



## SWAMPS

Swamps include a broad range of wetlands that have standing or slowly moving water and are dominated by trees or shrubs. Swamps differ from marshes in that swamps do not contain large amounts of cattails, sedges, bulrushes, and other non-woody aquatic plants. However, these plants may appear around swamp edges or in openings. Michigan swamps include conifer swamps, hardwood swamps, mixed conifer-hardwood swamps, and shrub swamps. Swamps and lowland forests are very similar and are often one in the same. However, swamps are often wetter for a longer period throughout the year and have deeper standing water than lowland forests. These lowland forests may be seasonal wetlands.

Like most wetlands, swamps are ever changing systems. Depending on the surrounding landscape, swamps are often a transitional step in the natural process from water to dry upland. All swamps start out as a lake, pond, stream, or other body of shallow slow moving water. Water-loving trees and shrubs take root in the warm, relatively stable wetland. As plants decay, their material accumulates and adds to the topsoil until the water depth decreases and supports more dense vegetation. Continued succession will result in very little surface water, and a buildup of organic soils, which sup-

port more woody vegetation. Occasional flooding or several years of wet weather can slow this process, and several dry years can speed it up.

Swamps provide habitat for mink, muskrats, beaver, otter, deer, black bear, squirrels, hares, barred owls, various species of woodpeckers, wood ducks, nuthatches, several kinds of warblers, black-capped chickadees, snakes, turtles, frogs, toads, butterflies, dragonflies, and many other insects. Uncommon animals such as red-shouldered hawks, cerulean and prothonotary warblers, Indiana bats, smallmouth salamanders, and Blanchard's cricket frog, all rely on swamps for survival.

About one-third to one-half of Michigan's wetland acreage has been lost since 1800. Swamps, conifer swamps in particular, com-

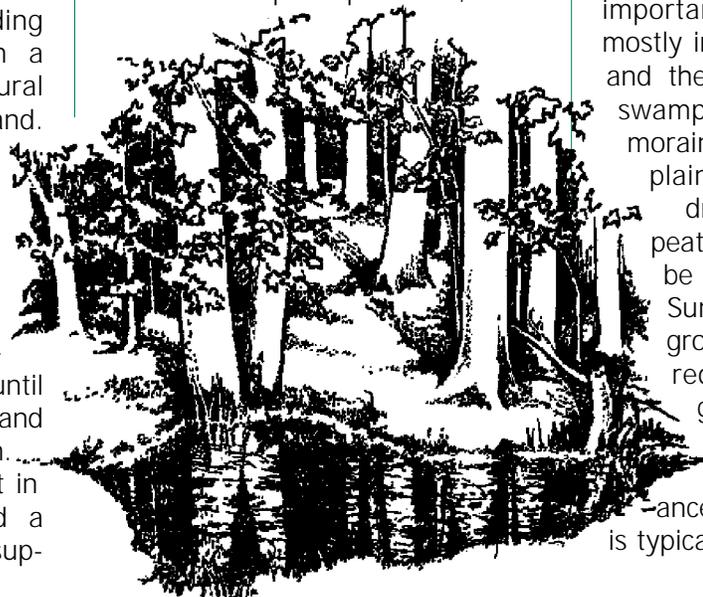


mink

prise much of the overall loss--about two-thirds of the original 5.5 million acres of conifer swamps have either been drained or converted by logging activity to lowland hardwood, farmland, marshes or shrub swamps.

