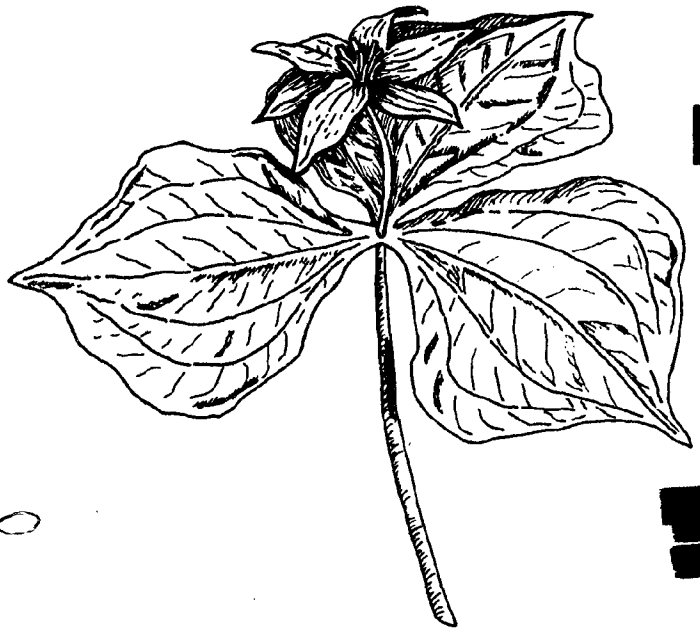
Maryland. Coastal Zone Management Program

A Habitat Assessment Study of



Harford County Maryland

[redacted]

AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

A HABITAT ASSESSMENT STUDY

OF

HARFORD COUNTY, MARYLAND

QL81 .F37 1988

Submitted by:

Patricia M. Farr
Biologist

Harford County Department
of Planning and Zoning

December 30, 1988

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INTRODUCTION

Information pertaining to the locations of significant plant and wildlife habitats in Harford County has, to date, been lacking. As a result, there is a high probability that many of these habitats have already been destroyed. The purpose of this study was to attempt to locate remaining significant plant and wildlife habitats in the County, and to determine appropriate management and regulatory measures to ensure the long-term existence of each identified habitat area. Specific tasks which were accomplished in this study are listed below:

Task 1 - Identify the plant and wildlife species and/or communities in Harford County that are endangered, rare, threatened, or otherwise in need of protection because of their local or regional significance.

Task 2 - Develop a system for locating those habitats which are or could be essential for the continued local viability of the species identified in Task 1. This task and the field inventory efforts described in Task 3 were accomplished in accordance with procedures established by, and with the assistance of, the Maryland Natural Heritage Program.

Task 3 - Field inventory of likely habitat areas noted in the Maryland Natural Heritage Program data files and other data sources, and of areas having characteristics such that they could reasonably be suspected of supporting the identified species and/or communities.

Task 4 - Map the ecological boundaries and appropriate buffer areas for identified habitat areas.

Task 5 - Determine appropriate management measures for minimizing the impacts that proposed developments or their activities may have on the identified species and their habitats.

Task 6 - Analyze existing regulatory measures and recommend modifications and/or additions needed to ensure protection of such species and their habitats.

METHODS

Development of a System for Locating Significant Plant and Wildlife Habitats

In order to locate significant plant and wildlife habitats, it was first necessary to define what constituted such a habitat. A habitat was considered to be significant if it:

(1) contained one or more species ranked by the Maryland Natural Heritage Program as Nationally Endangered, Nationally Threatened, Nationally Rare, Regionally Rare, Highly State Rare, or State Rare (See Appendix 1 for explanation of species statuses), and/or

(2) contained a natural community with a unique blend of geological, hydrological, climatological or biological features, which was among the best countywide examples of its kind.

The first definition included, but was not limited to, species which were officially listed by the state as Threatened, Endangered or In Need of Conservation in accordance with Annotated Code of Maryland (COMAR) 08.03.08 (See Appendix 2). The second definition represented a modification of the definition for state-designated Natural Heritage Areas in COMAR 08.03.08, and included both Natural Heritage Areas, and other natural communities which were considered to be of County Significance.

Information about known and potential locations of significant plant and wildlife habitats was then obtained from several sources, the bulk of which was obtained from the Maryland Natural Heritage Program. Specifically, this agency provided the County with a computerized list of known and historical locations of rare species and communities, access to maps of these locations, and information about other types of rare species and communities which could potentially occur in Harford County. Additional information pertaining to historical locations of rare plant species was obtained from the Towson State University herbarium and the University of Maryland-College Park herbarium, and from several long-term residents of the area.

Inventory Methods

Search for Historical Locations of Rare Plant Species

Historical locations of rare plant species were considered to be the most likely places to find significant plant and wildlife habitats, and, therefore, received the highest priority of all areas to be field-checked. An attempt was made to visit historical locations of as many Nationally Endangered, Nationally Threatened, Nationally Rare, Regionally Rare, Highly State Rare, and State Rare plant species as possible, for which there was a reasonable likelihood that the species could be rediscovered. A time schedule was developed to ensure that searches were made for species during the time of year when they were most likely to be found (i.e., when in flower or fruit). Habitat requirements and field identification characteristics were provided by the Maryland Natural Heritage Program to aid in locating these species.

Standard Natural Heritage Program methodology was used to assess the habitat at each site visited, and for each site, a Site Survey Summary (Appendix 3) was prepared. This Summary contained information about whether the species which historically occurred in the area had been located, habitat type(s) present, evidence of human disturbance to the site, surrounding land use, threats to the site, a list of plant species present, and a map of the area searched.

When a rare plant species was rediscovered, ecological boundaries for the species were mapped, and a Special Plant Survey Form (Appendix 4) was completed to provide detailed information about the biology of the species. When a species was not rediscovered, a determination was made about the suitability of the habitat to still support the species.

A Special Animal Survey Form (Appendix 5) or Natural Community Survey Form (Appendix 6) was completed as was deemed appropriate. A Special Animal Survey Form was filled out most often when a site occurred within the Chesapeake Bay Critical Area, in order to document the presence of forest interior dwelling bird species. A Natural Community Survey Form was completed to further characterize a site when a plant community was considered to be significant, regardless of whether a rare plant species was located.

Search for Other Significant Plant and Wildlife Habitats

An initial screening of other potentially significant habitat areas was conducted with the aid of 1986 and 1977 black and white aerial photos, U.S. Geological Survey topographic quad sheets and geologic maps, U.S. Fish & Wildlife Service National Wetlands Inventory Maps, 1972 Maryland Department of Natural Resources tidal wetlands boundary maps, a Harford County Soil Survey, and other available resources. Areas were then prioritized for field-checking, based on the likelihood of locating either a unique natural community or a habitat for a rare plant or animal species. The types of areas which were field-checked, in order of priority, were as follows:

(1) non-tidal wetlands which were noted as being potentially significant in the "Functional Assessment of Non-tidal Wetlands" (Bartgis, R.L., 1986, Maryland Natural Heritage Program), including:

(a) forested wetlands which appeared on aerial photos to contain seeps or vernal (temporary) pools,

(b) wetlands which contained a high number of adjoining National Wetlands Inventory (NWI) mapping units relative to the size of the wetland complex (e.g., at least 2 NWI mapping units for complexes under 10 acres, at least 4 NWI mapping units for complexes 10 to 100 acres, or at least 6 NWI mapping units for complexes greater than 100 acres),

(c) wetlands which appeared to be unusual or scarce;

(2) areas which potentially contained Nationally Threatened serpentine savannas or barrens;

(3) steep, wooded, northeast-facing slopes;

(4) tidal wetlands which appeared unusual or scarce;

(5) large, unfragmented forests (generally greater than 100 acres in size) which appeared on aerial photos to be mature;

(6) other potentially significant areas, as time permitted.

Habitat assessments of other potentially significant plant and wildlife habitats were conducted in a manner similar to that used to assess habitats at historical locations of rare plant species. For each site visited, a Site Survey Summary (Appendix 3) was completed. When a site was determined to be of significance, Special Plant Survey Forms (Appendix 4), Special Animal Survey Forms (Appendix 5) and/or a Natural Community Survey Form (Appendix 6) were completed as deemed appropriate.

Detailed Studies of Significant Natural Communities

In addition to searching for potentially significant plant and wildlife habitats, detailed studies of three natural communities known to be significant were conducted with the Maryland Natural Heritage Program. These communities included Broad Creek Woods, Deer Creek Barren, and Old Jarrettsville, which are discussed in detail in a later section of this report.

For each community, floristical analyses and vegetation sampling were conducted, so that an assessment of the significance of the community relative to similar communities could be made. Results from these studies are pending the completion of data analyses, and will eventually be submitted to professional journals for publication.

Preparation of Protection Area Summaries

For each identified significant plant and wildlife habitat area, a Protection Area Summary (See Appendix 7 for Summary outline) was prepared using standard Natural Heritage Program methodology. The purpose of preparing these Summaries was to provide the County and the Natural Heritage Program with sufficient information from which to make proper protection and/or management decisions about a habitat.

Each Protection Area Summary contains the following information, as applicable:

(1) discussion about the ecological significance of the site, including a description of the species populations and/or natural community to be protected, and pertinent information about the hydrology, geology, and physical features of the site;

(2) mention about other values and significance of the site;

(3) discussion of threats to, and management needs of, the site, including the applicability of local regulations for protection of the site;

(4) discussion of the Protection Area boundaries, and of the area to be encompassed within these boundaries;

(5) a general site description;

(6) appropriate references.

A set of maps to accompany each Protection Area Summary was also prepared. These maps include:

(1) a 1:100,000 scale road map which shows the general location of the Protection Area;

(2) a 1:24,000 scale topographic map which shows the Protection Area boundary;

(3) a 1:7,200 (1"=600') scale tax map which shows the Protection Area boundary.

An example set of these maps can be found in Appendix 8.

ANALYSIS OF REGULATORY MEASURES

Adequacy of Existing Regulations

An analysis of existing Harford County regulations was conducted to assess their adequacy in terms of providing protection for significant plant and wildlife habitats. Four sets of regulations were analyzed for this purpose, including the County's Chesapeake Bay Critical Area Management Program, Subdivision Regulations, Natural Resources District regulations, and Floodplain District regulations. A summary of the analysis is provided at the end of this section.

Chesapeake Bay Critical Area Management Program

The County's Chesapeake Bay Critical Area Management Program was borne out of a state law which required that local jurisdictions adjoining the Bay implement a land management and resource protection program for areas within 1000 feet of tidal waters and tidal wetlands. In order to comply with the law, it was necessary for the County to revise its zoning and subdivision regulations. Several of these revisions pertained to significant plant and wildlife habitats, and, as a result, habitats occurring in the Critical Area now receive the strongest protection currently available under County regulations. The County also added definitions to the Zoning Code which pertained specifically to significant plant and wildlife habitats. These definitions are as follows.

> "Threatened or Endangered Species or Species in Need of Conservation: A plant or wildlife species designated by the State Department of Natural Resources in accordance with COMAR 08.03.08 (See Appendix 2) as worthy of protection because of its rare or unusual occurrence in the State of Maryland."
>
> "Habitat Areas of Local Significance: Areas whose geographic location has been mapped by the Harford County Department of Planning and Zoning that have been determined to be important to the County because they contain a unique blend of geological, hydrological, climatological or biological features, and because they are considered to be among the best countywide examples of their kind."
>
> "Natural Heritage Area: An area that has been designated by the Secretary of the Department of Natural Resources in accordance with COMAR 08.03.08 (See Appendix 2) as a natural area which meets the following criteria: (1) contains one or more state-designated threatened or endangered species or species in need of conservation; (2) is a unique blend of geological, hydrological, climatological or biological features; and (3) is considered to be among the best statewide examples of its kind."

Habitat Areas of Local Significance included both unique natural communities, and sites of species which were considered by the Maryland Natural Heritage Program to be rare, threatened, or endangered either nationally or in Maryland (See Appendix 1), but which were not officially designated in accordance

with COMAR 08.03.08. To date, no Natural Heritage Areas have been designated by the state in Harford County.

The bulk of the County's Critical Area Management Program work efforts involved the creation of a Critical Area Overlay District. Within this District, new zoning regulations were established which were to be applied to the Critical Area portion of the County. Zoning regulations which now apply specifically to habitats within the Critical Area are as follows.

> Development activities and other land disturbances, including commercial tree harvesting and agricultural activities, are prohibited within areas mapped as state-designated Threatened or Endangered Species or Species in Need of Conservation, state-designated Natural Heritage Areas, and Habitat Areas of Local Significance, unless it can be shown that the proposed activities will not have or cause adverse impacts on the identified habitats. A site-specific study will be prepared in consultation with (the Maryland Natural Heritage Program of) the State of Maryland Department of Natural Resources to aid in making such a determination.
>
> Roads, bridges and utilities are also prohibited within the bounds of the identified habitats, unless no physically feasible alternative exists, in which case they shall be designed, constructed and maintained so as to minimize adverse impacts on the habitats. Additionally, Forest Management Plans, and Soil and Water Conservation Plans developed for forestry or agricultural operations within the bounds of the identified habitats, shall include measures to protect the integrity of these habitats.

In some cases, a mapped habitat occurred only partially within the 1000-foot Critical Area boundary, and, therefore, received only partial protection under the County's Chesapeake Bay Critical Area Management Program. The County "expanded" the Critical Area boundary in four such locations, in order to provide additional protection to two state-designated Endangered Species sites and two Habitat Areas of Local Significance. However, expansion of the Critical Area boundary was not possible in all cases, and, as a result, some habitats which occur in the Critical Area are still only partially protected by the Critical Area-related regulations. One possible solution to this problem is discussed on Page 16, under the section "Proposed Natural Resources District Changes."

Several new habitats were discovered in the Chesapeake Bay Critical Area during the FY 1988 field season. In order to protect these habitats, the Critical Area Overlay District would need to be amended to include the habitats as mapped Threatened or Endangered Species or Species in Need of Conservation sites, or mapped Habitat Areas of Local Significance.

Subdivision Regulations

As was noted above, Harford County's Subdivision Regulations were also modified as a part of the County's Chesapeake Bay Critical Area Management Program, and now contain language which pertains specifically to significant

plant and wildlife habitats. Some of the same definitions which were added to the Zoning Code were also added to the Subdivision Regulations, including Threatened or Endangered Species or Species in Need of Conservation, Habitat Areas of Local Significance, and Natural Heritage Area. One additional pertinent definition which was added to these regulations is as follows.

> "Significant/Special Natural Features: Areas to be left undisturbed, including, but not limited to, features such as water bodies, tidal and non-tidal wetlands, forested areas to be retained, and plant or wildlife habitat identified as of state or County importance."

Plant and wildlife habitat identified as of state or County importance is further defined in the Subdivision Regulations as including habitat for Threatened of Endangered Species or Species in Need of Conservation, Habitat Areas of Local Significance, and Natural Heritage Areas.

The Subdivision Regulations now require that plant and wildlife habitat of state or County importance, and Significant/Special Natural Features to be left undisturbed, be mapped on preliminary subdivision plans, regardless of where they occur in the County. Significant/Special Natural Features to be left undisturbed must also be mapped on final plats.

Within the Chesapeake Bay Critical Area, the Subdivision Regulations require that developments be designed to protect Significant/Special Natural Features located on, or adjacent to, the development site. A similar requirement could be added to these regulations to protect Significant/Special Natural Features which occur outside of the Critical Area.

Natural Resources District Regulations

Harford County's Natural Resources District regulations (See Appendix 9) function primarily to preserve special environmental features. As they exist, these regulations may provide both direct and indirect protection to significant plant and wildlife habitats.

Direct protection is provided to habitats as the result of a modification which was made to the Natural Resources District regulations through the County's Chesapeake Bay Critical Area Management Program. These regulations now require that Significant/Special Natural Features, which were previously noted as including Threatened or Endangered Species or Species in Need of Conservation, Habitat Areas of Local Significance, and Natural Heritage Areas, not be disturbed by development. However, this requirement applies only to habitats which have been officially mapped by the Department of Planning and Zoning, and, consequently, only to habitats (or portions of habitats) occurring in the Chesapeake Bay Critical Area.

Habitats (or portions of habitats) which occur outside of the Critical Area receive indirect protection from the Natural Resources District regulations when they are located within or on one of the special environmental features to which the regulations apply (i.e., non-tidal wetlands and steep slopes in excess of 40,000 square feet, buffers to designated streams, and tributaries to these streams which drain a subbasin of greater than 400

acres). Most of the habitats do occur in a non-tidal wetland, on a steep slope, etc., and, as such, are protected at least partially from development by these regulations. Also, the present Natural Resources District regulations do not prevent the placement of utilities or stormwater management facilities on steep slopes, in non-tidal wetlands, etc., nor do they prevent any areas from being used for agricultural or forestry purposes.

For these reasons, the County's Natural Resources District regulations are inadequate to protect significant plant and wildlife habitats which occur outside of the Chesapeake Bay Critical Area. Proposed changes to these regulations to better protect plant and wildlife habitats are discussed in a later section of this report.

Floodplain District Regulations

The County's Floodplain District regulations discourage the placement of structures within 100-year floodplains, and, therefore, provide some indirect protection to significant plant and wildlife habitats which occur within these floodplains. Because the regulations function primarily for reasons other than to protect environmental features, and because of the existence of the County's Natural Resources District regulations, modifications to the Floodplain District regulations to accommodate significant plant and wildlife habitats are considered unnecessary.

Summary of Analysis

In general, Harford County's existing regulations are inadequate in terms of providing protection to all significant plant and wildlife habitats which occur in the County. As can be seen in Table 1, only a few habitats (= Protection Areas) occur entirely on land covered by existing natural resources-related regulations and/or on State Park land, the majority of which occur in the Critical Area. (NOTE: Occurrence of habitats on State Park land has been included in Table 1 for completeness, because such an occurrence generally means that a habitat will receive protection). Most other habitats are protected only partially because of their occurrence on State Park land, or on land covered by the County's natural resources-related regulations, and a small number of habitats are unprotected.

Additional measures need to be taken in order to protect significant plant and wildlife habitats in Harford County from disturbance over the long term. Changes to the Natural Resources District regulations, such as those changes proposed in the section which follows, are considered necessary if these habitats are to be adequately protected through regulatory means.

TABLE 1. Occurrence of Protection Areas, either partially (P) or entirely (E), on land covered by existing Harford County natural resources-related regulations, or on State Park land (CBCA=Chesapeake Bay Critical Area-related zoning regulations; NRD=Natural Resources District regulations; Floodplain=Floodplain District regulations).

PROTECTION AREA NAME	CBCA	NRD[3]	FLOODPLAIN[3]	STATE PARK
Bald Hill		P		
Bel Air Old Field		P	P	
Broad Creek Woods		P	P	
Buck Ridge		P		
Cherry Hill Ravine		P		
Church Creek Pond[1]	E[4]			
Deer Creek	P[5]	P	P	P
Deer Creek Barren[2]				
Deer Creek Hillside[1]	E[4]			E
Deer Creek Pumping Station[1]	E[4]			E
Elbow Branch[1]	E[4]			E
Gasheys Run	P[5]	P	P	
Glen Cove Marina		P	P	
Greene Road Floodplain		P	P	P
Gunpowder Shore[1]	E[4]			
I-95 Crossing	P	P		P
Little Deer Creek Hill[2]				
Northern Susquehanna Canal	P	P	P	
North Harmony		P	P	
Oakington Shore[1]	P[4]	P		
Old Jarrettsville[2]				
Perryman Woods[1]	E[5]			
Saint Clair Bridge		P	P	
South Lapidum	P	P		P
Stafford Road Slopes[1]	E[4]			P
Wildcat Branch		P	P	P
Willoughby Woods[1]	E[5]			

1. Occurs entirely on land covered by existing County natural resource-related regulations, and/or occurs entirely within a State Park.
2. Does not occur on any land covered by existing County regulations, and does not occur within a State Park.
3. Pertains only to land which occurs outside of the Chesapeake Bay Critical Area.
4. Proposed for protection as either a Threatened or Endangered Species or Species in Need of Conservation site, or as a Habitat Area of Local Significance within the Chesapeake Bay Critical Area.
5. Chesapeake Bay Critical Area boundary was expanded to provide additional protection to the habitat.

Proposed Changes to Natural Resources District Regulations

As was previously mentioned, the County's Natural Resources District regulations (See Appendix 9) function primarily to preserve special environmental features. These regulations, therefore, are the most appropriate of all County regulations to modify for the purpose of providing additional regulatory protection to significant plant and wildlife habitats (or portions of habitats) which occur outside of the Chesapeake Bay Critical Area.

The proposed Natural Resources District changes can be found in Table 2. The reasons for each of these proposed changes are discussed below:

(1) The first change (Section 267-41(D)(2)(d)) is proposed to include significant plant and wildlife habitats (and portions of habitats) which occur outside of the Critical Area under the "applications" section of the Natural Resources District regulations. Habitats would be officially mapped by the Department of Planning and Zoning and, as such, would be included as one of the Significant/Special Natural Features to which the "conservation requirements" (Section 267-41(D)(5)) would apply. As was previously noted, these requirements now state that Significant/Special Natural Features shall not be disturbed by development.

This change would also require that plant and wildlife habitats outside of the Critical Area be mapped on preliminary subdivision plans and final plats, as a result of modifications which were made to the Subdivision Regulations through the Critical Area Management Program. Also, the terms which are proposed to be added to the Natural Resources District regulations as a part of this change were defined in the Zoning Code and/or Subdivision Regulations through the Critical Area Program, and the addition of new definitions would, therefore, be unnecessary.

(2) Changes to the "permitted uses" sections (Sections 267-41(D)(4)(c-d)) are proposed to alleviate adverse impacts to habitats which could potentially be caused by the installation or replacement of utilities, or the placement of stormwater management facilities. While these uses are permitted in non-tidal wetlands, on steep slopes, etc., such uses would, in many cases, destroy a rare habitat and/or the species dependent on such a habitat. These uses should, therefore, generally be prohibited within the boundary of an identified habitat unless no physically feasible alternative for this location exists.

(3) Changes to one of the "conservation requirements" of the Natural Resources District regulations (Section 267-41(D)(5)(c)) are proposed to establish procedures for determining potential impacts of development activities on habitats occurring outside of the Critical Area which are consistent with procedures for determining

(text continued on Page 18)

TABLE 2. Proposed changes to Harford County's Natural Resources District regulations to accommodate significant plant and wildlife habitats.

