

## MESIC CONIFERS (HEMLOCK, WHITE SPRUCE, BALSAM FIR)



Mesic conifer forests are upland forests of evergreens (conifers) growing in moderately moist (mesic) soils. There are two major groups of trees that occur in this type of forest: 1) Eastern hemlock often mixed with yellow birch, red maple, or white pine, and 2) white spruce, balsam fir, and northern white cedar. Mesic conifer forests are typically found in northern parts of the state along shorelines of the Great Lakes, along peatland edges, in narrow ribbons between lowlands and uplands, along ravines and river corridors, or in areas with seasonally wet soils. It is estimated that about 15 percent of Michigan's overall land base historically supported mesic conifer forests.

At one time hemlock was the dominant tree species along transition zones from lowlands to uplands. Here, it often grew with



eastern hemlock

northern hardwoods such as beech, sugar maple, and yellow birch, and occasionally with white pine and northern white cedar. Historically, hemlock-yellow birch forests existed along lake margins in the western Upper Peninsula. Forests of hemlock and white pine occurred on flat, sandy areas throughout the northern Lower Peninsula of the Saginaw Bay region. Hemlock can live to be 600 years old. Good places to see old stands of hemlock include the Porcupine and Huron mountains of the Upper Peninsula, high spots along old floodplains of the lower Manistee River in west-central Lower Michigan, and in the Black River gorge of the Port Huron State Game Area.

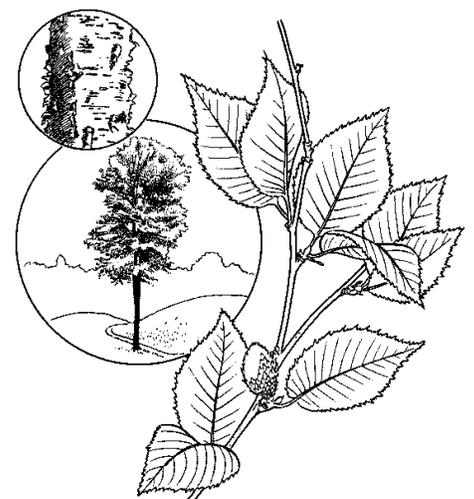
Today, hemlock is an uncommon component in most Michigan forests for several reasons. During northern Michigan's logging era from about 1840 to 1930, the tannin in hemlock bark was highly prized for tanning leather. Thus, hemlock became a targeted species. Since it is a shade-tolerant, slow-growing tree that needs rotting nurse logs or moist, acidic soils with very little leaf litter in order to grow, it is hard to regenerate. Also, hemlock is a favorite winter food of deer and elk, which cause damage by heavily browsing on seedlings and young trees.

The other kind of mesic conifer forest is often referred to as boreal forest. Those sites are dominated

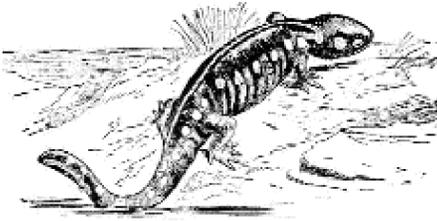
by white spruce, balsam fir, and northern white cedar and are typically too cold, humid, wet, or nutrient-poor for other trees to survive. These areas include sandy soils, rocky shorelines, and thin soils over bedrock. Here windthrow from storms occurs frequently because root growth is usually shallow. Paper birch and aspen often grow in these naturally created openings. Ground cover in the boreal forest includes sedges, mosses, lichens, twin flower, star flower, wild sarsaparilla, bunchberry, and mayflower.

