



MARSHES

Marshes are shallow-water areas that sustain water-loving plants such as cattail, sedge, arrowhead, bulrush, water lily, and pondweed. Marshes found in Michigan include wet meadows with grasses and sedges, potholes with cattails, and shallow vegetation zones along Great Lakes shorelines. While marshes are generally covered by standing or slow-moving water, certain marshes dry out late in the growing season or during dry years. This fluctuating water level is part of the natural process, which increases plant and habitat diversity, and productivity of the marsh.

Less than an acre or as large as several thousand acres, marshes have appeared and disappeared since the beginning of time. When the glaciers slowly melted about 12,000 years ago, they left behind depressions that formed lakes and potholes. As these bodies of water became shallower and warmer, many turned into marshes--an evolutionary step in the long natural succession process from water to dry upland. Also, when rivers change course in their serpentine march to the Great Lakes, they also leave old isolated sections of a channel, called oxbows, many of which become marshes over time. Marshes may also occupy slow-moving shallow zones of active rivers or develop at river mouths along the Great Lakes as coastal marshes. Fluctuating water levels in the Great Lakes create, maintain, and continually alter these marshes.

The Importance of Marshes

Like most wetlands, marshes are dynamic systems that are important to wildlife and also provide other valuable functions. On average, marshes produce at least three times more biomass than lakes, upland grasslands, and farmland. Their high rate of productivity allows marshes to support complex food chains and a broad diversity of wildlife. For example, about 80 percent of Great Lakes fish use coastal marshes during at least one stage of their life cycle. Marshes also store and collect nutrients and sediments from surface water runoff, and they reduce flooding by temporarily storing water.

All wetlands provide food, water, shelter, and living space to many kinds of wildlife. Mammals such as muskrats, raccoons, mink, and deer feed, rest, and hide in marshes. Herons, shorebirds, waterfowl, red-winged blackbirds, sedge wrens, common yellowthroats, and other songbirds also seek shelter, nesting habitats,

and food. Marshes with dense cattail stands provide choice winter habitat to ring-necked pheasants. Further, they supply food and cover to leopard and chorus frogs, snapping turtles, and northern water and ribbon snakes. Uncommon wildlife species that live in marshes include black terns, American and least bitterns, king rails, and massasauga rattlesnakes. Arrowhead and marsh mallow are examples of unique plants that may grow there.

Many human activities can harm marshes. Construction projects, some farming practices, and logging methods may increase silt loads into marshes. Draining marshes to create farmland and filling marshes to make building sites are activities that most commonly have destroyed these wetlands. Streams that provide water to marshes may also deliver pollutants and fertilizer runoff, which eventually alters marsh vegetation. Some marshes are accidentally ruined by well-intentioned landowners who dig ponds in the existing marsh and then deposit the spoils in the surrounding marsh. Because marshes are such a valuable natural resource, they should be preserved, restored, or enhanced whenever possible.

Marsh Conservation

The general rule for wetland management is to protect those that are healthy, restore those that have been damaged, and actively manipulate only those



that are too disturbed to function naturally. If a marsh on your property is not currently being affected by human activities, the best way to protect it for future generations may be to leave it alone, or conduct small management activities. In addition to avoiding harmful practices like draining or filling, consider the following:

- Avoid forest cutting and other mechanical operations, i.e., farming and logging, that may increase sediment within 100 feet of the marsh or any of its connecting streams. Cutting trees near the marsh can change water levels, accelerate erosion, and destroy travel corridors for wildlife using the marsh.

- Create or maintain a buffer zone of grassy vegetation to act as a filter strip around the marsh. Old farm fields taken out of production will naturally vegetate or can be planted to native grasses or wildflowers. This buffer will help protect the marsh and will provide habitat for insects, amphibians, reptiles, birds, and mammals. As a general guide, the buffer should be a minimum of 100 feet wide. For seeding rates and other information, refer to the chapters in the **Grass-land Management** section.

- Fence off the marsh and buffer zone if livestock have access to them. Heavy use by cows, horses and sheep can damage vegetation and pollute the water source with manure. However, light grazing over a short time period can be beneficial.

- Do not use the marsh environment as a dumping ground for refuse and debris, including logging waste. Doing so can lead to contamination of the water, soil, plants, and wildlife.

- Remove invasive plant species such as garlic mustard, glossy buckthorn, phragmites, and purple loosestrife. Reed canary grass is a problem plant that is best removed and replaced by native species such as cattail, bullrush, and cordgrass.

Marsh Restoration

Restoring a marsh on your property is one of the most satisfying of all habitat management projects because the results are usually immediate and dramatic. Normally too shallow to support fish, the restored marsh will become an oasis for other wildlife, and the amount and diversity of animals that quickly move in may surprise you.

