlife Research Center has decimated the herbaceous and shrub layers of the forests in many areas.

Management Needs

Existing roads should not be expanded and new roads should not be constructed in the Wildlife Research Center.

The clearing of forested land within the protection area

should be prohibited. Trees should not be cut within the protection area unless necessary for safety along existing trails.

Activities planned upstream from the protection area that would reduce water quality or alter drainage patterns should be reviewed for potential effects on the bottomland forest that borders the Patuxent River. Plans should be modified to prevent sedimentation, pollution, and hydrological changes in the bottomland forest.

The deer population should be controlled and maintained at a reduced size in order to reduce grazing pressure.

BOUNDARY RECOMMENDATIONS:

The protection area includes the mature bottomland forest, adjacent immature stands of bottomland forest, and adjacent upland forest that is undeveloped and is not actively managed for research. The area extends to Fort George G. Meade to the north and northeast and to the U.S. Department of Agriculture Research Center to the south and east.

SITE DESCRIPTION SUMMARY:

The 3000 acre protection area includes bottomland forest of Beech, Pin Oak, Tulip Tree, and Sweet Gum, and upland forests of oaks, Beech, and pine. The Patuxent River flows through well-drained bottomland forest dominated by Beech and swamp forest dominated by Pin Oak. Sweet Gum, Tulip Tree, and Red Maple are frequent in both types of forest. The well-drained bottomland forest supports a more diverse herbaceous layer that includes many spring wildflowers. The shrub layer of the well-drained bottomland forest is also better developed; Spicebush, Poison Ivy, and Black Haw are dominant.

Beech and White Oak dominate the uplands adjacent to the bottomland forest. Where land was previously cultivated, Virginia Pine and Pitch Pine are often abundant. In areas of sandy soil, Southern Red Oak and other oaks are mixed with the pines and the understory is sparse. The undisturbed upland forest south of Route 197 is dominated by oaks.

Prepared by: Katharine A. McCarthy

Date: December 1988

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The following general references are provided as background material and suggested reading to supplement this report.

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For information concerning Final Action on Regulations, see inside front cover.

Symbol Key

Roman type indicates text already existing at the time of the proposed action. *Italic type* indicates new text added at the time of proposed action. A single underline indicates text added at the time of final action. [Single brackets] indicate deleted text. [[Double brackets]] indicate text deleted at the time of final action.

Title 07
DEPARTMENT OF HUMAN RESOURCES

Subtitle 03 INCOME MAINTENANCE ADMINISTRATION

07.03.05 General Public Assistance to Employables

Authority: Article 88A, §§17, 17A-1 — 17A-3, 65B, Annotated Code of Maryland

Notice of Final Action
[87-110-F]

On May 26, 1987, the Secretary of Human Resources adopted amendments to Regulations .09 and .11 under COMAR 07.03.05 **General Public Assistance to Employables**. These amendments, which were proposed for adoption in 14:8 Md. R. 941 (April 10, 1987), have been adopted as proposed. (DHR Transmittal Number 87-12)

Effective Date: June 29, 1987.

RUTH MASSINGA
Secretary of Human Resources

Title 08
DEPARTMENT OF NATURAL RESOURCES

Subtitle 03 WILDLIFE

08.03.08 Threatened and Endangered Species

Authority: Natural Resources Article, §§ 4-2A-01 — 4-2A-09, 10-2A-01 — 10-2A-09, Annotated Code of Maryland

Notice of Final Action
[87-061-F]

On June 9, 1987, new Regulations .01 — .11 under a new chapter, COMAR 08.03.08 **Threatened and Endangered Species**, were adopted by the Secretary of Natural Resources. Existing Regulations .01 and .02 under COMAR 08.03.08 **Nongame and Endangered Species** were repealed. These actions, which were proposed for adoption in 14:6 Md. R. 719 — 726 (March 13, 1987), have been adopted as proposed.

Effective Date: June 29, 1987.

TORREY C. BROWN, M.D.
Secretary of Natural Resources

Subtitle 05 WATER RESOURCES ADMINISTRATION

08.05.03 Construction on Non-Tidal Waters and Floodplains

Authority: Natural Resources Article, §§8-801 — 8-814, Annotated Code of Maryland

Notice of Final Action
[87-060-F]

On June 9, 1987, amendments to Regulation .03 under COMAR 08.05.03 **Construction on Non-Tidal Waters and Floodplains**, were adopted by the Secretary of Natural Resources. These amendments, which were proposed for adoption in 14:6 Md. R. 726 — 728 (March 13, 1987), have been adopted with the non-substantial changes shown below.

Effective Date: June 29, 1987.

Attorney General's Certification

In accordance with State Government Article, §10-113, Annotated Code of Maryland, the Attorney General certifies that the following changes do not differ substantively from the proposed text. The nature of each change and the basis for this conclusion are as follow:

Regulation .03D(3)(b): The new language is added to restate the fact that tidal floodplains are not covered by this regulation and precludes any misunderstanding by prospective applicants on this issue. The State's regulatory authority pursuant to Natural Resources Article, Title 8, is specifically limited to the 100-year floodplain of free flowing streams and does not encompass federally designated tidal special flood hazard areas. Regulation .03 restates this limitation on the State's jurisdiction.

.03 Requirements for a Permit.

A. — *C.* (proposed text unchanged)

D. Exemptions. The following activities are exempted from the requirements for a permit from the Administration under this chapter:

(1) — *(2)* (proposed text unchanged)

(3) A person who proposes to change in any manner the course, current, or cross-section of any waters of the State other than those referenced in §D(1) and (2) of this regulation does not need a permit from the Administration if the:

Title 08
DEPARTMENT OF NATURAL RESOURCES

Subtitle 03 WILDLIFE

08.03.08 Threatened and Endangered Species

Authority: Natural Resources Article, §§4-2A-01 — 4-2A-09 and §§10-2A-01 — 10-2A-09, Annotated Code of Maryland

Notice of Proposed Action
[87-061-P]

The Secretary of Natural Resources proposes to repeal existing Regulations **.01** and **.02** under **COMAR 08.03.08 Nongame and Endangered Species** and to adopt new Regulations .01 — .11 under **COMAR 08.03.08 Threatened and Endangered Species.**

The proposed action does not affect any threatened and endangered species regulation or designations under **COMAR 08.02.12 Tidewater Administration.** The proposed action includes an increase in the number of wildlife species on the lists and for the first time includes plants. In addition, some species which meet the statutory definition of fish because they spend part of their life cycle in water, namely, amphibians, reptiles, crustaceans, mollusks and only those finfish of the species Blackbanded Sunfish (Enneacanthus chaetodon), Maryland Darter (Etheostoma sellare), Glassy Darter (Etheostoma vitreum), Stripeback Darter (Percina notogramma) and Trout-Perch (Percopsis omiscomaycus) are added. The latter species are not game or sport fish, therefore, are of no commercial significance. The lists also contain, for the first time, the names of all those species which are federally listed and, therefore, are required by Maryland law to be listed in Maryland.