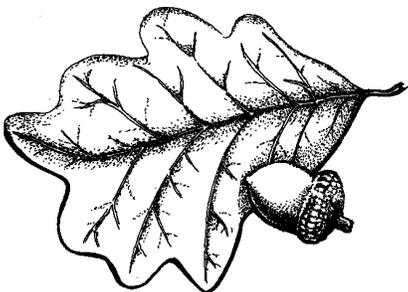
### Types of Swamps

Northern white cedar and black spruce dominate most **conifer swamps** in northern Michigan, although balsam fir, eastern hemlock, and white pine may also be important components. Found mostly in northern Lower Michigan and the Upper Peninsula, conifer swamps are situated along moraines, lake beds, outwash plains, and other glacial drainage. Associated with peatlands, conifer swamps may be rich or poor in minerals. Sunlight penetration to the ground is usually poor. This reduces the amount of ground cover and gives some conifer swamps a dark, mysterious appearance. The soil of these swamps is typically acid, but it may also be



neutral or even alkaline if it is influenced by groundwater input. Alkaline sites tend to be cedar-dominated and offer greater plant diversity. In slightly less water-saturated conditions in northern Michigan or along northern floodplains, mixed conifer-hardwood swamps are more common.

**Hardwood swamps** are those dominated by ash, elm, and red maple but may also include silver maple, cottonwood, and black willow. Pin oak and swamp white oak are included in southern Lower Michigan and quaking aspen, big-tooth aspen, and balsam poplar can be found throughout northern Michigan swamps. In 1800, hardwood swamps comprised about five percent (1.7 million acres) of the state's land base, and most were found in southern Lower Michigan. Today, many of the conifer swamps have been converted to hardwood swamps. This is due to the extensive logging of conifer swamps and changes in hydrology. Much of this has occurred in the northern Lower Peninsula and the Upper Peninsula. Many southern Michigan counties hardwood swamp areas have decreased by as much as 50 percent. Many hardwood swamps are located along lower river reaches that flood in spring and fall. Southern Michigan lowlands tend to be very diverse and support many plants commonly found in states farther south.



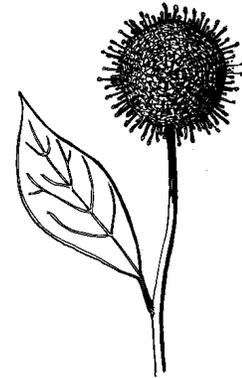
swamp white oak

Combinations of shrubs such as tag alder, buttonbush, willow, and dogwood often dominate **shrub swamps**. Alder-willow swamps are most commonly found along streams and lake margins in northern Lower Michigan and the Upper Peninsula. Buttonbush-willow swamps appear mostly in the southern Lower Peninsula. In 1800, about one percent, or some 43,000 acres, of Michigan was covered with some kind of shrub swamp, mostly in the Upper Peninsula. Today, about 730,000 acres are thought to exist statewide. The increase is due to extensive logging of conifer swamps and to the network of road construction.

## Management Considerations

Swamp management for wildlife can be as simple as doing nothing or it can be very complex and involve the manipulation of wildlife habitat. Swamps that have a steady, stable supply of water year round function naturally. Usually they can best be managed by protecting the water source and enhancing the adjacent uplands.

Water is the key to swamp maintenance, even though water levels fluctuate throughout the year. Additional water over several years or many years of drought can impact the condition of the site. Draining adjacent uplands into the swamp, for example, can lead to a higher water table, which may prompt conversion of the swamp to a marsh of cattails. By altering watertables, soils could dry out, leading to succession and a conversion to upland vegetation.



buttonbush

One management option, therefore, may be to leave the swamp alone and allow it to mature naturally, especially if the tract is large (200 acres or more). Old-growth forest left intact, for example, will favor area-sensitive birds like the red-shouldered hawk, the cerulean warbler, and the prothonotary warbler. Do not fragment the swamp by making roads, and trails. Create a buffer strip of grass, shrubs or trees at least 100 feet wide around the swamp. Remove invasive species like garlic mustard, glossy buckthorn, and purple loosestrife that may be growing in the swamp or around it.

