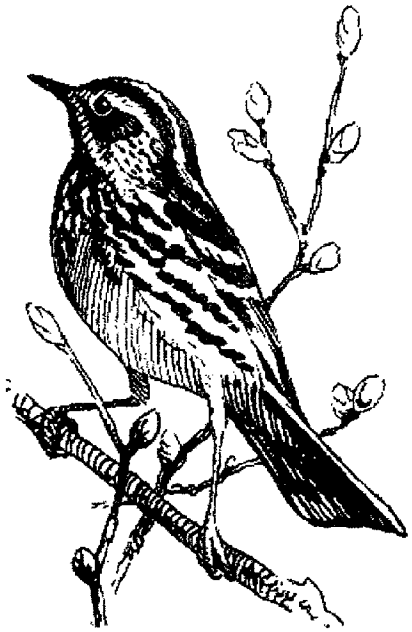
EXEMPLARY NATURAL HABITATS WITHIN MARYLAND'S COASTAL CORRIDOR STUDY AREA

FINAL REPORT: TASK 3



NEOTROPICAL MIGRATORY SONGBIRD REGIONAL COASTAL CORRIDOR STUDY

Prepared by:

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Department of Natural Resources

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FINAL REPORT: TASK 3

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INTRODUCTION

This report is a preliminary assessment of exemplary natural habitats within Maryland's coastal corridor. These sites are identified as Geographic Areas of Particular Concern (GAPC) in conjunction with with Maryland's Coastal Zone Management Program. The preliminary assessment provides a foundation for further analysis of natural communities in the Coastal Bay watershed of Maryland. Recent public concern with land use and interest in growth management in this region emphasize the need for more complete assessment of the status of natural communities. Such an assessment is essential to developing scientifically sound land use guidelines that will protect the most significant natural habitats of the region.

Exemplary natural habitats were identified based upon the following criteria:

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

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

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

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

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

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

Each exemplary natural habitat is reviewed in a Protection Area Summary (PAS) that describes the protection area, its values, and its protection needs. The PAS is composed of several parts, each of which is discussed below. Format and content are best understood with the insight provided in this section.

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

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

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

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

OTHER SIGNIFICANCE AND VALUES - This section describes other important aspects of the protection area. Often the habitat is the focus because the habitat in which most rare species are found is also rare.

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

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

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

Specific management recommendations are then given. Voluntary management agreements are often suggested. In some cases, monitoring of rare species populations is recommended.

Such studies are needed in order to learn more about the demographics and ecological requirements of the rare plants and to provide warnings of serious population declines.

BOUNDARY RECOMMENDATIONS - The proposed protection area is delineated by a line termed the protection area boundary. The habitats to be included within this boundary are described and the reasons for their inclusion are given. Within this boundary the threats listed in the previous section should be avoided to protect the significant habitat and rare species.

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

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

Maps and additional information concerning boundary locations are available from the Maryland Natural Heritage Program.

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

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

PROTECTION AREA SUMMARY

Protection Area Name: Campground Branch

County: Worcester USGS Quad: Public Landing

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

This bottomland hardwood forest contains three plant species that are rare in Maryland. Two of the species are known from fewer than ten sites in Maryland, and none of these sites is protected. The populations of all three rare species are large and widespread within the forest.

In addition there is little evidence of recent, unnatural disturbance of the habitat. This Red Maple and Oak-dominated swamp forest is an excellent example of the now uncommon mature bottomland hardwood forest.

OTHER VALUES AND SIGNIFICANCE:

Many of the Red Maples and oaks inhabiting the forest are quite large. Because such trees are usually harvested before they reach this size, old growth forest communities are becoming increasingly difficult to find in Maryland. Old growth provides habitat for specialized birds and insects which require dead or aging trees for food and shelter.

Because the forest is old and the only recent disturbance has been natural blowdown, the trees are well spaced. The canopy is broken in a number of places bringing in light, which, along with a fairly open understory, makes it an unusual habitat.