The criteria for listing and delisting species are set out and the process for petitioning the Department to list and delist a species as allowed by law is specified. The proposal also clarifies how to apply for the various permits which are allowed by law and what factors are considered before they are issued.

Maryland law authorizes the Secretary to prohibit certain acts with respect to threatened and endangered plants in addition to those set out in the statute. The added prohibitions are: taking threatened and endangered plants from private property without the permission of the owner and from State property without the permission of the Director; and exporting, possessing, processing, selling, offering for sale, delivering, carrying, transporting or shipping threatened plant species. The latter acts are already prohibited by statute with respect to endangered plants.

Maryland law also authorizes the Secretary to prohibit by regulation certain acts with respect to all other threatened species besides plants. Since there were no threatened species listed in the previous regulation, there were no additional prohibitions specified; thus, these regulations implement that section of the law for the first time. Included in the added prohibitions is an "incidental taking." This is a taking of a species which is caused by another otherwise lawful act, for example, the killing of a pond dwelling species by filling in a pond for other reasons. The landowner is required to give the Department 30 days notice before starting any action which would result in an "incidental taking." Within that 30 day time period the Department must either salvage the species or issue a permit for the "incidental take." The other added prohibitions are simply the same acts prohibited by statute with respect to endangered species.

This proposal defines for the first time what criteria are considered for designating Natural Heritage Areas. These Areas are an integral feature of the Critical Areas Criteria (set forth under **COMAR 14.15.01 — .11**) and by adding this regulation the Department hopes to aid the counties and the Critical Areas Commission in the protection of these Areas. Before Areas are designated the Department will notify all landowners of the proposed designation. There will be maps made available along with other pertinent and useful information. The Department hopes to work out management agreements with the landowners or buy conservation easements for property included in an Area if necessary.

The Critical Areas Criteria rely heavily on the Department's Threatened and Endangered Species Program to aid the counties in determining which species within the Critical Area need protection. The Department has available maps which locate listed species by planning zones and will make all this information as readily available as possible. The Department has always considered cooperative management agreements with private property owners to be the best way to preserve and protect habitat critical to threatened and endangered species, and intends to continue to use these agreements and other mutually agreeable management arrangements as much as possible.

Estimate of Economic Impact

I. Summary of Economic Impact. Administrative costs for units of the Department of Natural Resources will increase in terms of more staff time to address protection of these species, and some land acquisition costs will be incurred. Local governments will bear some costs in addressing protection of the listed species as part of their Critical Areas programs.

II. Types of Economic Impacts:	Revenue (+) Expense (−)	Amount
A. On issuing agency:		
1. Increased staff and support for threatened and endangered species Program	(−)	$193,497
2. Increased land acquisition staff and support	(−)	$74,106
3. Additional acquisition of interests in land	(−)	Indeterminable
B. On other State or local agencies affected:		
Local jurisdictions protect threatened and endangered species as part of Critical Areas programs	(−)	$40,000 — $100,000
C. On regulated industries or trade groups:	NONE	
	Benefit (+) Cost (−)	**Amount**
D. On other industries or trade groups affected:	NONE	

E. Direct and indirect effects on public:		
1. Prohibition on taking endangered wildlife may affect some real estate development	(−)	Indeterminable
2. Protect species' diversity	(+)	Indeterminable

III. Assumptions. (Identified by Impact Letter and Number from Section II):

A1. The amount indicated is a budget enhancement request for six new positions plus support for the Threatened and Endangered Species program. While not all attributable to the listing of species represented by this regulation, a significant portion of the additional staff time for which the new resources will be needed is to meet the needs of an expanded list of threatened and endangered species.

A2. The amount indicated is a budget enhancement request for two new positions plus support for acquisition of interests in land that may prove necessary to protect threatened and endangered species.

A3. At this time, it is impossible to calculate how much could be spent for acquisition of interests in land. The figure indicated is the amount budgeted in FY 1987 for acquisition of interests in property for protection of lands that support diverse ecological communities of plants or animals, including forestlands, habitats of rare, threatened or endangered species, and areas necessary for watershed protection. A similar amount has been requested for FY 1988.

B. The costs of local governments to develop Critical Area programs will be approximately $2,150,000 for FY 1987. A similar amount has been requested for FY 1988. The Director of the Critical Areas program estimates that between 2 percent and 5 percent of these costs may be attributable to that portion of the work involving threatened and endangered species.

E1. and E2. There is presently no trade in Maryland in any of the listed species, and therefore no impact is anticipated as a result of prohibiting such commerce. The prohibition on taking endangered species of wildlife in any manner will have some localized impacts on land use, but the impacts are indeterminable at this time. As to endangered or threatened species of plants, threatened species of wildlife, and wildlife species in neeed of conservation, the regulation prohibits only directed efforts to take the species; incidental impacts on the species from legitimate uses of land are not prohibited. Therefore, the listing of these species will not have an impact. Finally, there will be a long-term, positive, but incalculable benefit to the people of Maryland by protecting the diversity of species in the State.

Opportunity for Public Comment

Written comments may be sent to James Mallow, Forest, Park and Wildlife Service, Department of Natural Resources, Tawes State Office Building, Annapolis, MD 21401 or call 974-3771 Monday through Friday, 9 a.m. to 4 p.m. Public comment must be received not later than April 20, 1987 at 4 p.m.

If sufficient interest is shown a public hearing will be held. Copies of this proposal are available from James Mallow at the address given above.

.01 Definitions.

A. "Director" means the Director of the Maryland Forest, Park and Wildlife Service.

B. "Endangered extirpated species" means any species that was once a viable component of the flora or fauna of the State but for which no naturally occurring populations are known to exist in the State. Most of these species have not been recorded in Maryland since 1950.

