MARYLAND
NATURAL
HERITAGE
PROGRAM

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

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Sagittaria engelmanniana
Engelmann's Arrowhead

MANAGEMENT PROGRAMS FOR SIGNIFICANT PLANT AND WILDLIFE HABITAT AREAS IN WICOMICO COUNTY

FINAL REPORT

SUBMITTED TO:

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Tidewater Administration

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MANAGEMENT PROGRAMS FOR SIGNIFICANT PLANT AND WILDLIFE HABITAT AREAS IN WICOMICO COUNTY

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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 Geographic Areas of Particular Concern (GAPC) and Areas for Preservation and Restoration (APR) requirements of the Federal Coastal Zone Management Act. 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."

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 Shore.

By January 1987, the Coastal Resources Division and the Maryland Natural Heritage Program established specific objectives to accomplish the project on Maryland's Eastern Shore, from Kent County south. These objectives were:

1. identify criteria for the selection of significant plant and wildlife habitat areas, and conduct a field inventory of selected 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 habitat significance, in order to identify species and habitats associated with each site;

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

4. determine appropriate boundaries for each site including needed buffer areas; and

5. collect other locational information pertinent to the application of management mechanisms for a particular 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.

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.

based upon habitat data supplemented by National Wetland Inventory maps, aerial infrared photographs, and county soil surveys. The field staff surveyed sites when the species could be accurately identified according to phenological and taxonomic information.

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 2 wetland communities;

   ii. For 10- to 100-acre complexes, presence of at least 4 wetland communities; or

   iii. For complexes greater than 100 acres, presence of at least 6 communities.

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

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 (Taxodium distichum), or Atlantic White Cedar (Chamaecyparis thyoides).

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 the 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 a number of criteria which were assessed during the field inventory. These criteria are as follows:

1. Site contains species which 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. The presence of recent disturbances which will change the current character of the site by diminishing its natural ecologic balance may be reason to exclude a site from selection.

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 actions (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. Anticipated future land-use must not conflict with protection of the habitat.

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

SITE PROTECTION IMPLEMENTATION METHODS:

This section will be used in 1988 for the implementation of site protection. 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 available confer varying degrees of protection security and of landowner control. They range from designations which afford no legal protection to acquisition by a conservation organization. The following list describes the available options and the degree of protection which they provide. Because the significance and consequences of each mechanism varies, some sites may receive simultaneous protection from more than one type.

Natural area protection may be accomplished by a number of 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 which 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 promote 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. 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 his property until his 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 .08.03.03 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 1988. These tasks, described below, involve the further identification and protection of significant habitats within the coastal zone.

Next year, the methodology developed in this project will be utilized to continue the identification of significant plant and wildlife habitats in coastal counties west of the Chesapeake Bay. Protection Area Summaries identical in format to those used in 1987 will be completed for significant sites. Three counties, Baltimore, Harford, and Prince Georges have hired personnel (with the assistance of the Coastal Resources Division) to help complete this task in their counties.

Additionally, 1988 will mark the beginning of site protection implementation. Those areas identified in 1987 are now candidates for protection, and efforts will begin to insure that each site is protected. The effort required to afford protection to each site is great, and this task should continue into the 1990's. Significant areas identified in 1988 will also become candidates. It is important to note that many additional sites will be identified on Maryland's Eastern Shore, and these areas can and will be protected 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 will be 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 - the major reasons for protecting the site are summarized. This section, along with the following element summary table, describes the key ecologic significance of the protection area.

Both the rare species and habitat are considered significant. For some of the protection areas the habitat is described in this section. In others, rare plants or animals may be listed and their status with the State is given. In some cases, only the most endangered species are mentioned here, leaving the others to be mentioned in the element summary table.

ELEMENT SUMMARY TABLE - Each of the rare species currently known to occur at the site is listed. The scientific name is given along with the common name. In some cases, no common name was assigned to the species; therefore, only the scientific name is used.

The Maryland Natural Heritage Program has assigned all the rare species a rank based on their status nationally, within the region, or within the State. In addition, many of these species have been listed in the revised Department of Natural Resource's Regulations .01 - .11 under COMAR .08.03.08 Threatened and

rare species habitat (which includes additional buffer land), a safe haven is provided for wildlife and for the perpetuation of naturally functioning ecosystem processes.

Many of the proposed protection areas are adjacent to or part of designated management areas. They may overlap with or abut upon State Forests or Parks, State Scenic Rivers, Natural Heritage Areas or Nature Conservancy protection areas. 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.