THREATS AND MANAGEMENT NEEDS:

Threats

The major threat to this protection area is forest cutting. The trees are large, and because many of them are oaks they would provide valuable timber. Any logging activity would destroy the high quality of this mature forest. Non-native, weedy species invade the disturbed canopy openings, often to the exclusion of native plants. In addition, logging practices often alter local hydrology, which alters the species composition of the wetland.

A second threat comes from nearby agricultural lands. Fertilizers, farm chemicals, and weedy, non-native plants that invade cultivated fields must be prevented from impinging upon

the swamp forest. Such pollutants and plant invaders could endanger the health of the more fragile species.

Management Needs

Forest cutting and hydrologic alteration should be prohibited within the protection area boundary. Plans for ditching or drainage of land surrounding the protection area should be reviewed for potential effects on the rare species' populations.

BOUNDARY RECOMMENDATIONS:

The protection area boundary includes the floodplain of Campground Branch and is bordered by roads to the north and south. This is the portion of the creek which contains old growth forest and the rare sedges. A forested zone on either side of the floodplain is included as buffer and as habitat for forest interior dwelling wildlife. It extends to the crest of the surrounding upland. The creek's headwaters and tributaries are also protected by a forested buffer, ensuring high water quality downstream.

SITE DESCRIPTION SUMMARY:

This 230 acre protection area encompasses the floodplain of Campground Branch near its headwaters. At its origins, the creek flows in a southerly direction, but it soon turns and flows northward. It passes through two culverts under a road to the north. The bottomland is about 300 ft. wide and lies 10 ft. below the surrounding upland. The swamp forest is dominated by mature hardwoods, including Basket Oak and Red Maple. The trees are large and well spaced, creating an open forest. Understory vegetation consists of fetterbush and blueberry shrubs, several species of fern (which are quite dense in some places), and patches of grasses and sedges. The rare species inhabit forest openings created by natural tree blowdowns.

PROTECTION AREA SUMMARY

Protection Area Name: E. A. Vaughn WMA Woodland

County: Worcester USGS Quad: Girdletree

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

The E. A. Vaughn WMA Woodland Protection Area contains a large, mature, deciduous forest and swamp with one of Maryland's five populations of a rare plant species. This population is large and is widespread through the swamp forest. The presence of immature plants as well as mature, flowering plants indicates that the population is stable. The forest also supports many species which are otherwise very uncommon on the lower Delmarva peninsula.

OTHER VALUES AND SIGNIFICANCE:

The upland, old growth forest and adjacent bottomland hardwood forest provide diverse habitats for forest interior dwelling birds, reptiles, and amphibians.

THREATS AND MANAGEMENT NEEDS:

Threats

Logging within the protection area boundary is the biggest threat to the rare species inhabiting this site. If logging occurs upstream, hydrological disturbance to the stream could be detrimental to this wetland species. Logging the upland buffer would allow weed species to establish and potentially exclude the rare species and other native flora. Logging within the population boundary would physically destroy the rare plants.

Management Needs

If logging is avoided, no special management is needed to protect the site. The size and reproductive success of the rare species population should be monitored.

BOUNDARY RECOMMENDATIONS:

The protection area boundary contains the entire population of the rare species, the upstream forested areas, and the adjacent uplands as buffer. Within this boundary, active disturbances and the threats mentioned above should be avoided.

SITE DESCRIPTION SUMMARY:

This 65 acre area encompasses a portion of the south fork of Scarboro Creek. Thousands of plants of the rare species are found within 100 yds. of the nearby road and extend downstream 500 yds., always within 50 yds. of the forested bottomland. Old growth forest is adjacent to the forested bottomland, but has been clearcut in one section north of the stream 500 yds. from the road. Tulip Tree is abundant near the stream and less common on the upland, where oaks and Loblolly Pine are more common. Vernal pools occur in some sections of the upland forest and provide habitat for amphibians.

PROTECTION AREA SUMMARY

Protection Area Name: Hancock Creek Swamp

County: Worcester USGS Quad: Girdletree

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

This large, mature, deciduous forest and swamp contains three rare plant species. One species is known from just four other locations in Maryland. This population is very large and appears to be reproducing successfully. The forest is also inhabited by many other species which are otherwise very uncommon on the lower Delmarva peninsula. A fourth rare plant species has been reported from this site but was not observed in 1987.