C. "Endangered species" means any species whose continued existence as a viable component of the State's flora or fauna is determined to be in jeopardy including any species determined to be an "endangered species" pursuant to the federal Endangered Species Act of 1973, 16 U.S.C. §§1531 — 1543.

D. "Incidental taking" means takings of listed species that are incidental to, and not the purpose of, the carrying out of an otherwise lawful activity conducted by a person on private property.

E. "Jeopardize the continued existence of" means to engage in an action which reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of either the survival or recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of a listed species or otherwise adversely affecting the species.

F. "Listed species" means a species of flora or fauna deemed endangered, threatened or in need of conservation in this chapter due to any of the following factors:

(1) Present or threatened destruction, modification, or curtailment of the species' habitat or range;

(2) Overutilization for commercial, sporting, scientific, educational, or other purposes;

(3) Disease or predation;

(4) Inadequacy of existing regulatory mechanisms; or

(5) Other natural or manmade factors affecting the species' continued existence within the State.

G. "Natural heritage area" means any natural community of species designated in Regulation .10 in this chapter.

H. "Person" means any county, municipal corporation, or other political subdivision of the State, an individual, corporation, receiver, trustee, guardian, executor, administrator, fiduciary, or representative.

I. "Secretary" means the Secretary of the Department of Natural Resources.

J. "Service" means the Maryland Forest, Park and Wildlife Service.

K. "Species" means any species of wildlife or plant and reptiles, amphibians, crustaceans, mollusks and the following finfish: Enneacanthus chaetodon, Etheostoma sellare, Etheostoma vitreum, Percina notograma, Percopsis omiscomaycus or any part, egg, offspring, or dead body of any of them.

L. "Species in need of conservation" means any species determined by the Secretary to be in need of conservation measures for its continued ability to sustain itself successfully.

M. "Take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.

N. "Threatened species" means any species of flora or fauna which appears likely, within the foreseeable future, to become endangered including any species determined to be a "threatened species" pursuant to the federal Endangered Species Act of 1973, 16 U.S.C. §§1531 — 1543.

.02 Petitioning.

A. Except for species determined to be threatened or endangered pursuant to the federal Endangered Species Act of 1973, 16 U.S.C. §§1531 — 1543, any interested person may petition the Director to add or remove a species or natural heritage area to or from a list in this chapter. The Director shall review the evidence regarding the requested action and make a recommendation to the Secretary whether or not to list or delist the species or natural heritage area.

B. In a petition to list or delist a natural heritage area, the following information shall be provided:

(1) A map of the proposed natural heritage area.

(2) A description of the physical boundaries of the proposed area, total acreage, landowner name and address.

(3) A description of the biological community represented by the natural heritage area including, as far as practical, a list of the fauna and flora there, and other geologic,

hydrologic, or other features which blend together to make this area unique.

(4) A description of all major threats to the continued existence of the area, or if petitioning to delist an area, a description of how the natural features and species composition of the area have changed so it is no longer suitable to be designated as a natural heritage area.

(5) A statement indicating why the area should or should not be considered as among the best statewide examples of its kind.

(6) Other relevant information which might assist the Director in making a determination.

C. All sites used for evidence of current abundance shall be extant and all sitings shall be documented with appropriate vouchers. In a petition to list or delist a species, the following information shall be provided:

(1) A description of the biological distribution of the species in Maryland.

(2) Its life needs and habitat requirements.

(3) Evidence of its decline or evidence that it is more common than previously believed and documented.

(4) All known threats which jeopardize its continued existence.

(5) Other relevant biological and ecological data or other life history information pertinent to its status.

(6) The species shall be presently recognized as a valid species, or infraspecific taxa of regional or national significance. There shall be adequate documentation that it occurs naturally and is permanently established in Maryland.

.03 Permits.

A. Permits to take, transport, possess, sell, offer for sale, export or import any listed species may be obtained from the Director only after written application on a form provided by the Service, and upon payment of a fee of $25.

B. Each permit shall be subject to an expiration date and other limitations as may be prescribed by the Director.

C. Each permit application requesting permission to take a listed species from private property shall be accompanied by a signed statement from the landowner granting the applicant permission to enter the property to take the species.

D. A permit application shall describe the purpose of the request in such detail that the Director can determine whether it is in the best interest of the species and the State to issue it.

E. The Director shall consider, but not be limited to, the following information:

(1) The number of other known occurrences of the species in the State;

(2) Which of the occurrences of the species in §E(1) exist on:

(a) Private lands;

(b) Public lands; and

(c) What protection there is for the species' continued existence.

(3) The number of individuals in the occurrences of the species in §E(1) and the relative state of ecological stability.

F. Violation of any provision or restriction of the permit shall constitute a violation of this regulation and may result, at the discretion of the Director, in the revocation of the permit and confiscation of the species taken or possessed.

.04 Endangered Species of Wildlife, Reptiles, Amphibians, Mollusks, Crustaceans and Finfish.

A. Listing Criteria. The following factors shall be considered for listing any species other than plants as endangered:

(1) Whether the species is restricted to a minimal geographic area within Maryland;

(2) Whether the species has experienced a rapid, substantial decline in Maryland, and if the decline continues, the species' extirpation from Maryland is imminent;

(3) Whether the species' essential habitat has been rapidly lost and that loss is likely to continue;

(4) Whether the species' biology makes it highly susceptible to changes in its environment; or

(5) Whether the species' essential habitat is easily altered by even relatively minor activities.

B. Permits. The permit procedures to be followed are set forth in Regulation .03. The following apply:

(1) Permits shall be issued only for scientific research designed to enhance the recovery of the species or population.

(2) A person may not take, export, possess, process, sell or offer for sale, deliver, carry, transport, or ship by any means any endangered wildlife, reptile, amphibian, mollusk, crustacean or finfish species except by special permit from the Director.

C. The following wildlife, reptile, amphibian, mollusk, crustacean and finfish species are considered endangered throughout Maryland unless a smaller range is indicated:

(1) Platyhelminthes. A Planarian (Procotyla typhlops).

(2) Mollusks. Ancient Floater (Alasmidonta heterodon).

(3) Crustaceans.

(a) Dearolf's Cave Amphipod (Crangonyx dearolfi);

(b) Greenbriar Cave Amphipod (Stygobromus emarginatus);

(c) Shenandoah Cave Amphipod (Stygobromus gracilipes).

