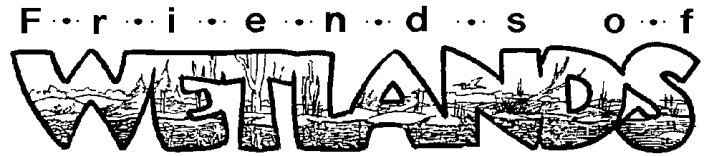


Basic Wetland Facts



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What is a wetland?

A wetland is a habitat that is halfway between a terrestrial (land) and an aquatic (water) environment. Wetlands officially must meet three requirements in order to be classified by the government as wetlands. These are:

1. wetland ("hydric" = having to do with water) soils: wetland soils are often clay-like and allow very little movement of water through them. Sometimes wetland soils are mostly organic (made of partly-decayed plant parts such as leaves and stems). Wetland soils are usually blackish, greyish, or even greenish, rather than the reddish or brown soils found in drier areas. These colors are due to chemical reactions that have to do with the absence (in wetland soils) or presence (in drier soils) of oxygen. Oxygen is mostly absent in wetland soils because they are usually soaked with water, rather than having the spaces between the soil particles holding air.

2. wetland hydrology (presence of water): wetlands have to have water present at least much of the time. Not all wetlands are wet all of the time, however, and not all wetlands have water sitting at their surface. The vernal ("spring") ponds near rivers in which many frogs and salamanders breed, for instance, usually dry up in late summer and the fall. These amphibians need these temporary wetlands to breed, because permanent pools usually contain fish which would eat the eggs, larvae (tadpoles), and even the adult frogs and salamanders. And a marsh may seem dry at the surface, but if one digs down six inches or a foot, one finds that the soil is waterlogged below the surface. This is important because the roots of the plants are in water soaked soil, which means that most of the plants growing there will be wetland plants. How long during the year the soil needs to be saturated (soaked) soil is still being discussed by scientists; the old (1989) rule was that it needed to be at least 5 days during the growing season, and that amount may be lengthened a little in some cases.

3. hydrophytic ("water plant") vegetation: usually, when plants have their roots soaked with water for too long, they die because they cannot get oxygen from the soil for respiration (which uses O_2 to break sugar into CO_2 and H_2O). Wetland plants have evolved from terrestrial (dry land) ancestors, and have evolved adaptations that let them live with their roots (or sometimes the entire plant) in water or water-soaked soil. One common adaptation of non-woody wetland plants is aerenchymous ("air-filled") tissues. This tissue is spongy (think of squeezing a cattail leaf) because it contains many special tubes that lead down from the green parts of the plant, where oxygen is produced during photosynthesis, to supply the roots with oxygen, is where it is constantly being used up by respiration. Some plants, like buttonbush, have evolved ways of breaking sugar apart without using oxygen. And plants such as Elodea, eelgrass, and coontail, which grow entirely under water (except for their flowers, which always grow into the air, a sure sign of their terrestrial beginnings), have other adaptations that allow them to survive in these aquatic environments.

Not all wetland plants grow *only* in wetlands; some prefer wetlands but can grow elsewhere, and are called **facultative** ("having the ability to do a certain thing"). Those which *must* grow in wetlands are called **obligate** ("having to do something").

Kinds of Wetlands

bogs: large chunks of glacial ice were left behind by retreating glaciers and were surrounded by sediments flowing out of these melting glaciers. When these chunks of ice melted, the depressions that were formed turned into bogs if there was no way for water to get into or out of them other than rain. Bogs have acidic water and floating mats formed from partly-decayed plant material. The mats start at the shore and grow inward, eventually covering the entire bog. These mats are very interesting places with unique plant communities,

including sphagnum mosses (which add to the acid levels in the bog), many species that are adapted to dry conditions (because they have such a hard time getting water from the acid bog water, plants behave as though they were in a very dry environment), and carnivorous plants - pitcher plant and sundew. The mats are also very dangerous places because people - and animals - can fall through and drown. Eventually the mat fills in the entire bog. Many well-preserved skeletons of ice-age animals such as woolly mammoths and mastodons have been discovered in filled-in bogs that have been mined for peat, which is the stuff from the old bog mat. Many of Ohio's bogs have been destroyed, and many of those that remain, such as Triangle Lake, Lake Kelsoe, Fern Lake, and Kent Bog, are protected as special Scientific Nature Preserves by the state of Ohio, and the public is not ordinarily allowed to go to these places any more. Lorain County has one fine bog, Camden Lake, which is also a state Scientific Nature Preserve.