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 may be included as buffer. Surrounding forest may be designated for many reasons. These include maintaining canopy cover to prevent the invasion of weedy or exotic species, stabilizing soils to prevent sedimentation of waterways, filtering out chemicals or excess nutrients, and maintaining hydrology.

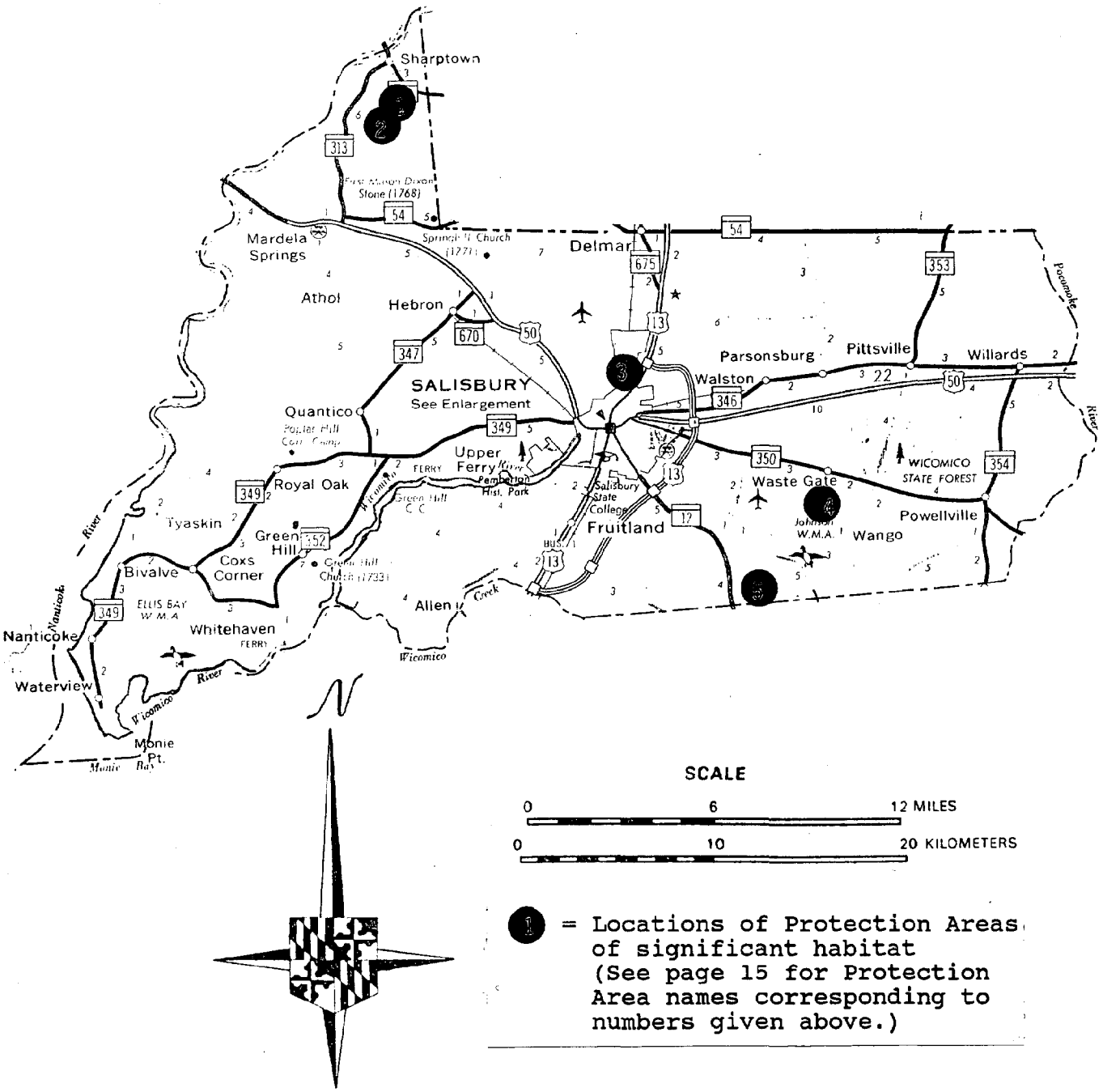
The delineation of buffers varies depending on the habitat, surrounding land use, protection of the species and its habitat, local hydrology, and possible future threats. Reasonable and effective buffers were determined after careful consideration of these factors.

Maps 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 of the natural communities is discussed and its relationship to surrounding communities is described. In addition, 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 Design Summary except when no common name is available. When a specific species is named, the common name is capitalized.

