August 1994

Wetland Status and Trends in St. Marys County, Maryland (1981-82 to 1988-89)

U.S. Department of the Interior
Fish and Wildlife Service
Region 5

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Maryland Department of Natural Resources
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August 1994

This report should be cited as follows:

Foulis, D.B., and R.W. Tiner. 1994. Wetland Status and Trends in St. Marys County, Maryland (1981-82 to 1988-89). U.S. Fish and Wildlife Service, Hadley, MA. Ecological Services report R5-93/20, 13 pp.

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 Maryland Department of Natural Resources, Water Resources Administration provided funding to initiate county-based wetland trends studies in Maryland. These studies identify the extent and nature of wetland alterations for designated local areas.

The purpose of this report is to present the findings of the wetland trends analysis study for St. Marys County, Maryland.

STUDY AREA

The study area is St. Marys County, Maryland, situated on the Atlantic Coastal Plain and bordering Chesapeake Bay, the Potomac River, the Wicomico River, and the Patuxent River (Figure 1). The County has a land surface area of approximately 373 square miles (Hoffman 1992). The study area encompasses 23 large-scale (1:24,000) U.S. Geological Survey topographic quadrangles: Barren Island, Benedict, Broomes Island, Burgess, Burgess East, Charlotte Hall, East Point Lookout, Heathsville, Hollywood, Hughesville, Kinsale, Leonardtown, Mechanicsville, Piney Point, Point Lookout, Point No Point, Richland Point, Rock Point, St. Clements Island, St. Georges Island, St. Marys City, Solomons Island, and Stratford Hall.

METHODS

Wetland trends analysis involves comparing aerial photography from at least two time periods. For the present study, aerial photos from 1981-82 and from 1988-89 were examined and compared to determine the extent of the wetland changes (losses, gains, or changes in type) that occurred during that time period in St. Marys County.

The 1981-82 photography was 1:58,000 scale color infrared aerial photography acquired by the National High Altitude Photography Program (NHAP). The 1988-89 photography was 1:40,000 scale color infrared aerial photography acquired by the National Aerial Photography Program (NAPP). Wetlands and deepwater habitats were interpreted on

the NHAP photography and classified according to the Service's official wetland classification system (Cowardin, et. al. 1979) following standard National Wetlands Inventory (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 a Bausch and Lomb SIS-95 zoom stereoscope. Changes were delineated on mylar overlays attached to the NAPP photographs. Cause of change was recorded for each polygon. The minimum mapping unit for wetlands was generally 0.5 acre, except for ponds, which were mapped when 0.1 acre or larger in size. Changes as small as 0.1 acre were detected. Wetland boundaries were improved and previously undetected wetlands were added to the original maps because the larger scale and more apparent signs of wetland hydrology of the NAPP photos improved our ability to detect and classify wetlands. Delineated changes and map refinements were then transferred to an NWI map using an Ottico Meccanica Italiana stereo facet plotter. Quality control of all photointerpretation was performed by a second photointerpreter. Tables were then prepared to present the study's findings.

RESULTS

Current Status

In 1988-89, St. Marys County contained about 16,730 acres of wetlands (roughly 7% of the County's land surface), excluding linear fringing wetlands along narrow streams. Table 1 summarizes the acreage of the different wetland types found in the County. Palustrine wetlands predominated with 10,076 acres, representing 60.2% of the County's total wetland acreage. Forested wetlands accounted for 86.6% (8,723 acres) of all palustrine wetlands, and about 52.1% of the County's wetland total. Tidal palustrine wetlands totaled 1,324 acres, representing 13.1% of the County's freshwater wetlands.

Estuarine wetlands comprise about 39.6% (6,629 acres) of the County's wetlands. Emergent wetlands (e.g., salt and brackish marshes) were the predominant vegetated type, accounting for almost 90.2% (3,142 acres) of the County's estuarine vegetated wetlands.