OTHER VALUES AND SIGNIFICANCE:

The upland hardwood forest and deciduous swamp forest provide diverse habitats for forest interior dwelling birds, reptiles, and amphibians.

THREATS AND MANAGEMENT NEEDS:

Threats

Logging within the protection area boundary is the biggest threat to the rare species. Due to severe disturbance to the habitat, canopy openings created by logging are usually invaded by non-native, weedy species. These weeds may exclude the rare species from the site. In addition, hydrological disturbance caused by logging upstream may alter the wetland habitat sufficiently to eliminate the rare wetland species. Logging activity within the population of the rare species would destroy individual plants of this species.

Management Needs

As long as logging is avoided, no special management is needed to protect the site. The rare species' populations should be monitored regularly.

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

BOUNDARY RECOMMENDATIONS:

The protection area boundary contains the entire population of the rare species with the upstream forested areas, and the adjacent uplands included as buffer. Within this boundary, active disturbances and the threats mentioned above should be avoided.

SITE DESCRIPTION SUMMARY:

This 25 acre protection area is adjacent to the eastern shoulder of Greenbackville Road along Hancock Creek. Descriptive information was provided by the staff of The Nature Conservancy. Heading east from the crossing of the road, the creek flows through a mature, deciduous swamp. The trees include Tulip Tree (primarily), Red Maple, oaks, and Loblolly Pine. On the south side of the swamp, an old-growth upland woods occurs. One rare species inhabits a seepage area between this upland and the swamp. A second rare species occurs along the stream and extends downstream about 300 yards. At this point logging has occurred and the rare species has been eliminated.

PROTECTION AREA SUMMARY

Protection Area Name: Pawpaw Creek

County: Worcester USGS Quad: Public Landing

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

A steep, north-facing bluff adjacent to Pawpaw Creek supports a vigorous population of a rare plant species. This plant is found at only four sites in Maryland, and is at the northeastern limit of its range. Another rare species inhabits low areas bordering a nearby pine forest. In addition, the aspect and steepness of the bluff along the creek provide habitat for other species that are uncommon on the Delmarva Peninsula.

OTHER VALUES AND SIGNIFICANCE:

Bluffs as high as 25 ft. line the creek, exhibiting a degree of topographic relief unusual for the lower coastal plain. Several seeps are present and these, as well as the steep slopes, support rich vegetation more characteristic of the Piedmont. A diversity of wildflowers carpet the forest in spring.

THREATS AND MANAGEMENT NEEDS:

Threats

The streamside community is a relatively natural one, not highly impacted by man. The major potential threat is a decline in water quality as a result of upstream agricultural runoff or forest cutting. One rare plant population is also subject to a more specific threat: erosion of the bluff it inhabits. Because the slope is undercut, it is highly subject to slumping. The forested buffer will help to prevent erosion from rain and wind. High spring river flow will continue to erode the bluff from below and create new habitat that may be colonized by the rare species.

The other rare plant population is threatened by use of the now abandoned forest roads. This rare plant grows in the roadway and any vehicular traffic would destroy it.

Management Needs

Nearby land-use activities should be monitored for potential effects on the watershed. This would ensure high water quality. In addition, large-scale cutting of the pine forest should be avoided. Instead, handcutting or pruning of nearby trees and shrubs would help to promote the population by providing light for the bog community.

BOUNDARY RECOMMENDATIONS:

The protection area boundary includes each of the rare plant populations and a buffer. Pawpaw Creek east of the road and the surrounding richly vegetated bluffs represent the core of the protection area. By protecting them, the unique streamside community may be preserved. The old forest roads which support the other rare species and the adjacent woods which drain into them are a second area of concern which should remain undisturbed. A forested buffer around the upstream area of Pawpaw Creek is incorporated to ensure the maintenance of water quality.

SITE DESCRIPTION SUMMARY:

The steep slopes that border Pawpaw Creek are the features of greatest ecological significance in this 175 acre protection area. This small creek originates at 40 ft. in elevation and travels eastward, quickly dropping to sea level to enter Chincoteague Bay at Public Landing. The middle section of the creek has numerous meanders and, although water flow may be high in the winter and spring (a result of the bluffs which concentrate runoff from the surrounding forest), the creek dries in the summer.

