



LOWLAND CONIFERS (TAMARACK, BLACK SPRUCE & WHITE CEDAR)

Lowland conifers are forests of evergreens that grow in association with swamps, in areas adjacent to streams, or other poorly drained depressions where peat or muck accumulates. These forests are found in the transition between aquatic environments and uplands. There are two groups of tree species associated with these areas: 1) tamarack (larch), black spruce, and northern white cedar are the most common and 2) white pine, balsam fir, eastern hemlock, and some hardwoods such as black ash. These forests of lowland conifers are primarily found in the northern Lower Peninsula and Upper Peninsula although they also grow in southern Michigan. Foresters estimate there are about 4.4 million acres throughout the state.

In general, black spruce is the dominant tree in the lowlands of the western Upper Peninsula.

Northern white cedar is the dominant species in lowlands of the northern lower and eastern Upper Peninsula, and tamarack tends to dominate in southern Michigan lowlands. However, conifer swamps vary throughout the state, and what grows on your property depends upon soils, climate, drainage, and past disturbances.

For example, in areas where there is significant water flow through calcium-rich bedrock or soil, northern white cedar is the most common species. Cedar will be the first of these species to colonize in very alkaline, high flowing groundwater conditions. In swamps, cedar is often accompanied by black ash, balsam poplar, speckled alder, aspen, and red maple. In lowland stream borders, cedar is found with balsam fir, black spruce, eastern hemlock, white spruce, and other hardwoods. Many swamps of white cedar have

an underlying layer of peat that is shallower than that found in bogs. Cedar swamps are common throughout Presque Isle county, the eastern Upper Peninsula within the Seney National Wildlife Refuge, and within Lake Skegemog Natural Area near Traverse City in the northern Lower Peninsula. Cedar swamps are also found in southern Michigan lowlands within the Highland Recreation Area and Horseshoe Lake State Game Area, which have significant cooler temperatures than surrounding uplands. Although white cedar is the dominant tree, there are also some balsam fir, eastern hemlock, white spruce, red maple, and paper birch.

Black spruce is dominant in acidic areas with cold, stagnant water. This includes very slow moving swamps and the edges of sphagnum bogs. In these areas, tamarack, balsam fir, red maple,



northern white cedar



tamarack



black spruce

and yellow birch are also found. Tamarack grows in most wet lowlands that receive full sunlight and have acidic soils. Spruce-tamarack bogs, which are basically peatlands, are common in the Upper Peninsula and in northern Lower Michigan. They occur as scattered trees over an open area containing a surface layer of deep peat, sphagnum moss, and sedges. The trees, seldom taller than 60 feet, give way to red maple around the edges, and these in turn progress to white pine and white cedar on adjacent areas. Sphagnum moss often blankets the ground of these conifer peatlands and is interspersed with a variety of ferns, orchids, and acid-loving shrubs such as Labrador tea, bog rosemary, and leatherleaf. Cranberries frequently grow in black spruce swamps and are typical inhabitants of open sphagnum bogs.

Many white cedar forests of the Upper Peninsula are 200 years old or older, are in healthy condition, and in no danger of being lost except for their timber value. However, these areas were historically not harvested for timber as much as other species on drier sites. Therefore, healthy lowland conifer forests can still be found throughout Michigan.

snowshoe hare

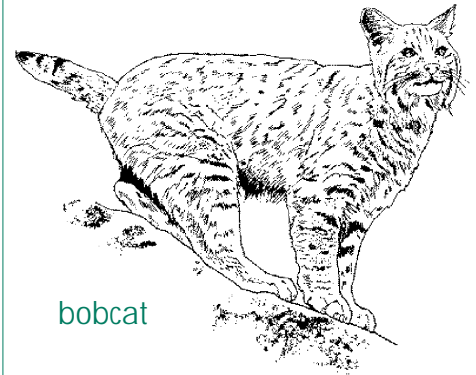
Wildlife Value

Those conifer swamps especially rich with white cedar provide habitat for many types of amphibians, songbirds, reptiles and mammals seeking water, insects and dense cover. Wood frogs breed in pools within these forests. White-tailed deer, elk, snowshoe hares, Swainson's thrush, American redstart, black-throated green warblers, and black and white warblers are also species that use cedar swamps. Uncommon birds include the palm warbler, boreal chickadee, and yellow-bellied flycatcher. Uncommon mammals include the moose, spruce grouse, and wood turtle. Examples of rare plants are the Michigan monkey-flower, round-leaved orchid, ram's head orchid, Calypso orchid, and marsh grass-of-parnassus.