Recent Wetland Trends

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

Vegetated Wetlands

Between 1981-82 and 1988-89, over 49 acres of vegetated wetlands were converted to upland (Table 2). Most of these losses affected palustrine forested wetlands. Housing and agriculture were the most significant causes of vegetated wetland loss, with commercial construction also significant (Table 3). About 154 acres of vegetated wetland changed from

one type to another. Upland conversion impacted the temporarily flooded palustrine wetland type more than others (Table 4). Approximately 232 acres of palustrine forested wetlands were converted to upland or changed to other wetland types (Table 5). Vegetated wetland gain from upland was limited to approximately 11 acres (Table 6). Most gains in particular types of vegetated wetlands came from other vegetated wetland types (Table 6). Beaver activity affected 118 acres of vegetated wetlands (Table 7).

Nonvegetated Wetlands

About 119 acres of new ponds were created from upland, and over 39 acres were constructed in vegetated wetlands (Table 8). More than 7 acres of ponds were converted to upland, while 39 acres changed to vegetated wetlands. Approximately 63% of the new ponds built in uplands were the result of farm pond construction (Table 9).

CONCLUSION

The County had approximately 7% of its land mass covered by wetlands. Wetlands totaling 16,730 acres (in 1988-89) were identified in the County by the Service's National Wetlands Inventory. Palustrine wetland was the dominant type, representing 60.2% of the wetlands in the County.

Between 1981-82 and 1988-89, the County lost about 143 acres of vegetated wetlands, with roughly 49 acres converted to upland. Temporarily flooded wetland was the type most frequently converted to upland. Pond construction added about 158 acres of palustrine nonvegetated wetlands, but this gain was reduced to about 111 acres by pond losses to upland and vegetated wetlands.

The overall trend for the County's wetlands was losses of vegetated wetlands and gains in nonvegetated wetlands (mostly ponds). The significance of the increase in ponds to fish and wildlife species has not been assessed and remains a point for discussion. The losses of vegetated wetlands, however, represent known losses of valuable fish and wildlife habitats and areas providing other valued functions, including flood water storage, water quality enhancement, and local water supply.

While this report documents recent trends in the County'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 agricultural 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.

ACKNOWLEDGMENTS

Funding for this project was provided by the Maryland Department of Natural Resources, Water Resources Administration through an existing cooperative agreement with the Service. David G. Burke was the project coordinator, and we appreciate his interest in monitoring wetland trends in Maryland.

Wetland maps and digital data were compiled by the U.S. Fish and Wildlife Service's National Wetlands Inventory Office at St. Petersburg, Florida. Special appreciation is extended to Becky Stanley and Linda Shaffer for their assistance. Photointerpretation was performed by the senior author and quality controlled by Glenn Smith. John Eaton compiled trend statistics, tables, and graphics for this report. Todd Nuerminger tabulated raw data.

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Figure 1. Location of Study Area - St. Marys County, Maryland.