Once reaching an elevation of about 5 ft., the creek opens out into a small swamp, soon reaching its tidal limit. The surrounding forest is fairly dry in the uplands, consisting mainly of Red Maple, oaks, dogwood, Tulip Poplar, Sassafras, and hickory. It becomes slightly wetter near the stream. The steep bluffs (which are unusual in the coastal plain) provide habitat for plants more common in the Piedmont. These include Bloodroot, Enchanter's Nightshade, grape fern and Wild Geranium. In a few spots the river channel undercuts the stream bank, creating overhangs up to 12 ft. high.

South of the creek are several forested tracts being managed commercially. The vegetation is predominantly 20 year-old pines with a dense, shrubby understory. A network of old, overgrown

roads laces the area. In low-lying, boggy spots sphagnum moss, grasses, and sedges dominate.

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

PROTECTION AREA SUMMARY

Protection Area Name: Pikes Creek

County: Worcester USGS Quad: Girdletree

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

The bottomland hardwood forest supports one of the Maryland's five populations of a rare plant species. All of these populations occur on streambanks in Worcester County. The population is large and extends over 5 acres of the forest. The forest also contains many species which are otherwise very uncommon on the lower Delmarva peninsula. Due to drainage and clearing, mature bottomland hardwood forest are increasingly uncommon on the Eastern Shore.

OTHER VALUES AND SIGNIFICANCE:

This hardwood swamp forest provides habitat for forest interior dwelling birds, amphibians, and reptiles.

THREATS AND MANAGEMENT NEEDS:

Threats

Logging within the protection area boundary is the biggest threat to the rare species at this site. Due to severe disturbance to the habitat, canopy openings created by logging are usually invaded by non-native, weedy species. These weeds may exclude the rare species from the site. In addition, hydrological disturbance caused by logging upstream may alter the wetland habitat sufficiently to eliminate the rare species. Logging activity within the rare species' population would destroy individual plants of this species.

Management Needs

If logging is avoided, no special management is needed to protect the site. The size and reproductive success of the rare species' population should be monitored.

BOUNDARY RECOMMENDATIONS:

The protection area boundary contains the entire population of the rare species, the upstream forested areas, and the adjacent uplands as buffer. Within this boundary, active

disturbances and the threats mentioned above should be avoided.

SITE DESCRIPTION SUMMARY:

This 65 acre protection area encompasses a portion of the floodplain of Pikes Creek. The Creek is forested on both sides with mature Tulip Tree and Red Maple. The first 100 yds. next to a state road are very weedy as are the edges of the forest about 200-500 ft. from the stream channel. The rare species population occurs along the stream banks about 200 yds from the road and extends for about 400 yds. A few mature Bald Cypress are also in this area. Beyond the population an elevated earthen dike runs perpendicular to the stream.

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

PROTECTION AREA SUMMARY

Protection Area Name: Porter Neck Bog

County: Worcester USGS Quads: Berlin, Ninepin Branch

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Porter Neck Bog Protection Area is a densely forested wetland which, at its margins and in slightly wetter areas, contains three species of rare plants. One species is known from only one other site in Maryland. A fourth rare plant species was recorded at this site in 1982 but was not observed in 1987. It too has been found in only one other site in Maryland. Because the species is known to remain dormant for several years at a time, and because its habitat has been maintained, there is a good chance that it still occurs here.

OTHER VALUES AND SIGNIFICANCE:

This pine-hardwood swamp forest provides habitat for amphibians, reptiles, and forest interior dwelling birds.

THREATS AND MANAGEMENT NEEDS:

Threats

Disruption of the local hydrology threatens the survival of the rare, wetland species. Woody vegetation is encroaching upon the herbaceous openings inhabited by rare species. If this continues, the populations of rare species may be eliminated.

Trampling is also a threat to these plants. One rare plant species occurs close to the road in an open sandy spot which is easily accessible. This area seems to be used as a trailhead for hunters.