Common wildlife species that inhabit spruce-tamarack bogs include white-tailed deer, spruce grouse, snowshoe hares, bobcats, black bears, mink frog, bog turtles, white-throated sparrows, ovenbirds, red-eyed vireos, Nashville warblers, and common yellowthroats.

Management Considerations

Forests of lowland conifers are susceptible to windthrow, fire, insect damage, and water level fluctuations. Small-scale disturbances from insects and fire open up the canopy, allowing sunlight to reach the forest floor and develop a diverse understory of shrubs and other plants. Larger scale disturbances such as logging, road building, or intense beaver activity can have vast negative effects on lowland conifers. Often after these disturbances aspen and birch, or in wetter sites cattail and sedges, move in and dominate the area.



bobcat

Most lowland conifer stands in Michigan are in good condition, and there is no need to regenerate them over the next 20 to 40 years. Further, researchers and other professionals have experienced limited success in duplicating the natural conditions that created these forests. Therefore, unless there is an economic need to harvest your lowland timber, you are best advised to leave these forests alone.

Protection

Lowland conifers provide thermal protection for several species of birds and mammals. The dense evergreen branches furnish escape cover from predators and offer secure nesting sites. Maintaining the hydrology (water level) of these forests is important because severe flooding or years of drought can have a major impact on the health of the stand. Draining adjacent uplands can lead to a higher water table which will flood lowland conifers. Flooding can eventually convert the forest to a stand of cattails or a thicket of alders and willows. Conversely, if the soil dries out over a long period of time, an invasion of upland trees and shrubs will likely occur.

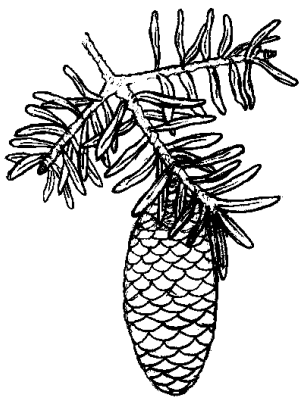
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For these reasons, plan for minimum disturbance to both lowland conifers and nearby uplands. Maintain a buffer strip of at least 100 feet wide around the site. Do not plan a major tree harvest or build roads or trails within the lowland stand or the buffer strip because little or no timber harvest is needed to increase the value of the stand to wildlife. If timber is removed, it should be done by removing single trees, preferably along the stand's edge. Small cuts that harvest one to four trees at a time is the closest method to imitating natural disturbance. To minimize impacts to the soil surface and water table, any cutting should be done after the ground is frozen.

A clear forest is not helpful to wildlife. Building brushpiles and leaving large branches on the forest floor are beneficial to wildlife. Leave dead standing trees (snags) and fallen logs because they provide valuable habitat for invertebrates, amphibians, woodpeckers, and other cavity-nesting birds. Avoid making roads, adding buildings, or opening up clearings.

Timber Harvesting

The low success rate of regenerating lowland conifers should preclude a major timber harvest.



balsam fir

Therefore, the financial return should be highly justified if you decide to harvest the forest. White cedar, tamarack, and black spruce reproduce best in full sunlight. Although some professionals encourage the harvest of cedar as part of an overall deer management plan, only in limited cases will cedar regenerate. Typically, only white spruce and balsam fir will grow because deer will browse on their preferred food-- young cedar sprouts.

If you want to harvest your stand of lowland conifers, consult with a professional forester who will consider the potential for regeneration. Sites with productive organic soils, slow-flowing groundwater, high soil pH, and low deer populations have the best chance at cedar regeneration. An example of this is seen in the northern Upper Peninsula and the north-central Lower Peninsula where areas receive at least 100 inches of snowfall each year. They have a good potential for regrowth because seedlings are somewhat protected from browsing deer in winter. Because young cedar grows slowly--about six inches per year--it may take 20 years for trees to grow tall enough to escape being damaged by deer browsing.

