Maryland Coastal Zone Management Program

CECIL COUNTY WETLAND MANAGEMENT PROGRAM

Phase 1: Rationale, Information Sources, and Analysis of Wetland Management Programs

Prepared for the Cecil County
Office of Planning and Economic Development

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

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Rogers, Golden & Halpern

CECIL COUNTY
WETLAND MANAGEMENT PROGRAM

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Cecil County

WETLAND MANAGEMENT PROGRAM

PHASE 1

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CECIL COUNTY
WETLAND MANAGEMENT PROGRAM
Phase 1

I. RATIONALE

Attitudes toward wetlands have continuously changed over the years. Long regarded as breeding grounds for mosquitoes or areas requiring demucking and filling by developers, their use has aroused conflict between those who wish to preserve them and those who wish to develop them. Even though wetlands require significant modifications prior to development, these same developers value their locations which are typically in close proximity to open water. Farmers owning land with wetlands have difficulty operating equipment in them; however, the farmer draining or clearing these wetlands benefits by planting crops in their rich organic soil.

Wetland values can be categorized into three major groups: intrinsic qualities, ecological, and global services. Wetlands provide many individual roles. The U.S. Department of Transportation recently recognized no less than 10 major roles for consideration in evaluating impacts associated with highway studies. The section below describes some of the most important and common roles that contribute to the overall value of wetlands. All wetlands will not exhibit each of the values to the fullest extent. Indeed, the overall value of an individual wetland is site-specific and is dependent upon many factors that may directly affect that wetland. The discussion that follows presents a general overview of wetland values that contribute to the need for their protection. When developing a wetland protection strategy, local decision-makers must take into account the development of methodologies to assess wetlands values on a more site-specific basis.

A. Values

Flood Control - Many freshwater and riverine wetlands have a significant influence on regional water flow regimes. Frequently occurring as topographic depressions, they are capable of intercepting stormwater runoff and retaining the runoff until they are full. As rivers and streams overflow their banks the flow is spread laterally and increases the conveyance capacity of that area. In doing this wetlands lessen sharp runoff peaks and release flows at a slower rate over longer periods of time. Since it is usually the peak flows that produce flood damage, wetlands reduce the peak flows and the frequency of flooding at downstream locations. When wetlands that provide this value are developed for buildings, parking areas, or roads, the increase in impermeable surfaces heightens the intensity of peak flows.

Erosion Control - In association with the increase in conveyance capacity noted above, the vegetation in flood plains and wetlands adjacent to streams and rivers helps to slow the velocity of the river. By reducing the velocity of flood waters, wetlands serve as sediment traps and allow for the accumulation of sediment. Likewise,

the reduction in velocity also reduces the erosion of streambanks. In other areas marsh plants stabilize and bind shorelines with root structures. The dense growths enhance sediment deposition instead of erosion. Vegetated shorelines are capable of absorbing and dissipating wave energy. This buffering effect can reduce damage due to wave action from storms and boat wake.

Groundwater Recharge - Groundwater recharge is the movement of surface water down through the soil to the underlying aquifer. Many wetlands recharge groundwater supplies that may play an important role for local potable water supplies. This is not always the case however, since the reason that many wetlands exist is due to the low permeability soils below them. Many wetlands often serve as discharge areas rather than recharge areas. The wetlands do play a role in influencing groundwater levels.

Water Quality - Wetlands have the ability to improve, in varying degrees, the quality of water. Under favorable conditions wetlands can serve as chemical sinks by retaining pollutants such as suspended material, excess nutrients, toxic chemicals, and disease-causing microorganisms. Factors for which wetlands should be protected include their ability to reduce the velocity of streams, allowing sediments and chemicals to settle into the wetlands; anaerobic and aerobic processes such as denitrification and chemical precipitation aid in removing certain chemicals; the high productivity rate in many wetlands may lead to mineral uptake by plants and subsequent burial in the sediments when the plants die; wetlands have a diversity of decomposers and decomposition processes; there is a high sediment-water exchange due to the amount of contact of water with sediments; and permanent burial of chemicals may occur in areas with the accumulation of peat in wetlands.

Wetlands can be used to treat or buffer discharges or surface water runoff prior to entering water bodies. The importance and ability of an individual wetland, however, needs to be evaluated on a site-to-site basis. Wetlands have an upper limit carrying capacity to handle pollutants that should not be exceeded. If the carrying capacity is exceeded, the wetland can lose part or all of its valuable characteristics.

Wildlife and Fisheries Habitat - Wetlands provide habitat for thousands of species of plants and animals. Wetland plants are primary producers and also provide nesting material and sites for many birds and mammals; locations for fish to deposit eggs; and shelter for fish and shellfish from predators. Wetlands may be year round homes for many species or may be used for food, cover, water, space, and/or freedom from disturbance. Wetlands also provide critical habitat for all or parts of the life cycles of many species listed as threatened and endangered.

Many wetlands have two major energy flow patterns. One, the grazing food chain, involves the consumption of plants by herbivores. The second involves the detrital food chain where organisms rely directly on organic debris as their food source.

The fertility of floodplains, resulting from deposits of enriched sediments carried by flood waters, is widely recognized. Decomposing leaves in bottomland forests serve as the base for large population bursts of many invertebrates that are in turn a food source for many predator species. Detritus from coastal marshes has long been considered a valuable food source for many commercially important fish and shellfish.

The importance of wetland habitat is paramount for many animals harvested commercially for pelts or for supporting a large and valuable recreational hunting industry. For commercially harvested fish and shellfish as well as recreationally important species, wetlands are a key component in their life cycles.

The abundance of plant and wildlife species that use wetland habitats provide man with a living laboratory for educational and research purposes. The diversity of life and the interaction between species and habitats also provides an aesthetic value worthy of protection. Not only do the common commercially and recreationally valuable species rely on wetlands, but many threatened and endangered species also rely on wetlands for all or part of their life cycles.

Other Values - Wetlands function in the maintenance of water and air quality on the local wetland ecosystem. They may play a role in moderating seasonal temperature extremes and are also a source of water to the atmosphere leading to the formation of clouds and precipitation. These functions may also go beyond the local level and may be global in scale. Wetlands, through processes of microbial decomposition, play a role in natural nutrient cycles. By processing, storing, or emitting nitrogen, sulfur, methane, and carbon dioxide, they are important to global atmospheric stability.

