

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

MARYLAND
NATURAL
HERITAGE
PROGRAM

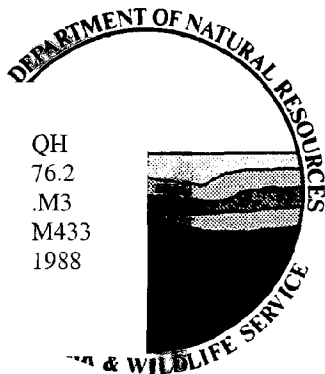


Maryland's Coastal Zone Management Program

QH 76.2.M3 M433 1988

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Helonias bullata
SWAMP PINK

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FINAL REPORT

SUBMITTED TO:

Coastal Resources Division
Tidewater Administration

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December 31, 1988

Preparation of this report was partially
funded by the Office of Ocean and Coastal
Resources Management, National Oceanic
and Atmospheric Administration

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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.

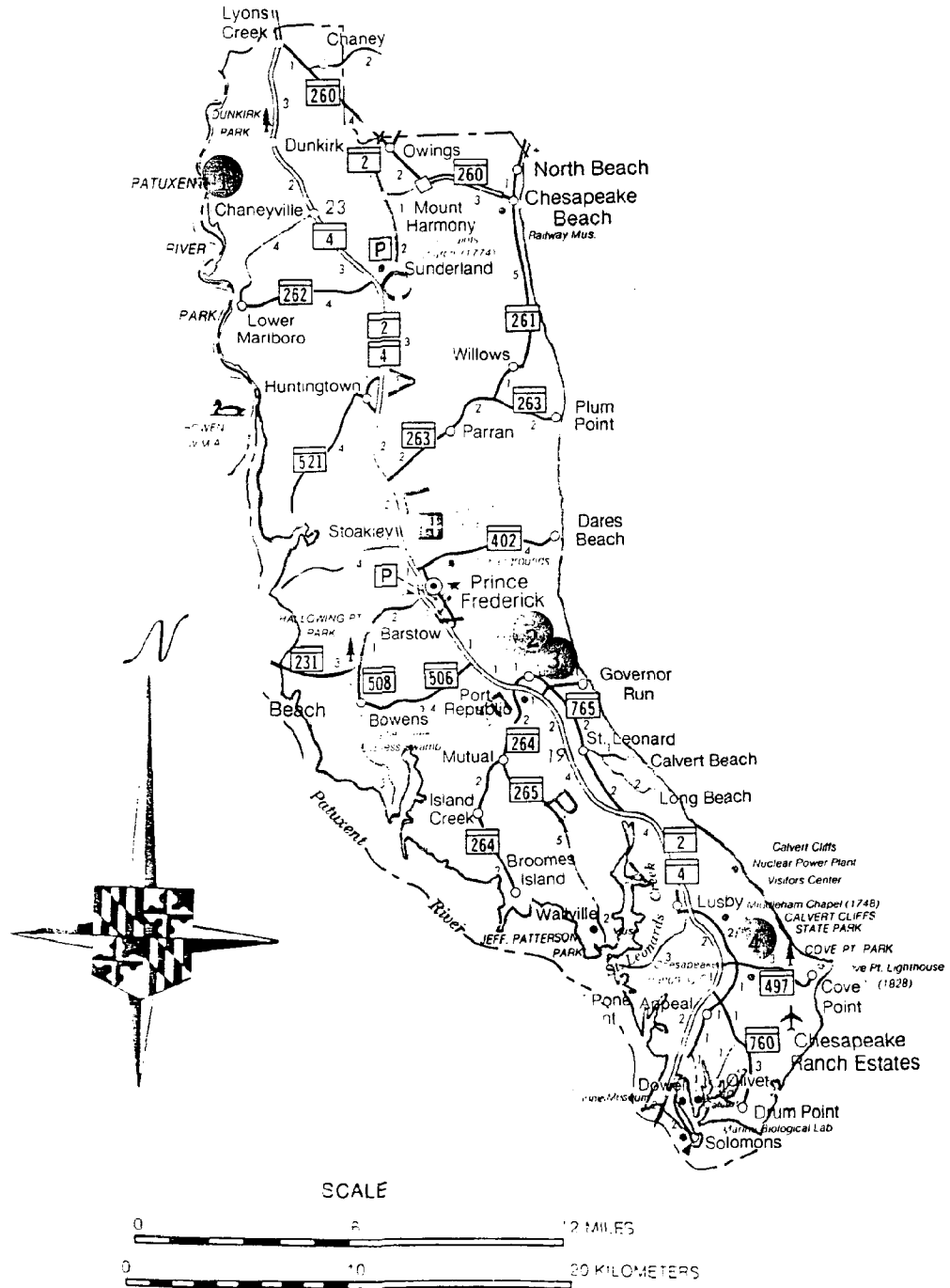
The delineation of buffers varies depending on the type of habitat, surrounding land use, habitat requirements of the rare species, local hydrology, and possible future threats. Reasonable and effective buffers were determined after careful consideration of these factors.

