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Booklet I

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**MICHIGAN COASTAL WETLANDS:
WHAT GOOD ARE THEY?**

MICHIGAN SEA GRANT PROGRAM

Swamps, bogs, and marshes conjure up visions of muck, weeds and bugs. Of what possible use could they be? In fact, wetland areas are natural ways to control flooding, and purify water. And they provide habitat for waterfowl, wildlife and fish. As land resources, wetlands serve as potential areas for agricultural, urban and recreational expansion.

This booklet, one of three reference articles about coastal wetlands in Michigan, gives general information about what wetlands are, where they are in the state, and why they are important.

Booklet II in this series gives a detailed description of St. John's Marsh in southeastern Michigan; Booklet III discusses land management alternatives for the St. John's Marsh.

This series was taken from *COASTAL WETLANDS With Emphasis on Freshwater Systems* by Jane Kreisman, James McDonald, Gary Rosenbaum, and Jonas Snyder, Regional Planning Program, School of Natural Resources, University of Michigan, Ann Arbor, Michigan, Ann Arbor, Michigan, April 1976. The series was prepared by Kurt Acker and Nancy Karner and edited by Suzanne Tainter. Marcia Dorr did the cover drawings. Cheryl Baker typed the booklets.

MAJOR COASTAL WETLAND AREAS IN MICHIGAN



INTRODUCTION

Definition of Coastal Wetlands

Coastal wetlands include any bank, marsh, swamp, meadow, flat, or other lowland between extremes of high and low water. Tidal action or coastal storm flooding affects them. Wetlands also include those areas, above or below water, which are necessary for the stability of the wetland community. Wetlands are generally within a mile of the shoreline and usually touch that shoreline.

Location

This report emphasizes the coastal wetlands in the southeastern Michigan-Ontario region, particularly from Port Huron to Toledo. This area includes a portion of Lake Huron, the St. Clair River, Lake St. Clair, the Detroit River, and the western end of Lake Erie to the Michigan-Ohio line.

Importance

Coastal wetlands form a transition zone between dry land and water, and they perform a number of important ecological functions. They:

- * form sumps and drainage basins which stabilize water runoff and aid flood control
- * store water in porous rock and sandy areas
- * decontaminate and purify water
- * store food sources in rivers, bays, and lake inlets
- * which act as nurseries for commercial and sport fish
- * provide habitat for varieties of plant and animal life

In the past, Americans thought of "wetlands" as "wastelands" and drained, dredged, or filled, these areas, converting the land to some desired use. Originally the United States had 127 million acres of wetlands, today less than half that number remain. Since only one-quarter of Michigan's original 11 million wetland acres remain, the state's destruction rate is higher than the national rate. Public ownership protects approximately one-third of Michigan's surviving wetlands.

NATURAL VALUES OF WETLANDS

Interrelationships between lakes and the surrounding land are complex. Water systems, land characteristics, wildlife, wildfowl, and fish are all inter-related. Hunters and game area managers recognized natural values of wetlands to waterfowl and wildlife long before ecologists focused attention on the wetlands.

Control Function

Wetlands play a significant role as natural flood and erosion control mechanisms. This is especially true of the Michigan coastal region.

Wetlands adapt well to large inputs of water because they allow fluctuating water levels and have aquatic vegetation. Wetlands have a significant water-holding capacity and effectively moderate extreme water levels. This flood control mechanism is especially important to the Lake St. Clair and Lake Erie shorelands. These coastal areas have gentle, sloping lake bottoms, flat shorelands, and prevailing strong winds, which all together may result in severe flooding during storms. Wetlands can act as buffers and holding basins, preventing flooding of valuable dry land. Unfortunately, people have overlooked this practical and environmentally sound way of dealing with flooding.

Yearly seasonal trends cause long-term changes in water levels, with the lowest stages in the winter and the highest in the summer. Changing water levels actually maintain the productivity of wetlands by flushing nutrients into and out of the system.

Besides providing flood control, wetlands also act as protective barriers to the erosive forces of storms and waves. Wind-generated waves may be the primary cause of shoreland erosion in Michigan. Wetlands serve as sediment traps and buffer zones against the impact of waves.

Water Purification

Wetlands also help improve water quality in various ways. Several factors may affect the chemical composition of the water in coastal wetland areas:

- * surface water runoff
- * climatic conditions
- * upstream activities
- * water circulation patterns

Wide ranges of chemical inputs to the Michigan coastal wetlands are probable, due to nearby industrial, residential, and agricultural areas. Research shows that wetlands filter water, which reduces nutrient loads and improves water quality. Chemical inputs may adversely affect this water purification process.