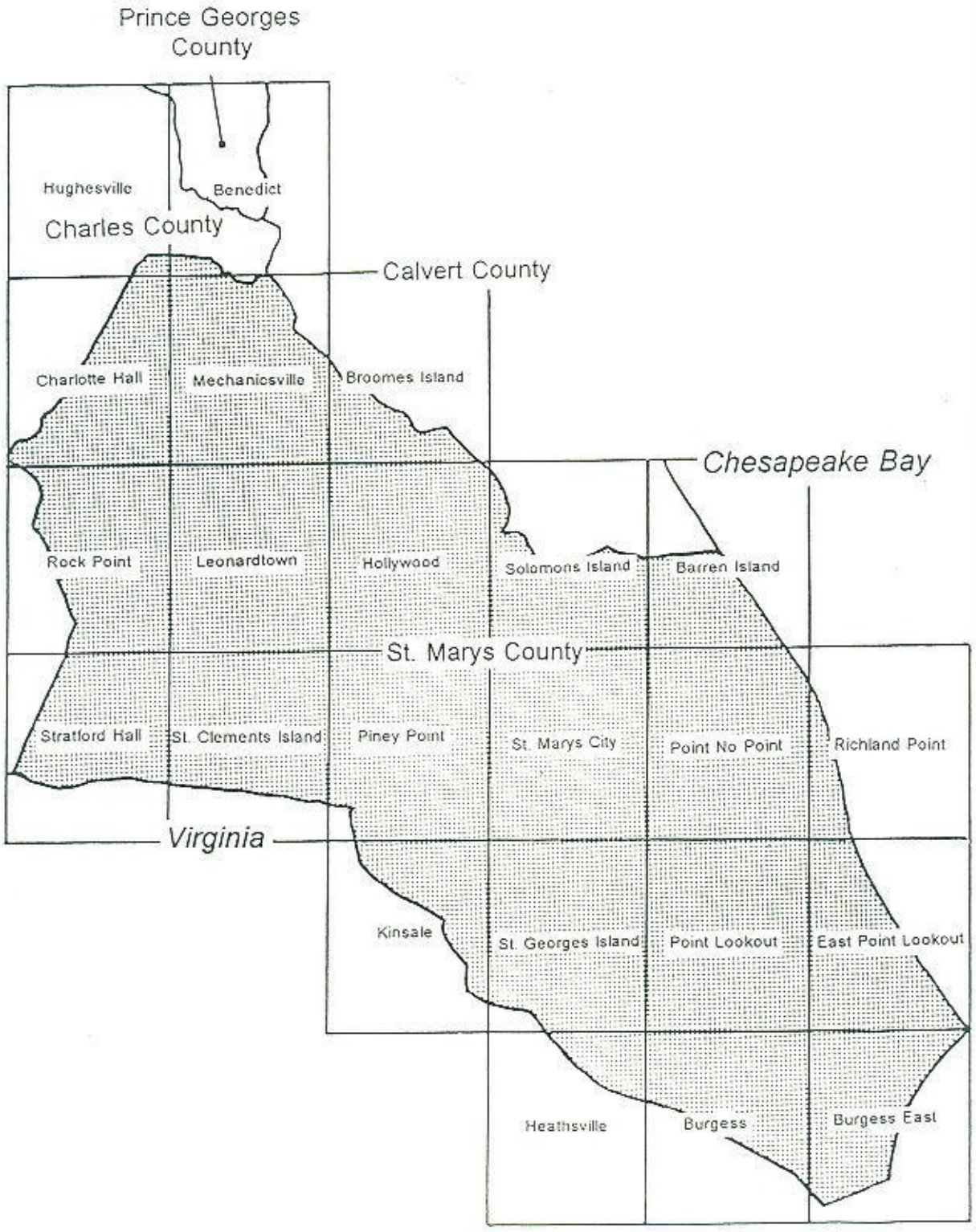

Table 1. Acreage of wetland types in St. Marys County, Maryland (1988-89).

Wetland Type	Acres	% of Total
PALUSTRINE WETLANDS		
Tidal Emergent		
Seasonally Flooded-Tidal	48.7	
Temporarily Flooded-Tidal	6.3	
(Subtotal Tidal)	*(55.0)*	0.3
Nontidal Emergent		
Semipermanently Flooded	20.2	
Seasonally Flooded/Saturated	167.5	
Seasonally Flooded	51.2	
Saturated	3.1	
Temporarily Flooded	110.2	
(Subtotal Nontidal)	*(352.2)*	2.1
Total Palustrine Emergent Wetlands	**407.2**	2.4
Tidal Forested		
Deciduous, Broad-leaved	1,026.5	
Evergreen, Needle-leaved	89.7	
(Subtotal Tidal)	*(1,116.2)*	6.7
Nontidal Forested		
Evergreen, Needle-leaved		
Seasonally Flooded/Saturated	8.2	
Seasonally Flooded	25.1	
Temporarily Flooded	282.8	
Deciduous, Broad-leaved		
Seasonally Flooded/Saturated	476.6	
Seasonally Flooded	1,388.4	
Temporarily Flooded	5,382.5	
Semipermanently Flooded	6.4	
Dead	36.1	
(Subtotal Nontidal)	*(7,607.2)*	45.5
Total Palustrine Forested Wetlands	**8,723.4**	52.1

