

# Guidelines for Managing Sites with Ash To Address the Threat of Emerald Ash Borer On Forestry-Administered Lands

## BACKGROUND

The ash genus (*Fraxinus*) in Minnesota comprises nearly one billion trees and is the second most common hardwood tree genus in the state. Emerald ash borer (EAB) was discovered in the United States in 2002, and by 2013 was present in at least 20 states east of the Mississippi and two Canadian provinces. It was found in Minnesota in 2009, and has been discovered in Hennepin, Houston, Ramsey, and Winona counties as of 2013.

EAB populations can spread rapidly in infested firewood, logs, and ash nursery stock. Therefore, it is assumed that EAB will soon infest Minnesota's forested areas and cause significant impact to the ash resource. Experience from other states has shown that EAB kills nearly one hundred percent of the ash in a stand once that stand becomes infested. This level of impact is greater than what occurred with American elm following the introduction of Dutch elm disease to Minnesota.

To date there has been no evidence of resistance to EAB within any North American ash species. Resistance does exist in some Asian ash species. Subtle differences in susceptibility to EAB between white, green, and black ash have been reported, but those differences are minor and should not influence management options. All three ash species in Minnesota will likely succumb to EAB attack.

## SCOPE

This document applies to –

- Forested stands classified as ash coertype
- Forested stands with an ash component of at least 20% of stand basal area but not typed as an ash coertype.
- Native plant communities where ash is and can be significant include: FDw44, MHs49, MHw36, MHc47, MHn46, FFs58, FFs59, FFn57, FFn67, WFs57, WFw54, WFn53, WFn55, WFn64.
- Forested stands with ash that are free of EAB occurrence and are greater than 25 miles from the closest known EAB infestation. This distance will allow multiple entries into a stand based on an average, natural movement of EAB of approximately ½ mile per year.

## ASH MANAGEMENT OBJECTIVES

- Landscape Perspective Manage ash populations across the landscape to protect sensitive wetland ecotypes and reduce outbreak costs, without eliminating ash within forest ecosystems.
- Stand Perspective Create conditions that will reduce potential impacts and increase the resiliency of forested stands by -
  - Keeping forested sites forested
  - Maintaining an ash component while increasing the presence of other tree species
  - Increasing tree species diversity
- Management objectives should focus on ecosystem function, health and management, in particular hydrologic function, and not on the emerald ash borer. The management intent is to increase stand resilience.

## CAVEATS

- There is a likelihood that the vast majority of ash trees in Minnesota will be killed by EAB regardless of the type or magnitude of actions taken.
- The large extent of the ash resource, particularly black ash, will likely mean that sufficient management actions will not occur in all stands prior to EAB becoming established throughout Minnesota. Forested sites will be altered or lost.
- Little is known through research and experience about how to maintain black ash forested sites as forested communities once the black ash is killed or removed. On-going research and knowledge gained through experience that can be passed along to all managers are critical to meeting long term ash management objectives. Therefore, this document presents guidance that will change as knowledge from research and experience is gained.

## MANAGING FORESTED STANDS WITH ASH

### DIRECTIVES FOR ALL STANDS WITH ASH

The current scientific evidence does not support investments in artificial regeneration of ash species or management practices implemented to expand or regenerate ash populations. These activities could compromise efforts to protect sensitive wetland ecosystems through canopy diversification, increase forest vulnerability and potentially compromise EAB response efforts.

Consider rare features and biodiversity significance when planning stand-level management. In MBS sites that are outstanding or high biodiversity significance or designated HCVF sites, or where rare species occur, ensure that management considers the need to maintain rare natural features.

**Ash species should not be planted on DNR state forest land for ornamental, shade or reforestation purposes. In implementing forest management prescriptions do not structure operations to intentionally favor the regeneration or reestablishment of ash.**

In order to avoid perpetuating habitat for EAB for future generations, the current objective is to diversify ash dominated plant communities now and into the near future.

- Do NOT plant ash seedlings on state forest land or recommend ash seedlings for reforestation on private lands.
- Do NOT use ash seed in the mix for direct seeding on state forest land or recommend ash seeds for direct seeding on private lands.
- Create conditions favorable for regeneration of non-ash tree species. Ash regeneration can be aggressive, particularly from stump sprouting; chemical application may be necessary to reduce ash on some sites. Removal of stump sprouts may be particularly important in cases when sprouts are competing with regeneration from desired non-ash species. Nonetheless, given our limited experience with regenerating other species on the sites black ash currently dominates, we do not recommend the complete removal of all stump sprouts as these individuals might help maintain hydrologic function during the regeneration phase.

**Prioritize opportunities to implement management practices in stands with ash as practical, regardless of EAB outbreaks.**

Given the magnitude of the ash resource in Minnesota today, forest managers must make ash management a higher priority. The proximity of EAB and the uncertainty of knowing where EAB is currently infesting ash necessitate taking immediate actions to ameliorate some of the negative consequences that have been documented in other states.

## Division of Forestry

---

- Ash stands on the annual stand exam list should be scheduled for a management action that addresses the objectives above. Do not defer stands with ash for a later action. Schedule treatment as soon as possible.
- Integrate state land programs - planning, silviculture, forest health and ECS - to revise SFRMP objectives and stand selection criteria to address ash management objectives.

