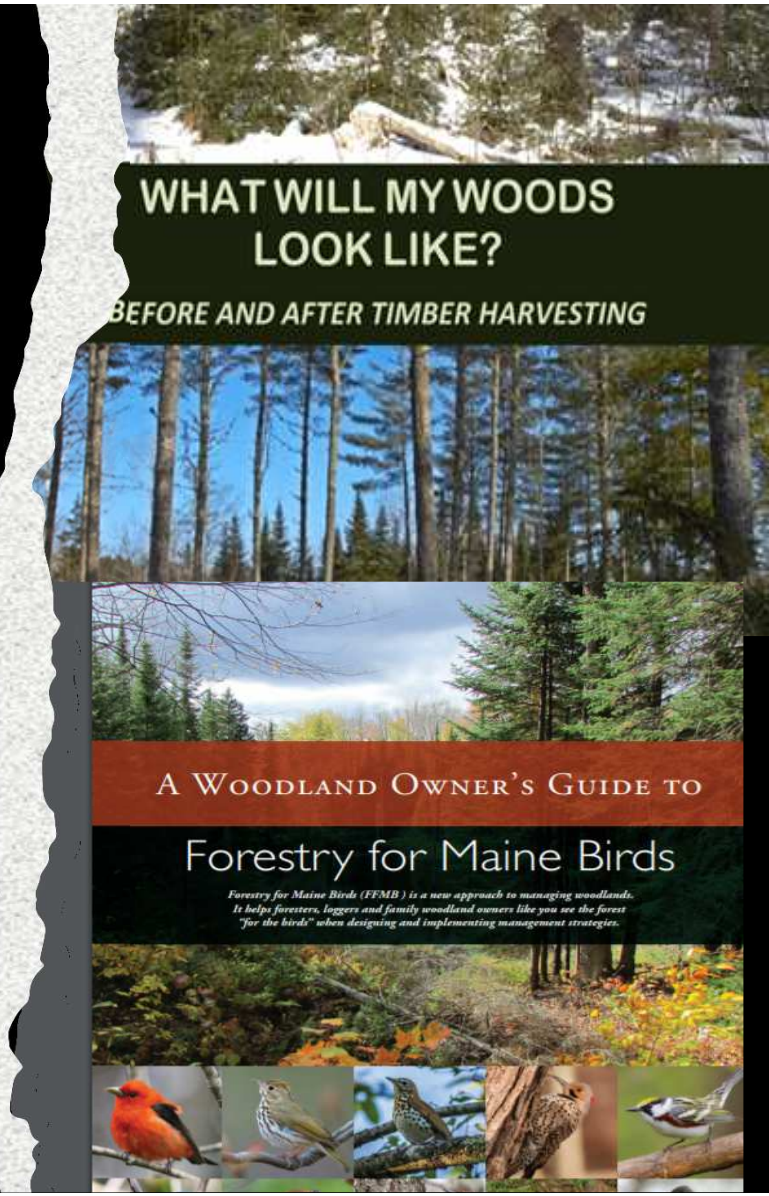
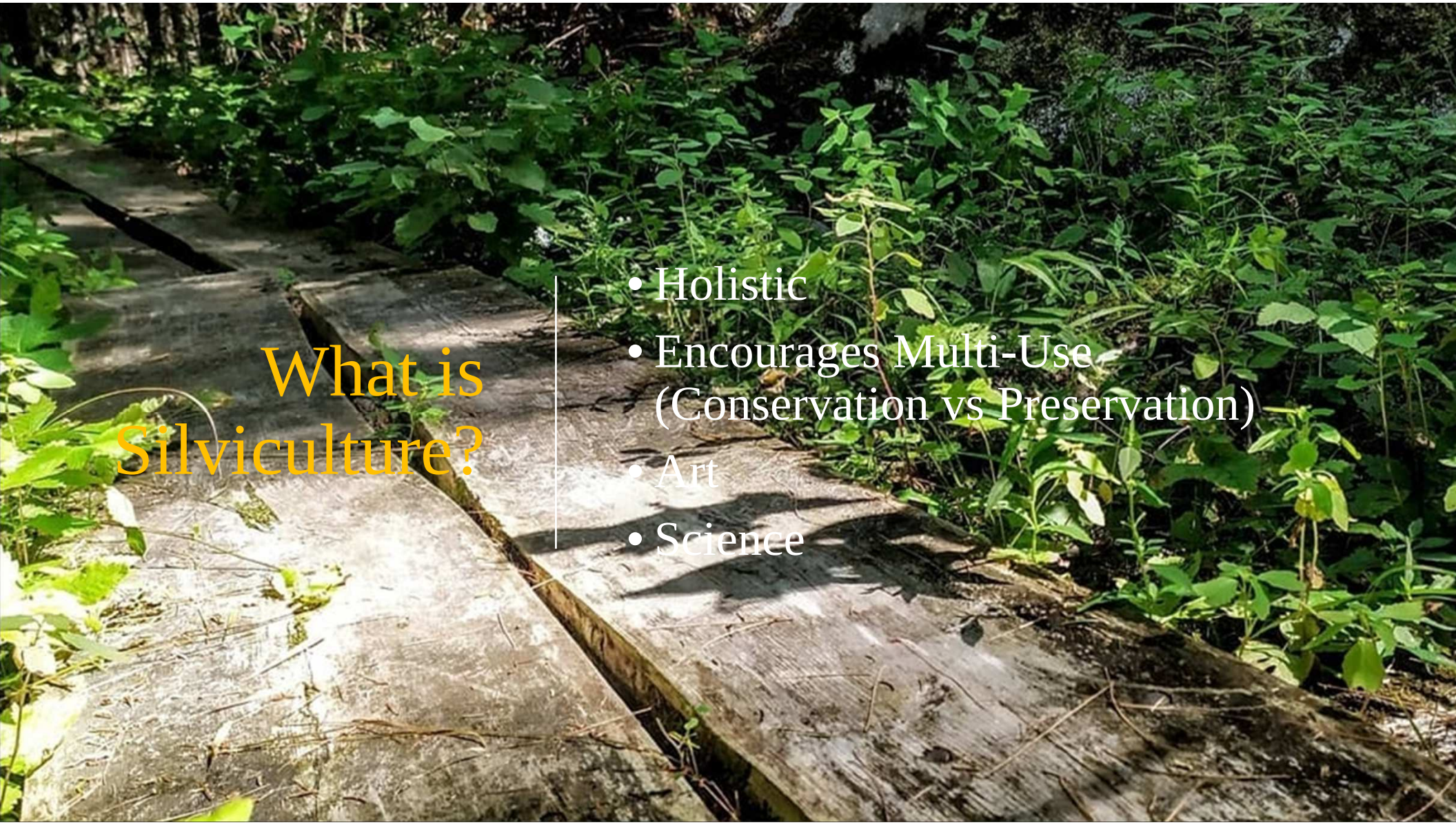
Silviculture

