

# FORESTRY FACTS



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## How To Manage Aspen

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### Species

The aspen forest type includes primarily two species: quaking aspen (*Populus tremuloides*), also known as trembling aspen; and bigtooth aspen (*Populus grandidentata*), also known as largetooth aspen.

In the Lake States, quaking aspen often grows in stands that include varying proportions of other species. Frequent associations include aspen with white (paper) birch, northern hardwoods (sugar maple, yellow birch, basswood and red oak), or conifers (pines, spruces, balsam fir and northern white cedar).

### Characteristics

Aspens are considered "pioneer" species because of their ability to invade cleared or abandoned areas. However, because they will not grow in shade, they will occupy an area only until more shade-tolerant species take over; or, until fires, windstorms, or complete clearcutting clears the area again. Repeated crops of aspen can be grown on an area successfully only if all trees are removed in a harvest.

On most sites, aspens do not grow to sawlog size, so aspen wood is used mainly for pulp, particleboards and similar products. But on good sites, large trees can be harvested as sawlogs, which can be processed into lumber and veneer.

### Hazards and Pests

Aspens are relatively fast growing, short-lived trees. On good sites they usually reach maximum development at about age 50-60 years, and on poor sites at 30-50 years. Stands older than this will continue to grow, but rot increases rapidly, destroying their value for wood production. As the trees become overmature, stands tend to deteriorate rapidly from decay.

Among the many insects that attack aspens are the forest tent caterpillar, gypsy moth and poplar borer. Among the diseases are hypoxylon canker, false tinder fungus and Armillaria root rot.

### Reproducing Aspen

Quaking and bigtooth aspen seldom reproduce from seed except under the most favorable conditions. Instead, aspens usually regenerate by means of abundant root sprouts, or "suckers," that develop after aspens of any age have been cut. When few or no other species are growing beneath mature aspen, young aspen suckers develop in large numbers following cutting.

In general, the number of suckers produced is proportional to the degree of cutting. More suckers develop, and grow best, in full sunlight. For this reason clearcutting is used to harvest and reproduce aspen.

Preferably, all trees greater than 2 inches in diameter should be cut. Leaving even a partial cover of mature trees can seriously reduce sucker growth. In some cases, the understory (brush and small trees) may also need to be controlled.

### Why Clearcut?

**Small to moderate clearcuts (5 to 60 acres) are really the only feasible option if aspen is to be regenerated and maintained on your property.**

**Clearcutting is not the same as deforestation, nor does clearcutting destroy wildlife habitat and soil productivity.**

**Dense regeneration of aspen appears quickly after a clearcut harvest and young aspens provide important habitat for many wildlife species, both game animals and a number of neotropical birds.**

**To soften the impact of a clearcut, keep a few mature trees (in an "island" or two) and make the harvest boundaries irregular instead of straight.**

achieved. Complete clearcutting usually assures enough sprouts to develop a new stand.

### Tending Young Stands

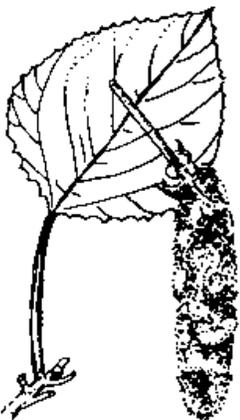
Typically, managed aspen stands receive no intermediate treatment (such as thinnings, release, etc.). Usually, the only cutting comes when the stand is mature.

If the stand is on a good to excellent site, a commercial thinning, at age 25 to 35, could be done. The recommended approach is to remove all trees except 200-300 crop trees per acre. The thinning can yield 10-15 cords per acre. The crop trees would be clearcut at maturity, yielding nearly as many cords as an unthinned stand. A thinned stand will also yield a larger and higher-quality sawlog harvest.

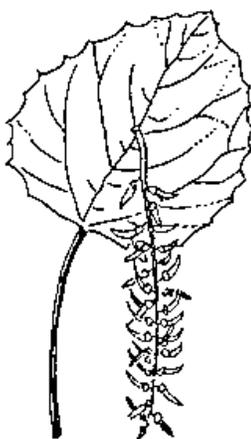
### Harvesting Mature Stands

Aspen can be managed at low cost to produce salable timber products while providing highly desirable wildlife habitat and soil cover. Dependable natural regeneration, thinning and pruning, along with fairly rapid volume growth over a short rotation make it possible to grow aspen without thinning.