(4) Insects.

(a) Northeastern Beach Tiger-Beetle (Cicindela dorsalis);

(b) Puritan Tiger-Beetle (Cicindela puritana);

(c) Six-Banded Longhorn-Beetle (Dryobius sexnotatus);

(d) Regal Fritillary (Speyeria idalia).

(5) Fish. Maryland Darter (Etheostoma sellare).

(6) Amphibians.

(a) Eastern Tiger Salamander (Ambystoma tigrinum);

(b) Green Salamander (Aneides aeneus);

(c) Hellbender (Cryptobranchus alleganiensis);

(d) Eastern Narrow-Mouthed Toad (Gastrophryne carolinensis).

(7) Reptiles.

(a) Atlantic Leatherback Turtle (Dermochelys coriacea);

(b) Atlantic Hawksbill Turtle (Eretmochelys imbricata);

(c) Northern Coal Skink (Eumeces anthracinus);

(d) Atlantic Ridley Turtle (Lepidochelys kempi);

(e) Mountain Earth Snake (Virginia valeriae pulchra).

(8) Birds.

(a) Piping Plover (Charadrius melodus);

(b) Peregrine Falcon (Falco peregrinus);

(c) Bald Eagle (Haliaeetus leucocephalus);

(d) Loggerhead Shrike (Lanius ludovicianus);

(e) Bewick's Wren (Thryomanes bewickii).

(9) Mammals.

(a) Black Right Whale (Balaena glacialis);

(b) Sei Whale (Balaenoptera borealis);

(c) Blue Whale (Balaenoptera musculus);

(d) Finback Whale (Balaenoptera physalus);

(e) Humpback Whale (Megaptera novaeangliae);
(f) Indiana Bat (Myotis sodalis);
(g) Sperm Whale (Physeter catodon);
(h) Delmarva Fox Squirrel (Sciurus niger cinereus);
(i) Water Shrew (Sorex palustris).

.05 Endangered Species of Plants.

A. Listing Criteria. The following factors shall be considered for listing a plant species as endangered:

(1) Whether only a few populations are known in Maryland and they cover only a small portion of land;

(2) Whether the species is restricted to a minimal geographic area;

(3) Whether the species has experienced a substantial decline in Maryland, and if the decline continues, the species' extirpation from Maryland is imminent;

(4) Whether the species' essential habitat has been rapidly lost and that loss is likely to continue;

(5) Whether the species' biology makes it highly susceptible to changes in its environment; or

(6) Whether the species' essential habitat is easily altered by even relatively minor activities.

B. Permits. The permit procedures to be followed are set forth in Regulation .03. The following apply:

(1) Permits shall be issued only for scientific research designed to enhance the recovery of the species or population;

(2) A person may not:

(a) Export, possess, process, sell, offer for sale, deliver, carry, transport, or ship by any means any endangered plant species without a special permit from the Director, the federal government, or another state government;

(b) Take any endangered plant species from State property except by special permit from the Director; and

(c) Take any endangered plant species from private property without the written permission of the landowner.

C. The following plant species are considered endangered throughout Maryland unless a smaller range is indicated:

(1) Sensitive Joint-Vetch (Aeschynomene virginica);
(2) Sandplain Gerardia (Agalinis acuta);
(3) (Agalinis fasciculata);
(4) Thread-Leaved Gerardia (Agalinis setacea);
(5) Woolly Three-Awn (Aristida lanosa);
(6) Virginia Heartleaf (Asarum virginicum);
(7) Red Milkweed (Asclepias rubra);
(8) Serpentine Aster (Aster depauperatus);
(9) Tickseed Sunflower (Bidens coronata);
(10) Small Beggar-Ticks (Bidens discoidea);
(11) (Bidens mitis);
(12) Aster-Like Boltonia (Boltonia asteroides);
(13) Grass-Pink (Calopogon tuberosus);
(14) Long's Bittercress (Cardamine longii);
(15) Barratt's Sedge (Carex barrattii);
(16) Buxbaum's Sedge (Carex buxbaumi);
(17) Coast Sedge (Carex exilis);
(18) Giant Sedge (Carex gigantea);
(19) (Carex joorii);
(20) Dark Green Sedge (Carex venusta);
(21) Marsh Wild Senna (Cassia fasciculata var. macrosperma);
(22) Spreading Pogonia (Cleistes divaricata);
(23) Wrinkled Jointgrass (Coelorachis rugosa);
(24) Wister's Coralroot (Corallorhiza wisteriana);
(25) Fraser's Sedge (Cymophyllus fraseri);
(26) Smooth Tick-Trefoil (Desmodium laevigatum);
(27) Linear-Leaved Tick-Trefoil (Desmodium lineatum);
(28) Cream-Flowered Tick-Trefoil (Desmodium ochroleucum);
(29) Rigid Tick-Trefoil (Desmodium rigidum);
(30) Pineland Tick-Trefoil (Desmodium strictum);
(31) Pink Sundew (Drosera capillaris);
(32) Log Fern (Dryopteris celsa);
(33) Knotted Spikerush (Eleocharis equisetoides);
(34) Black-Fruited Spikerush (Eleocharis melanocarpa);
(35) Robbins' Spikerush (Eleocharis robbinsii);
(36) Water Horsetail (Equisetum fluviatile);
(37) Bent-Awn Plumegrass (Erianthus contortus);
(38) Parker's Pipewort (Eriocaulon parkeri);
(39) White-Bracted Boneset (Eupatorium leucolepis);
(40) Darlington's Spurge (Euphorbia purpurea);
(41) Harper's Fimbristylis (Fimbristylis perpusilla);
(42) Box Huckleberry (Gaylussacia brachycera);
(43) Swamp-Pink (Helonias bullata);
(44) Featherfoil (Hottonia inflata);
(45) Creeping St. John's-Wort (Hypericum adpressum);
(46) Coppery St. John's-Wort (Hypericum denticulatum);
(47) Dwarf Iris (Iris verna);
(48) Red-Root (Lachnanthes caroliana);
(49) (Leersia hexandra);
(50) Star Duckweed (Lemna trisulca);
(51) Downy Bushclover (Lespedeza stuevei);
(52) Mudwort (Limosella subulata);
(53) Sandplain Flax (Linum intercursum);
(54) Pondspice (Litsea aestivalis);
(55) Canby's Lobelia (Lobelia canbyi);
(56) (Ludwigia glandulosa);
(57) Hairy Ludwigia (Ludwigia hirtella);
(58) Sessile-Leaved Water-Horehound (Lycopus amplectens);
(59) Erect Water-Hyssop (Mecardonia acuminata);
(60) Torrey's Dropseed (Muhlenbergia torreyana);
(61) Low Water-Milfoil (Myriophyllum humile);
(62) Floating-Heart (Nymphoides cordata);
(63) Virginia False-Gromwell (Onosmodium virginianum);
(64) Canby's Dropwort (Oxypolis canbyi);
(65) Tall Swamp Panicgrass (Panicum scabriusculum);
(66) Wright's Panicgrass (Panicum wrightianum);
(67) Kidneyleaf Grass-of-Parnassus (Parnassia asarifolia);
(68) Yellow Nailwort (Paronychia virginica);
(69) Walter's Paspalum (Paspalum dissectum);
(70) Canby's Mountain Lover (Paxistima canbyi);
(71) Blue Scorpion-Weed (Phacelia ranunculacea);
(72) Jacob's-Ladder (Polemonium van-bruntiae);
(73) Cross-Leaved Milkwort (Polygala cruciata);
(74) Dense-Flowered Knotweed (Polygonum densiflorum);
(75) Slender Rattlesnake-Root (Prenanthes autumnalis);
(76) Alleghany Plum (Prunus alleghaniensis);
(77) Short-Beaked Baldrush (Psilocarya nitens);
(78) Long-Beaked Baldrush (Psilocarya scirpoides);
(79) Harperella (Ptilimnium nodosum);
(80) One-Sided Pyrola (Pyrola secunda);
(81) Yellow Water-Crowfoot (Ranunculus flabellaris);
(82) (Rhynchosia tomentosa);
(83) Short-Bristled Hornedrush (Rhynchospora corniculata);
(84) Thread-Leaved Beakrush (Rhynchospora filifolia);
(85) Grass-Like Beakrush (Rhynchospora globularis);