Allyssa Gregory
MidCoast District Forester
Maine Forest Service
(207) 441-2895
Allyssa.Gregory@maine.gov

Resources

- What Will My Woods Look Like?
- A Woodland Owner's Guide To Forestry For Maine Birds
- Which Tree Do I Cut?





What is Silviculture?

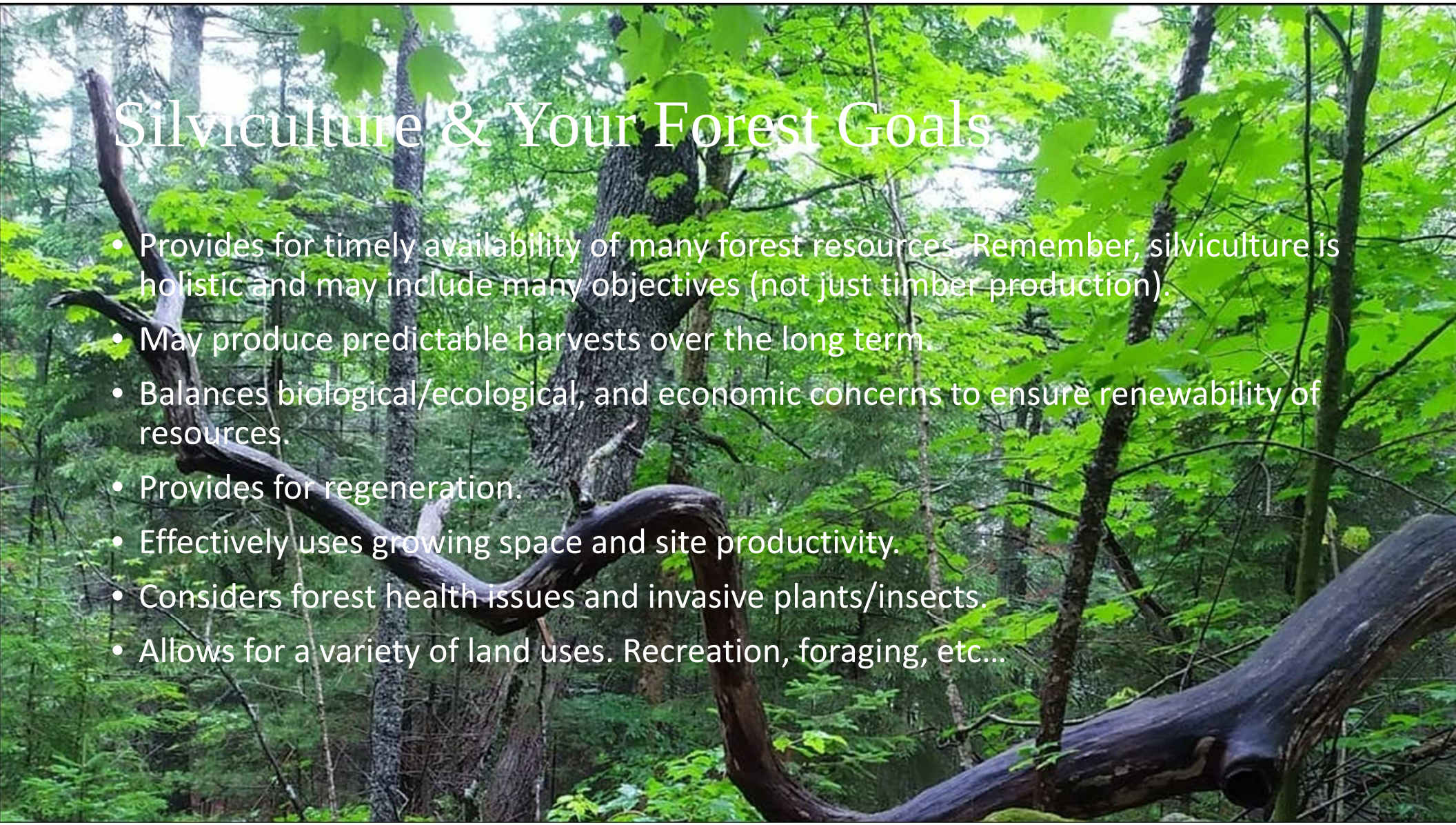
- Holistic
- Encourages Multi-Use (Conservation vs Preservation)
- Art
- Science

