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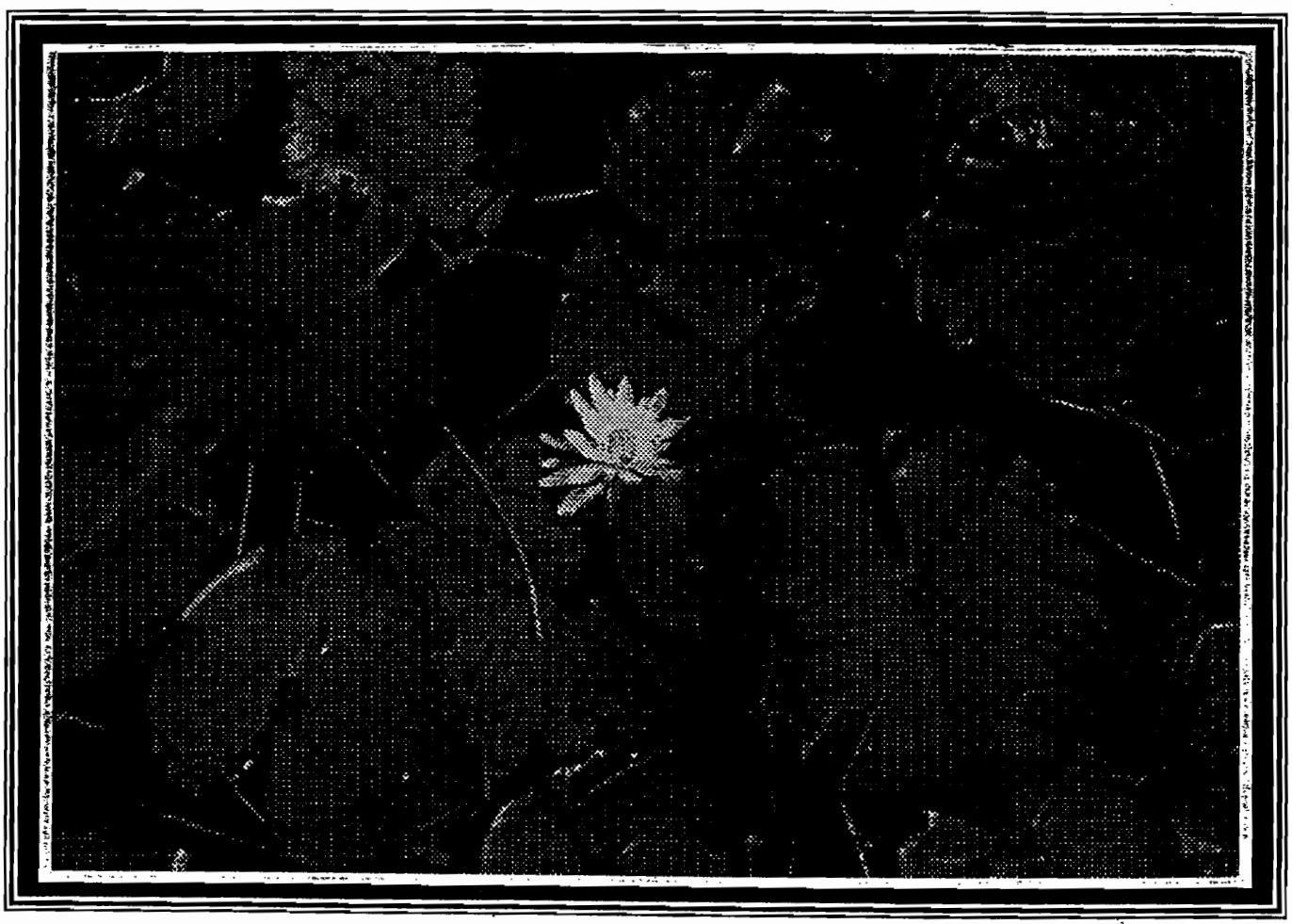
National Wetlands Inventory

December 1990

PENNSYLVANIA'S WETLANDS: CURRENT STATUS AND RECENT TRENDS



U.S. DEPARTMENT of the INTERIOR

FISH and WILDLIFE SERVICE

PENNSYLVANIA'S WETLANDS:

CURRENT STATUS AND RECENT TRENDS

by

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CHAPTER 1. INTRODUCTION

Wetlands, as the name implies, are lands that are wet for significant periods of time. They may be wet due to surface water, ground water, or usually a combination of both. They include the periodically flooded lands occurring between uplands and open water bodies such as lakes, rivers, streams, and estuaries. Many wetlands, however, may be isolated from such water bodies. These wetlands are located in depressional or sloping areas with seasonally high water tables that are surrounded by upland. Wetlands are commonly referred to by a host of terms based on their location and characteristics, such as salt marsh, tidal marsh, mudflat, wet meadow, cedar swamp, and hardwood swamp. These areas are important natural resources with numerous values, including fish and wildlife habitat, flood protection, erosion control, and water quality maintenance.

The Fish and Wildlife Service (Service) has always recognized the importance of wetlands to waterfowl, other migratory birds, and other wildlife. The Service's responsibility for protecting these habitats comes largely from international treaties concerning migratory birds and from the Fish and Wildlife Coordination Act. The Service has been active in protecting these resources through various programs. The Service's National Wildlife Refuge System was established to preserve and enhance migratory bird habitat in strategic locations across the country. More than 10 million ducks breed annually in U.S. wetlands and millions more overwinter here. The Service also reviews Federal projects and applications for Federal permits that involve wetland alteration.

Since the 1950's, the Service has been particularly concerned about wetland losses and their impact on fish and wildlife populations. In 1954, the Service conducted its first nationwide wetlands inventory which focused on important waterfowl wetlands. This survey was performed to provide information for considering fish and wildlife impacts in land-use decisions. The results of this inventory were published in a well-known Service report entitled *Wetlands of the United States*, commonly referred to as Circular 39 (Shaw and Fredine 1956).

Since this survey, wetlands have undergone many changes, both natural and human-induced. The conversion of wetlands for agriculture, residential and industrial developments, and other uses has continued. During the 1960's, the general public in many states became more aware of wetland values and concerned about wetland losses. They began to realize that wetlands provided significant public benefits besides fish and wildlife habitat, especially flood protection and water quality maintenance. Prior to this time, wetlands were regarded by most people as wastelands, whose best use could only be attained by alteration, e.g., draining for agriculture, dredging and filling for industrial and housing developments, and filling with sanitary landfill. Scientific studies demonstrating wetland values, especially for coastal marshes, were

instrumental in increasing public awareness of wetland benefits and stimulating concern for wetland protection. Consequently, several states passed laws to protect coastal wetlands, including Massachusetts (1963), Rhode Island (1965), Connecticut (1969), New Jersey (1970), Maryland (1970), Georgia (1970), New York (1972) and Delaware (1973). Four of these states subsequently adopted inland or nontidal wetland protection legislation: Massachusetts, Rhode Island, Connecticut and New York. Most of the other states in the Nation with coastal wetlands followed the lead of these northeastern states and enacted laws to protect or regulate uses of coastal wetlands. Pennsylvania passed the Dam Safety and Encroachments Act in 1980, which gave the Department of Environmental Resources regulatory authority over coastal and inland wetlands in the state. During the early 1970's, the Federal government also assumed greater responsibility for wetlands through Section 404 of the Federal Water Pollution Control Act of 1972 (later amended as the Clean Water Act of 1977) and by strengthening wetland protection under Section 10 of the Rivers and Harbors Act of 1899. Federal and state permits are now required for many types of construction in Pennsylvania's wetlands, although normal agricultural and forestry activities are exempt.

With increased public interest in wetlands and strengthened government regulation in the late 1970's, the Service considered how it could further contribute to this resource management effort, since it has prime responsibility for protection and management of the Nation's fish and wildlife and their habitats. The Service recognized the need for sound ecological information to make decisions regarding policy, planning, and management of the country's wetland resources, and established the National Wetlands Inventory Project (NWI) in 1974 to fulfill this need. The NWI aims to generate scientific information on the characteristics and extent of the Nation's wetlands. The purpose of this information is to foster wise use of U.S. wetlands and to provide data for making quick and accurate resource decisions.

Two very different kinds of information are needed: (1) detailed maps and (2) status and trends reports. First, detailed wetland maps are needed for impact assessment of site-specific projects. These maps serve a purpose similar to the U.S.D.A. Soil Conservation Service's soil survey maps, the National Oceanic and Atmospheric Administration's coastal and geodetic survey maps, and the U.S. Geological Survey's topographic maps. Detailed wetland maps are used by local, state and Federal agencies as well as by private industry and organizations for many purposes, including watershed management plans, environmental impact assessments, permit reviews, facility and corridor sitings, oil spill contingency plans, natural resource inventories, wildlife surveys, and other uses. To date, wetland maps have been prepared for 65% of the lower 48 states, 20% of Alaska, and all of Hawaii. Secondly, national estimates of the current status and recent losses and gains of wetlands are needed in order to provide improved information for reviewing the effectiveness of existing Federal programs and policies, for identifying national or regional problems, and for general public awareness. Technical and popular reports about these trends have been recently published

(Frayer, et al. 1983; Tiner 1984). The national trend study has been updated and a report detailing the findings should soon be available.

Pennsylvania Wetlands Inventory

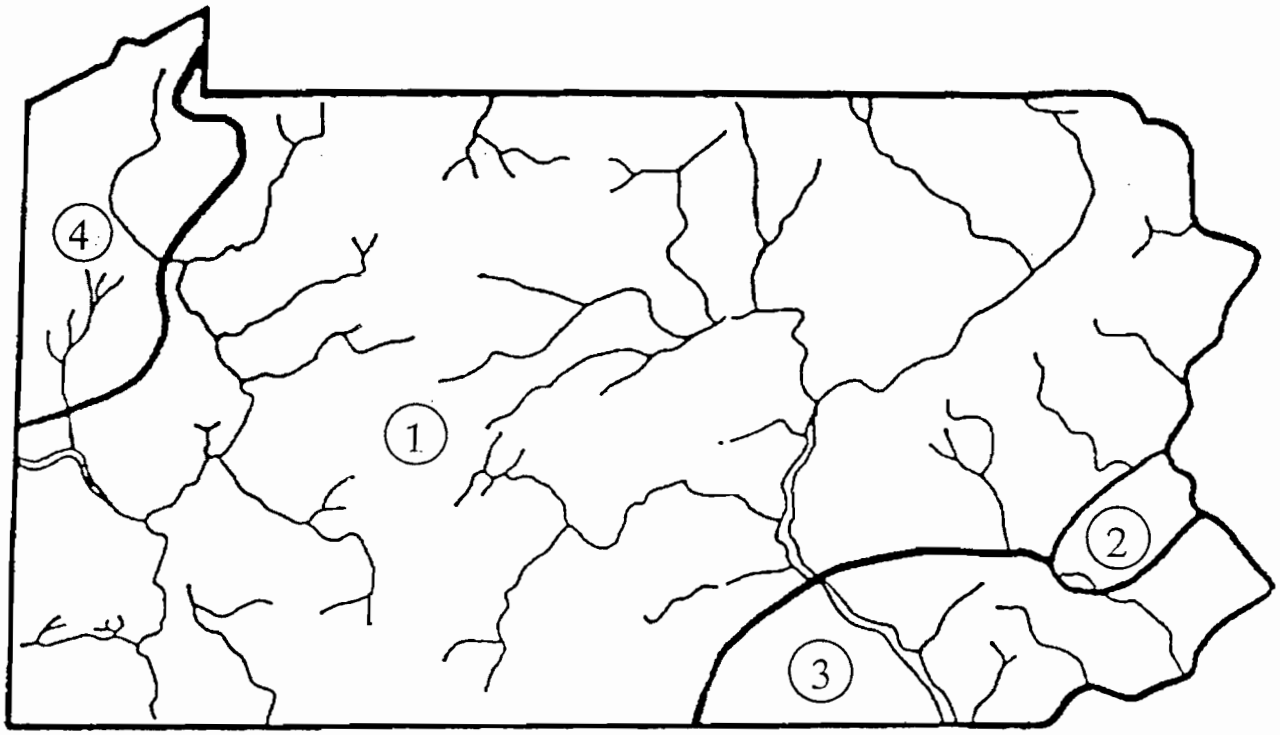
Pennsylvania's wetlands were mapped over the course of several years between the late 1970's and 1987. The Service's National Wetlands Inventory Project (NWI) has produced a consistent set of maps and other data for Pennsylvania's wetlands. This inventory identifies the current status of Pennsylvania's wetlands and serves as the base from which future changes can be determined. The inventory, therefore, provides government administrators, private industry, and others with improved information for project planning and environmental impact evaluation and for making land-use decisions about wetlands.

Besides the detailed mapping, the Service recently conducted a trend analysis of wetlands within a 5-state area including Pennsylvania (Tiner and Finn 1986). This study provided information on changes in Pennsylvania's wetlands between 1956 and 1979.

Description of the Study Area

Pennsylvania is one of the larger states in the Northeast occupying 44,966 square miles or about 28.8 million acres (Delury 1979). Four physiographic regions are represented in the state: (1) Appalachian Highlands, (2) Middle Western Upland Plain, (3) Piedmont, and (4) Adirondack-New England Highlands (Figure 1). The Appalachian Highlands dominates the state's landscape with its rolling hills, mountains, and river valleys. Major river systems in the state include the Susquehanna, the Delaware, the Allegheny, the Monongahela, and the Ohio. The Delaware River forms the state's eastern border, while the Lake Erie shoreline forms the northwestern corner of the state. The state contains 67 counties (Figure 2).

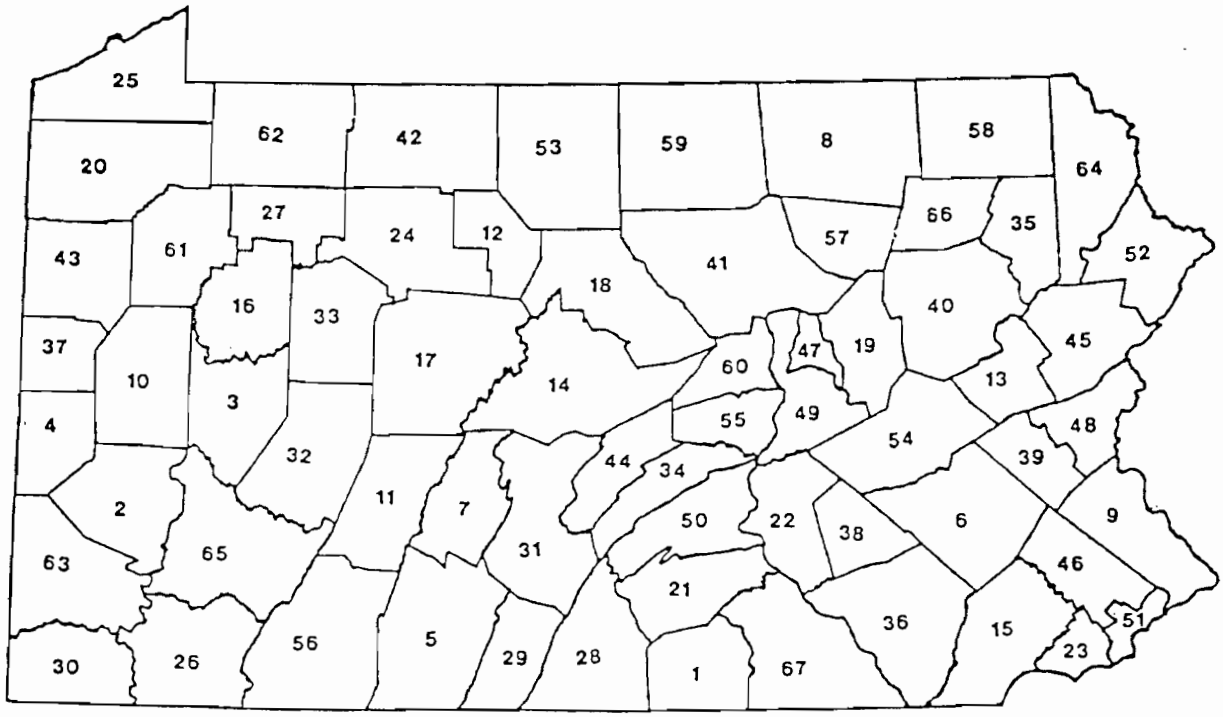
Figure 1. Physiographic regions of Pennsylvania.