WICOMICO COUNTY



1 = Locations of Protection Areas of significant habitat (See page 15 for Protection Area names corresponding to numbers given above.)

WICOMICO COUNTY: Protection Area Locations

PROTECTION AREA SUMMARY

Protection Area Name: Horsebridge Creek Powerline

County: Wicomico USGS Quad: Wango

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

The Horsebridge Creek Powerline right-of-way is kept free of woody species through active management. This open habitat has a sphagnous wetland of emergent vegetation including four rare species. During pre-settlement history, fires and floods created and maintained similar habitats. Now that these natural phenomena have been artificially suppressed, powerline right-of-ways provide some of the only habitat for species which require open, early successional conditions.

In the early 1980's four rare species were reported from this site including Long-beaked Baldrush (Psilocarya scirpoides), Fibrous Bladderwort (Utricularia fibrosa), Fringed-Yelloweyed-grass (Xyris fimbriata), and Small's Yelloweyed-grass (Xyris smalliana). All of these species may persist at this site. During the 1987 field survey, one State Endangered Species, two State Threatened Species, and a Watch List Species were observed in this powerline.

ELEMENT SUMMARY TABLE:

Element Name	Common Name	Status
Psilocarya scirpoides	Long-beaked Baldrush	Endangered
Sclerolepis uniflora	Pink Bog-button	Endangered
Xyris fimbriata	Fringed Yelloweyed-grass	Endangered
Xyris smalliana	Small's Yelloweyed-grass	Endangered
Sagittaria engelmaniana	Engelmann's Arrowhead	Threatened
Sarracenia purpurea	Northern Pitcher-plant	Threatened
Utricularia fibrosa	Fibrous Bladderwort	State Rare
Drosera rotundifolia	Round-leaved Sundew	Watch List

OTHER VALUES AND SIGNIFICANCE:

This area provides an opportunity to research the effects of an active ditch on a significant wetland.

THREATS AND MANAGEMENT NEEDS:

Threats

Many non-native, weed species are invading the more disturbed sections of the powerline right-of-way, competing with native species. These weeds establish in soil that has been disturbed and compacted by off-road vehicles.

Wetland drainage via Horsebridge Creek ditch also threatens the survival of the rare species. This deep ditch in close proximity to the significant wetland may have already degraded the area by lowering its water table. Research is needed to determine the severity of this threat.

Management Needs

Current right-of-way management practices do not appear to be detrimental to the rare species populations and habitats. It is recommended that off-road vehicles be prohibited from entering the protection area.

It is important to research the effect of the ditch on the wetland's hydrology and to monitor the non-native vegetation and rare species populations.

BOUNDARY RECOMMENDATIONS:

The protection area boundary includes all areas of the powerline right-of-way which contain rare species. Also included is a buffer along the right-of-way and in adjacent woodland.

SITE DESCRIPTION SUMMARY:

A small, sphagnous wetland is the prominent feature of ecological significance in this 23 acre protection area. The emergent, herbaceous wetland is located along the powerline right-of-way 100 ft. north of the Horsebridge Creek ditch. Bog vegetation dominates the wetland, including Northern Pitcher-plant, Pink Bog-button, Engelmann's Arrowhead, and sundews. The 0.5 acre wetland is bisected by an off-road vehicle trail running directly up the middle of the right-of-way. Non-native weed species are common in the drier sections of the wetland. Trash has been dumped near the road and ditch.

Descriptive information was obtained from field surveys conducted prior to 1987. Current aerial photographs were examined to update the existing survey data.

Prepared by: J. Christopher Ludwig

Date: November 1987

PROTECTION AREA SUMMARY

Protection Area Name: Johnson Pond

County: Wicomico USGS Quad: Delmar

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

The Johnson Pond Protection Area contains a large Atlantic White Cedar (Chamaecyparis thyoides) swamp where Long's Bittercress (Cardamine longii) can be found. This species is Endangered in Maryland, is known from fewer than thirty sites worldwide, and is under consideration by the U.S. Fish and Wildlife Service as a Federally Endangered Species. Sourwood (Oxydendrum arboreum) also occurs here; this is the only known extant Maryland location for this Highly State Rare shrub.

Atlantic White Cedar swamps are becoming increasingly rare on the Delmarva peninsula and areas this large are particularly unusual.