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.

CALVERT COUNTY



① = 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.)

CALVERT COUNTY: Protection Area Locations

<u>Protection Area</u>	<u>Site # on County Map</u>
Calvert Cliffs State Park.....	4
Patuxent Highlands.....	1
Port Republic Watershed.....	2
West Governor Run Watershed.....	3

<u>Site # on County Map</u>	<u>Protection Area</u>
1.....	Patuxent Highlands
2.....	Port Republic Watershed
3.....	West Governor Run Watershed
4.....	Calvert Cliffs State Park

PROTECTION AREA SUMMARY

Protection Area Name: Calvert Cliffs State Park

County: Calvert

USGS Quad: Cove Point

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Along the streams that dissect this protection area are excellent examples of old Tulip Tree-Sweet Bay-American Holly bottomland forest, Red Maple-Sweet Gum swamp forest, and old mixed oaks upland forest. This is among the largest contiguous tracts of old forests remaining in Calvert County. Numerous trees, including oaks and Tulip Tree, measure greater than 2 ft. in diameter. The presence of many dead standing trees and well-decayed logs and the uneven age of the trees reveal that these are old forests. The lack of non-native, weedy species indicates that this area has received little recent disturbance.

The forested ravines and uplands maintain the high water quality of the streams in the protection area. Nearly the entire watershed of these streams occurs on State-owned land and is forested. Protection of these forests would also protect the water quality of this second-order stream complex that feeds directly into the Chesapeake Bay.

The old forests of the protection area provide outstanding habitat for many species of wildlife. An owl and numerous woodpeckers were observed during the field survey. These species nest in the cavities of the large, old trees. The maturity of the forest and the lack of disturbance in the area provide excellent conditions for forest interior breeding birds. These species are declining in abundance in this region as forests are cleared for residential and commercial development and for timber harvest. Herons and beaver frequent the swamps at the mouths of the creeks. The swamps also provide habitat for ducks, amphibians, and reptiles. Deer are present throughout the protection area.

These old forests provide important educational resources to both scientists and local residents. Because this area has received minimal disturbance, the forests provide a laboratory for the research of animals and plants in their natural habitats. Large, old, relatively undisturbed forests such as these are essential for scientists to study the natural processes that sustain the forest and assess the effects of human-induced changes to the forests of this region. Plans to construct a nature center in the park have been proposed; such a facility would enhance the opportunity for environmental education. Local

residents, including students at local schools, may learn the natural history of the area with assistance from interpreters affiliated with the nature center.

OTHER VALUES OF SIGNIFICANCE:

The well-developed soils and lack of recent clearing or selective cutting in the old forests provide excellent growing conditions for rare plant species that inhabit this County. The forest has not been surveyed for rare herbaceous plants; however, because the habitat is of such high quality it is possible that future survey will reveal rare plant populations within the protection area.

Protection of this area will provide additional protection to the adjacent Cove Point Natural Heritage Area. The portion of this Natural Heritage Area within the park harbors two rare species of insects known from fewer than eight other sites in Maryland. These species are rare throughout their ranges. Protection of this area will also provide additional protection for a nearby Bald Eagle nesting site.