Another threat is forest clearing, either for agricultural or residential purposes. The latter seems more likely since the land across the street has been recently sub-divided into house lots, and a proposal has been made to do the same on the protection area side.

Management Needs

Management needs include maintaining some open areas for the rare plant occurring near the road since it thrives in sandy swamps and ditches with little or no forest canopy. Hand pruning

of trees and shrubs would be most effective, and is currently being practiced at this site. Local hydrology should be monitored to determine if groundwater is being depleted. This study may produce recommendations concerning local ditching.

BOUNDARY RECOMMENDATIONS:

The protection area boundary consists of the forested swamp bordered by roads on either side as well as adjacent upland. The dry upland forest, which is located on sandy soils, is included because it serves as a groundwater recharge area for the swamp. Protecting forest cover would maintain water quality and flow.

SITE DESCRIPTION SUMMARY:

The majority of this 175 acre protection area is forested wetland containing a mixed pine-hardwood forest. Dominant species include Red Maple, Sweet Gum, Loblolly Pine, Black Gum, American Holly, Sweet Pepperbush and blueberry. At the northern border is Bassett Creek, a brackish creek which was once impounded (Bassett Millpond) and which drains into Chincoteague Bay. To the east (outside the protection area) are open sand mines.

Two rare plant species grow among sphagnum moss and ferns in the wettest areas near the origins of two tributaries into Porter Creek. The soils have a surface layer of peat over sandy subsoil. Near the headwaters of the western tributary, an open pond approximately 1/2 acre in size has been created. It drains into a narrow, wooded channel for about 50 ft. before reaching a culvert at the road.

The other boggy stream origin is slightly more open and is used as a path by hunters. It opens out to the roadside where another rare plant species is found. Other dominant plants include sundew, bog clubmoss, St. John's-wort, Colicroot, and other wetland species that do well in sandy soils that are alternately very wet or very dry. At wetter times of year there may be standing water here and in the adjacent roadside ditch which drains into a culvert under the road. South of the road the creek surfaces into an open tidal channel.

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

PROTECTION AREA SUMMARY

Protection Area Name: Powell Creek

County: Worcester USGS Quad: Girdletree

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

The Powell Creek Protection Area contains a mature deciduous forest and swamp with one of the State's five populations of a rare plant species. Approximately 3,000 plants of this species were observed. The presense of immature plants as well as mature, fruiting plants indicates that the population is successfully reproducing and stable.

The forest has many species which are otherwise very uncommon on the lower Delmarva peninsula. Several of the observed species, such as Wood Anenome and Mayapple, require circumneutral soil which is uncommon in this region.

OTHER VALUES AND SIGNIFICANCE:

The hardwood swamp forest and adjacent upland forest provide diverse habitats for reptiles and amphibians. In addition, two forest interior dwelling birds, Red-eyed Vireo and Prothonetary Warbler, were observed in the forest.

THREATS AND MANAGEMENT NEEDS:

Threats

Logging within the protection area boundary is the biggest threat to the rare species at this site. Due to severe disturbance and increased sunlight, canopy openings created by logging are usually invaded by non-native, weedy species. These weeds may exclude the rare species from the site. In addition, hydrological disturbance caused by logging upstream may alter the wetland habitat sufficiently to eliminate this rare species. Logging within the rare species' population would destroy individual plants of this species.

Management Needs

If logging is avoided, no special management is needed to protect the site. The population size and reproductive success of the rare species should be monitored.

BOUNDARY RECOMMENDATIONS:

The protection area boundary contains the rare species' population, the upstream forested areas, and the adjacent uplands as buffer. Within this boundary, active disturbances and the threats mentioned above should be avoided.

SITE DESCRIPTION SUMMARY:

This 55 acre protection area encompasses part of Powell Creek. The creek runs north/south and is forested along most of its length. At the State border, the stream valley is overgrown with large patches of greenbrier. About 100 yds. upstream, the shrub layer thins and many interesting wetland herbs occur, including Wood Anemone, Green Woodland Orchid, Chain Fern, Jack-in-the-pulpit, Cowbane, and Turtlehead. The rare species occurs among these wetland herbs. Shrubs seen here include Spicebush and Swamp Withe-rod. Trees include Red Maple and Tulip Tree. A large old-growth Beech forest is adjacent to the west side of the stream valley. The rare species' population extends up the stream valley for another 500 yds.

