



**North Dakota Community
Preparedness & Response
Plan for Emerald Ash Borer**





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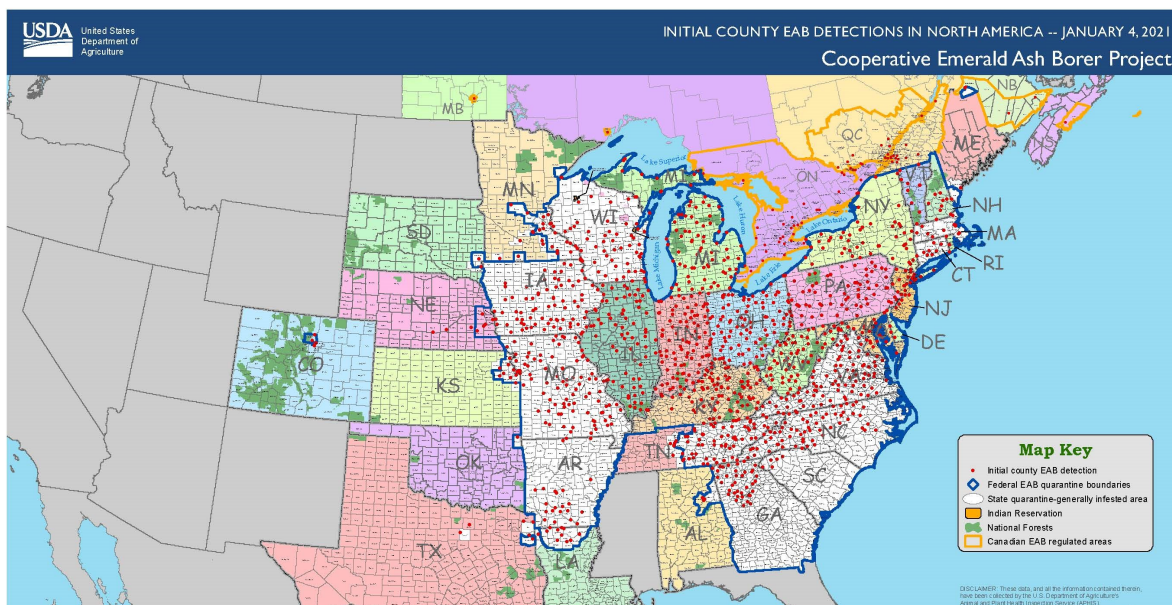
Photo, left: Green ash with typical response to EAB infestation (sprouting at base of trunk, thin foliage). Taken at Fort Snelling MN, 2012. M. O’Neill, NDFS

Photo, front page: Typical boulevard of green ash-Gwinner ND. M. O’Neill, NDFS

Emerald Ash Borer 101

Emerald ash borer (EAB), *Agrilus planipennis*, is an invasive wood-boring beetle first detected in the United States near Detroit, Michigan, in 2002. EAB has killed millions of ash trees since that time.

EAB has not yet been found in North Dakota, but it is as close as Sioux Falls, South Dakota as well as Winnipeg, Manitoba, Canada. It also has been steadily sneaking up the Interstate 94 corridor as it was found in Sauk Centre, MN in 2019.



Why is an EAB Plan important?

- **North Dakota has more than 90 million ash trees located across the state.** Ash trees are extremely common in North Dakota, and can be seen in boulevards, parks, yards, windbreaks, and in forests. North Dakota has green ash and black ash (both native) as well as some white ash and Manchurian ash. All of them are vulnerable to emerald ash borer.
- Once ash trees die, they quickly become brittle and hazardous. These trees need to be removed as they become public safety issues. This can be a significant expense depending on the number and size of hazardous ash trees in your community.
- Loss of shade in streets, parks, yards, and forested areas will negatively impact winter and summer energy consumption, water use, property values, aesthetics, and community pride.
- **Ash trees comprise roughly 46% of North Dakota's community forests**, and their potential elimination could have a profound effect on local economies including:
 - * The cost to treat or remove ash trees in public areas.
 - * The cost to replant.
 - * The devaluing of homes with ash shade trees.
 - * The loss of energy savings benefits and natural beauty.

