



What is Silviculture?

An Introduction for Woodland Owners

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Silviculture is the art and science of managing forests for desired outcomes. Silvicultural systems are based on the biological requirements of the trees.

Making management decisions about your woodland can be intimidating. Your forest is likely special to you, and harvest operations have the potential to create undesired, even destructive, results. How do you know you will end up with the desired result? There are no guarantees, but with a little basic knowledge and advice from professionals you can make informed decisions about what is right for your land.

Advice from a licensed forester about your objectives and alternatives for achieving them is a good place to start.¹ Their guidance can result in a healthier forest, greater satisfaction in the harvest, and increased income from the timber harvest. Even with a forester's help, forest management can be confusing. This is partly because of the terminology of forestry, specifically silviculture. Consulting foresters are educated in the practice of silviculture, but they can only make recommendations about different alternatives. The final decision rests in your hands. Understanding the terminology may help you make choices that are right for you and your land.

In silviculture, the focus is not on what will be harvested, but on what will be left behind.

Silviculture is the art and science of managing forests for desired outcomes, such as wildlife habitat, aesthetics, and timber production. This is accomplished by applying different types of cuttings at different times in your forest's development.

¹ A forester can help you develop a forest management plan which includes a statement of your objectives and the steps necessary to reach them (silvicultural prescriptions) (See MFS Information Sheet *Developing a Forest Management Plan*). If you are interested in having a management plan written, ask your Maine Forest Service District Forester or your consulting forester about options to help offset the cost of forest management planning.

These are called **silvicultural treatments**, and long-term planned sequences of these are called **silvicultural systems**. These systems are named by the number of age classes of trees that will result. The number of age classes is meaningful because it tells us about structure. All silviculture systems are based on the biological requirements of the trees themselves (silvics²), how they are applied depends on the specific desires and goals of the landowner. **Even-aged systems** create and maintain one age class. These stands usually have foliage in a single high layer when mature, with little to no vegetation in the understory. **Two-age systems** have two age classes arranged in a two-storied structure. **Uneven-aged systems** are characterized by three or more age classes with foliage typically dispersed from ground level to tree tops.





Even-aged Stand Profile



Uneven-aged Stand Profile

Treatments (cuttings) are defined by their purpose and the time of their application. Usually a silvicultural treatment is planned with either one or both of the following objectives in mind:

-  To improve the composition of the forest and increase the growth of the remaining trees (intermediate treatments).
-  To facilitate the production of new trees within or in place of the old forest (regeneration treatments).

² **Silvics** involves understanding how trees grow, reproduce, and respond to environmental changes.

Intermediate treatments or thinnings are applied to immature stands to redistribute growing space to desired trees. Regeneration treatments are applied to mature stands in order to establish a new age class of trees on the site, or to release existing seedlings. Regeneration treatments include:

Even-aged or Two-Aged Treatments

(Two aged if some trees are not harvested)

- 🌲 **Clearcut**—seedlings establish in the open after all trees removed. Effective for regenerating shade-intolerant species (for example aspen or birch).
- 🌲 **Seed tree**—Seedlings establish in the open from seed provided by scattered large trees retained after the cut. This does not work for shallow-rooted and/or shade-tolerant species (for example spruce or fir).
- 🌲 **Shelterwood**—seedlings establish under existing trees which are removed in 1 to 3 cuts at 5 to 10 year intervals. This is flexible and works for many species, including shade-tolerants (for example spruce and fir), and mid-tolerants (for example white pine) depending on the canopy cover.

Uneven-aged Treatments

- 🌲 **Selection**—seedlings establish or are released in small gaps resulting from the removal of single or small groups of trees. These cuts are repeated at 10 to 20 year intervals, with the whole canopy never being removed at once.

Harvests that remove the poorest trees, reduce competition around your most desired stems, and/or establish regeneration of desirable species will likely improve your forest and offer you a range of future management options.

In addition to the terminology associated with silviculture there are other terms which you may run across. Partial cutting, for example, refers to any type of harvest that removes some, but not all, of the trees from a stand. This term doesn't really tell you much about the type of harvest being conducted. The same is true of the phrase selective cutting; this just means that trees are selected for removal. They could be the worst trees, thus improving the stand, or the best trees, thus degrading your stand. Some types of cutting, called diameter-limit cutting or high-grading are exploitative. These cuts remove the biggest and/or best trees from your woodlot and reduce the potential for future volume and value growth.

While it helps to be familiar with these terms, it is even more important that you understand the basic idea behind silviculture. Silviculture refers to sound forestry that is applied to achieve a specific outcome or residual condition. The focus is not on what you are harvesting, but on what is being left behind. That is why diameter-limit cutting and high-grading are not silviculture. They are defined solely by what is cut, and what is left may or may not be acceptable. Whenever cutting is done on your land, whether by you or by a logger, you should consider what you want your forest to look like after the operation. Harvests that remove the poorest trees, reduce competition around your most desired stems, and/or establish regeneration of desirable species will likely improve your forest and offer you a range of future management options.

Harvests that appropriately apply silvicultural treatments have the potential to improve the health, productivity and value of your woodlot. With the advice of a forester, the services of a skilled logger and a basic understanding of silviculture you will be well equipped to implement sound management practices on your woodlot.

Further Reading

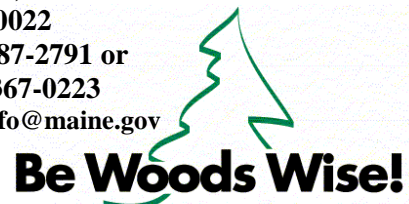
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Helms, J.A. (ed.). 1998. *The dictionary of forestry*. Society of American Foresters, Bethesda, MD. 210 pp.

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