Table 1, continued

Wetland Type	Acres	% of Total
Tidal Scrub-Shrub		
Deciduous, Broad-leaved		
Temporarily Flooded-Tidal	4.3	
Seasonally Flooded-Tidal	148.3	
Semipermanently Flooded-Tidal	0.4	
(Subtotal Tidal)	*(153.0)*	0.9
Nontidal Scrub-Shrub		
Deciduous, Broad-leaved		
Seasonally Flooded/Saturated	118.9	
Seasonally Flooded	48.2	
Temporarily Flooded	13.5	
Semipermanently Flooded	14.9	
(Subtotal Nontidal)	*(195.5)*	1.2
Total Palustrine Scrub-Shrub Wetlands	**348.5**	2.1
Aquatic Bed	6.6	
Total Palustrine Vegetated Wetlands	**9,485.7**	56.7
Unconsolidated Bottom (Ponds)	587.8	
Unconsolidated Shore	2.5	
Total Palustrine Nonvegetated Wetlands	**590.3**	5.9
GRAND TOTAL PALUSTRINE WETLANDS	**10,076.0**	60.2
ESTUARINE WETLANDS		
Emergent		
Regularly Flooded	4.8	
Irregularly Flooded	2,304.6	
Regularly Flooded, Oligohaline	7.0	
Irregularly Flooded, Oligohaline	784.8	
Unknown, Oligohaline	40.4	
Total Estuarine Emergent Wetlands	**3,141.6**	18.8

Table 1, continued

Wetland Type	Acres	% of Total
Scrub-Shrub		
Irregularly Flooded	133.6	
Irregularly Flooded, Oligohaline	40.4	
Total Estuarine Scrub-Shrub Wetlands	**177.0**	1.1
Forested, Irregularly Flooded	151.2	
Total Estuarine Forested Wetlands	**151.2**	0.9
Total Estuarine Vegetated Wetlands	**3,482.2**	20.8
Total Estuarine Unconsolidated Shore	**3,146.7**	18.8
GRAND TOTAL ESTUARINE WETLANDS	**6,628.9**	39.6
LACUSTRINE WETLANDS		
Unconsolidated Shore	24.9	
GRAND TOTAL LACUSTRINE WETLANDS	**24.9**	0.1
TOTAL WETLANDS	**16,729.8**	**100.0**

Table 2. Changes of vegetated wetlands in St. Marys County, Maryland (1981-82 to 1988-89).

Wetland Type	Converted to Upland (acres)	Changed to Other Vegetated Wetlands* (acres)	Changed to Nonvegetated Wetlands (acres)	Converted to Deepwater Habitat (acres)
Palustrine Emergent	8.0	16.7	3.8	33.9
Palustrine Scrub-Shrub	0.0	6.5	3.4	12.9
Palustrine Forested	38.0	88.3	24.9	2.2
Estuarine Aquatic Bed	0.0	0.0	3.0	0.0
Estuarine Emergent	3.2	38.2	6.1	3.3
Estuarine Scrub-Shrub	0.0	3.9	0.0	0.0
Total	**49.2**	**153.6**	**41.2**	**52.3**

*Represents changes in wetland 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 in St. Marys County, Maryland (1981-82 to 1988-89).