LEGEND

1. Appalachian Highlands
2. Adirondack - New England Highlands
3. Atlantic Rolling Plain (Piedmont)
4. Middle Western Upland Plain

Figure 2. Pennsylvania and its counties.



1. Adams
2. Allegheny
3. Armstrong
4. Beaver
5. Bedford
6. Berks
7. Blair
8. Bradford
9. Bucks
10. Butler
11. Cambria
12. Cameron
13. Carbon
14. Centre
15. Chester
16. Clarion
17. Clearfield
18. Clinton
19. Columbia
20. Crawford
21. Cumberland
22. Dauphin
23. Delaware
24. Elk
25. Erie
26. Fayette
27. Forest
28. Franklin
29. Fulton
30. Green
31. Huntingdon
32. Indiana
33. Jefferson
34. Juniata
35. Lackawanna
36. Lancaster
37. Lawrence
38. Lebanon
39. Lehigh
40. Luzerne
41. Lycoming
42. McKean
43. Mercer
44. Mifflin
45. Monroe
46. Montgomery
47. Montour
48. Northampton
49. Northumberland
50. Perry
51. Philadelphia
52. Pike
53. Potter
54. Schuylkill
55. Snyder
56. Somerset
57. Sullivan
58. Susquehanna
59. Tioga
60. Union
61. Venango
62. Warren
63. Washington
64. Wayne
65. Westmoreland
66. Wyoming
67. York

Purpose and Organization of this Report

The purpose of this publication is to report wetland acreage summaries and wetland trends information from the Service's wetlands inventory of Pennsylvania and its recent wetland trends study. The discussion will focus on wetlands with a few references to deepwater habitats which were also inventoried. The following chapters will include discussions of wetland concept and classification (Chapter 2), inventory techniques (Chapter 3), inventory results (Chapter 4), and wetland trends (Chapter 5).

CHAPTER 2. U.S. FISH AND WILDLIFE SERVICE'S WETLAND DEFINITION AND CLASSIFICATION SYSTEM

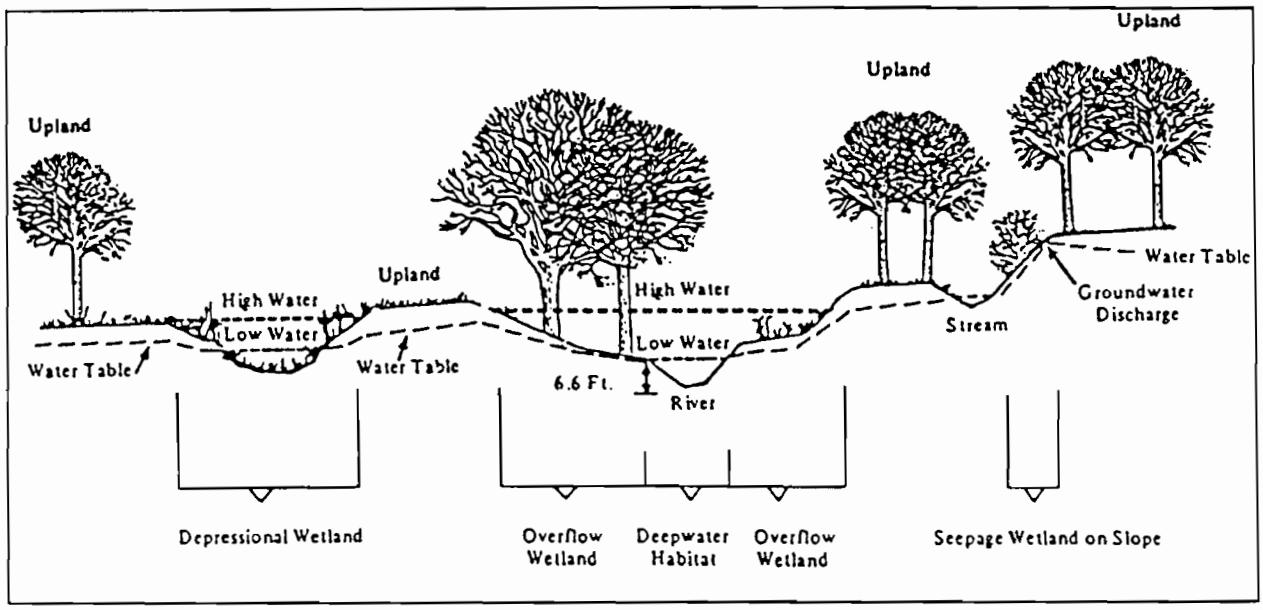
The Service's wetland classification was published in 1979 as a report entitled *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, et al. 1979). It was developed by a four-member team consisting of Dr. Lewis M. Cowardin (U.S. Fish and Wildlife Service), Virginia Carter (U.S. Geological Survey), Dr. Francis C. Golet (University of Rhode Island) and Dr. Edward T. LaRoe (National Oceanic and Atmospheric Administration), with assistance from numerous Federal and state agencies, university scientists, and other interested individuals. Four key objectives for the new system were established: (1) to develop ecologically similar habitat units, (2) to arrange these units in a system that would facilitate resource management decisions, (3) to furnish units for inventory and mapping, and (4) to provide uniformity in concept and terminology throughout the country. The classification system went through three major drafts and extensive field testing prior to its final publication. Since its publication, the Service's classification system has been widely used by Federal, state, and local agencies, university scientists, and private industry and non-profit organizations for identifying and classifying wetlands. Thus, the system appears to be moving quickly towards its goal of providing uniformity in wetland concept and terminology.

Wetland Definition

Conceptually, wetlands usually lie between the better drained, rarely flooded uplands and the permanently flooded deep waters of lakes, rivers and coastal embayments (Figure 3). Wetlands generally include the variety of marshes, bogs, swamps, shallow ponds, and bottomland forests that occur throughout the country. They usually lie in upland depressions or along rivers, lakes and coastal waters where they are subject to periodic flooding. Some wetlands, however, occur on slopes where they are associated with ground-water seepage areas or drainageways.

To accurately inventory this resource, the Service had to determine where along the natural soil moisture gradient wetland ends and upland begins. While many wetlands lie in distinct depressions or basins that are readily observable, the wetland-upland boundary is not always easy to identify. This is especially true along many floodplains, on glacial till deposits, in gently sloping terrain, and in areas of major hydrologic modification. In these areas, only a skilled wetland ecologist or other specialist can accurately identify the wetland boundary. To help ensure accurate and consistent wetland determination, an ecologically-based definition was constructed by the Service. In developing a multi-disciplinary definition of wetland, the Service first

Figure 3. Schematic diagram showing wetlands, deepwater habitats, and uplands on the landscape. Note differences in wetlands due to hydrology and topographic postion.



acknowledged that "There is no single, correct, indisputable, ecologically sound definition for wetlands, primarily because of the diversity of wetlands and because the demarcation between dry and wet environments lies along a continuum" (Cowardin, et al. 1979). After all, a wealth of wetland definitions grew out of different needs for defining wetlands among various groups or organizations, e.g., wetland regulators, waterfowl managers, hydrologists, flood control engineers, and water quality experts. The Service has not attempted to legally define wetland, since each state or Federal regulatory agency may define wetland somewhat differently to suit its administrative purposes. In Pennsylvania, the state has adopted the Federal regulatory definition from Section 404 of the Clean Water Act for its own regulatory programs. According to existing wetland laws, a wetland is whatever the law says it is (Table 1). Due to differences from state to state in defining wetlands, the Service needed to develop a definition that would allow accurate identification and delineation of the Nation's wetlands for resource management purposes.

The Service defines wetlands as follows:

> *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)*

In defining wetlands from an ecological standpoint, the Service emphasizes three key attributes of wetlands: (1) hydrology - the degree of flooding or soil saturation, (2) wetland vegetation (hydrophytes), and (3) hydric soils. All areas considered wetland must have enough water at some time during the growing season to stress plants and animals not adapted for life in water or saturated soils. Most wetlands have hydrophytes and hydric soils present, yet many are nonvegetated (e.g., tidal mud flats). The Service has prepared a list of plants occurring in the Nation's wetlands (Reed 1988) and the Soil Conservation Service has developed a national list of hydric soils (U.S.D.A. Soil Conservation Service 1987) to help identify wetlands.

Particular attention should be paid to the reference to flooding or soil saturation during the growing season in the Service's wetland definition. When soils are covered by water or saturated to the surface, free oxygen is generally not available to plant roots. During the growing season, most plant roots must have access to free oxygen for respiration and growth; flooding at

Table 1. Definitions of "wetland" according to selected Federal agencies and state statutes.

Organization (Reference)	Wetland Definition
U.S. Fish and Wildlife Service (Cowardin, et al. 1979)	"Wetlands are lands transitional betweenterrestrial 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."
U.S. Army Corps of Engineers (Federal Register, July 19, 1977), U.S. Environmental Protection Agency (Federal Register, 1980), and Pennsylvania Department of Environmental Resources (Pennsylvania Bulletin 10/39; September 27, 1980)	Wetlands are "those areas that are inundatedor saturated by surface or ground water at afrequency 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."
U.S.D.A. Soil Conservation Service (National Food Security Act Manual, 1988)	"Wetlands are defined as areas that have a predominance of hydric soils and that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions, except lands in Alaska identified as having a high potential for agricultural development and a predominance of permafrost soils."

this time would have serious implications for the growth and survival of most plants. In a wetland situation, plants must be adapted to cope with these stressful conditions. If, however, flooding only occurs in winter when the plants are dormant, there is little or no effect on them.

Wetlands typically fall within one of the following four categories: (1) areas with both hydrophytes and hydric soils (e.g., marshes, swamps and bogs), (2) areas without hydrophytes, but with hydric soils (e.g., farmed wetlands), (3) areas without soils but with hydrophytes (e.g., seaweed-covered rocky shores), and (4) periodically flooded areas without soil and without hydrophytes (e.g., gravel bars). All wetlands must be periodically saturated or covered by shallow water during the growing season, whether or not hydrophytes or hydric soils are present. Effectively drained hydric soils are not considered wetland due to a drastic change in water regime. Areas with effectively drained hydric soils are, however, good indicators of historic wetlands, which may be suitable for restoration through mitigation projects.

It is important to mention that the Service does not generally include permanently flooded deep water areas as wetland, although shallow waters are classified as wetland. Instead, these deeper water bodies are defined as deepwater habitats, since water and not air is the principal medium in which dominant organisms live. Along the coast in tidal areas, the deepwater habitat begins at the extreme spring low tide level. In nontidal freshwater areas, this habitat starts at a depth of 6.6 feet (2 m) because the shallow water areas are often vegetated with emergent wetland plants.

Wetland Classification

The following section represents a simplified overview of the Service's wetland classification system. Consequently, some of the more technical points have been omitted from this discussion. When actually classifying a wetland, the reader is advised to refer to the official classification document (Cowardin, et al. 1979) and should not rely solely on this overview.

The Service's wetland classification system is hierarchial or vertical in nature proceeding from general to specific, as noted in Figure 4. In this approach, wetlands are first defined at a rather broad level - the SYSTEM. The term SYSTEM represents "a complex of wetlands and deepwater habitats that share the influence of similar hydrologic, geomorphologic, chemical, or biological factors." Five systems are defined: Marine, Estuarine, Riverine, Lacustrine and Palustrine. The Marine System generally consists of the open ocean and its associated high-energy coastline, while the Estuarine System encompasses salt and brackish marshes, nonvegetated tidal shores, and brackish

Figure 4. Classification hierarchy of wetlands and deepwater habitats showing systems, subsystems, and classes. The Palustrine System does not include deepwater habhitats (Cowardin *et al.* 1979).

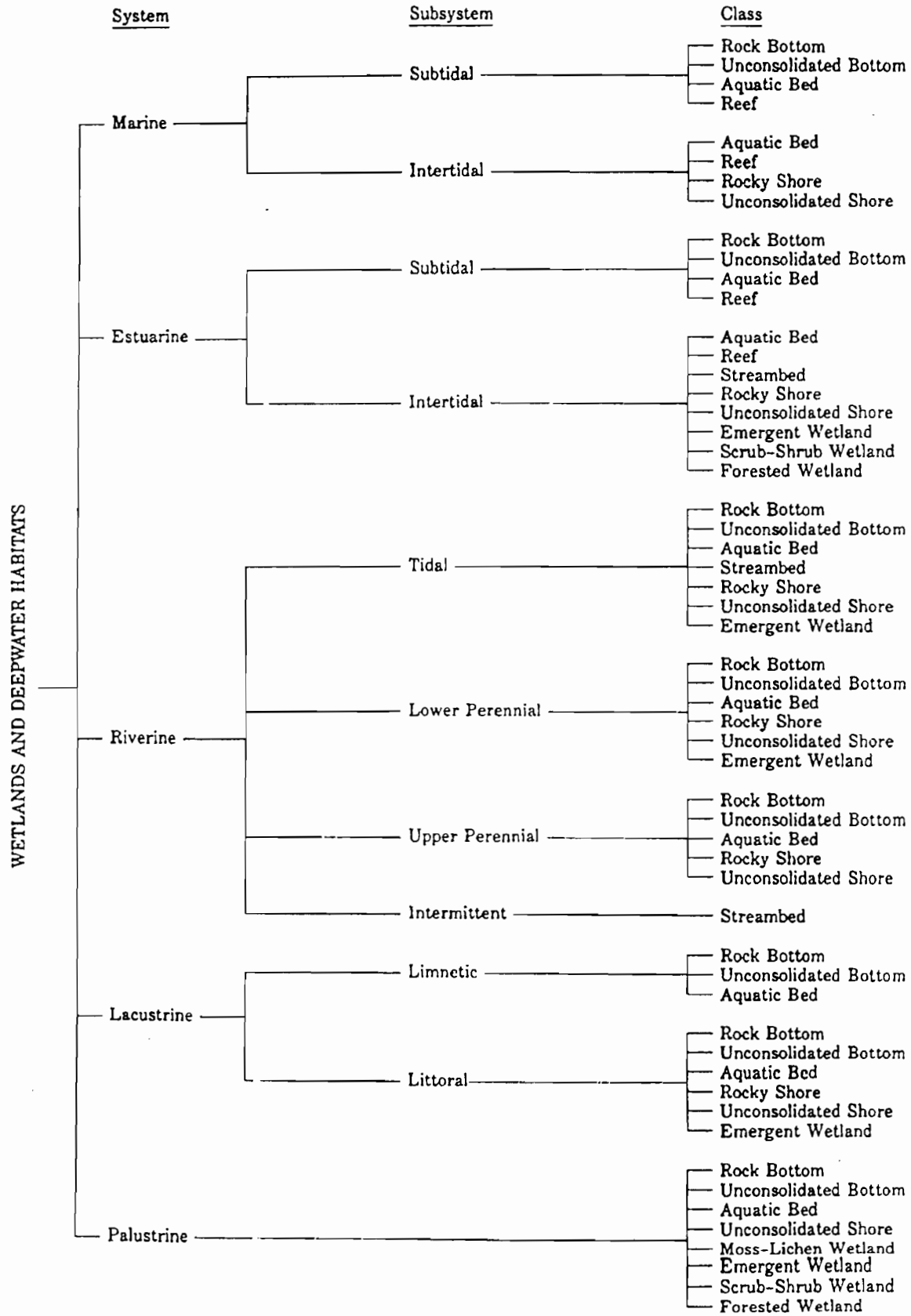
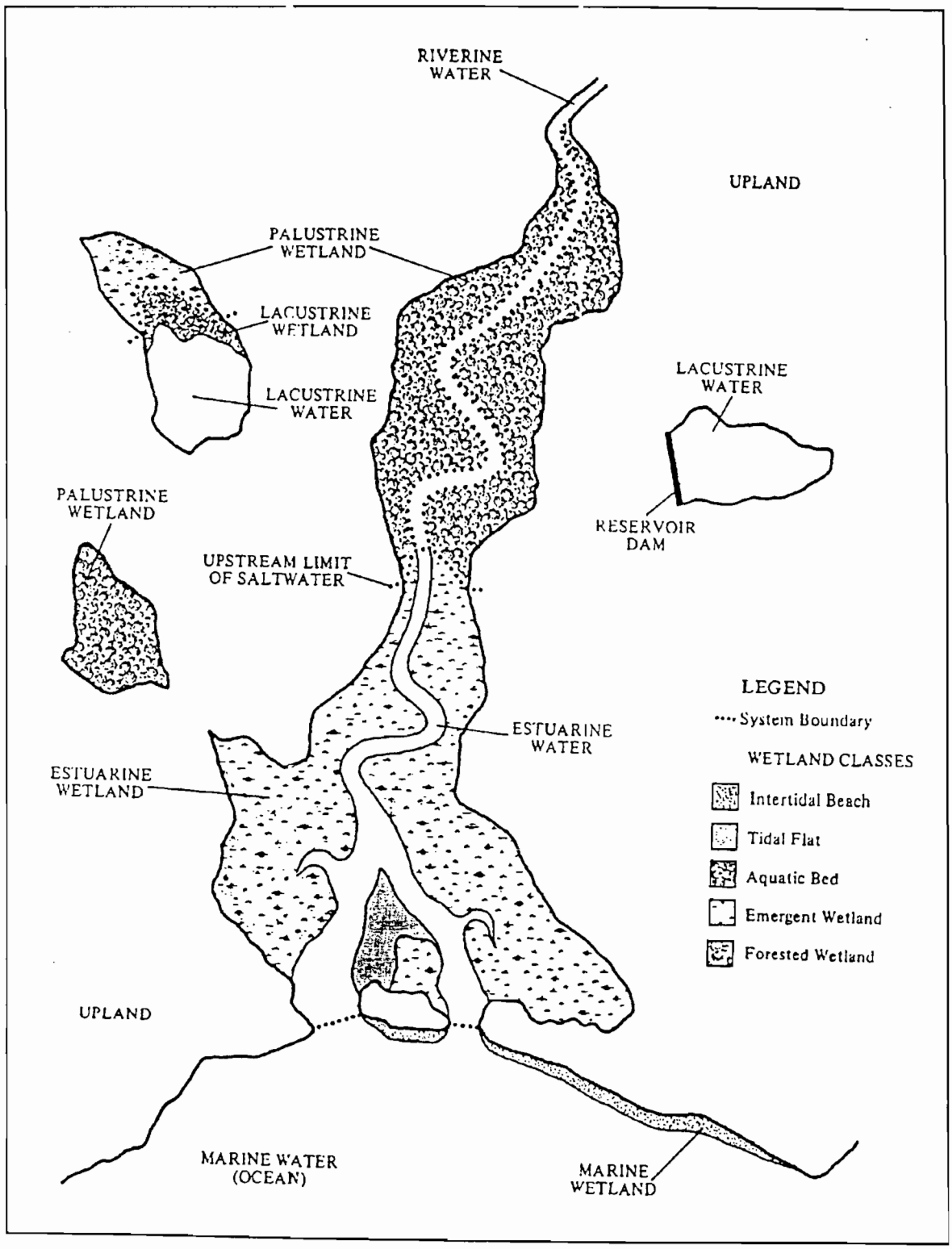


