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Wetland Trends for the Hazelton Quadrangle in Pennsylvania (1981 to 1987)

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WETLAND TRENDS FOR THE HAZELTON QUADRANGLE IN PENNSYLVANIA (1981 to 1987)

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INTRODUCTION

Wetlands are subjected to multiple impacts, both natural and human-induced. They may change from one type to another, e.g., emergent wetland to scrub-shrub wetland, due to natural succession or to minor filling or drainage. Wetlands are also destroyed directly or indirectly by human activities. Most wetlands, however, change gradually over long periods of time. Knowledge of wetland losses and gains is important for evaluating the effectiveness of government programs and policies designed to protect wetlands and for developing strategies to reverse undesirable trends.

The U.S. Environmental Protection Agency (EPA) and the U.S. Fish and Wildlife Service (FWS) provided funding to initiate quadrangle-based wetland trends studies for selected areas in the Chesapeake Bay watershed. These studies identify the extent and nature of small- and large-scale wetland alterations for selected local areas.

The purpose of this report is to present the findings of the wetland trends analysis study for the Hazelton Quadrangle in Pennsylvania, one of numerous study areas selected by the EPA and FWS for detailed wetland trends analysis.

STUDY AREA

The study area is the Hazelton Quadrangle in Pennsylvania (Figure 1) which has a land surface area of approximately 56 square miles. The study area encompasses one large-scale (1:24,000) U.S. Geological Survey topographic quadrangle: Hazelton.

METHODS

Wetland trends analysis involves comparing aerial photography from at least two time periods. For the present study, aerial photos from 1981 and from 1987 were examined and compared to determine the extent of the wetland changes (losses, gains, or changes in wetland type) that occurred during that time period in the study area.

The 1981 photography was 1:58,000 scale color infrared (CIR) aerial photography acquired by the U.S. Geological Survey's National High-Altitude Photography Program (NHAP). The 1987 photography was 1:40,000-scale CIR aerial photography acquired by the National Aerial Photography Program (NAPP). Wetlands and deepwater habitats were initially interpreted on the 1:58,000 photography and classified according to the Service's official wetland classification system (Cowardin, et al. 1979), following standard NWI mapping conventions (National Wetlands Inventory, 1990). These interpretations served as the basis for evaluating recent wetland trends.

The two sets of photographs were compared using an Ottico Meccanica Italiana stereo facet plotter. Changes and map refinements were transferred to an NWI map using this device. Causes of change were recorded for each polygon. The minimum mapping unit for wetlands was generally 1/2 acre, except for ponds, which were mapped when 1/10th of an acre or larger in size. Changes as small as 1/10th acre were detected. Wetland boundaries were improved and previously undetected wetlands were added to the original maps because the larger scale and more apparent seasonal signs of wetland hydrology on the NAPP photos improved our ability to detect and classify wetlands. Quality control of all photointerpretation was performed by a second photointerpreter.

Interpreted data were digitized and acreage summaries generated. Tables were then prepared to present the study's findings.

RESULTS

Current Status

In 1987, the study area possessed about 728 acres of wetlands, excluding linear fringing wetlands along narrow streams. This total amounts to roughly 2 percent of the study area's land surface. Table 1 summarizes the acreage of the different classification types found in the study area. Palustrine wetlands are the only wetland type found. Forested areas alone account for 59 percent of the palustrine wetlands.

Recent Wetland Trends

The results of the wetland trends analysis study are presented in Tables 2 through 9. The following discussion highlights the more significant or interesting findings.

Vegetated Wetlands

From 1981 to 1987, about 14 acres of vegetated wetland changed (Table 2). Only 4 acres were converted to upland due to roads, recreational facilities, and reservoirs (Table 3). Most of the wetland change was forested wetland changing to other vegetated wetlands (Table 2). About 11 acres of forested wetlands were converted to deepwater habitats, while about 12 acres changed to other wetlands (including changes of water regime within the forested wetland category) (Table 5). Modest gains in emergent and scrub-shrub wetlands came from other wetland types (Table 7).

Nonvegetated Wetlands

About 30 acres of new nonvegetated wetlands, essentially ponds, were created from upland. Thirty-one acres of nonvegetated wetlands were filled in and another nine acres changed to vegetated wetland (Table 8). Most of the new ponds were the result of mining activities (Table 9).

