Principles of Northern Mixedwood and Northern Hardwood Silviculture:

Advance Regeneration

Presenter: Gareth Davies, Professional Forest Technologist & Educator

Maritime College of Forest Technology • October 20, 2026

Objective:

Emphasize the critical importance of securing advance regeneration to ensure the successful silviculture (and sustainable timber harvesting) of natural northern mixedwood, and northern hardwood forests.



Image: Robert S. Seymour, Managing Beech I - Favoring Sugar Maple (2023) via ResearchGate.

Northern Mixedwood & Northern Hardwood Forests in Northeastern North America



Northern Mixedwood Stands

Canopies dominated by mixtures of late-successional hardwood and softwood species

Example stand types:

- spruce – fir – maple – birch
- hemlock – maple – birch

Northern Hardwood Stands

Canopies dominated by late-successional sugar maple and/or beech

Example stand types:

- maple – beech – birch
- maple – ash

Practical silviculture of these forest types utterly relies on securing natural advance regeneration

Note that the natural regeneration of many softwood forest types is also reliant on advance regeneration

Case Study: Mixed Central Hardwood Forests of the Allegheny Plateau (The Practice of Silviculture, Dr. David Smith)

Landscape-level clearcutting (late 1900s)

Massive industrial demand for hardwood energy. Mixed central hardwood stands were clearcut at a landscape-level scale.

Result: SUCCESSFUL Regeneration

2nd Harvest (60 Years Later)

Assuming clearcutting was appropriate, 60-year-old second-growth stands were clearcut.

Result: Regeneration FAILURE

Why did it fail?

The 60-year-old stands lacked sufficient established advance regeneration prior to overstory removal.

What is Advance Regeneration & Where Does it Come From?

Advance Regeneration (Defn)

- natural regeneration from seed, that originates from living seed-producing trees within the stand

the Seed Tree

- a living seed-producing tree within a stand

Advance Regeneration– Regeneration Methods:

- Shelterwood Method
- Seed Tree Method
- Selection Method

What is Advance Regeneration & Where Does it Come From?

Silvicultural Definition: regeneration from seed- established in "advance" of the final harvest of seed trees

Advance regeneration can occur with- or in the absence of- disturbance

Advance regeneration can occur before- or after- a major, stand-replacing disturbance



Image: Keith Kanoti, *Pinus resinosa* via Wikimedia Commons, CC BY-SA.



Image: David J. Stang, *Quercus rubra* via Wikimedia Commons, CC BY-SA.



Image: National Parks Gallery via Picryl, Public Domain.

Facilitating Successful Advance Regeneration

1

Tend Seed Trees

Promote crown expansion, health, and vigor in desirable seed-bearing trees.

2

Grow Stands Long Enough

Allow time for regeneration to establish before harvesting seed trees.

3

Applied Experimentation

Test site prep, canopy opening, and understory vegetation control.

4

Disciplined Harvest

Do not harvest overstory seed trees until advance growth is established.

5

REGENERATION SURVEYS!

Long before we harvest mature trees and/or stands- we should be assessing regeneration.

Some Lessons from the Allegheny Plateau?

1

The challenges of fixating on short rotations

It takes as long as it takes!

2

Thin instead of harvest?

What if they had commercially thinned these 60–year-old stands, rather than harvest them?

Think of the possibilities!

- Seed trees given more growing space…
- species composition manipulated to favor desirable seed trees…
- partial sunlight in the understory…
- …
- …

Applied Silviculture and the Risks of Taking Things for Granted



Image: Debbie Koenigs / USFWS via Wikimedia Commons, Public Domain.



Image: Scott Thomas Photography, *Views Infinitum* (2011), CC BY-NC-ND.

Patience and Time: The Ultimate Silvicultural Principle

When managing natural mid to late-successional stands, our best practical and cost-effective tool is often time and human patience.

DISCUSSION
Q&A Session

CONTACT
mcft.ca