(86) Clustered Beakrush (Rhynchospora glomerata);
(87) Drowned Hornedrush (Rhynchospora inundata);
(88) Torrey's Beakrush (Rhynchospora torreyana);
(89) Sacciolepis (Sacciolepis striata);
(90) Sessile-Fruited Arrowhead (Sagittaria rigida);
(91) Sandbar Willow (Salix exigua);
(92) Canby's Bulrush (Scirpus etuberculatus);
(93) Water Clubrush (Scirpus subterminalis);
(94) Slender Nutrush (Scleria minor);
(95) Pink Bog-Button (Sclerolepis uniflora);
(96) Halberd-Leaved Greenbrier (Smilax pseudo-china);
(97) Red-Berried Greenbrier (Smilax walteri);
(98) Showy Goldenrod (Solidago speciosa);
(99) Two-Flowered Bladderwort (Utricularia biflora);
(100) Fringed Yelloweyed-Grass (Xyris fimbriata);
(101) Small's Yelloweyed-Grass (Xyris smalliana).

.06 Endangered Extirpated Species.

A. Listing Criteria. The following factors shall be considered for listing a species as endangered extirpated:

(1) The species was once a viable component of the State's flora and fauna and there are no records of it naturally occurring in Maryland after 1950; or

(2) The species was once a viable component of the State's flora or fauna and recent scientific investigations have documented the loss of its habitat or disappearance of its population in Maryland.

B. Permits. Upon the discovery of a viable, naturally occurring population of any species in §§C — H, that species will be considered an endangered species and shall require the permits and conditions afforded to that status.

C. The following plant species are considered endangered extirpated throughout Maryland:

(1) Pine-Barren Gerardia (Agalinis virgata);
(2) Rough-Stemmed Wheatgrass (Agropyron trachycaulum);
(3) Golden Colicroot (Aletris aurea);
(4) Beach Pigweed (Amaranthus pumilus);
(5) Canada Anemone (Anemone canadensis);
(6) Great Angelica (Angelica atropurpurea);
(7) Filmy Angelica (Angelica triquinata);
(8) Arethusa (Arethusa bulbosa);
(9) Lake Cress (Armoracia aquatica);
(10) Bradley's Spleenwort (Asplenium bradleyi);
(11) Steele's Aster (Aster concinnus);
(12) Silvery Aster (Aster concolor);
(13) Showy Aster (Aster spectabilis);
(14) (Axonopus furcatus);
(15) Mat-Forming Water-Hyssop (Bacopa stragula);
(16) Sea Ox-Eye (Borrichia frutescens);
(17) Triangle Grape-Fern (Botrychium lanceolatum);
(18) Leathery Grape-Fern (Botrychium multifidum);
(19) Small Grape-Fern (Botrychium simplex);
(20) Blue-Hearts (Buchnera americana);
(21) Great Indian-Plantain (Cacalia muhlenbergii);
(22) (Carex careyana);
(23) Cypress-Knee Sedge (Carex decomposita);
(24) (Carex foenea);
(25) (Carex glaucescens);
(26) Lake-Bank Sedge (Carex lacustris);
(27) New England Sedge (Carex novae-angliae);
(28) Variable Sedge (Carex polymorpha);
(29) (Carex striatula);
(30) (Carex tenera);
(31) (Carex tetanica);
(32) Wood's Sedge (Carex woodii);
(33) Chaffweed (Centunculus minimus);
(34) Purple Clematis (Clematis occidentalis);
(35) Curly-Heads (Clematis ocroleuca);
(36) Rose Coreopsis (Coreopsis rosea);
(37) Pygmyweed (Crassula aquatica);
(38) Hazel Dodder (Cuscuta coryli);
(39) (Cyperus plukenetii);
(40) Showy Ladies'-Slipper (Cypripedium reginae);
(41) Few-Flowered Tick-Trefoil (Desmodium pauciflorum);
(42) (Digitaria villosa);
(43) (Eleocharis halophila);
(44) Three-Ribbed Spikerush (Eleocharis tricostata);
(45) Downy Willowherb (Epilobium strictum);
(46) Seven-Angled Pipewort (Eriocaulon septangulare);
(47) Tall Rattlesnake Master (Eryngium yuccifolium);
(48) (Festuca paradoxa);
(49) Pumpkin Ash (Fraxinus profunda);
(50) Small Bedstraw (Galium trifidum);
(51) (Gentiana puberula);
(52) Sea Milkwort (Glaux maritima);
(53) Sharp-Scaled Mannagrass (Glyceria acutiflora);
(54) Dwarf Rattlesnake-Plantain (Goodyera repens);
(55) Tesselated Rattlesnake-Plantain (Goodyera tesselata);
(56) (Gratiola ramosa);
(57) Rough Heuchera (Heuchera villosa);
(58) Sea-Beach Sandwort (Honkenya peploides);
(59) Nits-and-Lice (Hypericum drummondii);
(60) Clasping-Leaved St. John's-Wort (Hypericum gymnanthum);
(61) Great St. John's-Wort (Hypericum pyramidatum);
(62) Bloodleaf (Iresine rhizomatosa);
(63) Small Whorled Pogonia (Isotria medeoloides);
(64) Small-Headed Rush (Juncus brachycephalus);
(65) New Jersey Rush (Juncus caesariensis);
(66) (Juncus megacephalus);
(67) Bayonet Rush (Juncus militaris);
(68) Torrey's Rush (Juncus torreyi);
(69) Common Juniper (Juniperus communis);
(70) Narrow-Leaved Pinweed (Lechea tenuifolia);
(71) Catchfly-Grass (Leersia lenticularis);
(72) Long-Awned Diplanche (Leptochloa fascicularis);
(73) Fall Witchgrass (Leptoloma cognatum);
(74) Scaly Blazing-Star (Liatris squarrosa);
(75) American Lovage (Ligusticum canadense);
(76) American Frog's-Bit (Limnobium spongia);
(77) Twinflower (Linnaea borealis);
(78) Florida Yellow Flax (Linum floridanum);
(79) Heartleaf Twayblade (Listera cordata);
(80) (Lobelia glandulosa);
(81) Carolina Clubmoss (Lycopodium carolinianum);
(82) Large-Flowered Barbara's Buttons (Marshallia grandiflora);
(83) (Matelea decipiens);
(84) (Matelea obliqua);
(85) Broad-Leaved Bunchflower (Melanthium latifolium);
(86) Nuttall's Micranthemum (Micranthemum micranthemoides);
(87) Evergreen Bayberry (Myrica heterophylla);
(88) Thread-Like Naiad (Najas gracillima);
(89) Northern Panicgrass (Panicum boreale);
(90) May Grass (Pharlaris caroliniana);
(91) (Phlox carolina);

