Mixed oak – Hickory Silvicultural systems



Photo: Emery Gluck

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Laws of oak silviculture Loftis (2004)

- 1. The presence of competitive sources of oak regeneration (advanced regen / stump sprouts).
- 2. Timely, sufficient release of these oak regeneration sources.
- 2a. "timely, sufficient release of oaks throughout stand development"



How and when you can influence stand dynamics

- Seedling stands
- Sapling stands
- Pole / sawtimber stands
- Regenerating stands

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Canopy closure begins the crucial period of rapid self-thinning







Many, if not most, codominant and intermediate oak saplings will <u>not</u> remain in the upper canopy of unmanaged sapling stands – except on drier sites.











Stem Quality

- Precommercial release had no effect on:
- Tree form (stem taper)
- % of trees with stem defect (lean, sweep, crook)
- Presence or number of branches on lower bole
- Proportion of trees without forks or large branches (>5 cm, 2") for the first two sawlogs (10 m or 32 ft)

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Advanced regeneration is key for Oak, ... but also for red maple







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Assumptions

What is established on site at time of crown closure (8-12 years) is what you have to work with.

What is in upper canopy at time of crown closure is what will dominate site for decades to come*

*except grey birch and pin cherry *can be modified with early cleaning

Therefore:

- Failure is defined as inadequate regeneration of species you want after final harvest to have a fully stocked stand at canopy closure.
- **<u>BUT</u>** you will eventually have some trees on the site, just maybe not those you want and it might take a couple of decades.

Causes of Regeneration Failure

- Inadequate advanced regeneration
- No seed source (light seeded, seedbank)
- Site problems
- Animal damage
- Interference from competing vegetation

Competitive regeneration

- Advanced regeneration essential
- Oak, maple, hickory, white pine
- Can seed in after harvest
- Birch, aspen, ash, yellow-poplar, black cherry*





Inadequate advanced regeneration

Oak, maple, hickory, white pine



- Assess stand before final harvest.
- If inadequate regen present, determine cause* and take action.
- Assess stand again after several years.
- *Low light, deer browse, competition









- Most tagged oak seedlings readily survived to age 7.
 - Age 3 survival = 90%
 - Age 5 survival = 88%
 - Age 7 survival = 82%
- But many of these seedlings were not competitive.
 - 43% overtopped by age 5
 - 58% overtopped by age 7





No seed source (light seeded, seedbank) Birch, aspen, ash, yellow-poplar, black cherry



- <u>Wind disseminated</u> Seeds can travel hundreds of yards, but most stay fairly close.
- <u>Seedbank</u> Either it's there or it isn't.





Ralph Nyland – 50 years distilled



- In this order ...
- 1. Shoot the deer
- 2. Poison the beech
- 3. Manage the light
 - In this order ...
- Ralph Nyland

CAES

- **1. Limit browse damage**
- **2.** Control competition
- 3. Let the sunshine in



lower









Oak regen depressed by deer browsing

































Application: Irregular Shelterwoods – General principles for

Conservation - Reserves and Structures • Soft mast - Red maple, cherry Hard mast – hickory and white oak • Den and structural islands – wolf trees Snags and cavity trees – all species except birch - >10 /ac >10dbh

- Future snags and cavities/bark red maple, hickory •
- Structure groups and individuals hemlock
- Other species basswood, yellow birch white oak, tulip • poplar, cherry.....
- Wildlife activity nest platforms, woodpecker holes

Economic Reserves

- Sugar maple form and size strong epinastic growth and deep crown (not more that 10/ac)
- Red oak no sign of epicormics, ski-tracks and potential vase-shaped crown expansion









Ridge – thin to bedrock till 30-35' spacing; 15" = dbh Can hold on to more structure and build oak regeneration









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