Silviculture is the art and science of controlling the establishment, growth, composition, and quality of forest vegetation for the full range of forest resource objectives.

Terminology

- Stand: a land area that can be managed as a unit. Perspective depends on the management objectives. A stand should be large enough to map, but small enough to be sufficiently uniform to be treated as a unit.
- Forest Succession: the natural replacement of one plant community by another over time in the absence of a (major) disturbance.
- Silvicultural Systems: long term planned sequences of harvesting and practices at different times in a forests development that meet the landowners desired outcome.

- Silvicultural Treatments: Single harvesting operations that are part of the silvicultural system.



Silviculture & Your Forest Goals

- Provides for timely availability of many forest resources. Remember, silviculture is holistic and may include many objectives (not just timber production).
- May produce predictable harvests over the long term.
- Balances biological/ecological, and economic concerns to ensure renewability of resources.
- Provides for regeneration.
- Effectively uses growing space and site productivity.
- Considers forest health issues and invasive plants/insects.
- Allows for a variety of land uses. Recreation, foraging, etc…

Issues That May be Addressed with Silviculture

Too many trees:	Removing competitors, reducing stand density, allocating more resources to fewer trees.
Not enough trees:	Reforestation, afforestation, and supplemental planting
Wrong type of vegetation	Creating conditions that favor some species over others. Removal of invasives
Balancing access & ecosystem health	Creating safe access for all involved with the land and ensuring practices are compatible with the desired regeneration of the next stand
Uniformity	Emphasis on diversity and multiple objectives rather than actual uniformity. Managing forests not city parks.

Ex: Dodge Point Preserve

Past Land Use

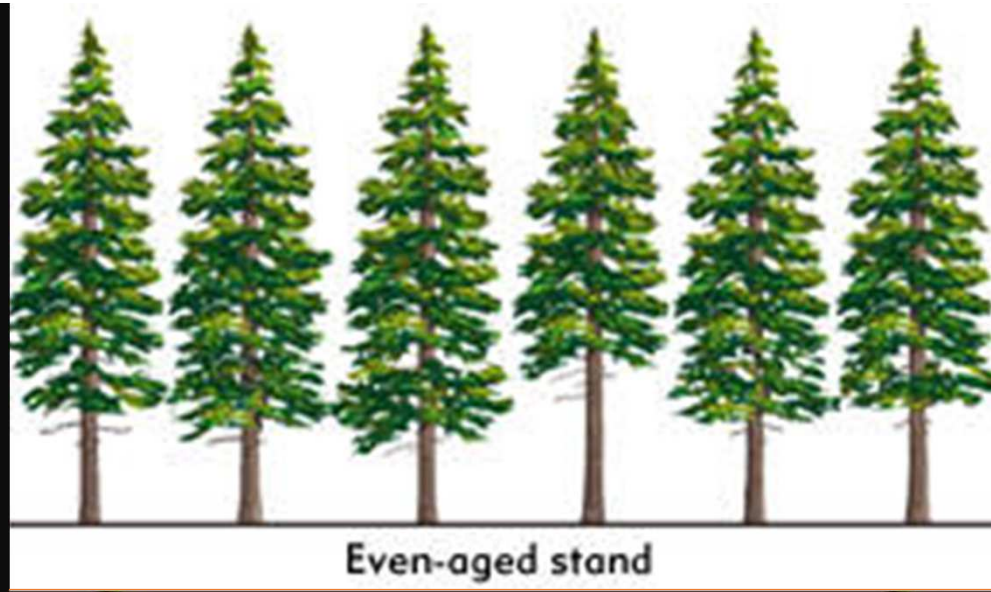
- Can play a role in current/future site conditions and should always be considered prior to management activities.
- Could change hydrology or wildlife use
- May increase or decrease productivity:
  - Increase: residual fertilizers present, legume crops that fix nitrogen were/are present.
  - Decrease: soil degradation, compaction, and/or erosion.