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

PROTECTION AREA SUMMARY

Protection Area Name: Scotts Landing Pond

County: Worcester USGS Quad: Boxiron

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Scotts Landing Pond is a one-acre seasonal pond. Seasonal ponds are centripetally-drained, non-tidal wetlands and are considered unique natural communities because they are the only remaining naturally open freshwater wetlands on the interior of the Coastal Plain. These ponds are highly threatened because they are easily affected by agricultural drainage or other hydrological disturbances.

This particular seasonal pond is unusual in that it very rarely dries out. As a result, it is used as a year-round feeding site by many types of birds and other forms of wildlife.

Three rare herbaceous plant species inhabit this protection area. Two rare plants grow in the swampy woods adjacent to the seasonal pond. A third rare species grows at the edges of the pond. This species is known from fewer than 10 locations in Maryland.

OTHER VALUES AND SIGNIFICANCE:

The pond also supports a variety of reptiles and amphibians. One of these is the Red-spotted Newt (Notophthalmus viridescens viridescens). The form found here is unusual in that it does not pass through the land stage (red eft) but remains aquatic throughout its life cycle, becoming sexually mature in the larval stage.

The salt marsh on the eastern side of the protection area provides nutrients for large numbers of invertebrates which form the basis of aquatic food chains.

THREATS AND MANAGEMENT NEEDS:

Threats

Alteration of the local hydrology could eliminate the rare species. The salt marsh has been ditched to control mosquitoes. As a result of these ditches, the water table may decline in the wetland forest and shrubs may encroach and exclude the rare

herbaceous species. A ditch currently drains the pond. If this ditch is maintained, it could eventually lower the water table sufficiently to allow the establishment of woody species within the pond.

Logging would threaten the survival of the rare plant species. Due to severe disturbance to the habitat, canopy openings created by logging are usually invaded by non-native, weedy species. Near the openings, the additional light promotes the growth of shrubs and vines. These weedy species and shrubs could exclude the rare species.

Management Needs

The natural hydrology of the protection area should be restored and maintained. Existing drainage ditches have begun to fill with sediment. The process of sedimentation of the ditches near the protection area should be allowed to continue, so that no further draining of the wetland forest takes place.

No removal of forest vegetation should occur within the protection area. One of the rare plant species requires a closed tree canopy with few shrubs in the understory.

BOUNDARY RECOMMENDATIONS:

The protection area boundary encompasses the seasonal pond, the surrounding wetland forest containing the rare species, and a forested buffer. The buffer includes the forested area which drains into the pond. It also incorporates the stream east of the pond and its salt marsh borders, in order to prevent further disruption of the hydrology of the protected wetlands.

SITE DESCRIPTION SUMMARY:

Scotts Landing Pond Protection Area is a 55 acre site containing a one-acre, open water, seasonal pond surrounded by a forested wetland. The perimeter of the pond is vegetated with sedges and shrubs such as blueberry, American Holly, and Wax Myrtle. The dominant soil type near the pond, and in the wetland forest to the north and east, is termed mixed alluvial land. This soil has been washed out from adjacent streams and is composed of a well-mixed combination of acidic sand, silt and clay.

Surrounding the pond is a mixed pine-hardwood forest which is drained by several creeks flowing eastward into the bay. It is dominated by Sweet Gum, Red Maple, and Loblolly Pine and has an herbaceous understory consisting mainly of ferns, Partridge Berry, and Poison Ivy. In some areas it is quite swampy,

providing good habitat for the rare plant species. A shrubby swale in the woods south of the pond supports Whorled Water-Pennywort. Footpaths run from the road west of the pond, around the pond, and to the salt marsh to the east.

To the east of the swamp forest is a major stream surrounded by a narrow band of salt marsh dominated by cattails and cordgrasses. The marsh has been ditched to control mosquitoes, and is contiguous with an extensive salt marsh south and east of the protection area.