The forests provide excellent recreational opportunities to hikers, birdwatchers, and naturalists. The existing trails provide access to much of the park.

THREATS AND MANAGEMENT NEEDS:

Threats

Forest clearing or selective cutting within the protection area would eliminate the old character of the forest, reduce the habitat quality for many species of wildlife, threaten the water quality of the streams, and reduce the quality of growing conditions for rare plants. Many species of wildlife require large, old trees for nesting sites. In addition, many species of forest interior birds and plants require the well-developed canopy and deep shade of the old forest. Opening of the canopy would allow the establishment of non-native, weedy plants that outcompete the native plant species. Forest interior dwelling birds would gradually be eliminated by forest edge species that thrive near clearings. The cutting of trees would cause soil erosion and potential sedimentation of the streams and, ultimately, the Chesapeake Bay.

Erosion along existing roads and trails also contributes to sedimentation of the streams.

Management Needs

Clearing and selective cutting of trees should not occur within the protection area. An extensive trail system exists that provides access to much of the area.

Erosion along existing trails should be reduced. Methods of erosion control should not detract from the natural character of the area. Some of the trails slope downhill and therefore promote soil erosion; these sections of trails may require regrading.

Many species of forest interior birds are sensitive to disturbances such as noise. Visitors to the park should be encouraged to stay on the trails, particularly if a nature center is constructed and visitation increases.

BOUNDARY RECOMMENDATIONS:

To the south, the protection area extends to the northern edge of the wetlands of Gray's Creek. Fields border the protection area to the west and northwest. Existing fields near the center of the protection area are excluded. To the northeast, the boundary follows a dirt road north of Grover Creek.

SITE DESCRIPTION SUMMARY

American Holly dominates the ravines near the headwaters of the streams in this 165 acre protection area. Proceeding downstream, Tulip Tree, Sweet Gum, and Red Maple are increasingly abundant. Seepage swamps dominated by Sweet Pepperbush and sphagnum occur at the base of steep slopes. Sheep Laurel grows next to one of these swamps; this species is rare in Calvert County. The stream valleys broaden into swamp forests near the Chesapeake Bay. The water quality of the streams and wetlands appears to be exceptionally high.

The uplands are dominated by oaks, particularly White Oak and Southern Red Oak. Mountain Laurel is abundant in some areas. Many upland trees are 2-3 ft. in diameter and appear to be over 100 years old. The many dead standing trees and decaying logs are characteristic of an old forest. Pines are abundant in isolated areas that were relatively recently cleared. Other than these pine stands, there is little evidence of recent disturbance to the uplands.

Trails and a service road cross the protection area. Fields are maintained along the western and northwestern borders of this site. A stream was dammed to form a pond at the southwestern

edge of the protection area. The area near the pond is maintained as a picnic and recreation area. The land to the northeast and south of the protection area is forested.

Prepared by: Katharine A. McCarthy

Date: December 1988

PROTECTION AREA SUMMARY

Protection Area Name: Patuxent Highlands

County: Calvert

USGS Quad: Lower Marlboro

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Wetlands at the base of these ravines harbor a rare plant known from just one other site in Maryland. Historical records indicate that this species has always been rare in the State. This site is near the northern extreme of the plant's range, and the nonacidic wetland habitat that this species requires is rare in Maryland. Protection of the two known sites for this species is therefore particularly important because it is likely that few other suitable sites exist in the State.

OTHER VALUES OF SIGNIFICANCE:

The forested watershed maintains high water quality in the wetlands. A small area along the wetlands has been cleared and maintained as a lawn; however, most of the watershed remains forested. These wetlands feed directly into the Patuxent River and contribute to the maintenance of water quality in the river.

Although there is evidence of selective cutting on the uplands, numerous large trees are present and provide excellent nesting and den sites for many species of wildlife.

