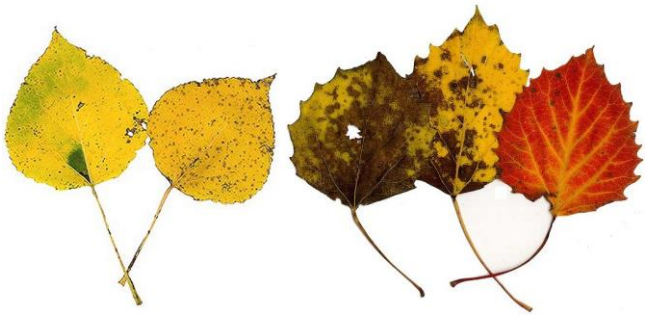
Forest Types of Michigan

MICHIGAN STATE UNIVERSITY | Extension

ASPEN FOREST TYPES

Number 3, May 2013

Aspen, or "popple', forests are early successional, short-lived forest types. They require full sunlight to reproduce and grow well. Aspen provides some of the best habitat for Michigan's favorite game species, as well as a host of non-game species. Many wood products are manufactured from aspen, particularly pulp for paper-making and chips for oriented-strand board. Aspen is one of Michigan's most versatile and utilitarian forest types. The major controversies lie in the necessity of clearcutting for regeneration and the desirable amount of aspen in the Lake States.



The Trees

Aspen consists of two main species, quaking aspen (*Populus tremuloides*) and bigtooth aspen (*Populus grandidentata*). Other members of the genus include balsam poplar (*Populus balsamifera*) and cottonwood (*Populus deltoides*), but are not major elements of the aspen forest type. Both aspens have flat leaf stems that easily flutter in a light breeze. Bark is light-colored, often mistaken for paper birch. Quaking aspen begins to decline by age 50-60, earlier on poorer sites. Bigtooth aspen will last a decade or two longer and tends to grow on better sites. Trees might grow to 100 feet tall and 2-3 feet in diameter, although most trees don't reach this size.

Distribution

Quaking aspen has the widest tree range in North America, from tree line across Alaska to Labrador, down to Iowa and Pennsylvania, and through much of the Rocky Mountains. Bigtooth aspen ranges from Manitoba and Iowa, then east to the Atlantic Ocean. Quaking aspen grows on a wide range of soils, but does best on well-drained loams. Northern Michigan produces some of the finest aspen on the continent.

Ecology

Aspen forests are early successional types adapted to catastrophic disturbances, such as fire and windstorm. Survival strategy is to aggressively reproduce, grow fast, live a short time, and die a "violent" death. Aspen trees are very intolerant of shade and cannot reproduce under shade, even their own canopy. Young aspen stands are dominated by aspen species, but the forest type is one of the most diverse in Michigan, especially at the regional level. The most common Michigan associates of aspen are red maple, white pine, balsam fir, and paper birch.[1] Huge amounts of seed are produced every 4-5 years, often resembling light snow. However, reproduction is more often achieved through root suckers, which usually sprout prolifically following the death of the parent, forming clones. These clones are connected through the roots and are genetically identical. Trees are typically either male or female. As dense sucker stands mature, aspen naturally thins itself. Trees that fall behind soon die.

As aspen stands thin and reach maturity, other tree species appear in the understory. They were either present all along, mixed with the abundant aspen, or entered the stand from a nearby seed source at any time. These longer-lived understory trees represent the type that a particular stand will become, if the stand remains undisturbed. The most common successional paths, based on sapling composition, lead to balsam fir, northern hardwood, white pine, and oak stands.

Many wildlife species rely on aspen for at least a portion of their habitat requirements, including rare species such as the golden-winged warbler and game species such as ruffed grouse and deer.

Aspen occupies much more acreage today than 200 years ago, due to the cutting and burning of a century ago. Aspen acreage is now declining throughout much of the Lake States due to natural succession. Michigan has lost nearly a half-million acres of aspen forest type between 1980 and 2009.[2] The desired amount of aspen is highly controversial.

Management & Silviculture

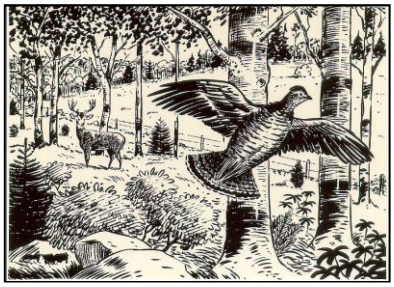
Clearcutting is the primary harvest system employed to regenerate aspen stands. It is the only one that works. Sometimes only a few well-spaced healthy aspen trees in the mature stand are needed to regenerate aspen. Historically, natural stand-regenerating disturbances often created large areas of even-aged aspen, sometimes several thousand acres in size. Forest management at the landscape level attempts to create a mosaic of age classes and forest types. This is particularly true on less fertile sites.