PROTECTION AREA SUMMARY

Preserve Name: Swans Gut Marsh

County: Worcester USGS Quad: Girdletree

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

The brackish and fresh tidal marshes of Swans Gut harbor nine rare and uncommon plant species. Within the protection area there has been very little direct disturbance and the marsh includes excellent examples of brackish and fresh tidal plant communities. Groundwater seepage from adjacent slopes provides regular fresh water to isolated fresh tidal wetlands along Swans Gut. These unusual groundwater-fed wetlands support the State's only known population of a plant species in the sedge family. This is the first report of this plant species in Maryland.

THREATS AND MANAGEMENT NEEDS:

Threats

The major threat to the rare plants and to the marsh is cutting of the forest around Swans Gut. Canopy removal would contribute to erosion and sedimentation of the marsh and creek. Activities farther upstream would be less likely to have an effect on this tidal community because the dam at Big Mill Pond traps sediment there.

A second threat is the excavation of ditches to drain agricultural fields in the uplands. The introduction of farm chemicals via such ditches or along natural gullies would be deleterious to the fragile species of the marsh.

Management Needs

No specific management practices are currently required.

BOUNDARY RECOMMENDATIONS:

The protection area consists of the creek, the marsh, and the surrounding upland from the upstream impoundment at Big Millpond to the Maryland-Virginia border. This stretch comprises the entire tidal section of Swans Gut within Maryland. The zone of forested upland covers approximately 500 feet on either side from the marsh edge, but extends farther up around gullies and tributaries which drain into Swans Gut.

SITE DESCRIPTION SUMMARY:

Swans Gut is the continuation of Little Mill Run below its impoundment at Big Millpond. It is tidal along its entire length; within Maryland, its waters are brackish. It receives fresh water from the millpond and from Bunn Ditch, which enters from the northeast. Along the edges on both sides of the creek is brackish marsh (up to 100 ft. wide in places) that harbors several rare species. The dominant vegetation of the marsh center is Rose Mallow, Threesquare, cattails, cordgrasses and Spikegrass. Small, isolated fresh tidal marshes border the brackish marshes in areas where groundwater seepage contributes a large perennial supply of freshwater to the wetland. Several rare sedges and a rare grass inhabit these fresh tidal marshes.

The upland hillsides are forested, very quickly rising to a level of 25 ft. above the marsh. It is, however, the border between marsh and upland which is most interesting botanically. Along with the four recorded rare plants, the vegetation is a mix of wetland and rich woods species. The dominant trees are pine and Red Maple, but White Oak, Sassafras, Red Cedar, American Holly, Sweetbay Magnolia, Black Gum and Bald Cypress are also seen. Shrubs include Sweet Pepperbush, blueberry, and viburnum; while herbaceous vegetation consists of ferns, grasses, and weedy species such as Virginia Creeper, greenbrier and Poison Ivy. The latter may be invading from farmland located at the crest of the upland, approximately 500-600 ft. from the creek.

PROTECTION AREA SUMMARY

Protection Area Name: Tanhouse Creek

County: Worcester USGS Quad: Public Landing

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

Within the protection area, a large swamp forest supports one of the State's five populations a rare plant species. This floristically diverse forest supports numerous plant species not typical of the lower coastal plain. The relief along the creek is unusual for this region. The plants found here are more common in the Piedmont and upper coastal plain, and indicate rich, well-drained soils.

OTHER VALUES AND SIGNIFICANCE:

The protection area includes a small section of brackish tidal marsh. Such marshland is exceptionally productive, supporting numerous invertebrates which form the basis of the food chain. In addition, the swamp and adjacent upland forest provide habitat for forest interior dwelling birds.

THREATS AND MANAGEMENT NEEDS:

Threats

Forest cutting is a significant threat to this natural community. It would eliminate the rich woods habitat and, because of the steep (i.e., for the coastal plain) bluffs, would cause sedimentation of the stream. In fact, some siltation is already visible in the stream in areas adjacent to agricultural fields. Uncontrolled soil erosion, as well as runoff of farm chemicals and fertilizers, would reduce water quality and harm the rare species' habitat in the lowest, wettest areas. In addition, non-native, weedy species invade openings created by logging. These weeds may exclude the rare species from the site.