THREATS AND MANAGEMENT NEEDS:

Threats

A decline in the quality or change in the quantity of water in the wetlands may eliminate the rare species. The clearing of trees within the protection area or in the adjacent Critical Area would increase runoff to the wetlands and promote erosion of the unstable soils. Because the soils of this site are unusually fragile, the use of heavy equipment for forest clearing or other purposes would be very destructive and would contribute to sedimentation of the wetlands.

Management Needs

The maintenance of water quality in the wetlands is essential to the survival of the rare plant species. Trees should not be cleared within the protection area; forest cover should be maintained throughout this area. The area near the

Patuxent River that is maintained as lawn adjacent to the wetland should be allowed to revert to forest to form a buffer on the north edge of the wetland. Heavy equipment should not be used within the protection area.

BOUNDARY RECOMMENDATIONS:

The rare species' wetland habitat and the slopes that drain into these wetlands are included within the protection area. The adjacent Critical Area is outside the scope of this report, but should be protected since it harbors the rare species.

SITE DESCRIPTION SUMMARY:

Within this 128 acre protection area, three ravines drain into a wetland that harbors a rare plant species. Sycamore, Tulip Tree, and Sweet Gum dominate the wetland canopy. Spicebush is abundant. In areas that have been disturbed, greenbrier and non-native, weedy species are encroaching. Water flows from the wetlands directly into the Patuxent River. The adjacent uplands are dominated by Beech and Tulip Tree. Mountain Laurel is common in some areas. Virginia Pine is present where clearing occurred. Unstable soils are eroding on a slope that was disturbed by a selective timber harvest more than 15 years ago.

Abandoned houses are present on the upland along the Patuxent River just north of the wetlands. The Patuxent River forms the western edge of the protection area. Cultivated fields border the protection area to the east and northwest. To the south is forested land.

Prepared by: Katharine A. McCarthy

Date: December 1988

PROTECTION AREA SUMMARY

Protection Area Name: Port Republic Watershed

County: Calvert

USGS Quad: Prince Frederick

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Port Republic Watershed Protection Area contains one of the few complete second-order watersheds remaining in a relatively natural, forested condition in this region. Many large forests have been cleared or fragmented for agriculture or for residential or commercial development. Although most of the watershed has been logged within the past 100 years, the steep slopes do not appear to have suffered from the severe erosion that has affected many previously cultivated steep slopes in parts of Southern Maryland. Underlying Miocene marl deposits have produced a band of soils that are porous and much less acidic than most soils of the Coastal Plain. The circumneutral soils support a diverse group of plants that are uncommon in this region. Springs and seepage wetlands are common in these porous soils.

Parker Creek, into which this watershed drains, is unusual in that it is a "barbed" watershed. It once flowed west, rather than east, as evidenced by the direction of its feeder streams. The second-order stream featured in this protection area flows north into Parker Creek, resulting in many lateral ravines with cool, north-facing slopes. Topography, geology, and hydrology combine to produce a flora that is very unusual for the Coastal Plain. North-facing slopes, calcareous soils, and wetland seeps create microhabitats that are more characteristic of the mountain and Piedmont physiographic provinces--cool, nutrient-rich, and moist. Many disjunct populations of species more common in the mountains or Piedmont, such as Miterwort and Golden Saxifrage, occur in these microhabitats.

Populations of six rare plant species occur within this protection area. Four of these are each known from fewer than five locations in Maryland. For one of these species, the Port Republic Watershed population is the only currently known population in the State.

OTHER VALUES AND SIGNIFICANCE:

This site adjoins a Listed Species Habitat Protection Area in the Critical Area. Port Republic Watershed may contain additional, undiscovered populations of the listed species. Protection of this site will also help preserve the water quality and scenic qualities of the larger Parker Creek watershed.

The small non-tidal wetlands (springs and seeps) and the clear-flowing streams in Port Republic Watershed provide excellent breeding and feeding habitat for wildlife such as amphibians and songbirds. The large size of the contiguous forest and its relative maturity make this site suitable habitat for a great diversity of forest interior breeding birds.