EAB Life Cycle and Identification

EAB adult females lay their eggs on the bark of the tree. Eggs are very small (less than 1 mm) and rarely observed. Once hatched, the larvae tunnel their way into the tree where they feed beneath the bark creating serpentine (S-shaped) galleries. Larvae are up to 1.25 inches long, creamy white and have several bell shaped segments. In the spring the EAB will pupate beneath the bark and emerge as an adult. The adult EAB will chew its way out of the tree, creating D-shaped exit holes that are approximately 3-4 mm in diameter. Adult EAB are 0.3-0.53 inches long with metallic green elytra (wing coverings).

Damage

While feeding beneath the bark of the tree, the larvae disrupt the flow of nutrients throughout the tree. Once infested, an ash tree can die in as little as 2 years.

The above information is via the North Dakota Department of Agriculture. For more information, please visit: <https://www.nd.gov/ndda/plant-industries/pest-survey-and-outreach/emerald-ash-borer-eab>

For more information on EAB biology and management, check out the NDSU Extension Publication “[Emerald Ash Borer Biology and Integrated Pest Management in North Dakota](#)”.

Emerald Ash Borer (EAB) has NOT been detected in North Dakota.

Ash Tree ID



Green ash (*Fraxinus pennsylvanica*) is the most common ash species in North Dakota.
(photos from ND Tree Handbook, NDSU)

1. Title

Emerald Ash Borer Preparedness and Response Plan for the
City of
as approved by the City Council on

2. Purpose & Objectives

- This plan is a working document and will be updated to reflect changes as needed as our understanding of Emerald Ash Borer (EAB) evolves. The intent is to mitigate the spread of EAB, an invasive beetle that kills ash trees (*Fraxinus* species), which are native to and abundant in North Dakota. An established set of Best Management Practices (BMPs) are outlined here and are based on the most recent scientific findings.
- Preparation for EAB will lessen the social implications of losing ash trees throughout the community, distributing the economic costs over a more feasible timeframe. The initial management objectives should have preventative measures to reduce the risk of EAB establishment through ash removal and monitoring.
- **Preparing for EAB will maximize and maintain the long-term benefits of the community forest. Benefits include stormwater runoff protection, energy savings, removal of pollutants, carbon storage, health benefits, and natural beauty.**

3. Applicable Properties Include:

a. Public Properties

Management, cost, and removal of affected trees on city properties, parks and open spaces, boulevard trees, will be the responsibility of the city.

B. Private Properties

Management, cost, and removal of affected trees on:

will be the responsibility of the property owner.

4. Administration

Administration of this plan will be a collaborative community effort including:

- a. Public Works staff (*See contact list for names, titles and contact info*)
- b. Parks & Recreation staff
- c. City Administration staff
- d. Tree Board
- e. Volunteers
- f. Private Consultants & Vendors

5. Executive Summary

An Executive Summary is provided as a separate document and serves as a synopsis of the plan for residents, city leaders and other interested parties. It includes a summary of EAB, the impact of the pest on the community, and a summary of this plan.

6. Planning: Phase I

A. Inventory of Community Forest

Public and private trees should be inventoried and maintained as changes occur.

The ND TIP Tool is available for capturing this information.

<https://ndcitytrees.org>

B. Determine Infested Wood Handling Procedures

- i) Where it needs to go and when (infested tree removal should occur during EAB dormancy– October 1st through mid-May).
- ii) Determine a list of contractors capable of effective tree removal.
- iii) Utilization
 - a) Large material with the bark and at least one inch of the most recent wood removed has the potential to be used WITHOUT spreading EAB.
 - b) All wood from the infested tree should otherwise be destroyed.
- iv) Destroying infested wood
 - a) Burning or thoroughly chipping wood material (chips 1” or less) will kill EAB larvae.