Section	Proposed Change
267-41(D)(2)(d)	(New) Plant and wildlife habitats that have been identified as being of State or County importance, the geographic locations of which have been mapped by the Harford County Department of Planning and Zoning. These habitats include: (1) Habitats of state-designated Endangered or Threatened Species or Species in Need of Conservation (2) State-designated Natural Heritage Areas (3) Habitat Areas of Local Significance.
267-41(D)(4)(c)	(Add) Utilities shall not be replaced or installed within plant and wildlife habitats identified as being of State or County importance unless they meet the conservation requirements under Subsection D(5) below.
267-41(D)(4)(d)	(Add) Stormwater management facilities shall not be placed within plant and wildlife habitats identified as being of State or County importance unless they meet the conservation requirements of Subsection D(5) below.
267-41(D)(5)(c)	(Add) Subject to the review of a site-specific study prepared in consultation with the State of Maryland Department of Natural Resources, the Zoning Administrator may approve development activities or disturbances within the boundaries of a plant and wildlife habitat identified as being of State or County importance, only if it can be shown that the proposed activities will not have or cause adverse impacts on the identified habitat, or species dependent upon the habitat. Stormwater management facilities, utilities, and roads shall be prohibited within the boundaries of an identified plant and wildlife habitat unless there is no physically feasible alternative, as determined by the Zoning Administrator in consultation with the Director of Public Works, in which case they shall be located, designed, constructed, and maintained so as to minimize adverse impacts on the habitat and species dependent upon the habitat. The Zoning Administrator shall consider written comments from the State of Maryland Department of Natural Resources when determining if such impacts have been minimized.

such impacts on Critical Area habitats. These changes would greatly facilitate the use of habitat information by Planning and Zoning staff during the development review process, by allowing for a single set of procedures to be used to assess potential impacts on habitats, regardless of where they occur in the County.

These procedures would ensure that the County obtained technical assistance from the Maryland Department of Natural Resources, so that potential impacts to the habitats could be properly assessed and alleviated. The procedures would also allow development activities to occur within the boundary of an identified habitat, if it could be shown that the activities would not adversely impact the habitat or species which depend on the habitat. Roads, utilities, and stormwater management facilities would generally be prohibited within the boundary of a habitat, unless no physically feasible alternative for this location existed, in which case mitigation measures to minimize any adverse impacts would be required.

It should be noted that the proposed Natural Resources District changes pertain only to development activities, and would not protect non-Critical Area habitats from adverse impacts which could potentially be caused by agricultural and forestry operations. Non-regulatory measures, such as voluntary landowner cooperation and conservation easements, could be used to supplement the regulations and provide additional protection to the habitats. Discussion of these measures is, however, beyond the scope of this study.

INCORPORATION OF HABITAT INFORMATION INTO THE DEVELOPMENT REVIEW PROCESS

The incorporation of significant plant and wildlife habitat information into the development review process would enable the County to implement both existing and proposed regulatory protection measures pertaining to the habitats. This incorporation would involve the completion of two tasks, each of which is discussed below.

Establishment of Interagency Coordination Procedures

Maryland Natural Heritage Program

Interagency coordination between the County and the Maryland Natural Heritage Program is fundamental to the long-term protection of significant plant and wildlife habitats in Harford County. Such coordination would ensure that the County would be able to obtain technical assistance during the development review process, so that a proper determination could be made about whether a proposed development project would adversely impact a habitat.

In an effort to formalize interagency coordination between the County and the Maryland Natural Heritage Program, a proposed Memorandum of Understanding (Appendix 10) has been developed. This Memorandum would clarify the need for coordination between the two agencies, and would also establish mutually agreed upon turnaround times for correspondence, and the types of information and correspondence to be exchanged during the development review process.

Figure 1 shows the County's development review process in relation to proposed interagency coordination procedures, and to both existing and proposed natural resources-related regulations. A generalization of how this process would work is as follows:

> When a development project is proposed within the boundaries of an identified significant plant and wildlife habitat (= Protection Area), the County would send a letter of notification to the Maryland Natural Heritage Program (See Appendix 11 for proposed letter), along with a copy of the preliminary plan for the project, and any other pertinent information. In the letter, the County would indicate which County natural resources-related regulations apply to the project, whether or not the County requires technical assistance from the Maryland Natural Heritage Program, and when the County would need to receive written comments from the Maryland Natural Heritage Program about the possible adverse impacts of the proposed project. The Natural Heritage Program, in turn, would provide written comments and technical assistance the County needed to proceed with its development review process, by the date specified in the notification letter. The County would then keep the Maryland Natural Heritage Program informed about project approval and follow-up enforcement actions, if any.

The proposed notification letter (Appendix 11) is similar in format to a letter which is used by the County to notify the U.S. Army Corps of

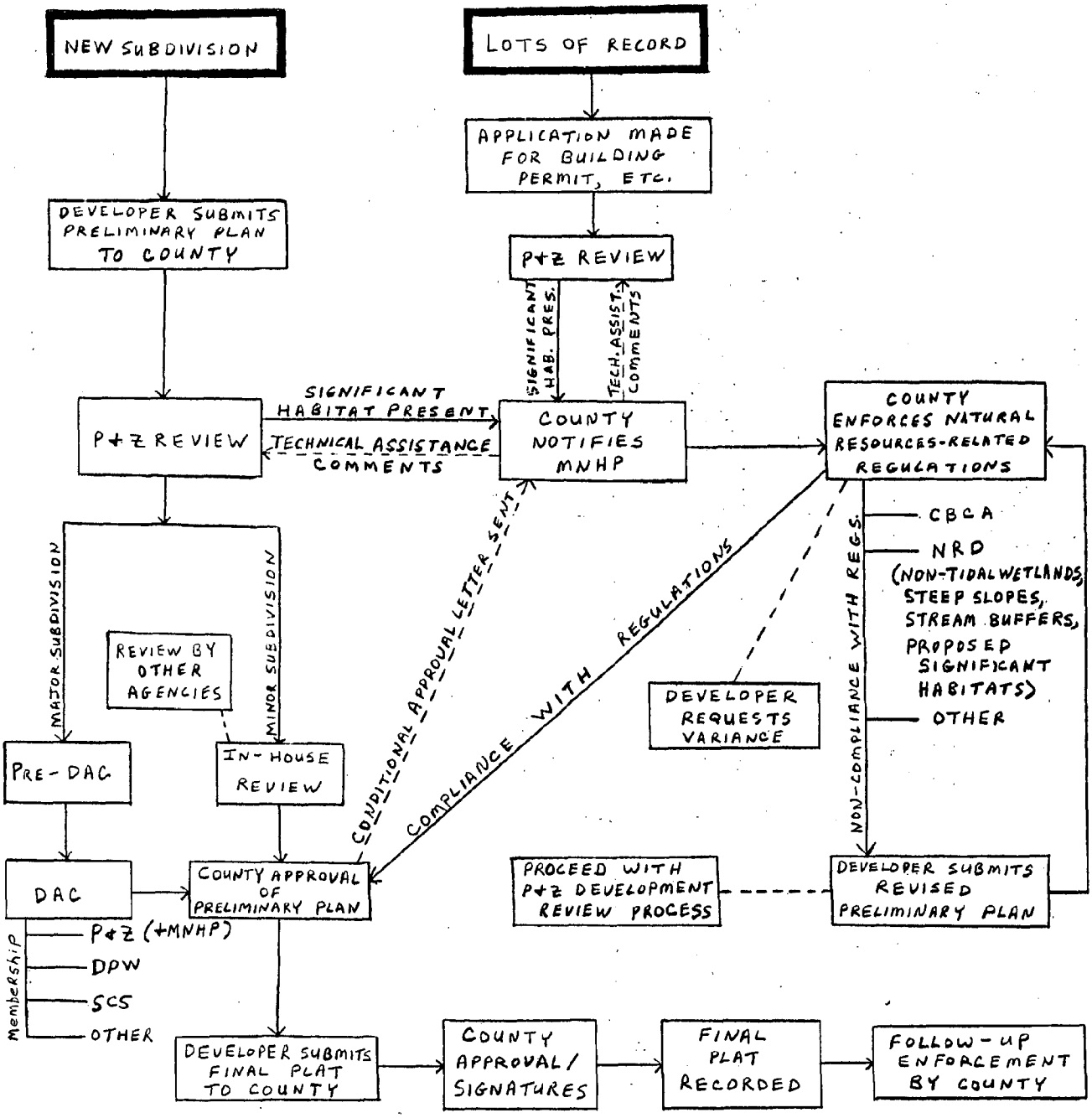


Figure 1. Harford County's development review process, as it relates to interagency coordination procedures with the Maryland Natural Heritage Program, and to existing and proposed regulations pertaining to significant plant and wildlife habitats. Solid lines indicate the primary flow of events through the system, and dashed lines indicate secondary flow.

Engineers about proposed development projects which may impact wetlands under the Corps' jurisdiction. With the exception of the technical assistance aspect, the proposed interagency coordination procedures described above are also similar to procedures used between the County and the Corps.

Nongame and Endangered Species Program

The Nongame and Endangered Species Program of the Maryland Department of Natural Resources manages a species which occurs in one of the significant plant and wildlife habitats which has been identified in the County (i.e., Buck Ridge). Interagency coordination between the County and this agency would, therefore, be desirable. The Nongame and Endangered Species Program has asked to be notified of any proposed land use changes within the boundaries of the Protection Area for Buck Ridge, but has stated that a formal Memorandum of Understanding with the County would be unnecessary. Should any development project be proposed within the boundaries of this Protection Area, however, the County could notify this agency using procedures similar to the ones being proposed to notify the Maryland Natural Heritage Program.

Training of Planning and Zoning Personnel

In order to facilitate the incorporation of habitat information into the development review process, some informal training of individuals who will use the information will be necessary. These individuals must know what types of information are available, what security precautions must be taken with this information, how to interpret regulations pertaining to the habitats, and how to follow in-house review and interagency coordination procedures. A supplemental implementation document will be prepared in 1989, which will aid in this training. This document will include:

(1) updated versions (if applicable) of Natural Resources District and other regulations, including changes to accommodate significant plant and wildlife habitats which occur outside of the Chesapeake Bay Critical Area;

(2) final in-house procedures for implementing regulatory protection of significant plant and wildlife habitats in the County during the development review process;

(3) final interagency coordination procedures, including final versions of the notification letters to the Maryland Natural Heritage Program and the Nongame and Endangered Species Program (if applicable), and a final version of the Memorandum of Understanding between the County and the Maryland Natural Heritage Program;

(4) Protection Area maps to accompany the Protection Area Summaries (reasons why these maps have been excluded from this habitat assessment document can be found on Page 23);

(5) Protection Area Summaries for any sites for which information becomes available in 1989;

(6) security precautions to be taken with habitat assessment information, and reasons for these precautions.

Preparation of the supplemental document, and subsequent training of Planning and Zoning personnel, will take place once it has been determined if proposed regulations pertaining to significant plant and wildlife habitats will become existing regulations.

SIGNIFICANT PLANT AND WILDLIFE HABITATS OF HARFORD COUNTY

Twenty-seven significant plant and wildlife habitats have been identified to date in Harford County, the general locations of which are shown in Figure 2. The remainder of this document consists of a set of Protection Area Summaries for these identified habitats.

It should be noted that references to species and natural community names have been purposely excluded from the Protection Area Summaries, because the distribution of such information to the general public could prove to be detrimental to species populations or communities. For similar reasons, maps to accompany the Protection Area Summaries have not been included within this document.

Information about species names and/or natural community names for each Protection Area will be housed in the Maryland Natural Heritage Program's office, and will be available on a site by site basis for use in implementing regulations pertaining to significant plant and wildlife habitats. Protection Area maps will be included within a supplemental implementation document to be prepared in 1989, and will be housed in offices of both the Harford County Department of Planning and Zoning and the Maryland Natural Heritage Program.

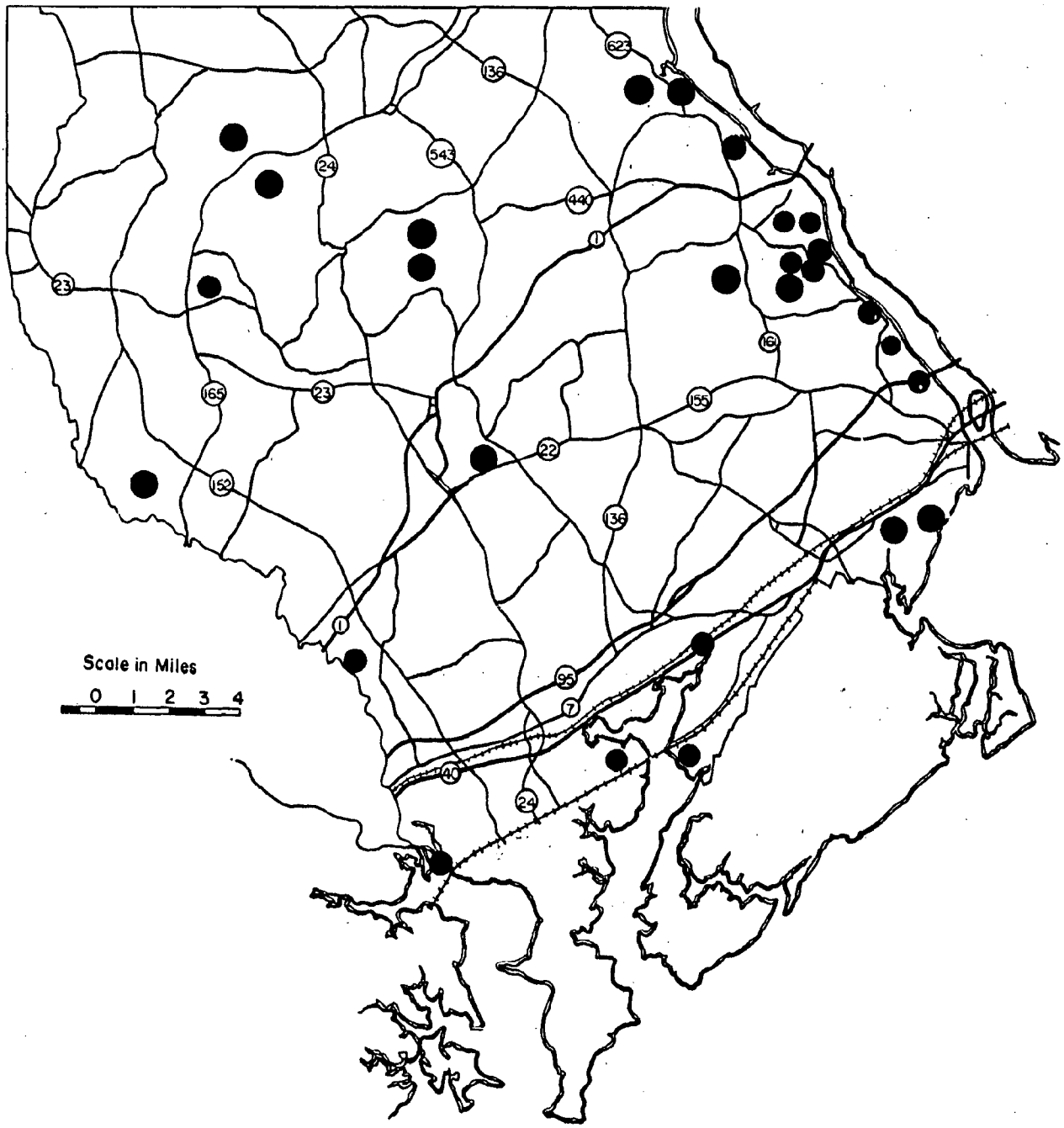


Figure 2. General locations of significant plant and wildlife habitats in Harford County.

PROTECTION AREA SUMMARY

Protection Area Name: BALD HILL
County: Harford
USGS Quad Map(s): Conowingo Dam

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Serpentine barrens and savannas are Nationally Threatened plant communities which occur on, and often contain, exposed outcrops of serpentine bedrock. These communities contain assemblages of plant species which are unique to serpentine outcrops, and often harbor populations of plant and animal species which are considered to be rare.

A serpentine outcrop occurs within the Bald Hill Protection Area, and is kept open, in part, by the maintenance of a powerline corridor which traverses the site. This serpentine "barren" supports populations of both a State Rare plant species, and a species on the state's Watch List. A thriving population of a rare form of an otherwise common plant species can also be found within the Protection Area.

OTHER VALUES AND SIGNIFICANCE:

The forested hillside adjoining the powerline corridor within this Protection Area provides habitat for forest interior dwelling birds. Species of these birds which have been observed on this hillside include Hooded Warbler (*Wilsonia citrina*), Scarlet Tanager (*Piranga olivacea*), Red-eyed Vireo (*Vireo olivaceus*), Kentucky Warbler (*Oporornis formosus*), Worm-eating Warbler (*Helmitheros vermivorus*), Acadian Flycatcher (*Empidonax virescens*), and Yellow-throated Vireo (*Vireo flavifrons*).

THREATS AND MANAGEMENT NEEDS:

Threats

The powerline which traverses Bald Hill precludes most other development activities from occurring within the Protection Area. Such activities are, therefore, not considered to be major threats to the rare species populations on the site.

Perhaps the greatest threat to the rare species populations is the encroachment of woody vegetation, primarily greenbrier (*Smilax rotundifolia*) and brambles (*Rubus* sp.). Exotic plant species, which also occur within the Protection Area, could also encroach upon these populations.

Management Needs

The removal of woody vegetation from the powerline corridor within the next five to ten years is necessary in order to prevent this vegetation from taking over the rare species populations on the site. Management practices which have been used in the past to maintain the corridor do not appear to have damaged these populations, and could be used to control the woody vegetation.

BOUNDARY RECOMMENDATIONS:

Bald Hill consists primarily of a powerline corridor which passes over a serpentine bedrock outcrop, and a strip of deciduous forest on either side of this corridor. The corridor contains many bare rocky areas, particularly on the steep slopes in the southeastern portion of the site, and on the maintenance road which runs the entire length of the site.

Plant species occurring in the powerline corridor consist of a mixture of species which commonly occur on Nationally Threatened serpentine barrens and savannas, and species which are weedy. Typical serpentine species which grow in the Protection Area include arrow-leaved violet (*Viola sagittata*), common cinquefoil (*Potentilla canadensis*), bluets (*Houstonia caerulea*), mountain mint (*Pycnanthemum flexuosum*), little bluestem (*Andropogon scoparius*), rock cress (*Arabis lyrata*), and early saxifrage (*Saxifraga virginiensis*). Weedy species include greenbrier, which is also common on serpentine areas, brambles, Japanese honeysuckle (*Lonicera japonica*), yarrow (*Achillea millefolium*), and several grass species.

Prepared by: Patricia M. Farr

Date: 22 November 1988

PROTECTION AREA SUMMARY

Protection Area Name: BEL AIR OLD FIELD
County: Harford
USGS Quad Map(s): Bel Air

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

This Protection Area provides habitat for a population of a plant species which is considered to be Highly Rare in Maryland. Only a few populations of this species are known to occur in the state, of which the population at Bel Air Old Field is probably the largest.

None of the sites where the Highly Rare species occurs in Maryland currently receive protection from human disturbance. For this reason, the Bel Air Old Field population of this species should be protected, particularly since it is among the best occurrences for the species in the state.

OTHER VALUES AND SIGNIFICANCE:

The meadow in which the rare species occurs provides a natural buffer to the stream which bisects the site, and filters nutrient and pollutant runoff before it enters the stream. Protection of this meadow would, therefore, benefit the water quality of the stream.

THREATS AND MANAGEMENT NEEDS:

Threats

The most immediate threat to the rare species population is the proposed expansion of the state highway which borders the site to the south. Any expansion of this road into the meadow which harbors the population would, in all likelihood, cause direct damage to the portion of the population which occurs immediately adjacent to the road. Additional damage would likely be caused by increased runoff from the expanded highway into the meadow.

A new County road may also be proposed within the Protection Area in the future. Depending on the width of the road, and where it is eventually located, this road could have some of the same adverse impacts as were mentioned above. This road could also impact the rare species population indirectly, by altering the hydrology of the meadow in which the population is located. Mitigation measures would be necessary to ensure that these adverse impacts are minimized.

Water and sewer lines which run through the site may, at some point in the future, need maintenance. Should such maintenance be necessary,

precautionary measures would need to be taken to minimize damage to the rare species population.

Mowing of the meadow has occurred in past years, and may have actually benefitted the rare species population by preventing woody vegetation from encroaching into the meadow. Any future mowing should be done either before June or after mid-November, to avoid direct damage to the population.

Management Needs

The eradication of small patches of common reed (*Phragmites communis*) and asiatic knotweed (*Polygonum perfoliatum*) which occur on the site would prevent these species from encroaching upon the rare species population. The need for this eradication to occur is not considered to be immediate.

BOUNDARY RECOMMENDATIONS:

This Protection Area includes the floodplain which harbors the rare species population, and a seventy-five foot buffer to this floodplain. A County road forms the northern border of the Protection Area. The site is bordered on the south by a state highway.

SITE DESCRIPTION:

Bel Air Old Field is comprised of a seasonally flooded wet meadow, which is located within a river floodplain. This meadow is predominated by goldenrods (*Solidago* spp.), tearthumb (*Polygonum sagittatum*), mountain mint (*Pycnanthemum muticum*), joe-pye weed (*Eupatorium dubium*), aster (*Aster novae-angliae*), and various grasses, including *Arthraxon* sp. A small stand of willows (*Salix nigra*) and common reed occurs in the southeastern portion of the site.

Grassy, mowed fields and yard areas border the meadow on the upper edges of the floodplain. The meadow is bisected by a ten foot wide stream which flows in a north-south direction. A narrow row of willows grows along the banks of the stream, and underground water and sewer lines run parallel to the stream.

Prepared by: Patricia M. Farr

Date: 2 December 1988

PROTECTION AREA SUMMARY

Protection Area Name: BROAD CREEK WOODS
County: Harford
USGS Quad Map(s): Delta

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

This Protection Area contains a 75+ acre, old-growth stand of Canadian hemlocks (Tsuga canadensis). The stand is in a nearly pristine state, and has remained virtually undisturbed for many years.

The hemlock stand is disjunct, meaning that it is located in an area other than where hemlock stands normally occur. While hemlocks are common in the cool, mountainous region of western Maryland, a stand the size and quality of that which is found in Broad Creek Woods is very rare in the warmer, Piedmont region of the state. The hemlock stand may, in fact, be a relict of a much cooler geological time period that has long since passed.

For reasons mentioned above, Broad Creek Woods is considered to be a very significant and unique natural community. This site is, therefore, worthy of protection.