B. Definition of Wetlands

1. Critical Area

a. "Non-tidal wetlands" are defined in Section 14.15.01 Definitions (46) as those lands, excluding tidal wetlands regulated under Title 9 of Natural Resources Article, Annotated Code of Maryland, where the water table is usually at or near the surface, or lands where the soil or substrate is covered by shallow water at some time during the growing season. These lands are usually characterized by land that support primarily hydrophytic vegetation (see B.4.b) or lands where the substrate is predominantly undrained hydric soils (see B.4.a). The Critical Area definition refers to the Palustrine Class of non-tidal

wetlands as defined by the U.S. Fish and Wildlife Service (see B.3.a below).

b. "Tidal Wetlands" (to be provided)

2. State Definition

a. "Non-tidal wetland" includes the following wetland classes as defined by the U.S. Fish and Wildlife Service: palustrine aquatic bed, palustrine emergent, palustrine forested, palustrine scrub-shrub, and palustrine open water excluding tidal wetlands as defined below. These wetland classes are lands where the water table is usually at or near the surface (i.e., periodically saturated); or lands where the substrate or soil is covered by shallow water at some time during the growing season. These lands are usually further characterized by one or both of the following attributes:

1) At least periodically, the land supports predominantly hydrophytes, and

2) The substrate is predominantly undrained hydric soil.

b. "Tidal wetlands" include any land considered "private wetland"" or "state wetland" pursuant to Title 9, Wetland and Riparian Rights of the Natural Resources Article Annotated Code of Maryland (1983 Replacement Vol.).

3. Federal

a. U.S. Fish and Wildlife Service - "Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification wetlands must have one or more of the following three attributes:

1) at least periodically, the land supports predominantly hydrophytes,

2) the substrate is predominantly undrained hydric soil, and

3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year" (Cowardin et al., 1979).

b. U.S. Army Corps of Engineers - "Wetlands are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support and that

under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

c. Soil and Conservation Service - "Wetlands are soils that are covered with standing water or are saturated most of the year and that support mostly water-loving plants."

4. Wetland terms

a. Hydric soils - A hydric soil is a soil that in its undrained condition is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation. For Maryland, 43 classifications of soils have been listed as being hydric using the following criteria:

1) All Histosols except Folists; or

2). Soils in Aquic subgroups, Albolls suborder, Salorthids great group, or Pell great groups of Vertisols that are:

a) somewhat poorly drained and have a water table less than 0.5 feet from the surface at some time during the growing season, or

b) poorly drained or very poorly drained and have either:

i. water table less than 1.0 feet from the surface at some time during the growing season if permeability is equal to or greater than 6.0 in/hr in all layers within 20 inches, or

ii. water table at less than 1.5 feet from the surface at some time during the growing season if permeability is less than 6.0 in/hr in any layer within 20 inches, or

iii. soils that are ponded during any part of the growing season, or

iv. soils that are frequently flooded for long or very long duration during the growing season.

b. Hydrophyte - A hydrophyte is any plant growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content (plants typically found in wet habitats). Vascular Plant Species Occurring in Maryland Wetlands (Dawson and Burke, 1985) lists 1,218 plant species occurring in Maryland wetlands with data on the indicator status for each species [i.e., obligate (>99% occurrence in wetlands), facultative wetland (66 - 99% occurrence in wetlands), etc.] as well as notes on abundance in Maryland when considered rare, threatened, or endangered.

c. Palustrine - "The Palustrine System includes all non-tidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 parts per thousand (ppt). It also includes wetlands lacking such vegetation, but with all of the following four characteristics:

1) area less than 8 ha (20 acres);

2) active wave formed or bedrock shoreline features lacking;

3) water depth in the deepest part of basin less than 2 meters at low water; and

4) salinity due to ocean-derived salts less than 0.5 ppt."

C. County Wetland Types, Status, and Trends

1. Characterization of Wetland Types. Although conducted for a variety of reasons, studies of wetlands in Maryland were performed as early as 1908. In 1908 the Maryland Conservation Commission initiated surveys in coastal areas of wetlands that "should be made available for agricultural purposes." Mapping of marshes of the Eastern Shore and the Atlantic coast of Maryland into six general types was commissioned by the Department of Natural Resources and the Department of Research and Education in the 1950s. During 1953 and 1954 the U.S. Fish and Wildlife Service (F&WS) conducted an inventory of wetlands in Maryland that used a classification system later modified to a minor degree and later published as Circular 39 in 1956. This wetlands classification system has been employed by wildlife biologists for over 20 years.

Geared to evaluate the importance of wetland habitat for most species of game and furbearing animals, the Maryland Game & Inland Fish Commission conducted an inventory of potential wetland developmental areas in 1956. The Game & Inland Fish

Commission study was statewide and surveyed wetland areas as small as 0.5 acre whereas the prior F&WS survey was conducted in the Coastal Plain and limited the survey to areas of 40 acres and larger.

In 1965, as a result of a Commission on Hunting Spaces' recommendation for an expanded action to preserve lands that serve the increasing demand for hunting areas open to the public, another wetlands inventory was conducted. This study used aerial photographs and evaluated 2,500 plots of 100 acres each. The study represented 4 percent of the total land area in Maryland. A study commenced in 1967 in response to House Resolution No. 2 and was published in a final report in 1973 (Metzgar, 1973). This inventory considered wetlands of five acres or more and used a modification of the Circular 39 classification scheme. The results of the state-conducted studies are not comparable due to the difference between the minimum size of the areas considered.

In 1982 The Coastal Wetlands of Maryland was published by the Maryland DNR (McCormick and Somes, 1982). The study, which included an inventory, discussed values of coastal wetlands and suggested a standard evaluation scheme for coastal wetlands. The McCormick inventory relates best to the U.S. Fish and Wildlife Service National Wetlands Inventory (NWI), which used interpretation of aerial photographs to map specific wetland types using the classification system described in Cowardin et al., 1979. The NWI is mapped at a scale of 1:24,000 on USGS 7.5 minute topographic quadrangle base maps. This classification scheme employs a series of letters and numbers to signify systems, subsystems, and classes as well as for other modifiers such as water chemistry, soil, and other special conditions. The NWI inventory is the most accurate mapping of non-tidal wetlands in Maryland including Cecil County.

a. Wetland Acreage in Cecil County - The NWI mapping and digitization effort for Cecil County shows a total of 51,704 acres of wetlands, including both tidal and non-tidal wetlands. This total includes 146 individual classifications using the current U.S. Fish and Wildlife Service system by Cowardin. These individual classifications occurred a total of 2,545 times ranging from a high of 382 locations of POWZH (palustrine open water non-tidal intermittently exposed/permanent with a special modifier of diked/impounded; essentially ponds less than 8 acres in size) to a low of only a single occurrence for each of 44 different classifications.