### Wildlife Value

Mesic conifer forests provide good habitat for a variety of wildlife species. Bald eagles and ospreys perch and sometimes nest in the tall evergreens. This is especially seen along the northern Great Lakes. Uncommon plants that grow in these forests include the ram's head orchid and dwarf lake iris. The dwarf lake iris is found only along



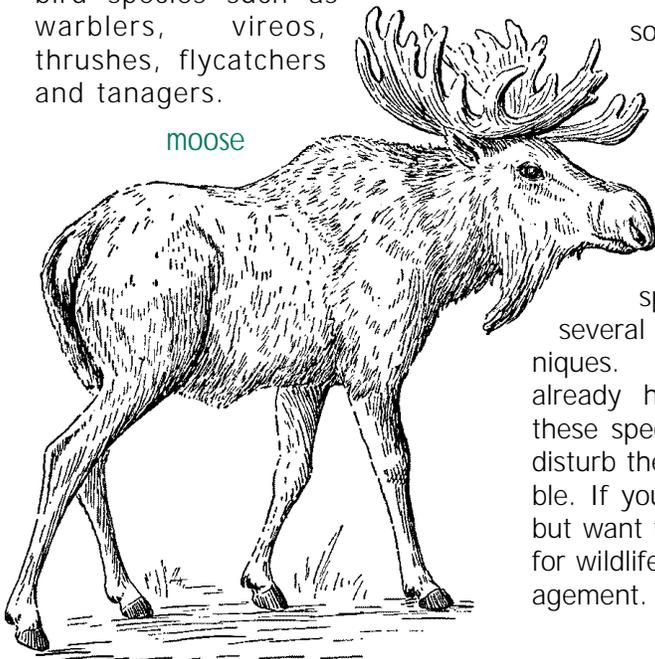
yellow birch



spotted salamander

northern shorelines of Lake Michigan and Lake Huron, and is the official state wildflower. Mesic conifers offer thermal protection for deer, ravens, sharp-shinned hawks, and other wildlife species during cold weather. Moose, fishers, and American martens also live in these forests, as well as Blackburnian warblers, winter wrens, Canada warblers, ruffed grouse, brown creepers, white-tailed deer, bobcats, and spotted and blue-spotted salamanders. The veery and junco in particular like to nest in thick hemlock groves. The seeds from hemlock cones provide food for red crossbills, pine siskins, black-capped chickadees, and red squirrels. Shrubs and ground cover attract insects that provide food for migrating bird species such as warblers, vireos, thrushes, flycatchers and tanagers.

moose



## Management Considerations

There are two management options to consider: protection or timber harvesting.

### Protection

In forests with a large amount of hemlock and yellow birch, or white spruce, balsam fir, and northern white cedar, little or no timber harvest may be necessary to increase habitat value to wildlife. Therefore, healthy mesic conifer forests and their adjacent uplands should be disturbed as little as possible. In fact, because wet or seasonally wet soils are typical of this forest type, logging operations if done poorly can have a negative impact because they often disturb the soil and impound water. Mature hemlock are especially susceptible to disturbance. Therefore, avoid creating roads, trails, or openings as much as possible. If you must make roads, maintain a gradual edge, and reseed and block access when they are no longer needed.

However, without some type of disturbance, establishment of a younger hemlock stand may occur once every 50 to 200 years because of the slow rate of regeneration. Landowners can help speed up this process with several timber harvesting techniques. However, if your forest already has a large amount of these species present it is best to disturb the forest as little as possible. If you wish to remove timber but want to retain maximum value for wildlife, use uneven-aged management. This practice, which is

best performed near the forest edge, will mimic natural disturbances as it limits your cuts to single trees or small clumps of five to ten trees. If you have pure stands of hemlock, it is best to leave uncut groves that are several acres in size. You can also use this practice for managing mesic conifer forests of mostly white spruce and balsam fir. However, be sure to spare any northern white cedar as it is very hard to regenerate, especially in areas that support moderate to high deer numbers.