OTHER VALUES AND SIGNIFICANCE:

Broad Creek Woods has exceptional scenic value, and is among the most scenic areas in Harford County. The near-pristine condition of the unique hemlock stand, combined with the expanse of forest land surrounding this stand, provide individuals who visit the site with as close to a wilderness experience as can be found within this area.

The water which flows through the ravines containing the hemlocks is very clear, even after a heavy rain. The clarity of this water is due to the excellent watershed protection afforded by the hemlocks and the adjoining hardwoods.

This Protection Area also provides breeding habitat for forest interior dwelling birds. Species of these birds which have been observed during several visits to the site include Louisiana Waterthrush (Seiurus motacilla), Ovenbird (Seiurus aurocapillus), Hooded Warbler (Wilsonia citrina), and Red-eyed Vireo (Vireo olivaceus).

THREATS AND MANAGEMENT NEEDS:

Threats

The County's Natural Resources District regulations apply to the steep ravines on the site, and to the area immediately adjacent to Broad Creek, where a Natural Resources District buffer is required. The lower portion of the Protection Area is located within a 100-year floodplain and, as such, is subject to the provisions of the County's Floodplain District regulations. While the County's regulations prohibit some types of development from occurring within portions of the hemlock stand, they do not prohibit the installation of roads and utilities within the stand, nor do they prohibit timber harvesting.

The placement of buildings, roads, and utility lines in or near the hemlocks could destroy the overall integrity and the scenic value of the stand. Timber harvesting could have these same adverse impacts, and even limited harvesting could destroy the old-growth character or the cool microclimate of the stand. For these reasons, the aforementioned activities should not occur within the bounds of the Protection Area.

Management Needs

The maintenance of Broad Creek Woods in its present condition would provide the natural community with the best chance for survival over the long term. No management activities are needed within the foreseeable future.

BOUNDARY RECOMMENDATIONS:

The Maryland Natural Heritage Program and the County are currently undertaking a study to determine the ecological significance of this community. The limits of the Protection Area will be delineated once this study has been completed.

SITE DESCRIPTION:

Broad Creek Woods contains a nearly pure stand of Canadian hemlocks, which encompasses both the banks of Broad Creek, and three steep ravines which drain into this creek from the south. The stand is in a very undisturbed condition, with the exception of a few hiking trails which traverse the site.

The hemlock stand exhibits many characteristics that are typical of an old-growth forest, including a deep, multilayered crown canopy, some individual trees that are either old, or have achieved large size, significant coarse woody debris, including snags and down logs, and some snags and logs of large diameter (Thomas et al. 1988). Many of the trees which occur in the

stand are in the 12-24 inch diameter class, and a handful of trees exceed 36 inches in diameter. The microclimate within the hemlock stand is cool and moist, as evidenced by the thick layer of mosses which grows on the tree trunks, and the large number and diversity of ferns which grow in the ground layer.

A mixed hardwood forest adjoins the hemlock stand, both on the hilltops between the steep ravines, and to the south of the stand. This forest is predominated by oaks (*Quercus* spp.), with beech (*Fagus grandifolia*) and red maple (*Acer rubrum*) in the understory, and a shrub layer consisting of mountain laurel (*Kalmia latifolia*), pawpaw (*Asimina triloba*), and/or greenbrier (*Smilax rotundifolia*).

REFERENCES:

Thomas, J.W., L.F. Ruggiero, R.W. Mannan, J.W. Schoen, and R.A. Lancia. 1988. Management and conservation of old-growth forests in the United States. Wildlife Society Bulletin 16:252-262.

Prepared by: Patricia M. Farr

Date: 16 December 1988

PROTECTION AREA SUMMARY

Protection Area Summary: BUCK RIDGE
County: Harford
USGS Quad Map(s): Conowingo Dam

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Buck Ridge provides a breeding site for a Nationally Endangered animal species. In Maryland, this species breeds along the shores and inlets of the Chesapeake Bay and its tributaries, and sometimes in wetlands and estuaries associated with these water bodies.

Only a handful of active breeding sites for the Nationally Endangered species are known to occur in Harford County, and all but Buck Ridge are located within Aberdeen Proving Ground. The sites which occur within Aberdeen Proving Ground may not be entirely secure from human disturbance, and the Buck Ridge breeding site is, therefore, in need of protection.

OTHER VALUES AND SIGNIFICANCE:

The woodland on the site buffers a stream which flows into a tributary to the Susquehanna River, which eventually flows into the Chesapeake Bay. The protection of this woodland would, therefore, benefit the water quality of the Chesapeake Bay.

THREATS AND MANAGEMENT NEEDS:

Threats

The Nongame and Endangered Species Program of the Maryland Department of Natural Resources has recommended that a one-quarter mile "protection zone" be established around the breeding site for the rare species of Buck Ridge. Within this "protection zone", proposed land use activities, such as those activities associated with timber harvesting or development, would need to be carefully evaluated for their potential to adversely impact the rare species. Precautionary measures would need to be taken, in order to ensure that the species was not impacted by the destruction of their breeding site, or by an increase in human disturbance around this site during the breeding season.

Management Needs

The maintenance of Buck Ridge in its present condition would provide the rare species with the best chance of breeding success. No management activities are needed within the foreseeable future.

BOUNDARY RECOMMENDATIONS:

The Protection Area boundary for Buck Ridge encompasses the breeding site for the rare species, and the one-quarter mile "protection zone" recommended by the Nongame and Endangered Species Program.

SITE DESCRIPTION:

Buck Ridge consists of a small deciduous woodland, which is located near the headwaters of a tributary stream. This woodland is predominated by mixed hardwoods, and is surrounded by agricultural land.

Prepared by: Patricia M. Farr

Date: 12 November 1988

PROTECTION AREA SUMMARY

Protection Area Name: CHERRY HILL RAVINE
County: Harford
USGS Quad Map(s): Delta

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Cherry Hill Ravine provides habitat for a large population of a plant species which has been designated as a State Threatened Species (COMAR 08.03.08) and, additionally, is considered to be Highly Rare in Maryland. Although this species is found at five other locations in the state, most of these populations are very small, and only one population is protected. The Cherry Hill Ravine population represents the largest known occurrence of the species in Maryland, and is the only known occurrence of this species in the County. This population is, therefore, certainly worthy of protection.

One other notable species which occurs within the Protection Area is a species on the state's Watch List. This species is known only from one other site in Harford County.

THREATS AND MANAGEMENT NEEDS:

Threats

The ravine which encompasses the rare species populations is considered to be a non-tidal wetland by County definition, and, as such, is subject to the provisions of the County's Natural Resources District regulations. These regulations would generally prohibit development activities from occurring in, and immediately adjacent to, this ravine.

Activities which could destroy the cool microclimate of the ravine, such as heavy logging, could be detrimental to the rare species populations and should be avoided. Any change in the water level of the impoundment could harm the Threatened Species population either directly, by flooding the portion of the population which grows in the lower part of the ravine, or indirectly, by changing the hydrology of the habitat on which the species depends.

Management Needs

The maintenance of Cherry Hill Ravine in its present condition would provide the rare species populations on the site with the best chance of survival over the long term. No management activities are needed within the foreseeable future.

BOUNDARY RECOMMENDATIONS:

The Protection Area for this site includes the ravine which encompasses the rare species populations, and small tributaries which drain into this ravine. An artificial impoundment which occurs to the south of this ravine is also included within the Protection Area.

SITE DESCRIPTION:

Cherry Hill Ravine consists of a cool ravine which is underlain by serpentine bedrock, and the impoundment into which the ravine flows. Several intermittent streams flow through the ravine, most of which have narrow floodplains that are bordered by dry, rocky hillsides above.

The dominant tree species in the ravine is Virginia pine (*Pinus virginiana*), although scattered red cedars (*Juniperus virginiana*) can also be found. Greenbrier (*Smilax rotundifolia*), red maple (*Acer rubrum*), and spicebush (*Lindera benzoin*) are the most common plant species in the shrub layer. The ground layer is dominated by Christmas fern (*Polystichum acrostichoides*).

Prepared by: Patricia M. Farr

Date: 3 December 1988

PROTECTION AREA SUMMARY

Protection Area Name: CHURCH CREEK POND
County: Harford
USGS Quad Map(s): Perryman

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

This Protection Area contains the County's only population of a certain State Rare plant species. This species is found at only one other site in the state of Maryland.

The freshwater pond containing the rare plant species, because of its size and quality, represents the best example of its kind in Harford County. The uniqueness of the habitat, together with the presence of the rare plant species, make this site worthy of protection.

OTHER VALUES AND SIGNIFICANCE:

Church Creek Pond filters runoff from the highway and railroad tracks that border the site. The pond is hydrologically connected to Church Creek, which flows into Bush River, and subsequently into Chesapeake Bay. Protection of this pond would, therefore, benefit the water quality of Chesapeake Bay.

The pond is also aesthetically pleasing to motorists who travel along Pulaski Highway. The aesthetic value of the pond is most noticeable during the summer, when the water lilies that float on the surface of the water are in flower.

THREATS AND MANAGEMENT NEEDS:

Threats

This site is located entirely within the Chesapeake Bay Critical Area, and is proposed for protection as a Habitat of Local Significance (Site No. 6). The site is largely undevelopable due to the presence of the pond and the proximity of the site to the adjoining railroad tracks. The pond is considered to be a wetland by County definition, and, as such, is protected by the County's Critical Area-related regulations. Church Creek Pond should, therefore, receive adequate protection from most human disturbances.

Activities which could alter the hydrology of the pond or increase runoff into the pond threaten the integrity of this habitat and should, therefore, be avoided. Particularly notable are activities such as ditching or draining, which could change the water level in the pond, and subsequently threaten the rare species population.

Management Needs

The maintenance of the pond in its present condition would provide the rare species population with the best chance of survival over the long term. No management practices are needed within the foreseeable future.

BOUNDARY RECOMMENDATIONS:

The Protection Area boundary encompasses the pond containing the rare species population, and a small portion of the woodland to the north and east to serve as a buffer. Church Creek Pond is bordered on the south by Pulaski Highway, and on the north by Baltimore and Ohio railroad tracks.

SITE DESCRIPTION:

Church Creek Pond consists of a two acre, permanently flooded freshwater pond, and a portion of the adjoining oak (*Quercus* sp.)/beech (*Fagus grandifolia*) woodland to the north and west of the pond. The pond is impounded by Pulaski Highway, which borders the pond to the south. Several submerged and floating-leaved plant species grow within the pond, including fragrant water lily (*Nymphaea odorata*), yellow water lily (*Nuphar advena*), water milfoil (*Myriophyllum brasiliense*), curly pondweed (*Potamogeton crispus*), duckweed (*Lemna minor*), burreed (*Sparganium* sp.), and bladderwort (*Utricularia vulgaris*). Cattails (*Typha* sp.) and beak rush (*Rhynchospora* sp.) grow along the southern edge of the pond.

Prepared by: Patricia M. Farr

Date: 22 June 1988

PROTECTION AREA SUMMARY

Protection Area Name: DEER CREEK
County: Harford
USGS Quad Map(s): Aberdeen, Bel Air, Conowingo Dam, Delta, Fawn Grove, Jarrettsville, Norrisville, Phoenix

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

The lower stretch of Deer Creek has been designated by the U.S. Fish and Wildlife Service as critical habitat for a Nationally Endangered animal species. This species is extremely limited in its worldwide distribution, and is known to occur only in Harford County.

The presence of the Nationally Endangered species in the lower part of Deer Creek indicates that the water quality of the Deer Creek drainage system is, for the most part, very good. The retention of good water quality in this drainage system is vitally important to ensuring the continued existence of the rare species in Deer Creek.

OTHER VALUES AND SIGNIFICANCE:

Deer Creek has many values, not the least of which is its scenic value. The overall beauty of this riverine system, combined with the many unbroken stretches of woodland and farmland along its banks, prompted the Maryland Department of Natural Resources to designate Deer Creek as a Scenic River.

The scenic value of Deer Creek is, perhaps, most appreciated by individuals who use the creek and its surrounding watershed for passive recreational activities such as canoeing, fishing, and hiking. The three State Parks which occur along Deer Creek provide opportunities for people who wish to engage in these activities.

THREATS AND MANAGEMENT NEEDS:

Threats

The lower portion of the Deer Creek watershed has been included as a Threatened and Endangered Species site (Site No. 1) within the County's Chesapeake Bay Critical Area. This inclusion requires that the rare species in this area, and the habitat for the rare species, be protected from human disturbance. The Critical Area boundary was "expanded" beyond the original 1000 foot line in the lower Deer Creek area, in order to provide additional protection to the rare species and its habitat.

Steep slopes and/or 100-year floodplains occur along Deer Creek and its tributaries throughout much of the watershed above the Critical Area. The

areas where these natural features occur are subject to the provisions of either the County's Natural Resources District regulations or the County's Floodplain District regulations. Additionally, a Natural Resources District buffer is required along Deer Creek, and tributaries to this creek which drain more than 400 acres. These regulations should help protect the water quality in the Deer Creek drainage system.

Because the Deer Creek watershed encompasses such a large amount of land, there is a high potential for activities to occur which could degrade the water quality in the drainage system. Such water quality degradation could, in turn, adversely impact the rare species which occurs in the lower portion of Deer Creek, or the habitat on which this species depends. Activities which should be avoided include ones which would increase the runoff of nutrients, sediment, or pollutants into Deer Creek or its tributaries, or ones which would reduce the amount of forest cover adjacent to these streams.

Management Needs

Existing and proposed land use activities within the watershed should be carefully evaluated for their potential to impact the water quality of Deer Creek. Woody buffers should be established along Deer Creek and its tributaries, in areas where the present buffer is narrow or lacking, to help filter nutrient, pollutant, and sediment runoff, and to provide stream shading. Further research is needed to determine additional management needs.

BOUNDARY RECOMMENDATIONS:

A Protection Area has been established only for the Chesapeake Bay Critical Area portion of the Deer Creek watershed, or that portion of the watershed which extends from the U.S. Army water pumping station eastward to the confluence of Deer Creek and the Susquehanna River. This Protection Area encompasses the entire stretch of Deer Creek which has been designated as critical habitat for the Nationally Endangered animal species.

The Protection Area includes a 500 foot strip of land along the north side of Deer Creek, except near the Susquehanna River, where it was expanded to encompass Susquehanna State Park. Along the south side of Deer Creek, the Protection Area includes a 1000 foot strip of land adjoining the creek, and also includes buffers to Elbow Branch and some smaller Deer Creek tributaries which are located in Susquehanna State Park. The peninsula to the west of Deer Creek, between Deer Creek and the Susquehanna River, is also included within the Protection Area.

SITE DESCRIPTION:

Deer Creek is located in the north-central part of Harford County, and flows in a west to east direction from just beyond the Baltimore County line

to the Susquehanna River. The watershed for this creek encompasses approximately half of the Piedmont province of the County.

The Deer Creek watershed is rural in character, and consists primarily of an interspersion of agricultural fields and forest land. Some scattered development occurs in the watershed, most of which is located either along roads, or in small towns.

Natural wooded buffers can be found along Deer Creek and its tributaries in many places. In other places, however, these streams flow through agricultural fields, with little or no natural buffers.

Prepared by: Patricia M. Farr

Date: 15 December 1988

PROTECTION AREA SUMMARY

Protection Area Name: DEER CREEK BARREN
County: Harford
USGS Quad Map(s): Delta

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

This Protection Area contains two Nationally Threatened serpentine savannas. These savannas contain unique assemblages of plant species, and collectively, represent the best occurrence of this natural community type in the County, and the second best occurrence in the state.

The serpentine savannas harbor populations of nine plant species which are considered to be rare or unusual in Maryland. One of these species is Regionally Rare, and is known to occur in only one other location in the state. Two Highly State Rare species also occur here, one of which is known to occur nowhere else in Maryland, and the other of which grows only on serpentine bedrock. This site also contains populations of five plant species on the state's Watch List, and a rare form of an otherwise common plant which occurs only on serpentine bedrock.

For reasons mentioned above, Deer Creek Barren should be considered a very important natural community. This community is the most significant plant habitat known for the County, and, therefore, must be protected.

THREATS AND MANAGEMENT NEEDS:

Threats

This site occurs on a dry, gently sloping hillside, and, as such, is not protected from development by either the County's Natural Resources District regulations or Floodplain District regulations. Development within the Protection Area would, in all likelihood, destroy the integrity of the site, and would probably destroy many of the rare species populations which are present as well. Although the site is not considered to be immediately threatened by development, any future development in the area should be placed outside of the bounds of the Protection Area.

The most immediate threat to Deer Creek Barren is the encroachment of woody vegetation, particularly Virginia pine (*Pinus virginiana*), red cedar (*Juniperus virginiana*), and greenbrier (*Smilax rotundifolia*). As evidenced by a comparison of recent aerial photos of the site with photos from several years ago, this encroachment is occurring very rapidly. Should the woody vegetation remain unchecked, the savannas would likely succeed to a Virginia pine/greenbrier forest, very similar to that which occupies most of the land immediately surrounding the savannas. This succession would, in turn, result

in the disappearance of the rare species from the site (Tyndall and Farr, in press).

Management Needs

For reasons mentioned above, the woody vegetation needs to be removed from the site within the near future, in order to prevent the loss of the serpentine savanna through succession, and to prevent the subsequent loss of the rare species which occur in these savannas. The removal of woody vegetation from the largest savanna is scheduled to occur during the early part of 1989. However, due to access problems, it will not be possible to remove woody vegetation from the smaller savanna. Further exploration is needed in the near future to determine a way in which to access this savanna, so that the woody vegetation can be removed.

BOUNDARY RECOMMENDATIONS:

The Protection Area for this site encompasses the two serpentine savannas, and a 100 foot buffer around each of these openings.

SITE DESCRIPTION:

This site consists primarily of two serpentine savannas, one of which is five to six acres in size, and the other of which is two to three acres. These savannas are relatively undisturbed, with the exception of an old trail which cuts through the largest opening, and a rocky road which runs between, and partially bisects, the savannas. The savannas are separated by about 1200 feet.

Each serpentine savanna is comprised of an interspersion of trees and "openings". The dominant tree species on these savannas are Virginia pine and red cedar. Little bluestem (*Andropogon scoparius*) and three-awn (*Aristida purpurascens*) dominate the herbaceous layer of the "openings". Bare rocky areas can also be found within the savannas (Tyndall and Farr, in press).

REFERENCES:

Tyndall, R.W., and P.M. Farr. In press. Vegetation structure and flora of a serpentine pine-cedar savanna in Maryland. Castanea.

Prepared by: Patricia M. Farr

Date: 20 December 1988

PROTECTION AREA SUMMARY

Protection Area Name: DEER CREEK HILLSIDE
County: Harford
USGS Quad Map(s): Aberdeen

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Deer Creek Hillside provides habitat for a Highly State Rare plant species, which has been officially designated as a Threatened Species by the Maryland Department of Natural Resources (COMAR 08.03.08). Only four populations of this species are known to occur in the state, and the population at Deer Creek Hillside is by far the largest. None of these populations currently receives adequate protection from human disturbance.

The Maryland populations of the Highly State Rare species are at the extreme northeastern limit of the species' total range. The Deer Creek Hillside population of this species is the most northern occurrence known for the species in the state, and is probably among the most northern occurrences for the species as a whole. This population represents the only known occurrence for the species in Harford County.

For reasons mentioned above, the rare plant species population at Deer Creek Hillside is considered to be of high value, and the site should be protected.

OTHER VALUES AND SIGNIFICANCE:

The mature, forested hillside on this site drains directly into Deer Creek, and provides an excellent buffer to this creek. Protection of this site would, therefore, help protect the water quality of Deer Creek, and would subsequently help protect a population of a Nationally Endangered animal species which resides in the creek and depends upon good water quality for its continued existence.

THREATS AND MANAGEMENT NEEDS:

Threats

This Protection Area occurs entirely within both the Chesapeake Bay Critical Area (Proposed Threatened and Endangered Species Site, Site No. 5) and Susquehanna State Park. Because of its location, this site should receive protection from most human disturbances.

Timber harvesting could easily damage the rare species, or habitat for this species, and should be prohibited within the Protection Area, except to remove individual diseased trees, or trees which are in danger of falling

where they may threaten human safety (i.e., along the roads at the bottom of the hill). During such tree removal operations, disturbance to the rare species population and species habitat would need to be avoided.

Trampling by both humans and horses also has the potential to cause damage to the rare species or species habitat. Some damage to the habitat on the upper portion of the hillside has already occurred from trampling. Horseback riding should not be allowed to occur within the Protection Area in the future. This activity, and hiking, should be redirected to another part of the State Park.

Management Needs

The maintenance of Deer Creek Hillside in its present condition would provide the rare species population with the best chance of survival over the long term. No management activities are needed within the foreseeable future.

BOUNDARY RECOMMENDATIONS:

This site encompasses the entire hillside which contains the rare species population. The Protection Area is bordered at the base of this hill by two roads, and extends to just beyond the top of the hill.

SITE DESCRIPTION:

This Protection Area consists of a steep, relatively undisturbed hillside which is located at the edge of a river floodplain. Rocky outcrops, several of which are large, are common on the hillside.

A mature hardwood forest can be found growing on the hillside. This forest is predominated by beech (*Fagus grandifolia*) and oaks (*Quercus* spp.), with an understory of beech and flowering dogwood (*Cornus florida*), and a shrub layer of mountain laurel (*Kalmia latifolia*), pawpaw (*Asimina triloba*), red maple (*Acer rubrum*), and azalea (*Rhododendron* sp.). Ferns dominate the rich herbaceous layer of this forest, although a diversity of other species, including may-apple (*Podophyllum peltatum*), spring beauty (*Claytonia virginica*), violets (*Viola* spp.), and bluets (*Houstonia* sp.) also occur here. The forest floor is comprised of a mixture of mosses and rich, organic soil.

Prepared by: Patricia M. Farr

Date: 8 December 1988

PROTECTION AREA SUMMARY

Protection Area Name: DEER CREEK PUMPING STATION
County: Harford
USGS Quad Map(s): Aberdeen

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Deer Creek Pumping Station provides habitat for a population of a State Rare plant species. This species is found in only one other location in the state, within one-half mile of the population at Deer Creek Pumping Station. This population represents the best example of its kind in the state, and is therefore in need of protection.

The wetland which supports the rare species population also supports a population of marsh marigold (*Caltha palustris*). While marsh marigold is common in other regions of the state, it occurs in only a few locations within Harford County.