   The NWI data for Cecil County, which has 146 specific classifications, can be very confusing for the lay person. A simplification of the scheme leaves a total of

13 categories of systems and subsystems or in the case of the palustrine system, which has no subsystem classification, the system and classes. The generalized data are presented in Table 1. The data show that subtidal estuarine open water comprises over 38,000 acres, or 73.8 percent, of the wetlands in Cecil County. Non-tidal wetlands, on the other hand, represent over 18 percent of the total wetland acreage in Cecil County.

b. Frequency and Spatial Distribution of Wetlands in Cecil County - the NWI mapping at the scale of 1:24,000 is provided as an overlay to USGS 7.5 minute topographic quadrangle maps for the entire county. Tidal and non-tidal wetland areas have been classified using the Cowardin system (i.e., letter/number symbols) and approximate boundaries are highlighted on the maps. Copies of these maps can be obtained from the Maryland Department of Natural Resources, Wetlands Permit Division. The Cecil County Planning Office also has a complete set of these maps that can be reviewed. The NWI mapping has also been enlarged to be compatible with County tax maps, which are at a scale of 1 inch=600 feet. Copies of these maps can be reviewed at the County planning office. The County also has NWI data on a 1:50,000 scale map. However, this scale does not differentiate between categories at the class level.

As would be expected, wetlands, both tidal and non-tidal are distributed throughout the County.

The mapping and classification effort of tidal and non-tidal wetlands in Cecil County, by the F&WS, included 2,545 individual wetlands. These wetlands included 146 different categories (using the Cowardin system). Individual areas mapped were as small as .07 acres up to areas that included hundreds of acres for a specific wetland classification and location. The high frequency of occurrence and the diverse types and sizes of wetlands in the county make an analysis of the spatial distribution of wetland types quite difficult. Add to this the high degree of error the F&WS has experienced in identifying class, subclass, and water regime through their interpretation, and it becomes apparent that, in the absence of verifying the classifications in the field, only gross patterns on distribution may be evident.

The discussion below briefly describes some general patterns on frequency and distribution using the F&WS wetlands inventory data. The data in Table 1 clearly show that tidal wetlands comprise nearly 82 percent of the wetlands in the county. The average size of mapped tidal units is over 106 acres. The wetlands are obviously

distributed in those parts of the county where surface waters are affected by tidal action. On the other hand, while comprising only 18 percent of the total area in wetlands, the non-tidal wetlands have a frequency of occurrence of nearly seven times that of the tidal wetlands. The palustrine system alone accounts for over 83 percent of the wetland occurrences in the county, yet it only makes up 12.6 percent of the wetland area in the county.

The largest wetland classification in the County by area, estuarine open water (E1OW), is associated with upper Chesapeake Bay and the Northeast, Elk, Bohemia, and Sassafras Rivers, and the Chesapeake and Delaware Canal. The largest single area of riverine open water (R1OW) occurs in Cecil County's section of the Susquehanna River from about one mile west of Stump Point north to the Conowingo Dam. Other areas classified as riverine open water include Scotchman Creek and Octoraro Creek. The area north of North East and between Little Northeast Creek and Gravelly Run (including most tributaries) is also classified as riverine open water and has little association with palustrine wetlands. Lacustrine open water (L1OW) habitat occurs from the Conowingo Dam north on the Susquehanna River. Most of the other limnetic lacustrine habitat occurs east of the Elk River. Pearce Creek on the Cecilton peninsula is also a large lacustrine open water habitat. Based on the F&WS inventory data, it appears that there is a high frequency of occurrence of palustrine emergent (PEM) wetlands associated with palustrine forested (PFO) and palustrine scrub-shrub (PSS) and riverine open water in the northwest quadrant of the County that is not as apparent in other parts of the county. By comparison, although there are large single areas of palustrine emergent wetlands in other parts of the County (e.g., Pond Neck Wildlife Management Area), this classification does not appear to occur as frequently in most other areas of the County.

Table 2 lists the wetlands classifications that have only one reported occurrence in the County. The listing includes 44 classifications (35 non-tidal and 9 tidal) that represent only 1.3 percent of the total wetland area mapped by the F&WS. Since these areas are somewhat unique and typically include small areas, they should receive special consideration from activities occurring near them, perhaps specifying these areas as conservation areas or requiring wider buffers around them.

c. Plant and Animal Communities

This section briefly describes the types of plants and animals typically associated with several non-tidal wetland classifications. Similar but more detailed discussions of plant and animal associations with tidal wetlands in Maryland are provided in McCormick and Somes, 1982, and will not be repeated here. Since many species can tolerate fluctuations in salinity and many non-tidal wetlands interrelate with tidal wetlands, some overlap in comparing non-tidal with tidal associations is expected.

Emergent and/or Forested Wetland temporarily or intermittently flooded (Seasonally Flooded Basins and Flats: Meadows) are found in upland depressions and along the edges of streams in floodplains. Meadows occupy shallow upland basins or border deeper marshes. Rarely is standing water found. The soil is waterlogged within a few inches of the surface most of the year. Flooding occurs along river courses in late fall, winter, or spring. Vegetation varies and depends on the duration of saturation from flooding and groundwater levels. Plant communities provide nesting, feeding, and shelter to numerous species of resident and migratory songbirds. The areas are frequented by large numbers of upland game birds, small game, and furbearers.

Vegetation	Animals
hardwoods	squirrels
herbaceous growths	rabbits
native and cultured grasses	reckon
ironweed	fox
golden rod	deer
sweetflag	
common rush	
spikerush	
chufa	
smartweed	
sedges	
tearthumb	
joe-pye-weed	
arrow head	
manyleaved rush	
woolgrass	
jewelweed	
broad leaved annuals and perennials	

Semipermanently or Seasonally Flooded Emergent Wetland (Inland Shallow Fresh Marsh) is found at upper reaches of rivers and streams in shallow basins or bordering other types of wetlands. The soil is usually waterlogged during the growing season. Up to 6 inches of standing water is common. This classification commonly occurs as seep areas on irrigated land. As habitat it is used for nesting and rearing ducklings. It provides high quality foods for attracting migrating waterfowl and rails.

Vegetation	Animals
grasses	muskrats
bulrushes	black ducks
spike rushes	wood ducks
arrowhead	oppossum
pickerel weed	nutria
smartweed	otter
wild millet	reckon
wild rice	rabbit
cattail	

Aquatic Bed Unconsolidated Bottom Permanently Flooded or Intermittently Exposed (Inland Open Freshwater) includes shallow water in ponds, lakes, and open areas interspersed in inland shallow fresh marsh. This classification has a variable water depth and is usually bordered by emergent vegetation. This wetland type serves as resting and feeding habitat for migrating waterfowl and waterbirds. Wood ducks, black ducks, and mallards also find this habitat suitable as nesting and brooding areas.