Management Needs

Forest cutting should be avoided. In addition, agricultural runoff should be diverted away from the creek. Agreements with local landowners should be arranged in order to implement these management recommendations.

BOUNDARY RECOMMENDATIONS:

The protection area boundary surrounds the forested upland zones as well as the low swamp forest. It extends to agricultural lands that drain into the tributaries which form the headwaters of Tanhouse Creek. Including these ensures protection of downstream water quality. At the lower end, the boundary runs for about 0.6 mile from the confluence of the two major tributaries. This section of the creek is undisturbed brackish marsh and provides habitat for numerous productive tidal marsh species. A buffer of forest on either side is also included here.

SITE DESCRIPTION SUMMARY:

The primary feature of ecological significance in this 250 acre protection area is a forested wetland located at the headwaters of Tanhouse Creek. Its unique character results from the high degree of topographic variation: 35 ft. bluffs descend from an elevation of 40 ft. to the flat coastal plain. The creek originates from two narrow tributaries which flow from the uplands (which are now being farmed) and then descend quickly. At the base of the bluffs, the diverse herbaceous flora includes Toothwort, Bloodroot, Showy Orchis, Pennywort, Violet Wood Sorrel, Spring Beauty and Rattlesnake Fern. The canopy consists of several oak species, pine, dogwood, hickory and Tulip Poplar. The swamp below is dominated by Red Maple, Black Gum, Sweet Gum, ash, Sweet Pepperbush, fetterbush, American Holly, ferns, and Jack-in-the-pulpit. It is in the wettest areas, among sphagnous hummocks along the creek, that the rare species is found. The forested wetland continues to the east but soon becomes a brackish tidal marsh as it approaches Chincoteague Bay. Emergent vegetation here is dominated by Smooth Cordgrass, Meadow Cordgrass, Carolina Sea Lavender, Spikegrass, Groundselbush and Marsh Elder.

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

PROTECTION AREA SUMMARY

Protection Area Name: West Ocean City Pond

County: Worcester USGS Quad: Ocean City

SUMMARY OF ECOLOGICAL SIGNIFICANCE:

This large but shallow freshwater pond contains several rare aquatic plants that form large beds of submerged and emergent aquatic vegetation. This is the only State site for one of the rare species.

In addition to providing habitat for the rare plant species, the West Ocean City Pond is a well-known stop-over for migrating and wintering waterfowl. The pond also provides a feeding grounds for resident herons, egrets, ibis, gulls, and terns. Waterfowl and fish find a rich food supply in the large aquatic plant beds.

OTHER VALUES AND SIGNIFICANCE:

Further investigation of the pond's rich aquatic flora may yield the discovery of additional rare species, particularly during years of unusually low or high water levels. In addition, the pond is frequently used by birdwatchers who recognize the area as a good location to find coastal resident species as well as unusual vagrants.

THREATS AND MANAGEMENT NEEDS:

Threats

Any removal of forested buffers or forested portions of the watershed threatens the wetland with siltation, shortening the lifespan of the pond. Eutrophic conditions could result if excessive fertilizer is used in nearby agricultural fields.

Management Needs

The present water level flux of this pond should be maintained in order to preserve the rare species. In addition, drastically altering water levels could eliminate many species.

Logging should be prohibited within the protection area.

If signs of eutrophication are observed, a cooperative agreement with adjacent landowners should be established in order to minimize the use of fertilizers on adjacent fields.

BOUNDARY RECOMMENDATIONS:

The protection area boundary includes the pond, an upland buffer, and a small portion of the wooded watershed. Within this boundary, active disturbances and the threats mentioned above should be avoided.

SITE DESCRIPTION SUMMARY:

This 55 acre protection area encompasses West Ocean City Pond, a large, artificial pond with a thin forest buffer and a partially-forested watershed. At least 50% of the pond is an emergent wetland dominated by Angled Spikerush and a rare plant species known in Maryland only from this site. The deeper portions of the pond contain beds of aquatic vegetation, including an abundance of Hornwort. Willow is invading the shallow southern edge of the pond. Wildlife, particularly birds, are abundant. The aesthetic value of the pond is great.

REFERENCES

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

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