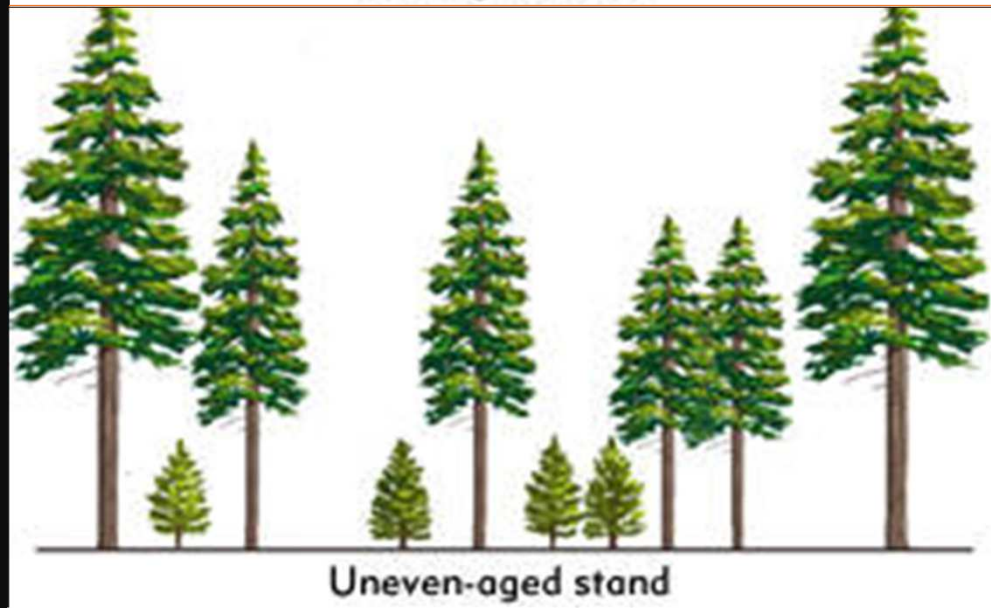
Ex of Past Land Use: Kankakee Black Oak Savannas

- Example of a past land use/human created ecosystem
- The oak savanna was created by firewood cutting over several decades which created a variety of diameter classes
- Human created and escaped fires developed the grassy savanna portion of the forest
- Nature Conservancy replicates the conditions by prescribed fire so they can maintain the black oak/grass cover. This allows for wildlife who have become dependent on the ecosystems to continue their use of the resource.

Silvicultural Systems

- 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.
- Even aged system – 1 or 2 age classes
- Uneven aged system – 3 or more age classes





Even-Aged vs Uneven-Aged Stands

- Even-aged: stands are roughly the same age & diameter class. Usually occurs when there is a major disturbance or a change in land-use.

- Uneven-aged: stands are 3 or more age and diameter classes. Usually occurs where low intensity disturbances take place and usually includes shade tolerant and intolerant species. Will result in more forest layers/strata

Most forests are not strictly even or uneven-aged, but a combination of both.