Vegetation	Animals
sage pondweed	wood duck
naiad	black duck
spatterdock	mallard
waterlily	fish
smartweed	muskrat
elodea	turtles
waterwillow	frogs
water cress	salamanders
coontail	predators of above
water milfoil	
duckweed	
arrowhead	
burreed	
spikerush	
grasses	
sedges	

Scrub-Shrub wetland having all non-tidal regimes except permanently flooded (Shrub Swamp) can typically be found adjacent to sluggish streams and less frequently on river floodplains. Common on landward side of coastal type wetlands. May be covered with six or more inches of water and the soil is normally waterlogged during growing season. Mallards, black ducks, and other puddle ducks use during migrations. Wood ducks use this habitat for nesting and nightly roosting.

Vegetation	Animals
alder	rabbit
buttonbush	reckon
willows	opossum
small maples	fox
small sweetgums	squirrel
tearthumb	otter
swamp rose	muskrat
beggar-ticks	deer
beggar-lice	reptiles
jewelweed	amphibians
joe-pye-weed	mallard
loosestrife	black duck
native grasses	wood duck
sedges	resident songbirds
	migratory songbirds

Forested Wetland with all non-tidal regimes except permanently flooded (Wooded Swamp) constitutes most of Maryland's non-tidal wetlands acreage; it comprises the largest single classification of non-tidal wetlands in Cecil County (over 3,220 acres). Like the scrub-shrub wetland discussed above, the palustrine forested wetland is also found along sluggish streams and on floodplains. This type is also found on flat, poorly drained uplands and in very shallow basins. Wooded swamps may be covered with a few inches of water or up to one foot near streams and rivers. Soils are waterlogged during the growing season to within a few inches of the surface.

Palustrine forested wetlands provide habitat for many types of waterfowl, wildlife, and fishery species. The habitat is used for nesting, feeding, brooding, night roosting, and migratory stops for most of the species indicated below. It provides complete life cycle requirements for sandpipers.

Vegetation	Animals
green ash	black duck
red maple	wood duck
river birch	mourning dove
sweetgum	wood cock
pin oak	sandpipers
cypress	resident songbirds
sycamore	migratory songbirds
other oaks	bald eagle
elms	osprey
cottonwood	large mouth bass
aspen	pickerel
poplar	catfish
nettle	white perch
lizard's tail	yellow perch
spice bush	
magnolia	
paw-paw	
winterberry	
greenbrier	
holly	
honeysuckle	
blackberry	
grapes	
beggar-ticks	
jewelweed	
grasses	
sedges	
broad-leaved plants	

2. Special Wetland Types

a. Natural Heritage Areas

The Natural Heritage Program has assigned significance to the following locations in Cecil County:

i. Site NHA-14 - Habitat adjacent to bald eagle nesting sites at Ordinary Point on the Sassafras River and the land adjacent to and upstream from Money Creek;

ii. Site NHA-14 - Habitat adjacent to bald eagle nesting sites at Grove Point U.S. Wildlife Sanctuary;

iii. Habitat adjacent to bald eagle nesting sites at McGill Creek, Back Creek, and Foreman Creek; and

iv. Endangered Species habitat on wetland and upland areas along the Elk River roughly between Timber Point and Stony Point; irregularly exposed tidal

riverine flats adjacent to the Elk River north of Old Frenchtown wharf; areas at the confluence of two unnamed tributaries to Great Bohemia Creek that are just to the east and to the west of Elk Road.

v. Grove Neck (along the Sassafras River near Money Creek) and Plum Creek (along the Elk River near Plum Point) are Natural Heritage Areas in the Critical Area.

b. Large Tracts

Wetland mapping conducted by the F&WS was reviewed to evaluate the locations of large wetland tracts within Cecil County. The detail of the data did not indicate the size of specific tracts. Therefore, the mapping was used to screen large areas with wetlands.

The largest individual wetland tracts in the County are the three major open water features discussed above: estuarine open water (E1OW) associated with upper Chesapeake Bay, Northeast River, Elk River, Bohemia River, Sassafras River and the Chesapeake and Delaware Canal; riverine open water (R1OW) from the confluence of the Susquehanna River with Chesapeake Bay north to the Conowingo Dam; and lacustrine open water (L1OW) north of the Conowingo Dam. These three classifications together with estuarine intertidal (E2 classifications), lacustrine littoral (L2 classifications), and riverine lower perennial (R2 classifications) comprise 45,134.6 acres, which equates to over 87 percent of the wetlands in Cecil County.

The largest single tract of palustrine emergent (PEM non-tidal) wetlands (approximately 280 acres) is found at the Pond Neck U.S. Wildlife Management Area. The second largest concentration of PEM wetland is at the U.S. Wildlife Management Area at Town Point Neck. Smaller concentrations of non-tidal PEM are found on Town Point Neck and Back Creek Neck. The largest individual concentration of palustrine emergent wetlands occurs along the Elk River from about Elkton Landing to Scotland Point. This area is roughly over 300 acres. It is seasonally tidal and classified PEMR. Other Elk River tributaries with extensive and a diverse wetland make-up including non-tidal wetlands are also associated with Back Creek, Plum Creek, and Long Branch.

The largest single area of palustrine scrub-shrub wetland (PSS) occurs just south of Red Point. Though not nearly as vast in area, several other areas of palustrine scrub-shrub wetland also occur in unnamed tributaries to the Sassafras River between Grove Point and Ordinary Point.

On the Cecilton peninsular area the palustrine deciduous forested wetlands (PFO1) are typically broader features than those that occur in most other areas of the County; this is probably due to the flatter topography that occurs there. The flatter topography may also play a role in the broader palustrine deciduous forested wetlands along the upper reaches of Northeast Creek (upstream from Bay View) and in wetland areas found between Elkton and the Chesapeake and Delaware Canal. Most of the tributaries to the Sassafras River and Bohemia Creek in Cecil County also have fairly significant concentrations of PFO1 wetlands.

Large tracts require protection due to the diversity of wetland types that are typically found in association with one another; thus, they are likely to afford a more diverse functional value. This is not to say that homogeneous tracts or wetlands with a smaller size may not be as important, only that the potential is greater for a multi-habitat wetland to have a more significant environmental function.

c. Wetland Associations with Upland Natural Areas

Upland natural areas include recreation areas such as parks or wildlife management areas. Wetland habitat often plays a major role in maintaining the values of these natural areas. Ten Upland Natural Areas are noted in Cecil County. In each area a diversity of wetland classifications occur, and with few exceptions are entirely non-tidal wetlands. The specific areas are listed below.