ELEMENT SUMMARY TABLE:

Element Name	Common Name	Status
Cardamine longii	Long's Bittercress	Endangered
Oxydendrum arboreum	Sourwood	Highly State Rare
Chamaecyparis thyoides	Atlantic White Cedar	Watch List

OTHER VALUES AND SIGNIFICANCE:

Protecting this wetland would aid in buffering wetlands downstream along the Wicomico River, much of which is Chesapeake Bay Critical Area. Additional rare species of plants may be found if this area is further explored. Atlantic White Cedar swamps frequently contain unusual species such as Northern Pitcher-plant and pipewort.

THREATS AND MANAGEMENT NEEDS:

Threats

Active disturbance of the Atlantic White Cedar Swamp (timber harvest, road construction) will eliminate habitat for the Long's Bittercress. Disturbance on the uplands of the swamp's watershed

causes heavy siltation of inflowing streams, and could eliminate habitat or adversely affect the existing population of Long's Bittercress.

Management Needs:

Artificial management of this habitat is not needed. Implementation of a monitoring program is recommended to examine the health of the Long's Bittercress population.

BOUNDARY RECOMMENDATIONS:

The protection area boundary includes the wetland containing all rare species' habitat and a buffer of upland area. Within this boundary, active disturbances and threats mentioned above should be avoided.

SITE DESCRIPTION SUMMARY:

This 105 acre protection area includes a large area of White Cedar swamp along the Wicomico River upstream from Johnson Pond. The swamp is a mixture of Atlantic White Cedar, Red Maple, Black Gum, oaks, and Sweet Gum. Along one of the many streamlets running through the swamp is a stand of Long's Bittercress. Bordering the swamp are sandy uplands that are partially forested and partially developed with industrial parks, roads and parking lots. The sandy woodlands contain Loblolly Pine and many species of upland oaks.

Prepared by: J. Christopher Ludwig

Date: October 1987

PROTECTION AREA SUMMARY

Protection Area Name: Plum Creek Powerline Bog

County: Wicomico USGS Quad: Sharptown

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Plum Creek Powerline Bog is a high quality sphagnum bog exhibiting a diverse flora, including five species considered rare in the State. Two-flowered Bladderwort (Utricularia biflora), a State Endangered species, inhabits the bog and is known from only one other place in Maryland. Six additional extant populations of Twisted Spikerush (Eleocharis tortilis) are known in this State. Rose Pogonia (Pogonia ophioglossoides), a Watch List Species, is a very showy orchid which blankets the bog in late June. Two other Watch List Species, Round-leaved Sundew (Drosera rotundifolia) and Green Spikerush (Eleocharis olivacea), also inhabit the bog.

ELEMENT SUMMARY TABLE:

Element Name	Common Name	Status
Eleocharis tortilis	Twisted Spikerush	Endangered
Utricularia biflora	Two-flowered Bladderwort	Highly State Rare
Drosera rotundifolia	Round-leaved Sundew	Watch List
Eleocharis olivacea	Green Spikerush	Watch List
Pogonia ophioglossoides	Rose Pogonia	Watch List

OTHER VALUES AND SIGNIFICANCE:

Sphagnum bogs are uncommon in Maryland and support interesting, peculiar plant species. They often harbor several types of carnivorous plants as well as showy orchids. These species are especially adapted to the highly acidic environment and have provided insight into the study of evolutionary processes.

Most of the sphagnum bogs on the coastal plain are in powerline right-of-ways. Powerline maintenance sustains an open canopy. Many wetland plants are shade intolerant and thrive in these open right-of-ways. Historically, fire and beaver were largely responsible for the creation and maintenance of inland freshwater emergent wetlands. Current fire suppression practices

and the decimation of the beaver have eliminated similar habitat on the Eastern Shore.

THREATS AND MANAGEMENT NEEDS:

Threats

The major threats to this bog community are certain detrimental powerline maintenance practices and hydrologic change. Right-of-way management practices that utilize non-selective herbicides threaten the rare plant populations. The use of heavy vehicles can also adversely affect the natural community by compacting soils, altering local hydrology by creating ruts, and crushing plants.

Deterioration of the water quality of Plum Creek and reduction of flow are also threats to the bog. Agricultural runoff which contains herbicides, pesticides, and fertilizers may kill certain species, and bring about increased competition from weedy plants. In addition, forest cutting and alteration of upstream areas of Plum Creek may upset the hydrologic regime in the powerline opening.

Management Needs

A management agreement with the utility company is recommended in order to ensure that powerline maintenance procedures are consistent with rare plant protection. At present, current management practices do not appear to be detrimental to the rare species. However, more information is needed concerning the effects of right-of-way maintenance on plant populations. Future study may yield more specific recommendations.