Silviculture Treatments

Treatments 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:

A. To improve the composition of the forest and increase the growth of the remaining trees (intermediate treatments).

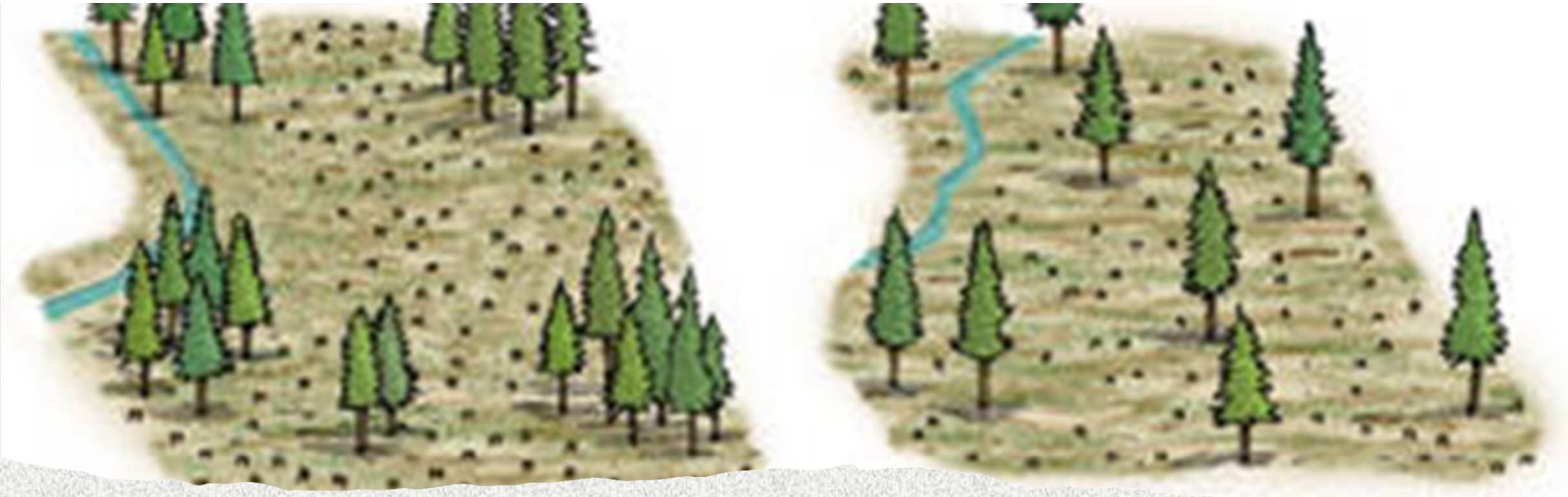
B. To facilitate the production of new trees within or in place of the old forest (regeneration treatments).

Even-aged Regeneration Treatments

- Clearcut
- Seed Tree
- Shelterwood & Group Shelterwood

Clearcut

- Removal of the entire stand in one cutting with reproduction obtained artificially or from seeds germinating after the clearing operation. Is effective in regenerating shade intolerant species (ex. Aspen, birch, or pin cherry)
- In Maine, the Forest Practice Act regulates the size, distribution, and planning of clear cuts.
- Removal of poor quality, intolerant, understocked, short lived or mature overstories where the retention of the residual Overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand;
- Ecologically appropriate improvement or creation of wildlife habitat,
- Removal of timber stands that, if partially harvested according to accepted silvicultural practices, are at high risk for windthrow due to factors such as soils, rooting depth, crown ratio or stem quality;
- Harvesting an existing plantation or other forest stands treated with precommercial silvicultural activities.



Seed Tree

- Seed Tree - Seedlings establish in the open from seed provided by scattered large trees retained after the cut.
- This treatment does not work for shallow rooted and or shade tolerant species. (ex. Spruce and fir)