C. Update City Ordinances

- i) Invasive pests should be defined to encompass future pests.
- ii) Authority to inspect properties should be determined to help facilitate monitoring and management activities.
- iii) Specific planting/replanting species should be defined to reduce the risk of infestation. A recommended tree planting list should be kept OUTSIDE of the ordinance so it can be easily updated.
- iv) Address wood utilization with respect to transporting invasive pests.
 - a) **Don't Move Firewood** (<https://www.dontmovefirewood.org/>)
 - b) **NDDA Firewood Finder** (<https://www.nd.gov/ndda/firewood-finder>)

7. Prevention: Phase II

A) Training

i) Training will be made available to city, state, North Dakota State University (NDSU), and North Dakota Forest Service (NDFS) employees by NDSU Extension, ND Department of Agriculture (NDDA), and NDFS. The intent of training is to teach the necessary skills to recognize indicators of potential EAB presence. Trainings can be conducted by request or as needed to supplement the current annual schedule.

B) Monitoring

i) Annual EAB trapping will be conducted through USDA-APHIS, NDDA, and NDFS. Once EAB is detected in a community, visual surveying for its distribution will be done regularly to maximize management needs.

C) Ash Tree Management

- i) Removals of declining ash trees should be guided by the health of inventoried trees using a combination of the following tools:
 - a) ND TIP Tool (<https://ndcitytrees.org>)
 - b) EAB Cost Calculator (part of TIP Tool and can also be found here: <https://int.entm.perdue.edu/ext/treecomputer/>)
 - c) EAB Planning Simulator (https://www.michigan.gov/documents/dnr/EABPlanning_374200_7.xls)

ii) Refer to the most recent Tree Inventory & Plan (TIP) or Community Threat Assessment Protocol (CTAP) for woody species recommendations.

iii) Follow International Society of Arboriculture (ISA) guidelines for planting and maintaining trees. www.treesaregood.com

a) Replacement tree plantings should follow the **10-20-30 Rule** to promote tree diversity standards:

i) No single tree species should make up more than 10% of the total tree population (ex: American elm, *Ulmus americana*).

ii) No single genus should make up more than 20% of the total tree population (ex: all types of elm, *Ulmus*).

iii) No single family should make up more than 30% of the total tree population (ex: *Ulmaceae*).

D) What To Do When An Infestation Is Suspected

i) Reports of suspect EAB should be submitted to one of the following:

A) North Dakota Department of Agriculture (NDDA) 701-220-0485 or 701-328-4765

B) North Dakota Forest Service (NDFS) 701-231-5138

C) North Dakota State University (NDSU) Extension Forester 701-231-8143

D) USDA-APHIS State Plant Health Director 701-250-4473

8. Eradication: Phase III

A) What Will Happen Following a Positive Detection of EAB

i) A quarantine regarding wood material movement will be put into place.

ii) A coordinated response with county and city governments and landowners will be developed, led by USDA-APHIS, NDSU Extension, NDDA, and NDFS to do the following:

a) Initiate emergency meetings to disseminate the necessary information.

b) Define the incident command structure.

c) Survey to determine the extent of the infestation.

d) Educate stakeholders regarding ash utilization (i.e. firewood and wood products). For more information, please visit:

http://www.dontmovefirewood.org/pest_pathogen/emerald-ash-borer-html/

B) Monitoring

i) Visual surveys for identifying EAB signs should become a regular part of trained employee outings.

ii) Bark sampling of suspected trees will be conducted by trained individuals when suspected infested trees are found.

9. Containment: Phase IV

A) Pesticide Treatment

i) What trees should be treated?

a) Treatment should **NOT** occur unless the tree(s) of concern are within 15 miles of a confirmed EAB presence.

b) Treatment should only apply to those trees of high value with greater than 50% healthy live crown. High value trees are generally large, old, healthy trees that may be in a place that has high removal cost (over a house) or in a high use area, such as a park. Treatment of high value trees with 50% or greater healthy crown needs to be weighted against removal costs.

ii) Insecticides are only valuable when there is a large population of EAB present that is capable of damaging a tree during the year.. As EAB populations are within 15 miles, the range of high value trees for treatment can be expanded. It should be kept in mind that treatment cost is frequently lower than removal cost.