OTHER VALUES AND SIGNIFICANCE:

The forested hillside and non-tidal wetland of Deer Creek Pumping Station provide an excellent buffer to the stream which occurs adjacent to the site. The forested portions of the site provide habitat for forest interior dwelling birds. Red-eyed Vireos (*Vireo olivaceus*), Ovenbirds (*Seiurus aurocapillus*), Scarlet Tanagers (*Piranga olivacea*), and Acadian Flycatchers (*Empidonax virescens*) have all been observed on the site during the breeding season.

THREATS AND MANAGEMENT NEEDS:

Threats

This Protection Area occurs entirely within both the Chesapeake Bay Critical Area (Proposed Habitat of Local Significance, Site No. 7) and Susquehanna State Park. The site should, therefore, receive adequate protection from most human disturbances.

Runoff from the adjoining road poses, perhaps, the greatest threat to the wetland containing the rare species population, but is unavoidable. Activities which have the potential to alter the hydrology of the wetland, such as ditching along the road or changing the flow of water through the culvert which leads out of the wetland, should not be allowed to occur.

Timber harvesting on the upland portion of the site should be limited to selective cutting, and should not alter the existing vegetative structure or change the existing species composition of the site. Disturbance to the wetland area during harvesting operations should be

avoided, and the habitat value for forest interior dwelling birds should be retained. Additionally, harvesting should be avoided during the May through August breeding season for these bird species (Chesapeake Bay Critical Area Commission 1986).

Management Needs

The maintenance of Deer Creek Pumping Station in its present condition would assure the long-term survival of the rare species population on the site. No management activities are needed within the foreseeable future.

BOUNDARY RECOMMENDATIONS:

The Protection Area boundary encompasses the non-tidal wetland which supports the rare species population, and the adjoining steep slopes and ravines which drain into the wetland. This boundary extends from just beyond the top of the steep slopes to the road, which partially impounds the wetland.

SITE DESCRIPTION:

Deer Creek Pumping Station consists of a seasonally to semi-permanently flooded non-tidal wetland, and a steep upland hillside. The wetland occurs on the outer edge of a river floodplain, and is partially impounded by a gravel road, which now cuts it off from the rest of the floodplain. Intermittent streams flow through the wetland, and eventually flow through a culvert underneath the road.

The drier portion of the wetland is dominated by a mature red maple (*Acer rubrum*) forest, with a shrub layer of smooth arrowwood (*Viburnum recognitum*) and spicebush (*Lindera benzoin*), and a ground layer dominated by skunk cabbage (*Symplocarpus foetidus*) and spotted jewelweed (*Impatiens capensis*). This forest opens up into a wet, mucky, shrubby/herbaceous wetland dominated by witch hazel (*Hamamelis virginiana*), grapes (*Vitis* sp.), tearthumb (*Polygonum arifolium*) and sedges (*Carex* sp.). The presence of skunk cabbage and marsh marigold indicate that the wetland is a seep (Bartgis 1987).

The hill above the wetland consists of a mature beech (*Fagus grandifolia*)/tulip poplar (*Liriodendron tulipifera*) forest with a ground layer dominated by ferns. This hill encompasses two steep ravines, and provides an excellent natural buffer to the wetland.

REFERENCES:

Bartgis, R. L. 1987. Functional assessment of non-tidal wetlands. Maryland Natural Heritage Program, Maryland Department of Natural Resources. 46 pp. Mimeo.

Chesapeake Bay Critical Area Commission. 1986. A guide to the conservation of forest interior dwelling birds in the Critical Area. Chesapeake Bay Critical Area Commission, Guidance Paper No. 1, 13 pp.

Prepared by: Patricia M. Farr

Date: 4 October 1988

PROTECTION AREA SUMMARY

Protection Area Name: ELBOW BRANCH
County: Harford
USGS Quad Map(s): Aberdeen

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Elbow Branch contains a population of a State Rare plant species. This species is found in only one other location in the state, within one-half mile of the population at Elbow Branch. This population is, therefore, in need of protection.

The floodplain which supports the rare species population also supports a population of marsh marigold (*Caltha palustris*). While marsh marigold is common in other regions of the state, it occurs in only a few locations in Harford County.

OTHER VALUES AND SIGNIFICANCE:

The forested hillside and floodplain of Elbow Branch provide an excellent buffer to the stream which borders the site. The forested portions of the site provide habitat for forest interior dwelling birds. Red-eyed Vireos (*Vireo olivaceus*), Ovenbirds (*Seiurus aurocapillus*), Scarlet Tanagers (*Piranga olivacea*), and Acadian Flycatchers (*Empidonax virescens*) have all been observed on the site during the breeding season.

THREATS AND MANAGEMENT NEEDS:

Threats

This Protection Area occurs entirely within both the Chesapeake Bay Critical Area (Proposed Habitat of Local Significance, Site No. 8) and Susquehanna State Park. The site should, therefore, receive adequate protection from most human disturbances.

Activities which could alter the hydrology of the floodplain, or change the character of the floodplain next to the road, have the potential to damage the rare species population, and should, therefore, be avoided. Such activities include parking, mowing, ditching, and heavy trampling.

Parking should be strictly prohibited on the east side of the road within the Protection Area boundary. Mowing, if it is to occur, should be avoided during the months of May through October, to avoid direct destruction of the rare species population. Additionally, hiking trails should be located outside of the floodplain.

Timber harvesting should be limited to the upland portion of Elbow Branch, and should not alter the existing vegetative structure or species composition of the site. Disturbance to the floodplain area during harvesting operations should be avoided, and the habitat value for forest interior dwelling birds should be retained. Also, harvesting should be avoided during the May through August breeding season for these species (Chesapeake Bay Critical Area Commission 1986).

Management Needs

In general, the maintenance of Elbow Branch in its present condition would provide the rare species population on the site with the best chance for survival over the long term. The placement of signs to prohibit parking on the east side of the road within the Protection Area is strongly recommended. No additional management measures are needed within the foreseeable future.

BOUNDARY RECOMMENDATIONS:

The Protection Area boundary encompasses the floodplain which supports the rare species population, and the adjoining steep slopes and ravine which drain into this floodplain. The boundary extends from the top of the slopes and ravine, across the floodplain, to the stream on the other side of the road.

SITE DESCRIPTION:

Elbow Branch consists of a steep ravine and adjoining steep slopes, and the floodplain into which the ravine and slopes drain. The mature tulip poplar (*Liriodendron tulipifera*)/beech (*Fagus grandifolia*) forest which grows on the slopes, provides an excellent buffer to the floodplain below.

The floodplain is dominated by a mature red maple (*Acer rubrum*)/tulip poplar forest, with a shrub layer containing smooth arrowwood (*Viburnum recognitum*), spicebush (*Lindera benzoin*), and beech. Skunk cabbage (*Symplocarpus foetidus*), pale jewelweed (*Impatiens pallida*), tearthumb (*Polygonum arifolium*), and ferns dominate the ground layer.

A gravel road bisects the floodplain, and partially impounds the portion of the floodplain occurring on the east side of the road. A permanent stream borders the floodplain, and forms the western border of the site.

REFERENCES:

Chesapeake Bay Critical Area Commission. 1986. A guide to the conservation of forest interior dwelling birds in the Critical Area. Chesapeake Bay Critical Area Commission, Guidance Paper No. 1, 13 pp.

Prepared by: Patricia M. Farr

Date: 5 October 1988

PROTECTION AREA SUMMARY

Protection Area Name: GASHEYS RUN
County: Harford
USGS Quad Map(s): Aberdeen, Havre de Grace

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

The lower portion of Gasheys Run, and the tributary which drains into Gasheys Run from the west, have been designated by the U.S. Fish and Wildlife Service as critical habitat for a Nationally Endangered animal species. This species is extremely limited in its worldwide distribution, and is known to occur only in Harford County. Protection of the remaining habitat for this rare species, including that which is found in Gasheys Run and its tributary, is of the utmost importance.

OTHER VALUES AND SIGNIFICANCE:

Gasheys Run and its tributaries flow into Swan Creek, which, in turn, flows into Chesapeake Bay. Protection of the water quality in the Gasheys Run drainage system would, therefore, benefit the water quality of Chesapeake Bay.

THREATS AND MANAGEMENT NEEDS:

Threats

The lower portion of the Gasheys Run watershed has been included as a Threatened and Endangered Species site (Site No. 4) within the County's Chesapeake Bay Critical Area. This inclusion requires that the rare species habitat be protected from human disturbance. The Critical Area boundary was "expanded" beyond the original 1000 foot line in the lower Gasheys Run area, in order to provide additional protection to the critical habitat for the rare species.

One hundred-year floodplains, and to a lesser extent, steep slopes, occur along Gasheys Run and its tributaries throughout much of the watershed above the Critical Area. The areas where these natural features occur are subject to the provisions of either the County's Floodplain District regulations or the County's Natural Resources District regulations. In addition, a Natural Resources District buffer is required along Gasheys Run, and tributaries to this stream which drain more than 400 acres. These regulations should help to protect the water quality in the Gasheys Run drainage system.

Because the Gasheys Run watershed encompasses a relatively large amount of land, there is a high potential for activities to occur which could degrade the water quality in the drainage system. Such water quality

degradation could, in turn, adversely impact the rare species habitat in the lower portion of the drainage system. Activities which should be avoided include ones which would increase the runoff of nutrients, sediment, or pollutants into Gasheys Run or its tributaries, or ones which would reduce the amount of forest cover adjacent to these streams.

One notable activity which could adversely impact the water quality of Gasheys Run is the proposed realignment of Maryland Route 155. The southern-most of the alternatives for this proposed realignment would necessitate crossing Gasheys Run, which could cause both sediment and pollutant runoff into this stream during construction, and road runoff into the stream after construction. Placing a major new road within the watershed could cause additional adverse impacts to Gasheys Run, by encouraging future development into the area. Because the land to be developed would likely be annexed by the City of Havre de Grace, the County's natural resources-related regulations would not be applicable.

Management Needs

Existing and proposed land use activities within the watershed should be carefully evaluated for their potential to impact the water quality in the Gasheys Run drainage system. Prior to the onset of development on any land annexed by Havre de Grace, discussion should be initiated by the County with individuals from both this city and the Maryland Natural Heritage Program, to make certain that the city understands the ecological significance and management needs of the area.

Woody buffers should be established along Gasheys Run and its tributaries, in areas where the present buffer is narrow or lacking, to help filter runoff, and to provide stream shading. Further research is needed to determine additional management needs in this area.

BOUNDARY RECOMMENDATIONS:

A Protection Area boundary has been established only for the Chesapeake Bay Critical Area portion of Gasheys Run watershed, or that portion of the watershed which extends from the AMTRAK railroad tracks south of Route 40 to the confluence of Gasheys Run and Swan Creek. This Protection Area encompasses the entire area designated as critical habitat for the Nationally Endangered species in Gasheys Run and the adjoining tributary.

In general, the Protection Area includes a 300 foot strip of land on either side of Gasheys Run and its tributary. The Protection Area boundary was adjusted in some places, to encompass a few small ravines which drain into the two streams.

SITE DESCRIPTION:

Gasheys Run consists of a small watershed in the southeastern portion of Harford County, which flows from the Piedmont province, through the Coastal Plain province, and eventually into Swan Creek. The character of the watershed is largely rural, and is comprised, for the most part, of an interspersion of agricultural fields and wooded ravines.

The watershed is bisected by Maryland Route 40 and two adjoining railroad lines, which run in an east-west direction near the "fall line" between the Piedmont and the Coastal Plain provinces. Interstate 95 crosses over the headwaters of Gasheys Run in the upper portion of the watershed.

Some development occurs along Route 40, and is primarily of the commercial variety. Scattered low density residential development can be found in other portions of the watershed. This development is concentrated on hilltops, away from Gasheys Run and associated ravines.

Prepared by: Patricia M. Farr

Date: 15 December 1988

PROTECTION AREA SUMMARY

Protection Area Name: GLEN COVE MARINA
County: Harford
USGS Quad Map(s): Conowingo Dam

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Glen Cove Marina harbors a population of a Highly State Rare plant species, which has been officially listed by the Maryland Department of Natural Resources as Threatened (COMAR 08.03.08). This plant has been harvested extensively for its medicinal value, which has led to the near disappearance of the species throughout most of its range. The loss of forest habitat has also contributed to the decline of this species.

Only five populations of the Highly Rare plant species are known to occur in Maryland, and only three of these populations are considered to be adequately protected from human disturbance. The Glen Cove Marina population is among the best in the state, and represents the only known occurrence for this species in Harford County. Because of the rarity of this species, and its susceptibility to overharvesting, the Glen Cove Marina population is in need of protection.

OTHER VALUES AND SIGNIFICANCE:

The mature, deciduous hillside that occupies most of the site provides an excellent buffer to Peddler Run, and to the Susquehanna River into which Peddler Run drains. This hillside is also aesthetically pleasing, and has scenic value to boaters who utilize the marina.

THREATS AND MANAGEMENT NEEDS:

Threats

The lower portion of the Protection Area occurs within both a 100-year floodplain, and a Natural Resources District buffer to a stream that drains more than 400 acres. This part of the site is, therefore, subject to the provisions of the County's Floodplain District regulations, and the County's Natural Resources District regulations. These regulations, however, do not adequately protect the site from development, nor do they prohibit timber harvesting from occurring within the area occupied by the rare species population.

Timber harvesting poses one of the greatest threats to the rare species population of Glen Cove Marina. This activity could significantly reduce the integrity of the site for the rare species, either by altering the existing species composition of the site, or by altering the microclimate on which the

species depends for its continued existence. Direct damage to the species population could also occur during timber harvesting. Any removal of trees within the Protection Area should avoid the rare species population, and the area immediately surrounding this population, and should be limited to selective cutting.

Development activities could also damage the rare species population, either directly, or by causing sediment and pollutant runoff into the area occupied by this population. Any proposed development activities would need to be carefully evaluated for their potential to adversely impact the rare species on the site.

Management Needs

The maintenance of the Glen Cove Marina site in its present condition would provide the rare species population on the site with the best chance for survival over the long term. No management activities are needed within the foreseeable future.

BOUNDARY RECOMMENDATIONS:

The Protection Area for this site encompasses the rare species population, and the forested hillside and a portion of the adjoining agricultural field which drain into the population. The site is bordered on the north by a parking lot and dirt road, and on the northeast by a powerline corridor.

SITE DESCRIPTION:

Glen Cove Marina consists of a mature deciduous forest, which is located on a gently sloping, northeast-facing hillside overlooking Peddler Run. The canopy layer of this forest is dominated by oaks (*Quercus* spp.) and tulip poplar (*Liriodendron tulipifera*), and also contains a few scattered beech (*Fagus grandifolia*) and hickory (*Carya* sp.) trees.

The shrub layer of the forest is diverse, and is comprised of a mixture of spicebush (*Lindera benzoin*), maple-leaved viburnum (*Viburnum acerifolium*), red maple (*Acer rubrum*), sugar maple (*Acer saccharum*), pawpaw (*Asimina triloba*), poison ivy (*Rhus radicans*), and other species. The ground layer is equally diverse, and contains blue cohosh (*Caulophyllum thalictroides*), may-apple (*Podophyllum peltatum*), wild ginger (*Asarum canadense*), bloodroot (*Sanguinaria canadensis*), jack-in-the-pulpit (*Arisaema triphyllum*), and various fern species, including maidenhair fern (*Adiantum pedatum*), and Christmas fern (*Polystichum acrostichoides*). The ground itself is very stony, and the stones are interspersed with rich, organic soil.

Prepared by: Patricia M. Farr

Date: 7 December 1988

PROTECTION AREA SUMMARY

Protection Area Name: GREENE ROAD FLOODPLAIN
County: Harford
USGS Quad Map(s): Jarrettsville, Phoenix

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Greene Road Floodplain provides breeding habitat for an animal species which is considered to be Highly Rare in the state, that has also been designated by the Maryland Department of Natural Resources as a Threatened Species (COMAR 08.03.08). This species has been observed during its breeding season at only one other Maryland location in recent years. The breeding population of this rare species which has been observed at the Greene Road Floodplain site is the largest known for the state. The habitat for the species at this site should be protected.

OTHER VALUES AND SIGNIFICANCE:

This Protection Area is largely vegetated and, as such, provides a buffer to the tributary stream which flows through the site. Protection of this site would, therefore, benefit the water quality of this tributary, and subsequently that of the Little Gunpowder River, into which the tributary flows.

THREATS AND MANAGEMENT NEEDS:

Threats

Greene Road Floodplain occurs almost entirely within Gunpowder Falls State Park, and should receive adequate protection from most human disturbances.

The improper maintenance of the powerline corridor or the encroachment of woody vegetation could destroy the integrity of the open habitat on which the rare species depends. Perhaps most important, the powerline corridor should be kept open by mechanical means rather than through the use of herbicides.

Sediment runoff into the floodplain could also destroy the integrity of the habitat for the rare species. Watershed protection factors should be taken into consideration during any tree harvesting operations or development activities which may occur on the hillside which drains into the floodplain.

Management Needs

Woody vegetation has begun to invade the floodplain outside of the powerline corridor, and should be removed before it takes over the herbaceous species in this area. The powerline corridor is not in immediate need of maintenance. Should this corridor be mowed in the future, the resultant hay from the mowing operation should be removed to prevent it from smothering the herbaceous plants on the site.

BOUNDARY RECOMMENDATIONS:

The Protection Area for this site encompasses the floodplain, and the ravines and hillside to the west which drain into this floodplain. Paved roads form the northern and eastern boundaries of the site.

SITE DESCRIPTION:

Greene Road Floodplain consists largely of a narrow, shrubby/herbaceous floodplain which, at one time, was a pasture. A small stream meanders through this floodplain, and a powerline corridor extends the length of the site.

Vegetation within the powerline corridor is comprised of a mixture of grasses and forbs. Herbaceous species which occur in this corridor include goldenrods (*Solidago* spp.), Queen Anne's lace (*Daucus carota*), asters (*Aster* spp.), clover (*Trifolium* sp.), common milkweed (*Asclepias syriaca*), yarrow (*Achillea millefolium*), and agrimony (*Agrimonia* sp.). Many of these species also occur to the east of the powerline, although woody species, such as black cherry (*Prunus serotina*), dewberry (*Rubus* sp.), and multiflora rose (*Rosa multiflora*), have begun to invade along the edge of the site.

The floodplain to the west of the powerline is dominated by blackberries (*Rubus* sp.) and goldenrods, with scattered red maples (*Acer rubrum*) and silver maples (*Acer saccharinum*), and a fringe of black willow (*Salix nigra*). A moderately sloping hillside drains into the floodplain on this side. The hillside contains an interspersion of mixed hardwoods and pine (*Pinus* sp.) plantations, and also includes a small portion of an agricultural field.

Prepared by: Patricia M. Farr

Date: 11 December 1988

PROTECTION AREA SUMMARY

Protection Area Name: GUNPOWDER SHORE
County: Harford
USGS Quad Map(s): Edgewood

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Gunpowder Shore contains an ecologically fragile intertidal zone consisting of a mixture of cobble, sand, and mud. This habitat type is very uncommon in the upper Chesapeake Bay region, and is known to occur in only one other location in the County.

The intertidal zone supports a population of a Nationally Rare plant species, which is considered to be Endangered within the State of Maryland (COMAR 08.03.08). The presence of this species indicates that the intertidal area is presently undisturbed, and that it has been in such a condition for a long period of time.

The rare species which grows on the site is very vulnerable to human disturbance, and is dependent upon undisturbed habitats for its existence. Additionally, this population represents one of the most northern occurrences for this species in Maryland. For these reasons, and because the habitat in which the species occurs is unique, the Gunpowder Shore site should be protected.

THREATS AND MANAGEMENT NEEDS:

Threats

Gunpowder Shore is located entirely within the Chesapeake Bay Critical Area, and is proposed for designation as a Threatened and Endangered Species site (Site No. 7). This designation would require that the rare species, and the habitat on which this species depends, be protected from human disturbances.

Activities which could increase sediment or pollutant runoff into the intertidal zone have the potential to adversely impact the rare species population, and should be avoided. Even small amounts of sediment runoff into the portion of the intertidal zone containing the rare species population could smother, and ultimately destroy, the rare species population. Preventive measures would need to be taken both during and after any construction near the steep, erodible slopes on the site, to ensure that such runoff does not occur.

The Nationally Rare species population is also very sensitive to trampling, and recreational use of the shoreline within the Protection Area boundaries should be discouraged. The placement of boat docks along the

shoreline would encourage, rather than discourage, human use of this area, and could also damage the rare species population directly. This type of development activity could also lead to an increase in shoreline erosion caused by boat wake, which could further damage the rare species population or the fragile habitat on which it grows. Any docks to be placed along the shoreline area should be located outside of the Protection Area, and as far south of the rare species population as possible.

A population of common reed (Phragmites communis) grows along the intertidal zone within the Protection Area. If left unchecked, this species could outcompete the rare species which occurs on the site.

Management Needs

The common reed population within the intertidal area should be eradicated. During eradication, care should be taken to avoid damaging the rare species population by trampling, or by disturbing the substrate on which the species grows.

The slopes of an eroding gully which is located within the forested portion of the site should be stabilized, to prevent further erosion of this gully from occurring. No additional management measures are needed within the foreseeable future.

BOUNDARY RECOMMENDATIONS:

The Protection Area encompasses the intertidal area containing the rare species population, and the forest containing the highly erodible soils which occurs immediately above, and which drains into, this population. Also included within the Protection Area, are the tidal wetlands, cove, and peninsula which occur to the north of the rare species population, and a 100 foot buffer to these environmental features.

SITE DESCRIPTION:

Gunpowder Shore consists primarily of a complex of tidal wetlands, which are situated on a peninsula between a freshwater stream and a narrow tidal cove, and along a shoreline on the other side of this cove. These wetlands are predominated by emergent plant species, including arrow arum (Peltandra virginica), pickerelweed (Pontederia cordata), arrowhead (Sagittaria sp.), common reed, and threesquare (Scirpus americanus). The intertidal zone along some of these wetlands contains a mixture of cobble, sand, and mud.

The tidal wetlands along the shoreline to the east of the cove are buffered by a beech (Fagus grandifolia)/tulip poplar (Liriodendron tulipifera) forest, with a shrub layer of spicebush (Lindera benzoin), smooth arrowwood (Viburnum recognitum), and blackberry (Rubus sp.), and a ground layer of Japanese honeysuckle (Lonicera japonica). Some of the soils within

this forest are highly erodible, as evidenced by the presence of a deep, eroding gully which drains into the narrow cove.