Hardwood Seed
Tree

Softwood Seed Tree

Shelterwood

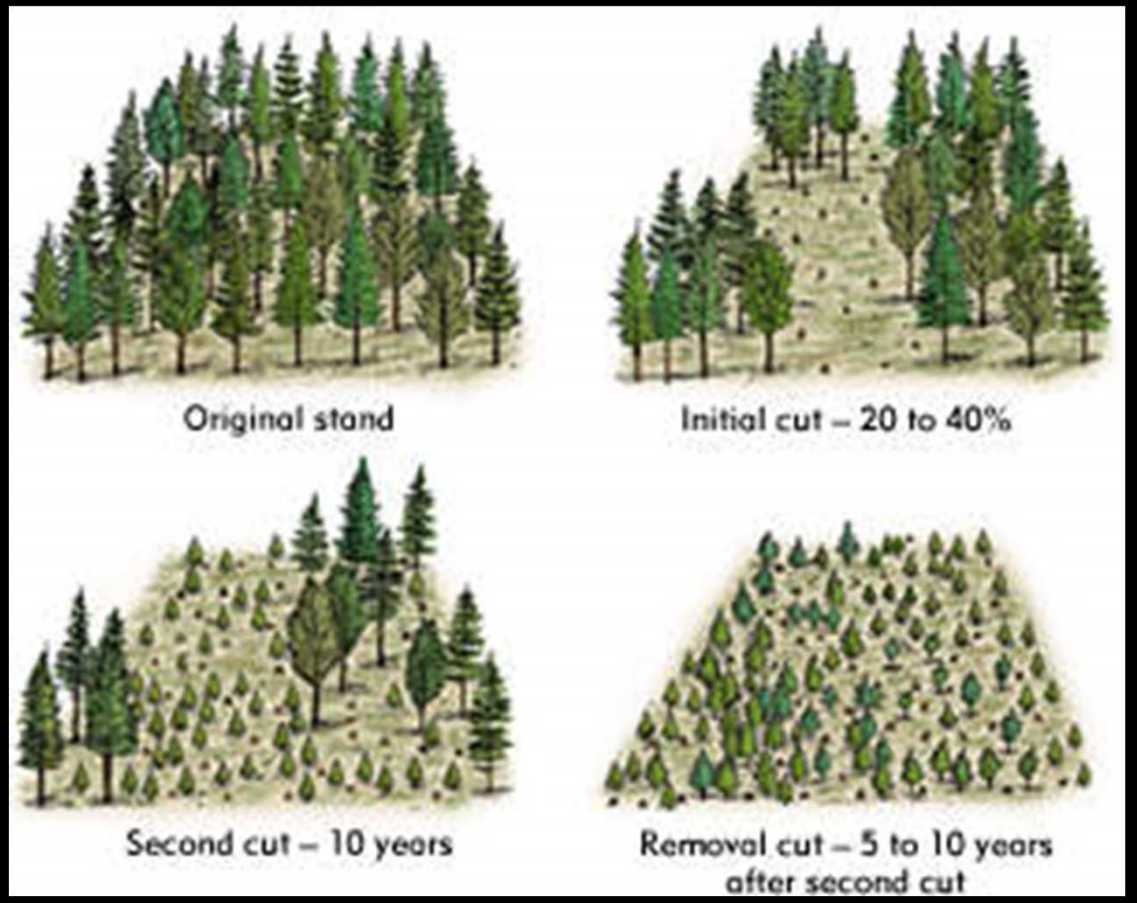
- Shelterwood – seedlings establish under existing trees which are removed in 1 to 3 cuts at 5-to-10-year intervals.
- Works for many species, including shade tolerant (ex. spruce and fir), and mid-tolerant (ex. white pine)
- Maintaining shade until white pine is at least 20 feet tall, minimizes white pine weevil attacks.

White Pine Weevil

- The white pine weevil kills the top of conifers. It locates the pines by the top of its silhouette. It is important to shade the top of pines until they are reasonably established (about 20 feet tall).
- One of the first symptoms of attack in the spring is the presence of pitch flowing from the feeding punctures in the previous year's leading shoot.
- Beginning in late June the new growth on infested shoots starts to droop (see photo). Shortly thereafter the tops die and turn brown. Up to 2-3 years of top growth may be destroyed.
- The damage results in trees that candelabra shaped/pasture pines