fens: fens are unusual and special places which form when water seeps through alkaline soils (containing limestone or its related minerals) into depressions along gentle slopes found in the sediments left behind by melting glaciers. The water in fens is alkaline, and plants living there must be adapted to these alkaline conditions. There are a few fens in northern Ohio, including Herrick Fen near Kent, but none in Lorain County.

swamps: this is generally what forested wetlands are called. The most common trees in our swamp woods are pin oaks, swamp white oaks, and red maple. Other trees such as tupelo, sycamore, cottonwood, and American elm are also often found. Shrubs include elderberry, swamp rose, and European buckthorn - an alien species that is invading many of our local wetlands. Beautiful spring wildflowers such as bluebells, marsh marigold, buttercups, and violets, as well as sedges grow under the trees. Swamp woods originally covered almost all of northern Lorain County, but are mostly gone now due to drainage for farmland and development for houses, malls, and other human activities.

marshes: the term used for open wetlands without trees. Common plants in marshes include cattails, sedges, and rushes. A number of grasses are found in marshes as well. Marshes are rich in wildlife, including many birds and mammals. Ohio still has more fur-bearing animals killed such as mink, raccoon, and muskrat every year than any other state in the U.S. except for Louisiana, and it is our marshes that support most of these animals.

vernal pools: temporary ponds that fill with water during the spring rains and floods, but which dry up later in the summer or fall. These places are very important for a number of wildlife species, including amphibians (frogs, toads, and salamanders) which don't live in them year-round (many frogs live in trees or shrubs or on the ground; most salamanders live under logs or stones or in burrows that may go many feet underground) but need them to breed and lay eggs in. Permanent ponds are not suitable for many amphibian species because the fish that will be present would eat the eggs, larvae, and adult amphibians.

Why are Wetlands Important?

Wetlands were once thought of as horrid, dangerous places filled with evil spirits, dangerous animals, and disease-carrying insects. While it is true that wetlands can be unwelcoming at times and have produced mosquitoes that carried malaria and other diseases, there is nothing more beautiful than a spring pool in April, with its shimmering waters, lacy flights of insects, alive with the flutter of warblers and woodpeckers and all kinds of birds, and with the brilliant greenery growing around, out of, and in the water, punctuated with a riot of color from marsh marigolds, violets, buttercups, and bluebells, and throbbing with the calls of chorus frogs and spring peepers. No shopping mall or computer game can come close to the experience of sitting quietly by such a celebration of life and nature, or of tromping through warm, misty March nights in search of salamander breeding ponds. So one of the most valuable things about wetlands is

Wetlands provide us with fascinating places to observe nature. This is especially important for young people, who need to experience natural places if they are to understand and respect them. If we are familiar with the plants and animals that live in wild places and with their needs and benefits, we will be thoughtful about the effects of our behavior on these creatures - whether that behavior is making so much noise that we disturb the natural activities of animals, or throwing garbage and poisons away in a way that harms plants and animals, or deciding whether or not we need another road or shopping center in a place where these natural areas are.

Wetlands provide habitat for many plants and animals. Many insects, amphibians, snakes, birds, and mammals, as well as hundreds of species of trees, shrubs, grasses, sedges, rushes, orchids, water plants, and wildflowers must have wetlands to survive. Some animals which may not live in wetlands still need them for feeding, breeding, resting, or safety. A large number of plants and animals that may have been once common but are now rare or endangered in Ohio are species which live in or use wetlands. The main reason for this is that about 95% of Ohio's wetlands have been destroyed, and many of those that remain have been damaged by human activity. Biologists know that it is always dangerous to reduce the numbers of any species of plant or animal to only a few individuals living in only a few areas. For many, many reasons it is much better for that species to have many individuals in many different populations. As an example, imagine that a deadly disease were to strike a village with a population of 100 people, and that every person died. This would be a catastrophe for the village, of course, but it would not really threaten the continuation of humans as a species. But what if that village was the only one left in the world? This is what we are doing to many species of organisms by destroying so much of their habitat: we put them at great risk of extinction. Species also need a certain number of individuals in order for evolution to continue. This is why it is so important that we not only stop destroying the few natural areas we have left, but also try to restore, or bring back, such areas wherever we can. Some people would argue that these plants and their inhabitants have as much right to exist as we do - simply because they are a part of creation, whether that creation is the result of a miracle or as a result of natural processes. These people say that when we destroy other life on our planet, we can not feel very good about ourselves. Other people, of course, say that we have the right to do anything we want to other living things, and to the air we breathe and the water we drink.

