Arrangement & Development of Eastern Lake Ontario Wetlands

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Photo by Mary Penney

Introduction

Wetlands are exciting and lively places, although it may seem differently at first glance. The wet, muddy, and often "stinky" nature of some wetlands may cause some people to keep their distance! Some may avoid wetlands because they don't understand how wetlands such as swamps, marshes, fens, and bogs can maintain and even improve their daily lives.

In addition to providing habitat for interesting plants and animals, wetlands improve water quality, control flooding, and provide recreational opportunities like fishing and bird watching. Many of these functions are possible because of the diversity of plants and the arrangement of these plants, or zones, within wetlands.

Fun Fact:

According to the U.S. Environmental Protection Agency, wetlands are found on every continent but Antarctica.

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What are wetland plant zones?

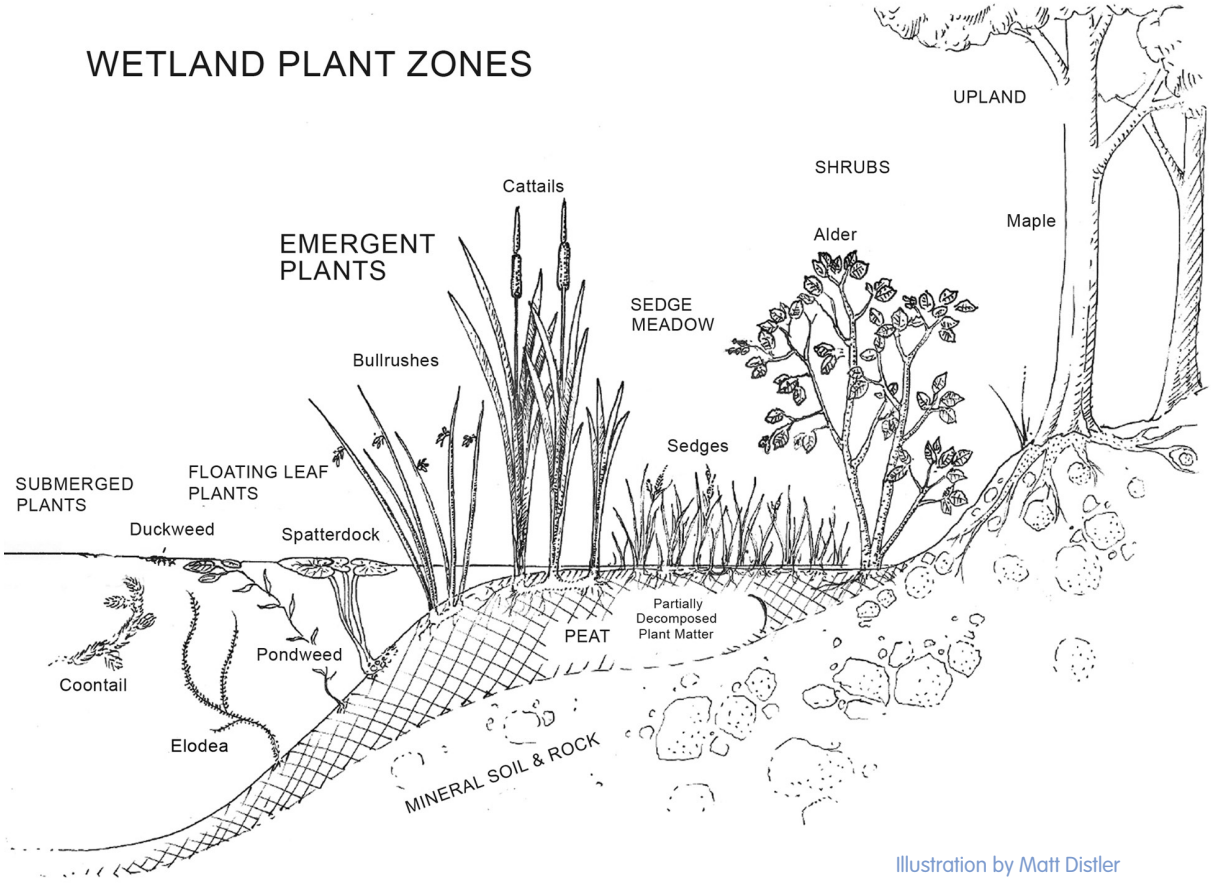


Illustration by Matt Distler

Wetlands are found where the water and land meet. There is often a steady slope, or incline, from deep waters through shallow wetland to the dry upland. Very often, a known series of plant groups is seen growing along that slope, making wetland "zones" (see illustration).