If it is determined by a professional that the area has a high chance of successful regeneration, lowland stands can be harvested using seed tree, shelterwood, or clear-cut methods, all of which are described in detail in the chapter on **Timber Harvest** in this section. Cutting is often done as clear-cuts in strips and blocks. They should be 150 to 250 feet wide and at least two acres in size. Cuts from two to 10 acres on the correct site will often result in regeneration.

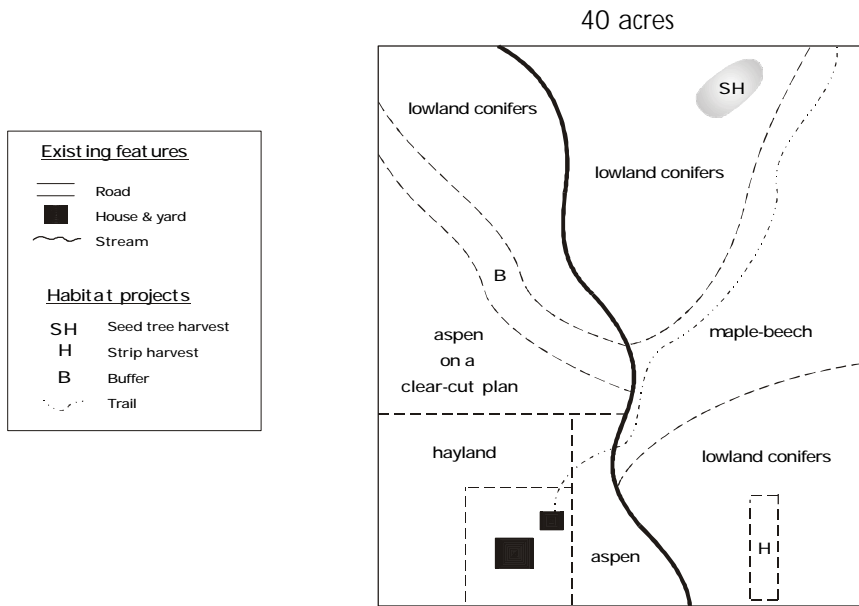


eastern hemlock

Management of a large cedar swamp that may be several square miles in size will likely require the cooperation of several landowners. The overall goal should be to identify harvest blocks of 40 to 60 acres in size and then cut the block over a 10-year period by removing two to 10 acres of cedar each year. Stands dominated by black spruce and tamarack may need clearcutting as large as 40 acres in order to ensure regeneration. If you or your fellow landowners are not able to follow this plan or can not get professional help, you should delay or cancel your cutting plans.

Of critical importance with any harvest of lowland conifers is to avoid disturbing the peat layer and avoid creating logging roads that will alter the flow of water. Locate main skid trails and any roads on the upland edge of the cut to minimize soil disturbance and soil compaction. Log only when the ground is frozen, and leave clumps of scattered trees as seed sources for regeneration. After the harvest, close any roads or trails against further use and reseed them if neces-

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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.

sary. Leftover branches and other slash should be evenly distributed over the harvest area or stacked in brushpiles along the edge of the cut. For instructions on making brushpiles, see the chapter on **Rabbits** in the Species Management section. However, be aware that attracting too many rabbits may be detrimental to the regeneration of lowland conifers due to over browsing. Also, do not harvest white cedar where deer browsing is moderate to severe.

Burning the site may also help in the regeneration process. If you choose to burn, however, be sure to develop fire lanes around the area and consult with local officials

for permits and assistance. For more information refer to the chapter on **Prescribed Burning** in the Grassland Management section.

As you can see, lowland conifers are among the hardest of all forest types to regenerate. For this reason, and because of their great value to wildlife, lowland conifers are generally best left alone and protected. If you have a swamp of black spruce, white cedar, or tamarack on your property, it is probably already very beneficial wildlife habitat. You will be able to enjoy a variety of wildlife on your property with a very small amount of work.

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