Figure 5. Diagram showing major wetland and deepwater habitat systems. Predominant wetland classes for each system are also designated. (*Note:* Tidal flat and beach classes are now considered unconsolidated shore.)



waters of coastal rivers and embayments. Freshwater wetlands and deepwater habitats fall into one of the other three systems: Riverine (rivers and streams), Lacustrine (lakes, reservoirs and large ponds), or Palustrine (e.g., marshes, bogs, swamps and small shallow ponds). Thus, at the most general level, wetlands can be defined as either Marine, Estuarine, Riverine, Lacustrine or Palustrine (Figure 5).

Each system, with the exception of the Palustrine, is further subdivided into SUBSYSTEMS. The Marine and Estuarine Systems both have the same two subsystems, which are defined by tidal water levels: (1) Subtidal - continuously submerged areas and (2) Intertidal - areas alternately flooded by tides and exposed to air. Similarly, the Lacustrine System is separated into two systems based on water depth: (1) Littoral - wetlands extending from the lake shore to a depth of 6.6 feet (2 m) below low water or to the extent of nonpersistent emergents (e.g., arrowheads, pickerelweed, or spatterdock) if they grow beyond that depth, and (2) Limnetic - deepwater habitats lying beyond the 6.6 feet (2 m) at low water. By contrast, the Riverine System is further defined by four subsystems that represent different reaches of a flowing freshwater or lotic system: (1) Tidal - water levels subject to tidal fluctuations for at least part of the growing season, (2) Lower Perennial - permanent, flowing waters with a well-developed floodplain, (3) Upper Perennial - permanent, flowing water with very little or no floodplain development, and (4) Intermittent - channel containing nontidal flowing water for only part of the year.

The next level - CLASS - describes the general appearance of the wetland or deepwater habitat in terms of the dominant vegetative life form or the nature and composition of the substrate, where vegetative cover is less than 30% (Table 2). Of the 11 classes, five refer to areas where vegetation covers 30% or more of the surface: Aquatic Bed, Moss-Lichen Wetland, Emergent Wetland, Scrub-Shrub Wetland and Forested Wetland. The remaining six classes represent areas generally lacking vegetation, where the composition of the substrate and degree of flooding distinguish classes: Rock Bottom, Unconsolidated Bottom, Reef (sedentary invertebrate colony), Streambed, Rocky Shore, and Unconsolidated Shore. Permanently flooded nonvegetated areas are classified as either Rock Bottom or Unconsolidated Bottom, while exposed areas are typed as Streambed, Rocky Shore, or Unconsolidated Shore. Invertebrate reefs are found in both permanently flooded and exposed areas.

Each class is further divided into SUBCLASSES to better define the type of substrate in nonvegetated areas (e.g., bedrock, rubble, cobble-gravel, mud, sand, and organic) or the type of dominant vegetation (e.g., persistent or nonpersistent emergents, moss, lichen, or broad-leaved deciduous, needle-leaved deciduous, broad-leaved evergreen, needle-leaved evergreen and

Table 2. Classes and subclasses of wetlands and deepwater habitats (Cowardin *et al.*, 1979).

Class	Brief Description	Subclasses
Rock Bottom	Generally permanently flooded areas with bottom substrates consisting of at least 75% stones and boulders and less than 30% vegetative cover.	Bedrock; Rubble.
Unconsolidated Bottom	Generally permanently flooded areas with bottom substrates consisting of at least 25% particles smaller than stones and less than 30% vegetative cover.	Cobble-gravel; Sand; Mud; Organic
Aquatic Bed	Generally permanently flooded areas vegetated by plants growing principally on or below the water surface line.	Algal; Aquatic Moss; Rooted Vascular; Floating Vascular
Reef	Ridge-like or mound-like structures formed by the colonization and growth of sedentary invertebrates.	Coral; Mollusk; Worm
Streambed	Channel whose bottom is completed dewatered at low water periods.	Bedrock; Rubble; Cobble-gravel; Sand; Mud; Organic; Vegetated
Rocky Shore	Wetlands characterized by bedrock, stones or boulders with areal coverage of 75% or more and with less than 30% coverage by vegetation.	Bedrock; Rubble
Unconsolidated Shore*	Wetlands having unconsolidated substrates with less than 75% coverage by stone, boulders and bedrock and less than 30% vegetative cover, except by pioneer plants. (*NOTE: This class combines two classes of the 1977 operational draft system—Beach/Bar and Flat)	Cobble-gravel; Sand; Mud; Organic; Vegetated
Moss-Lichen Wetland	Wetlands dominated by mosses or lichens where other plants have less than 30% coverage.	Moss; Lichen
Emergent Wetland	Wetlands dominated by erect, rooted, herbaceous hydrophytes.	Persistent; Nonpersistent
Scrub-Shrub Wetland	Wetlands dominated by woody vegetation less than 20 feet (6 m) tall.	Broad-leaved Deciduous; Needle-leaved Deciduous; Broad-leaved Evergreen; Needle-leaved Evergreen; Dead
Forested Wetland	Wetlands dominated by wood vegetation 20 feet (6 m) or taller.	Broad-leaved Deciduous; Needle-leaved Deciduous; Broad-leaved Evergreen; Needle-leaved Evergreen; Dead

dead woody plants). Below the subclass level, DOMINANCE TYPE can be applied to specify the predominant plant or animal in the wetland community.

To allow better description of a given wetland or deepwater habitat in regard to hydrologic, chemical and soil characteristics and to human impacts, the classification system contains four types of specific modifiers: (1) Water Regime, (2) Water Chemistry, (3) Soil, and (4) Special. These modifiers may be applied to class and lower levels of the classification hierarchy.

Water regime modifiers describe flooding or soil saturation conditions and are divided into two main groups: tidal and nontidal. Tidal water regimes are used where water level fluctuations are largely driven by oceanic tides. Tidal regimes can be subdivided into two general categories, one for salt and brackish water tidal areas and another for freshwater tidal areas. This distinction is needed because of the special importance of seasonal river overflow and ground-water inflows in freshwater tidal areas. By contrast, nontidal modifiers define conditions where surface water runoff, ground-water discharge, and/or wind effects (i.e., lake seiches) cause water level changes. Both tidal and nontidal water regime modifiers are presented and briefly defined in Table 3.

Water chemistry modifiers are divided into two categories which describe the waters salinity or hydrogen ion concentration (pH): (1) salinity modifiers and (2) pH modifiers. Like water regimes, salinity modifiers have been further subdivided into two groups: halinity modifiers for tidal areas and salinity modifiers for nontidal areas. Estuarine and marine waters are dominated by sodium chloride, which is gradually diluted by fresh water as one moves upstream in coastal rivers. On the other hand, the salinity of inland waters is dominated by four major cations (i.e., calcium, magnesium, sodium and potassium) and three major anions (i.e., carbonate, sulfate, and chloride). Interactions between precipitation, surface runoff, ground-water flow, evaporation, and sometimes plant evapotranspiration form inland salts which are most common in arid and semiarid regions of the country. Table 4 shows ranges of halinity and salinity modifiers which are a modification of the Venice System (Remane and Schlieper 1971). The other set of water chemistry modifiers are pH modifiers for identifying acid (pH<5.5), circumneutral (5.5- 7.4) and alkaline (pH>7.4) waters. Some studies have shown a good correlation between plant distribution and pH levels (Sjors 1950; Jeglum 1971). Moreover, pH can be used to distinguish between mineral-rich (e.g., fens) and mineral-poor wetlands (e.g., bogs).

The third group of modifiers - soil modifiers - are presented because the nature of the soil exerts strong influences on plant growth and reproduction as well as on the animals living in it. Two soil modifiers are given:

Table 3. Water regime modifiers, both tidal and nontidal groups (Cowardin *et al.* 1979).

Group	Type of Water	Water Regime	Definition
Tidal	Saltwater and brackish areas	Subtidal	Permanently flooded tidal waters
		Irregularly exposed	Exposed less often than daily by tides
		Regularly flooded	Daily tidal flooding and exposure to air
		Irregularly flooded	Flooded less often than daily and typically exposed to air
	Freshwater	Permanently flooded-tidal	Permanently flooded by tides and river or exposed irregularly by tides
		Semipermanently flooded-tidal	Flooded for most of the growing season by river overflow but with tidal fluctuation in water levels
		Regularly flooded	Daily tidal flooding and exposure to air
		Seasonally flooded-tidal	Flooded irregularly by tides and seasonally by river overflow
		Temporarily flooded-tidal	Flooded irregularly by tides and for brief periods during growing season by river overflow
Nontidal	Inland freshwater and saline areas	Permanently flooded	Flooded throughout the year in all years
		Intermittently exposed	Flooded year-round except during extreme droughts
		Semipermanently flooded	Flooded throughout the growing season in most years
		Seasonally flooded	Flooded for extended periods in growing season, but surface water is usually absent by end of growing season
		Saturated	Surface water is seldom present, but substrate is saturated to the surface for most of the season
		Temporarily flooded	Flooded for only brief periods during growing season, with water table usually well below the soil surface for most of the season
		Intermittently flooded	Substrate is usually exposed and only flooded for variable periods without detectable seasonal periodicity (Not always wetland: may be upland in some situations)
		Artificially flooded	Duration and amount of flooding is controlled by means of pumps or siphons in combination with dikes or dams

Table 4. Salinity modifiers for coastal and inland areas (Cowardin *et al.*, 1979).

Coastal Modifiers[1]	Inland Modifiers[2]	Salinity (parts per thousand)	Approximate specific conductance (μMhos at 25°C)
Hyperhaline	Hypersaline	>40	>60,000
Euhaline	Eusaline	30.0-40	45,000-60,000
Mixohaline (Brackish)	Mixosaline [3]	0.5-30	800-45,000
Polyhaline	Polysaline	18.0-30	30,000-45,000
Mesohaline	Mesosaline	5.0-18	8,000-30,000
Oligohaline	Oligosaline	0.5-5	800- 8,000
Fresh	Fresh	<0.5	<800

1 - Coastal modifiers are employed in the Marine and Estuarine Systems.

2 - Inland modifiers are employed in the Riverine, Lacustrine and Palustrine Systems.

3 - The term "brackish" should not be used for inland wetlands or deepwater habitats.

(1) mineral and (2) organic. In general, if a soil has 20% or more organic matter by weight in the upper 16 inches, it is considered an organic soil, whereas if it has less than this amount, it is a mineral soil. For specific definitions, please refer to Appendix D of the Service's classification system (Cowardin et al. 1979) or to *Soil Taxonomy* (Soil Survey Staff 1975).

The final set of modifiers - special modifiers - were established to describe the activities of people or beaver affecting wetlands and deepwater habitats. These modifiers include: excavated, impounded (i.e., to obstruct outflow of water), diked (i.e., to obstruct inflow of water), partly drained, farmed, and artificial (i.e., materials deposited to create or modify a wetland or deepwater habitat).

CHAPTER 3. NATIONAL WETLANDS INVENTORY TECHNIQUES

The National Wetlands Inventory Project (NWI) utilizes remote sensing techniques with supplemental field investigations for wetland identification and mapping. High-altitude aerial photography ranging in scale from 1:58,000 to 1:80,000 serves as the primary remote imagery source. Once suitable high-altitude photography is obtained, there are seven major steps in preparing wetland maps: (1) field investigations, (2) photo interpretation, (3) review of existing wetland information, (4) quality assurance, (5) draft map production, (6) interagency review of draft maps, and (7) final map production. Steps 1, 2 and 3 encompass the basic data collection phase of the inventory. Sometime after publication of final wetland maps for Pennsylvania, the Service began collecting acreage data on the state's wetlands and deepwater habitats. The procedures used to inventory Pennsylvania's wetlands are discussed below.

Mapping Photography

For mapping Pennsylvania's wetlands, the Service used 1:80,000 black and white photography and 1:58,000 color infrared photography (Table 5). For most of the state, early 1980's photos were used, whereas western Pennsylvania was largely covered by mid-1970's photography. The western region was done prior to the availability of the 1980's color infrared photography, hence the use of black and white photos. This was also true for the Pennsylvania-New Jersey border. Subsequently, through funding from the State's Office of Coastal Zone Management, 1989 aerial photos were used to update the inventory in the Lake Erie and Delaware River coastal zones.

Photo Interpretation and Collateral Data

Photo interpretation was performed by the Department of Forestry and Wildlife Management, University of Massachusetts, Amherst. All photo interpretation was done in stereo using mirror stereoscopes. Standard photo interpretation conventions developed by the NWI Project were followed. Due to national policy, farmed wetlands were not mapped. Information on farmed wetlands may be available from the State office of the U.S.D.A. Soil Conservation Service. Collateral data sources used to aid in wetland detection and classification included: (1) U.S. Geological Survey topographic maps; and (2) U.S.D.A. Soil Conservation Service soil surveys; (3) U.S. Department of Commerce coastal and geodetic survey maps.