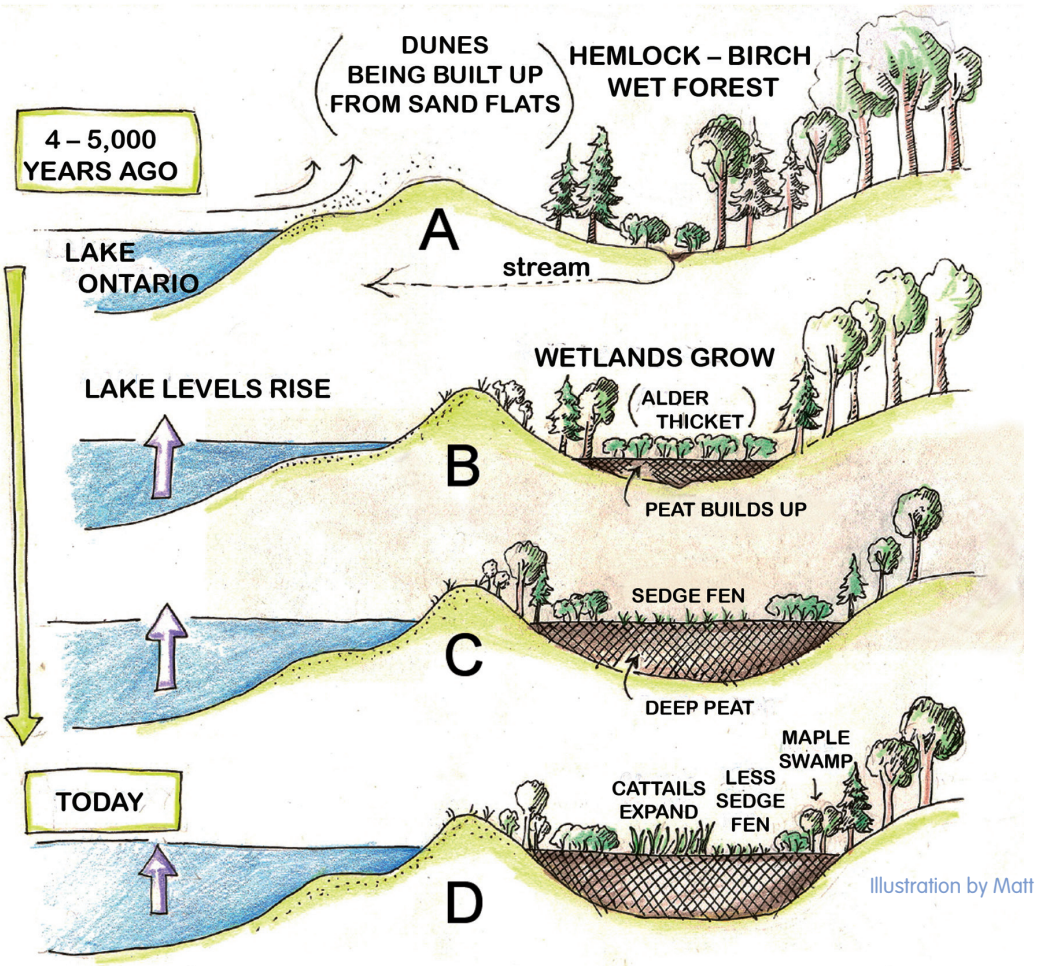
In the deep water you might find submerged (underwater) or floating plants. Some of these plants, like coontail (*Ceratophyllum demersum*) simply float freely in the water. Others, like pondweeds (*Potamogeton* spp.), have roots in the sediment. Some, like elodea (*Elodea canadensis*) have submerged leaves. Spatterdock (*Nuphar lutea*) and the tiny duckweed (*Lemna* spp.) have floating leaves or float entirely on the water's surface.