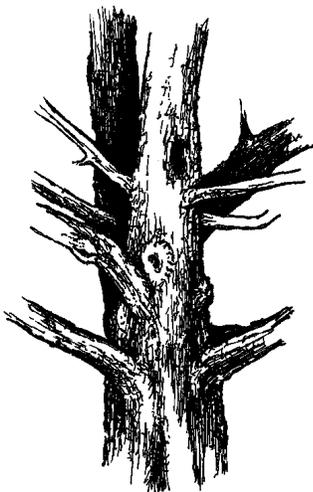
Swamps that have been fragmented can be regenerated by planting tree and shrub species suited to the sites, but the process takes a long time and may not be successful. The slow growth of many swamp-loving trees and the exacting conditions required to restore them are good reasons for maintaining what already exists. In many cases, little or no timber harvest is needed to increase the value to wildlife.

If timber harvest is part of your overall plan, however, take no more than 25 percent of the trees at one time and space harvests 10 to 20 years apart. Removing one to four trees in a group is the best way to

mimic natural disturbances such as lightning strikes and severe storms that topple trees. This method of uneven-aged management (also called selective cutting) promotes a swamp of mixed-aged, young and old trees and is the best timber harvesting strategy as it creates the least amount of disturbance to the swamp. Uneven-aged management can retain benefits to a variety of wildlife species that require mix-aged forests. However, it is not the best harvesting method for many edge-loving wildlife species.

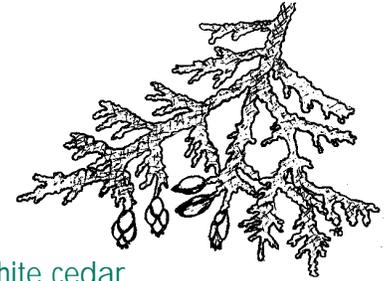
When conducting timber harvesting, retain a good mix of tree species, including swamp white oak, basswood, and hackberry, while managing for structural diversity--a mixture of ages, diameters, crown sizes, and shapes of trees. Leave old logs, large standing snags, and den trees because they provide food and habitat for invertebrates, amphibians, woodpeckers, and other cavity-nesting birds. See the **Timber Harvesting** chapter in the Forest Management section for more harvest strategies.

Because swamps are often devoid of young trees and an understory of shrubs, they don't provide high quality habitat for



some wildlife species such as deer, rabbit, wild turkey, grouse, and woodcock. Opening the canopy by careful timber harvest to allow sunlight to reach the ground may stimulate the growth of vegetation that these species prefer. However, where stands exist on poorly drained muck soils or on sites with a high water table, the results of the timber harvest are far less predictable. The species composition of the resulting stand may not be at all like the parent stand. Consider, for example, that full-crowned swamps release up to 1/4 inch of soil moisture into the air each day through the process of evaporation and transpiration. The higher water table and seasonal flooding, which could result from extensive logging, may completely change the vegetation composition. Also, success in regenerating conifer swamps can be poor, especially if white cedar is the target species. White cedar is often promoted as critical to deer management because it provides both quality food and cover. However, once cedar is cut, white spruce and balsam fir usually regenerate the site because deer browse the nourishing shoots of white cedar. For more information see the chapter on **Lowland Conifers**.

Minimize harvest activities in spring when water levels are high and flood events are likely. Do any selective cutting in late summer, and only when soils are dry and firm. Some swamps freeze, allowing for a winter harvest. Be careful not to disturb the soil any more than is necessary and avoid making permanent logging roads, which will alter the flow of water. Do not log where deer browsing is severe. Locate skid trails and any roads on the upland edge of the cut, and leave clumps of scattered trees as