- U.S. Wildlife Management Area at Pond Neck
- U.S. Wildlife Management Area below Courthouse Point
- U.S. Wildlife Management Area at Elkhaven
- U.S. Wildlife Management Area at Elkton
- Elk Neck State Forest
- Elk Neck State Forest at Black Hill
- Elk Neck State Forest at Turkey Point (2)
- Grove Point U.S. Wildlife Sanctuary
- Susquehanna State Park

d. Wetlands of Special Interest

Certain wetland areas or types are of special significance for fish, plant, and wildlife and are deserving of protection. These wetlands may or may not have been mapped and included in the inventories conducted to date. Due to their potential for containing, supporting, or contributing to the existence of threatened and endangered species, exemplary communities, or unique species and/or

associations in Maryland, the local wetland protection program should determine methods for locating such wetlands. The Chesapeake Bay Critical Area Commission, 1987, has outlined positive indicators for non-tidal wetlands of special importance. Though not specific to Cecil County, the following positive indicators should be used when evaluating programs affecting wetlands:

1) Areas that contain two or more contiguous wetland complexes.

2) Wetlands with special soil types (excluding even-aged loblolly pine dominated areas): Pocomoke; Elkton; Evesboro-Goldstown; peat; and muck.

3) Wetlands in gravel/sand pits abandoned for more than 5 years.

4) Seep wetlands with muck or peat soils or at least 70 percent cover of sphagnum moss. Indicator plant species include:

Common Name	Scientific Name
skunk cabbage	Symplocarpus foetidus
follicled sedge	Carex folliculata
marsh marigold	Caltha palustris
Canada mayflower	Maianthemum canadensis
wood anemone	Anemone quinquefolia

5) Forested wetland with bald cypress (Taxodium ditichum - PF02) or Atlantic white cedar (Chamaecyparis thyoides).

6) Forested wetlands dominated by large trees [e.g., greater than 24 inches diameter at breast height (dbh)] with less than 30 percent herbaceous cover of exotic species including:

Common Name	Scientific Name
Japanese honeysuckle	Lonicera japonica
Japanese barberry	Berberis thunbergii
Japanese knotweed	Polygonum cuspidatum
Kudzu-vine	Pueraria lobata
Asiatic knot weed	Polygonum perfoliatum
Day lily	Hemerocallis fulva
Multiflora rose	Rosa multiflora
Privet	Ligustrum sp.
Garlic mustard	Aliaria officinalis
Autumn/Russian olive	Eleaganus sp.
Purple loosestrife	Lythrum salicaria
Common reed	Phragmites australis

7) Forested wetlands with shrub and herbaceous cover of at least 30 percent. Indicates well-defined vegetation layers with high diversity.

8) Wetlands adjacent to bayside pond. Identified as PSS/E, PSS1R, or E2SS on NWI maps.

9) Forested or scrub-shrub wetland over one acre in size, except those where loblolly pine is dominant.

10) Wetlands associated with extensive forested tracts, such as those used by interior dwelling songbirds.

11) Delmarva Bays - wetlands dominated by drawdown or emergent vegetation in centripetally-drained, seasonally flooded basins.

12) Bogs - highly acidic wetlands characterized by peat, or a floating mat of vegetation, and Sphagnum. Often occur adjacent to old mill ponds and in old gravel/sand pits.

13) Forested wetlands with vernal pools (seasonal ponds).

Wetlands that do not meet these criteria are not necessarily of insignificant value. Surely, many wetlands not meeting these criteria will be capable of providing important water quality values, such as filtering impervious surface runoff or even point source discharges. They may also provide valuable flood storage capabilities. The local wetland protection plan should include measures to assess other wetland values and the importance of individual wetlands in the context of specific activities affecting wetlands in the County.

3. Trends

a. NWI vs. McCormick Survey

Classification schemes used prior to 1975 for wetland inventories in Maryland were based on the characterization of wetland complexes. The 1975/1978 State Wetland Mapping System used a system that delineated wetland vegetation types. The basic approaches are not directly comparable.

The classification system used for the U.S. Fish and Wildlife System mapping in the most recent NWI mapping used the hierarchical classification system introduced by Cowardin et al., 1979. The final level of detail in this system is "Dominance Type." The types used in the Maryland scheme are equivalent to the Dominance Types used in the Cowardin scheme. Since the Maryland coastal

mapping inventoried coastal wetlands up to the inland boundary, this program did not consider much of the palustrine wetlands in the County. Comparisons of data between the two inventories are therefore very difficult. For instance, the McCormick study mapped 77 acres of what would be the equivalent of palustrine forested wetland by Cowardin; the NWI study mapped over 3,200 acres of palustrine forested wetland. A closer relationship may exist between the McCormick study's brackish and fresh marsh and the NWI estuarine and riverine emergent categories. McCormick mapped 1,928 acres of marsh while the NWI study mapped 1,543 acres of estuarine emergent wetlands and 38 acres of riverine emergent wetland for a total of 1,581 acres. Using the similarity between the schemes relating to the scrub-shrub category, the McCormick inventory mapped 341 acres and the NWI study accounted for only 16 acres. Another example of the differences between the two schemes is with submerged vegetation. McCormick accounted for 681 acres of submerged vegetation wetlands while the NWI study map had no estuarine and riverine submerged aquatic bed classifications in Cecil County.

Without having a more reliable basis for comparison between the two classification schemes, it is impossible to quantify any trends in wetland growth or loss in the County.

b. Threats to County Wetlands

Historically, the greatest source of non-tidal wetland loss in Maryland has been from drainage that has occurred for forestry, agriculture, mosquito control, and land development. Filling of wetlands to improve ground stability to support structures such as homes, industry, etc. has also been responsible for wetland destruction. Other activities that have also contributed to wetland destruction or alteration have been dredging; solid waste disposal; road construction; mineral extraction for coal, peat, sand, and gravel; and water pollution including industrial wastes, sediments, urban runoff, and sewage and agricultural runoff.

Wetlands may be destroyed directly by filling or dredging. However, even a minor modification may result in reducing the value of a specific wetland or in destroying it by more subtle changes occurring upstream of, adjacent to, or within a given wetland. Minor changes in hydrology or water quality can have devastating effects on wetlands.

