



INTRODUCTION TO FOREST MANAGEMENT

In the early 1800s, forests covered most of Michigan's more than 36 million acres of land. Today, nearly all of the state's landscape has been disturbed by human activity. This disturbance has decreased our forests by 50 percent. A long period of heavy logging and fires, which began about 1840 and ended about 1930, substantially contributed to this loss. Currently, the largest threat to our remaining forests is fragmentation, which occurs when larger properties are divided into smaller parcels. Also, the lack of old growth forests, which provides structural diversity, is a threat to our landscape ecosystems. Current logging practices favor certain tree species over others causing forests to become "over simplified" and altering natural processes. Other threats to Michigan forests include over browsing by deer, hydrologic alterations, and the timber harvesting process of "high grading" which is a profit motivated technique that has no value for wildlife.

Importance as a Natural Resource

Michigan's more than 19.3 million acres of forest provide ecological, economic, recreational, and aesthetic benefits to the state's citizens. One of Michigan's important natural resources, these forests range in size from small, privately owned woodlots to larger areas owned by the public, industry, or timber companies. Trees help to

hold the soil in place and prevent erosion. They remove carbon dioxide from the air and replace it with oxygen, furnish shade, and help cool rivers and streams. In addition, they furnish homes, food, and shelter for wildlife and provide wood for the production of lumber, paper, and various other products.

Forest Types

Michigan forests form a broad transition zone between the conifer forests (evergreens that bear needle leaves) of Canada and the deciduous forests (those broadleaf-bearing trees) of the eastern United States. For example, Michigan is in the southern range of the jack pine and white spruce and in the northern range of the Kentucky coffeetree, shagbark hickory, and tuliptree. As a result of this transition, there are many kinds of trees found throughout the state.



Forest types reflect changes in climate and soil texture. Within the Lower Peninsula, an imaginary line called the "tension zone" (that runs from Muskegon to Saginaw Bay) demonstrates such changes. South of the tension line the presettlement forests were primarily deciduous on all but the wettest sites. Black oak, white oak, red maple, and shagbark hickory grew on dry, well-drained uplands. Sugar maple, beech, basswood, and red oak flourished on moist, somewhat fine soils. Lowland areas, river bottoms, and lake plain soils supported forests of ash, silver, and red maple, swamp white oak, American elm, and cottonwood. White pine and hemlock grew along dunes.

North of the tension zone the soils tend to be coarser, the growing season is shorter, and the climate is cooler. As a result, beech and sugar maple, mixed with hemlock, white pine, and yellow birch grew on all but the driest uplands and wettest wetlands. Pines and mixed-pine communities were prevalent as they prospered on drier soils. In the Upper Peninsula, similar patterns developed with pines growing on sandy, acidic soils. Cooler summers promoted the growth of hemlock, yellow birch, balsam fir, and white spruce. Poorly drained sites contained black spruce and larch (tamarack), which tended to grow in bog communities.

Knowing what type of forest historically grew on your land will help you understand what is there today. It is important to know what kind of forest is on your property before you can make any management decisions. Although you can identify individual tree species with the help of field guides, it is more difficult to recognize forest types. One reason is because your property may contain more than one soil condition. Another reason is because individual trees don't always grow in only one type of soil. A professional forester or wildlife expert can help you identify the kind of forest you own.

This section contains chapters that explain eight different types of forest. These types are categorized by soil moisture content. The term "mesic" refers to soil that is moderately moist. Listed below are the classifications and their respective importance to wildlife. Keep in mind that just as a tree species may occur in more than one kind of forest, a species of wildlife may also use more than one kind of forest.

DRY CONIFERS



jack pine

are northern Michigan forests containing stands of jack pine and red pine as well as mixtures of these species with northern pin oak, white pine, and aspen. They grow on very dry, sandy plains and ridges that are acidic and low in nutrients. Today, about 800,000 acres occur mainly in the high plains region from Mio to Vanderbilt and in flat, sandy areas of the Upper Peninsula. Historically, dry conifer forests were found in a mosaic of pine "barrens" and prairies. Only 100 acres of high

quality pine barrens exist today. If presettlement maps show that historically there was a pine barren on your land, chances are it can be restored.

Common mammals found in dry conifer forests are the badger, coyote, snowshoe hare, and black bear. Birds include the upland sandpiper, northern harrier, red crossbill, hermit thrush, bluebird, red-tailed hawk, American kestrel, and raven. The Kirtland's warbler is the best known of the rare species, which include the prairie warbler, black-backed woodpecker, sharp-tailed, and spruce grouse. The frosted elfin butterfly and secretive locust are two other rare creatures that inhabit dry conifer forests. A large number of rare plant species are also found here.