white cedar

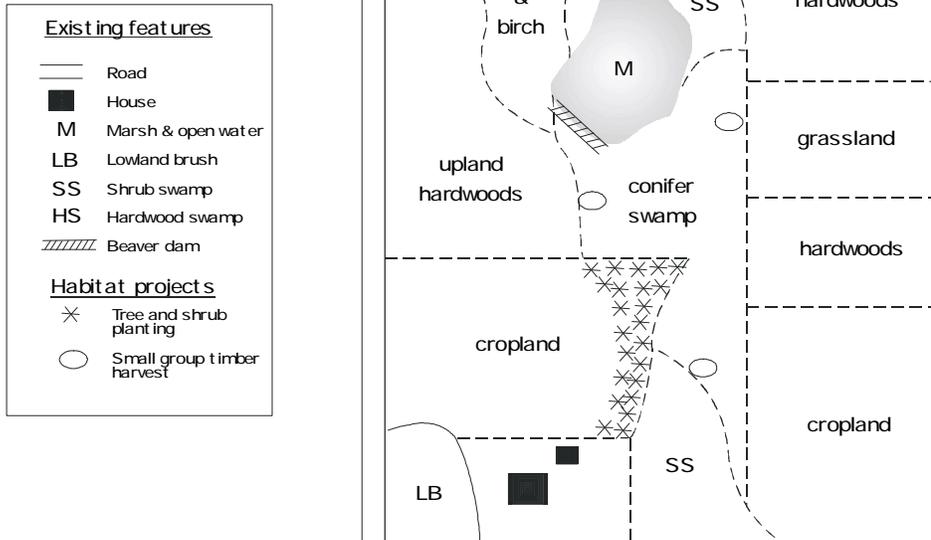
seed sources for regeneration.

Shrub swamps with a ratio of 40 to 60 percent open water can provide habitat for a variety of wildlife such as beaver, muskrat, waterfowl, and numerous reptiles and amphibians. If your shrub swamp contains more than 60 percent woody vegetation, consider creating openings 30 feet by 30 feet or 30-foot-wide strips from edge to edge. Make the openings in winter by cutting willow, button-bush and other woody plants at ice level with a chainsaw, loppers, or backblade pulled by a tractor. This practice works best after a dry fall because spring flooding over the cut stems during the next growing season will eliminate or reduce regrowth for several years.

Wildlife professionals do not usually recommend building water-control devices in swamps because of the difficulty in duplicating and enhancing the natural wetland processes. However, if dikes or other means of water retention already exist, waterfowl and shorebirds may benefit by drawing down the water level to only a few inches in spring to allow preferred plants such as smartweed, wild millet, arrowhead, bulrushes, and sedges to grow on exposed mud flats. The spring draw-down also provides waterbirds with improved access to insects, crayfish, and other invertebrates. Once the plants have produced seed in late summer or

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40 acres



This map is an example that demonstrates the many management options discussed throughout this chapter. The option(s) you choose should depend not only on your goals, but the location, condition, and present use of your land.

ally inappropriate for the north. Furthermore, government permits will be needed for most activities in a swamp.

Beaver dams often create combination marshes and swamps. Although many individuals are tempted to eliminate the beaver and its dam and replace it with an earthen dam, this is extremely costly and difficult due to soil conditions. If you have a beaver dam on your land, realize its importance to the landscape and enjoy the natural engineering abilities of the beaver.

In summary, swamps occur throughout Michigan and are important havens for many wildlife species. Determining the water source and evaluating the condition of the swamp and adjacent uplands will help you decide on management options. Simply protecting the swamp and its water source as it now exists will often be the most effective management decision. When considering harvest of swamp timber, carefully consider the various possible outcomes as these are highly complex environments.

early fall, relood the area with six inches of water to attract herons, rails, red-winged blackbirds, and waterfowl. Throughout the fall you can increase the depth to 12 inches to enable migrants to reach acorns and other food. Because ice action during the winter and early spring can cause significant damage to trees, it is important to draw down the area in late fall to water depths less than twelve inches. This practice of flooding and draw-down is best conducted in dormant swamps that have a dependable water supply and heavy soil to help retain the water. They should be at least one acre in size and contain a

large number of mast-producing trees such as oak, red maple, willow, and ash.

Before creating dikes, earthen dams, or other water-control structures, consult with a professional to see if the management goal is desirable and realistic in terms of the site's potential. Water control structures are helpful in maintaining vegetation growth and regrowth. Unfortunately, they can be costly to install and maintain, and may alter the natural processes of the area. Remember that wildlife-flooding practices used in the southern United States are usu

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