Land-use activities that affect the creek upstream of the bog must be monitored to ensure that there are no deleterious effects downstream. Forest cutting and hydrologic alterations (those which affect water quality as well as quantity) should be avoided.

The informal agreement established by The Nature Conservancy with the landowner should be maintained in order to promote cooperation in protecting this site.

BOUNDARY RECOMMENDATIONS:

The protection area boundary encompasses the wetlands under the powerline as well as land that drains into them in order to protect water quality and flow. The upland that is included extends from the edge of a farm field on the southwest to the

crest of the hill northeast of Plum Creek. The wetland valleys upstream are also included, the latter extending to the Maryland-Delaware border.

SITE DESCRIPTION SUMMARY:

Plum Creek Powerline Bog is a low-lying section of a Delmarva Power and Light Company right-of-way which is bisected by Plum Creek. The protection area designated to conserve this bog encompasses 30 acres. Descriptive information for this site was provided by The Nature Conservancy. The creek has a narrow channel with a sandy bottom and originates in Delaware to the east. Associated with it are a series of springs which surface under the powerline and sustain the sphagnous bog. The soils consist of an organic layer over sand. Grasses, sedges and rushes as well as sundews, meadow rue, Joe-pye-weed, violets, and St. John's-wort predominate. Wetland tree saplings and some weedy plants, such as Virginia Creeper, blackberry, Marsh Rose, grape, and Bracken Fern may also be seen in the slightly dryer areas. The uplands under the powerline to both sides are farmed. Beyond the right-of-way is a forest of Red Maple, Tulip Poplar, Sweetbay Magnolia, Sweet Pepperbush, and fetterbush.

Prepared by: Abigail Rome

Date: July 1987

PROTECTION AREA SUMMARY

Protection Area Name: Sharptown Bog

County: Wicomico USGS Quads: Sharptown, Hebron

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Sharptown Bog is a floristically diverse sphagnum bog containing twelve plants considered rare in Maryland. Five State Endangered Species inhabit in the bog: Cross-leaved Milkwort (Polygala cruciata), Short-beaked Baldrush (Psilocarya nitens), Water Clubrush (Scirpus subterminalis), Robbins' Spikerush, (Eleocharis robbinsii), and Pink Bog-button (Sclerolepis uniflora). Northern Pitcher-plant (Sarracenia purpurea), is considered Threatened in Maryland but is well represented at this site. Also found here are Clustered Beakrush (Rhynchospora glomerata), considered Highly State Rare, and Smooth Fuirena (Fuirena pumila), which is State Rare. Finally, four Watch List Species flourish in the bog: Round-leaved Sundew (Drosera rotundifolia), Rose Pogonia (Pogonia ophioglossoides), Loose-headed Beakrush (Rhynchospora chalarocephala), and Radial-leaved Bladderwort (Utricularia radiata).

Spreading Pogonia (Cleistes divaricata), considered rare throughout most of its range, has also been reported for this site. Five individuals were seen here in 1982 but have not been evident in recent years. Since this species is known to remain dormant in some years, the status of this population (as well as the one other similarly elusive Maryland population) is questionable.

ELEMENT SUMMARY TABLE:

Element Name	Common Name	Status
Cleistes divaricata	Spreading Pogonia	Endangered
Eleocharis robbinsii	Robbins' Spikerush	Endangered
Polygala cruciata	Cross-leaved Milkwort	Endangered
Psilocarya nitens	Short-beaked Baldrush	Endangered
Scirpus subterminalis	Water Clubrush	Endangered
Sclerolepis uniflora	Pink Bog-button	Endangered
Sarracenia purpurea	Northern Pitcher-plant	Threatened

Rhynchospora glomerata	Clustered Beakrush	Highly State Rare
Fuirena pumila	Smooth Fuirena	State Rare
Drosera rotundifolia	Round-leaved Sundew	Watch List
Pogonia ophioglossoides	Rose Pogonia	Watch List
Rhynchospora chalarocephala	Loose-headed Beakrush	Watch List
Utricularia radiata	Radial-leaved Bladderwort	Watch List

OTHER VALUES AND SIGNIFICANCE:

Sphagnum bogs are uncommon in Maryland and support interesting, peculiar plant species. They often harbor several types of carnivorous plants as well as showy orchids. These species are especially adapted to the highly acidic environment and have provided insight into the study of evolutionary processes.