Quaking aspen



Bigtooth aspen



From *Forest Trees of Wisconsin*, Wisconsin Dept. Of Natural Resources, 1990

Time of logging can influence suckering. Logging in winter and fall results in more and more vigorous sprouts than logging in summer and spring does. But for all practical purposes, stands can be harvested in any season if a complete clearcut is

The recommended management system for growing and reproducing aspen is complete clearcutting (all trees large than 2 inches in diameter) at rotation age to regenerate fully stocked stands of suckers. To minimize losses from insects and diseases, aspen should be harvested promptly at maturity.

One problem is that maturity differs with different sites. A determination of site quality should be made before a management program is started. Site quality determination is a most important first step in managing an aspen stand and can best be done by a forester.

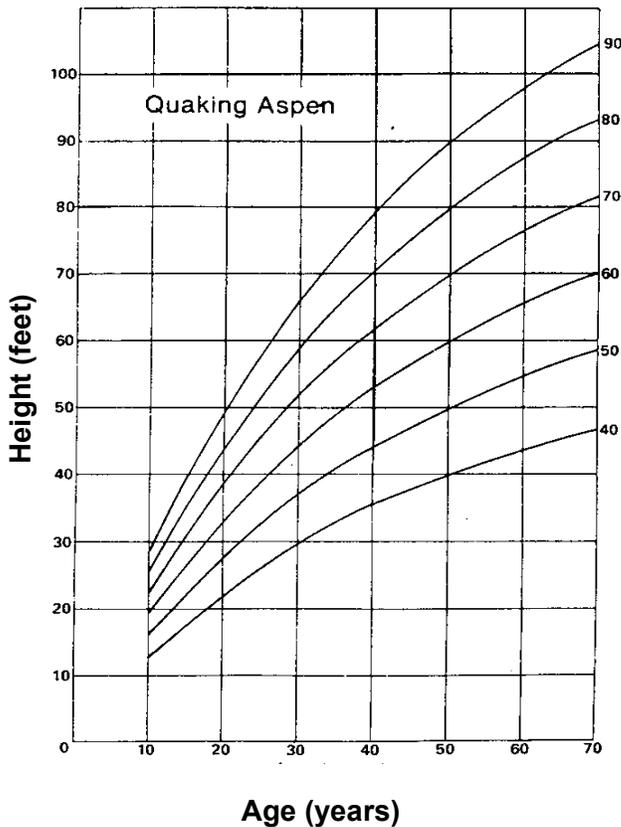
It is not always easy to determine aspen site quality, especially when stands are young. Foresters use site index and/or habitat classification to gauge site quality.

Site index is simply the average height of the trees in the stand at age 50. A site index of 60, for example, means the trees are 60 feet tall at 50

years of age. The best sites are those having a site index of 70 and above. A site index of 56 to 70 is average and an index of less than 55 is considered poor.

**On Poor Sites**

- growth & yield are usually poor, little can be done to increase low yields.
- harvest as soon as stand reaches merchantable size before trees deteriorate & become unmerchantable.
- harvest at about 30-35 years of age.
- on very poor sites, trees may not even reach salable size. You may want to convert to other species by planting or other means.



**On Medium Sites**

- trees generally grow to cordwood size (6-10 inches in DBH) at maturity.
- mature stands yield 20-25 cords per acre.

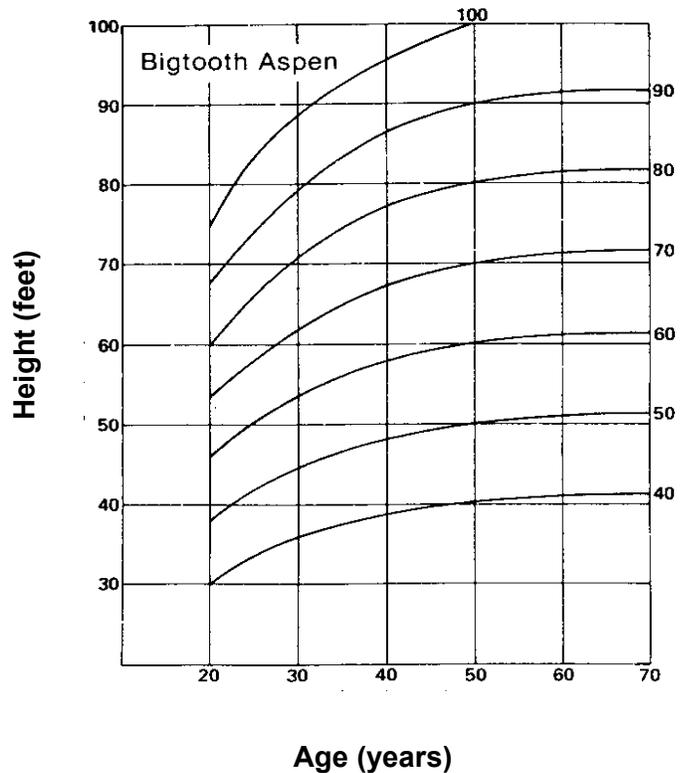
- harvest at about 40-50 years of age, when annual growth is at a maximum.

