



LOWLAND HARDWOODS

(RED & SILVER MAPLE, RED ASH & COTTONWOOD)

Lowland hardwoods are found in areas that hold water at least some part of the year. There are two kinds of lowland hardwood forests: hardwood swamps and floodplain forests. Hardwood swamps are forests that grow in depressions containing standing water at least part of the year. Floodplain forests are found next to rivers along flat, seasonally flooded areas. Lowland hardwoods form a dynamic ecosystem containing many trees and shrubs not commonly found in other forest types. They are one of the state's largest remaining natural habitats because they are not easily farmed or logged.

Lowland hardwoods occur mostly in southern Lower Michigan. However, some hardwood swamps can be found in northern Michigan depressions, and there are some occurrences of floodplain forests in the Upper Peninsula. Today about five percent of the entire state is comprised of this forest type.

Mixed hardwood swamps contain red maple, black and red ash, swamp white oak, and American elm. American elm used to be more dom-

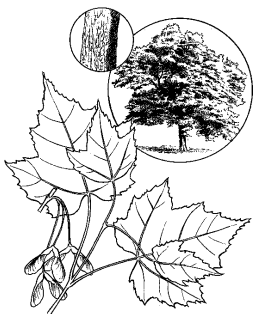
inant than it is today, but the elm blight has shortened its life cycle and reduced its dominance. A variation of the mixed hardwood swamp occurs in depressions on southern Michigan sandy plains where the soil is very acidic. Pin oak, black oak, and black gum dominate this rare kind of wetland. Black ash swamps can also occur on flat, sandy plains in southern Michigan, but also mix with northern white cedar or tamarack in scattered regions of northern Michigan. Swamps have dense canopies and are often flooded in spring and fall causing the ground layer to be relatively sparse. However, if there is a drought, or severe windthrow occurs, the groundcover can also be dense. The trees in these swamps are often subject to windthrow during severe storms as they have shallow roots. This disturbance, along with lightning strikes, creates a complex forest of many age classes and tree species.

The southern floodplain forest is one of Michigan's most diverse natural communities as well as one of its most threatened. Damming, dredging, and channelization are all human induced threats to these forests.

Seasonally flooded in spring and fall by the wide rivers and streams they flank, these forests grow in loam or silt-loam soils that are rich in minerals. Silver maple, red ash, red maple and cottonwood dominate these forests. Red oak, swamp white oak, black willow, and black walnut also occur as smaller components. Trees that reach their northern limit in these forests are Ohio buckeye, pawpaw, red bud, blue ash, Kentucky coffee tree, honeylocust, sycamore, hackberry, and red mulberry. Shrubs and small trees include spicebush, hawthorn, alternate-leafed dogwood, American hornbeam, American bladder-nut, steeplebush, prickly ash, and ninebark. Common ground-layer plants are skunk cabbage, jewelweed, wild geranium, cinnamon fern, sensitive fern, buttercup, jack-in-the-pulpit, and meadow rue. Rare plants include winged stemmed monkey flower, prairie trillium, snow trillium, black cottonwood, and twinleaf.

Wildlife Values

Floodplains, swamps, and seasonal pools offer water, food, and cover for many kinds of birds and mammals. The warbling vireo, northern oriole, red-eyed vireo, indigo



red maple



silver maple



cottonwood



swamp white oak

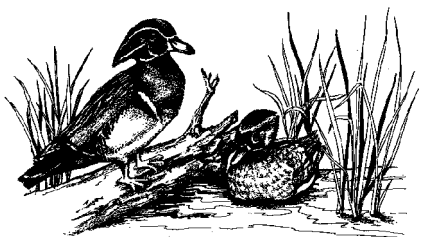


black ash

bunting, gray catbird, and eastern wood pewee are birds that live in these forests. Other species include the wood duck, cottontail rabbit, raccoon, woodcock, white-tailed deer, wild turkey, and many species of migratory waterfowl. Rare animals include the red-shouldered hawk, Indiana bat, several amphibians (smallmouth salamander, spotted turtle, and Blanchard's cricket frog), and at least three warblers (cerulean, prothonotary and yellow-throated). Streams and rivers, which flow through these forests, are home to numerous rare mussels such as the clubshell, catspaw, northern riffleshell, and round hickory nut.

Floodplains, swamps, and seasonal pools provide many benefits to wildlife. These areas are rich in plants and invertebrates because of their shallow depths and warm temperatures. They provide beneficial food and breeding grounds for many species of wildlife including migratory birds, frogs, toads, and salamanders. Refer to the **Swamps** and **Seasonally Flooded Wetlands** chapters in the Wetland Management section for more information.

Floodplains are also an important aspect in many of these forests. They exist along rivers, lakes, and streams and provide many benefits not only to wildlife, but also to humans. Floodplains provide corridors for wildlife to move from one habitat to another, which is especially important in urban and residential areas where few natural places occur. Without floodplains, the river system would be altered in structure and composi-



wood duck

tion, and the hydrology of the area would be changed. Floodplains benefit humans directly as they provide areas for water overflow, which helps prevent upland flooding. When floodplain forests are developed by humans, there are frequent and often severe flooding occurrences that affect cities and residential areas. Floodplain forests also help to maintain cool waterways in the summer.

