

MESIC HARDWOODS (SUGAR MAPLE & BEECH)



Mesic hardwood forests are areas where hardwoods grow in cool, moist soils that fall between wetlands and drylands. From the sugar maple-beech forests in southern Michigan to the sugar maple-basswood forests of the western Upper Peninsula, mesic hardwood forests are the state's most common forest type. Before European settlement, these forests were the most dominant forest types in Michigan and covered nearly half the state. Today, these forests cover about 19 percent of Michigan's landscape with more than half of the total occurring in the Upper Peninsula.

Southern Michigan mesic hardwoods are dominated by beech and sugar maple but also contain basswood, northern red oak, white ash, American and red elm, shagbark hickory, black walnut, bitternut hickory, and tuliptree. Along an imaginary line that runs from Bay City to Muskegon, or what is known

as the "tension zone," these forests blend into northern hardwood stands. Tuliptree, bitternut hickory, and other more southern species give way to eastern hemlock, white pine, and yellow birch. In the western Upper Peninsula, beech is replaced by white pine, yellow birch, basswood, and hemlock.

Mesic hardwood forests are typically dominated by plant species tolerant of dense shade. For this reason, few shrubs are found in the understory, although Canada yew was an important historical component in northern tracts. Shade tolerant shrubs that sometimes grow under the canopy include maple-leaved viburnum, leatherwood, spicebush, and prickly gooseberry. In spring before leaves emerge to shade the forest floor, an array of wildflowers often carpets the ground. Common species include trout lily, spring beauty, toothwort, Dutchman's breeches, and squirrel corn along

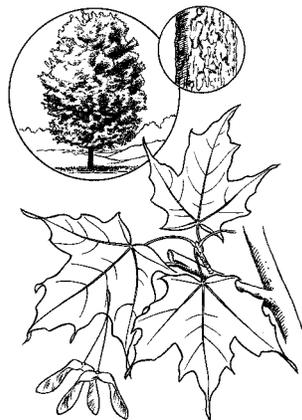
with large-flowered trillium, wild ginger, hepatica, bloodroot, and wild geranium. Because of the high levels of shade, morel mushrooms, and ferns also appear

in abundance in these forests. Uncommon ferns include green spleenwort, American hart's-tongue fern, expanded fern, and male fern. Rare plants associated with the southern Michigan beech-maple forests are prairie trillium, green trillium, toadshade, nodding pogonia, cranefly orchid, goldenseal, and purple twayblade. Ginseng, which is listed as a state-threatened species, grows in both beech-maple and northern hardwood-conifer forests.

A unique microhabitat associat-



beech



sugar maple



basswood

ed with mesic hardwoods is the seasonal wetland. These shallow pools of water occur in the spring within small depressions on the forest floor. Many of these wetlands include a large amount of standing dead or dying trees (snags) that provide homes for many wildlife species. For more information, see the chapter on **Seasonal Wetlands** in the Wetlands Management section.

Mesic forests host a diverse mixture of trees, shrubs, flowers, and other plants. This diversity is maintained by periodic disturbances. For example, lightning strikes kill individual trees and sometimes create fires. Insects and diseases also are responsible for killing trees, and even take out large groups of trees. Windthrow, caused by tornadoes and other severe storms, topple single trees or knock down groups of trees. Historically, these natural forces created a complex forest canopy of many-aged trees with shade-intolerant early successional species, such as aspen and birch, often filling in where large disturbances had taken place.

Depending on location within the state, soil type, moisture gradient, and age of the stand, mesic forests have different compositions. Aspen and birch eventually mature and give way to maple-beech, white pine, or hemlock depending on the site. Today, however, many of these northern Michigan stands, lack the white pine and hemlock that historically were common components. Reasons include fire suppression, intensive timber harvesting over short rotation periods, and intensive deer browsing on young hemlock. After these hardwood sites were cleared, areas that

morels



were allowed to grow back as forests often regenerated into even-aged forests of aspen and birch. This conversion to aspen-birch stands is also seen in southern Michigan where severe disturbance has effected these forests.