Prepared by: Patricia M. Farr

Date: 8 December 1988

PROTECTION AREA SUMMARY

Protection Area Name: I-95 CROSSING
County: Harford
USGS Quad Map(s): Havre de Grace

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

The wetlands, tributaries, old canal, and Susquehanna River shoreline of I-95 Crossing provide suitable habitat for a Highly State Rare animal species. This species is currently listed as a Species in Need of Conservation under the Maryland Department of Natural Resources' Threatened and Endangered Species Regulations (COMAR 08.03.08).

One other notable features of I-95 Crossing is the steep, northeast-facing slopes which occur to the west of the wetlands. The Canadian hemlocks (*Tsuga canadensis*) which grow in the rocky crevices along the slopes indicate that the slopes have a cool microclimate. Extensive northeast-facing slopes such as the ones found within this Protection Area are very unique in the Piedmont province of Maryland, and occur only on the Harford County side of the Susquehanna River. These slopes have a high likelihood of harboring rare plant species and should, therefore, be protected.

OTHER VALUES AND SIGNIFICANCE:

An additional value of I-95 Crossing is that it provides habitat for forest interior dwelling birds. Forest interior dwelling species which have been observed on the site include Red-eyed Vireo (*Vireo olivaceus*), Acadian Flycatcher (*Empidonax virescens*), Ovenbird (*Seiurus aurocapillus*), and Northern Parula (*Parula americana*).

THREATS AND MANAGEMENT NEEDS:

Threats

The portion of I-95 Crossing within 1,000 feet of the Susquehanna River has been designated as both a Threatened and Endangered Species Site (Site No. 3), and also as a Habitat of Local Significance (Site No. 3) under the County's Chesapeake Bay Critical Area Management Program. These designations should protect the integrity of the wetlands and steep slopes within the Critical Area, and should also protect forest interior dwelling bird habitat. The County's Natural Resources District Regulations should provide some protection to the steep slopes and tributary streams which occur outside of the Critical Area.

Principal threats to the site include sediment and stormwater runoff from adjacent uplands, which could degrade the quality of the wetlands and tributaries on which the rare species depends. Also, the expansion of the adjacent quarry could lower the water table, which could, in turn, alter the hydrology of the wetlands. Any future construction activities on adjoining lands should take measures to prevent degradation or alteration of the wetlands on this site.

Other threats to I-95 Crossing are activities which could alter the character of the steep slopes, or reduce the habitat value of the site for forest interior dwelling birds. Timber harvesting on the site should not occur on slopes of 15% or greater, to prevent a change in the microclimate or species composition of the steep slopes. Substantial removal of forest cover immediately above the steep slopes, which could also alter this microclimate, should be avoided. The Chesapeake Bay Critical Area Commission (1986) has listed ways in which forest interior dwelling bird habitat can be protected.

Management Needs

The maintenance of I-95 Crossing in its present condition would ensure the long-term existence of the plant communities on the site. No management activities are needed within the foreseeable future.

BOUNDARY RECOMMENDATIONS:

This Protection Area boundary is located along the Susquehanna River from approximately 1,000 feet north of Interstate 95 to the edge of the quarry on the other side of this highway. The site encompasses the non-tidal wetland complex which occurs near the river, and the adjoining steep slopes, tributary streams, and upland area which drain into the wetlands. Susquehanna River forms the northeastern border of the site.

SITE DESCRIPTION:

I-95 Crossing includes an old, unused railroad bed (about ten feet high) which runs along the Susquehanna River, and the long, narrow wetland complex to the west of this railroad. The northern portion of this wetland complex consists of the old Susquehanna Canal, which flows through a flat, floodplain woodland. To the south of this woodland, a very diverse emergent marsh with standing dead trees can be found.

Steep, wooded slopes border the wetland complex to the west. These slopes contain many rocky outcrops. Scattered Canadian hemlocks, which are indicative of a cool microclimate, can be found growing in the rock crevices on some of these outcrops.

REFERENCES:

Chesapeake Bay Critical Area Commission. 1986. A guide to the conservation of forest interior dwelling birds in the Critical Area. Chesapeake Bay Critical Area Commission, Guidance Paper No. 1. 13 pp.

Prepared by: Patricia M. Farr

Date: 29 October 1988

PROTECTION AREA SUMMARY

Protection Area Name: LITTLE DEER CREEK HILL
County: Harford
USGS Quad Map(s): Fawn Grove

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Serpentine barrens and savannas are Nationally Threatened natural communities which contain unique assemblages of plant species, and often contain populations of rare plant species. Two serpentine savannas can be found within the Little Deer Creek Hill Protection Area.

The serpentine savannas of Little Deer Creek Hill are somewhat disturbed, and, as such, the plant assemblages within these communities are not as unique as they would be if the communities were undisturbed. However, with proper management measures, these savannas could probably be restored.

THREATS AND MANAGEMENT NEEDS:

Threats

This site occurs on a dry, gently sloping hillside, and, as such, is not protected from development by either the County's Natural Resources District regulations or the Floodplain District regulations. Development within the Protection Area would, in all likelihood, destroy the serpentine community, and should occur elsewhere.

The most immediate threat to Little Deer Creek Hill is the encroachment of both woody vegetation and weedy plant species. Should this vegetation remain unchecked, the species which are characteristic of less disturbed serpentine communities would begin to disappear, the savannas would succeed to forests, and the integrity of the site as a whole would be lost.

Management Needs

For reasons mentioned above, both woody and weedy vegetation needs to be removed from the serpentine savannas. At minimum, the red cedars (*Juniperus virginiana*) from the larger savanna, and both red cedars and red maples (*Acer rubrum*) from the smaller savanna, need to be removed in the near future, to keep these communities from succeeding to forests. Further research is needed to determine ways in which to restore the savannas to a more undisturbed state.

BOUNDARY RECOMMENDATIONS:

The Protection Area boundary for the largest serpentine savanna should generally follow the limits of the cedar trees adjoining the savanna, with the exception of to the north and extreme northeast, where a 100 foot buffer should be delineated. A 100 foot buffer should also be delineated around the smallest savanna.

SITE DESCRIPTION:

Little Deer Creek Hill consists primarily of two small serpentine savannas, one of which is five to six acres in size, and the other of which is about two acres. These savannas are separated by about 600 feet.

The largest savanna is predominated by red cedars, and is rapidly succeeding to a cedar forest. This savanna contains an interspersion of small "openings" some of which are dominated by species that are typically found in serpentine communities, such as little bluestem (Andropogon scoparius), Indian grass (Sorghastrum nutans), mountain mint (Pycnanthemum flexuosum), and rock cress (Arabis lyrata), and others of which are dominated by weedy species, including blackberries (Rubus spp.), goldenrods (Solidago spp.), and Japanese honeysuckle (Lonicera japonica). Some rocky outcrops can be found within this savanna.

Red cedars and red maples dominate the smaller serpentine savanna, which is also succeeding rapidly to a forest. Greenbriers (Smilax rotundifolia) can be found growing along the edge of this savanna, and the herbaceous layer is dominated by little bluestem and an unidentified white aster (Aster spp.).

Prepared by: Patricia M. Farr

Date: 19 December 1988

PROTECTION AREA SUMMARY

Protection Area Name: NORTHERN SUSQUEHANNA CANAL
County: Harford
USGS Quad Map(s): Aberdeen, Conowingo Dam

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Northern Susquehanna Canal contains populations of seven plant species that are rare or unusual in Maryland. One of these species has been designated as a State Threatened Species by the Maryland Department of Natural Resources (COMAR 08.03.08). Another species is considered to be Highly Rare in the state.

A rare white form of red trillium (*Trillium erectum* var. *album*) can be found growing in large numbers on the steep slopes of this Protection Area. Two other species, both of which are State Rare, are also present in large numbers, and occur in several places scattered throughout the site.

As evidenced by the number of rare or unusual species on this site, Northern Susquehanna Canal is a highly significant Protection Area. The extensive northeast-facing slopes which occur on the site are unique in the Piedmont region of the state, and add to the significance of the site. Northern Susquehanna Canal is, therefore, very worthy of protection.

OTHER VALUES AND SIGNIFICANCE:

The well-stratified, mature forest covering the slopes and bottomland of Northern Susquehanna Canal provides exemplary breeding habitat for forest interior dwelling birds. Fourteen species of these birds have been observed on the site, five of which are listed as indicators of high-quality habitat (Chesapeake Bay Critical Area Commission 1986), including Hooded Warbler (*Wilsonia citrina*), Kentucky Warbler (*Oporornis formosus*), Worm-eating Warbler (*Helmitheros vermivorus*), American Redstart (*Setophaga ruticilla*), and Louisiana Waterthrush (*Seiurus motacilla*). Other forest interior dwelling bird species which have been observed within this Protection Area include Acadian Flycatcher (*Empidonax virescens*), Ovenbird (*Seiurus aurocapillus*), Northern Parula (*Parula americana*), Scarlet Tanager (*Piranga olivacea*), Red-eyed Vireo (*Vireo olivaceus*), Prothonotary Warbler (*Protonotaria citrea*), Black-and-White Warbler (*Mniotilta varia*), Hairy Woodpecker (*Picoides villosus*), and Pileated Woodpecker (*Drycopus pileatus*).

This site provides habitat for other important bird species as well. Most notable of these species is the Wood Duck (*Aix sponsa*), large numbers of which have been seen in the lower canal area. Several Green-backed Herons (*Butorides striatus*) have also been seen in this area.

An additional value of this Protection Area is that it provides an excellent wooded buffer to the Susquehanna River, by filtering runoff from the adjoining agricultural fields at the top of the steep slopes. Because this site is undeveloped, it also has scenic value to boaters who utilize the River. The site is also used regularly by County residents as a passive recreational area.

THREATS AND MANAGEMENT NEEDS:

Threats

The southern portion of this site has been designated as a Habitat of Local Significance (Site No. 1) under the County's Chesapeake Bay Critical Area Management Program. This designation requires the protection of the rare species populations and forest interior dwelling bird habitat in the area. Because this part of the site lies within the 100-foot Critical Area buffer, and is both a non-tidal wetland and Habitat of Local Significance, timber harvesting and other tree removal is prohibited.

Timber harvesting on the remainder of the site, while not prohibited by County regulations, should, at all costs, avoid disturbance to the numerous rare species found in this area, and should be avoided entirely on the steep slopes. The habitat value for forest interior dwelling birds should also be retained. The Chesapeake Bay Critical Area Commission (1986) has suggested several ways to protect habitat for these species.

Because the portion of the site outside of the Critical Area consists almost entirely of steep slopes and non-tidal wetlands, development of this area is generally prohibited by the County's Natural Resources District Regulations. However, these regulations do not prevent the installation of utility lines in this area, an activity which would, in all likelihood, adversely effect the rare species growing here, and which would also destroy the integrity of the site as a whole.

The integrity of the wetland portion of the site is somewhat threatened by the presence of exotic plant species, including red dead nettle (*Lamium purpureum*), gill-over-the-ground (*Glecoma hederacea*), and garlic mustard (*Alliaria officinalis*). These species probably invaded during past disturbance to the site, and have the potential to outcompete some of the rare species of Northern Susquehanna Canal. Efforts to eradicate the exotic plants would probably be futile.

Management Needs

The maintenance of Northern Susquehanna Canal in its present condition would provide the rare species on the site with the best chance of survival over the long term. No management activities are needed within the foreseeable future.

BOUNDARY RECOMMENDATIONS:

Northern Susquehanna Canal is located along the Susquehanna River shoreline, and extends from the mouth of Deer Creek toward Conowingo Dam. This Protection Area encompasses the peninsula area east of lower Deer Creek, the old canal, abandoned railroad, and Susquehanna River floodplain in the lower elevations of the site, and the steep slopes and ravines which drain into the floodplain. Susquehanna River borders the site to the east.

SITE DESCRIPTION:

Northern Susquehanna Canal borders the Susquehanna River north of Deer Creek. An abandoned railroad and the old Susquehanna Canal run virtually the entire length of the site.

Non-tidal wetlands can be found throughout the lower elevations of the site, both in the Susquehanna River floodplain, and in the old canal. Ponding of the canal has occurred in some places, particularly in the southern portion of the site. The wetlands are dominated by red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), box elder (*Acer negundo*), and sycamore (*Platanus occidentalis*). The shrub layer of these wetlands is well-stratified, and is dominated by spicebush (*Lindera benzoin*). Red dead nettle, gill-over-the-ground, garlic mustard, and bedstraw (*Galium* sp.) dominate the ground layer.

Extensive northeast-facing steep slopes border the wetlands to the west. These slopes are relatively undisturbed and contain a mature oak (*Quercus* spp.)/beech (*Fagus grandifolia*) forest with a rich ground layer dominated by a diversity of herbaceous species, including a rare white form of red trillium.

REFERENCES:

Chesapeake Bay Critical Area Commission. 1986.
A guide to the conservation of forest interior dwelling birds in the Critical Area. Chesapeake Bay Critical Area Commission, Guidance Paper No. 1. 13 pp.

Prepared by: Patricia M. Farr

Date: 26 October 1988

PROTECTION AREA SUMMARY

Protection Area Name: NORTH HARMONY
County: Harford
USGS Quad Map(s): Aberdeen

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

North Harmony contains two subpopulations of a State Rare plant species. These subpopulations are separated by about 200 meters, and they are likely remnants of a much larger population which once occupied an undisturbed floodplain before the road that now bisects the floodplain was constructed.

Only one other population of this species is known to occur in Harford County. The remaining subpopulations of the North Harmony site are in need of protection.

THREATS AND MANAGEMENT NEEDS:

Threats

The non-tidal wetland which encompasses the largest subpopulation of the rare species on the site occurs in a floodplain, and is, therefore, subject to the provisions of the County's Floodplain District Regulations. Because this wetland exceeds 40,000 square feet in size, development in and immediately adjacent to this wetland is prohibited by the County's Natural Resources District (NRD) Regulations.

The NRD Regulations may also apply to the steep slopes which occur on the site. Nearly all slopes on the site exceed 15%, and slopes in excess of 25% border the aforementioned non-tidal wetland and the smaller subpopulation of the rare plant species. The extent to which the portion of the NRD Regulations pertaining to steep slopes applies to this site would need to be determined at the time of development review.

Current threats to the site include roadside mowing, and runoff from the pasture and road which border the site. Roadside mowing has caused direct damage to both subpopulations. Future mowing operations should avoid the subpopulations entirely.

The mature forest cover on the hillside above the rare species subpopulations should be retained to filter nutrient runoff from the adjoining pasture. Should any housing construction be proposed on the hillside in the future, measures would need to be taken to prevent sediment runoff, which could have adverse impacts on the rare plant species.

Evidence of sediment runoff from the gravel road which borders the site has been observed in the wetland which harbors the largest rare

species subpopulation. Any plans to pave this road should include steps to prevent asphalt runoff into this wetland.

Management Needs

The establishment of an herbaceous or woody buffer around the tops of the ravines in the pasture would provide additional protection from nutrient runoff. No other management activities are needed within the foreseeable future.

BOUNDARY RECOMMENDATIONS:

The Protection Area boundary encompasses the rare plant species subpopulations, and the steep hillsides and ravines which drain directly into these subpopulations. This boundary also encompasses most of the remaining watershed, which includes the entire woodland above the rare species, and a portion of the pasture which extends to the top of the hill.

SITE DESCRIPTION:

North Harmony consists of a seasonally flooded non-tidal wetland, and the adjoining steep slopes and ravines which drain into the wetland. This wetland occurs on the outer edge of a river floodplain, and is partially impounded by a road which separates it from the rest of the floodplain. Sycamore (*Platanus occidentalis*) dominates the canopy layer of the wetland, while box elder (*Acer negundo*), black gum (*Nyssa sylvatica*), and musclewood (*Carpinus caroliniana*) occur in the understory. Spicebush (*Lindera benzoin*) is the most common shrub species in the wetland, and the herb layer is dominated by ferns, pale jewelweed (*Impatiens pallida*), and red dead nettle (*Lamium purpureum*).

A mature tulip poplar (*Liriodendron tulipifera*) woodland occurs on the hillside above the non-tidal wetland. This hillside encompasses two steep ravines, which drain directly into the wetland. A few scattered houses can be found on this hillside. The upper reaches of the ravines extend into a pasture, which is located uphill from the woodland.

Prepared by: Patricia M. Farr

Date: 27 October 1988

PROTECTION AREA SUMMARY

Protection Area Name: OAKINGTON SHORE
County: Harford
USGS Quad Map(s): Havre de Grace

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Oakington Shore encompasses two shallow tidal bays and associated tidal wetlands, which occur along the shore of Chesapeake Bay. These bays collectively contain an ecologically fragile intertidal zone comprised of a mixture of cobble, sand, and mud, a habitat type which is very uncommon in the upper Chesapeake Bay region. The Oakington Shore example of this habitat type is the best example of its kind in the County.

Two Nationally Rare plant species grow within the intertidal zone of the bays, which indicates that these bays are undisturbed, and have been that way for a long period of time. The rare species which grow here are very vulnerable to human disturbance, and are dependent upon undisturbed habitats for their continued existence.

One of the rare plant taxa is very restricted in its worldwide distribution, and is known to occur only in the upper Chesapeake Bay region. Much of the habitat for this taxon has been destroyed, by activities such as recreational beach use and the installation of bulkheading, and by shoreline erosion.

Because of the uniqueness of the habitat type in this Protection Area, and the presence of two Nationally Rare plant species which are vulnerable to human disturbance, Oakington Shore is considered to be among the most significant habitats known in Harford County. For this reason, every effort should be made to protect this site.

OTHER VALUES AND SIGNIFICANCE:

The tidal wetlands and buffered tributary streams of Oakington Shore filter nutrient runoff from the adjoining agricultural fields, thereby protecting the water quality of Chesapeake Bay. The shoreline of this site, because it is undisturbed, has high scenic value to boaters of the upper Chesapeake Bay region.

The northern-most tidal wetland on the site provides feeding and roosting habitat for Great Blue Herons (*Ardea herodias*). Twenty of these birds were observed in this wetland during a recent visit to the site.

THREATS AND MANAGEMENT NEEDS:

Threats

Oakington Shore is located almost entirely within the Chesapeake Bay Critical Area, and is proposed for designation as a Threatened and Endangered Species site (Site No. 6). This designation would require that this site is protected from most human disturbances.

Activities which would cause increased runoff into the shallow bays could be detrimental to the rare species populations, and should be avoided. Existing woody buffers to the shoreline, tidal wetlands, and tributary streams should be left intact to help prevent sediment and other runoff from entering these bays.

Both of the Nationally Rare species of Oakington Shore are very sensitive to trampling, and recreational use of the shoreline area should be strongly discouraged. The placement of boat docks or other structures along the shoreline would most likely encourage, rather than discourage, human use of this area, and could also cause direct damage to the rare species populations or habitat. This type of activity should, therefore, not be allowed to occur.

Small, isolated stands of purple loosestrife (*Lythrum salicaria*), an exotic plant species, can be found growing in the intertidal zone of the bays. If left unchecked, this species could destroy the integrity of the habitat for the rare species which grow there.

Management Needs

Native woody vegetation should be planted along the tidal wetlands and tributary streams, in places where the existing buffer is inadequate to filter runoff. Also, the purple loosestrife population should be eradicated, to prevent it from spreading to other portions of the intertidal area. The removal of trash from the southern-most tidal wetland and bay is recommended to enhance the aesthetic value of the site.

BOUNDARY RECOMMENDATIONS:

The Protection Area for the site includes the shoreline and shallow bays containing the rare species populations, and the tributary streams and tidal wetlands which drain into the shallow bays. Appropriate buffers to these environmental features are also included within this Protection Area, to prevent agricultural or stormwater runoff from degrading the quality of the habitat on which the rare species depend.

SITE DESCRIPTION:

The most notable features of Oakington Shore are two tidal bays which open directly into Chesapeake Bay. The intertidal zone of these unique bays are largely undisturbed, and consist of a mixture of cobble, sand, and mud. Some stretches of this intertidal zone are vegetated, and are predominated by quillwort (Isoetes sp.), an aquatic form of a species of arrowhead (Sagittaria sp.), beggar-ticks (Bidens sp.), smartweed (Polygonum sp.), and threesquare (Scirpus americanus). Other intertidal stretches are virtually unvegetated.

The water within the tidal bays is very shallow, and is underlain by sand. During low tide, exposed sand can be found as far as sixty feet off shore. Scattered patches of submerged aquatic vegetation, including hydrilla (Hydrilla verticillata), Eurasian watermilfoil (Myriophyllum spicatum), and wildcelery (Vallisneria americana), grow within these bays.

Oakington Shore also includes two tidal wetlands and associated tributary streams which drain into the shallow bays. The southern-most of these wetlands consists of a heavily harvested red maple (Acer rubrum)/black cherry (Prunus serotina)/tulip poplar (Liriodendron tulipifera) forest, with a shrub layer dominated by multiflora rose (Rosa multiflora). The northern-most tidal wetland is much more open, and is predominated by arrow arum (Peltandra virginica) and tearthumb (Polygonum arifolium), with a fringe of rose mallow (Hibiscus sp.), black willow (Salix nigra), and sweet bay (Magnolia virginiana). In the ravine above each wetland, a drier beech (Fagus grandifolia)/oak (Quercus spp.) forest with an understory of flowering dogwood (Cornus florida) can be found.

Prepared by: Patricia M. Farr

Date: 6 December 1988

PROTECTION AREA SUMMARY

Protection Area Name: OLD JARRETTSVILLE
County: Harford
USGS Quad Map(s): Jarrettsville

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Serpentine barrens and savannas are Nationally Threatened natural communities which contain unique assemblages of plant species, and often contain populations of rare plant and/or animal species. A small serpentine savanna can be found at Old Jarrettsville. This savanna is a remnant of a much larger serpentine community which occupied the area several years ago.

The Maryland Natural Heritage Program and the County are undertaking a study to determine the ecological significance of Old Jarrettsville. This study has already revealed the presence of two rare plant species from the state's Watch List. Other rare plant species may be present, and the overall significance of the community has yet to be determined.

THREATS AND MANAGEMENT NEEDS:

Threats

Old Jarrettsville occurs on a dry hilltop, and, as such, is not protected from development by either the County's Natural Resources District regulations or Floodplain District regulations. Development within the Protection Area would, in all likelihood, destroy the integrity of the site, and would probably destroy the rare species populations which are present as well. Any future development in the area should be placed outside of the bounds of the Protection Area.