The most important consideration is restoring the wetland depression or basin with a stable supply of water. Most likely the marsh has been drained by a ditch or field tiles. If the marsh has been drained by a ditch, plugging the ditch with soil will restore the natural water source. If drainage has occurred from buried field tiles, removing at

least 50 feet of tile will also bring water back to the marsh. Some landowners also add water-control structures to allow periodic draw-downs and re-flooding. The Michigan Department of Natural Resources, U.S. Fish & Wildlife Service, and Natural Resource Conservation Service (NRCS), and County Conservation Districts are among several organizations and agencies that offer assistance to landowners interested in wetland restorations. For additional information, see the **Wetland Restoration Techniques** chapter.

Marsh Creation

Although many landowners are interested, creating a marsh can be expensive and hard to do, especially if the site is not on hydric soils. In addition, quality wet meadows, sedge marshes, wooded swamps, and uplands may be destroyed by landowners trying to create deep water marshes or ponds. Careful planning is required, along with securing government permits. Remember, most private and government groups provide only technical assistance to wetland creation, whereas financial assistance is provided to projects that restore natural wetland systems.

The topography of your property and the surrounding land -- along with the soil type, watershed size, and drainage patterns--are important points to consider before actual construction begins. The U.S. Department of Agriculture maintains a NRCS office in nearly every Michigan County. Agency staff can help you evaluate the water-holding capability of the soil, the elevation of the present water table, and whether or not there will be adequate runoff or spring flow to maintain desired water levels in a con-



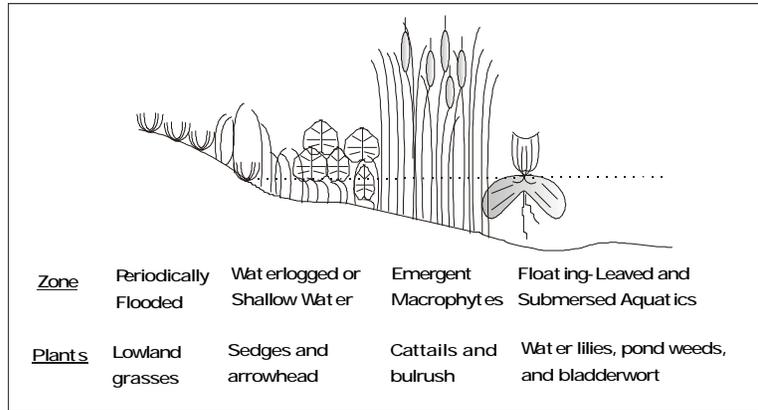
invasive species: reed canary grass, phragmites, and purple loosestrife

structed basin. Also, they can help you design the project.

In your design, think small and shallow. Areas as small as one-half acre or less will support a marsh. However, two to five acres would be productive for wildlife, especially waterfowl. Various water depths result in a mosaic of vegetation zones and increased diversity of both plant and animal species. A general rule worth noting is to provide water depths in the following proportions: 50 percent at less than 1-1/2 feet, 30 percent at 1-1/2 to 3 feet, and 20 percent at 3 to 6 feet.

No simple guidelines exist that cover all the construction methods possible. Site characteristics, available funding, water source, and total size of the marsh to be created all must be considered. The project design may include excavations below the water table and the use of berms to catch surface water.

Great care should be taken in planning any excavation projects--including soil probing--to ensure that you can reach your goals without destroying desirable natural conditions. Digging too deep, for example, could cause many problems. A thin layer of clay or other impermeable soil may be the only reason water exists above the surface at the project site. Breaking this subsurface seal by digging too deeply would remove existing water, much like pulling a bathtub plug. Also, you need to be careful that you are not creating a pond that is too deep for maximum wildlife benefit. Another consideration is the side-slope grade of the excavation. This grade should range



Cross-section through a fresh water marsh, showing the water depth, and the plants found in each zone.

from a 4:1 to 6:1 horizontal distance:vertical drop to ensure that a variety of marsh-loving plants will grow in various patterns.

When excavating, be sure to scrape and stockpile the topsoil, then replace the upper six to eight inches on the berm and excavated basin to take advantage of seed sources already in the soil. In general, planting aquatic plants is not necessary because seeds are naturally transported in the environment and are usually already in the soil. But if vegetation is slow to respond on a new site (after 2-3 years) or you wish to add diversity to a present site, you might consider planting duck potato, pickerelweed, bulrush, and cattail—all of which are available from specialty growers. Water depths between one and two feet are ideal for these species. In addition, sago pondweed, coontail, and wild celery are common submergent plants able to grow at a variety of water depths.