Most of the sphagnum bogs on the coastal plain are in powerline right-of-ways. Powerline maintenance sustains an open canopy. Many wetland plants are shade intolerant and thrive in these open right-of-ways. Historically, fire and beaver were largely responsible for the creation and maintenance of inland freshwater emergent wetlands. Current fire suppression practices and the decimation of the beaver have eliminated similar habitat on the Eastern Shore.

THREATS AND MANAGEMENT NEEDS:

Threats

The major threats to this powerline bog community are herbicide spraying and hydrologic change. The use of heavy machinery to apply herbicides or to remove vegetation could damage or destroy the natural community. Non-selective herbicide applications could also kill the rare species.

Another threat is nearby timber cutting. Trees are now being cut selectively in the woods to the northwest of the bog. Large scale clearing could allow weedy and non-native species to invade, crowding out the less competitive plants. Current cutting practices, however, provide no immediate threat.

Management Needs

The high water quality of this creek and the constant flow

must be maintained in order to protection area the bog community. Therefore, land-use activities which affect the creek upstream must be monitored. These include agricultural application of herbicides, pesticides and fertilizers as well as introduction of sediments into the waterway.

Because the area will continue to be managed as a powerline right-of-way, removal of woody vegetation will be required. This should be accomplished by foliar or frill herbicide applications to individual plants. Administration of chemicals should be conducted on foot and without heavy machinery which would disrupt plant habitat.

The size and reproductive success of the rare species populations should be monitored regularly.

The informal agreement established by The Nature Conservancy with the landowner should be maintained in order to promote cooperation in protecting this site.

BOUNDARY RECOMMENDATIONS:

The protection area boundary extends from San Domingo Road at the downstream end of the swampy section of the creek to its headwaters. At the lower end it encompasses the land to 300 ft. on either side of the floodplain. This provides a buffer on all sides of the powerline opening to prevent land-use changes in the immediately adjacent areas. Beginning 300 ft. upstream of the right-of-way, the protection area includes all upstream land which is within 150 ft. of the creek. By protecting the water quality of the tributaries, high water quality within the bog will be ensured.

SITE DESCRIPTION SUMMARY:

The focal point of this 115 acre protection area is an open sphagnum bog located in a Delmarva Power and Light Company powerline right-of-way south of Santa Domingo. Descriptive information for this site was provided by the staff of The Nature Conservancy. It is part of an unnamed creek which otherwise flows entirely within the forest. There are two narrow, slow-moving channels under the powerline as well as several small seeps. The vegetation is a mix of grasses, sedges, rushes, meadow-sweet, St. John's-wort, Marsh Fern, sundews, Pink Bog-button, pitcher-plants, and shrubs such as Speckled Alder and Sweet Gum.

Bladderworts, arrowhead, pennywort, and mermaid weed inhabit the stream. The soils are sandy and on the adjacent uplands (especially to the west) vegetation is sparse, consisting only of plants which can tolerate a dry substrate with little or no organic matter. The palustrine forest on either side of the

powerline has a fairly dense shrub understory near the stream, but is more open in the sandier uplands.

Prepared by: Abigail Rome

Date: July 1987

POSTSCRIPT:

As of September 10, 1987 much of the powerline right-of-way bog was destroyed. Clearcutting of forest land upstream was initiated in early August and timber was dragged through the powerline opening. The soil was dug up and 80% of the bog vegetation was destroyed. Large ruts remain in all wetland areas and the majority of the forested canopy upstream is gone.

In spite of this large scale disturbance, the downstream section of the bog remains, and representatives of nine of the twelve rare species have survived. In most cases, population sizes have been vastly reduced, but viable seed sources may remain and there is a chance that some species will recover.

Nevertheless, potential threats discussed above have become real. The loss of forest canopy and large-scale mechanical disturbance will allow increased sedimentation in the bog and may change the hydrologic character of the site. In addition, weedy species will be more likely to invade from open areas upstream. Therefore, the future of this site for rare and endangered plant species is uncertain. Monitoring of these rare species should begin immediately.

PROTECTION AREA SUMMARY

Protection Area Name: Spearin Road Powerline

County: Wicomico/Worcester USGS Quad: Salisbury

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

The Spearin Road Powerlines Protection Area has a right-of-way which is kept free of woody species through active management. This open habitat has boggy emergent wetlands and upland meadows where ten rare species occur (see list below). In pre-settlement history, fires and floods created and maintained these communities. Since these natural disturbance phenomena are now artificially suppressed, the only remaining suitable habitat for species which require these open conditions is along and in powerline right-of-ways.

