



DRY MESIC CONIFERS (WHITE PINE)

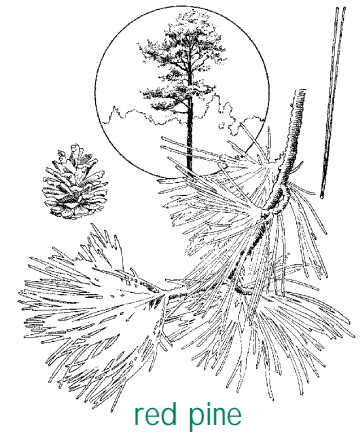
Dry mesic conifers are evergreen species that grow on dry, mostly sandy soils, although they can also tolerate a variety of conditions including drier mounded areas in wet depressions. White pine is the dominant species in this forest type. Michigan was once known as the king of white pine, and today this majestic evergreen is the official state tree. Before the logging era of 1840 to 1930, white pines dominated these forests and were found along Lake Michigan and throughout the northern Lower Peninsula and the Upper Peninsula. By far, the northern Lower Peninsula contained the largest tracts of white pine forest. From 1850 to 1900, Michigan delivered more board feet of this prized, long-lived tree to the lumber mills than did any other state. Two of the most productive regions in Michigan for white pine during that time period were the Muskegon River and Saginaw River watersheds.



white pine

Unfortunately, most of the white pine forests never recovered from this logging. Today, many former white pine sites have converted to a variety of forests including oak, aspen-birch, and red pine plantations. The white pine forests were also converted to farmland, especially along the Saginaw watershed. Although heavily logged, white pine is still found in mixed forests. These mixed communities 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, rolling hills of west-central Lower Peninsula. White pine and red pine grow in combination with red, black, and white oak. White pine may also grow with eastern hemlock in mixed hardwoods of beech, red maple, and red oak.

White pine regenerates well following fire on a variety of sites. Fire is beneficial to the regeneration of white pine because it exposes the soil, releases nutrients from the leaf litter, and kills hardwoods such as sugar maple and beech that compete with white pine for space. However, white pine is also able to regenerate without the aid of fire because it is able to tolerate a variety of sun-shade conditions, except for extremely dense shade. For this reason it can be found growing in the understory of young stands of red and jack pine, and red, white, and black oak. If managed correctly, white pine can



red pine

again increase in numbers within these forests. Current locations of forests with white pine include the west central Lower Peninsula from the Allegan State Game Area in Allegan County to Evart in Osceola County to Hartwick Pines area near Grayling. White pine forests are also found in the Upper Peninsula. This tree is restricted in ornamental plantings due to its susceptibility to the white pine blister rust fungus and the white pine weevil.

Wildlife Value

White pine forests provide roost trees for wild turkeys, browse for deer in winter, dens for porcupines, and nesting cavities for woodpeckers, flickers, and flying squirrels. Crossbills, red squirrels, chipmunks, and gray squirrels eat the pine cone seeds in winter. Common plants that grow in the understory include bracken fern, blueberry, bush honeysuckle, wintergreen, and hazelnut. These food-producing shrubs attract



porcupine

ruffed grouse, rabbits, and many other species of wildlife. Black bears make dens under the roots of uprooted trees. The forest provides thermal protection in winter for many wildlife species. Also, the majority of eagle nests found in Michigan are in tall white pines near lakes and rivers. Other birds that frequent white pine habitats include scarlet tanagers, black-throated green warblers, black-capped chickadees, great-crested flycatchers, and pine warblers. The blue racer is a species of snake that likes the coolness of the white pine forest floor. The uncommon Karner blue butterfly is attracted to the edges of open dry white pine-white oak forests in limited areas in the Lower Peninsula.

Management Considerations

If you own a stand of white pine mixed with some hardwoods in a multiple-aged forest of seedlings, saplings, mature trees, and dead trees, then your forest is high-quality habitat and little further management may be needed at this time. However, in most cases you will probably need further management to successfully reestablish white pine in your forest. If your forest consists of a majority of red pine, jack pine, or

oak with white pine growing in the understory, a timber harvest strategy could reestablish white pine as a dominant species and also produce income.

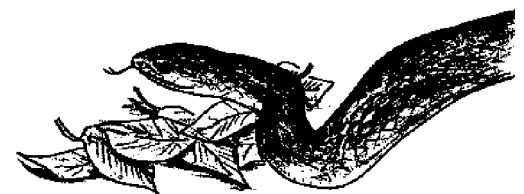
Preferred management for a variety of white pine forest systems are timber harvesting methods that can include group selection, shelterwood, strip clearcut, or seed tree techniques. The openings that result from these cuts allow the regeneration of a diverse stand of pines, hardwoods, and herbaceous cover. These harvest methods leave mature trees in or adjacent to the cut to provide a seed source and/or shelter for the regenerating seedlings. For more information refer to the **Timber Harvesting** chapter in this section.

Of these methods, the group selection method creates the least amount of disturbance to the existing forest. It involves cutting small patches in the stand up to 1/2 acre in size. Trees adjacent to these patches will provide both the seed source and shelter for the regenerating trees. This cut should be no wider than 150 feet. If possible, plan the harvest across a diversity of forest types with a mixture of pines and hardwoods preferred. Although some hardwood regeneration is good because it adds to new-stand diversity, you may need to apply a selective herbicide to keep maples and other shade-loving hardwoods from completely taking over.