Closer to the shore in the shallow water, you will find plants with leaves that stick out of the water into the air. These are known as "emergent" plants and include bullrushes (*Scirpus* or *Schoenoplectus* spp.) and cattail (*Typha* spp.). Where the water is only a few inches deep, you will find many species of sedge (*Carex* and other genera). Often, these "sedge meadows" grow atop many feet of waterlogged peat. Peat is made of dead and decaying plants that have dropped into the water over thousands of years. Many small-statured plant species are found in these meadows including sedges, herbs and low shrubs. Small plants dominate here, in part, because there are too few nutrients to support big, fast-growing plants that could overgrow, and out-compete the smaller ones.

In upland areas, more nutrients are available and water levels rarely rise very high. There, taller shrubs like alder (*Alnus rugosa*) often form thickets. Sometimes you can find large swamps of red maple (*Acer rubrum*) bordering the upland.

The plant zones that we see along the eastern shore of Lake Ontario are not all the same. In some areas, wetlands go through cycles. They are created and dry up each year. But one characteristic that the wetlands along the eastern shore of Lake Ontario share is that it took thousands of years to for them to develop.

The story of how the Eastern Lake Ontario Wetlands came to be



Stages in the formation of the Eastern Lake Ontario Wetlands

Before Lake Ontario: If you stood on the present shore of Lake Ontario 12,000 years ago, you'd be under water. That's because an even larger lake, named Lake Iroquois, was there before Lake Ontario. Lake Iroquois not only covered the area of today's Lake Ontario, but also stretched further inland to where the cities of Syracuse and Rome are located today. The water that filled Lake Iroquois came from the massive glaciers that covered Canada and the northern United States during the last Ice Age. As those glaciers melted, dams of ice blocked the flow of water through the St. Lawrence River. This ice blockage caused the water to back up, creating Lake Iroquois.

The lake drains: The ice dams along the St. Lawrence River didn't last forever. As the climate warmed, the dams slowly melted, which allowed water to flow into the St. Lawrence River and to drain into the Atlantic Ocean. 5,000 years ago Lake Ontario's water level was below its present day average by an estimated 30 feet where the Eastern Lake Ontario dunes are today. As the water drained away, it exposed large flats of sand, allowing winds to create the 50-foot tall dunes we see today. Soon, water began to pool behind the dunes creating woodlands of hemlocks and birches (stage "A" above). These pools eventually became our modern-day wetlands.

The waters rise again: The weight of nearly a mile of ice had pushed the earth's crust down. As the land slowly rebounded, the outlet of Lake Ontario rose faster than the rest of the lake's edge, causing the lake basin to fill up again. Because waters rose so slowly (probably about 1-2 mm/year), the dead material from plants growing in the newly wetted areas built up as quickly as the water rose. This plant material formed peat in deep, mucky wetlands behind the dunes (stage "B" above).

Lake Ontario Wetlands

The wetlands change: As the hemlocks and birches that grew behind the dunes began to drown, the wetland became an alder thicket (stage "B"). After enough peat was built up, fewer nutrients and minerals could penetrate the central areas so that sedges and bog-like plants began to dominate (stage "C"). These plants characterize the most diverse portions of these wetlands today, the sedge meadow. There you can find not only sedges, but shrubs like leatherleaf and bog rosemary, and carnivorous plants like pitcher plants and sundews. In recent decades there have been major changes to these communities, however (stage "D"): nutrients and sediment from human disturbance, along with human control of water levels have contributed to an explosion of cattail in these wetlands, pushing the diverse sedge communities out of many areas.

Taking centuries to form and with many important ecological roles, the eastern Lake Ontario wetlands and other Great Lakes' wetlands are currently receiving local and national attention. Whether the topic is the natural flushing of wetlands to promote the natural cycles of plant zones found within wetlands or a rare species found within a wetland, ecologists are investigating ways to preserve the diversity of Great Lakes' wetlands.

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This fact sheet was prepared for the New York State Department of State, Division of Coastal Resources, with funds provided under Title 11 of the Environmental Protection Fund