Wetland photo interpretation, although extremely efficient and accurate for inventorying wetlands, does have certain limitations (Tiner 1990). Consequently, some problems arose during the course of the survey. Additional field work or use of collateral data was necessary to help overcome these

Table 5. Summary of aerial photography used for the National Wetlands Inventory in Pennsylvania. CIR - color infrared; BW - black and white panchromatic.

1:100,000 Map Name	Photography Used			Number of Quads
	Scale	Emulsion	Dates	
Baltimore NE	1:58K	CIR	4/81, 3/82	24
Baltimore NW	1:58K	CIR	3/80, 4/81, 4/82	24
Buffalo SW	1:80K	BW	5/75, 4/77, 6/77	4*
Canton NE	1:58K	CIR	4/82, 5/82, 11/82, 5/83	20
Canton SE	1:58K	CIR	4/82, 11/82, 3/85	20
Clarksburg NE	1:58K	CIR	4/82, 11/82, 3/85	16
Cleveland NE	1:80K	BW	4/77, 6/77	20
Cleveland SE	1:80K	BW	4/77, 6/77	20
Cumberland NE	1:58K	CIR	4/82	18
	1:80K	BW	4/77, 5/77	6
Cumberland NW	1:58K	CIR	4/82	12
	1:80K	BW	4/76, 4/77	12
Erie	1:80K	BW	5/75	5*
Harrisburg NE	1:58K	CIR	4/83, 3/84	32
Harrisburg NW	1:58K	CIR	4/83, 5/83, 3/84	29
	1:80K	BW	5/77	3
Harrisburg NE	1:58K	CIR	4/83, 3/84	32
Harrisburg SW	1:58K	CIR	4/83, 5/83, 3/84	28
	1:80K	BW	3/80	4
Newark NW	1:58K	CIR	4/81, 5/81	32
Newark SE	1:80K	BW	3/72, 11/75	6*
	1:58K	CIR	3/83, 3/84	1
Newark SW	1:58K	CIR	4/81, 5/81, 4/82	32
Pittsburgh NE	1:58K	CIR	5/81	32
Pittsburgh NW	1:80K	BW	4/77, 5/77	32
Pittsburgh SE	1:80K	BW	4/77, 5/77	32
Pittsburgh SW	1:80K	BW	4/77, 5/77	32
Scranton NW	1:80K	BW	10/76	22
	1:58K	CIR	4/81, 5/81	10
Scranton SE	1:80K	BW	3/72, 4/72, 4/81	9
Scranton SW	1:80K	BW	10/76, 11/76	19
	1:58K	CIR	4/81, 5/81	13
Warren NE	1:80K	BW	4/77	32
Warren NW	1:80K	BW	4/77, 4/77, 6/77	32
Warren SE	1:58K	CIR	4/83, 5/83	32
Warren SW	1:80K	BW	4/77, 5/77, 6/77	32
Williamsport NE	1:80K	BW	10/76, 4/77	20
	1:58K	CIR	5/81, 4/82	12
Williamsport NW	1:58K	CIR	5/83	32
Williamsport SW	1:80K	BW	10/76, 4/77, 5/77	26
Williamsport SW	1:58K	CIR	5/83	32
Wilmington NW	1:58K	CIR	4/81, 3/81, 4/82	13
	1:80K	BW	3/72	4*

**Updated with spring 1989 photographs for the Delaware River and Lake Erie Coastal Zones and 1985 photos to update the rest of the quads containing the Lake Erie Coastal Zone.*

constraints. These problems and their resolution are discussed below.

1. Identification of freshwater aquatic beds and nonpersistent emergent wetlands. Due to the primary use of spring photography, these wetland types were not interpretable. They were generally classified as open water, unless vegetation was observed during field investigations.

2. Forested wetlands on glacial till. Some of these wetlands are difficult to identify in the field, let alone through air photo interpretation. Consequently, some of these wetlands were not detected and do not appear on the NWI maps.

3. Identification of forested wetlands in western Pennsylvania. Where leaf-on black and white photography (e.g., 5/77 and 6/77) was used, forested wetlands were extremely difficult to delineate. Use of soil maps and considering topographic relief helped to identify the general limits of these areas. The location of forested wetlands in western Pennsylvania should be considered very conservative, as many such areas probably do not appear on the maps. It is recommended that this region be updated in the near future to provide more accurate results.

4. Inclusion of small upland areas within delineated wetlands. Small islands of higher elevation and better drained uplands naturally exist within many wetlands. Due to the minimum size of mapping units, small upland areas may be included within designated wetlands. Field inspections and/or use of larger-scale photography may be used to refine wetland boundaries when necessary.

Field Investigations

Ground truthing surveys were conducted to collect information on plant communities of various wetlands and to gain confidence in detecting and classifying wetlands from aerial photography. Detailed notes were taken at hundreds of sites throughout the state. In addition to these sites, observations were made at countless other wetlands for classification purposes and notations were recorded on appropriate topographic maps. Approximately three months were spent in the field examining Pennsylvania's wetlands.

Draft Map Production

Upon completion of photo interpretation, two levels of quality assurance were performed: (1) regional quality control and (2) national consistency quality assurance. Regional review of each interpreted photo was accomplished by Regional Office's NWI staff to ensure identification of all wetlands and proper classification within the constraints of photo interpretation. National quality control by the NWI Group at St. Petersburg, Florida entailed spot-checking of photos to ensure that national standards had been successfully followed. Once approved by quality assurance, draft large-scale (1:24,000) wetland maps were produced by the Group's support service contractor using Bausch and Lomb zoom transfer scopes.

Draft Map Review

Draft maps were sent to the following agencies for review and comment: (1) U.S. Fish and Wildlife Service, State College Field Office; (2) U.S. Army Corps of Engineers, Baltimore, Buffalo, Philadelphia, and Pittsburgh Districts; (3) U.S.D.A. Soil Conservation Service; (4) U.S. Environmental Protection Agency (Region III); (5) National Marine Fisheries Service; and (6) Pennsylvania Department of Environmental Resources.

In addition, the Regional Office's NWI staff conducted field checks and a thorough examination of draft maps to ensure proper placement of wetland polygons and labels as well as accurate classification.

Final Map Production

All comments received were evaluated and incorporated into the final maps, as appropriate. Final maps were published for the entire state by 1987.

Wetland Acreage Compilation

From 1986 to 1989, the Service collected wetland acreage information from NWI maps for Pennsylvania. Area measurements were recorded using Numonics planimeters. Acreages of individual wetland polygons were determined. Acreage data on wetland and deepwater habitats for each county were compiled.

CHAPTER 4. NATIONAL WETLANDS INVENTORY RESULTS

National Wetlands Inventory Maps

A total of 868 1:24,000-scale wetland maps were produced. These maps identify the size, shape and type of wetlands and deepwater habitats in accordance with NWI specifications. The minimum mapping unit for wetlands ranges between approximately 1-3 acres where 1:58,000 color infrared photos were used and from 3-5 acres where the 1:80,000 black and white photography was used. A recent evaluation of NWI maps in Massachusetts determined that these maps had accuracies exceeding 95% (Swartwout, et al. 1982). This high accuracy is possible because the inventory technique involves a combination of photo interpretation, field studies, use of existing information and interagency review of draft maps. Final maps have been available since 1980 for the western part of the state and the Pennsylvania-New Jersey border; the rest of the state had final maps by 1987. Copies of NWI maps for Pennsylvania can be ordered from the Cartographic Information Research Center, 102-D Hasbrouck Lab, University of Massachusetts, Amherst, MA 01003 (Phone Number: (413) 545-0359).

Wetland and Deepwater Habitat Acreage Summaries

State Totals

According to this survey, Pennsylvania possessed 403,924 acres of wetlands and 412,905 acres of deepwater habitats, excluding farmed wetlands, and smaller rivers and streams that either appeared as linear features on wetland maps or wetlands that were not identified due to their small size or other limitations of the aerial photos. About 1.4% of the state's land surface is represented by wetlands.

About 97% of the state's wetlands fall within the palustrine system (Table 6). Lacustrine wetlands, mainly composed of the shallow water zone (less than 6.6 feet in depth) of Lake Erie, represented about two percent of the state total, while riverine wetlands made up the remaining one percent.

Nearly 393,000 acres of palustrine wetlands were mapped by the National Wetlands Inventory Project. Thirty-six percent of Pennsylvania's wetlands were deciduous forested wetlands, excluding mixed forested-shrub and forested-emergent wetlands. In contrast, evergreen forested wetlands only accounted for 8% of the state's wetlands. Small ponds comprised about 15% of the total. Emergent wetlands (i.e., marshes and wet meadows) and shrub swamps were nearly equally abundant, making 13% and 12% of the state's wetlands, respectively.

Table 6. State wetland acreage totals for Pennsylvania based on National Wetlands Inventory mapping.

Palustrine Wetlands	
Emergent	*52,338 a*
Deciduous Forested	*146,715 a*
Evergreen Forested	*31,204 a*
Deciduous Scrub-Shrub	*47,539 a*
Evergreen Scrub-Shrub	*1,849 a*
Mixed Deciduous Shrub-Emergent	*25,000 a*
Open Water	*61,841 a*
Other Mixed Types	*26,242 a*
Total Palustrine Wetlands	*392,728 a*
Lacustrine Wetlands	*8,521 a*
Riverine Wetlands	*2,675 a*
PENNSYLVANIA WETLANDS	*403,924 a*

County Totals

Wetlands were most prevalent in Crawford, Erie, Monroe, Pike, Wayne, Luzerne, and Mercer counties (Table 7). These counties contained 40% of the state's wetlands. Wetlands were also common in Bradford, McKean, Warren, Susquehanna, Bucks, and Lackawanna counties.

Pike and Monroe Counties had the highest percentages of land area covered by wetlands, with 6.7% and 6.4%, respectively (Table 7). Other counties with 2.0% or more of their land surface represented by wetlands included: Crawford (5.2%), Erie (4.8%), Wayne (4.4%), Mercer (3.7%), Lackawanna (3.2%), Luzerne (3.0%), Bucks (2.6%), Wyoming (2.5%), Susquehanna (2.3%), McKean (2.2%), Sullivan (2.2%), Warren (2.2%), Adams (2.1%), Bradford (2.0%), and Lawrence (2.0%).

Deepwater habitats in Pennsylvania totaled 412,905 acres. As expected due to Lake Erie and many reservoirs and natural lakes, lacustrine waters predominated with 242,433 acres, representing 58.7% of the total. Freshwater rivers and streams made up 41.2% or 170,207 acres. Only 265 acres of estuarine waters were inventoried; these areas represent the upper limit of brackish water penetration in the Delaware River. Table 8 summarizes deepwater habitat acreages for each county.

Due to the presence of Lake Erie, Erie County had the most lacustrine deepwater habitat acreage (103,677). Other counties with more than 5,000 acres of lacustrine waters included Lancaster (15,258 acres), Crawford (13,811), Wagner (10,647), Pike (9,515), Huntington (7,763), Warren (6,536), and Mercer (5,339).

Dauphin County had the highest acreage of riverine deepwater habitats, with 19,972 acres. Northumberland County had 11,540 acres, while other counties with more than 5,000 acres of rivers and streams included Allegheny (9,564 acres), Lancaster (6,618), Lycoming (5,661), Venango (5,462), and Armstrong (5,425).

Wetland and deepwater habitat acreage data for each county (in alphabetical order) are presented on the following one page summaries. (Note: Data presented represents polygon acreages from NWI maps and does not include linear features, e.g., narrow streams, or farmed wetlands.)

Table 7. County wetland acreage totals for Pennsylvania based on NWI mapping.

County	Wetland Acreage	% of Land Area Covered by Wetland	County	Wetland Acreage	% of Land Area Covered by Wetland
Adams	6,948	2.1	Lackawanna	9,319	3.2
Allegheny	1,001	0.2	Lancaster	4,706	0.8
Armstrong	1,121	0.3	Lawrence	4,637	2.0
Beaver	2,009	0.7	Lebanon	2,324	1.0
Bedford	1,189	0.2	Lehigh	1,534	0.7
Berks	5,847	1.1	Luzerne	16,925	3.0
Blair	900	0.3	Lycoming	4,645	0.6
Bradford	14,518	2.0	McKean	13,668	2.2
Bucks	10,144	2.6	Mercer	15,656	3.7
Butler	6,065	1.2	Mifflin	1,019	0.4
Cambria	2,129	0.5	Monroe	24,872	6.4
Cameron	998	0.4	Montgomery	3,493	1.1
Carbon	3,022	1.2	Montour	356	0.4
Centre	4,416	0.6	Northampton	2,943	1.2
Chester	7,676	1.6	Northumberland	2,038	0.7
Clarion	1,118	0.3	Perry	2,696	0.8
Clearfield	5,796	0.8	Philadelphia	747	0.9
Clinton	2,273	0.4	Pike	23,336	6.7
Columbia	2,001	0.6	Potter	4,173	0.6
Crawford	33,792	5.2	Schuylkill	3,831	0.8
Cumberland	3,489	1.0	Snyder	1,969	0.9
Dauphin	2,136	0.6	Somerset	6,211	0.9
Delaware	1,582	1.3	Sullivan	6,602	2.2
Elk	4,493	0.9	Susquehanna	12,134	2.3
Erie	24,960	4.8	Tioga	8,058	1.1
Fayette	2,293	0.4	Union	2,025	1.0
Forest	2,015	0.8	Venango	3,172	0.7
Franklin	5,424	1.1	Warren	12,469	2.2
Fulton	982	0.4	Washington	2,550	0.5
Green	894	0.2	Wayne	20,829	4.4
Huntingdon	2,161	0.4	Westmoreland	3,330	0.5
Indiana	3,249	0.4	Wyoming	6,408	2.5
Jefferson	2,780	0.7	York	3,718	0.6
Juniata	2,110	0.9			

Table 8. County deepwater habitat acreage totals for Pennsylvania based on NWI mapping.

County	Lacustrine Acreage	Riverine Acreage	Total Deepwater Habitat Acreage
Adams	756	459	1,215
Allegheny	84	9,564	9,648
Armstrong	1,328	5,425	6,753
Beaver	705	4,915	5,620
Bedford	835	1,260	2,095
Berks	2,711	1,619	4,330
Blair	357	249	606
Bradford	150	64,572	6,078
Bucks	3,299	4,676	7,975
Butler	3,453	387	3,840
Cambria	2,538	615	3,153
Cameron	139	1,032	1,171
Carbon	2,794	925	3,719
Centre	2,075	1,508	3,583
Chester	1,229	840	2,069
Clarion	224	4,405	4,629
Clearfield	1,359	3,246	4,605
Clinton	265	4,845	5,110
Columbia	240	2,588	2,828
Crawford	13,811	1,016	14,827
Cumberland	78	1,549	1,627
Dauphin	916	19,972	20,888
Delaware*	708	3,365	4,338
Elk	1,552	1,061	2,613
Erie**	103,677	296	103,973
Fayette	1,480	3,932	5,412
Forest	435	2,104	2,539
Franklin	125	687	812
Fulton	87	61	148
Greene	113	2,012	2,125
Huntingdon	7,763	1,889	9,652
Indiana	2,072	1,247	3,319
Jefferson	182	1,470	1,652
Juniata	--	1,861	1,861
Lackawanna	3,268	340	3,680
Lancaster	15,258	6,618	21,876
Lawrence	372	1,395	1,767
Lebanon	243	590	833
Lehigh	217	767	984
Luzerne	4,524	4,972	9,496
Lycoming	894	5,661	6,555
McKean	1,561	489	2,050
Mercer	5,339	446	5,785
Mifflin	82	1,801	1,883
Monroe	3,508	843	4,351
Montgomery	954	1,809	2,763
Montour	199	683	882
Northampton	468	1,729	2,917
Northumberland	135	11,540	11,675
Perry	86	2,023	2,109
Philadelphia	307	4,696	5,003

Table 8 (continued)

County	Lacustrine Acreage	Riverine Acreage	Total Deepwater Habitat Acreage
Pike	9,515	2,029	11,544
Potter	107	186	293
Schuylkill	2,049	697	2,746
Snyder	498	494	992
Somerset	3,797	1,459	5,256
Sullivan	867	342	1,209
Susquehanna	2,829	870	3,699
Tioga	2,039	1,699	3,738
Union	64	570	634
Venango	290	2,462	5,752
Warren	6,536	3,036	9,572
Washington	691	2,003	2,694
Wayne	10,647	1,233	11,880
Westmoreland	2,471	3,131	5,602
Wyoming	826	3,615	4,441
York	2,896	1,145	4,041

**Includes 265 acres of estuarine waters of the Delaware River.*
***Includes the portion of Lake Erie shown on NWI maps.*

ADAMS COUNTY

Adams County had 6,948 acres of wetlands. About 2.1% of the county is represented by wetlands. Wetland acreage totals by major type are outlined below.