Therefore, it is important that the local decision-makers also be a party to the protection of wetlands. Historically, wetland loss in Maryland has occurred at a rate of about 1,000 acres per year. With enactment of the Maryland Wetlands Act of 1970, that amount was reduced to about 20 acres per year of tidal wetlands. These numbers are based mainly on losses occurring during the 1950s to 1970s. The older wetland definitions were being used then. Now that wetland mapping has improved substantially, especially for wetlands with drier water regimes (much of the palustrine descriptors), the actual losses were probably much greater. Care should be taken in developing measures to protect non-tidal wetlands, which may or may not play a role in maintaining the quality of coastal wetlands, but deserve no less attention.

TABLE 1

A Generalization of Wetland Classifications in Cecil County, Maryland

NWI Category	System Description	Individual NWI Classifications	Area (acres)	Frequency	Avg. Acres/ Occurrence
E1	Estuarine subtidal	2	38,184.43	22	1735.66
E2	Estuarine intertidal	18	2155.73	361	5.97
R1	Riverine tidal	6	1948.10	14	139.15
Subtotal Tidal wetlands		**26**	**42,288.31**	**397**	**106.79**
R2	Riverine lower perennial	4	946.03	10	9.46
R3	Riverine upper perennial	3	61.01	6	10.17
L1	Lacustrine limnetic	2	1862.95	14	133.08
L2	Lacustrine littoral	2	37.31	2	18.65
PAB	Palustrine aquatic bed	3	7.77	3	2.59
PEM	Palustrine emergent	40	1693.73	282	6.01
PFL	Palustrine flat	4	17.61	16	1.10
PFO	Palustrine forested	29	3222.71	761	4.23
POW	Palustrine open water	15	962.77	881	1.09
PSS	Palustrine scrub-shrub	18	603.79	173	3.49
Subtotal Non-tidal wetlands		**120**	**9415.68**	**2148**	**4.38**
Total Wetlands		**146**	**51,703.99**	**2545**	**20.32**

TABLE 2

A Listing of Wetland Classifications Having Only a Single Occurrence in Cecil County, Maryland

Tidal Wetlands

NWI Classification	Area (Acres)
EIOWLX6	334.22
E2EM2/FLN6	31.37
E2EM5/FLN6	2.18
E2EM5N6	3.20
E2FOI/EM5P6	2.15
R1BBS	1.02
R1EM2/FLN	34.29
R1EM2T	.24
R1FLM	91.05
9 Categories	499.72

Non-Tidal Wetlands

NWI Classification	Area Acres
L2EM2FH	.33
L2OWZHS	36.98
PAB4/OWZH	3.29
PAB4H	3.10
PEM/OWF	1.67
PEM1/5EH	2.67
PEM1/OWFHS	7.00
PEM1EHS	35.38
PEM1FHS	1.00
PEM2FH	1.69
PEM2/5RB	1.10
PEM5AX	1.25
PEM5CX	.38
PEM5S	.90
PEMF	.23
PFLCX	.07
PFO/SS1F	1.47
PFO1/EM5R	6.62
PFO1AH	.66
PFO1EB	23.49
PFO5/OWZB	3.20
PFO5/SS1F	3.76
PFO5FH	1.14
POWFB	1.53
POWFHX	2.45
POWKX	.63

Table 2, cont'd.

POWTH	.58
PSS1/5FH	15.19
PSS1/EM5CH	1.63
PSS1/EM5EH	2.44
PSS1EB	.86
PSS5/OWFB	2.52
R2BBA	2.94
R2FLA	.60
R3BBA	.33
35 Categories	170.08

II. WETLAND INFORMATION SOURCES

A. Maryland Department of Natural Resources (DNR). The DNR maintains several data sources that can be used to obtain useful information on tidal and non-tidal wetlands. The data include maps as well as aerial photographic products and reports on Maryland's wetlands.

1. The Wetlands Division has complete coverage of tidal wetlands in tidewater Maryland. Tidal wetland areas have been mapped on aerial photo mylars at a scale of 1 inch = 200 feet. These areas are classified by vegetation type. Natural color and infrared aerial photographs can also be obtained from the Wetlands Division.

2. Flood Hazard Boundary Maps and Flood Insurance Rate Maps are available from DNR, Flood Management Division. The flood data generated under the direction of the Federal Emergency Management Agency have limitations for wetland identification. However, many areas have aerial photographic coverage and accompanying planimetric maps at a scale of 1 inch = 600 feet, which may be useful for wetland identification purposes.

3. An Upland Natural Resources Inventory, which catalogued and mapped environmental features of natural resource sites, was performed by the Tidewater Administration. The Inventory, which is at a scale of 1 inch = 1 mile, may include some wetland areas.

4. The Coastal Resources Division has prepared a comprehensive listing of vascular plant species occurring in Maryland wetlands entitled Vascular Plant Species Occurring in Maryland Wetlands by Dawson and Burke, 1985.

5. The Coastal Resources Division has on file the digitized U.S. F&WS mapping of tidal and non-tidal wetlands including all of Cecil County A two-map set is available for the County at a scale of 1:50,000. At this scale certain subsystems and classes (using F&WS hierarchial classification scheme) are combined to maintain clarity. More detailed descriptions as mapped by the F&WS are available with the NWI overlays at a scale to be used over USGS 7.5 minute topographic quadrangle base maps.

6. The Natural Heritage Program maintains a computerized filing system on unique, rare, and endangered species habitat areas in Maryland. A great deal of useful information has been collected, although little is in the map format. Many of these areas contain non-tidal wetlands.

B. Maryland Department of State Planning. The Department has also compiled information that is available and that has applications to wetlands concerns.

1. Tidal and non-tidal wetlands have been mapped by the Maryland Wildlife Administration and are included in the Maryland Automated Geographic Information System data base. This information system includes a variety of physical, cultural, and aerial data. The base data maps were prepared at a scale of 1:63,360 from land use/cover information in 1973 and 1978. Non-reproducible base maps are available for review at the Department. These maps are at a scale of 1:24,000.

2. The Maryland Recreational Inventory System locates all public, quasi-public, private recreation, and open space areas.

3. Selected tidal and non-tidal wetlands may be contained in Areas of Critical State Concern: Designation Report. The maps are at a scale of 1 inch = 2,000 feet.

C. U.S. Soil Conservation Service. The Soil Conservation Service (SCS) maintains lists of the kinds and combinations of soils and plants that define wetland areas. A copy of Hydric Soils of the State of Maryland, 1985 can be obtained from the SCS. The boundaries of various soil types are delineated in the SCS County soil survey and are depicted over aerial photography at a scale of 1:15,840. Staff at SCS are also available to review plans for selection of sites and design and maintenance of artificial ponds.