### Timber Harvesting

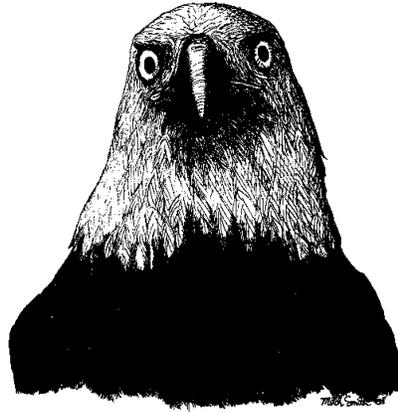
In mixed hardwood forests with hemlock present in the understory, timber harvesting of the overstory hardwood trees may help hemlock to grow and become a dominant species. Hemlock regenerates in moist soils beneath the shade of more sun-loving trees. Seedlings often establish themselves on large fallen rotting logs or on moist exposed soils. However, if these shady conditions remain, the hemlock can remain stunted for 25 to 200 years. When some type of disturbance, such as windthrow or fire, opens the canopy and lets sunlight in hemlock begins to grow very rapidly. The following are timber harvesting methods to be used in forests where hemlock is found in the understories of other species, and needs help becoming more quickly established. Please refer to the **Timber Harvesting** chapter in this section for more detailed information on these techniques.

Uneven-aged management causes the least amount of disturbance and comes closest to providing the greatest diversity of tree ages and heights, which are of the greatest benefit to wildlife. Single

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tree or small group selections of five to ten trees promotes a diverse stand. Locate hemlock seedlings in the understory and remove competing trees around them. Creating these small openings will allow hemlock to receive enough sunlight to grow. Follow-up with group selection treatments every three to five years to thin out competing hardwoods.

Even-aged management using shelterwood cuts is the preferred method when conducting a large scale harvest. This method removes 40 to 60 percent of the mature trees but leaves the healthiest and largest trees to provide shelter for the growing seedlings. Because the tree species in a mesic conifer forest prefer shade or partial sun, cut small areas of 60 feet to a side and leave these tree species as well as others to ensure a diverse regeneration. This first cut will allow sunlight to reach the forest floor and prompt tree seedlings to sprout and grow beneath the protection of the shelterwood trees. When seedling and sapling development has reached four to six feet in height, and shelter is no longer necessary, the remaining mature trees can be cut. This technique can be done in uni-



bald eagle

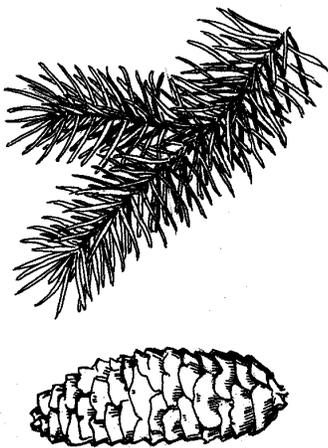
form, group, or strip formations.

Even-aged management using clearcutting followed by planting can also be used when managing areas with few hemlock, spruce, fir, or cedar. However, it may be difficult to regenerate a diverse stand of tree species with this method. Small patch cuts of five to 10 acres in size and narrow strips are preferred. Strips should be no wider than 150 feet in areas with mild winds and no wider than 50 feet in areas with strong winds that are prone to windthrow. Desired species can then be planted in the cut areas. Adjacent uncut areas should be at least 100 feet wide. These cut areas will progress from open ground to saplings and finally to mature trees over a period of 50

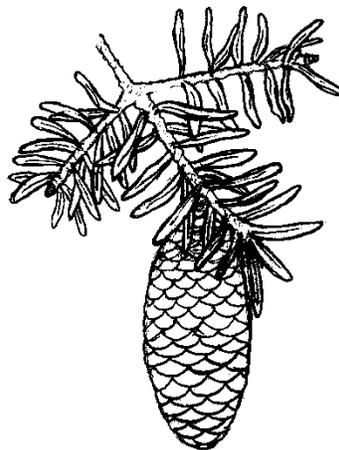
to 80 years. The different stages of growth and diversity of tree species will provide varying habitats that will attract different species of wildlife over a long period of time.

If you choose to harvest your mesic conifer forest, all cutting activities should be conducted after the ground is frozen to minimize disturbance to the soil. In clearcuts, consider leaving clumps of 20 plus trees to provide nesting habitat and thermal cover for wildlife. Wherever needed, add culverts to maintain normal water flow.