Palustrine Wetlands	
Emergent	*1,082 a*
Deciduous Forested	*3,754 a*
Evergreen Forested	*201 a*
Mixed Deciduous Forested-Shrub	*89 a*
Mixed Deciduous Forested-Emergent	*72 a*
Deciduous Scrub-Shrub	*104 a*
Mixed Deciduous Shrub-Emergent	*262 a*
Open Water	*1,323 a*
Total Palustrine Wetlands	*6,887 a*
Lacustrine Wetlands	*55 a*
Riverine Wetlands	*6 a*
ADAMS COUNTY WETLANDS	*6,948 a*

Adams County had 1,215 acres of deepwater habitats: 756 acres of lacustrine waters and 459 acres of rivers and streams.

ALLEGHENY COUNTY

Allegeny County had 1,001 acres of wetlands, representing only 0.2% of the county's land area. Wetland acreage totals by major type are listed below.

Palustrine Wetlands	
Emergent	*150 a*
Deciduous Forested	*308 a*
Mixed Deciduous Forested-Shrub	*18 a*
Deciduous Scrub-Shrub	*39 a*
Mixed Deciduous Shrub-Emergent	*10 a*
Open Water	*476 a*
ALLEGHENY COUNTY WETLANDS	*1,001 a*

A total of 9,648 acres of deepwater habitats was mapped in the county: 9,564 acres of rivers and streams and 84 acres of lacustrine waters

ARMSTRONG COUNTY

Armstrong County had 1,121 acres of wetlands. This represents only 0.3% of the county. Wetland acreage totals by major type are listed below.

Palustrine Wetlands	
Emergent	*35 a*
Deciduous Forested	*446 a*
Mixed Deciduous Forested-Shrub	*121 a*
Deciduous Scrub-Shrub	*65 a*
Mixed Deciduous Shrub-Emergent	*24 a*
Open Water	*429 a*
Total Palustrine Wetlands	*1,120 a*
Riverine Wetlands	*1 a*
ARMSTRONG COUNTY WETLANDS	***1,121 a***

Armstrong County had 6,753 acres of deepwater habitats: 5,425 acres of rivers and streams and 1,328 acres of lacustrine waters.

BEAVER COUNTY

Beaver County had 2,009 acres of wetlands, which represents 0.7% of the county. Wetland acreage totals by major type are outlined below.

Palustrine Wetlands	
Emergent	*448 a*
Deciduous Forested	*786 a*
Mixed Deciduous Forested-Shrub	*49 a*
Mixed Deciduous Forested-Emergent	*8 a*
Deciduous Scrub-Shrub	*199 a*
Mixed Deciduous Shrub Emergent	*41 a*
Open Water	*450 a*
Total Palustrine Wetlands	*1,981 a*
Lacustrine Wetlands	*25 a*
Riverine Wetlands	*3 a*
BEAVER COUNTY WETLANDS	*2,009 a*

Beaver County had 5,620 acres of deepwater habitats: 4,915 acres of rivers and streams and 705 acres of lacustrine waters.

BEDFORD COUNTY

Bedford County had 1,189 acres of wetlands. This amounts to only 0.2% of the county's land area. Wetland acreage totals by major type are listed below.

Palustrine Wetlands	
Emergent	*215 a*
Deciduous Forested	*274 a*
Evergreen Forested	*15 a*
Mixed Deciduous Forested-Shrub	*28 a*
Deciduous Scrub-Shrub	*84 a*
Mixed Deciduous Shrub-Emergent	*75 a*
Open Water	*490 a*
Total Palustrine Wetlands	*1,181 a*
Lacustrine Wetlands	*4 a*
Riverine Wetlands	*4 a*
BEDFORD COUNTY WETLANDS	***1,189 a***

Bedford County had 2,095 acres of deepwater habitats: 1,260 acresof rivers and streams and 835 acres of lacustrine waters.

BERKS COUNTY

Berks County had 5,847 acres of wetlands, occupying 1.1% of the county. Wetland acreage totals by major type are summarized below.

Palustrine Wetlands	
Emergent	*1,314 a*
Deciduous Forested	*2,368 a*
Evergreen Forested	*32 a*
Mixed Deciduous Forested-Shrub	*224 a*
Mixed Deciduous Forested-Emergent	*51 a*
Deciduous Scrub-Shrub	*249 a*
Mixed Deciduous Shrub-Emergent	*252 a*
Open Water	*1,313 a*
Total Palustrine Wetlands	*5,803 a*
Lacustrine Wetlands	*44 a*
BERKS COUNTY WETLANDS	*5,847 a*

Berks County contained 4,330 acres of deepwater habitats: 2,711 acres of lacustrine waters and 1,619 acres of rivers and streams.

BLAIR COUNTY

Blair County had 900 acres of wetlands. This figure represents only 0.3% of the county. Wetland acreage totals by major type are outlined below.

Palustrine Wetlands	
Emergent	*143 a*
Deciduous Forested	*245 a*
Evergreen Forested	*18 a*
Mixed Deciduous Forested-Shrub	*16 a*
Deciduous Scrub-Shrub	*84 a*
Mixed Deciduous Shrub-Emergent	*69 a*
Open Water	*325 a*
BLAIR COUNTY WETLANDS	*900 a*

Only 606 acres of deepwater habitats were inventoried in Blair County: 357 acres of lacustrine waters and 249 acres of rivers and streams.

BRADFORD COUNTY

Bradford County had 14,518 acres of wetlands. About 2.0% of the county is wetland. Wetland acreage totals by major types are listed below.

Palustrine Wetlands	
Aquatic Bed	*38 a*
Emergent	*3,370 a*
Deciduous Forested	*2,703 a*
Evergreen Forested	*662 a*
Mixed Deciduous Forested-Shrub	*756 a*
Mixed Deciduous Forested-Emergent	*212 a*
Deciduous Scrub-Shrub	*1,714 a*
Evergreen Scrub-Shrub	*83 a*
Mixed Deciduous Shrub-Emergent	*1,190 a*
Open Water	*3,358 a*
Total Palustrine Wetlands	*14,086 a*
Lacustrine Wetlands	*19 a*
Riverine Wetlands	*413 a*
BRADFORD COUNTY WETLANDS	*14,518 a*

Bradford County possessed 6,078 acres of deepwater habitats: 4,572 acres of rivers and streams and 1,506 acres of lacustrine waters.

BUCKS COUNTY

Bucks County had 10,144 acres of wetlands. This represents 2.6% of the county. Wetland acreage totals by major type are listed below.

Palustrine Wetlands	
Aquatic Bed	*11 a*
Emergent	*966 a*
Deciduous Forested	*6,727 a*
Deciduous Scrub-Shrub	*812 a*
Open Water	*1,405 a*
Total Palustrine Wetlands	*9,921 a*
Riverine Wetlands	*223 a*
BUCKS COUNTY WETLANDS	*10,144 a*

Bucks County had 7,975 Acres of deepwater habitats: 4,676 acres of rivers and streams and 3,299 acres of lacustrine waters.

BUTLER COUNTY

Butler County had 6,065 acres of wetlands. This acreage represents 1.2% of the county's land area. Wetland acreage totals by major type are summarized below.

Palustrine Wetlands	
Aquatic Bed	*37 a*
Emergent	*631 a*
Deciduous Forested	*2,572 a*
Evergreen Forested	*13 a*
Mixed Deciduous Forested-Shrub	*346 a*
Mixed Deciduous Forested-Emergent	*8 a*
Deciduous Scrub-Shrub	*587 a*
Mixed Deciduous Shrub-Emergent	*306 a*
Open Water	*1,565 a*
BUTLER COUNTY WETLANDS	*6,065 a*

A total of 3,840 acres of deepwater habitats were inventoried in Butler County: 3,453 acres of lacustrine waters (lakes and reservoirs) and 387 acres of rivers and streams.

CAMBRIA COUNTY

Cambria County had 2,129 acres of wetlands. This amounts to 0.5% of the county's land area. Wetland acreage totals by major type are presented below.

Palustrine Wetlands	
Emergent	*374 a*
Deciduous Forested	*409 a*
Evergreen Forested	*123 a*
Mixed Deciduous Forest-Shrub	*172 a*
Mixed Deciduous Forested Emergent	*14 a*
Deciduous Scrub-Shrub	*274 a*
Mixed Deciduous Shrub-Emergent	*120 a*
Evergreen Scrub-Shrub	*3 a*
Open Water	*610 a*
Total Palustrine Wetlands	*2,099 a*
Lacustrine Wetlands	*28 a*
Riverine Wetlands	*2 a*
CAMBRIA COUNTY WETLANDS	***2,129 a***

Cambria County contained 3,151 acres of deepwater habitats: 2,538 acres of lacustrine waters and 615 acres of rivers and streams.

CAMERON COUNTY

Cameron County had 998 acres of wetlands, covering 0.4% of the county's land area. Wetland acreage totals by major type are outlined below.

Palustrine Wetlands	
Emergent	*213 a*
Deciduous Forested	*279 a*
Evergreen Forested	*106 a*
Mixed Deciduous Forested-Shrub	*22 a*
Deciduous Scrub-Shrub	*130 a*
Mixed Deciduous Shrub-Emergent	*121 a*
Evergreen Scrub-Shrub	*14 a*
Open Water	*101 a*
Total Palustrine Wetlands	*986 a*
Riverine Wetlands	*12 a*
CAMERON COUNTY WETLANDS	***998 a***

A total of 1,171 acres of deepwater habitats were inventoried in Cameron County: 1,032 acres of rivers and streams and 139 acres of lacustrine waters.

CARBON COUNTY

Carbon County had 3,022 acres of wetlands. This represents 1.2% of the county's land area. Wetland acreage totals by major type are listed below.

Palustrine Wetlands	
Emergent	*81 a*
Deciduous Forested	*798 a*
Evergreen Forested	*908 a*
Mixed Deciduous Forested-Shrub	*174 a*
Mixed Deciduous Forested-Emergent	*16 a*
Deciduous Scrub-Shrub	*343 a*
Mixed Deciduous Shrub-Emergent	*136 a*
Open Water	*398 a*
Total Palustrine Wetlands	*2,854 a*
Lacustrine Wetlands	*116 a*
Riverine Wetlands	*52 a*
CARBON COUNTY WETLANDS	***3,022 a***

Carbon County had 3,719 acres of deepwater habitats: 2,794 acres of lacustrine waters and 925 acres of rivers and streams.

CENTRE COUNTY

Centre County had 4,416 acres of wetlands. This acreage represents 0.6% of the county's land area. Wetland acreage totals by major type are summarized below.

Palustrine Wetlands	
Emergent	*1,093 a*
Deciduous Forested	*1,234 a*
Evergreen Forested	*483 a*
Mixed Deciduous Forested-Shrub	*186 a*
Mixed Deciduous Forested-Emergent	*48 a*
Deciduous Scrub-Shrub	*572 a*
Mixed Deciduous Shrub-Emergent	*165 a*
Open Water	*612 a*
Total Palustrine Wetlands	*4,393 a*
Lacustrine Wetlands	*12 a*
Riverine Wetlands	*11 a*
CENTRE COUNTY WETLANDS	***4,416 a***

A total of 3,583 acres of deepwater habitats was mapped in Centre County: 2,075 acres of lacustrine waters and 1,508 acres of rivers and streams.

CHESTER COUNTY

Chester County had 7,676 acres of wetlands. This amounts to 1.6% of the county's land area. Wetland acreage totals by major type are presented below.

Palustrine Wetlands	
Aquatic Bed	*18 a*
Emergent	*2,075 a*
Deciduous Forested	*2,626 a*
Mixed Deciduous Forested-Shrub	*231 a*
Mixed Deciduous Forested-Emergent	*281 a*
Deciduous Scrub-Shrub	*253 a*
Evergreen Scrub-Shrub	*4 a*
Mixed Deciduous Shrub-Emergent	*570 a*
Open Water	*1,614 a*
Total Palustrine Wetlands	*7,672 a*
Riverine Wetlands	*4 a*
CHESTER COUNTY WETLANDS	***7,676 a***

Chester County contained 2,069 acres of deepwater habitats: 1,229 acres of lacustrine waters and 840 acres of rivers and streams.

CLARION COUNTY

Clarion County had 1,118 acres of wetlands, covering 0.3% of the county's land area. Wetland acreage totals by major type are outlined below.

Palustrine Wetlands	
Emergent	*14 a*
Deciduous Forested	*275 a*
Mixed Deciduous Forested-Shrub	*40 a*
Mixed Deciduous Forested-Emergent	*9 a*
Deciduous Scrub-Shrub	*47 a*
Mixed Deciduous Shrub-Emergent	*39 a*
Open Water	*680 a*
Total Palustrine Wetlands	*1,104 a*
Riverine Wetlands	*14 a*
CLARION COUNTY WETLANDS	***1,118 a***

A total of 4,629 acres of deepwater habitats were also inventoried: 4,405 acres of rivers and streams and 224 acres of lacustrine waters.

CLEARFIELD COUNTY

Clearfield County had 5,796 acres of wetlands. This represents 0.8% of the county. Wetland acreage totals by major type are listed below.

Palustrine Wetlands	
Aquatic Bed	*13 a*
Emergent	*916 a*
Deciduous Forested	*1,425 a*
Evergreen Forested	*455 a*
Mixed Deciduous Forested-Shrub	*373 a*
Mixed Deciduous Forested-Emergent	*22 a*
Deciduous Scrub-Shrub	*892 a*
Evergreen Scrub-Shrub	*14 a*
Mixed Deciduous Shrub-Emergent	*402 a*
Open Water	*1,147 a*
Total Palustrine Wetlands	*5,704 a*
Lacustrine Wetlands	*76 a*
Riverine Wetlands	*16 a*
CLEARFIELD COUNTY WETLANDS	*5,976 a*

Clearfield County had 4,605 acres of deepwater habitats: 3,246 acresof riverine waters and 1,359 acres of lacustrine waters.

CLINTON COUNTY

Clinton County had 2,273 acres of wetlands. This acreage represents 0.4% of the county's land area. Wetland acreage totals by major type are summarized below.

Palustrine Wetlands	
Aquatic Bed	*34 a*
Emergent	*503 a*
Deciduous Forested	*632 a*
Evergreen Forested	*290 a*
Mixed Deciduous Forested-Shrub	*84 a*
Mixed Deciduous Forested-Emergent	*125 a*
Deciduous Scrub-Shrub	*209 a*
Evergreen Scrub-Shrub	*47 a*
Mixed Deciduous Shrub-Emergent	*68 a*
Open Water	*262 a*
Total Palustrine Wetlands	*2,254 a*
Riverine Wetlands	*19 a*
CLINTON COUNTY WETLANDS	***2,273 a***

A total of 5,110 acres of deepwater habitats was inventoried in Clinton County: 4,845 acres of rivers and streams and 265 acres of lacustrine waters.

COLUMBIA COUNTY

Columbia had 2,001 acres of wetlands. This amounts to 0.6% of the county's land area. Wetland acreage totals by major type are presented below.