The research potential and educational opportunities offered by a large, forested watershed such as this one are enormous. Studies of the effects of human activities in altered ecological systems require undisturbed sites for comparison. For this purpose, a forest in the later stages of transition to an old-growth condition, like Port Republic Watershed, is a rare and invaluable resource.

THREATS AND MANAGEMENT NEEDS:

Threats

The greatest threat to the natural character of the protection area and to the rare species would be the clearing of the forest. Clearcutting would result in soil erosion and compaction, loss of nutrients, and alteration of the hydrologic features essential to the unique botanical communities found here. Increased sunlight would allow the invasion of weedy non-native species which could take over areas previously occupied by rare or unusual species.

Because much of the forest cover is oak, Gypsy Moth-induced mortality of trees could pose a serious threat.

Management Needs

Existing hardwood forest and mixed hardwood forests should be left in a natural state. No silvicultural management should be practiced on the steep slopes.

The forest should be evaluated for susceptibility to Gypsy Moth-induced mortality (not merely defoliation). If this risk appears significant, Gypsy Moth infestation should be controlled by the use of the biological control--Bt, not by the long-lasting and broad-spectrum insecticide known as Dimilin.

BOUNDARY RECOMMENDATIONS:

The protection area boundary contains the Port Republic watershed, including its tributaries. It does not include residences already located on the uplands. The northern boundary of the protection area is the boundary of the Critical Area.

SITE DESCRIPTION SUMMARY:

This 644 acre protection area is a steep, forested, second-order watershed which flows north into Parker Creek, an unusual "barbed" watershed. Although the area was farmed in past centuries and portions were logged earlier in this century, much of the second growth forest is now approaching old growth stage and supports an unusual diversity of native species. The uplands are forested with mixed hardwoods, especially Red Oak, Chestnut Oak, Spanish Oak, and hickories. American Beech is found on some of the dry slopes and ridges. Virginia and Loblolly Pines are most common in the driest sites and those most recently logged. American Chestnut was once the dominant tree in the region but is now represented primarily by root sprouts and an occasional taller, usually blighted tree. American Holly and blueberry are common in the understory. In the wetter areas and woodland margins, Tulip Tree and Sweet Gum are common. Many of the north-facing slopes are cool and moist, supporting plants more typical of the Mountains and Piedmont than the Coastal Plain. Among these are Wild Geranium, Bloodroot, and the only known specimen of Great Laurel from Maryland's Coastal Plain.

Red Maple and Swamp Chestnut Oak grow in the bottomland forest, where Spicebush and numerous wetland sedges, grasses and ferns occur. Wetland springs and seeps are common in the porous, circumneutral soils of the lower slopes, where calcareous Miocene deposits surface. In these wetlands grow plants unusual for the Coastal Plain, such as Golden Saxifrage and Spring Cress.

Prepared by: Judith L. Robertson

Date: December 1988

PROTECTION AREA SUMMARY

Protection Area Name: West Governor Run Watershed

County: Calvert

USGS Quad: Prince Frederick

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

West Governor Run Watershed contains a mature hardwood forest, many portions of which have not been logged for 70 years or more. Older forests such as this are uncommon in the region, due to the clearing of forests for timber management, agriculture, and residential and commercial development. Old maps show that this site was one of the largest forested sites in the area in the mid-1800s, when most of coastal Calvert County had been cleared for agriculture, especially tobacco farming. A number of uncommon plants grow at this site because of its unusual geology and the deep humus and litter layers that have developed in the absence of recent soil disturbance. Underlying marl deposits from the Miocene Epoch have produced soils that are much less acidic than most Coastal Plain soils. These circumneutral soils support several plant species found more often in the mountains and Piedmont than on the Coastal Plain.

Seven rare plant species grow within this protection area. This is the only known site in the State for one species, which is rare in neighboring states as well as in Maryland. Two additional species are each known from only one other site in the State. Another species is known from fewer than five other locations in Maryland.

OTHER VALUES AND SIGNIFICANCE:

This forested watershed provides excellent habitat for forest interior species of breeding birds, which require large tracts of contiguous, relatively old forest. The snags, blow downs and hollow trees characteristic of this older second growth forest provide suitable nest and den sites for many species of wildlife.