a) Timing: treating in the spring has consistently shown to be the most effective time to treat. This allows time for the systemic insecticide to distribute through the tree, killing young larvae and emerged adults that will feed on upper crown foliage. Late growing season (July-August) applications can still be used to protect high value trees, but the application is not as effective as when it is conducted in the spring.

b) Emamectin Benzoate: this insecticide is **applied by a professional** as a trunk injection that is timed to come shortly after ash trees have flowered and leaves have started to expand. This injection will protect the tree for two-to-three growing seasons and currently is understood to have the least environmental impact.

c) Imidacloprid: can be applied as a soil drench by the homeowner near the second week of April. Completion of flowering of ash trees should be used to guide the timing of the application in order to minimize the effects on pollinators. **Imidacloprid is recognized to cause declines in pollinators and has been found to have undesirable ecological effects.**

d) Dinotefuran: can be applied as a soil drench or a basal bark spray by the homeowner. The timing of the application should come approximately four weeks after ash trees have completed flowering.

B) Tree Removals

i) Sanitation removals should be conducted on infested trees and on neighboring declining trees once EAB has been detected. Declining ash in close proximity to an infested tree are a natural vector for continued spread.

ii) Continue to remove declining trees throughout the community as resources permit.

C) Appropriate Material Handling

i) A wood management and utilization process should be in place from Phase I (Planning) to deal with infested material.

a) Sanitation material should only be removed and hauled to a predetermined location by trained individuals and be done during the EAB dormancy period from October 1st through mid-April. Once at the site, material can be destroyed.

D) Replanting

i) Replanting should be a continuous process in areas where preventative or sanitation removals have occurred. See materials listed below for guidance on species to use and planting methods:

a) [Recommended Trees for ND Communities](https://www.ag.ndsu.edu/ndfs/documents/rec-trees-for-nd-2021-final-final-draft.pdf) (https://www.ag.ndsu.edu/ndfs/documents/rec-trees-for-nd-2021-final-final-draft.pdf)

b) [NDSU Extension- Trees & Shrubs](https://www.ag.ndsu.edu/publications/lawns-gardens-trees/trees-shrubs) (https://www.ag.ndsu.edu/publications/lawns-gardens-trees/trees-shrubs)

c) [ISA-Planting a Tree](https://www.treesaregood.org/treeowner/plantingtree) (https://www.treesaregood.org/treeowner/plantingtree)

E) Biological Control

i) Biological control will only be applied to natural forests that can not otherwise be managed effectively through pesticide treatment and removals.



Photo: Classic EAB serpentine galleries and sprouting– Fort Snelling, MN 2012. M. O'Neill, NDFS

Additional Resources

NDFS, NDDA, & NDSU Extension resources:

Emerald Ash Borer

<https://www.ndinvasives.org/emerald-ash-borer>

<https://www.ag.ndsu.edu/cpr/horticulture/new-ndsu-extension-publications-on-emerald-ash-borer-05-24-18>

<https://www.nd.gov/ndda/plant-industries/pest-survey-and-outreach/emerald-ash-borer-eab>

<https://www.nd.gov/ndda/sites/default/files/resource/EAB%20FAQs.pdf>

Ash Tree Identification

<https://www.ag.ndsu.edu/publications/lawns-gardens-trees/ash-tree-identification>

ND TIP Tool & EAB Calculator

<https://ndcitytrees.org/NorthDakota/>

Recommended Trees for North Dakota Communities:

<https://www.ag.ndsu.edu/ndfs/documents/rec-trees-for-nd-2021-final-final-draft.pdf>

Other Resources:

USDA APHIS

<https://www.aphis.usda.gov/aphis/resources/pests-diseases/hungry-pests/the-threat/emerald-ash-borer/emerald-ash-borer-beetle>

Emerald Ash Borer Information Network

<http://www.emeraldashborer.info/>

<http://www.emeraldashborer.info/resources.php>

International Society of Arboriculture (ISA)-Planting a Tree

<https://www.treesaregood.org/treeowner/plantingatree>

Don't Move Firewood

https://www.dontmovefirewood.org/pest_pathogen/emerald-ash-borer-html/