Palustrine Wetlands	
Emergent	*203 a*
Deciduous Forested	*781 a*
Evergreen Forested	*99 a*
Mixed Deciduous Forested-Shrub	*57 a*
Deciduous Scrub-Shrub	*95 a*
Mixed Deciduous Shrub-Emergent	*115 a*
Open Water	*614 a*
Total Palustrine Wetlands	*1,964 a*
Riverine Wetlands	*37 a*
COLUMBIA COUNTY WETLANDS	***2,001 a***

Columbia County had 2,828 acres of deepwater habitats: 2,588 acres of rivers and streams and 240 acres of lacustrine waters.

CRAWFORD COUNTY

Crawford County had 33,792 acres of wetlands, covering 5.2% of the county's land area. Wetland acreage totals by major type are outlined below.

Palustrine Wetlands	
Aquatic Bed	*177 a*
Emergent	*2,888 a*
Deciduous Forested	*13,636 a*
Evergreen Forested	*713 a*
Mixed Deciduous Forested-Shrub	*4,988 a*
Mixed Deciduous Forested-Emergent	*29 a*
Deciduous Scrub-Shrub	*5,147 a*
Evergreen Scrub-Shrub	*5 a*
Mixed Deciduous Shrub-Emergent	*4,415 a*
Open Water	*1,585 a*
Total Palustrine Wetlands	*33,583 a*
Lacustrine Wetlands	*209 a*
CRAWFORD COUNTY WETLANDS	***33,792 a***

A total of 14,827 acres of deepwater habitats was inventoried in Crawford County: 13,811 acres of lacustrine waters and 1,016acres of rivers and streams.

CUMBERLAND COUNTY

Cumberland County had 3,489 acres of wetlands. This represents 1.0% of the county. Wetland acreage totals by major type are listed below.

Palustrine Wetlands	
Emergent	*649 a*
Deciduous Forested	*2,086 a*
Evergreen Forested	*7 a*
Mixed Deciduous Forested-Shrub	*11 a*
Mixed Deciduous Forested-Emergent	*40 a*
Deciduous Scrub-Shrub	*87 a*
Mixed Deciduous Shrub-Emergent	*28 a*
Open Water	*580 a*
Total Palustrine Wetlands	*3,488 a*
Riverine Wetlands	*1 a*
CUMBERLAND COUNTY WETLANDS	*3,489 a*

Cumberland County had 1,627 acres of deepwater habitats: 1,549 acres of rivers and streams and 78 acres of lacustrine waters.

DAUPHIN COUNTY

Dauphin County had 2,136 acres of wetlands. This acreage represents 0.6% of the county's land area. Wetland acreage totals by major type are summarized below.

Palustrine Wetlands	
Aquatic Bed	*20 a*
Emergent	*359 a*
Deciduous Forested	*657 a*
Evergreen Forested	*47 a*
Mixed Deciduous Forested-Shrub	*65 a*
Mixed Deciduous Forested-Emergent	*16 a*
Deciduous Scrub-Shrub	*190 a*
Evergreen Scrub-Shrub	*17 a*
Mixed Deciduous Shrub-Emergent	*39 a*
Open Water	*655 a*
Total Palustrine Wetlands	*2,065 a*
Lacustrine Wetlands	**71 a**
DAUPHIN COUNTY WETLANDS	***2,136 a***

Dauphin County possessed 20,888 acres of deepwater habitats: 19,972 acres of rivers and streams and 916 acres of lacustrine waters.

DELAWARE COUNTY

Delaware County had 1,582 acres of wetlands. This amounts to 1.3% of the county's land area. Wetland acreage totals by major type are presented below.

Palustrine Wetlands	
Emergent	*450 a*
Deciduous Forested	*217 a*
Evergreen Forested	*6 a*
Deciduous Scrub-Shrub	*106 a*
Open Water	*390 a*
Total Palustrine Wetlands	*1,223 a*
Lacustrine Wetlands	*161 a*
Riverine Wetlands (Tidal)	*198 a*
DELAWARE COUNTY WETLANDS	*1,582 a*

A total of 4,338 acres of deepwater habitats was inventoried for Delaware County: 3,365 acres of rivers and streams, 708 acres of estuarine waters, and 265 acres of lacustrine waters.

ELK COUNTY

Elk County had 4,493 acres of wetlands, covering 0.9% of the county's land area. Wetland acreage totals by major types are outlined below.

Palustrine Wetlands	
Aquatic Bed	*5 a*
Emergent	*830 a*
Deciduous Forested	*899 a*
Evergreen Forested	*949 a*
Mixed Deciduous Forested-Shrub	*233 a*
Mixed Deciduous Forested-Emergent	*174 a*
Deciduous Scrub-Shrub	*335 a*
Evergreen Scrub-Shrub	*6 a*
Mixed Deciduous Shrub-Emergent	*509 a*
Open Water	*509 a*
Total Palustrine Wetlands	*4,449 a*
Lacustrine Wetlands	*30 a*
Riverine Wetlands	*14 a*
ELK COUNTY WETLANDS	*4,493 a*

Elk County had 2,613 acres of deepwater habitats: 1,552 acres of lacustrine waters and 1,061 acres of rivers and streams.

ERIE COUNTY

Erie County had 24,960 acres of wetlands. This represents 4.8% of the county. Wetland acreage totals by major type are listed below.

Palustrine Wetlands	
Aquatic Bed	*51 a*
Emergent	*1,732 a*
Deciduous Forested	*8,446 a*
Evergreen Forested	*119 a*
Mixed Deciduous Forested-Shrub	*2,889 a*
Mixed Deciduous Forested-Emergent	*146 a*
Deciduous Scrub-Shrub	*2,468 a*
Mixed Deciduous Shrub-Emergent	*2,091 a*
Open Water	*1,354 a*
Total Palustrine Wetlands	*19,296 a*
Lacustrine Wetlands	*5,650 a*
Riverine Wetlands	*14a*
ERIE COUNTY WETLANDS	*24,960 a*

A total of 103,973 acres of deepwater habitats was inventoried in Erie County: 103,677 acres of lacustrine water (mostly Lake Erie) and 296 acres of rivers and streams.

FAYETTE COUNTY

Fayette County had 2,293 acres of wetlands. This acreage represents 0.4% of the county's land area. Wetland acreage totals by major type are summarized below.

Palustrine Wetlands	
Emergent	*395 a*
Deciduous Forested	*625 a*
Evergreen Forested	*30 a*
Mixed Deciduous Forested-Shrub	*97 a*
Mixed Deciduous Forested-Emergent	*20 a*
Deciduous Scrub-Shrub	*266 a*
Mixed Deciduous Shrub-Emergent	*216 a*
Open Water	*639 a*
Total Palustrine Wetlands	*2,288 a*
Riverine Wetlands	*5 a*
FAYETTE COUNTY WETLANDS	***2,293 a***

Fayette County contained 5,412 acres of deepwater habitats: 3,932 acres of rivers and streams and 1,480 acres of lacustrine waters.

FOREST COUNTY

Forest County had 2,015 acres of wetlands. This amounts to 0.8% of the county's land area. Wetland acreage totals by major type are presented below.

Palustrine Wetlands	
Emergent	*361 a*
Deciduous Forested	*916 a*
Evergreen Forested	*127 a*
Mixed Deciduous Forested-Shrub	*120 a*
Mixed Deciduous Forested-Emergent	*119 a*
Deciduous Scrub-Shrub	*62 a*
Mixed Deciduous Shrub-Emergent	*137 a*
Open Water	*173 a*
FOREST COUNTY WETLANDS	*2,015 a*

A total of 2,539 acres of deepwater habitats was inventoried for the county: 2,104 acres of rivers and streams and 435 acres of lacustrine waters.

FRANKLIN COUNTY

Franklin County had 5,424 acres of wetlands, covering 1.1% of the county's land area. Wetland acreage totals by major type are outlined below.

Palustrine Wetlands	
Emergent	*1,265 a*
Deciduous Forested	*2,586 a*
Evergreen Forested	*46 a*
Mixed Deciduous Forested-Shrub	*159 a*
Mixed Deciduous Forested-Emergent	*57 a*
Deciduous Scrub-Shrub	*131 a*
Mixed Deciduous Shrub-Emergent	*125 a*
Open Water	*942 a*
Total Palustrine Wetlands	*5,311 a*
Lacustrine Wetlands	*111 a*
Riverine Wetlands	*2 a*
FRANKLIN COUNTY WETLANDS	***5,424 a***

A total of 812 acres of deepwater habitats was mapped: 687 acres of rivers and streams and 125 acres of lacustrine waters.

FULTON COUNTY

Fulton County had 982 acres of wetlands. This represent 0.4% of the county. Wetland acreage totals by major type are listed below.

Palustrine Wetlands	
Emergent	*86 a*
Deciduous Forested	*510 a*
Evergreen Forested	*73 a*
Mixed Deciduous Forested-Shrub	*18 a*
Deciduous Scrub-Shrub	*47 a*
Mixed Deciduous Shrub-Emergent	*50 a*
Open Water	*198 a*
FULTON COUNTY WETLANDS	*982 a*

Only 148 acres of deepwater habitats were mapped in Fulton County: 87 acres of lacustrine water and 61 acres and streams.

GREENE COUNTY

Green County had 894 acres of wetlands. This acreage represents only 0.2% of the county's land area. Wetland acreage totals by major type are summarized below.

Palustrine Wetlands	
Emergent	*187 a*
Deciduous Forested	*191 a*
Mixed Deciduous Forested-Shrub	*27 a*
Deciduous Scrub-Shrub	*37 a*
Mixed Deciduous Forested-Emergent	*30 a*
Open Water	*415 a*
Total Palustrine Wetlands	*887 a*
Lacustrine Wetlands	*7 a*
GREEN COUNTY WETLANDS	*894 a*

A total of 2,125 acres of deepwater habitats was inventoried in Green County: 2,012 acres of rivers and streams and 113 acres of lacustrine waters.

HUNTINGDON COUNTY

Huntingdon County had 2,161 acres of wetlands. This amounts to 0.4% of the county's land area. Wetland acreage totals by major type are presented below.

Palustrine Wetlands	
Emergent	*241 a*
Deciduous Forested	*1,303 a*
Evergreen Forested	*67 a*
Mixed Deciduous Forested-Shrub	*87 a*
Mixed Deciduous Forested-Emergent	*18 a*
Deciduous Scrub-Shrub	*133 a*
Mixed Deciduous Shrub-Emergent	*44 a*
Open Water	*267 a*
Total Palustrine Wetlands	*2,160 a*
Riverine Wetlands	*1 a*
HUNTINGDON COUNTY WETLANDS	***2,161 a***

Huntingdon County had 9,652 acres of deepwater habitats: 7,763 acres of lacustrine waters and 1,889 acres of rivers and streams.

INDIANA COUNTY

Indiana County had 3,249 acres of wetlands, covering 0.6% of the county's land area. Wetland acreage totals by major type are outlined below.

Palustrine Wetlands	
Emergent	*215 a*
Deciduous Forested	*1,098 a*
Evergreen Forested	*96 a*
Mixed Deciduous Forested-Shrub	*131 a*
Mixed Deciduous Forested-Emergent	*198 a*
Deciduous Scrub-Shrub	*189 a*
Mixed Deciduous Shrub-Emergent	*48 a*
Open Water	*856 a*
Total Palustrine Wetlands	*2,831 a*
Lacustrine Wetlands	*418 a*
INDIANA COUNTY WETLANDS	*3,249 a*

A total of 3,319 acres of deepwater habitats was mapped in the county: 2,072 acres of lacustrine waters and 1,247 acres of rivers and streams.

JEFFERSON COUNTY

Jefferson County had 2,780 acres of wetlands. This represents 0.7% of the county. Wetland acreage totals by major type are listed below.

Palustrine Wetlands	
Emergent	*366 a*
Deciduous Forested	*840 a*
Evergreen Forested	*253 a*
Mixed Deciduous Forested-Shrub	*123 a*
Mixed Deciduous Forested-Emergent	*14 a*
Deciduous Scrub-Shrub	*302 a*
Mixed Deciduous Shrub-Emergent	*160 a*
Open Water	*719 a*
Total Palustrine Wetlands	*2,777 a*
Riverine Wetlands	*3 a*
JEFFERSON COUNTY WETLANDS	***2,780 a***

Jefferson County possessed 1,652 acres of deepwater habitats: 1,470 acres of rivers and streams and 182 acres of lacustrine waters.

JUNIATA COUNTY

Juniata County had 2,110 acres of wetlands. This acreage represents 0.9% of the county's land area. Wetland acreage totals by major type are summarized below.

Palustrine Wetlands	
Emergent	*319 a*
Deciduous Forested	*1,510 a*
Evergreen Forested	*9 a*
Mixed Deciduous Forested-Shrub	*21 a*
Deciduous Scrub-Shrub	*78 a*
Mixed Deciduous Shrub-Emergent	*52 a*
Open Water	*121 a*
JUNIATA COUNTY WETLANDS	*2,110 a*

Juniata County had a total of 1,861 acres of riverine deepwater habitats.

LACKAWANNA COUNTY

Lackawanna County had 9,319 acres of wetlands. This amounts to 3.2% of the county's land area. Wetland acreage totals by major type are presented below.

Palustrine Wetlands	
Aquatic Bed	*45 a*
Emergent	*693 a*
Deciduous Forested	*3,616 a*
Evergreen Forested	*1,226 a*
Deciduous Scrub-Shrub	*1,376 a*
Evergreen Scrub-Shrub	*10 a*
Mixed Deciduous Shrub-Emergent	*771 a*
Open Water	*1,563 a*
Total Palustrine Wetlands	*9,300 a*
Lacustrine Wetlands	*19a*
LACKAWANNA COUNTY WETLANDS	*9,319 a*

A total of 3,608 acres of deepwater habitats was inventoried in the county: 3,268 acres of lacustrine waters and 340 acres of rivers and streams.

LANCASTER COUNTY

Lancaster had 4,706 acres of wetlands, covering 0.8% of the county's land area. Wetland acreage totals by major type are outlined below.

Palustrine Wetlands	
Emergent	*1,211 a*
Deciduous Forested	*1,039 a*
Mixed Deciduous Forested-Shrub	*194 a*
Mixed Deciduous Forested-Emergent	*99 a*
Deciduous Scrub-Shrub	*60 a*
Mixed Deciduous Shrub-Emergent	*169 a*
Open Water	*1,181 a*
Total Palustrine Wetlands	*3,953 a*
Lacustrine Wetlands	*139 a*
Riverine Wetlands	*614 a*
LANCASTER COUNTY WETLANDS	***4,706 a***

Lancaster County had 21,876 acres of deepwater habitats: 15,258 acres of lacustrine waters and 6,618 acres of rivers and streams.

LAWRENCE COUNTY

Lawrence County had 4,637 acres of wetlands. This represents 2.0% of the county. Wetland acreage totals by major type are listed below.

Palustrine Wetlands	
Aquatic Bed	*36 a*
Emergent	*1,016 a*
Deciduous Forested	*1,518 a*
Mixed Deciduous Forested-Shrub	*317 a*
Deciduous Scrub-Shrub	*669 a*
Mixed Deciduous Shrub-Emergent	*184 a*
Open Water	*894 a*
Total Palustrine Wetlands	*4,634 a*
Riverine Wetlands	*3 a*
LAWRENCE COUNTY WETLANDS	***4,637 a***

Lawrence County had 1,767 acres of deepwater habitats: 1,395 acres of rivers and streams and 372 acres of lacustrine waters.

LEBANON COUNTY

Lebanon County had 2,324 acres of wetlands. This acreage represents 1.0% of the county's land area. Wetland acreage totals by major type are summarized below.

Palustrine Wetlands	
Emergent	*593 a*
Deciduous Forested	*779 a*
Evergreen Forested	*91 a*
Mixed Deciduous Forested-Shrub	*82 a*
Mixed Deciduous Forested-Emergent	*29 a*
Deciduous Scrub-Shrub	*66 a*
Mixed Deciduous Shrub-Emergent	*19 a*
Open Water	*665 a*
LEBANON COUNTY WETLANDS	*2,324 a*

Only 833 acres of deepwater habitats were mapped in the county: 590 acres of rivers and streams and 243 acres of lacustrine waters.