D. U.S. Fish and Wildlife Service. The F&WS has conducted the mapping of tidal and non-tidal wetlands in Maryland, including Cecil County, at the scale of 1 inch = 2,000 feet using the USGS 7.5 minute topographic quadrangle base maps. With their role to evaluate the impacts on water quality, wildlife, and wildlife habitat in wetlands, the F&WS has experienced staff to discuss wetland projects. The F&WS makes recommendations to the Army Corps of Engineers on the approval or denial of permits for projects involving wetlands being reviewed by the Corps. The F&WS can also be consulted to assist in evaluating whether specific projects fall under the jurisdiction of the Corps of Engineers.

III. Analysis of Wetland Management Programs

A. State

1. Critical Area Commission

The Maryland General Assembly enacted legislation in 1984, the Chesapeake Bay Critical Area Protection Program Law, which focused public attention on land development near the Chesapeake Bay and its tidal tributaries. The Critical Areas Commission was responsible for developing criteria to guide the development of local Critical Area protection programs by local jurisdictions. These protection programs encourage more sensitive development along the Bay and its tidal tributaries. The Commission developed criteria that support the overall goals of

the program: (1) minimize adverse impacts on water quality that result from pollutants that are discharged from structures or conveyances that have run-off from surrounding lands; (2) conserve fish, wildlife, and plant habitat; and (3) establish land use policies for development in the Chesapeake Bay Critical Area that accommodate growth and also address the fact that, even if pollution is controlled, the number, movement, and activities of persons in that area can create adverse environmental impacts.

The protection of tidal wetlands is inherent in the Critical Area program since the designated Critical Area is based on the lands and waters indicated as wetlands on state coastal wetland maps as well as all land and water 1,000 feet beyond the landward boundary of State or private wetlands and the heads of tides as designated.

The Critical Area Criteria also call for the protection of all wetlands connected to tidal wetlands, tidal waters, tributaries, and wetlands of special habitat importance, regardless of size. The Criteria address four of the eight classes of Palustrine wetlands described in Cowardin et al., 1979: Aquatic Bed, Emergent, Forested, and Scrub-shrub. Local jurisdictions must identify and provide protection for these palustrine wetlands of 1 acre or larger. Protection must include two components. The first is that a minimum 25-foot buffer be established around the non-tidal wetland. Development activities or other activities that may disturb the wetland are prohibited. Encroachment into the buffer may be allowed if it can be determined that the proposed activity will not adversely affect the wetland or wildlife contained therein. The hydrologic regimes of wetlands are also required to be protected.

The second component is a requirement for mitigation. There must be an attempt to avoid and minimize impacts before alterations are deemed unavoidable and necessary. Alterations to non-tidal wetlands, when permitted, (e.g., associated with a water-dependent facility or when determined to be of substantial economic benefit) must show that alterations are necessary and that there are no alternative sites available that could be used to avoid the wetland alteration. A plan for mitigation is required and must compensate for the impact by replacing or providing a substitute wetland.

Under the Critical Area program, wetlands and non-tidal wetlands within the buffer are also afforded some protection under other criteria including forest and woodland protection, agriculture, natural parks, and habitat protection areas. The Commission has a guidance paper that is available on non-tidal wetlands.

2. Maryland Department of Natural Resources

a. Flood Hazard Management Planning

Although its primary goal is protection against flood losses, the Flood Hazard Management Act of 1976 provides provisions that local regulations must consider the protection of the biological values in developing flood management plans. Jurisdictions with approved flood management plans can apply for funding on a 50 percent state/50 percent local matching basis to implement capital projects. Non-structural measures are given top priority. DNR will assist jurisdictions willing to incorporate wetland protection measures into floodplain regulations.

b. Watershed Permits Program

The Water Resources Administration (WRA) of the DNR requires state permits for placing fills or for development in the 100-year floodplain. A "waterway construction" permit is required before construction can begin in or along a non-tidal stream or any construction that changes the course, current, or cross-section of that stream or its 100-year floodplain including dams, reservoirs, or small ponds. Since permits are required only for work within the 100-year floodplain, the program is only partially effective in protecting non-tidal wetlands. However, regulations promulgated in November 1986 require that applicants avoid, minimize, or mitigate adverse impacts to terrestrial habitat and non-tidal wetlands. The program also exempts many activities that have adverse effects on wetlands and the criteria for permit approval do not provide for guaranteeing that non-tidal wetlands will remain unaltered.

c. Surface Mining Act

The WRA also administers the permitting of mine owners and operators of surface mining operations that extract materials other than coal through the Surface Mining Act of 1975. The Act does include several safeguards to help prevent the destruction of non-tidal wetlands.

1) The operation should not adversely affect the wildlife of fresh water, estuarine, or marine fisheries;

2) the operation should not adversely affect publicly owned park, forest, or recreation areas; and

3) there should be no substantial deposits of sediment in stream beds or lakes or not result in landslides or other water pollution.

The Act also includes provisions for denial of a permit if operations will:

1) be incompatible with state or local land use plans;

2) affect fragile or historic lands in such a way to damage their historic, cultural, scientific, aesthetic, and natural system values;

3) affect renewable resource lands where there would be a substantial loss or reduction of long-range productivity of water supply or food or fiber products, including aquifers and aquifer recharge areas; and

4) affect natural hazard lands where there could be a significant endangerment of life and property, such lands including those areas subject to frequent flooding or areas of unstable geology.

Although currently in draft form, the latest version includes buffer requirements for streams, Areas of Critical State Concern, and Wild and Scenic Rivers.

d. Sewage Treatment and Water Supply

The Department of the Environment regulates the construction of sewage treatment plants. The Department of the Environment reviews permit applications for consistency with established discharge criteria. There must also be a consistency of discharge points and levels of treatment with local and state water quality and sewerage plans. Individual water and waste water systems are also regulated by the Department of the Environment. Standards for well and septic systems are promulgated by the Department of the Environment and include the prohibition of individual treatment systems in saturated soils or in sites with high water tables characteristic of most wetlands. Applicants filing for a Section 10 or 404 Corps of Engineers permit must get the Department of the Environment Water Quality Certification approved before the Corps will issue their permit.

e. State Intervention in Land Use Proceedings

The Department of State Planning has been given the authority to intervene in judicial, administrative, or other proceedings involving land use, development, or construction. It can intervene on its own initiative or by request from another state agency or federal or local

government on decisions having the potential to affect statewide interests. The program gives local jurisdictions a means of obtaining assistance for the purpose of protecting wetlands.

f. Maryland Coastal Zone Management Program

The Maryland Coastal Zone Management (CZM) Program received the approval of the federal Office of Coastal Zone Management on September 30, 1978. The overall goals of the program are to:

- o preserve and protect coastal resources,
- o protect and promote economic and social stability in an environmentally compatible manner;
- o protect public interest, safety, and welfare in natural hazard areas;
- o locate major facilities only in appropriate coastal areas maintaining environmental quality;
- o promote appropriate methods for using coastal areas to prevent coastal resources degradation;
- o promote intergovernmental coordination and public participation; and
- o provides comments to the permit issuing agencies.