THREATS AND MANAGEMENT NEEDS:

Threats

Clearing of the forest would pose a serious threat to the protection area. Besides direct loss of rare species habitat, removal of the forest cover would result in soil compaction and erosion on the steeper slopes, loss of soil nutrients, and an increase in weedy, non-native plant species which would

proliferate and exclude native species. The rare plant species at this site require very specific microhabitats and any disturbance to the soil, light, or moisture regimes could destroy these populations.

Because much of the forest is dominated by oak trees, Gypsy Moth-induced tree mortality could pose a serious threat.

Management Needs

No removal of forest vegetation should be conducted within the protection area.

The risk of Gypsy Moth-induced mortality to trees in this forest should be evaluated. If the risk is high, Gypsy Moths should be controlled by the use of the biological control--Bt, not by the long-lasting and broad-spectrum insecticide known as Dimilin.

BOUNDARY RECOMMENDATIONS:

The protection area boundary includes the rare species habitats, adjacent potential habitat, contiguous riparian forest which provides breeding habitat for forest interior birds, and a forested buffer. The buffer extends to the top of the slope above the rare species populations to avoid potential impacts on soil, hydrology, or exposure that would affect the rare species. It extends 300 ft. south of the stream that flows through the site. In order to maintain a contiguous forest sufficiently large to support forest interior species of breeding birds, the boundary includes two forested corridors that connect this site to Port Republic Watershed protection area.

SITE DESCRIPTION SUMMARY;

This 185 acre site encompasses the major portion of a forested watershed which flows east into the Chesapeake Bay. Portions of the upland may not have been timbered for more than 100 years. The dry slopes are dominated by Red Oak, White Oak, and Spanish Oak; hickories are also found in the canopy. American Beech and American Holly dominate the understory, which is quite open. A few Flowering Dogwoods are also present. The dominant shrub is Vaccinium sp., and Mountain Laurel and Strawberry Bush also occur. The leaf litter is thick and the humus layer is deep and moist, supporting such species as Indian Pipe, Striped Wintergreen, and a rare wildflower.

Pawpaw grows on the lower slopes of the site, in the circumneutral soils caused by calcareous Miocene deposits. Yellow Corydalis and Winged Monkeyflower also require calcareous soils, and are found the moist bottomland. The lower stream

valley has been more disturbed than the dry slopes. Non-native Field Garlic is evidence of past livestock grazing. The lack of cut stumps and the abundance of Fox Grape vines suggest that the lower valley may have been logged about 50 years ago.

Prepared by: Judith L. Robertson

Date: December 1988

REFERENCES

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

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Final Action On Regulations

1471

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 Em-
ployables

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 need 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 notogramma*, *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 practicable, 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 jorii*);
- (20) Dark Green Sedge (*Carex venusta*);
- (21) Marsh Wild Senna (*Cassia fasciculata* var. *macroperma*);
- (22) Spreading Pogonia (*Cleistes divaricata*);
- (23) Wrinkled Jointgrass (*Coelorachis rugosa*);
- (24) Wister's Coralroot (*Corallorrhiza 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 perpustilla*);
- (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 carolina*);
- (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 amplexifolius*);
- (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 smaliana*).

.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 trachycalum*);
- (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 (*Borrchia 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 oroleuca*);
- (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 tessellata*);
- (56) (*Gratiola ramosa*);
- (57) Rough Heuchera (*Heuchera villosa*);
- (58) Sea-Beach Sandwort (*Honkenya peploides*);
- (59) Nits-and-Lice (*Hypericum drummondii*);
- (60) Claspng-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 Diplanthe (*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 (*Phalaris caroliniana*);
- (91) (*Phlox carolina*);

- (92) *Phlox glaberrima*;
 (93) Mountain Phlox (*Phlox latifolia*);
 (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 humilis*);
 (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 (*Tofieldia 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 notogramma*);
 (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 canadensis*);
- (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 (*Sagittaria 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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