Wetlands clean our drinking water. As water slowly seeps through wetlands, the plants living there filter out much of the human-made pollutants (like pesticides from farms, and industrial chemicals) that reach the groundwater. Some of these pollutants are trapped in the soils and plants; some chemicals are actually changed so that they are no longer poisonous. Wetlands also absorb fertilizers that run off farmlands. If there are no wetlands to perform this task, more of these pollutants will eventually sink down into people's wells, or seep into the rivers and lakes from which we get our drinking water. Even though much progress has been made at reducing pollution into Lake Erie, it is still a dangerously polluted lake, and some of the reason for this is the destruction of so much of the wetlands that lie along the rivers which run into the lake. So restoring wetlands around our rivers and streams would really help clean the water that flows off of our farms, factory areas, parking lots, and city streets.

Wetlands help control floods and erosion of soil. Because so many of our wetlands have been destroyed, when it rains a lot many people find that their basements become flooded. This is because these houses are often built where the wetlands used to be, and the water now has nowhere else to go. Wetlands act like sponges during periods of flooding, and they hold a lot of the water, letting it drain into rivers and streams slowly, instead of all at once. Furthermore, wetlands slow down the erosion of soil from farmed fields in the springtime, which not only saves the topsoils for farmers, but also prevents the water in rivers and streams from getting all muddy. Muddy water is *very* bad for stream ecologies because, among other things, the plants can't get enough light to carry on photosynthesis; fish and other animals can't see to hunt and carry on other activities that depend on vision, and the gravelly and sandy places that fish and other species depend on to lay their eggs get covered over with fine silt, which kills the eggs even if the animals do lay them.

Wetlands help supply water in times of drought. Since wetlands hold water and prevent it from running off into streams right away, they will also be wet even when periods of drought begin. This water in wetlands has more of a chance to seep into the ground and so will help keep the water table up during drought periods. This would benefit farmers and people who get their drinking water from wells.

How are wetlands doing in the United States, Ohio and in Lorain County? In a word- not too well. In the whole country (not counting Alaska, which still has almost all of its tundra and taiga wetlands), we started out with more than 200 million acres of wetlands, and now a little less than 100 million acres remains. 95% of Ohio's wetlands have been destroyed, and the situation is probably about the same in Lorain County. The northern part of Lorain County - the part that was once part of Lake Erie as it was forming - used to be about 90% wetlands. Most wetland destruction in the past was due to draining them for use as farmland. Today, almost all wetland destruction results from housing, road, factory, and shopping center construction. People who want to destroy wetlands, whether on public or private lands, now have to get a permit from the U.S. Army Corps of Engineers. The Corps almost always grants these permits, but often requires the developer to restore a wetland somewhere in return for this destruction. These restoration projects are often not very successful, however, so our wetland acreage continues to decrease. There are, however, efforts by many conservationist groups to save and restore wetlands, and the Ohio Department of Natural Resources is also making some efforts along these lines.

Some wetland plants in our area are:

obligate - have to grow in wetlands

facultative - prefer wetlands

trees
and
shrubs

some willows
buttonbush
swamp rose

elderberry, spicebush
red and silver maples
pin and swamp white oaks
cottonwood
black, green, and red ash
American elm
sycamore

herbaceous
(non-woody)
plants

skunk cabbage
rose mallows
some buttercups
royal fern
many rushes and sedges
some grasses (e.g. rice cut-grass)
sphagnum mosses
some beggar ticks, smartweeds,
goldenrods

touch-me-not
bluebells
sensitive and marsh ferns
most horsetails
phragmites and purple loosestrife (alien spp.)
some grasses (e.g. Cinna and canary reed grass)
some violets

rooted in water with
leaves sticking out or
floating on surface

pondweeds
cattails, water lilies
arrowheads, water pickerel, duck corn
duckweeds

growing under water
but with flowers
growing on the
surface or sticking

Elodea
eelgrass
coontail
water milfoil

out of water

bladderwort