DRY MESIC CONIFERS



white pine

are evergreens that grow on dry, sandy soils. The key tree species of this type is white pine. Because white pine was favored by loggers it no longer dominates dry mesic sites. Historically, white pine grew with red pine, white oak, beech, maple, and hemlock. These mixed stands include white pine-red pine forests in the high plains and rolling hills of the northern Lower Peninsula and white pine-white oak forests on the dry hills of west-central lower Michigan. White and red pine also mixed at times with combinations of red, black, and white oak. Mixed hardwoods of beech, red maple, and red oak grew with white pine and hemlock. Today, mature stands of white pine dominated forest are very uncommon.

The wild turkey, white-tailed deer, porcupine, red and gray squirrel, chipmunk, and black bear favor white pine dominated forests. Bird species include woodpeckers, crossbill, redpoll, scarlet tanager, red-breasted nuthatch, black-throated green warbler, black-capped chickadee, great-crested flycatcher, and pine warbler. The blue racer, a snake, lives there, and the rare Karner blue butterfly is sometimes attracted to the forest edge of open oak-pine forests.

MESIC CONIFERS



northern white cedar

are upland forests of evergreens that grow in moderately moist soils. There are two major types of mesic conifer forests. One type is dominated by eastern hemlock, while white spruce, balsam fir, and northern white cedar dominate the other type. These forests typically occur in northern Michigan along Great Lakes shorelines, along peatland edges, in narrow zones between wetlands and uplands, or in areas with seasonally wet soils. Historically, about 15 percent of Michigan's forests contained mesic conifers. Today, only a few small pockets of hemlock dominated forests still exist in Michigan, and very little hemlock can be found growing in northern hardwoods or other forest types.

Mesic conifer forests provide winter cover, thick branches for nesting, and seed food sources for many wildlife species. Such species include the Canada warbler, ruffed grouse, brown creeper, junco, veery, pine siskin, red crossbill, redpoll, black-capped chickadee, white-tailed deer, bobcat, red squirrel,

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rel, and spotted and blue-spotted salamanders. Also, many species of birds migrating along the Great Lakes rely on early spring insect production from shallow bays bordering mesic conifer forests.

LOWLAND CONIFERS comprise about 4.4 million acres of Michigan forest. These evergreen forests of black spruce, white cedar, and tamarack grow in muck- or peat-bottomed swamps and other poorly drained depressions mostly in the northern Lower and Upper Peninsulas. Sometimes these conifers mix with hemlock, white pine, and some hardwoods such as black ash. These forests often appear as a transition between wetland and upland habitats. Today, white cedar swamps have dramatically declined due to development, hydrologic alterations, roads, and over browsing by deer.



tamarack

Spruce-tamarack bogs attract white-tailed deer, spruce grouse, snowshoe hare, bobcat, black bear, white-throated sparrow, ovenbird, red-eyed vireo, Nashville warbler, and common yellow-throat. Additional species that favor white cedar swamps include the Swainson's thrush, Tennessee warbler, and yellow-bellied flycatcher.

DRY HARDWOODS are dominated by several species of oak and hickory and comprise six percent of Michigan forests. These forests were historically found mostly in the southern Lower Peninsula. Today, they are mostly found in the northern



oak

Lower Peninsula. These forests, which thrive best after fire, typically contain white, black, or red oak, along with pignut hickory. Other components may include white ash, red maple, black cherry, beech, and shagbark hickory. White and black oak with smaller amounts of black cherry, pignut hickory, and sassafras dominate mixed-oak forests.

Dry hardwoods attract the great-crested flycatcher, Eastern wood pewee, rose-breasted grosbeak, scarlet tanager, ruffed grouse, wood duck, ovenbird, white-breasted nuthatch, red-bellied woodpecker, downy woodpecker, northern flicker, wild turkey, and black-capped chickadee. White-tailed deer, squirrels, chipmunks, deer mice, and voles are common mammals.

