Maintain WFn55 forests as would selective windthrow by removal of initial-cohort trees in large gaps

Emulating selective windthrow to promote good and excellent suitable shade intolerant and shade tolerant species.

The primary goal when maintaining a WFn55 forest using this strategy is to remove a portion of the mature canopy in large gaps to avoid hydrologic swamping that would favor non-tree vegetation (e.g., cattails, lake sedge, etc.). The silvicultural focus is to establish a fully-stocked forest through episodic creation of large-gaps to release and recruit high-quality, mid-to shade-tolerant advance regeneration.

Large gap concept

Windthrow commonly maintained large-gap habitat in WFn55 forests by selectively toppling the largest and tallest trees on a weak substrate. Such events 1) selected for yellow birch, green ash, and red maple as wind-firm residuals, 2) released advance regeneration strongly dominated by black ash but included American elm, red maple, yellow birch, balsam fir, green ash, basswood, and northern white cedar, 3) created future nurse logs that especially encouraged yellow birch and northern white cedar establishment, and 4) created deep cradles that functioned as treeless pools for decades.

Silviculture prescription highlights (see table on next page)

- Favor non-ash species for natural regeneration
- Increase or introduce non-ash replacement species via artificial regeneration
- Reduce the black ash canopy to 20-50 square feet per acre of basal area depending on regeneration method
- Cull low-value or poor-quality trees and leave as potential nurse logs
- Retain a legacy of dominant or co-dominant black ash to help regulate water table response and favor retention of healthy non-ash trees suitable to WFn55 sites

Photo

Figure 1. Patch and strip clearcut with reserves in mature ash WFn55 native plant communities.

Large Gap Silviculture Prescription Summary Table

Objective

- Even-or two-aged forest, with patches, strips, and scattered seed-tree residuals. Release of advance understory or poles if present
- Reduce black ash basal area. Favor artificial regeneration opportunities due to greater range of suitable species

Species Favored (Natural or Advance Regeneration)

- Quaking aspen, paper birch, northern white cedar, yellow birch, American elm, red maple, basswood, balsam poplar

Species to Diminish

- Black ash because of its susceptibility to emerald ash borer morality; it is the superior competitor and frequently dominates sites

Canopy Removal

- 0.50-0.75 acre gap size – emulate a patch or strip clearcut with reserves regeneration method OR
- 0.25-0.50 acre gap size – emulate seed tree or shelterwood with reserves regeneration method

Forest Health Concerns

- WFn55 has a high hazard rating for emerald ash borer
- If emerald ash borer mortality is present in the stand, implement regeneration methods that salvage timber
- Several native insects and abiotic factors contribute to black ash decline with signs and symptoms similar to emerald ash borer

Legacy Considerations

- Healthy black ash trees or advance regeneration to control water table response
- Retention of all desirable non-ash trees as seed trees

Management Concerns and Risk

- Soils are weak and inoperable unless frozen solid. Springheads and seeps may never freeze enough for heavy equipment
- Rutting risk is very high due to constant soil saturation
- Maintaining hydrologic regime and preventing swamping is important to keep a suitable seeding substrate
- If rough alder, bluejoint grass, fowl manna grass, or lake sedge are abundant, damage to the organic layer poses a risk of converting forested wetlands to non-forest

Site Preparation

- Although not a common practice, consider trenching and mounding for planting or seeding
- Careful consideration of surface hydrology is required; orientate trenches parallel to surface flow

Artificial Regeneration (See Table 4 in Ash Management Guidelines)

- Balsam poplar, swamp white oak, hackberry, cottonwood, silver maple, red maple, bur oak, disease resistant elm, yellow birch, balsam fir, tamarack, northern white cedar, white spruce, and black spruce
- Techniques: hand planting (before or after harvesting), live staking, and direct seeding

Climate Change Considerations

- Forested wetlands have low adaptive capability due to hydrologic regimes, and low tree species diversity
- Black ash is expected to decrease in suitable habitat; assess site-level factors to determine management and regeneration opportunities to establish non-ash species
- Consult the NPC-silviculture strategies website for tree habitat response to climate change in WFn55
- Winter frozen ground conditions may decline requiring modifications to harvest operations; longer permit durations

Future Actions

- Evaluate the tree and hydrologic response within the first 3 years after treatment
- Conduct a regeneration survey age 3 (natural regeneration), age 1 (planting/live staking), age 5 (direct seeding)
- Consider crop tree selection, release, thinning, or stand improvement

Case Studies

- Several unpublished, contact the ECS and Silviculture Programs for more information
- Great Lakes Silviculture Library

Literature

- Ash Management Guidelines