Genetically superior clones can be favored by aggressive regeneration practices. Poor clones can be converted to other forest types.

Aspen sprouts best when the stand is harvested during the winter, when the bulk of stored reserves is underground and become available in the spring. Aspen should be clearcut prior to over-maturity, to help assure adequate vigor of the root system. Size and shape of the clearcuts are important. Small clearcuts, about 10 acres or less, need to account for shade cast by any trees along the edge. This shade will negatively impact aspen regeneration.

Shape and size of clearcuts can be adjusted to special economic, ecological, or visual conditions. Irregular shapes will produce a greater amount of forest "edge", which will affect different species of wildlife in different ways. The irregular border is often more visually appealing. Leaving "islands" and corridors within larger clearcuts will also mediate some of the initial visual impacts of a clearcut. Some trees, especially longer-lived species, can be left inside a clearcut to provide a seed source for regeneration, food for wildlife, and to modify visual quality.

Considering the objectives of nearby landowners can be an important factor in determining how a particular aspen ownership might be managed. Landowners with smaller parcels may be able to work with adjacent landowners on a common aspen management plan. A professional forester can help coordinate this sort of effort.



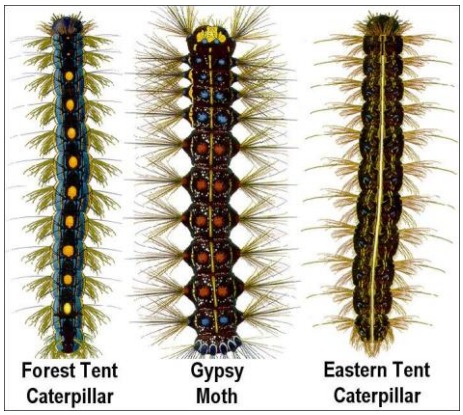
Dr. Gordon Gullion wrote well-developed management guidelines for wildlife habitat, particularly ruffed grouse (sometimes called partridge). Smaller stands, about 10 acres, of variously aged aspen across the landscape are key to much of what he recommended. Of course, landowners have a variety of potential objectives. Other game species favoring aspen include white-tailed deer, woodcock, bear, and snowshoe hare.

Depending on the soil type, active conversion or natural succession of aspen to other forest types might be considered. There are a number of viable successional and management pathways available, usually leading to balsam fir, maple, oak, or pine types.

If forest owners wish to change aspen to a different species mix, a variety of silvicultural practices can be considered. It is best to discuss this with a professional forester.

Tree Health Issues

Aspen is a supermarket for insects, diseases, and wildlife. This is part of the nature of aspen. A few of the more prominent damaging agents are: forest tent caterpillar (*Malacosoma disstria*), large aspen tortrix (*Choristoneura conflictana*), Saperda borers (*Saperda spp.*), gypsy moth (*Lymantria dispar*), conks (*Phellinus tremulae, et al.*), root rot (*Armillaria mellea, et al.*), Hypoxylon canker (*Hypoxylon mammatum*), Cytospora canker (*Cytospora chrysosperma*), and Ceratocystis canker (*Ceratocystis spp.).* There are many other insects and diseases that affect aspen. Most of these are natural stand-thinning agents. Defoliators (leaf-eaters) such as forest tent caterpillar and gypsy moth seldom kill trees, but do contribute to growth loss. Beaver, white-tailed deer, and yellow-bellied sapsuckers are some of the



common wildlife that feed on aspen. Small clearcuts may not regenerate in areas with high deer pressure, especially close to deer yarding areas. Deer tend not to stray far from a forest edge, so regeneration in the center of larger clear-cuts will be somewhat protected from deer browsing. Aspen along creeks are vulnerable to flooding and feeding by beaver.

Landowner Tips

- Develop a management plan
- Hire a forester for volume estimation, management advice, etc.
- Selection harvesting will not regenerate stand
- Reproduction is most commonly from root suckers
- Consider a clearcut harvest at age 45-55
- An age class mosaic across the landscape is usually best

See http://michigansaf.org about Forest Management Guidelines from the Michigan Society of American Foresters

[1] Relative volumes of species are derived from the USDA Forest Service, Forest Inventory and Analysis Data [*http://www.fia.fs.fed.us/tools-data*].

[2] Ibid.