Shelterwood

Group Shelterwood

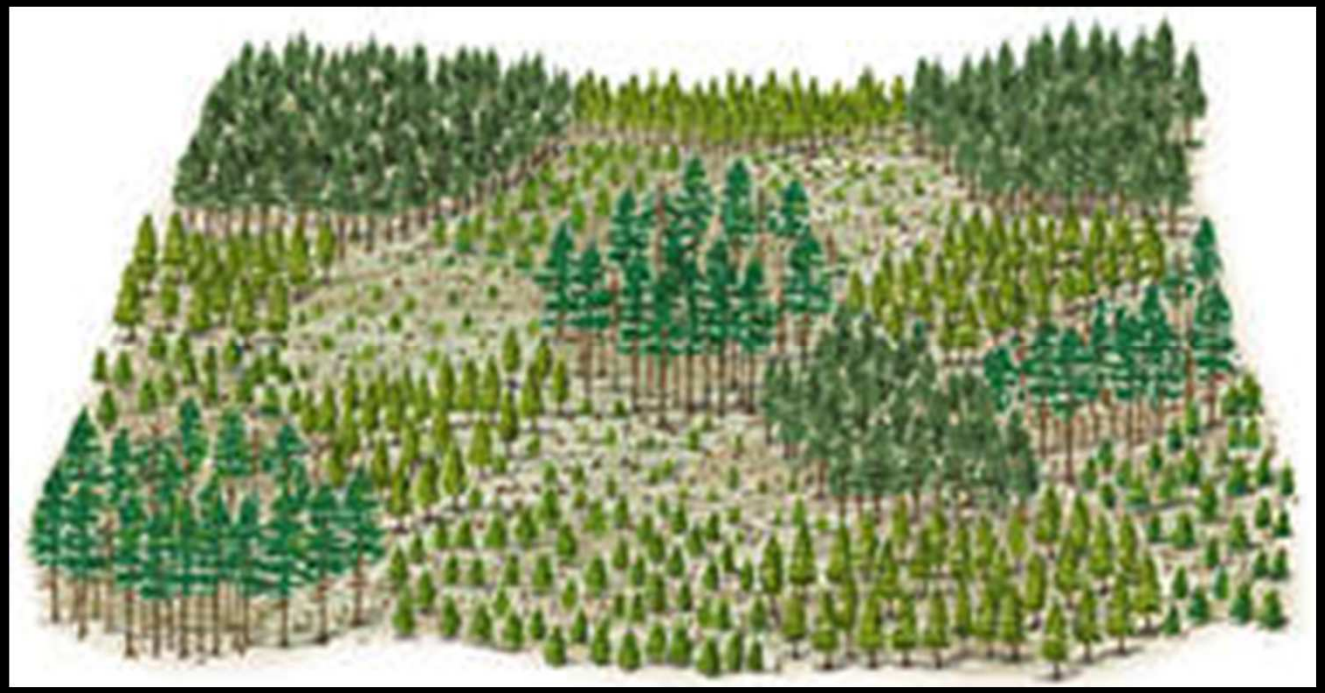


Uneven-aged Regeneration Treatments

- Single or Small Group Selection
- Patch Selection Cuts

Selection

- Seedlings established or released in small gaps resulting from the removal of single or small groups of trees.
- Cuts repeated at 10-to-20-year intervals, with the whole canopy never being removed at once.
- Frequent repeated cutting/disturbances produces three or more age classes.



Example of Selection Cut

Patch Selection

- Patches are between about 0.5 and 4 acres (0.2 and 1.6 hectares) in size (i.e., group selection patches).
- Mimics small scale disturbances
- Often used to create meet wildlife habitat goals (grouse and woodcock).

Intermediate Treatments

- Weeding
- Thinning
- Crop Tree Release

Weeding

- Removing undesirable tree species that are competing with preferred tree species. (<4” DBH)
- Weed once desirable species are established and can out compete sprouts.
- Weed hardwoods in mid summer to decrease sprouting.
- Prepare a list of preferred species.

Thinning

- Age 10 to 30
- Concentrates growth on most desirable trees

Figure 2-A crop tree is straight and tall. Its relatively smooth bark is free of seams, breaks, and large wounds.