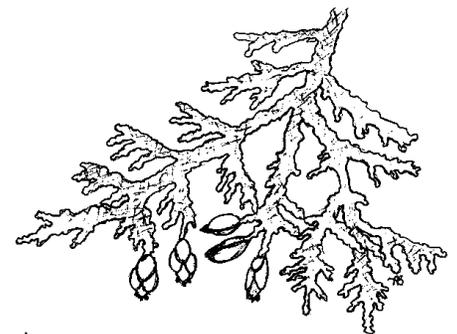
A clear forest is not beneficial to wildlife. Leaving large branches on the forest floor is beneficial to many species of wildlife. Creating brushpiles provides essential cover, especially for rabbits and snowshoe hares. However, be aware that attracting these species to the area can lead to over-browsing of regenerating seedlings. Leaving dead standing trees (snags) and fallen logs, provides valuable habitat for invertebrates, amphibians, woodpeckers and cavity-nesting birds. Also, leaving logs on the forest floor aids with the regeneration of hemlock and yellow birch.



white spruce

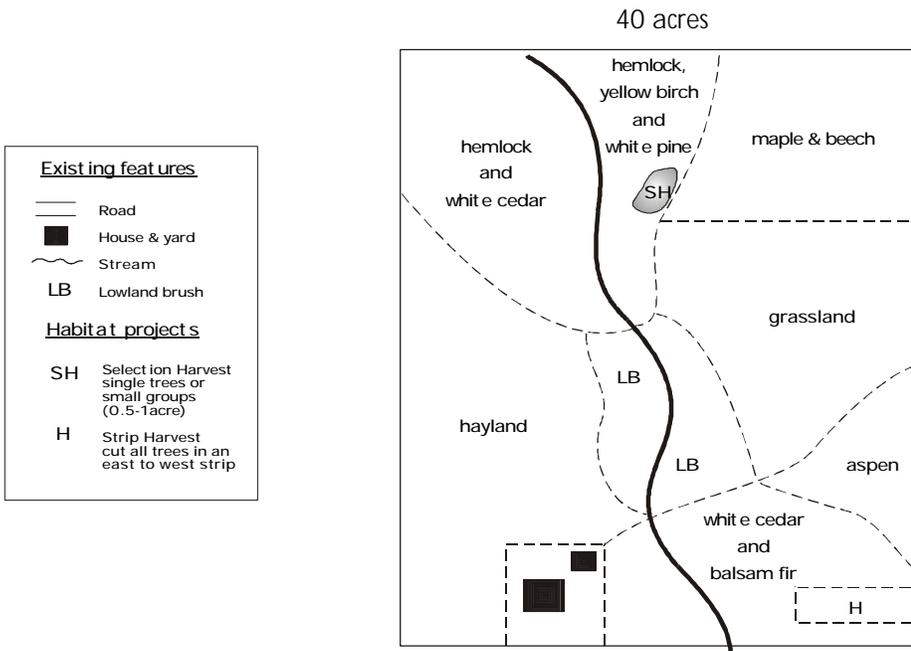


balsam fir



northern white cedar

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that can help them become established. Knowing how different wildlife species are impacted by your decisions should help guide you in the management choices you make.

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.

## Exotic Mesic Conifers

Norway, Austrian, and blue spruce are not native to Michigan. However, some landowners add them to their property where they provide aesthetic value as landscape screens and have some benefit for wildlife--mostly in the form of travel lanes and corridors as well as winter cover.

Blue spruce and Scotch pine (Scots pine) have economic value when they are grown in Christmas tree plantations. Rabbits, mice, and other small mammals may find shelter and nesting sites under the

spreading limbs of trees under 20 years old, if they are periodically thinned. Mourning doves often nest in the crooked branches of blue spruce. However, these exotic species lose their limited wildlife value the older they grow, and Scotch pine in particular is susceptible to insects and diseases.

In summary, wherever mesic conifer forests grow in Michigan, they have high value for wildlife. If you have healthy mesic conifer forest you should protect it if possible. If your forest has the potential to contain more of these species there are timber harvesting techniques

### FOR ADDITIONAL CHAPTERS CONTACT:

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