The largest State population of Barratt's Sedge (Carex barrattii) occurs in this protection area. This species is endangered in Maryland, is known from fewer than 100 sites worldwide, and is under consideration by the U.S. Fish and Wildlife Service as a Federally Endangered Species. This population of Dwarf Iris (Iris verna) is also the larger of the two known populations in Maryland. Nearly one thousand flowering plants were observed in the powerline in 1987.

In the early 1980's Few-flowered Nutrush (Scleria pauciflora) was found in this powerline, the only recent sighting on the Delmarva peninsula. Slender Nutrush (Scleria minor), a State Endangered Species, was also found - one of two recent Delmarva sightings.

ELEMENT SUMMARY TABLE:

Element Name	Common Name	Status
Carex barrattii	Barratt's Sedge	Endangered
Hypericum gymnanthum	Clasping-leaved St. John's-wort	Endangered
Iris verna	Dwarf Iris	Endangered
Prenanthes autumnalis	Slender Rattlesnake-root	Endangered
Rhynchospora torreyana	Torrey's Beakrush	Endangered
Scleria minor	Slender Nutrush	Endangered

Amphicarpum purshii	Pursh's Amphicarpum	Watch List
Crotonopsis elliptica	Rushfoil	Watch List
Iris prismatica	Slender Blue Flag	Watch List
Lycopodium alopecuroides	Fox-tail Clubmoss	Watch List
Pyrrhopappus carolinianus	False Dandelion	Watch List
Scleria pauciflora	Pappilose Nutrush	Watch List

OTHER VALUES AND SIGNIFICANCE:

With additional investigation, this area should yield additional rare plants, and may turn up rare moths and butterflies that favor special plants growing in habitats created by powerline right-of-ways.

THREATS AND MANAGEMENT NEEDS:

Threats

Non-native weed species are invading the more disturbed areas of the powerline right-of-way and are competing with native species. Many of these weeds establish when off-road vehicles and logging equipment compact and disturb the soils.

Management Needs

Current management practices do not appear to be detrimental to the rare species populations and habitats. The populations of rare species and non-native, weedy species should be monitored regularly. The use of off-road vehicles should be prohibited within the protection area.

BOUNDARY RECOMMENDATIONS:

The protection area boundary includes all powerline right-of-way areas containing rare species and a woodland buffer along the right-of-way. A small portion of a cornfield and Spearin Road, which bisect the right-of-way, are included due to their proximity to the rare species habitat. Runoff from the field and roadside management may affect the rare species.

SITE DESCRIPTION SUMMARY:

The 90 acre protection area contains approximately 1.5 miles of 100 yd.-width powerline right-of-way. The line runs southwest

to northeast. Bisecting the right-of-way near the northeastern end is Spearin Road and a cornfield, which extends 200 yds. along the right-of-way. Northeast of Spearin Road, three rare species, Clasping-leaved St. John's-wort, Rushfoil, and False Dandelion are found within 100 yds. of the road. The other rare species are found southeast of Spearin Road (and the adjacent cornfield). Both areas have sparse woody vegetation and a rich herbaceous flora due to periodic herbicide applications. Wetland areas contain Slender Iris and Barratt's Sedge, while dry areas have large patches of Wooly Ragwort. Most non-native, weedy species are found along the powerline right-of-way in three areas: 1) adjacent to the southwest edge of the cornfield; 2) where heavy off-road vehicle traffic has occurred in the far southwest section; and 3) immediately adjacent to Spearin Road.

Prepared by: J. Christopher Ludwig

Date: October 1987

REFERENCES

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

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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 notograma) and Trout-Perch (Percopsis omiscomaycus) are added. The latter species are not game or sport fish, therefore, are of no commercial significance. The lists also contain, for the first time, the names of all those species which are federally listed and, therefore, are required by Maryland law to be listed in Maryland.

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

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

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

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

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

Estimate of Economic Impact

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

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

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

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

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

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

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

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

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

Opportunity for Public Comment

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

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

.01 Definitions.

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

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

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

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

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

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

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

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

(3) Disease or predation;

(4) Inadequacy of existing regulatory mechanisms; or

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

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

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

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

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

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

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

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

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

.02 Petitioning.

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

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

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

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

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

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

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

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

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

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

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

(2) Its life needs and habitat requirements.

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

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

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

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

.03 Permits.

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

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

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

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

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

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

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

(a) Private lands;

(b) Public lands; and

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(3) Crustaceans.

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

(b) Greenbriar Cave Amphipod (Stygobromus emarginatus);

(c) Shenandoah Cave Amphipod (Stygobromus gracilipes).

(4) Insects.