A shelterwood harvest involves a two-cut strategy where 40 to 60 percent of the trees are removed in the first cut, and the remaining trees are taken out 10 to 20 years later. This can be done in uniform,

group, or strip formations. The trees left in the first cut provide shelter for the regenerating trees. They also provide shade that helps the young white pines to compete with more aggressive, sun-loving plants. Again, if regeneration is mostly hardwoods, then treatment with herbicides may be needed. Once the new pines are well established in the overall mix, then the remaining mature trees can be harvested. Most shelterwood cuts are from two to 20 acres in size. Be sure to make the first cut areas small enough to provide some shade for the regenerating white pines.

The clearcutting method involves removing all trees greater than one inch in diameter in one cut. This method can be used when there are many young white pines found in the understory as it allows them to grow without competition from larger trees. Plan cuts that are two to 10 acres in size, and provide for at least 100 feet of buffer forest between cuts. Smaller clearcuts scattered over an area produce the greatest amount of edge, while one large cut produces the least amount of edge. In areas with high deer numbers, cuts may have to be larger to overcome the impact of browsing on the regenerating trees. Clearcutting can also be done in strips. The exact size of the strips depends on the size of your property, the mix of forest species, and your overall goals.



blue racer

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The seed tree harvest method is a type of clearcut that leaves specific mature trees or groups of trees within the cut itself to provide seeds for regeneration. These trees are chosen to dominate the stand. In this case, you would leave any white pine existing in the stand, young or mature, as well as some mature red pine and/or hardwoods to provide diversity. The remaining trees also decrease the environmental and visual impact of the clearcut.

Thinning, followed by planting, is another management option to consider. This method is used when you do not want to change the dominant tree species in your forest, but want to establish some white pine. For example, if you own a large, red-pine plantation which you want to keep but also wish to establish some white pine, you can accomplish this by thinning the red pine by 30 percent or more and planting white pine seedlings in the created openings. This is a good option to consider in these plantations as straight-growing red pines begin to lose their lower branches and their food and cover value to wildlife at about 20 years of age. Underplanting the red pines with white pine or oak will increase the wildlife value of the stand.

In many black oak-white oak forests, white pine often grows in the understory. Thinning around the young pines in these forests will decrease competition for food, water, and light and encourage them to grow. You can also help to establish more white pine in these forests by planting. If you are planting white pine within a mixed-species forest, try to plant up to 20 percent white pine.



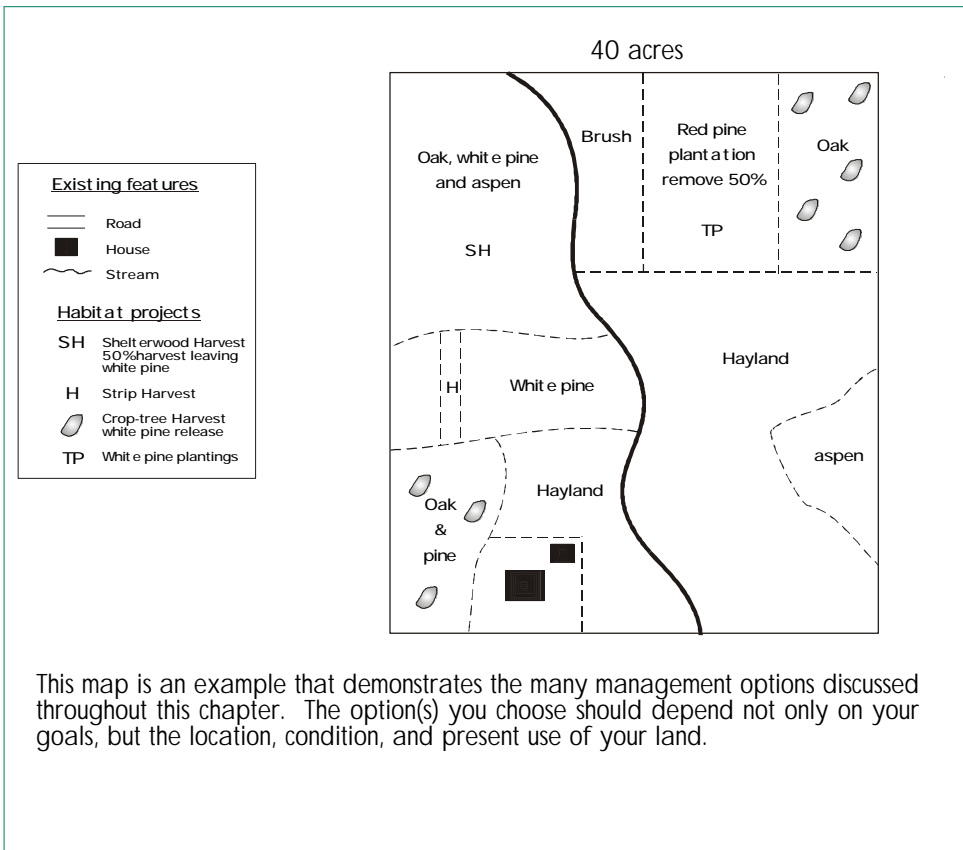
oak

Following these timber harvests with fire will also help in establishing white pine. Burning the openings created by the harvests will discourage the establishment of hardwoods such as sugar maple and beech that compete heavily with white pine. It will also encourage the establishment of oaks which will increase the wildlife value of the white pine forest. Further, burning the stand will increase the amount of ground-cover diversity which is also beneficial to many species of wildlife. If prescribed burning is part of your overall management plan, be sure to contact local fire authorities for permits and advice. For more information refer to the **Prescribed Burning** chapter in the Grassland Management section.

In summary, if white pine is found in your forest, you have the potential to create valuable habitat for wildlife, especially if it is mixed with other tree species. Consult with a forester or wildlife biologist

to consider the options that are best for your forest.

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FOR ADDITIONAL CHAPTERS CONTACT:
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FOR ADDITIONAL ASSISTANCE: CONTACT YOUR LOCAL CONSERVATION DISTRICT