Another water quality value wetlands possess are as settling and filtering basins for sediments, organic matter, and nutrients. Wetlands trap sediment runoff, creating rich soil for plant growth. Marshes recycle organic matter. Destruction of coastal wetlands may decrease regional water quality.

Waterfowl Habitat

Wetlands in the coastal region between Michigan and Ontario Province provide important habitat for both migratory and nesting waterfowl, like ducks, geese, coots, and swans. At least 25 species of waterfowl use this area during spring and fall migrations.

More than one million ducks use Lake St. Clair and the western basin of Lake Erie during peak migrations. Endangered species in this area include eagles; protected species include whistling swans, osprey, and marsh hawks. Two-thirds of North America's 100,000 whistling swans use these wetlands.

Shallow open-water areas and adjacent uplands provide supplemental food and refuge for waterfowl. Adjacent upland areas cannot take the place of natural wetlands, however. The increasing destruction of wetlands concentrates the waterfowl onto existing refuges and strains the capacity of the remaining areas.

Wildlife Habitat

Wetlands provide a transition between dry land and open water, a prime habitat for certain wildlife. This area provides optimum conditions for mammals needing wetland shelter and breeding areas. Examples are fox, racoon, skunk, opossum, and mink. Muskrats thrive on the underwater parts of cattail and other marsh plants. Amphibians and reptiles are also common wetland inhabitants. Shallow marsh areas in Michigan support numerous species of clams, mussels, and snails, all of which provide additional food for aquatic birds and animals.

Fish

Estimates show 60 to 70 percent of the fish in United States coastal waters depend directly on coastal wetlands for food, spawning, and shelter. Wetlands enhance fish production because they are naturally fertile. They are feeding and nursery grounds for young fish. Lake St. Clair has shallow water depths averaging 10 feet, thus light penetrates to the bottom of the lake, allowing plant growth throughout the lake.

The delta area of the St. Clair River is an important spawning ground for sturgeon, an endangered species. The southeastern corner of Lake St. Clair is a major spawning area for a majority of the walleye in the St. Clair River and lower Lake Huron. Shallow bays like Anchor Bay, Goose Bay, Muscamoot Bay, St. Anne's Bay, and Mitchell Bay provide valuable spawning and nursery grounds for largemouth and

smallmouth bass, pike, panfish, and carp. Wetland areas of Lake Erie are important spawning and nursery areas for yellow perch, white bass, gizzard shad, alewife, and yellow pickerel. The Anchor Bay wetlands of Lake St. Clair are especially important northern pike and muskellunge spawning areas. The lake also supports the only major Great Lakes muskellunge fishery.

LAND RESOURCE VALUES

Population pressures and increasing urbanization are forcing assessment of land values. Wetlands could serve as future land for residential development or agricultural use. But any decision to convert coastal wetlands for either use must first take into account the natural values of these areas. This section discusses agricultural, urban development, and recreational uses for wetlands.

Agricultural Uses

Agricultural use of wetlands requires diking and draining to create a fertile area which will not be flooded during the growing season. This use of wetlands destroys functioning wetlands and alters those remaining. Agricultural use increases the runoff of nutrients and pollutants into the nearby wetlands and forces the wildlife to survive in a smaller wetland area. Agricultural use also disrupts natural drainage patterns in adjacent marshes. Wetlands do make rich agricultural areas, but this use may adversely affect the quality of adjacent regions.

Urban Development

Development in wetlands requires dredging and filling to create usable land from the marsh. The economy of this development depends on the cost of nearby land and the availability of inexpensive fill. Large cities tend to fill nearby wetlands to expand. The Detroit metropolitan area is following this pattern because inexpensive fill is available and the area is expanding. This development destroys some wetlands and alters nearby areas. Like agricultural uses, development increases water runoff and possible pollution hazards.

Recreational Use

Least damaging to the wetland ecological system is recreational use of these areas. While hunters and fishing enthusiasts take their catch with them, they leave the wetlands intact. In the Lake Erie and Lake St. Clair regions, an estimated 12,500 hunters take 75,300 ducks each year. Sport fishing is also a very popular activity in the large Lake St. Clair area.

SUMMARY

Michigan's coastal wetlands perform important ecological functions as natural water purification and flood control systems. Wetlands also provide habitat for wildlife and fish. Urban development and pressure from the surrounding area for additional land are prompting officials and citizens to study alternative land management programs. Booklet II of this reference series provides a detailed study of St. John's Marsh.

Copies of this and other publications are available from:

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