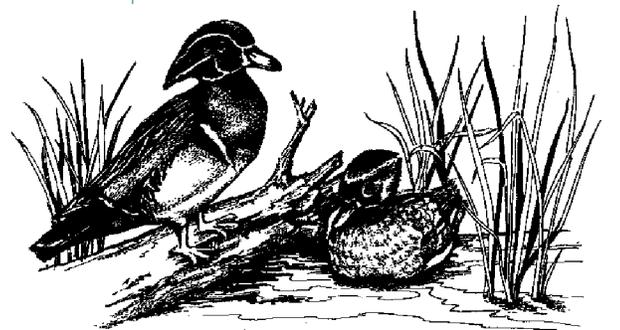
Other Management Considerations

The following are general options to consider when managing a marsh:

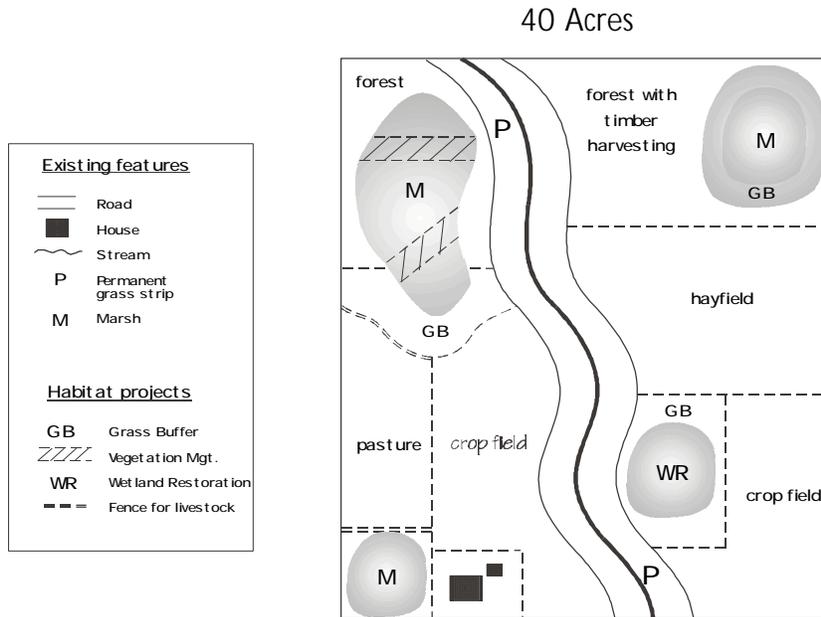
- Building nesting structures for wood ducks, mallards, and other waterfowl is not necessary, but can be helpful in attracting them. Ducks, turtles, and other animals will use loafing platforms. To learn more, refer to the chapters on **Wetland Birds, Waterfowl, and Frogs, Turtles, and Snakes** in the species section.

- You may want to adjust the vegetation:open water ratio of your marsh. Marshes with a ratio of 40 percent vegetation to 60 percent open water provide habitat for the greatest variety of wildlife. Wetlands with higher levels of vegetation will attract rails and red-winged blackbirds. More open water wetlands with a small percentage of vegetation will attract species such as herons and Canada geese.

- If your marsh contains more than 60 percent emergent vegetation, you may want to create openings approximately 30 feet by 30 feet, or strips 30 feet wide from shore to shore. Openings in cattail marshes can be made in winter by cutting plants at ice level with a backblade pulled by a tractor. This practice works best after a dry fall because spring runoff will



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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.

flood plant stubble with at least six inches of water during the next growing season, and should reduce regrowth for a few years. Herbicides that can be used in wetlands, such as Rodeo, can also be used to control vegetation. Remember to always follow label directions on all herbicides.

•Fire is another marsh management tool that can be used during winter or early spring. In addition to creating openings, the technique helps to rejuvenate fertility and to reduce the amount of emergent plant debris. Be sure to obtain necessary permits and follow all safety precautions. For more information, see the chapter on **Prescribed Burning** as a management tool.

•Constructing peninsulas and islands can enhance marsh use by waterfowl, shorebirds, and wading birds. However, if not done properly, such land forms can have a negative impact on wildlife and be a costly addition to your project. Consider increasing shoreline irregularity with small peninsulas. In wetlands larger than two to three acres, you might construct an island. Marshes from four to 25 acres in size should feature a maximum density of one island per four acres. Marshes larger than 25 acres can support a higher density. The islands should be at least 200 feet apart and 100 feet from the mainland to protect nesting waterfowl from predators.

•Another method to control the amount of marsh vegetation is to control the number of muskrats, which eat cattails and other tall emergents and build their homes from the plants. Regulating muskrat numbers through trapping will indirectly balance the amount of vegetation and open water in the marsh.

In summary, marshes are an important part of Michigan's natural landscape. Identifying any that exist or historically existed on your property is the first step toward developing a management plan. By protecting, restoring, enhancing, or successfully creating marshes using the above management practices, these dynamic wetlands will provide critically important wildlife habitat.

FOR ADDITIONAL CHAPTERS CONTACT:
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Private Land Partnerships: This partnership was formed between both private and public organizations in order to address private lands wildlife issues. Individuals share resources, information, and expertise. This landowner's guide has been a combined effort between these groups working towards one goal: Natural Resources Education. We hope this manual provides you with the knowledge and the motivation to make positive changes for our environment.

FOR ADDITIONAL ASSISTANCE: CONTACT YOUR LOCAL CONSERVATION DISTRICT