LEHIGH COUNTY

Lehigh County had 1,534 acres of wetlands. This amounts to 0.7% of the county's land area. Wetland acreage totals by major type are presented below.

Palustrine Wetlands	
Emergent	*176 a*
Deciduous Forested	*656 a*
Evergreen Forested	*5 a*
Mixed Deciduous Forested-Emergent	*24 a*
Deciduous Scrub-Shrub	*51 a*
Mixed Deciduous Shrub-Emergent	*52 a*
Open Water	*551 a*
Total Palustrine Wetlands	*1,515 a*
Lacustrine Wetlands	*2 a*
Riverine Wetlands	*17 a*
LEHIGH COUNTY WETLANDS	*1,534 a*

Lehigh County had 984 acres of deepwater habitats: 767 acres of rivers and streams and 217 acres of lacustrine waters.

LUZERNE COUNTY

Luzerne County had 16,925 acres of wetlands, covering 3.0% of the county's land area. Wetland acreage totals by major type are outlined below.

Palustrine Wetlands	
Aquatic Bed	*129 a*
Emergent	*1,129 a*
Deciduous Forested	*4,181 a*
Evergreen Forested	*2,280 a*
Mixed Deciduous Forested-Shrub	*1,194 a*
Mixed Deciduous Forested-Emergent	*42 a*
Deciduous Scrub-Shrub	*3,770 a*
Evergreen Scrub-Shrub	*106 a*
Mixed Deciduous Shrub-Emergent	*1,216 a*
Open Water	*2,800 a*
Total Palustrine Wetlands	*16,847 a*
Lacustrine Wetlands	*78 a*
LUZERNE COUNTY WETLANDS	*16,925 a*

A total of 9,496 acres of deepwater habitats was inventoried in Luzerne County: 4,972 acres of rivers and streams and 4,524 acres of lacustrine waters.

LYCOMING COUNTY

Lycoming County had 4,645 acres of wetlands. This represents 0.6% of the county. Wetland acreage totals by major type are listed below.

Palustrine Wetlands	
Emergent	*556 a*
Deciduous Forested	*1,174 a*
Evergreen Forested	*914 a*
Mixed Deciduous Forested-Shrub	*140 a*
Mixed Deciduous Forested-Emergent	*21 a*
Deciduous Scrub-Shrub	*483 a*
Evergreen Scrub-Shrub	*21 a*
Mixed Deciduous Shrub-Emergent	*163 a*
Open Water	*888 a*
Total Palustrine Wetlands	*4,360 a*
Lacustrine Wetlands	*79 a*
Riverine Wetlands	*206 a*
LYCOMING COUNTY WETLANDS	*4,645 a*

A total of 6,555 acres of deepwater habitats was mapped in the county: 5,661 acres of rivers and streams and 894 acres of lacustrine waters.

McKEAN COUNTY

McKean County had 13,668 acres of wetlands. This acreage represents 2.2% of the county's land area. Wetland acreage totals by major type are summarized below.

Palustrine Wetlands	
Aquatic Bed	*34 a*
Emergent	*1,743 a*
Deciduous Forested	*7,343 a*
Evergreen Forested	*854 a*
Mixed Deciduous Forested-Shrub	*1,457 a*
Mixed Deciduous Forested-Emergent	*146 a*
Deciduous Scrub-Shrub	*622 a*
Mixed Deciduous Shrub-Emergent	*1,049 a*
Open Water	*401 a*
Total Palustrine Wetlands	*13,649 a*
Lacustrine Wetlands	*19 a*
McKEAN COUNTY WETLANDS	***13,668 a***

McKean County had 2,050 acres of deepwater habitats: 1,561 acres of lacustrine waters and 489 acres of rivers and streams.

MERCER COUNTY

Mercer County had 15,656 acres of wetlands. This amounts to 3.7% of the county's land area. Wetland acreage totals by major type are presented below.

Palustrine Wetlands	
Aquatic Bed	*187 a*
Emergent	*1,440 a*
Deciduous Forested	*7,765 a*
Evergreen Forested	*37 a*
Mixed Deciduous Forested-Shrub	*1,205 a*
Deciduous Scrub-Shrub	*2,775 a*
Mixed Deciduous Shrub-Emergent	*952 a*
Open Water	*1,295 a*
MERCER COUNTY WETLANDS	***15,656 a***

A total of 5,785 acres of deepwater habitats was inventoried: 5,339 acres of lacustrine waters and 446 acres of rivers and streams.

MIFFLIN COUNTY

Mifflin County had 1,019 acres of wetlands, covering 0.4% of the county's land area. Wetland acreage totals by major type are outlined below.

Palustrine Wetlands	
Emergent	*140 a*
Deciduous Forested	*637 a*
Evergreen Forested	*55 a*
Mixed Deciduous Forested-Shrub	*33 a*
Deciduous Scrub-Shrub	*39 a*
Mixed Deciduous Shrub-Emergent	*29 a*
Open Water	*86 a*
MIFFLIN COUNTY WETLANDS	*1,019 a*

Mifflin County contained 1,883 acres of deepwater habitats: 1,801 acres of rivers and streams and 82 acres of lacustrine waters.

MONROE COUNTY

Monroe County had 24,872 acres of wetlands. This represents 6.4% of the county. Wetland acreage totals by major type are listed below.

Palustrine Wetlands	
Aquatic Bed	*31 a*
Emergent	*899 a*
Deciduous Forested	*10,615 a*
Evergreen Forested	*5,294 a*
Mixed Deciduous Forested-Shrub	*28 a*
Deciduous Scrub-Shrub	*4,672 a*
Evergreen Scrub-Shrub	*120 a*
Mixed Deciduous Shrub-Emergent	*1,087 a*
Open Water	*1,940 a*
Total Palustrine Wetlands	*24,686 a*
Lacustrine Wetlands	*102 a*
Riverine Wetlands	*84 a*
MONROE COUNTY WETLANDS	*24,872 a*

A total of 4,351 acres of deepwater habitats was mapped in Monroe County: 3,508 acres of lacustrine waters and 843 acres of rivers and streams.

MONTGOMERY COUNTY

Montgomery County had 3,493 acres of wetlands. This acreage represents 1.1% of the county's land area. Wetland acreage totals by major type are summarized below.

Palustrine Wetlands	
Emergent	*316 a*
Deciduous Forested	*2,132 a*
Mixed Deciduous Forested-Shrub	*166 a*
Mixed Deciduous Forested-Emergent	*60 a*
Deciduous Scrub-Shrub	*76 a*
Mixed Deciduous Shrub-Emergent	*80 a*
Open Water	*657 a*
Total Palustrine Wetlands	*3,487 a*
Riverine Wetlands	*6 a*
MONTGOMERY COUNTY WETLANDS	*3,493 a*

Montgomery County possessed 2,763 acres of deepwater habitats: 1,809 acres of rivers and streams and 954 acres of lacustrine waters.

MONTOUR COUNTY

Montour County had 356 acres of wetlands. About 0.4% of the county's land area is wetland. Wetland acreage totals by major type are presented below.

Palustrine Wetlands	
Emergent	*71 a*
Deciduous Forested	*87 a*
Mixed Deciduous Forested-Shrub	*11 a*
Mixed Deciduous Forested-Emergent	*8 a*
Deciduous Scrub-Shrub	*7 a*
Mixed Deciduous Shrub-Emergent	*6 a*
Open Water	*103 a*
Total Palustrine Wetlands	*293 a*
Lacustrine Wetlands	*63 a*
MONTOUR COUNTY WETLANDS	*356 a*

Only 882 acres of deepwater habitats were mapped in Montour County: 683 acres of rivers and streams and 199 acres of lacustrine waters.

NORTHAMPTON COUNTY

Northampton County had 2,943 acres of wetlands, covering 1.2% of the county's land area. Wetland acreage totals by major type are outlined below.

Palustrine Wetlands	
Emergent	*292 a*
Deciduous Forested	*1,492 a*
Mixed Deciduous Forested-Shrub	*77 a*
Deciduous Scrub-Shrub	*157 a*
Mixed Deciduous Shrub-Emergent	*79 a*
Open Water	*799 a*
Total Palustrine Wetlands	*2,896 a*
Riverine Wetlands	*47 a*
NORTHAMPTON COUNTY WETLANDS	*2,943 a*

Northampton County had 2,197 acres of deepwater habitats: 1,729 acres of rivers and streams and 468 acres of lacustrine waters.

NORTHUMBERLAND COUNTY

Northumberland County had 2,038 acres of wetlands. This represents 0.7% of the county. Wetland acreage totals by major type are listed below.

Palustrine Wetlands	
Emergent	*324 a*
Deciduous Forested	*543 a*
Evergreen Forested	*10 a*
Mixed Deciduous Forested-Shrub	*37 a*
Mixed Deciduous Forested-Emergent	*12 a*
Deciduous Scrub-Shrub	*476 a*
Mixed Deciduous Shrub-Emergent	*26 a*
Open Water	*615 a*
Total Palustrine Wetlands	*2,031 a*
Riverine Wetlands	*7 a*
NORTHUMBERLAND COUNTY WETLANDS	*2,038 a*

A total of 11,675 acres of deepwater habitats was inventoried in the county: 11,540 acres of rivers and 135 acres of lacustrine waters.

PERRY COUNTY

Perry County had 2,696 acres of wetlands. This acreage represents 0.8% of the county's land area. Wetland acreage totals by major type are summarized below.

Palustrine Wetlands	
Emergent	*331 a*
Deciduous Forested	*1,900 a*
Evergreen Forested	*35 a*
Mixed Deciduous Forested-Shrub	*15 a*
Mixed Deciduous Forested-Emergent	*35 a*
Deciduous Scrub-Shrub	*73 a*
Mixed Deciduous Shrub-Emergent	*19 a*
Open Water	*288 a*
PERRY COUNTY WETLANDS	*2,696 a*

Perry County had 2,109 acres of deepwater habitats: 2,023 acres of rivers and streams and 86 acres of lacustrine waters.

PHILADELPHIA COUNTY

Philadelphia County had 747 acres of wetlands. This amounts to 0.9% of the county's land area. Wetland acreage totals by major type are presented below.

Palustrine Wetlands	
Emergent	*276 a*
Deciduous Forested	*234 a*
Deciduous Scrub-Shrub	*41 a*
Open Water	*194 a*
Total Palustrine Wetlands	*745 a*
Riverine Wetlands (Tidal)	*2 a*
PHILADELPHIA COUNTY WETLANDS	*747 a*

Philadelphia County had a total of 5,003 acres of deepwaterhabitats: 4,538 acres of freshwater tidal waters, 158 acres of nontidal riverine waters, and 307 acres of lacustrine waters.

PIKE COUNTY

Pike County had 23,336 acres of wetlands, covering 6.7% of the county's land area. Wetland acreage totals by major type are outlined below.

Palustrine Wetlands	
Emergent	*1,633 a*
Deciduous Forested	*8,825 a*
Evergreen Forested	*5,739 a*
Mixed Deciduous Forested-Shrub	*262 a*
Deciduous Scrub-Shrub	*3,782 a*
Evergreen Scrub-Shrub	*981 a*
Open Water	*1,647 a*
Total Palustrine Wetlands	*22,869 a*
Lacustrine Wetlands	*415 a*
Riverine Wetlands	*52 a*
PIKE COUNTY WETLANDS	***23,336 a***

Pike County contained 11,544 acres of deepwater habitats: 9,515 acres of lacustrine waters and 2,029 acres of rivers and streams.

POTTER COUNTY

Potter County had 4,173 acres of wetlands. This represents 0.6% of the county. Wetland acreage totals by major type are listed below.

Palustrine Wetlands	
Emergent	*876 a*
Deciduous Forested	*1,032 a*
Evergreen Forested	*327 a*
Mixed Deciduous Forested-Shrub	*360 a*
Mixed Deciduous Forested-Emergent	*125 a*
Deciduous Scrub-Shrub	*365 a*
Evergreen Scrub-Shrub	*2 a*
Mixed Deciduous Shrub-Emergent	*415 a*
Open Water	*670 a*
Total Palustrine Wetlands	*4,172 a*
Riverine Wetlands	**1 a**
POTTER COUNTY WETLANDS	*4,173 a*

Only 293 acres of deepwater habitats were mapped in Potter County: 186 acres of rivers and streams and 107 acres of lacustrine waters.

SCHUYLKILL COUNTY

Schuylkill County had 3,831 acres of wetlands. This acreage represents 0.8% of the county's land area. Wetland acreage totals by major type are summarized below.

Palustrine Wetlands	
Emergent	*502 a*
Deciduous Forested	*789 a*
Evergreen Forested	*352 a*
Mixed Deciduous Forested-Shrub	*99 a*
Mixed Deciduous Forested-Emergent	*50 a*
Deciduous Scrub-Shrub	*207 a*
Evergreen Scrub-Shrub	*1 a*
Mixed Deciduous Shrub-Emergent	*98 a*
Open Water	*1,731 a*
Total Palustrine Wetlands	*3,829 a*
Lacustrine Wetlands	*2 a*
SCHUYLKILL COUNTY WETLANDS	***3,831 a***

A total of 2,746 acres of deepwater habitats was mapped in the county: 2,049 acres of lacustrine waters and 697 acres of rivers and streams.

SNYDER COUNTY

Synder County had 1,969 acres of wetlands. This amounts to 0.9% of the county's land area. Wetland acreage totals by major type are presented below.

Palustrine Wetlands	
Emergent	*235 a*
Deciduous Forested	*1,112 a*
Evergreen Forested	*52 a*
Mixed Deciduous Forested-Shrub	*47 a*
Mixed Deciduous Forested-Emergent	*12 a*
Deciduous Scrub-Shrub	*165 a*
Mixed Deciduous Shrub-Emergent	*23 a*
Open Water	*253 a*
Total Palustrine Wetlands	*1,899 a*
Lacustrine Wetlands	*66 a*
Riverine Wetlands	*4 a*
SNYDER COUNTY WETLANDS	*1,969 a*

Snyder County has 992 acres of deepwater habitats: 498 acres of lacustrine waters and 494 acres of rivers and streams.

SOMERSET COUNTY

Somerset County had 6,211 acres of wetlands, covering 0.9% of the county's land area. Wetland acreage totals by major type are outlined below.

Palustrine Wetlands	
Emergent	*1,114 a*
Deciduous Forested	*1,400 a*
Evergreen Forested	*477 a*
Mixed Deciduous Forested-Shrub	*468 a*
Mixed Deciduous Forested-Emergent	*27 a*
Deciduous Scrub-Shrub	*973 a*
Evergreen Scrub-Shrub	*6 a*
Mixed Deciduous Shrub-Emergent	*805 a*
Open Water	*900 a*
Total Palustrine Wetlands	*6,170 a*
Lacustrine Wetlands	*39 a*
Riverine Wetlands	*2 a*
SOMERSET COUNTY WETLANDS	***6,211 a***

A total of 5,256 acres of deepwater habitats was inventoried for Somerset County: 3,797 acres of lacustrine waters and 1,459 acres of rivers and streams.

SULLIVAN COUNTY

Sullivan County had 6,602 acres of wetlands. This represents 2.2% of the county. Wetland acreage totals by major type are listed below.

Palustrine Wetlands	
Aquatic Bed	*18 a*
Emergent	*617 a*
Deciduous Forested	*1,042 a*
Evergreen Forested	*1,584 a*
Mixed Deciduous Forested-Shrub	*166 a*
Mixed Deciduous Forested-Emergent	*17 a*
Deciduous Scrub-Shrub	*1,175 a*
Evergreen Scrub-Shrub	*113 a*
Mixed Deciduous Shrub-Emergent	*631 a*
Open Water	*1,086 a*
Total Palustrine Wetlands	*6,449 a*
Lacustrine Wetlands	*27 a*
Riverine Wetlands	*126 a*
SULLIVAN COUNTY WETLANDS	*6,602 a*

Sullivan County had 1,209 acres of deepwater habitats: 867 acres of lacustrine waters and 342 acres of rivers and streams.

