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Adaptive Silviculture at the Petawawa Research Forest

Preparing our forests for climate change

Climate change is resulting in warmer and drier summer conditions in the Great Lakes-St. Lawrence forest region. To better prepare forest managers for these changes, the Adaptive Silviculture for Climate Change (ASCC) Network site at the Petawawa Research Forest (PRF) is developing 'climate change ready' silviculture prescriptions for the region's pine mixedwood forests.

The ASCC Network: A collaborative research group

- United States Department of Agriculture's Forest Service
- State Forest Services
- Academic institutions

PRF site partners

- Academia
- Not-for-profit organizations
- Local forest industry
- Federal and provincial governments

The ASCC Network has two primary objectives

Introduce forest managers to **new tools and approaches** to integrate climate change adaptation into sustainable forest management, including the ASCC Network's climate adaptation option spectrum: **resilience, resistance, transition.**

Create a **multi-regional study** with locally suited climate change adaptation prescriptions with **local input** from regional scientists and local forest managers.

Canada

Locally adapted silviculture prescriptions

Prescriptions are applied to the Petawawa Research Forest's white pine-dominant mixedwood forests.

Assisted Migration: Movement of species to increase adaptation to progressively warmer and drier future conditions. NRCan's SeedWhere Model is used to identify climate adapted seed sources.

Within Range

Seeds moved from southern locations within their natural range.

WHITE PINE | RED PINE | RED OAK

Range Expansion

Seeds moved to just outside their natural range.

WHITE OAK

Range Migration

Seeds moved far from their natural range.

PITCH PINE

This study is testing a **spectrum of silviculture prescriptions** for adaptation using a range of harvesting treatments and assisted migration strategies:

Manage for Persistence ⟵ ⟶ **Manage for Change**

RESISTANCE

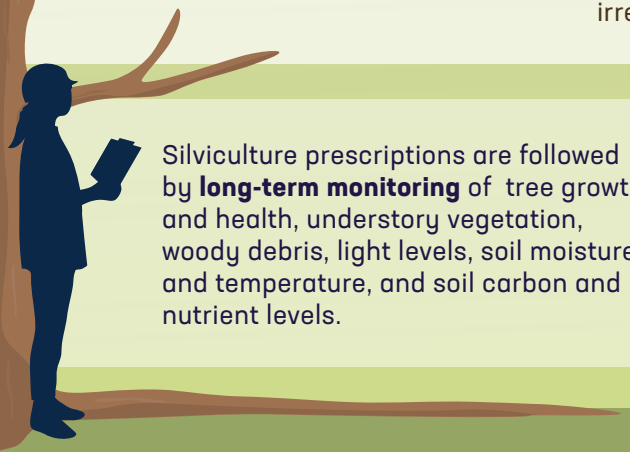
Improve forest **defences against change.** Regenerate climate adapted white pine within the uniform shelterwood system.

RESILIENCE

Increase ability to **rebound from disturbance** by increasing structural and species diversity. Regenerate climate adapted white pine, red oak and white oak in an expanding gap irregular shelterwood system.

TRANSITION

Facilitate change to a climate adapted forest. Establish pitch pine, and climate adapted red pine, red oak and white oak in a clearcut with seedtrees system.



Silviculture prescriptions are followed by **long-term monitoring** of tree growth and health, understory vegetation, woody debris, light levels, soil moisture and temperature, and soil carbon and nutrient levels.

Research for today and tomorrow

A tree planted today will be growing under a different climate in 100 years. To better understand how trees respond to the growing conditions created by each treatment, researchers have installed 168 research plots. Through time, data collected from these sites will **inform forest managers and policy makers to ensure the long-term sustainability of Canada's forests.**

Contact Us

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