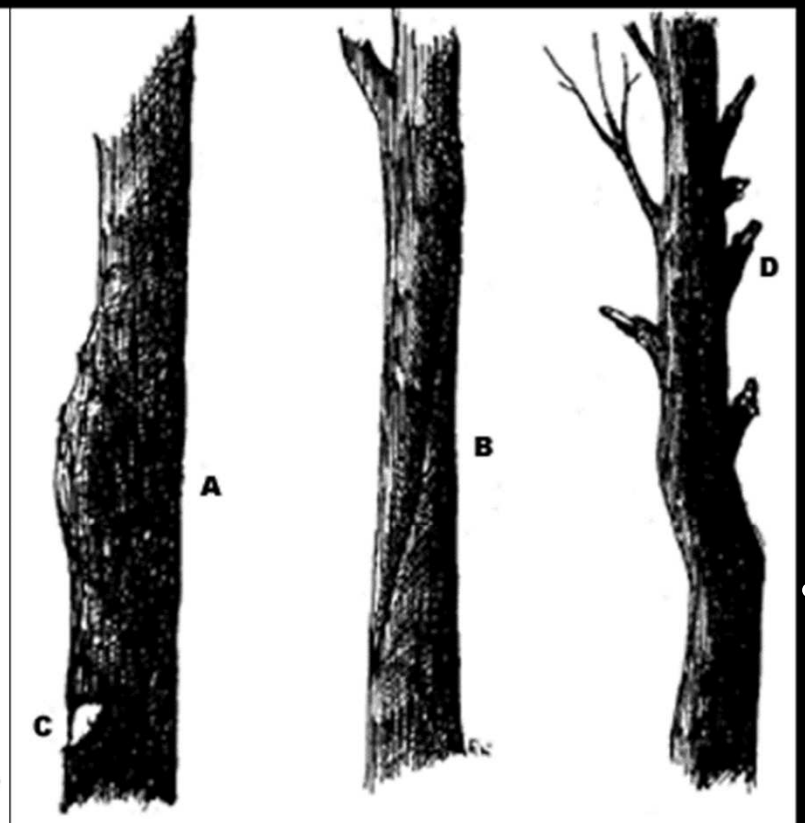
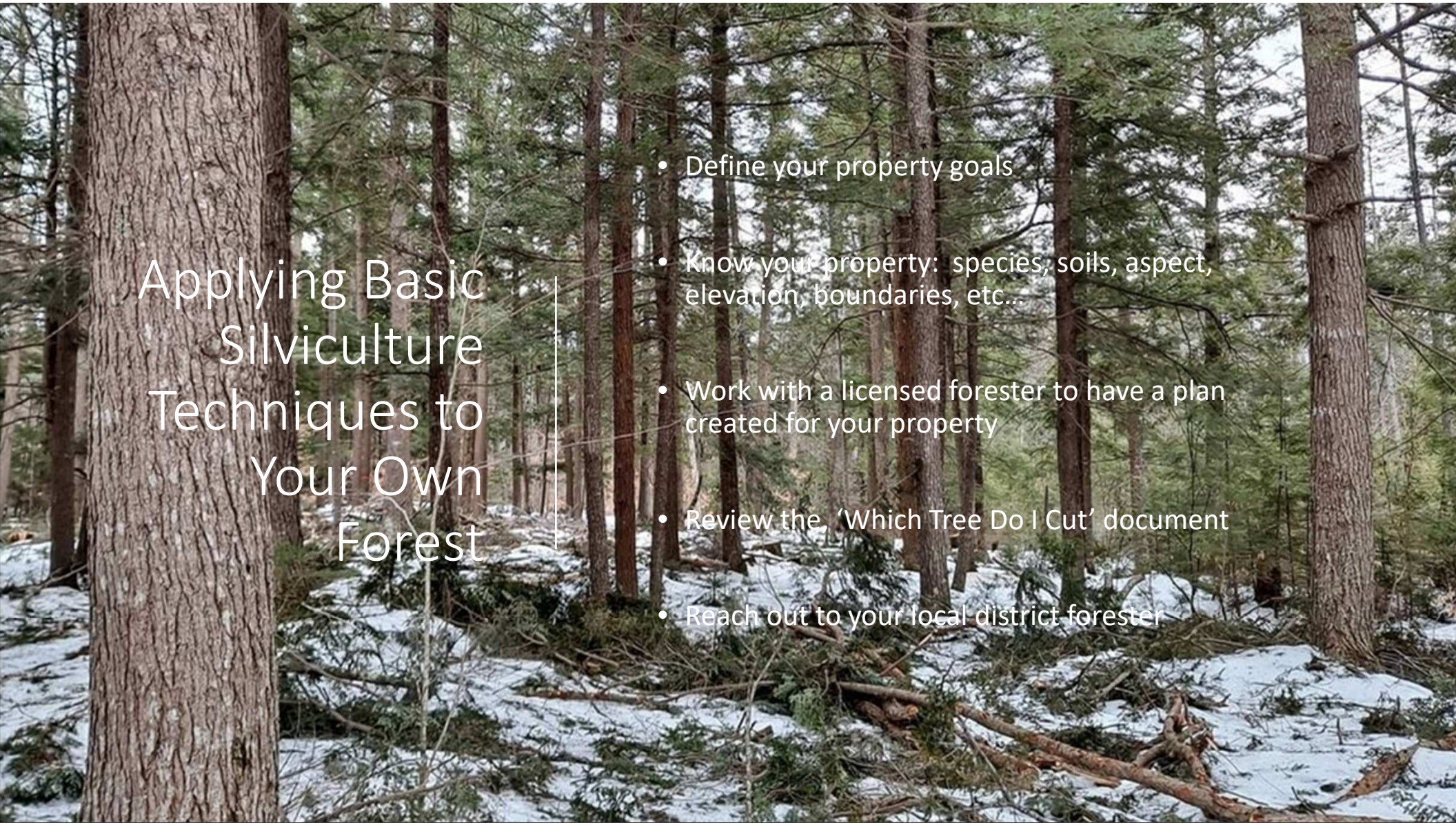


Figure 3.-Crop trees should not have: A. Swollen stems: B. Seams or breaks in the bark: C. Mechanical wounds caused by logging or other equipment: D. Poorly healed branch stubs. All of these defects indicate internal damage or disease. Such affected trees and crooked trees are best removed for firewood.

Crop Tree Release

- Select and mark final crop trees, early in the life of the stand (110 to 225 TPA) = (20’ to 14’ spacing)
- Identify crop trees in stands 10 to 15 yrs old (15’ tall)
- Don’t remove more than 1/3rd of the trees at once.
- Periodically thin to maintain 3’ to 5’ around the crown of the crop trees.



Applying Basic Silviculture Techniques to Your Own Forest

- Define your property goals
- Know your property: species, soils, aspect, elevation, boundaries, etc…
- Work with a licensed forester to have a plan created for your property
- Review the, ‘Which Tree Do I Cut’ document
- Reach out to your local district forester

Questions?

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