### **GUIDELINES FOR ALL STANDS WITH ASH**

#### **Reduce the number of ash trees (TPA) and stocking (occupancy)**

Reducing the ash component may reduce future impacts and may help slow the spread of EAB. A dispersed ash component can lessen the impacts to the stand by reducing the likelihood of EAB killing large areas of ash which may or may not have an understory of other tree species. Work to create and maintain scattered ash throughout the stand rather than maintaining pure or nearly pure ash areas within the stand.

- In mixed stands, reduce the ash component to no more than 20% of current stand basal area. Use scattered ash in the stand to meet the basal area goal.
- Leave other species as residuals during harvesting or regenerate other, non-ash species to maintain a forested cover.
- Intermediate stand treatments are often precommercial. The cut material can be left on the forest floor if biomass opportunities are limited or non-existent. EAB will not utilize dead ash trees as host material. Leaving uninfested stems on the forest floor will not create EAB habitat.
- Thinnings should leave a variety of ash tree diameters.

#### **Transition sites to a composition that favors non-ash species**

Despite all management efforts, current experience indicates that EAB will kill nearly one hundred percent of the ash in the stand regardless of ash tree size and spatial occurrence within the stand. The ultimate strategy must be to move stands away from ash dominance and maintain the forest community with other species.

- Use the native plant community field guides to determine the growth stage and refer to *Silviculture Interpretation, Table PLS-2, Abundance of trees throughout succession* to identify favorable ingressing species.
- Consider the regeneration strategies (tolerance) of non-ash tree species already on the site.
- If non-ash species are few or nonexistent, consider artificial regeneration. Try aerial seeding non-ash species as well as underplanting non-ash species even in the absence of any other kinds of stand treatment.
- Consider creating canopy gaps through hand felling or girdling to provide light conditions more suitable for the establishment of underplanted or seeded non-ash species. However, openings greater than 60 feet in diameter may encourage ash regeneration and may also lead to increases in the height of the water table limiting opportunities for regenerating other species.
- Use the NPC tree table, *Silviculture Interpretation Table R-1, Suitability ratings of trees*, to select non-ash species best adapted to the site.

### **ADDITIONAL GUIDELINES FOR BLACK ASH**

#### **Protect the hydrologic functions of the site to maintain a tree cover**

The guiding principle for all black ash management decisions is to protect the hydrology of the site. Black ash, because of its abundance on some sites, often controls water levels in the stand. If the black ash is cut or die off, water levels often increase and there is a chance sites will convert to wet meadows or become dominated by alder. The greatest concerns are black ash communities classified in the wet forest system (WF).

## Division of Forestry

---

Given the importance of black ash in regulating water levels, methods used for reducing ash abundance and encouraging other species will need to maintain ash canopy cover during the regeneration phase. As a result, we recommend shelterwood and selection methods when regenerating these areas.

Use native plant community information along with stand site index to help guide management decisions. The greater the site index, the more flexibility in applying a management treatment that will not cause long-term alteration of the site. General site index guidance –

SI = <45 These sites are low priority for management. Harvest is not prohibited. Avoid expending resources on these sites unless needed to meet management objectives.

SI = 45-55 These sites may provide limited forest management opportunities. Extreme care must be taken on these sites when trees are harvested. These sites are appropriate candidates for understory planting or direct seeding of non-ash species.

SI = >55 Consider management for timber with the cautions listed below for specific NPCs. Regeneration harvests, salvaging, and regeneration by planting, underplanting, and direct seeding to non-ash species may be appropriate. Use the NPC tree table, *Silviculture Interpretation Table R-1, Suitability ratings of trees*, to select non-ash species best adapted to the site.

When working in black ash stands, always monitor treatment results and apply lessons learned to future black ash management opportunities.

### **Precautions for specific native plant communities at risk**

The following communities are at risk for hydrologic damage if the tree cover is significantly altered. Generally, management actions should be lightly applied, and follow up monitoring is extremely important.

#### **WFn55 – Northern Wet Ash Swamp**

- When there is substantial aspen or balm of Gilead (bam) in the stand, use regeneration methods such as 2-step shelterwood and strip clearcut. Suckering aspen and bam will help avoid swamping the site.
- When substantial aspen or bam is lacking -
  - Stands with a site index of 55 or greater, partial harvesting is possible. However, extreme care should be taken by removing not more than 50% of the basal area at one time.
  - Stands with a site index under 55, avoid harvesting and intermediate stand treatment but consider establishing non-ash species.
- Underplant or aerial seed appropriate species listed in the NPC tree tables, *Table R-1, Suitability ratings of trees*, to select species alternates to ash. Browse protection will be necessary.
- In the absence of any harvesting or intermediate stand treatments, consider hand felling or girdling to create gaps for the establishment of non-ash species.

#### **WFn64 – Northern Very Wet Ash Swamp**

- Avoid harvesting or intermediate stand treatments.
- In lieu of any harvesting, consider underplanting or aerial seeding appropriate species listed in the NPC tree tables, *Silviculture Interpretation Table R-1, Suitability ratings of trees*, to select species alternates to ash. Browse protection will be necessary.
- Consider creating small gaps by hand felling or girdling when underplanting and seeding.

#### **Wfs57 – Southern Wet Ash Swamp**

- This is a rare community often found near springs, mostly in rugged topography of the Blufflands Subsection and along the tributaries of the Minnesota and St. Croix rivers.

## Division of Forestry

---

- Avoid any harvesting or intermediate treatments in or immediately adjacent to these communities. Allow other tree species to naturally seed or develop in the understory.

Approved by:

/s/ Forrest Boe Date: 2/25/2013  
Forrest Boe, Director, Division of Forestry  
Minnesota Department of Natural Resources