**On Good Sites**

- mature stands yield 30 or more cords per acre.
- harvest at about 50-60 years of age, when annual growth is at a maximum.

In actual practice, stands may be harvested at younger or older ages to take advantage of favorable markets. But harvest should not be delayed more than 10 or 15 years beyond the age ranges given because overmature stands of aspen can deteriorate rapidly. Harvest the better sites first, then the lower quality sites.

**Site index curves for the two aspens**



**Mixtures with Other Species**

Where aspen is growing with **white birch**, management probably should favor aspen. Birch is usually clearcut along with aspen to promote aspen suckers. White birch is also a relatively fast-

growing, short-lived intolerant species, but usually it has less value than aspen (especially for pulp).

Where aspen is growing with more valuable maple, birch and basswood, especially on sites that will yield good quality hardwoods, the **maple, birch and basswood** are usually encouraged in the next stand. When aspen is cut, the more shade-tolerant maple, birch and basswood are left.

This will reduce aspen regeneration, but it is likely that some aspen will grow to maturity and can be cut again. But eventually, maple, birch and basswood will replace the intolerant aspen.

Where aspen is growing with **white spruce and balsam fir**, it is possible to manage these two different types concurrently. If your stand has mature aspen with a conifer understory, cut the aspen and release the spruce and fir. Some aspen will sucker and you will then have a conifer stand with scattered aspen. Conifers are shade-tolerant so there will be some conifer seedlings in the stand.

When mature, the aspen and (mature) conifers should be clearcut to encourage aspen suckers, which will soon overtop the slower growing conifer seedlings. Eventually you will have another mature aspen stand with a spruce-fir understory, and the cycle can be started over again.

### **Wildlife and Aesthetics**

In the aspen forest type, the goal of producing both timber and wildlife are fully compatible because the clearcutting necessary for perpetuating aspen results in good habitat for many species of wildlife. Small clearcuts, say 10-20 acres, are best for wildlife and woodland appearances. They are also more compatible with small ownerships.

**Ruffed grouse** utilize aspen stands of all ages. Sucker stands 2-10 years old are important brood habitats. Grouse prefer sapling and pole stands 10-25 years old for overwintering and breeding cover. Stands over 25 years of age serve as an important food source.

**Deer** rely heavily on the aspen type, especially for spring and fall range. It is also important for winter range, particularly if it is within 1/2 mile of lowland conifers, which deer use for shelter. In addition, openings within the aspen type allow shrubs and herbs to grow, which helps provide the diverse vegetation deer need.

**Beaver** prefer the bark, leaves, twigs and branches of aspen to those of all other Lake States trees.

Many **other birds and mammals** also use aspen stands because of the diverse vegetation that is found. Leaving snags for cavity-nesters will not interfere with sucker regeneration.

The shape and size of areas to be harvested in an aspen forest depend upon the owner's goals; age, size and stocking of the aspen; and economics of harvesting and marketing. If the market is strong, and you have 20 acres or more of well-stocked maturing aspen on a good site, you could break this into smaller stands, and cut some now and leave some for a future harvest. This could produce a more desirable age distribution and greater visual variety.

The visual appearance of clearcuts can be improved by using irregular harvest boundaries that are blended to fit the natural terrain, and by retaining a few "islands" of uncut trees. Keeping some mature trees in *a few small clusters* will not interfere substantially with aspen sucker development throughout the stand. However, this approach may improve both the visual appearance and the wildlife habitat.