(92) (Phlox glaberrima);
(93) Mountain Phlox (Phlox latifola);
(94) Downy Phlox (Phlox pilosa);
(95) Heart-Leaved Plantain (Plantago cordata);
(96) Slender Plantain (Plantago pusilla);
(97) (Poa saltuensis);
(98) Clammyweed (Polansia dodecandra);
(99) America Ipecac (Porteranthus stipulatus);
(100) Redheadgrass (Potamogeton richardsonii);
(101) Robbins' Pondweed (Potamogeton robbinsii);
(102) Flatstem Pondweed (Potamogeton zosteriformis);
(103) Pale Mannagrass (Puccinellia pallida);
(104) Awned Mountain-Mint (Pycnanthemum setosum);
(105) Greenish-Flowered Pyrola (Pyrola virens);
(106) (Ranunculus hederaceus);
(107) Bristly Crowfoot (Ranunculus pensylvanicus);
(108) Awned Meadow-Beauty (Rhexia aristosa);
(109) Tiny-Headed Beakrush (Rhynchospora microcephala);
(110) Few-Flowered Beakrush (Rhynchospora rariflora);
(111) Wild Black Currant (Ribes americanum);
(112) Hairy Wild Petunia (Ruellia humilus);
(113) Pursh's Ruellia (Ruellia purshiana);
(114) Slender Marsh Pink (Sabatia campanulata);
(115) Lance-Leaved Sabatia (Sabatia difformis);
(116) Slender Arrowhead (Sagittaria teres);
(117) Shining Willow (Salix lucida);
(118) (Salvia urticifolia);
(119) Hard-Stem Bulrush (Scirpus acutus);
(120) Torrey's Clubrush (Scirpus torreyi);
(121) Shining Nutrush (Scleria nitida);
(122) Veined Skullcap (Scutellaria nervosa);
(123) Small Skullcap (Scutellaria parvula);
(124) Sand Blueeyed-Grass (Sisyrinchium arenicola);
(125) Mountain Goldenrod (Solidago roanensis);
(126) Rock Goldenrod (Solidago rupestris);
(127) (Sorghastrum elliottii);
(128) Indian-Pink (Spigelia marilandica);
(129) (Stachys aspera);
(130) Trailing Stitchwort (Stellaria alsine);
(131) (Tephrosia spicata);
(132) Coastal False Asphodel (Tofieldila racemosa);
(133) Auricled Gerardia (Tomanthera auriculata);
(134) Buffalo Clover (Trifolium reflexum);
(135) (Triglochin striatum);
(136) Tall Cornsalad (Valerianella umbilicata);
(137) Purple Vetch (Vicia americana);
(138) Wolffiella (Wolffiella floridana).

D. The following fish species are considered endangered extirpated throughout Maryland:
(1) Glassy Darter (Etheostoma vitreum);
(2) Stripeback Darter (Percina notograma);
(3) Trout-Perch (Percopsis omiscomaycus).

E. The following amphibian species is considered endangered extirpated throughout Maryland: Greater Siren (Siren lacertina).

F. The following reptile species is considered endangered extirpated throughout Maryland: Rainbow Snake (Farancia erytrogramma).

G. The following bird species are considered endangered extirpated throughout Maryland:
(1) Bachman's Sparrow (Aimophila aestivalis);
(2) Ivory-Billed Woodpecker (Campephilus principalis);
(3) Lark Sparrow (Chondestes grammacus);
(4) Eskimo Curlew (Numenius borealis);
(5) Red-Cockaded Woodpecker (Picoides borealis);
(6) Roseate Tern (Sterna dougallii);
(7) Greater Prairie Chicken (Tympanuchus cupido).

H. The following mammal species are considered endangered extirpated throughout Maryland:
(1) Gray Wolf (Canis lupus);
(2) American Elk (Cervus canadensis);
(3) Eastern Mountain Lion (Felis concolor);
(4) Snowshoe Hare (Lepus americanus);
(5) Marten (Martes americana).