Wildlife Value

Diverse mesic hardwood stands offer varied habitats that are used by a wide variety of songbirds, invertebrates, amphibians, and mammals. Deep leaf litter in these stands affords different levels of decomposition. Combined with fallen branches and logs in varying stages of decay, the forest floor is critical habitat for insects, blue-spotted salamanders, white-footed mice, shrews, and chipmunks. Furthermore, certain types of wildlife use the different layers of the forest such as various levels of the overstory, understory, as well as the forest floor.

The red-shouldered hawk, a state-threatened species, prefers to nest in the lower crotches of mature trees in northern hardwood and southern floodplain forests. Other uncommon or declining birds found in mesic hardwood forests include the northern goshawk, black-throated blue warbler, and--especially where hemlock is present--the blackburnian warbler.

The American marten, fisher, elk, and gray wolf live here along with the barred owl, pileated woodpecker, broad-winged hawk, bald eagle, wood frog, chorus frog, and deer mouse. Other species include ruffed grouse, woodcock, cottontail rabbit, snowshoe hare, fox and eastern gray squirrel, wild turkey, white-tailed deer, bobcat, fox, coyote, raccoon, and black bear.

Seasonal wetlands in these forests attract many migrating and nesting birds due to large amounts of insects present at these times. The wetlands within these forests also provide critical habitat for several kinds of frogs--the chorus, wood, and gray tree species.

Management Considerations

Management options for mesic hardwood forests include both protection and timber harvesting. If you own a mature mesic hardwood stand that is diverse in structure and species composition, it may be best to disturb the stand as little as possible. Structural diversity refers to age, tree diameter, crown size, and shape of trees within the stand. Included are microhabitats, such as cavities and crotches, within individual trees. Compositional



red-shouldered hawk

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diversity promotes a mixture of several tree species. In a forest like this, little timber harvest is needed to increase the value to wildlife.

However, like all other forest types, mesic forests change with time, and some type of management may be needed to keep them viable for some species of wildlife. Also, the market value of the forest is sometimes an important consideration to landowners. When conducting timber harvesting, you must take into account the full range of benefits that these forests provide. Such benefits include habitat for wildlife, soil protected from erosion, good water quality in streams and ponds, and a healthy environment for soil organisms. Any cutting program you choose should also take into account local factors--problems with gypsy moth infestation or overbrowsing by deer--and the importance or unique nature of the forest relative to surrounding landscapes.

Protection

If your forest has a diversity of trees along with a variety of understory shrubs and plants, it is probably in good shape to be managed as a mature stand. Many migratory songbirds that nest in these forests are declining due to stand-size reduction, which occurs when property is developed or subdivided. Species that need a large amount of interior forest are jeopardized when large, intact, mature stands of 100 acres or larger are fragmented. Such interior species include the American redstart, ovenbird, wood thrush, and red-eyed vireo. Because there are not many large tracts of mature forest, these forests should not be fragmented if possible. Therefore, do not disturb intact stands by adding roads and clearings, erecting build-



pileated woodpecker

ings, or allowing livestock to graze. Also, stands that connect waterways or other woodlands offer the greatest benefit to wildlife and should be maintained or restored whenever possible. Please see the chapter on **Edges and Fragments** in the Habitat Planning section for more information.

Timber Harvesting

There are two timber harvesting methods: uneven-aged management and even-aged management. Both methods are discussed in detail in the **Timber Harvesting** chapter in this section.