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

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

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

(d) Regal Fritillary (Speyeria idalia).

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

(6) Amphibians.

(a) Eastern Tiger Salamander (Ambystoma tigrinum);

(b) Green Salamander (Aneides aeneus);

(c) Hellbender (Cryptobranchus alleganiensis);

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

(7) Reptiles.

(a) Atlantic Leatherback Turtle (Dermochelys coriacea);

(b) Atlantic Hawksbill Turtle (Eretmochelys imbricata);

(c) Northern Coal Skink (Eumeces anthracinus);

(d) Atlantic Ridley Turtle (Lepidochelys kempi);

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

(8) Birds.

(a) Piping Plover (Charadrius melodus);

(b) Peregrine Falcon (Falco peregrinus);

(c) Bald Eagle (Haliaeetus leucocephalus);

(d) Loggerhead Shrike (Lanius ludovicianus);

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

(9) Mammals.

(a) Black Right Whale (Balaena glacialis);

(b) Sei Whale (Balaenoptera borealis);

(c) Blue Whale (Balaenoptera musculus);

(d) Finback Whale (Balaenoptera physalus);

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

.05 Endangered Species of Plants.

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

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

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

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

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

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

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

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

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

(2) A person may not:

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

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

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

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

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

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

.06 Endangered Extirpated Species.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(b) Other valid scientific research; or

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

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

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

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

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

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

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

(3) Reptiles.
(a) Atlantic Loggerhead Turtle (Caretta caretta);
(b) Atlantic Green Turtle (Chelonia mydas).

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

.08 Threatened Species of Plants.

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

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

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

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

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

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

(2) A person may not:

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

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

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

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

(1) Single-Headed Pussytoes (Antennaria solitaria);
(2) Giant Cane (Arundinaria gigantea);
(3) Glade Fern (Athyrium pycnocarpon);
(4) Maryland Bur-Marigold (Bidens bidentoides);
(5) Button Sedge (Carex bullata);
(6) Shoreline Sedge (Carex hyalinolepis);
(7) Inflated Sedge (Carex vesicaria);
(8) Leatherleaf (Chamaedaphne calyculata);
(9) Red Turtlehead (Chelone obliqua);
(10) Goldenseal (Hydrastis canadenis);
(11) Deciduous Holly (Ilex decidua);
(12) Narrow-Leaved Bushclover (Lespedeza angustifolia);
(13) Wild Lupine (Lupinus perennis);
(14) Climbing Fern (Lygodium palmatum);
(15) American Lotus (Nelumbo lutea);
(16) Red Bay (Persea borbonia);
(17) Pale Green Orchis (Platanthera flava);
(18) Purple Fringeless Orchis (Platanthera peramoena);
(19) Spongy Lophotocarpus (Sagittaria calycina);
(20) Engelmann's Arrowhead (Sagitttaria engelmanniana);
(21) Northern Pitcher-Plant (Sarracenia purpurea);
(22) Virginia Mallow (Sida hermaphrodita);
(23) Featherbells (Stenanthium gramineum);
(24) Mountain Pimpernel (Taenidia montana);
(25) Steele's Meadowrue (Thalictrum steeleanum);
(26) Kate's-Mountain Clover (Trifolium virginicum);
(27) Dwarf Trillium (Trillium pusillum);
(28) Purple Bladderwort (Utricularia purpurea).

.09 Species in Need of Conservation.

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

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

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

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

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

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

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

(b) Other valid scientific research; or

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

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

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

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

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

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

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

(5) Birds.

(a) Henslow's Sparrow (Ammodramus henslowii);
(b) Short-Eared Owl (Asio flammeus);
(c) American Bittern (Botaurus lentiginosus);
(d) Sedge Wren (Cistothorus platensis);
(e) Little Blue Heron (Egretta caerulea);
(f) Common Moorhen (Gallinula chloropus);
(g) American Oystercatcher (Haematopus palliatus);
(h) Least Bittern (Ixobrychus exilis);
(i) Black Rail (Laterallus jamaicensis);
(j) Swainson's Warbler (Limnothlypis swainsonii);
(k) Least Tern (Sterna antillarum).

(6) Mammals.

(a) Porcupine (Erethizon dorsatum);
(b) Bobcat (Lynx rufus);
(c) Least Weasel (Mustela nivalis);
(d) Small-Footed Bat (Myotis leibii);
(e) Southeastern Shrew (Sorex longirostris).

.10 Natural Heritage Areas.

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

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

(2) Be a unique blend of geological, hydrological, climatalogical 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.