.07 Threatened Species of Wildlife, Reptiles, Amphibians, Mollusks, Crustaceans, and Finfish.

A. Listing Criteria. The following factors shall be considered for listing species other than plant species as threatened:

(1) Whether the species has experienced a steady, substantial decline in Maryland, and if the decline continues, the species is likely to become endangered;

(2) Whether there has been steady, widespread loss of the species' essential habitat; or

(3) Whether protection measures already taken have significantly reduced the chances of the species becoming extirpated from Maryland.

B. Permits. The permit procedures to be followed are set forth in Regulation .03. The following apply:

(1) Except by special permit from the Director a person may not take, export, possess, process, sell, offer for sale, deliver, carry, transport or ship by any means any threatened wildlife, reptile, amphibian, mollusk, crustacean or finfish species.

(2) Permits to take threatened species shall be issued only for:

(a) Scientific research designed to enhance the recovery of the species or population;

(b) Other valid scientific research; or

(c) Educational purposes designed to further public awareness regarding the species.

(3) Incidental taking of a threatened wildlife, reptile, amphibian, mollusk, crustacean or finfish species shall be allowed only after the Director has been notified 30 days in advance of the change in land use or other action by a private landowner which shall result in the incidental taking. The Maryland Forest, Park and Wildlife Service, upon receipt of the application for an incidental taking permit from the landowner, shall within 30 days either:

(a) Take action to salvage the threatened species; or

(b) Issue to the landowner an incidental taking permit authorizing the landowner to proceed with the action which will result in the incidental taking of the species.

C. The following species are considered to be threatened throughout Maryland unless a smaller range is indicated:

(1) Crustaceans. Allegheny Cave Amphipod (Stygobromus allegheniensis).

(2) Insects. Rare Skipper (Problema bulenta).

(3) Reptiles.

(a) Atlantic Loggerhead Turtle (Caretta caretta);

(b) Atlantic Green Turtle (Chelonia mydas).

(4) Birds. Black Skimmer (Rynchops niger).

.08 Threatened Species of Plants.

A. Listing Criteria. The following factors shall be considered for listing a plant species as threatened:

(1) Whether the species has experienced a substantial decline in Maryland, and if the decline continues, the species is likely to become endangered;

(2) Whether there has been a steady widespread loss of the species' essential habitat; or

(3) Whether the species has been listed as endangered but it has been shown that protection measures taken have significantly reduced the chances of the species becoming extirpated from Maryland.

B. Permits. The permit procedures to be followed are set forth in Regulation .03. The following apply:

(1) Permits shall be issued only for scientific research designed to enhance the recovery of the species or population.

(2) A person may not:

(a) Export, possess, process, sell, offer for sale, deliver, carry, transport, or ship by any means any threatened plant species except by a special permit from the Director;

(b) Take any threatened plant species from State property except by special permit from the Director; and

(c) Take any threatened plant species from private property without the written permission of the landowner.

C. The following plant species are considered threatened throughout Maryland unless a smaller range is indicated:

(1) Single-Headed Pussytoes (Antennaria solitaria);

(2) Giant Cane (Arundinaria gigantea);

(3) Glade Fern (Athyrium pycnocarpon);

(4) Maryland Bur-Marigold (Bidens bidentoides);

(5) Button Sedge (Carex bullata);

(6) Shoreline Sedge (Carex hyalinolepis);

(7) Inflated Sedge (Carex vesicaria);

(8) Leatherleaf (Chamaedaphne calyculata);

(9) Red Turtlehead (Chelone obliqua);

(10) Goldenseal (Hydrastis canadenis);

(11) Deciduous Holly (Ilex decidua);

(12) Narrow-Leaved Bushclover (Lespedeza angustifolia);

(13) Wild Lupine (Lupinus perennis);

(14) Climbing Fern (Lygodium palmatum);

(15) American Lotus (Nelumbo lutea);

(16) Red Bay (Persea borbonia);

(17) Pale Green Orchis (Platanthera flava);

(18) Purple Fringeless Orchis (Platanthera peramoena);

(19) Spongy Lophotocarpus (Sagittaria calycina);

(20) Engelmann's Arrowhead (Sagitttaria engelmanniana);

(21) Northern Pitcher-Plant (Sarracenia purpurea);

(22) Virginia Mallow (Sida hermaphrodita);

(23) Featherbells (Stenanthium gramineum);

(24) Mountain Pimpernel (Taenidia montana);

(25) Steele's Meadowrue (Thalictrum steeleanum);

(26) Kate's-Mountain Clover (Trifolium virginicum);

(27) Dwarf Trillium (Trillium pusillum);

(28) Purple Bladderwort (Utricularia purpurea).

.09 Species in Need of Conservation.

A. Listing Criteria. The following factors shall be considered for listing a species as in need of conservation:

(1) Whether the population is limited or declining within Maryland; and

(2) Whether the species may become threatened in the foreseeable future, if current trends or conditions persist.

B. Permits. The permit procedures to be followed are set forth in Regulation .03. The following apply:

(1) Except by special permit, a person may not take, export, possess, process, sell, offer for sale, deliver, carry, transport, or ship by any means any species in need of conservation.

(2) Permits to take species in need of conservation shall be issued only for:

(a) Scientific research designed to enhance the recovery of the species or population;

(b) Other valid scientific research; or

(c) Educational purposes designed to further public awareness regarding the species.

(3) Incidental taking permits are not required for species in need of conservation.

C. The following species are considered to be in need of conservation throughout Maryland unless a smaller range is indicated:

(1) Insects. King's Hairstreak (Satyrium kingi).

(2) Fish. Blackbanded Sunfish (Enneacanthus chaetodon).

(3) Amphibians. Carpenter Frog (Rana virgatipes).

(4) Reptiles. Map Turtle (Graptemys geographica).

(5) Birds.

(a) Henslow's Sparrow (Ammodramus henslowii);

(b) Short-Eared Owl (Asio flammeus);

(c) American Bittern (Botaurus lentiginosus);

(d) Sedge Wren (Cistothorus platensis);

(e) Little Blue Heron (Egretta caerulea);

(f) Common Moorhen (Gallinula chloropus);

(g) American Oystercatcher (Haematopus palliatus);

(h) Least Bittern (Ixobrychus exilis);

(i) Black Rail (Laterallus jamaicensis);

(j) Swainson's Warbler (Limnothlypis swainsonii);

(k) Least Tern (Sterna antillarum).