Management Limitations

Many larger forested lowlands have been broken up into fragments. Reasons include excessive logging, farming and grazing. Fragmentation tends to lessen wildlife values of the forest. Other problems include the invasion of aggressive non-native plants such as glossy buckthorn, purple loosestrife, reed canary grass, and garlic mustard; and Dutch elm disease. These problems have reduced tree species and diversity. As trees die or are removed, the forest canopy changes in structure and composition and loses some of its value for wildlife.

There are several things to consider when weighing your management options. What little information that has been published on how best to manage lowland hardwoods suggests that these stands present special problems when harvesting timber. Because they occur on poorly drained sites, access with equipment is difficult. The quality of wood varies but typically is less valuable than other forest types.

Where stands exist on poorly drained muck soils or in places with high water tables, the regrowth following a timber harvest may not be predictable. Sometimes the makeup of the new stand is not at all like the parent forest, especially if the water

table has been greatly affected by the harvest. As stated before, this can reduce the value to wildlife. Fully-crowned lowland hardwoods will release up to a quarter-inch of soil moisture into the air each day. Therefore, if these trees are taken out, there may be more water present on the ground than before. A high water table and seasonal flooding can add to this and completely change the vegetation composition. Instead of trees, sedges and cattails may grow if the area is too wet. However, if the area is too dry shrub by brush may grow. Either way, you have destroyed the lowland hardwood forest. It may be helpful to know the stand's elevation above the local groundwater table before choosing a management option. Agency technicians in your county Conservation District office can help you determine the elevation of the present water table.

Management Considerations

Given these limitations, it may be best to manage for protection of your lowland hardwoods instead of harvesting timber. However, there are still several management options to consider if harvesting timber will best achieve your goals.

Protection

In a mature floodplain forest little or no timber harvest is needed to increase wildlife values. The decline of certain migratory songbirds in lowland hardwoods is primarily due to fragmentation of large, intact tracts of mature forest. For more information, see the chapter on **Woodland Birds** in the Species Management section. Many lowland hardwood fragments should simply be protected and allowed to mature. Planting native trees and shrubs to reconnect fragments is also a consideration. Be sure to choose species suited to site

conditions. Connecting other woodlands can greatly benefit wildlife, especially when the forest size exceeds 100 acres. If possible, manage for a mature forest on parcels larger than 100 acres. Be advised, however, that the creation of a full canopy from the crowns of mature trees will produce little ground cover for other species that require this kind of habitat.

Allow seasonal water fluctuation to occur naturally. Leave most cavity trees regardless of age. Eliminate or limit trails and roads to lessen the impact on wildlife species that move back and forth from the water's edge to upland areas. This consideration is especially important during the spring and early summer when birds, amphibians, and reptiles are breeding and laying eggs, and when young of the year disperse.

Large logs play a key role in a stream's health because they help retard bank erosion, provide shelter for fish, sunning sites for turtles, create sandbars and other depositions, encourage channel scouring, and retain nutrients. Therefore, if possible leave trees that fall into the river. Allow the river system to naturally meander, which helps slow the water flow. This reduction in velocity permits the growth of vegetation and stream microorganisms which start the food chain. Major threats to southern Michigan floodplains include water diversion for dams and wells, channelization, and dredging. Another key concern is non-point source pollution from runoff from farms and urban area storm water, construction, and leaky septic systems. For more information refer to the chapter on **Streams and Rivers** in the Wetlands Management section.

Exotic nuisance plant species can also lower the value of lowland hard-

woods as they lessen species diversity. Learn to identify purple looses-trife, garlic mustard, reed canary grass, or glossy buckthorn. Cut them back in late winter or early spring, and apply a glyphosphate herbicide, such as Rodeo in wet areas, to the stumps within ten minutes of cutting. Follow all label directions.

Timber Harvesting

Occasionally, lowland hardwood stands lack the young growth of saplings, shrubs, and ground covers that benefit deer, grouse, woodcock and many other animals. If creating more young growth is part of your management plan, opening the canopy through timber harvest will permit sunlight to reach the forest floor and stimulate the growth of many kinds of plants. There are several timber harvesting methods that can achieve this and still maintain the integrity of the forest. Again, you should check the hydrology of the area before conducting any harvesting to determine the chances of regeneration of the stand. If the regeneration rate is expected to be low, you may want to reevaluate your goals and chose another management option.