Perhaps the most immediate threat to Old Jarrettsville is the encroachment of woody vegetation. As evidenced by a comparison of recent aerial photos of the site with photos from many years ago, this encroachment is occurring very rapidly. Should the woody vegetation remain unchecked, the serpentine savanna would likely succeed to a forest, which would result in the loss of not only the existing serpentine community, but of the rare species which occur within this community.

Management Needs

The removal of woody vegetation from this site is needed within the near future, in order to prevent the loss of the serpentine savanna through succession. Other management recommendations are pending the outcome of the ecological study being conducted on the site.

BOUNDARY RECOMMENDATIONS:

The Protection Area encompasses, at minimum, the small serpentine savanna on the site. The limits of the Protection Area will be determined once the ecological study of the site has been completed.

SITE DESCRIPTION:

Old Jarrettsville consists of a two acre serpentine savanna, which occurs within a deciduous forest. The dominant tree species within the savanna is red cedar (Juniperus virginiana), although a few scattered black-jack oaks (Quercus marilandica) can also be found.

The herbaceous layer of the savanna is very diverse, and is comprised of a mixture of grasses and forbs. The most dominant species in this layer appears to be little bluestem (Andropogon scoparius).

Prepared by: Patricia M. Farr

Date: 22 December 1988

PROTECTION AREA SUMMARY

Protection Area Name: PERRYMAN WOODS
County: Harford
USGS Quad Map(s): Perryman

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

The deciduous woodland and associated vernal pools of the Perryman Woods site represent a natural community type called "flatwoods". This community type is found only in the Coastal Plain portion of the County, and is thus of limited occurrence.

"Flatwoods" communities have been substantially fragmented and reduced in Maryland (Bartgis 1987). In Harford County, most "flatwoods" communities have been destroyed by agricultural and development activities. The Perryman Woods site represents one of the best remaining examples of this community type in the County. The large trees on the site make this community particularly unique.

The vernal pools within Perryman Woods provide breeding and feeding habitat for a large number and variety of amphibians, a few reptile species, and a large number of aquatic invertebrates. Many of these species are vernal pool specialists, and require natural pools to complete their life cycles.

OTHER VALUES AND SIGNIFICANCE:

Perryman Woods functions as an excellent woodland buffer to Bush River, and the tidal and non-tidal wetlands on this site are hydrologically connected through surface and/or subsurface flow to this river. Protection of this site would, therefore, benefit the water quality of Bush River, and subsequently that of the Chesapeake Bay into which Bush River flows.

An additional value of the Perryman Woods site is that it provides habitat for forest interior dwelling birds. Wiese and Ball (1984) documented several such species on the site, including Pileated Woodpecker (*Drycopus pileatus*), Hairy Woodpecker (*Picoides villosus*), Whip-poor-will (*Caprimulgus vociferus*), Acadian Flycatcher (*Empidonax virescens*), Yellow-throated Vireo (*Vireo flavifrons*), Red-eyed Vireo (*Vireo olivaceus*), Northern Parula (*Parula americana*), Ovenbird (*Seiurus aurocapillus*), American Redstart (*Setophaga ruticilla*), and Scarlet Tanager (*Piranga olivacea*).

THREATS AND MANAGEMENT NEEDS:

Threats

Perryman Woods has been designated as a Habitat of Local Significance (Site No. 4) under the County's Chesapeake Bay Critical Area Management Program. This designation would require that the vernal pools and overall integrity of the site are protected.

A high-voltage powerline has been proposed for construction immediately adjacent to the existing powerline on the site. This new powerline would traverse a number of vernal pools. Mitigation measures, such as careful pole placement to avoid the vernal pools, and retention of as much woody vegetation as possible in the powerline corridor, would be necessary to alleviate adverse impacts to these wetlands.

The new powerline would likely reduce the habitat value of the site for forest interior dwelling birds, by decreasing the total amount of forest cover present, by narrowing the width of contiguous forest cover on the south side of the powerline, and by further separating the two forested tracts on the site. Further adverse impacts to these birds should be avoided, and any clearing of trees within the new powerline corridor would need to be done at a time other than the May through August breeding season for these species (Chesapeake Bay Critical Area Commission 1986).

Runoff from the adjoining agricultural field has the potential to adversely impact the vernal pools on the site, and also to impact the water of the tributary streams flowing through the site. Precautionary measures should be taken during any future construction in the vicinity of Perryman Woods, to prevent sedimentation of these streams and vernal pools.

Timber harvesting should not alter the existing vegetation structure or change the existing species composition of the site. Disturbances to vernal pools and the tidal wetland during harvesting operations should be avoided, and the habitat value for forest interior dwelling birds should be retained. The Chesapeake Bay Critical Area Commission (1986) has listed several ways to protect forest interior dwelling bird habitat.

The use of pesticides, such as Dimilin, or herbicides on or adjacent to the site could potentially have adverse impacts to the plants, reptiles and amphibians, and other wildlife of Perryman Woods. Of particular concern is the use of herbicides within the powerline right-of-way which bisects the site.

Management Needs

A buttonbush (*Cephalanthus occidentalis*)-dominated vernal pool occurs near the woodland edge in the southeastern part of the site. The establishment of a 100 foot woody buffer to this wetland is recommended to prevent the invasion of exotic plants.

BOUNDARY RECOMMENDATIONS:

The Protection Area boundary is contiguous with the woodland on the site, with the exception of developed woodland areas along Bush River to the west, and a small patch of woods south of Boyer Road.

SITE DESCRIPTION:

According to the Upland Natural Areas Study conducted by the Maryland Department of Natural Resources, Perryman Woods is a flat, wooded site predominated by white oak (Quercus alba), tulip poplar (Liriodendron tulipifera), beech (Fagus grandifolia), and sweetgum (Liquidambar styraciflua) with diameters generally ranging from 12 to 18 inches. Several larger trees with diameters of 24 inches also occur on the site. Subdominant tree species include northern red oak (Quercus borealis), black oak (Quercus velutina), hickory (Carya sp.), and red maple (Acer rubrum). Arrowwood (Viburnum sp.), blueberries (Vaccinium sp.), and greenbrier (Smilax sp.) occur in the understory, as do saplings of overstory trees.

The most important features of Perryman Woods are the many temporarily to seasonally flooded non-tidal wetlands (vernal pools) which occur throughout the site. Some of these pools support wetland vegetation, including willow oak (Quercus phellos), smooth arrowwood (Viburnum recognitum), spicebush (Lindera benzoin), buttonbush, and willow (Salix sp.), while others are virtually unvegetated.

Perryman Woods is bisected by a powerline corridor which runs in an east-west direction through the middle of the site. A red maple/green ash (Fraxinus pennsylvanica) tidal marsh with a fringe of cattails (Typha sp.) and arrow arum (Peltandra virginica) can be found in the southern portion of this site.

REFERENCES:

Bartgis, R.L. 1987. Functional assessment of non-tidal wetlands. Maryland Natural Heritage Program, Maryland Department of Natural Resources. 46 pp. Mimeo.

Chesapeake Bay Critical Area Commission. 1986. A guide to the conservation of forest interior dwelling birds in the Critical Area. Chesapeake Bay Critical Area Commission, Guidance Paper No. 1. 13 pp.

Maryland Power Plant Siting Program. 1973. Perryman Site. Power Plant Siting Evaluation, JHU PPSE 2-M-1. Johns Hopkins University.

Wiese, J.H., and A.B. Ball. 1984. Baltimore Gas and Electric Company, Perryman Site - terrestrial ecology baseline study. ESE No. 83-302-030-2130.

Prepared by: Patricia M. Farr

Date: 12 October 1988

PROTECTION AREA SUMMARY

Protection Area Name: SAINT CLAIR BRIDGE
County: Harford
USGS Quad Map(s): Fawn Grove

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

This Protection Area provides habitat for a population of an aquatic animal species which is considered to be Highly State Rare. Despite the intensive sampling of aquatic habitats throughout Maryland in recent years, this species has been located at only one other site in the state (C. Staines, Maryland Dept. of Agriculture, personal communication). The Saint Clair Bridge site represents the only known occurrence for the rare species in Harford County.

Neither of the two sites where the Highly State Rare species occurs is adequately protected from human disturbance. For this reason, the Saint Clair Bridge site should be protected.

THREATS AND MANAGEMENT NEEDS:

Threats

Saint Clair Bridge encompasses 100-year floodplains, non-tidal wetlands, and steep slopes, and, as such, the County's Floodplain District regulations and Natural Resources District regulations apply to the site. In addition, a Natural Resources District buffer is required along the stream containing the rare species.

Activities which would alter the portion of the stream where the rare species population is located have the greatest potential to adversely impact the population and should be avoided. Such activities include placing riprap or other materials in the stream, allowing cattle to wade in, or graze near, the stream, and disturbing the stream banks, or vegetation growing on these banks. Other activities which could adversely impact the rare species or habitat for the species, include ones which would cause sedimentation of the stream channel, or erosion and subsequent collapse of the stream banks (C. Staines, personal communication).

Management Needs

The Protection Area includes only the area immediately surrounding the rare species population, where potential threats from human disturbance are the greatest. This population, however, occurs in a stream with a large watershed, and activities which could degrade the water quality in the stream above the Protection Area could also adversely impact the rare species or habitat on which it depends. Further research is needed to determine ways in

which to minimize the likelihood of water quality degradation in the drainage system above the Protection Area.

BOUNDARY RECOMMENDATIONS:

The Protection Area encompasses the stream channel containing the rare species population, and the adjoining floodplain, ravines, and tributary stream which drain into this channel.

SITE DESCRIPTION:

Saint Clair Bridge consists of a short stretch of a major stream which flows through the Piedmont region of the County. The steam banks are undercut in this stretch of the stream, and overhanging shrubby vegetation can be found growing along the stream.

The stream flows through a large, open floodplain. This floodplain is traversed by several roads, and is bordered by farmland and isolated deciduous forests.

Prepared by: Patricia M. Farr

Date: 16 December 1988

PROTECTION AREA SUMMARY

Protection Area Name: SOUTH LAPIDUM
County: Harford
USGS Quad Map(s): Aberdeen, Havre de Grace

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

The wetlands, tributaries, old canal, and Susquehanna River shoreline of South Lapidum provide suitable habitat for a Highly State Rare animal species. This species is currently listed as a Species in Need of Conservation under the Maryland Department of Natural Resources' Threatened and Endangered Species Regulations (COMAR 08.03.08).

One other notable feature of South Lapidum is the steep, northeast-facing slopes which occur to the west of the wetlands. The Canadian hemlocks (*Tsuga canadensis*) which grow in the rocky crevices along the slopes indicate that the slopes have a cool microclimate. Extensive northeast-facing slopes such as the ones found within this Protection Area are very unique in the Piedmont province of Maryland, and occur only on the Harford County side of the Susquehanna River. These slopes have a high likelihood of harboring rare plant species, and should, therefore, be protected.

OTHER VALUES AND SIGNIFICANCE:

An additional value of South Lapidum is that it provides habitat for forest interior dwelling birds. Forest interior dwelling species which have been observed on the site include Red-eyed Vireo (*Vireo olivaceus*), Acadian Flycatcher (*Empidonax virescens*), Prothonotary Warbler (*Protonotaria citrea*), Kentucky Warbler (*Oporornis formosus*), Ovenbird (*Seiurus aurocapillus*), and Northern Parula (*Parula americana*).

THREATS AND MANAGEMENT NEEDS:

Threats

The portion of South Lapidum within 1,000 feet of the Susquehanna River has been designated as both a Threatened and Endangered Species Site (Site No. 2), and also as a Habitat of Local Significance (Site No. 2) under the County's Chesapeake Bay Critical Area Management Program. These designations should protect the integrity of the wetlands and steep slopes within the Critical Area, and should also protect forest interior dwelling bird habitat. The County's Natural Resources District Regulations should provide protection to the portions of these slopes and wetlands which occur outside of the Critical Area.

Principal threats to the site include sediment and stormwater runoff from adjacent uplands, which could degrade the quality of the wetlands and tributaries on which the rare species depends. Any future construction activities on these uplands should take measures to prevent sedimentation of the wetlands on this site.

Other threats to South Lapidum are activities which could alter the character of the steep slopes, or reduce the habitat value of the site for forest interior dwelling birds. Timber harvesting on the site should not occur on slopes of 15% or greater, to prevent a change in the microclimate or species composition of the steep slopes. Substantial removal of forest cover immediately above the steep slopes, which could also alter this microclimate, should be avoided. The Chesapeake Bay Critical Area Commission (1986) has listed ways in which forest interior dwelling bird habitat can be protected.

Management Needs

The maintenance of South Lapidum in its present condition would assure the long-term existence of the plant communities on the site. No management activities are needed within the foreseeable future.

BOUNDARY RECOMMENDATIONS

This Protection Area boundary is located along the Susquehanna River from Lapidum to approximately 2,000 feet north of Interstate 95. South Lapidum encompasses the non-tidal wetland complex which occurs near the river, and the adjoining steep slopes and tributary streams which drain into the wetlands. Susquehanna River forms the northeastern border of the site.

SITE DESCRIPTION:

South Lapidum includes an old, unused railroad bed (about ten feet high) which runs along the Susquehanna River, and the long, narrow wetland complex to the west of this railroad. The northern portion of this wetland complex consists of the old Susquehanna Canal, which flows through a flat, floodplain woodland. To the south of this woodland, a very diverse emergent marsh with standing dead trees can be found. This marsh, in turn, drains into an open water wetland complex, just before it meets with an inlet that forms the mouth of the old canal.

Steep, wooded slopes border the wetland complex to the west. These slopes contain many rocky outcrops. Scattered Canadian hemlocks, which are indicative of a cool microclimate, can be found growing in the rock crevices on some of these outcrops.

REFERENCES:

Chesapeake Bay Critical Area Commission. 1986. A guide to the conservation of forest interior dwelling birds in the Critical Area. Chesapeake Bay Critical Area Commission, Guidance Paper No. 1. 13 pp.

Prepared by: Patricia M. Farr

Date: 29 September 1988

PROTECTION AREA SUMMARY

Protection Area Name: STAFFORD ROAD SLOPES
County: Harford
USGS Quad Map(s): Aberdeen

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Stafford Road Slopes in comprised of a long stretch of steep, rocky slopes with a northeastern exposure. Extensive northeast-facing slopes such as the ones found within this Protection Area are very unique in the Piedmont province of Maryland, and occur only on the Harford County side of the Susquehanna River.

The microclimate of the slopes is very cool and moist. These slopes harbor both a State Rare animal species, and a tremendously large population of a rare white form of red trillium (*Trillium erectum* var. *album*). The uniqueness of the slopes, combined with the presence of rare species on the site, make Stafford Road Slopes very worthy of protection.

OTHER VALUES AND SIGNIFICANCE:

The slopes along Stafford Road are well-known for their exceptional springtime beauty. This beauty is due primarily to the abundance of wildflowers on the slopes, most notably the rare trilliums and dutchman's breeches (*Dicentra cucullaria*). The white color of these flowers carpets the slopes of the Protection Area for their entire length.

The mature forest which grows on the slopes provides an excellent natural buffer to the Susquehanna River. Protection of this site would, therefore, benefit the water quality of the Susquehanna River, and subsequently that of the Chesapeake Bay, into which this river flows.

THREATS AND MANAGEMENT NEEDS:

Threats

Stafford Road Slopes occurs entirely within the Chesapeake Bay Critical Area, and is proposed for protection as a Habitat of Local Significance (Site No. 9). Additionally, this site lies almost entirely within Susquehanna State Park. As such, the site should receive adequate protection from most human disturbances.

One activity which has the potential to destroy the integrity of the site is timber harvesting. This activity could alter the microclimate of the slopes, and subsequently change the species composition of these slopes. Timber harvesting could also cause direct damage to the rare species on the

site, or lessen the scenic value of the site. For reasons mentioned above, timber harvesting should be prohibited within the Protection Area, except to remove individual diseased trees, or trees which are in danger of falling where they may threaten human safety (i.e., along Stafford Road at the base of the slopes).

Management Needs

The maintenance of Stafford Road Slopes in its present condition would provide the rare species on the site with the best chance of survival over the long term. No management measures are needed within the foreseeable future.

BOUNDARY RECOMMENDATIONS:

This site encompasses the steep slopes and moderately sloping hillsides which occur along the Susquehanna River to the west of Stafford Road. The Protection Area extends from Lapidum to the open area near Rock Run Road, and continues from this point to just beyond the mouth of Deer Creek. Stafford Road forms the eastern border of the site.

SITE DESCRIPTION:

Stafford Road Slopes consists of a two mile stretch of land along the Susquehanna River, which is comprised of extensive northeast-facing slopes. These slopes are generally very steep, and contain several seeps.

A rich, deciduous forest can be found growing on the slopes. This forest is dominated by tulip poplar (*Liriodendron tulipifera*) and oaks (*Quercus* spp.), with an understory of red maple (*Acer rubrum*) and a shrub layer of pawpaw (*Asimina triloba*). The herbaceous layer of the forest is very diverse, and contains may-apple (*Podophyllum peltatum*), pale jewelweed (*Impatiens pallida*), blue cohosh (*Caulophyllum thalictroides*), a rare form of red trillium, dutchman's breeches, Christmas fern (*Polystichum acrostichoides*), bloodroot (*Sanguinaria canadensis*), wild ginger (*Asarum canadense*), jack-in-the-pulpit (*Arisaema triphyllum*), and many other species. The ground itself is very stony, and the stones are interspersed with rich, organic soil.

Prepared by: Patricia M. Farr

Date: 21 December 1988

PROTECTION AREA SUMMARY

Protection Area Name: WILDCAT BRANCH
County: Harford
USGS Quad Map(s): White Marsh

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Wildcat Branch harbors populations of six plant species that are rare or uncommon in Maryland. One of these species is considered to be State Rare, and is known from only five other locations in the state. The Wildcat Branch population of this species represents the only occurrence for the species in Harford County. For this reason, and because of the number of rare or uncommon species on the site, Wildcat Branch should be protected.

OTHER VALUES AND SIGNIFICANCE:

The mature forest which occupies the hillsides and floodplain on the site provides an excellent natural buffer to the Little Gunpowder River, which flows along the edge of the site. Protection of this site would, therefore, benefit the water quality of the Little Gunpowder River.

Wildcat Branch also provides breeding habitat for forest interior dwelling birds. Species of these birds which have been observed within the Protection Area during the breeding season include Red-eyed Vireo (*Vireo olivaceus*), Acadian Flycatcher (*Empidonax virescens*), Ovenbird (*Seiurus aurocapillus*), Louisiana Waterthrush (*Seiurus motacilla*), and Hairy Woodpecker (*Picoides villosus*).

THREATS AND MANAGEMENT NEEDS:

Threats

This site is located almost entirely within Gunpowder Falls State Park, and should, therefore, receive protection from most human disturbance. The portions of the site which occur outside of the State Park contain, for the most part, non-tidal wetlands and steep slopes, and should be protected by the County's Natural Resources District regulations.

One threat to the rare species on the site is the maintenance of the powerline corridor which bisects the Protection Area. Because some of the rare species populations are located within this corridor, preventive measures would need to be taken during maintenance, to avoid causing direct damage to these populations. One such measure would be to use mechanical means, rather than herbicides, to remove unwanted vegetation from within the corridor.

Management Needs

Further research is needed to determine additional measures to protect the rare species populations which occur within the powerline corridor during the maintence of this corridor. No additional management measures are needed within the foreseeable future.

BOUNDARY RECOMMENDATIONS:

This Protection Area encompasses the rare species populations, and the hillsides and ravines which drain into these populations. The site is bordered on the north by a subdivision, and on the south by the Little Gunpowder River. The western border of the site is formed by a paved road.

SITE DESCRIPTION:

Wildcat Branch contains an interspersion of moderately sloping to steeply sloping hills and cool, narrow ravines. These hills and ravines drain southward into a narrow floodplain, and eventually into the Little Gunpowder River.

The site is predominated by an oak (*Quercus* spp.)/beech (*Fagus grandifolia*)/tulip poplar (*Liriodendron tulipifera*) forest. Several mucky seeps, most of which are dominated by skunk cabbage (*Symplocarpus foetidus*), can be found within the floodplain. Seeps are also present along some of the ravines on the site.

A powerline corridor bisects the site, and runs in a north-south direction. The upland portion of this corridor has been mowed, and consists of a mixture of Indian grass (*Sorghastrum nutans*), yellow crownbeard (*Verbesina occidentalis*), and red maple (*Acer rubrum*). A small bog can be found where the powerline corridor crosses over a seep within the floodplain. This bog contains a diversity of species, including red maple, sensitive fern (*Onoclea sensibilis*), sedges (*Carex* spp.), sphagnum moss (*Sphagnum* spp.), and skunk cabbage.

Prepared by: Patricia M. Farr

Date: 19 December 1988

PROTECTION AREA SUMMARY

Protection Area Name: WILLOUGHBY WOODS
County: Harford
USGS Quad Map(s): Edgewood

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

The deciduous woodland and associated vernal pools of the Willoughby Woods site represent a natural community type called "flatwoods". This community type is found only in the Coastal Plain portion of the County, and is thus of limited occurrence.

"Flatwoods" communities have been substantially reduced in Maryland (Bartgis 1987). In Harford County, most "flatwoods" communities have been destroyed by agricultural and development activities. The Willoughby Woods site represents one of the best remaining examples of this community type in Harford County, and is also the largest intact woodland in the Coastal Plain portion of the County.

The vernal pools within Willoughby Woods provide breeding and feeding habitat for a large number and a variety of amphibians, a few reptile species, and a large number of aquatic invertebrates. Many of these species are vernal pool specialists, and require natural pools to complete their life cycles. A high concentration of vernal pools occurs on the Willoughby Woods site, which makes this natural community particularly valuable to species that depend on such pools.

OTHER VALUES AND SIGNIFICANCE:

Willoughby Woods functions as an excellent woodland buffer to Bush River, and the tidal and non-tidal wetlands on this site are hydrologically connected through surface and/or subsurface flow to this river. Protection of this site would, therefore, benefit the water quality of Bush River, and subsequently that of the Chesapeake Bay, into which Bush River flows.

An additional value of the Willoughby Woods site is that it provides habitat for forest interior dwelling birds. Interior dwelling species which have been observed on the site include Ovenbird (*Seiurus aurocapillus*), Red-eyed Vireo (*Vireo olivaceus*), Scarlet Tanager (*Piranga olivacea*), Acadian Flycatcher (*Empidonax virescens*), Hairy Woodpecker (*Picoides villosus*), and Kentucky Warbler (*Oporornis formosus*).