(6) Mammals.

(a) Porcupine (Erethizon dorsatum);

(b) Bobcat (Lynx rufus);

(c) Least Weasel (Mustela nivalis);

(d) Small-Footed Bat (Myotis leibii);

(e) Southeastern Shrew (Sorex longirostris).

.10 Natural Heritage Areas.

A. Listing Criteria. In order to qualify as a natural heritage area a natural community shall:

(1) Contain one or more threatened or endangered species or wildlife species in need of conservation;

(2) Be a unique blend of geological, hydrological, climatological or biological features; and

(3) Be considered to be among the best Statewide examples of its kind.

B. The Forest, Park and Wildlife Service shall prepare maps describing the location of all natural heritage areas. The maps shall be filed in the office of the Director of the Forest, Park and Wildlife Service, Department of Natural Resources, Tawes State Office Building, Annapolis, MD 21401.

C. The following areas are designated natural heritage areas:

(1) Kasecamp Shale Barrens ..... Allegany County;

(2) Maple Run ..... Allegany County;

(3) Outdoor Club Shale Barrens ..... Allegany County;

(4) Sideling Hill Creek .. Allegany, Washington County;

(5) Cypress Creek Swamp ..... Anne Arundel County;

(6) Eagle Hill Bog ..... Anne Arundel County;

(7) Upper Patuxent Marshes .. Anne Arundel, Prince George's County;

(8) Black Marsh ..... Baltimore County;

(9) Robert E. Lee Park ..... Baltimore County;

(10) Camp Roosevelt Cliffs ..... Calvert County;

(11) Cove Point Marsh ..... Calvert County;

(12) Flag Ponds ..... Calvert County;

(13) Randle Cliff Beach ..... Calvert County;

(14) Grove Neck ..... Cecil County;
(15) Plum Creek ..... Cecil County;
(16) Allen's Fresh ..... Charles County;
(17) Chicamuxen Creek ..... Charles County;
(18) Popes Creek ..... Charles County;
(19) Upper Nanjemoy Creek ..... Charles County;
(20) Chicone Creek ..... Dorchester County;
(21) Mill Creek ..... Dorchester County;
(22) Savanna Lake ..... Dorchester County;
(23) Upper Blackwater River ..... Dorchester County;
(24) Upper Nanticoke River, Marshes and Swamps ..... Dorchester, Wicomico County;
(25) High Rock ..... Garrett County;
(26) Toliver Run ..... Garrett County;
(27) Great Falls ..... Montgomery County;
(28) Irish Grove ..... Somerset County;
(29) Hickory Point Cypress Swamp ... Worcester County;
(30) Lower Nassawango Creek ..... Worcester County;
(31) Mattaponi ..... Worcester County;
(32) North Sinepuxent Bay Dunes .... Worcester County.

.11 Violation of Regulations.

Violation of these regulations is a misdemeanor punishable under Natural Resources Articles, §§10-2A-07, 10-1101 et seq., 4-2A-07, and 4-1201 et seq., Annotated Code of Maryland.

TORREY C. BROWN, M.D.
Secretary of Natural Resources

Subtitle 05 WATER RESOURCES ADMINISTRATION

08.05.03 Construction on Non-Tidal Waters and Floodplains

Authority: Natural Resources Article §§8-801 thru 8-814, Annotated Code of Maryland

Notice of Proposed Action

[87-060-P]

The Secretary of Natural Resources proposes to amend Regulation .03 under **COMAR 08.05.03 Construction on Non-Tidal Waters and Floodplains.** The purpose of this amendment is to delete certain exemptions for projects in environmentally sensitive areas of the State's waterways.

Estimate of Economic Impact

I. Summary of Economic Impact. Natural Resources Article, §8-803, Annotated Code of Maryland, requires that any person wishing to change in any manner the course, current, or cross-section of any stream or body of water, first obtain a permit from the Department. Permits are obtained following the submittal of an application and accompanying documentation prescribed in **COMAR.** Regulations governing these activities have existed since the 1930's and have been amended from time-to-time in order to keep pace with goals and objectives of the Department of Natural Resources. The regulatory changes proposed at this time are necessary in order to incorporate those items the General Assembly recognized as necessary in order to preserve and enhance the quality of the State's water resources as they relate to the Chesapeake Bay.

II. Types of Economic Impacts.	Revenue (+) Expense (−)	Magnitude
A. On issuing agency: The Department expects an increase in workload as a result of the deletion of certain exemptions.	(−)	$141,000
B. On other State or local agencies affected: Additional cost to prepare submittals to the Department for review and approval.	(−)	Indeterminable. Depends on amount of applications received from other agencies.
C. On regulated industries or trade groups: 1. Additional cost to prepare engineered submittals to the Department for review and approval.	(−)	$500,000
2. Cost to persons obtaining a permit due to processing time.	(−)	$87,250
3. Time delay for those projects that require an administrative opportunity for a public hearing.	(−)	$105,000
D. On other industries or trade groups affected: Certain delays in starting the intended works may be incurred to the permit applicant as a result of the regulatory process. These delays could be borne by trade groups or subcontractors as a result of scheduling problems.	(−)	Determined on a case-by-case basis but could result in lost earnings to trade groups.
E. Direct and indirect effects on public:	(+)	Could be very large.

III. Assumptions. (Identified by Impact Letter and Number from Section II):

A. A 20 percent increase in applications received is anticipated which would bring the total number of files reviewed by WRA to 1,200 yearly. Each engineer reviews an average of 174 files per year and an inspector inspects an average of 72 waterway permit projects yearly. Based upon the current staff available, it is projected that 1 engineering and 2 inspector positions will be required.

B. An estimated expense to other State and local agencies would be based upon the time and material required to prepare permit applications.

C.1. Given an estimated increase in permit applications of 200 per year, an estimated project cost of $25,000, and an average application preparation fee of 10 percent of the project cost.

C.2. This cost is based on a minimum time to obtain a permit of one month and interest of 12 percent per annum on an average project cost of $25,000.

C.3. This cost is based on a minimum time delay of 2 additional months in permit processing time due to an expected 50 percent increase in the number of applications received. Also included is an average hearing notice publication cost of $100 per permit.

D. Depending on the amount of detailed submittals required for a particular project, time delays will result to the construction industry. In addition, improper implementation of the construction drawings, which cannot be anticipated, can result in time delays to the contractor.

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