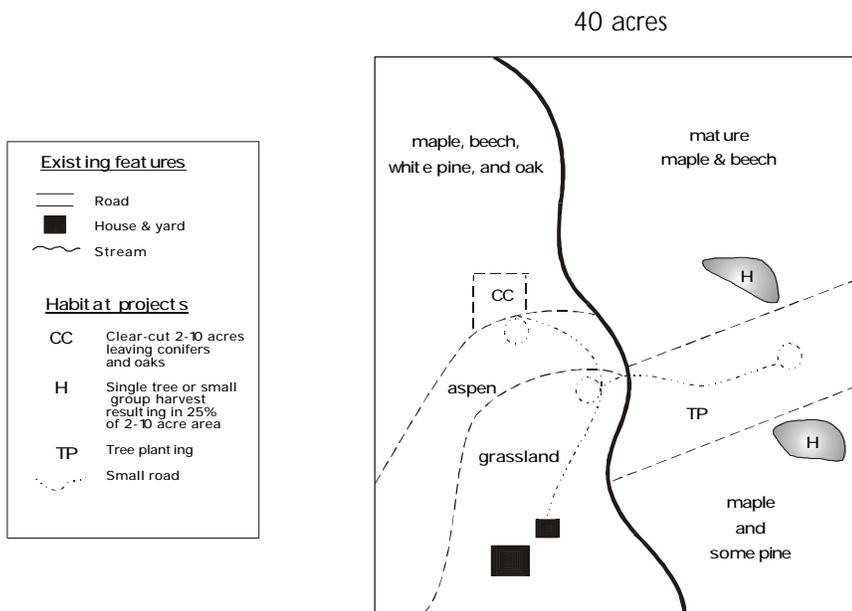
Uneven-aged management promotes a forest of mixed-aged trees of many species and is the best timber harvesting method for wildlife in these forests. It creates the least amount of disturbance and helps to maintain the integrity of the ecosystem. The forest should contain multiple levels from the canopy trees to shrubs to downed logs. This method can include either single tree or group selection cutting techniques. Single tree selection calls for removing single trees, especially along the edge. Group selection calls for small cutting areas that remove two to four trees. These techniques are supposed to mimic natural disturbances.

Single trees or small groups of trees are harvested with no more than 25 percent of the trees in the stand removed at any one time. Space cuttings 10 to 20 years apart and retain a broad mix of species. Spare some basswood, beech, and other large, mature trees that may serve as dens, snags, or wolf trees (mature, large sprawling trees that are still alive). Limit your group cuttings to one-half to one-acre parcels. Because of the overall dominance of sugar maple, remove this species in favor of less-dominant ones such as basswood, oak, yellow birch, white pine, spruce, and hemlock.

Michigan property owners who decide to cut their mesic hardwoods tend to prefer an even-aged management technique such as clear-cutting. However, in the past this strategy has focused on short harvest rotations of 30 to 50 years to promote aspen, which grows in the early successional stage of this ecosystem. By managing in longer rotations, the hardwoods-conifer mix of the original mesic forest can return to provide the habitat diversity that attracts many types of wildlife.

Even-aged management of mesic hardwood forests involves two- to 10-acre cuts using the seed tree or shelterwood techniques. Trees are left within the cutting area to provide shelter or a seed source, which will promote regeneration of that species within the stand. To minimize the amount of edge, plan the cut as a circle or square rather than a rectangle or other shape. This practice will reduce the impact of parasitism by brown-headed cowbirds on nesting interior woodland bird species.

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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.

Seed tree and shelterwood harvests can help maintain the diversity of mesic hardwood forests. In cuttings larger than eight acres, leaving small stands of trees 1/2 to one acre in size within the cut will provide diversity. Even when focusing on conifers, sparing important species such as oak will add diversity. Remove mostly dominant broadleaf bearing trees, such as maple, and leave a variety of other species for regeneration of a diverse forest. If your sugar maple forest is in southern Michigan, leave species such as northern red oak, white ash, black cherry, and tuliptrees. For property in northern Michigan, leave hemlock, white pine, yellow birch, and black cher-

ry. Saving only 10 to 15 percent of these mature trees will add diversity values. About 60 years later, a total of 40 to 70 percent of the forest can again be cut, once more leaving a diversity of species as shelter and future seed sources.

A clear forest is not beneficial to wildlife. Building brush piles and leaving large branches on the forest floor are helpful to wildlife. Also, save any standing dead trees (snags) and fallen logs because they too provide valuable habitat for invertebrates, amphibians, woodpeckers, and other cavity-nesting birds. During the harvest, protect all waterways and seasonal wetlands from logging equipment

and vehicles. Leave a vegetative buffer at least 100 feet wide around any ponds, streams, rivers, and lakes, and protect any corridors that connect waterways to the forest interior. In northern Michigan, if no conifers are present in the forest, consider planting a few after the harvest, but realize that cedar and hemlock are hard to establish, especially in areas where deer are plentiful, as they take a relatively long time to grow.

In summary, mesic hardwood forests are Michigan's most widespread forest type. Those stands that offer the most diversity attract the largest number of wildlife species. It is beneficial to protect the integrity of these forests. Landowners have several timber harvesting options to consider that may help to maintain the diversity of these forests. If you decide to harvest your forest, you should consult with a forester or wildlife biologist. They will help you sort through the many options to make the best decision.

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