MESIC HARDWOODS are Michigan's most common forest type because they grow in cool, moist soils that fall between drylands and wetlands. About 19 percent of the state's forest community are mesic hardwoods consisting mainly of beech and sugar maple. In southern Michigan, these forests occasionally include a component of conifers along with basswood, red oak, white ash, American and red elm, shagbark hickory, black walnut, bitternut hickory, and tuliptree. North of the tension zone, hemlock, white pine, and yellow birch replace tuliptree, bitternut hickory, and other more southern species. In the western Upper Peninsula, beech is rare and white pine, yellow birch, basswood, and hemlock become major components.



beech

These forests are home to the ruffed grouse, woodcock, cottontail rabbit, snowshoe hare, elk, fox and Eastern gray squirrel, wild turkey, white-tailed deer, bobcat, fox, coyote, raccoon, black bear, American marten, fisher, gray wolf, barred owl, broad-winged hawk, wood frog, chorus frog, and vole. Uncommon animals include the northern goshawk, red-shouldered hawk, and black-throated blue and Blackburnian warbler.

LOWLAND HARDWOODS are hardwood swamps and floodplain forests that comprise about five percent of Michigan and provide some of the state's largest remaining natural forest habitats.



swamp white oak Red maple, black and red ash, and swamp white oak dominate in mixed hardwood swamps, and may include pin and black oak, and black gum. Black ash swamps also occur on flat, sandy plains in southern Michigan. In northern Michigan, black ash sometimes mixes with northern white cedar or tamarack. Canopies are typically dense in hardwood swamps as well as in floodplain forests whose rich soils tend to flood in spring and sometimes fall. Southern Michigan floodplain forests support silver and red maple, red ash, and cottonwood with minor components of swamp white oak, black willow, and black walnut also occurring. Several southern trees reach their northern ranges in these forests.

Songbirds that inhabit these forests include the warbling and red-eyed vireo, northern oriole, indigo bunting, gray catbird, and eastern wood pewee. Other

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species include the wood duck, raccoon, woodcock, white-tailed deer, wild turkey, bats, salamanders, frogs, snakes, and many species of migrant waterfowl. Uncommon species include the red-shouldered hawk, Indiana bat, smallmouth salamander, spotted turtle, Blanchard's cricket frog, several species of mussels, and the cerulean, prothonotary, and yellow-throated warbler.



aspen

ASPEN-BIRCH forests comprise about 3 million acres, or roughly 10 percent, of the state's land base. Not truly a forest type, it is an early growth stage within a variety of forests. Historically, less than 270,000 acres of aspen-birch forests were present in Michigan. These sun-loving, fast-growing, relatively short-lived forests often grow with smaller components of balsam fir, pin cherry, red maple, white and red oak, and white and red pine. Aspen, often called poplar, regenerates best after it is clearcut by sending thousands of sprouts above the ground soon after the forest is harvested. Aspen and birch form open forests that allow many species of ground covers and fruiting shrubs to grow beneath the forest canopy, and these in turn attract a wide variety of wildlife.

At varying stages of growth, aspen-birch forests attract the chestnut-sided and mourning war-

bler, indigo bunting, least flycatcher, yellow-bellied sapsucker, ruby-throated hummingbird, red-eyed vireo, ovenbird, and pileated woodpecker. Other species include the black bear, white-tailed deer, woodcock, snowshoe hare, cottontail rabbit, ruffed grouse, woodland jumping mouse, porcupine, white-footed deer mouse, flying squirrel and, where evergreens are present, the American marten and fisher.

Management Options

Managing these forest types begins with defining what your goals are. Refer to the **Habitat Planning** section for more information. Perhaps more than any other type of natural resource you may own, forests require the skills of a professional to help you sort through the many options available. Your goals may or may not include a timber harvest. If you decide to harvest your forest, a forester or wildlife biologist can help you receive its full economic value. Also, they may be able to supervise timber removal in a way that minimizes impact to the environment, and to help you achieve your goals for improving or creating wildlife habitat.

Not cutting your forest is a management option that has both positive and negative consequences for wildlife. Harvest strategies of shelterwood cutting, clearcutting, and seed-tree management also have far-reaching implications. An example of when to cut occurs with a closed-canopy

oak forest that you might want to manage for wild turkey habitat as well as generate income. An example of when not to cut involves a conifer swamp of white cedar or hemlock that you want to maintain for thermal cover for wintering wildlife.

In summary, Michigan's considerable forest resources are characterized into eight different communities keyed to soil moisture and conditions of climate. Over the years many of these forests have been dramatically altered, and may require some type of manipulation in order to provide optimal wildlife habitat for some species of wildlife. Although several million forested acres are owned by the public or by timber industries, about half of Michigan's forests are owned by more than 350,000 private property holders. On these private lands lies the future for improving or creating wildlife habitats. The type of management style a landowner chooses to conduct on their land will effect the kind of wildlife that are supported on the property.

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