One of the specific objectives to attain these goals includes the protection of "coastal terrestrial areas of significant value, areas having scenic, scientific, geologic, hydrologic, biologic, or ecosystem maintenance importance -- such as non-tidal wetlands, endangered species habitat, significant wildlife habitat, and wintering and resting areas of migratory birds." The non-tidal wetlands program also provides assistance and project comments upon request for issues concerning non-tidal wetlands, both inside and outside the Coastal Zone.

The Corps of Engineers cannot issue a permit that is not consistent with the State CZM Program.

g. Recreation and Open Space Plan

The DSP developed the Maryland State Comprehensive Outdoor Recreation and Open Space Plan as well as 24 local recreational plans. The plans identify significant natural areas that should be preserved or conserved for open space, recreation, and natural resource potential. Wetlands are

included in a generic category of significant areas of natural diversity. The plans recommend the protection of such areas.

B. Federal

The U.S. Army Corps of Engineers (COE) has the primary responsibility for wetlands protection at the federal level. The U.S. Environmental Protection Agency is responsible for developing guidelines to assist in the decision making process for permit applications. This responsibility has its roots in two important laws, Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. A full explanation may be found in the regulations, 33 Code of Federal Regulations, Parts 320 through 329.

1. Corps of Engineers

The Rivers and Harbors Act of 1899 and the Clean Water Act (Federal Water Pollution Control Act, as amended in 1977) gives the COE the authority to regulate the building of structures or filling of "navigable waters of the United States." Principally written to avoid obstructions in navigable waters, the scope has changed in response to changing environmental, social, and economic conditions. The COE's jurisdiction originally extended to only navigable waters. Its authority was expanded in 1975, due to the growing concern for resource protection, to all waters of the U.S. including most wetlands. In 1984, its jurisdiction was extended to include isolated wetlands, areas not connected to streams.

Under Section 10 of the Rivers and Harbors Act, the COE's jurisdiction extends only to the mean high water mark. Construction of structures such as docks, jetties, and bulkheads and the excavation or deposition of materials into wetlands up to the mean high water mark requires a Section 10 permit. The area usually involves low marsh wetlands and nonvegetated wetlands or mudflats.

The COE's jurisdiction is not as limited under Section 404 of the Clean Water Act. The jurisdiction here extends to the high water mark and beyond to the landwardmost limit of existing wetlands, including isolated wetlands. Activities involving dredging or filling associated with things such as construction of homes, roads, dikes, seawalls, and other work involving dredging or the discharge or fill require a 404 permit.

While not exempted under Section 10, certain activities are exempted under Section 404 and include:

1) construction of farm or forest roads;

2) maintenance of shoreline structures;

3) soil and water conservation practices; and

4) activities associated with farming, tilling, harvesting, etc.

Activities that the COE feels will result in minimal impacts either individually or cumulatively may be issued a general permit by the COE. Examples include:

1) road crossings;

2) utility crossings;

3) bank stabilization; and

4) pollution clean-up activities.

These activities may be denied a water quality certification or CZM consistency. A separate application is still necessary for the Department of the Environment.

A major component of the COE's review of permit applications includes public interest review. The benefits that reasonably may accrue from a specific project must be balanced against its reasonably foreseeable detriments. During the COE's review they must consider the general needs of the public: resource conservation, navigation, economics, recreation, aesthetics, water supply, historic values, food production, fish and wildlife values, flood damage prevention, energy needs, and land use. No permit will be granted unless its issuance is found to be in the public interest.

Citizens can be involved by reviewing Public Notices, which the COE issues to advise the public of the proposed activities. Public Hearings may be held by the COE were it is warranted based on the COE review and comments received.

Although the COE makes the final decision on approval or denial of permit applications, they must also consider the comments and recommendations of the Environmental Protection Agency, Fish and Wildlife Service, the National Marine Fisheries Service, state agencies, and the public.

2. Executive Orders

On May 24, 1977, President Carter issued Executive Order 11990 and Executive Order 11988, which concerned the Protection of Wetlands and Floodplain Management, respectively. The orders emphasizing the continuing importance given to wetlands required that federal agencies avoid activities that have adverse impacts on wetlands, where practical, and that they avoid undertaking funding or permitting operations in the 100-year floodplain.

3. Soil Conservation Service

The Soil Conservation Service (SCS) assists in the conservation, development, and productive use of the nations's soil, water, and related resources. Technical assistance and data on resources are offered through the National Cooperative Soil Survey, Small Watershed Program, Water Bank Program, to help make long-term decisions about wetlands.

On December 23, 1985, the Food Security Act (Swampbuster) became effective. It was aimed at discouraging the conversion of wetland for agricultural purposes. The provisions of the Act, with a few exceptions, indicate that farmers converting wetland to cropland will lose eligibility for certain USDA benefits on not only the converted wetland area but on all the land farmed.

C. County Plans and Regulations Affecting Wetlands

Cecil County has no regulations affecting wetlands. The County is dependent on the Army Corps of Engineers (COE) permit process. Whenever the County's Technical Advisory Committee has information about a site proposed for development that contains non-tidal wetlands, it recommends that the applicant contact the COE for detailed information on its wetland identification and permit requirements.

The draft Cecil County Chesapeake Bay Critical Area Program contains the requirement that all development activities other than water-dependent facilities leave a 25-foot, undisturbed buffer around all palustrine non-tidal wetlands. This buffer must be expanded up to 50 feet if there are steep slopes (>15 percent), highly erodible soils ("K" value >0.35), hydric soils, or soils with hydric properties adjacent to the 25-foot buffer. In addition to this protection measure, many palustrine non-tidal wetlands are protected by a 110-foot buffer adjacent to all tributary streams, tidal waters, and tidal wetlands (expanded up to 160 feet to include adjacent sensitive soils, as above) if the 110-foot buffer is not completely forested. These proposed non-tidal wetland protection measures will apply to the first 1,000 feet of land above the mean high water line if they are approved by the Chesapeake Bay Critical Area Commission and by the County Commissioners. They are scheduled to go into effect in 1988.