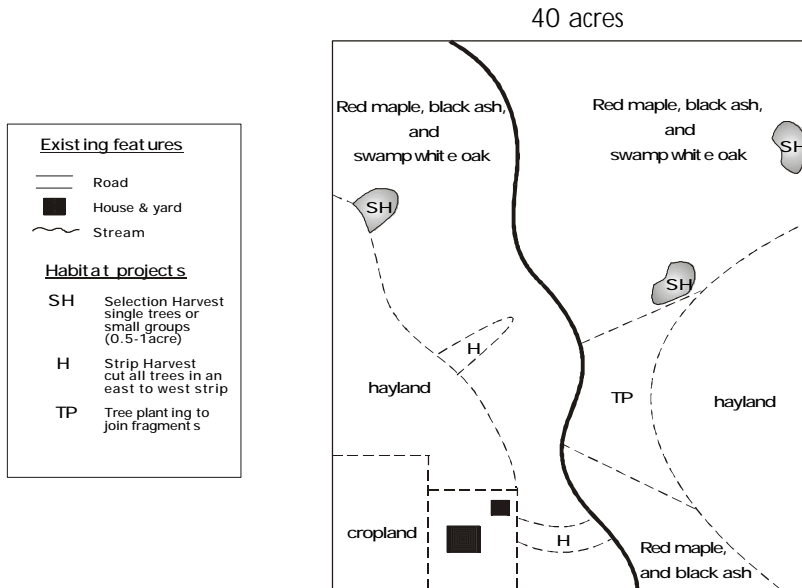
One timber harvesting method used in lowland hardwood stands is selection cutting. This method best mimics natural disturbances and is the least detrimental to forest structure and composition. This method focuses on the harvest of single trees or small groups of trees. It is often used to obtain firewood or veneer-grade lumber. In these cases limit the harvest to single trees along the stand's edge or one to four trees within the forest itself. Plan to remove no more than 25 percent of the trees in any one cutting. For group selection cuts concentrate on one-half acre to one-acre openings. To minimize large disruptions to the stand, space harvests by 10 to 20

years. Because of the overall dominance of red maple, plan to remove this species in favor of less-dominant types such as ash and American elm. Retain a good mix of species including swamp white oak, basswood, ironwood, and hackberry. Retain some den trees, snags, and wolf trees (mature, large sprawling trees that are still alive). Plan the harvest for late summer when soils are dry and firm or winter when the ground is frozen.

The selective harvest method promotes a forest of mixed-aged trees of many kinds. Structural (age, diameter, crown size, and shape of tree) and compositional (species of trees) diversity is therefore assured. Also maintained are micro-habitats within individual trees--cavities that attract flying squirrels and northern flickers, and low crotches in large trees that red-shouldered hawks find suitable for nesting. This strategy is a low-impact timber removal alternative that maintains the integrity of the ecosystem. Many landowners prefer it because of its overall value to wildlife although it is not as beneficial for some game species as other harvest techniques.

Another method of timber harvesting conducted in lowland hardwoods is seed tree cutting. In lowland hardwoods seed tree cutting is done in strips, and is a type of clearcutting where all, or most, of the timber is removed. Trees left standing next to the strips will furnish seeds needed for regeneration. Landowners who do not want the stand to convert to marsh grass or shrubs, but who wish to remove more timber than the selective harvest method, often choose seed tree strip cutting. The goal is to cut one-third of the stand, in strips 120 feet wide. If possible, cut the strips in a general east-to-west orientation to reduce the chance for windthrow

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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.

from prevailing west winds. Retain some swamp white oak and pin oak within the strips, because these trees provide important mast (nuts) for wildlife food. Ground cover will most likely increase in the remaining stand because of better light penetration.

After ten years, another 1/3 of the stand can be harvested. The remaining 1/3 can be cut ten years after that. On each cut, save enough oak and den trees to comprise 10 to 15 percent of the remaining stand. The mixture of saplings, pole-sized, and mature trees you will create with the strip harvest method should provide abundant cover for deer, rabbit, raccoon, grouse, wild turkey, cardinals, and many other species. Wood ducks, squirrels, and other cavity nesters will also find den sites. Adding to habitat diversity will be

ground covers and fruiting shrubs. To increase diversity even more you can plant some shrubs, such as nannyberry and highbush cranberry, along with a few lowland conifers (evergreens).

Most lowland hardwood forests are odd-shaped because of varying soil types, topography, and old land-use patterns. When cutting strips, follow the land's contours as much as possible, keeping in mind that long stretches of straight-edged cutting blocks are less beneficial to wildlife and may create a wind-tunnel effect during storms.

Cut no closer to waterways than 100 feet. This precaution will avoid problems with erosion and sedimentation. The 100-foot-wide buffer you leave will also shade the stream, and help regulate water levels and tem-

perature. Also, it is best to cut in winter when the ground is frozen to minimize soil disturbance.

A clear forest--one with all downed timber, logs and branches removed--is not beneficial to wildlife. Leave most snags (dead or dying standing trees), logs and fallen branches because they provide valuable habitat for invertebrates, amphibians, woodpeckers, and other cavity-nesting birds. Building brush-piles will create habitat for many small creatures, including rabbits.

In summary, if you have lowland hardwoods on your property you have an opportunity to attract a wide variety of wildlife. Large, unbroken tracts with a variety of trees of different ages provide the diverse habitats that many kinds of wildlife use. Protection may be the best management strategy when harvesting and regrowth may be difficult due to uncertain water tables. Lowland hardwoods that were artificially drained can sometimes be restored to original habitats if present trees are cut and any drains plugged.

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