Maintain WFn64 forests as would senescence, disease, or selective windthrow to create small gap habitat

Emulating fine-scale disturbance to promote good and excellent suitable shade tolerant species.

The primary goal when maintaining a WFn64 forest using this strategy is to create small gaps ranging from the space occupied by a single tree or groups of trees up to 0.50 acres over advance regeneration of black ash, northern white cedar, yellow birch, red maple or other naturally occurring tree species. The silvicultural focus is to recruit tolerant, high quality stems through episodic small gap creation using selection harvest.

Small gap concept

Mature WFn64 forests were maintained by fine scale disturbances that killed individual trees or groups of trees, thus creating small-gap habitat. Natural senescence, disease pockets, accumulated wounding and subsequent rot, and pockets of deep and unstable peat could all result in fine-scale disturbance that ultimately was manifest as windthrow. Such events 1) 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, 2) created future nurse logs that especially encouraged yellow birch and northern white cedar establishment, and 3) 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 by creating small gaps to 50-60 square feet per acre of basal area
- 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 WFn64 sites

Photo

Figure 1. Small gap harvest in a mature ash WFn64 native plant community.

Small Gap Silviculture Prescription Summary Table

Objective

- Two- or uneven-aged forest; release of advance understory or poles if present
- Reduce black ash basal area

Species Favored (Natural or Advance Regeneration)

- Northern white cedar, yellow birch, American elm, and red maple

Species to Diminish

- Black ash because of its susceptibility to eastern larch beetle morality; it is the superior competitor and frequently dominates sites

Canopy Removal

- 0.10 -0.50 acre – emulate single tree or group selection regeneration methods

Forest Health Concerns

- WFn64 has a high hazard rating for emerald ash borer
- If emerald as borer damage 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 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

- None

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 a low adaptive capability due to specific 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 WFn64
- Winter frozen ground conditions may decline significantly and require modifications to harvest operations; longer permit durations
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Future Actions

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

Case Studies

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

Literature

- Ash Management Guidelines