THREATS AND MANAGEMENT NEEDS:

Threats

Willoughby Woods has been designated as a Habitat of Local Significance (Site No. 5) under the County's Chesapeake Bay Critical Area Management Program. This designation would generally require protection of the vernal pools, the habitat value of the site for forest interior dwelling birds, and the natural integrity of the site as a whole.

A high-voltage powerline has been proposed for construction along the eastern border of Willoughby Woods. Although this powerline would avoid the most sensitive portions of the site, it would traverse a number of vernal pools. Mitigation measures, such as careful pole placement to avoid the vernal pools, and the retention of as much woody vegetation in the powerline corridor as possible, would be necessary to alleviate adverse impacts to these wetlands.

Because the powerline is proposed to be built near the edge of the Protection Area, it would not substantially reduce the habitat value of the remainder of the site for forest interior dwelling birds. However, trees in the powerline corridor would need to be cleared at a time of year other than the May through August breeding season for these birds (Chesapeake Bay Critical Area Commission 1986).

Runoff from existing housing developments, the adjoining agricultural field, and Willoughby Beach Road have the potential to adversely impact vernal pools near the periphery of the site, and also to impact the water quality of tributary streams flowing through the site. Precautionary measures should be taken during any future housing construction in the vicinity of Willoughby Woods, to prevent sedimentation of these streams and vernal pools.

Timber harvesting should not alter the existing vegetation structure or change the existing species composition of the site. Disturbances to vernal pools and tidal wetlands during harvesting operations should be avoided, and habitat value for forest interior dwelling birds should be retained. The Chesapeake Bay Critical Area Commission (1986) has listed several ways to protect forest interior dwelling bird habitats.

Management Needs

Small stands of common reed (*Phragmites australis*) in two of the wetlands along the railroad tracks threaten the integrity of these wetlands and should be eradicated. Sweetgum (*Liquidambar styraciflua*) is beginning to move into an otherwise open wetland along the north edge of Willoughby Beach Road in the eastern part of the site, and should be removed to keep this unique wetland open. No other management activities are needed within the foreseeable future.

BOUNDARY RECOMMENDATIONS:

The Protection Area boundary is contiguous with the woodland on the site, with the exception of two small patches of woods, one directly behind Trojan Harbor Marina, and the other just north of Willoughby Beach Road in the western part of the site.

SITE DESCRIPTION:

Willoughby Woods consists primarily of a flat, well-stratified deciduous woodland, dominated by white oak (Quercus alba), tulip poplar (Liriodendron tulipifera), and sweetgum, with an understory of red maple (Acer rubrum) and sweetgum, and a shrub layer of blueberries (Vaccinium spp.), and saplings of overstory trees. A large alluvial red maple/tulip poplar floodplain occurs in the northwestern portion of the site, and the site is bisected by Willoughby Beach Road.

The most notable features of Willoughby Woods are the many temporarily to seasonally flooded non-tidal wetlands (vernal pools) which occur throughout the site. Most of the vernal pools support wetland vegetation, including willow oak (Quercus phellos), smooth arrowwood (Viburnum recognitum), and spicebush (Lindera benzoin), while some of the smaller pools are virtually unvegetated.

Several open non-tidal wetlands and one tidal wetland add to the overall diversity of the site. Three non-tidal wetlands, along the railroad tracks in the southwestern portion of the site, were once part of the large tidal marsh complex to the south, in Aberdeen Proving Ground. These wetlands are now somewhat impounded by the railroad tracks, and as a result, are semi-permanently to permanently flooded. These wetlands presently support a high diversity of plant species, including sedges (Carex spp.), rushes (Juncus spp.), bulrushes (Scirpus spp.), burreed (Sparganium sp.), beggar-ticks (Bidens spp.), buttonbush (Cephalanthus occidentalis), and bladderworts (Utricularia sp.), and also contain some standing dead trees.

One wetland, along the north edge of Willoughby Beach Road in the eastern part of the site, contains roses (Rosa sp.), narrow-leaved cattails (Typha angustifolia), buttonbush, and bladderworts. This wetland is unique in that Sphagnum spp. is present over large portions of the wetland, creating somewhat of a bog-like situation.

REFERENCES:

Bartgis, R.L. 1987. Functional assessment of non-tidal wetlands. Maryland Natural Heritage Program, Maryland Department of Natural Resources. 46 pp. Mimeo.

Chesapeake Bay Critical Area Commission. 1986.
A guide to the conservation of forest interior dwelling birds in the Critical Area. Chesapeake Bay Critical Area Commission, Guidance Paper No. 1. 13 pp.

Prepared by: Patricia M. Farr

Date: 12 October 1988

APPENDIX 1

Explanation of Species Statuses

Status	Explanation
Nationally Endangered*	In imminent danger of extinction throughout range; endangered throughout range
Nationally Threatened*	In danger of extinction rangewide; threatened throughout range
Nationally Rare*	Close to extinction throughout all or most of range; rare throughout range
Regionally Rare*	In danger of extinction in Maryland, and rare throughout all or most areas of surrounding states
Highly State Rare*	In danger of extinction in Maryland
State Rare*	In danger of extinction in Maryland
Watch List*	Considered to be secure in Maryland, but worthy of monitoring due to declining or restricted populations
Locally Significant	Of unusual or limited occurrence in Harford County

* = Status as designated by the Maryland Natural Heritage Program, Forest, Park and Wildlife Service, Department of Natural 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 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.

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

Symbol Key

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

Title 07
DEPARTMENT OF HUMAN RESOURCES

Subtitle 03 INCOME MAINTENANCE ADMINISTRATION

07.03.05 General Public Assistance to Employables

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

Notice of Final Action
[87-110-F]

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

Effective Date: June 29, 1987.

RUTH MASSINGA
Secretary of Human Resources

Title 08
DEPARTMENT OF NATURAL RESOURCES

Subtitle 03 WILDLIFE

08.03.08 Threatened and Endangered Species

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

Notice of Final Action
[87-061-F]

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

Effective Date: June 29, 1987.

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

Subtitle 05 WATER RESOURCES ADMINISTRATION

08.05.03 Construction on Non-Tidal Waters and Floodplains

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

Notice of Final Action
[87-060-F]

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

Effective Date: June 29, 1987.

Attorney General's Certification

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

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

.03 Requirements for a Permit.

A. — C. (proposed text unchanged)

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

(1) — (2) (proposed text unchanged)

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

APPENDIX 3

SITE SURVEY SUMMARY

✓Site Name: _____

✓Quad Name(s): _____

✓Quad Code(s): _____ 10/10 locator: _____

State: _____ ✓County(ies): _____

Town(s): _____

Township/Range/Section: _____

Field Quad Margin #: _____

Source of lead:

_____

_____

_____

Site Visit Chronology

✓Date: _____ ✓Time: _____ to _____ Source Code: _____

✓Surveyor(s): _____

Date: _____ Time: _____ to _____ Source Code: _____

Surveyor(s): _____

Date: _____ Time: _____ to _____ Source Code: _____

Surveyor(s): _____

Date: _____ Time: _____ to _____ Source Code: _____

Surveyor(s): _____

Date: _____ Time: _____ to _____ Source Code: _____

Surveyor(s): _____

Other individuals knowledgeable about site and/or EO's: _____

Current use of site: _____

Tract ownership or managed area name (names, addresses, phone #). Continue on last page for others.

_____ _____ _____

_____ _____ _____

_____ _____ _____

INDEX

Under "Element Name", list all heritage-listed species/communities sought, found or reported from site. Under "Code on Base Map", indicate a simple code number or letter to be used in identifying element locations on the base map. Indicate occurrence numbers, if known. Lastly, indicate whether the element was found (Y,N,N/A) on each particular date, whether the EOR was trancribed or updated and whether a return visit is needed.

			✓Date:										✓Revisit needed?
✓Element Name (rank)	Code on Base Map	Occ.#	✓Found?	Transcr/ Updt?	Found?	Transcr/ Updt?	Found?	Transcr/ Updt?	Found?	Transcr/ Updt?	Found?	Transcr/ Updt?	✓When?

SITE DESCRIPTION /DISCUSSION

(use additional pages as necessary)

Written description - DESCRIBE the site in the space below. Try to convey a mental image of the site's features (including vegetation, significant species, aquatic features, notable landforms, natural disturbances, scenic qualities, natural hazards, etc.):

Evidence of disturbance - DESCRIBE any unnatural on-site disturbances (e.g., livestock grazing, structures, past logging, mining, plantations/orchards, exotic flora, etc.).

Surrounding land use - DESCRIBE physical structures and land use practices in the surrounding area (e.g., residential and commercial buildings; agricultural, recreational, residential, and commericial uses):

Threats to site/Management needs - DISCUSS on-site and off-site threats to site and management implications; if applicable, discuss why sought species/communities may no longer exist here.

DETAILED LOCATION INFORMATION

✓**Directions to site** - Provide written directions to the site. Be concise. Refer to the nearest topographic map landmark (hills, villages, ponds, highway junctions, etc.) as your starting point.

_____

_____

_____

Topographic base map - Attach (staple) a photocopy of that portion of the topographic map(s) showing the site. Aerial photographs may also be used. Upon this base map note the following:

Completed?

_____yes _____no 1. Indicate precise element locations (using dots) and/or boundaries (using solid lines). Identify each element with the codes you used in the index of page 1.

_____yes _____no 2. If knowledge of the site permits, draw primary (-+-+-) and secondary (-||-||-) ecological site boundaries. Within the primary site boundary include all known element occurrences and lands deemed necessary for the continued viability of the EOs. The secondary boundary, or "buffer", includes lands intended to mitigate future unforeseen negative impacts to the EOs (i.e., to control erosion, trespass-related damage, natural succession, exotic species, urban sprawl, etc.). Use -+-||-+-||- where primary and secondary coincide.

_____yes _____no 3. If known, indicate tract ownership boundaries, using dashed lines (- -),

✓Justification of primary and secondary boundaries:

Habitat map - The purpose of the sketch is to show fine details of the site which are not shown on the topographic base map. Sketch the habitat area searched, and show; 1) the route taken, 2) any listed species/communities and their boundaries, and 3) landmarks. Include scale and indicate north.

PLANT LIST

List species observed and mark appropriate column. If specimens are collected indicate collection #.

For unfamiliar species indicate, for example, "Carex sp.", or "grass sp.".

Species	Dom. tree	Other tree	Dom. sh-v	Other sh-v	Dom. herb	Other herb	Coll. #	Photo

APPENDIX 4

SPECIAL PLANT SURVEY FORM

√Site Name: _____ √Date: _____ √Source Code: _____

√Quad Name: _____ Date: _____ Source Code: _____

√Quad Code: _____ Date: _____ Source Code: _____

State: _____ √County: _____ Date: _____ Source Code: _____

√Field Quad Margin #: _____ Date: _____ Source Code: _____

Full extent of EO known and mapped? ____yes ____no

Precise locations of individuals or groups mapped on base map? ____yes ____no

_____

BIOLOGY

√Element Name: _____ Element Code: _____ Occ. #: _____

√Phenology	√Approx #		√Population Area	√Age Structure	√Vigor
	Ramets	Genets			
____In leaf	____	____	____1yd^2	____% Seedlings	____Very feeble
____In bud	____1-10	____	____1-5 yd^2	____% Immature	____Feeble
____In flower	____11-50	____	____5-10 yd^2	____% 1st year	____Normal
____Immature fruit	____51-100	____	____10-100 yd^2	____% Mature (established)	____Vigorous
____Mature fruit	____101-1000	____	____100 yd^2-2ac		____Exceptionally vigorous
____Seed dispersing	____1001-10,000	____	____2 ac+	____% Senescent	
____Dormant	____10K+	____	____est. area		
	____est. #	____			

√Comments on above: _____

√Evidence of reproduction? ____yes ____no Explain: _____

Type of reproduction: ____sexual ____asexual ____both

Evidence of symbiotic or parasitic relationships? ____yes ____no Explain: _____

Evidence of disease, predation, etc. ____yes ____no Explain: _____

Success at Each Stage of Life Cycle

	good	fair	poor	none	uncertain
reproduction					
dispersal					
establishment					
maintenance					

Comments: _____

HABITAT

√Aspect	√Slope	√Light	√Topographic position	√Moisture
____N ____NE	____Flat	____Open	____Crest	____Inundated (Hydric)
____E ____NW	____0-10	____partial	____Upper Slope	____Saturated(Wet-mesic)
____S ____SE	____10-35	____Filtered	____Mid-Slope	____Moist(Mesic)
____W ____SW	____35+	____shade	____Lower-Slope	____Dry-Mesic
	____Vertical		____Bottom	____Dry(Xeric)

Elevation: _____ ft to _____ ft

√Cross section of topography (habitat)/include scale, direction, element position (if helpful)

HABITAT (continued)

√Associated natural community/plant community: _____

Natural community form completed? ___yes ___no

√Associated plant species: _____

_____

Substrate/Soils: _____

Estimated # of acres of potential habitat in the immediate area: _____

IDENTIFICATION

Photograph taken? ___yes ___no

Specimen taken? ___yes ___no If yes, give coll. # and repository: _____

Do other members of this genus co-occur at this site? ___yes ___no If yes, complete below:

List: _____

Hybridization? ___yes ___no

Identification problems? ___yes ___no Explain: _____

CONSERVATION

Owner aware of EO? ___yes ___no ___unknown Owner protecting EO? ___yes ___no ___Unknown

Evidence of disturbance: _____

Threats to EO: _____

How large an area is needed to provide species survival here? _____

Explain: _____

_____

Conservation/management needs: _____

_____

Research needs: _____

Data security? ___yes ___no Explain: _____

SUMMARY

√ EO Quality: (ie, How representative is this occurrence? Consider the size and productivity of the population and the vitality and vigor of the individuals.)

A-Excellent B-Good C-Marginal D Poor

Comments: _____

√ EO Condition: (ie, Is the habitat supporting the EO pristine or degraded? Is there a potential for the habitat to recover from disturbances?)

A-Excellent B-Good C-Marginal D Poor

Comments: _____

√ EO Viability: (ie, What are the long-term prospects for continued existence of this occurrence at the indicated level of quality?)

A-Excellent B-Good C-Marginal D Poor

Comments: _____

√ EO Defensibility: (ie, Can this occurrence be protected from extrinsic human factors?)

A-Excellent B-Good C-Marginal D Poor

Comments: _____

√ EO Rank: (ie, a summary of all factors listed above) A B C D

Comments: _____

APPENDIX 5

SPECIAL ANIMAL SURVEY FORM

Site Name: _____ Date: _____ Source Code: _____

Quad Name: _____ Weather Conditions: _____

Quad Code: _____ Date: _____ Source Code: _____

State: _____ County: _____ Weather Conditions: _____

Field Quad Margin #: _____ Date: _____ Source Code: _____

Full extent of EO known and mapped? Weather Conditions: _____

___yes ___no Date: _____ Source Code: _____

Precise locations of individuals or group Weather Conditions: _____

mapped on base map? ___yes ___no Date: _____ Source Code: _____

Weather Conditions: _____

_____

BIOLOGY

Element Name: _____ Element Code: _____ Occ. #: _____

Nature of observation: ___sight record; ___tracks; ___song; ___road kill;

___collected specimen; ___other: _____

Numbers observed (give age and sex if known): _____

_____

_____

_____

Numbers estimated: _____ Basis for this estimate: _____

_____

_____

Evidences of reproduction at site: _____

_____

_____

Behavioral notes: _____

_____

_____

Suggestions for what to look for on next site visit: _____

_____

IDENTIFICATION

Photograph taken? ___yes ___no

Specimen taken? ___yes ___no If yes, give coll. # and repository: _____

Identification problems? ___yes ___no Explain: _____

HABITAT

Associated natural community/plant community: _____

Natural community form completed? ____yes ____no Elevation: _____ft to _____ft

Substrate/soils: _____

Describe habitat and/or microhabitat (include associated plant species): _____

_____

_____

_____

_____

Associated animal species (list especially, any related species present): _____

_____

_____

Estimated # of acres of potential habitat in the immediate area: _____

Proportion of this habitat apparently occupied by species: _____

CONSERVATION

Owner aware of EO? ____yes ____no ____unknown Owner protecting EO? ____yes ____no ____unknown

Evidence of disturbance: _____

Threats to EO: _____

How large an area is needed to provide species survival here? _____

Explain: _____

_____

Conservation/management needs: _____

_____

Research needs: _____

Data security? ____yes ____no Explain: _____

SUMMARY

EO Quality: (ie, How representative is this occurrence? Consider the size of the population and evidence of successful reproduction.)

A-Excellent B-Good C-Marginal D Poor

Comments: _____

EO Condition: (ie, is the habitat supporting the EO pristine or degraded? Is there a potential for the habitat to recover from distubances?)

A-Excellent B-Good C-Marginal D Poor

Comments: _____

EO Viability: (ie, What are the long-term prospects for continued existence of this occurrence at the indicated level of quality?)

A-Excellent B-Good C-Marginal D Poor

Comments: _____

EO Defensibility: (ie, Can this occurrence be protected from extrinsic human factors?)

A-Excellent B-Good C-Marginal D Poor

Comments: _____

EO Rank: (ie, a summary of all factors listed above) A B C D

Comments: _____

APPENDIX 6

NATURAL COMMUNITY SURVEY FORM

Site Name: _____ Date: _____ Source Code: _____

Quad Name: _____ Date: _____ Source Code: _____

Quad Code: _____ Date: _____ Source Code: _____

State: _____ County: _____ Date: _____ Source Code: _____

Field Quad Margin #: _____ Date: _____ Source Code: _____

Full extent of EO known and mapped? ____yes ____no

Precise location of community mapped on base map? ____yes ____no

BIOLOGICAL DESCRIPTION

Element Name: _____ Element Code: _____ Occ. #: _____

Included plant communities (name each PC using 1,2 or 3 dominant species):

(1) _____ (list additional PC's

(2) _____ on last page)

(3) _____

For each PC list the canopy dominants (tree-T, shrub-S, herb-H) and % cover.

(1) Name	T S H	%cover	(2) Name	T S H	%cover	(3) Name	T S H	%cover

For each PC list the stratal dominants or codominants (tree-T, shrub-S, herb-H) and % cover.

Name	T S H	%cover	Name	T S H	%cover	Name	T S H	%cover

Were cover values determined ____visually?, ____quantitatively?

% bare ground: _____ Species list generated? ____yes ____no

Characteristic species: _____

Exotics: _____

Rare taxa: _____

General description and comments (word picture of the NC):

PHYSICAL DESCRIPTION

Size : _____ Elevation: _____ ft to _____ ft

Aspect		Slope	Topographic position	Moisture
___N	___NE	___Flat	___Crest	___Inundated (Hydric)
___E	___NW	___0-10	___Upper slope	___Saturated (Wet-Mesic)
___S	___SE	___10-35	___Mid-slope	___Moist(Mesic)
___W	___SW	___35+	___Lower slope	___Dry-Mesic
		___Vertical	___Bottom	___Dry(Xeric)

Cross section of natural community, showing topographic and aquatic features, vegetation structure, and location of various plant communities or species. Include scale and direction.

APPENDIX 7

PROTECTION AREA SUMMARY

Protection Area Name:
County: Harford
USGS Quad Map(s):

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

OTHER VALUES AND SIGNIFICANCE:

THREATS AND MANAGEMENT NEEDS:

Threats

Management Needs

BOUNDARY RECOMMENDATIONS:

SITE DESCRIPTION:

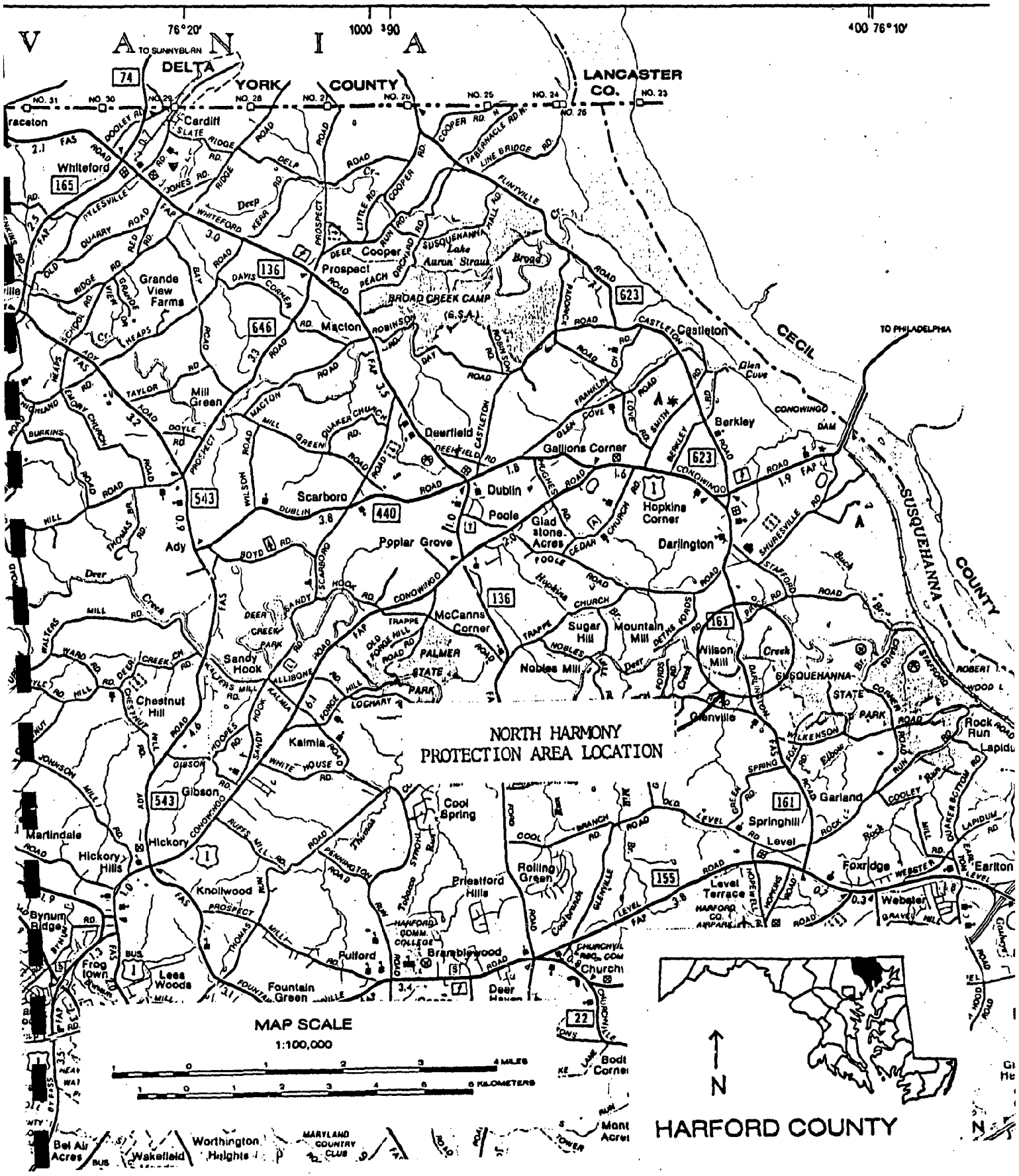
REFERENCES:

Prepared by:

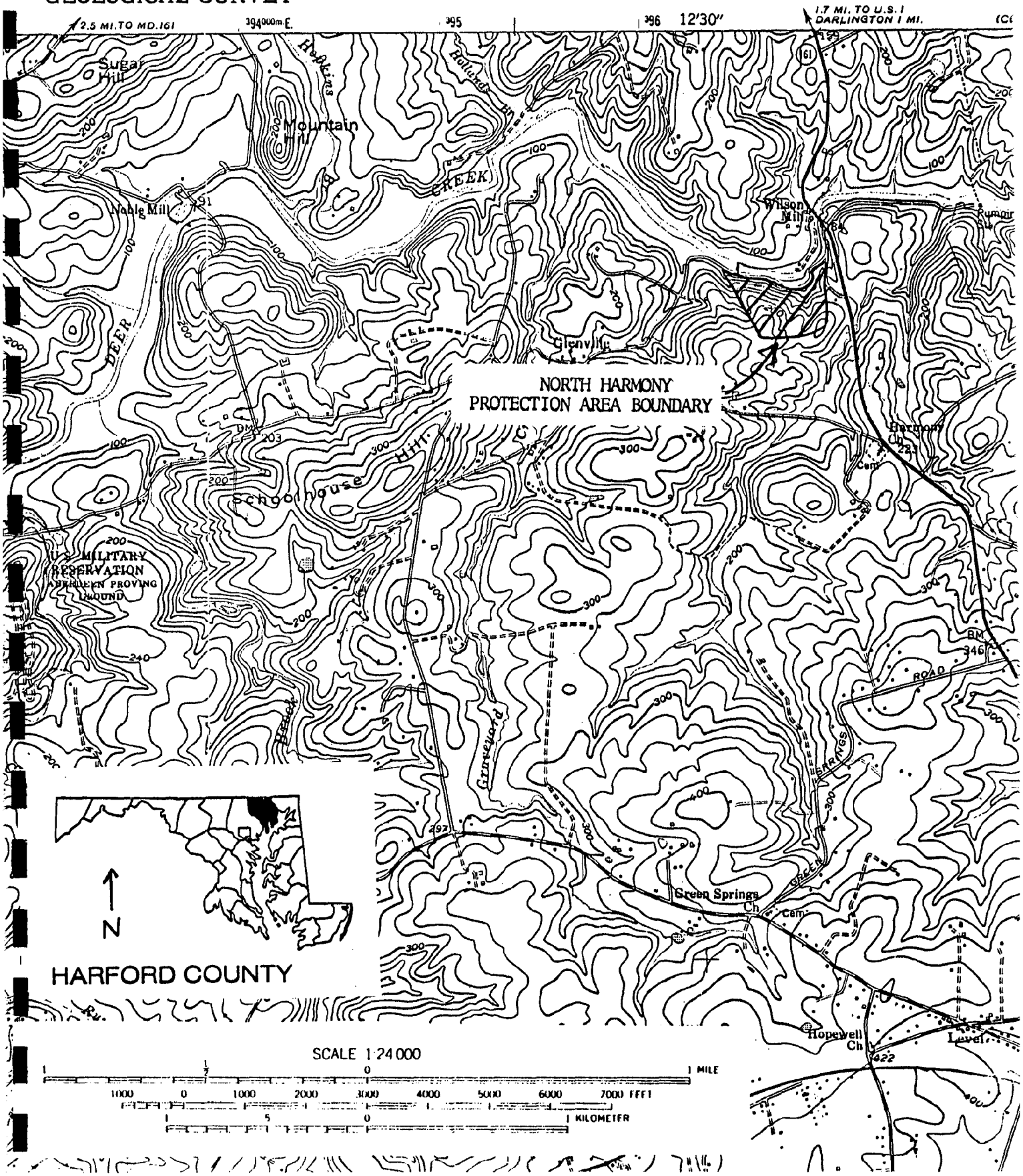
Date:

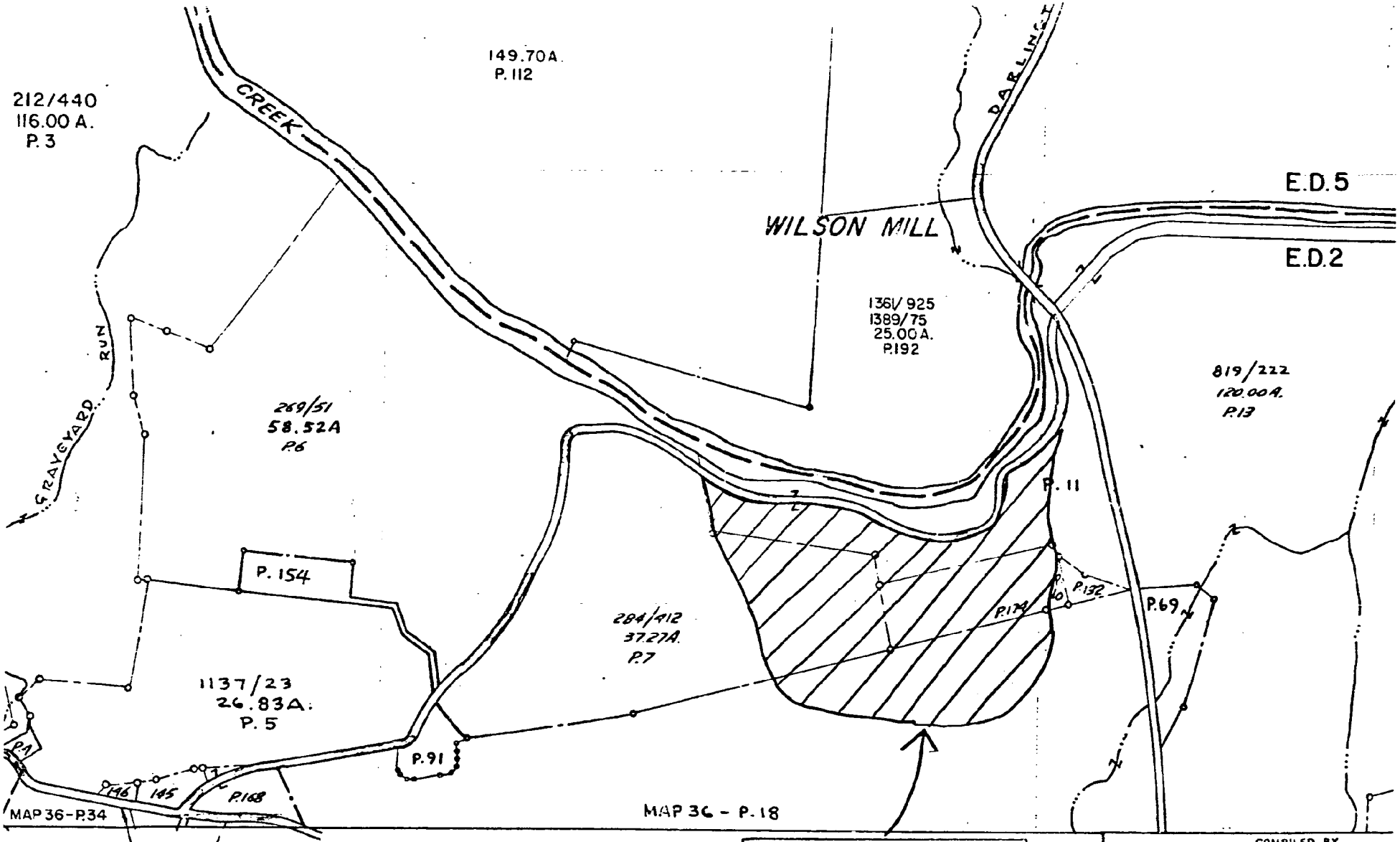
APPENDIX 8

EXAMPLE SET OF MAPS



UNITED STATES
PARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY





SCALE IN FEET

600 0 600 1200 1800

N

NORTH HARMONY
PROTECTION AREA BOUNDARY

TAX MAP NO. 28

1025

COMPILED BY
DEPT. OF ASSESSMENTS & T
MAP DIVISION

THE INFORMATION SHOWN HEREON HAS B
FROM DEED DESCRIPTIONS AND IS NOT AN A
IT SHOULD NOT BE USED FOR LEGAL DESCRI
NOTING ERRORS ARE URGED TO NOTIFY D
ASSESSMENTS & TAXATION, 301 W. PRESTON ST

REVISED

APPENDIX 9

SECTION 267-41, Subsection D(2)(d)

D. Natural Resources District.

(1) Purpose. The intent of this overlay district is to preserve significant/special environmental features identified herein and to:

(a) Provide uniform guidelines for orderly development and use of land within the Natural Resources District to protect the ecology of the area.

(b) Protect steep terrain.

(c) Protect water quality in streams and rivers.

(d) Minimize erosion/siltation and protect essential vegetation.

(e) Protect non-tidal wetlands.

(f) Protect persons and property from environmental hazards such as erosion, siltation and floodwaters.

(2) Application. The Natural Resources District shall apply to the following environmental features:

(a) Steep slopes: any land area exceeding forty thousand (40,000) square feet with a slope in excess of twenty-five percent (25%).

(b) Marsh areas: any area of non-tidal wetlands exceeding forty thousand (40,000) square feet, including but not limited to, areas designated as "areas of critical state concern" by the Maryland Department of State Planning. The Natural Resources District boundaries under this provision shall include the buffers described in Subsection D(5)(e) below.

(c) Streams: the following streams, including Broad Creek, Bynum Run, Carsins Run, Deer Creek, Grays Run, Ha Ha Branch, Herring Run, Little Gunpowder Falls, Rock Run, Peddler Run, Swan Creek, Winters Run and their tributaries, as identified on the Harford County Hydrology Map (1976 Revised Maryland Geological Survey Base Map 1:62,500). Tributaries to the above streams which drain a subbasin of more than four hundred (400) acres are included in the Natural Resources District stream designation. The acreage of a subbasin is determined at the point of confluence with another stream identified on the County Hydrological Map. The Natural Resources District area for stream protection shall be a minimum distance of one hundred fifty (150) feet on both sides of the center line of the stream or fifty (50) feet beyond the one hundred year floodplain, whichever is greater, and along their tributaries for a minimum of seventy-five (75) feet on both sides of the center line of the tributary. The Natural Resources District boundaries under this provision shall include the buffer requirements of Subsection D(4)(b) and (5)(b) of this Section.

(3) Use restrictions. The following uses shall be prohibited:

(a) Mining or excavation, except existing operations of either, and dredging, except such dredging as may be permitted by State law.

(b) Deposit or landfills of refuse or solid or liquid waste, except manure. Acceptable fill permitted by the United States Army Corps of Engineers may be used for stream bank erosion control.

(c) Alteration of the streambed and bank of a waterway, except for Best Management Practices to reduce stream erosion and maintenance of stream crossings for agricultural purposes.

(4) Permitted uses. The following land uses shall be permitted, provided that the conditions described herein are met:

(a) Agriculture. Agriculture shall be permitted, provided that accepted soil conservation practices of the Soil Conservation Service are implemented along watercourses or a twenty-five foot wide grass filter strip along the edge of cropland bordering streams is provided to reduce surface runoff and associated pollutants from entering waterways.

(b) Forestry. Commercial timber operations shall be permitted, provided that a Forest Management Plan (FMP) is approved by the Maryland Forest, Park and Wildlife Service and the Department of Planning and Zoning. Along streams, a buffer of fifty (50) feet, plus four (4) feet for each one percent increase in slope, measured from the water's edge shall be provided. The restriction on harvesting within this buffer may be waived, provided that a site-specific Buffer Management Plan is prepared and approved as an amendment to the Forest Management Plan (FMP). The Buffer Management Plan shall address potential water quality impacts and shall include a minimum undisturbed buffer designed according to site characteristics. Trees within the buffer may also be harvested to remove diseased, insect-damaged or fire-damaged trees in order to salvage the same or reduce potential stream blockage due to fallen timber. Landowners are exempted from the Forest Management Plan (FMP) requirement when timber is harvested for personal use only. Forestry operations within the Urban Residential districts (R1, R2, R3 or R4) shall be required to meet the conservation requirements under Subsection D(5) below.

(c) Utilities. The replacement of existing utilities or installation of new and accessory utilities will be permitted within the Natural Resources District. Following the placement of utilities, the disturbed land area shall be stabilized and reseeded. Wherever technically feasible, a buffer of seventy-five (75) feet from the water's edge shall be provided along watercourses.

(d) Stormwater Management. Where required, stormwater management facilities are permitted within the Natural Resources District, subject to other Harford County Stormwater Management Regulations.

(5) Conservation Requirements. The following conservation measures are required within this district:

(a) All development shall minimize soil disturbance during development and shall reduce soil erosion and sedimentation. When developing site plans, consideration shall be given to maintaining the existing drainageways within the Natural Resources District.

(b) Clearing or removal of natural ground cover and vegetation in preparation for development shall be minimized. Site development shall be clustered or designed in such a manner to preserve large contiguous tracts of woodland. Clearing of woodlands shall not reduce the area coverage of trees below seventy percent (70%). Along streams, a buffer with minimum width of fifty (50) feet, plus four (4) feet for each one percent increase in slope, measured from the water's edge shall be provided. Trees within the buffer may be harvested to remove diseased, insect-damaged or fire-damaged trees to salvage the same or reduce potential stream blockage due to fallen timber. Essential access roads may be permitted to traverse the buffer.

(c) Sensitive environmental areas, including significant/special natural features, significant wildlife habitats, saturated soils, highly erodible soils and designated scenic areas shall not be disturbed during any development.

(d) Any land in excess of twenty-five percent (25%) slope for an area of forty thousand (40,000) square feet or more shall not be cleared of natural ground cover or vegetation in preparation for development, except for necessary roads and utilities. Not more than thirty percent (30%) of any land in excess of fifteen percent (15%) slope and less than twenty-five percent (25%) slope shall be cleared of natural ground cover or vegetation in preparation for development.

(e) Non-tidal wetlands shall not be disturbed by development. A buffer of at least seventy-five (75) feet shall be maintained in areas adjacent to wetlands.

(6) Variances. The Board may grant a variance to Subsection D(3), (4) or (5) of the Natural Resources District regulations upon a finding by the Board that the proposed development will not adversely affect the Natural Resources District. Prior to rendering approval, the Board shall request advisory comments from the Zoning Administrator, the Soil Conservation service and the Department of Natural Resources.

(7) Development adjustment. If more than thirty percent (30%) of a parcel zoned residential or agricultural, as of September 1, 1982, is within this district, the housing types and design requirements, excluding gross density, of the next most dense residential district shall apply, provided that sensitive environmental features on the site are protected. When this adjustment is used, development shall not occur on slopes in excess of fifteen percent (15%) for an area of forty thousand (40,000) square feet or more.

(8) Extension of district. Upon presentation of factual information by the property owner demonstrating the existence of sensitive environmental features deserving protection, the Board may, pursuant to Section 267-9, Board of Appeals, extend the boundaries of the district.

(9) Adjustment of district. The application of this district to the Zoning Maps shall be construed as general in nature and may be adjusted by the Zoning Administrator upon the presentation of engineering data which delineate more precisely the boundaries of this district in conformance with Subsection D(2) above.

E. The requirements of this Section shall not apply to developments with approved concept plans or preliminary plans prior to the effective date of this Part 1.

APPENDIX 10

MEMORANDUM OF UNDERSTANDING

BETWEEN

THE MARYLAND DEPARTMENT OF NATURAL RESOURCES,
MARYLAND NATURAL HERITAGE PROGRAM
AND
THE HARFORD COUNTY, MARYLAND DEPARTMENT OF PLANNING AND ZONING

WHEREAS, the Maryland Natural Heritage Program, hereinafter called the Program, is an agency of the State of Maryland Department of Natural Resources, which has the expertise for determining appropriate protection measures for Habitats of Species in Need of Conservation, Threatened and Endangered Species, Habitat Areas of Local Significance, and Natural Heritage Areas, hereinafter collectively called Habitats; and

WHEREAS, Harford County, hereinafter called the County, is required by the Chesapeake Bay Critical Area Law to have a local Critical Area Management Program (Annotated Code of Maryland, Natural Resources Article, Section 8-1808); and

WHEREAS, Harford County's Critical Area Overlay District specifies that the County shall protect from the adverse impacts of development activities, Habitats within the Chesapeake Bay Critical Area that have been mapped by the Department of Planning and Zoning (Harford County Code, Section 267-41.1); and

WHEREAS, (proposed) Harford County's Natural Resources District regulations specify that the County shall protect from the adverse impacts of development activities, Habitats that have been mapped by the Department of Planning and Zoning (Harford County Code, Section 267-41(D)), all of which occur outside of the Chesapeake Bay Critical Area; and

WHEREAS, (proposed) Harford County's Natural Resources District regulations also specify that the County shall prepare a site-specific study in consultation with the State of Maryland Department of Natural Resources, of which the Program is an agency, when determining if a proposed development project will have or cause adverse impacts on a Habitat mapped by the Department of Planning and Zoning, or on a species dependent upon the Habitat (Harford County Code, Section 267-41(D)); and

WHEREAS, the County has designated the Department of Planning and Zoning, hereinafter called the Department, as the agency responsible for the preparation and implementation of the local Critical Area Management Program, and the Natural Resources District regulations;

NOW THEREFORE, the Program and the Department agree to enter into this Memorandum of Understanding as a foundation for an enduring, cooperative, working arrangement, whereby:

THE PROGRAM AGREES TO:

(1) upon the request of the Department, send written comments regarding potential adverse impacts of a proposed development project on a Habitat, or on a species dependent upon the Habitat, along with recommendations for project changes to minimize such impacts, by the date specified in the notification letter sent to the Program by the Department for that project;

(2) provide additional technical assistance to the Department, when requested to do so by the Department;

(3) provide the Department with species and/or community names for a Habitat, when requested to do so by the Department, but only when a development project is proposed within the boundaries of the Habitat;

(4) inform the Department about any Habitat in Harford County which, because of a change in the status of the species contained within the Habitat, is no longer in need of protection;

(5) provide the County with a map showing the Protection Area boundary for any previously undiscovered Habitat in Harford County of which the Program becomes aware after the effective date of this Memorandum, along with other pertinent information about the Habitat, such as is contained within a Protection Area Summary.

THE DEPARTMENT AGREES TO:

(1) incorporate regulatory protection measures for Habitats into its development review process, as is required by the County's Chesapeake Bay Critical Area Overlay District (Harford County Code, Section 267-41.1) and (proposed) the County's Natural Resources District regulations (Harford County Code, Section 267-41(D));

(2) send a notification letter to the Program for each development project proposed within the boundaries of a Habitat, which specifies the Protection Area name for the Habitat, whether or not

the County requires technical assistance from the Program, applicable local regulations, and the date by which the Department would need to receive written comments from the Program regarding adverse impacts which could potentially be caused to the Habitat by the proposed project;

(3) attach to each notification letter sent to the Program, a copy of the preliminary plan for the proposed development project, and any other information that the Department deems pertinent;

(4) allow the Program at least ___ calendar days in which to provide the Department with written comments about a proposed development project;

(5) consider written and verbal comments from the Program, when preparing a site-specific study to determine if a proposed development project will have or cause adverse impacts on a Habitat, or species dependent upon the Habitat, and when determining appropriate actions to take in order to protect the Habitat or species;

(6) make on-site visits, as necessary, to ensure compliance with local regulations pertaining to Habitats;

(7) send written notification to the Program, of any violation to the local regulations which threatens the integrity of a Habitat, request assistance from the Program when determining how to minimize any damage to the Habitat which may have been caused by the violation, and notify the Program, in writing, of any enforcement actions taken by the County with respect to the violation;

(8) send written notification to the Program, of any request for a variance to the local regulations which could potentially threaten the integrity of a Habitat, request assistance from the Program when determining how to minimize any damage to the Habitat which may be caused by granting the variance, and notify the Program, in writing, of the outcome of the variance request;

(9) send a copy of a preliminary plan approval letter to the Program for each development project for which the Program has provided the Department with written comments.

BOTH PARTIES AGREE AND UNDERSTAND THAT:

(1) the Department and the Program will cooperate in determining if a proposed development project will adversely impact a Habitat; and

(2) this agreement shall be effective on the date of the last signature hereto; and

(3) this agreement shall be reviewed annually on a mutually acceptable date.

Approved by:

Coordinator, Maryland Natural Heritage Program	Date
Director, Department of Planning and Zoning	Date

APPENDIX 11

HARFORD COUNTY GOVERNMENT

DEPARTMENT OF PLANNING AND ZONING

MEMORANDUM

TO: Name
Maryland Natural Heritage Program

FROM: Kurt Leitholf, Chief
Development Review Section

SUBJECT: Subdivision Name: _____
Subdivision No.: _____
Date Submitted: _____

Owner: _____
_____
_____

Engineer: _____
_____
_____

The Department of Planning and Zoning is hereby notifying the Maryland Natural Heritage Program that it has received the above referenced plan for review, and that this plan has the potential to impact the following Protection Area:

Protection Area Name	USGS Quad. Name(s)

The following situation(s) is/are applicable in this case:

_____ The Department of Planning and Zoning requests the assistance of the Maryland Natural Heritage Program in determining whether the proposed development plan will adversely impact the Protection Area.

_____ The aforementioned Protection Area occurs entirely/partially within the Chesapeake Bay Critical Area.

_____ The aforementioned Protection Area is protected by Harford County's Natural Resources District regulations.

220 SOUTH MAIN STREET / BEL AIR, MARYLAND 21014-3865
(301) 838-6000 (301) 879-2000

_____ Other: _____

_____

The Department of Planning and Zoning would appreciate receiving written notification of the findings of the Maryland Natural Heritage Program with respect to this development by _____. Thank you.

If you have any questions, please call Kurt Leitholf at 879-2000, ext. 228.

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