Cause of Loss	Acres
Housing	14.4
Agriculture	11.8
Commercial Development	10.7
Unknown Cause	4.4
Road/Highway Construction	4.3
Ditching	3.1
Marina Facilities	0.4
Total	**49.1**

Table 4. **Conversion of hydrologically similar palustrine vegetated wetlands to upland in St. Marys County, Maryland (1981-82 to 1988-89).**

Palustrine Wetland Type	Acres	% Total Loss
Semipermanently Flooded	0.5	1.0
Temporarily Flooded	35.5	77.0
Seasonally Flooded	7.1	15.0
Seasonally Flooded/Saturated	2.5	6.0
Seasonally Flooded-Tidal	0.4	1.0
Total	**46.0**	**100.0%**

Table 5. **Changes in palustrine forested wetlands in St. Marys County, Maryland (1981-82 to 1988-89).**

Forested Wetland Type	Converted to Upland (acres)	Changed to Other Wetland Types* (acres)	Total Loss (acres)
Seasonally Flooded/Saturated	2.5	24.8	27.4
Seasonally Flooded	2.4	7.1	9.5
Temporarily Flooded	32.7	98.1	130.8
Semipermanently Flooded	0.0	15.4**	15.4
Seasonally Flooded-Tidal	0.4	46.4	46.7
Temporarily Flooded-Tidal	0.0	2.2	2.2
Total	**38.0**	**194.0**	**232.0**

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

**10.9 acres of this total are dead forested wetlands.

Table 6. Gains in vegetated wetlands in St. Marys County, Maryland (1981-82 to 1988-89).

Wetland Type	Gain from Nonvegetated Wetlands (acres)	Gain from Upland (acres)	Gain from Other Vegetated Wetlands (acres)*
Palustrine Emergent**	34.3	1.3	71.9
Palustrine Scrub-Shrub**	5.0	0.0	45.8
Palustrine Forested	0.0	6.8	0.0
Palustrine Aquatic Bed	0.0	0.3	0.0
Estuarine Scrub-Shrub	0.0	0.0	35.9
Estuarine Forested	0.0	2.9	0.0
Total	**39.3**	**11.3**	**153.6**

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

Also, **2.3 acres of palustrine emergent wetlands and **3.9** acres of palustrine scrub-shrub wetlands were created from deepwater habitat.

Table 7. Changes of wetlands in St. Marys County, Maryland due to beaver activity (1981-82 to 1988-89).

Wetland Type	Change in Water Regime Only (acres)	Change in Vegetated Class (acres)	Gain from Upland (acres)
Palustrine Emergent	0.9	0.7	0.0
Palustrine Scrub-Shrub	0.0	3.9	6.8
Palustrine Forested	73.3	26.3	0.0
Estuarine Emergent	0.0	2.3	0.0
Estuarine Scrub-Shrub	0.0	3.9	0.0
Total	**74.2**	**37.1**	**6.8**

Table 8. Gains and losses in nonvegetated wetlands in St. Marys County, Maryland (1981-82 to 1988-89).

	GAINS		LOSSES		
Wetland Type	Created from Upland (acres)	Created in Vegetated Wetlands (acres)	Changed to Converted to Upland (acres)	Changed to Vegetated Wetlands (acres)	Deepwater Habitats (acres)
Palustrine Unconsolidated Bottom	118.5	39.0	7.2	38.6	0.0
Palustrine Unconsolidated Shore	0.0	0.0	0.0	0.6	0.0
Estuarine Unconsolidated Shore*	1.5	2.3	0.0	0.0	9.1
Total	**120.0**	**41.3**	**7.2**	**39.2**	**9.1****

*Also, 6.4 acres of estuarine unconsolidated shore were gained from estuarine deepwater habitat due to coastal erosion and deposition and beach nourishment projects.

**Due to coastal erosion and deposition.

Table 9. Causes of recently constructed upland ponds in St. Marys County, Maryland (1981-82 to 1988-89).

Causes	Pond Acreage
Farm Ponds	74.9
Ponds of Unkown Purposes	26.3
Ponds in Undeveloped Areas	5.2
Other Ponds	4.4
Sand and Gravel Pit Ponds	3.5
Urban Ponds	3.4
Stormwater Detention Basins	0.9
Total	**118.6**