SUSQUEHANNA COUNTY

Susquehanna County had 12,134 acres of acres of wetlands. This acreage represents 2.3% of the countys land area. Wetland acreage totals by major type are summarized below.

Palustrine Wetlands	
Aquatic Bed	*107 a*
Emergent	*2,201 a*
Deciduous Forested	*2,595 a*
Evergreen Forested	*459 a*
Mixed Deciduous Forested-Shrub	*641 a*
Mixed Deciduous Forested-Emergent	*95 a*
Deciduous Scrub-Shrub	*2,076 a*
Evergreen Scrub-Shrub	*73 a*
Mixed Deciduous Shrub-Emergent	*768 a*
Open Water	*3,070 a*
Total Palustrine Wetlands	*12,085 a*
Lacustrine Wetlands	*47 a*
Riverine Wetlands	*2 a*
SUSQUEHANNA COUNTY WETLANDS	*12,134 a*

Susquehanna County had 3,699 acres of deepwater habitats: 2,829 acres of lacustrine waters and 870 acres of rivers and streams.

TIOGA COUNTY

Tioga County had 8,058 acres of wetlands. This amounts to 1.1% of the countys land area. Wetland acreage totals by major type are presented below.

Palustrine Wetlands	
Aquatic Bed	*61 a*
Emergent	*2,346 a*
Deciduous Forested	*539 a*
Evergreen Forested	*1,160 a*
Mixed Deciduous Forested-Shrub	*274 a*
Mixed Deciduous Forested-Emergent	*41 a*
Deciduous Scrub-Shrub	*1,496 a*
Evergreen Scrub-Shrub	*8 a*
Mixed Deciduous Shrub-Emergent	*450 a*
Open Water	*1,545 a*
Total Palustrine Wetlands	*7,920 a*
Lacustrine Wetlands	*1 a*
Riverine Wetlands	*137 a*
TIOGA COUNTY WETLANDS	*8,058 a*

Tioga County possessed 3,738 acres of deepwater habitats: 2,039 acres of lacustrine waters and 1,699 acres of rivers and streams.

UNION COUNTY

Union County had 2,025 acres of wetlands, covering 1.0% of the countys land area. Wetland acreage totals by major type are outlined below.

Palustrine Wetlands	
Emergent	*283 a*
Deciduous Forested	*1,093 a*
Evergreen Forested	*163 a*
Mixed Deciduous Forested-Shrub	*22 a*
Mixed Deciduous Forested-Emergent	*14 a*
Deciduous Scrub-Shrub	*67 a*
Mixed Deciduous Shrub-Emergent	*24 a*
Open Water	*359 a*
UNION COUNTY WETLANDS	*2,025 a*

Only 634 acres of deepwater habitats were mapped in Union County: 570 acres of rivers and streams and 64 acres of lacustrine waters.

UNION COUNTY

Union County had 2,025 acres of wetlands, covering 1.0% of the county's land area. Wetland acreage totals by major type are outlined below.

Palustrine Wetlands	
Emergent	*283 a*
Deciduous Forested	*1,093 a*
Evergreen Forested	*163 a*
Mixed Deciduous Forested-Shrub	*22 a*
Mixed Deciduous Forested-Emergent	*14 a*
Deciduous Scrub-Shrub	*67 a*
Mixed Deciduous Shrub-Emergent	*24 a*
Open Water	*359 a*
UNION COUNTY WETLANDS	*2,025 a*

Only 634 acres of deepwater habitats were mapped in Union County: 570 acres of rivers and streams and 64 acres of lacustrine waters.

VENANGO COUNTY

Venango County had 3,172 acres of wetlands. This represents 0.7% of the county. Wetland acreage totals by major type are listed below.

Palustrine Wetlands	
Emergent	*98 a*
Deciduous Forested	*2,026 a*
Evergreen Forested	*20 a*
Mixed Deciduous Forested-Shrub	*189 a*
Deciduous Scrub-Shrub	*228 a*
Mixed Deciduous Shrub-Emergent	*71 a*
Open Water	*516 a*
Total Palustrine Wetlands	*3,148 a*
Riverine Wetlands	*24 a*
VENANGO COUNTY WETLANDS	***3,172 a***

A total of 5,752 acres of deepwater habitats were mapped in Venango County: 5,462 acres of rivers and streams and 290 acres of lacustrine waters.

WARREN COUNTY

Warren County had 12,469 acres of wetlands. This acreage represents 2.2% of the county's land area. Wetland acreage totals by major type are summarized below.

Palustrine Wetlands	
Aquatic Bed	*26 a*
Emergent	*1,005 a*
Deciduous Forested	*7,000 a*
Evergreen Forested	*1,186 a*
Mixed Deciduous Forested-Shrub	*54 a*
Deciduous Scrub-Shrub	*871 a*
Mixed Deciduous Shrub-Emergent	*1,800 a*
Open Water	*424 a*
Total Palustrine Wetlands	*12,366 a*
Lacustrine Wetlands	*103 a*
WARREN COUNTY WETLANDS	*12,469 a*

Warren County had 9,572 acres of deepwater habitats: 6,536 acres of lacustrine waters and 3,036 acres of rivers and streams.

WASHINGTON COUNTY

Washington County had 2,550 acres of wetlands. This amounts to about 0.5% of the county's land area. Wetland acreage totals by major type are presented below.

Palustrine Wetlands	
Emergent	*764 a*
Deciduous Forested	*433 a*
Evergreen Forested	*6 a*
Mixed Deciduous Forested-Shrub	*15 a*
Deciduous Scrub-Shrub	*126 a*
Mixed Deciduous Shrub-Emergent	*22 a*
Open Water	*1,139 a*
Total Palustrine Wetlands	*2,505 a*
Lacustrine Wetlands	*42 a*
Riverine Wetlands	*3 a*
WASHINGTON COUNTY WETLANDS	*2,550 a*

A total of 2,694 acres of deepwater habitats was inventoried: 2,003 acres of rivers and streams and 691 acres of lacustrine waters.

WAYNE COUNTY

Wayne County had 20,829 acres of wetlands, covering 4.4% of the county's land area. Wetland acreage totals by major type are outlined below.

Palustrine Wetlands	
Aquatic Bed	*29 a*
Emergent	*3,700 a*
Deciduous Forested	*4,721 a*
Evergreen Forested	*2,314 a*
Mixed Deciduous Forested-Shrub	*1,271 a*
Mixed Deciduous Forested-Emergent	*390 a*
Deciduous Scrub-Shrub	*2,148 a*
Evergreen Scrub-Shrub	*191 a*
Mixed Deciduous Shrub-Emergent	*1,883 a*
Open Water	*3,918 a*
Total Palustrine Wetlands	*20,565 a*
Lacustrine Wetlands	*26 a*
Riverine Wetlands	*228 a*
WAYNE COUNTY WETLANDS	*20,829 a*

Wayne County had 11,880 acres of deepwater habitats: 10,647 acres of lacustrine waters and 1,233 acres of rivers and streams.

WESTMORELAND COUNTY

Westmoreland County had 3,330 acres of wetlands. This represents 0.5% of the county. Wetland acreage totals by major type are listed below.

Palustrine Wetlands	
Emergent	*265 a*
Deciduous Forested	*1,076 a*
Mixed Deciduous Forested-Shrub	*328 a*
Mixed Deciduous Forested-Emergent	*274 a*
Deciduous Scrub-Shrub	*238 a*
Evergreen Scrub-Shrub	*13 a*
Mixed Deciduous Shrub-Emergent	*86 a*
Open Water	*942 a*
Total Palustrine Wetlands	*3,222 a*
Lacustrine Wetlands	*108 a*
WESTMORELAND COUNTY WETLANDS	***3,330 a***

A total of 5,602 acres of deepwater habitats was inventoried in Westmoreland County: 3,131 acres of rivers and streams and 2,471 acres of lacustrine waters.

WYOMING COUNTY

Wyoming County had 6,408 acres of wetlands. This acreage represents 2.5% of the county's land area. Wetland acreage totals by major type are summarized below.

Palustrine Wetlands	
Aquatic Bed	*53 a*
Emergent	*567 a*
Deciduous Forested	*1,713 a*
Evergreen Forested	*603 a*
Mixed Deciduous Forested-Shrub	*568 a*
Deciduous Scrub-Shrub	*1,837 a*
Evergreen Scrub-Shrub	*11 a*
Open Water	*956 a*
Total Palustrine Wetlands	*6,308 a*
Lacustrine Wetlands	*58 a*
Riverine Wetlands	*42 a*
WYOMING COUNTY WETLANDS	*6,408 a*

Wyoming County had 4,441 acres of deepwater habitats: 3,615 acres of rivers and streams and 826 acres of lacustrine waters.

Statewide Trends

Between 1956 and 1979, Pennsylvania had an estimated net loss of about 28,000 acres or 6% of its vegetated wetlands. This amounted to an average annual net loss of over 1,200 acres. Meanwhile, pond acreage increased by about 130% (or roughly 37,000 acres). Tremendous losses in emergent wetlands took place, with a net loss of nearly 42,500 acres which represents a 38% loss of this type. Over 1,800 acres of this type were lost annually, on average. These emergent wetland losses were mostly (64%) attributed to changes to other vegetated wetland types (i.e., forested and shrub wetlands), while direct human-induced changes to other land and water types were mostly the result of channelization, pond construction and urban development. Net losses of 16,600 acres of emergent wetlands to scrub-shrub wetlands and 8,500 acres of emergent wetlands to forested wetlands were estimated. These losses of emergent wetlands, in fact, contributed to estimated small net gains (but not statistically significant) in the two other vegetated types. Actual conversion of palustrine vegetated wetlands to ponds, lakes, and reservoirs (mostly ponds) accounted for about 46% of the human-induced losses. Conversion to farmland, urban development, and other lands (largely due to channelization/drainage projects) were responsible for 17%, 14% and 23% of the losses of vegetated wetlands, respectively.

Slightly more than one-third (9,700 acres) of the palustrine vegetated wetland losses took place in northeastern Pennsylvania. The heaviest loss (5,300 acres) was observed in the northern Poconos area, which lost about 15% of its vegetated wetlands. The northwestern part of the state (i.e., Middle Western Upland Plain) also lost substantial amounts of wetlands, recently losing about 5% (4,600 acres) of its vegetated wetlands.

Statewide, pond acreage increased by 37,000 acres due to alteration of vegetated wetlands and conversion of other land types. Forty-two percent of the new pond acreage came from wetland (mostly from emergent wetlands), while 30% came from other land (mainly upland forests) and 23% from farmland.

Delaware River Estuary Coastal Zone Trends

Since the mid-1970s, a net loss of 184 acres of palustrine wetlands took place within the Delaware River Estuary Coastal Zone (Tiner et al. 1978). During this period, there was no net change in riverine tidal wetlands (Table 10).

Palustrine nontidal emergent wetlands experienced the greatest net losses (129 acres), amounting to a 22% loss. The causes of this loss were varied, but most of the loss (68%) was attributed to sewage treatment plant facilities near the Philadelphia International Airport. Highway construction of Interstate 95 was responsible for 13% and 24% of pond losses, respectively.

Thirteen percent of the losses were attributed to sewage treatment plant facilities, while highway construction (8%) and commercial developments (4%) were other major causes of pond loss.

Net losses of other palustrine wetlands were seven acres of nontidal unconsolidated shore (due mostly to vegetative succession to emergent wetland), six acres of mixed shrub and emergent wetland (due to unknown activities), and six acres of forested wetland (due mostly to commercial development).

Lake Erie Coastal Zone Trends

Net changes in wetlands in the Lake Erie Coastal Zone between the mid-1970s and 1986 are summarized in Table 11. In general, only minor net changes occurred during this period. Small net losses of three wetland types (i.e., palustrine scrub-shrub/emergent wetland, lacustrine littoral unconsolidated bottom, and palustrine scrub-shrub wetland) were observed. In contrast, three types of palustrine wetlands experienced slight net gains, whereas six other wetland types did not change.

Specific wetland changes are outlined in Table 12. Urbanization, mostly housing developments, caused about 70% of the wetland losses and little of the wetland gains or changes in wetland type, and about 30% of the wetland losses. Largely by abandoning farming of one large area of wet soils in Springfield, the net effect of agriculture on wetlands in the Lake Erie Coastal Zone was an increase of 25.2 acres since the mid-1970s.

Table 9. Number of plots and percentage of eacl: stratum sampled in Pennsylvania (Tiner and Finr 1986).

Stratum	# Plots	% of Stratum Sampled
Middle Western Upland Plain	34	4.4
Appalachian Highlands	28	0.3
Poconos #1 (Southern)	17	6.8
Poconos #2 (Northern)	21	5.3
Other Glaciated Northeast	10	1.2
Adirondack-New England Highlands	4	2.1
Rolling Plain	26	2.4
Lake Erie	6*	3.3

* Open water plots only

Table 10. Wetland trends in the Delaware River Estuary Coastal Zone between the Mid - 1970's and 1986 (Tiner et al. 1987).

Wetland Types	Net Change
Riverine Wetlands	
Emergent Wetland (Tidal)	No change
Palustrine Wetlands	
Emergent Wetland (Tidal)	No change
Forested Wetland (Tidal)	No change
Emergent Wetlands (Nontidal)	129 acres lost
Scrub - Shrub Wetland / Emergent Wetland (Nontidal)	6 acres lost
Forested Wetland (Nontidal)	6 acres lost
Aquatic Bed (Nontidal)	No change
Unconsolidated Shore (Nontidal)	7 acres lost
Unconsolidated Bottom (Nontidal)	36 acres lost
Net Change in Palustrine Wetlands	184 acres lost

Table 11. Wetland trends in the Lake Erie Coastal Zone from the mid-1970s to 1986 (Tiner and Anderson 1986).

Wetland Types	Net Change
Lacustrine Wetlands	
Unconsolidated Bottom (Littoral)	7 acres lost
Aquatic Bed (Littoral)	No change
Unconsolidated Shore (Littoral)	1 acre gained
Net Change in Lacustrine Wetlands	6 acres lost
Palustrine Wetlands	
Unconsolidated Bottom	5 acres gained
Aquatic Bed	No change
Emergent Wetland	6 acres gained
Scrub-Shrub Wetland	3 acres lost
Scrub-Shrub/Emergent Wetland	10 acres lost
Scrub-Shrub Emergent/Aquatic Bed	No change
Forest Wetland	5 acres gained
Forested/Emergent Wetland	No change
Forested/Scrub-Shrub Wetland	No change
Net Change in Palustrine Wetlands	3 acres gained
Riverine Wetlands	
Unconsolidated Shore	No change

Table 12. **Wetland changes in the Lake Erie Coastal Zone between 1975/77 and 1986 (Tiner and Anderson 1986). NOTE: All Changes are the Result of Human Activities.**

Type of Change	Wetlands Affected*	Cause of Change	# of Wetlands Affected	Total Acreage of Change
Loss (Converted to Upland)	PUB	Agriculture	3	2.4
	PFO	Agriculture	1	8.1
	PSS	Agriculture	1	3.1
	PFO	Urban (Housing, Commercial Development & Mining	3	11.2
	PSS/EM	Urban (Housing)	1	13.3
	PEM	Urban (Housing)	1	0.8
	L2UB	Urban (Marina Breakwater)	1	6.3
Gain (From Upland)	PUB	Agriculture (Pond Construction)	11	5.4
	PEM	Agriculture (Channel Widening)	1	0.3
	PFO	Agriculture (Abandoned Farming of Wet Soils)	1	33.1
	PSS/EM	Urban (Altered Drainage Patterns)	1	3.0
Changes in Wetland Type	PFO to PUB	Agriculture (Pond Construction)	3	2.2
	PFO to PEM	Agriculture (Clearing & Partial Drainage)	1	6.2
	L2UB to L2US	Urban (Deposition)	1	0.9

*PUB - palustrine unconsolidated bottom
PFO - palustrine forested wetland
PSS - palustrine scrub - shrub wetlands
PSS/EM - palustrine scrub - shrub/emergent wetland
L2UB - lacustrine littoral unconsolidated bottom
L2US - lacustrine littoral unconsolidated shore

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