SUMMARY

The study area has about 2 percent of its land mass covered by wetlands. Wetlands totaling 728 acres in 1987 were identified in the study area by the Service's National Wetlands Inventory. Palustrine forested wetland is the dominant wetland type, representing 59 percent of the wetlands in the study area. Between 1981 and 1987, the study area lost about 15 acres of vegetated wetlands, with roughly 4 acres converted to upland. Semipermanently flooded emergent wetland was the type most frequently converted to upland. Pond construction added about 30 acres of palustrine nonvegetated wetlands, but this gain was essentially nullified by pond losses of 42 acres to upland and vegetated wetlands. This was primarily due to mining activity. The overall trend for the study area's wetlands was losses of vegetated wetlands and losses in nonvegetated wetlands (mostly ponds). The losses of vegetated wetlands represent known losses of valuable fish and wildlife habitats and areas providing other valued functions. While this report documents recent trends in the study area's wetlands, it does not address changes in the quality of the remaining wetlands. As development increases, the quality of wetlands can be expected to deteriorate due to runoff, increased sedimentation, groundwater withdrawals, increased water pollution, and other factors, unless adequate safeguards are taken to protect not only the existence of wetlands, but their quality.

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Table 1. Acreage of wetland types for the Hazelton Quadrangle in Pennsylvania (1987).

Wetland Type	Acres
PALUSTRINE WETLANDS	
Emergent	45.74
Forested	431.55
Scrub-Shrub	50.28
Total Palustrine Vegetated Wetlands	**527.57**
Unconsolidated Bottom (Ponds)	169.61
Unconsolidated Shore	31.50
Total Palustrine Nonvegetated Wetlands	**201.11**
TOTAL WETLANDS	**728.68**

Table 2. Changes of vegetated wetlands for the Hazelton Quadrangle in Pennsylvania (1981 to 1987).

Wetland Type	Converted to Upland (acres)	Changed to Other Vegetated Wetlands * (acres)	Converted to Deepwater Habitat (acres)
Palustrine Emergent	2.29	0.00	0.00
Palustrine Forested	0.00	9.68	11.30
Palustrine Scrub-Shrub	1.78	0.00	0.00
Total	4.07	9.68	11.30

* Represents changes in class (e.g., emergent to scrub-shrub) but not changes in water regime within a given wetland class.

Table 3. Causes of vegetated wetland loss to upland for the Hazelton Quadrangle in Pennsylvania (1981 to 1987).

Cause of Loss	Acres
Recreational Facility Development	1.78
Road Construction	1.48
Reservoir Construction, Improvement	0.81
Total	4.07

Table 4. **Conversion of hydrologically similar palustrine vegetated wetlands to upland for the Hazelton Quadrangle in Pennsylvania (1981 to 1987).**

Palustrine Wetland Type	**Acres**
Semipermanently Flooded	1.48
Seasonally Flooded/Saturated	2.59
Total	4.07

Table 5. **Changes in palustrine forested wetlands for the Hazelton Quadrangle in Pennsylvania (1981 to 1987).**

Forested Wetland Type	**Changed to Other Wetland Types * (acres)**	**Changed to Deepwater Habitat (acres)**	**Total Loss (acres)**
Temporarily Flooded	6.09	0.00	6.09
Seasonally Flooded/Saturated	5.52	9.63	15.15
Semipermanently Flooded **	0.71	1.67	2.38
Total	12.32	11.30	23.62

* Includes both changes in class (e.g., forested to emergent) and changes in water regime within a given class.

** Represents dead forested wetlands.

Table 6. Causes of loss in palustrine emergent wetlands for the Hazelton Quadrangle in Pennsylvania (1981 to 1987).

Palustrine Emergent Type	Converted to Upland (acres)	Cause of Loss for PEM
Seasonally Flooded/Saturated	0.81	Reservoir Construction/Improvement
Semipermanently Flooded	1.48	Road Construction
Total Palustrine Emergent Loss	2.29	

Table 7. Gains in vegetated wetlands for the Hazelton Quadrangle in Pennsylvania (1981 to 1987).

Wetland Type	Gain from Nonvegetated Wetlands (acres)	Gain from Other Vegetated Wetlands * (acres)
Palustrine Emergent	9.19	6.23
Palustrine Scrub-Shrub	0.00	3.45
Total	9.19	9.68

* Represents changes in class (e.g., emergent to scrub-shrub) but not changes in water regime within a given class.

Table 8. Gains and losses in palustrine nonvegetated wetlands for the Hazelton Quadrangle in Pennsylvania (1981 to 1987).

Wetland Type	Gained From Upland (acres)	Lost to Upland (acres)	Changed to Vegetated Wetlands (acres)	Changed to Other Nonvegetated Wetlands (acres)
Palustrine Unconsolidated Bottom	17.11	31.35	9.19	1.41
Palustrine Unconsolidated Shore	13.26	0.00	0.00	0.00
Total	30.37	31.35*	9.19	1.41

* Of this total, 29.31 acres were converted to upland due to mining activities.

Table 9. Causes of recently constructed ponds on upland sites for the Hazelton Quadrangle in Pennsylvania (1981 to 1987).

Causes	Pond Acreage Created
Mining	24.70
Ponds in undeveloped setting	4.68
Urban ponds	0.50
Farm ponds	0.49
Total	30.37