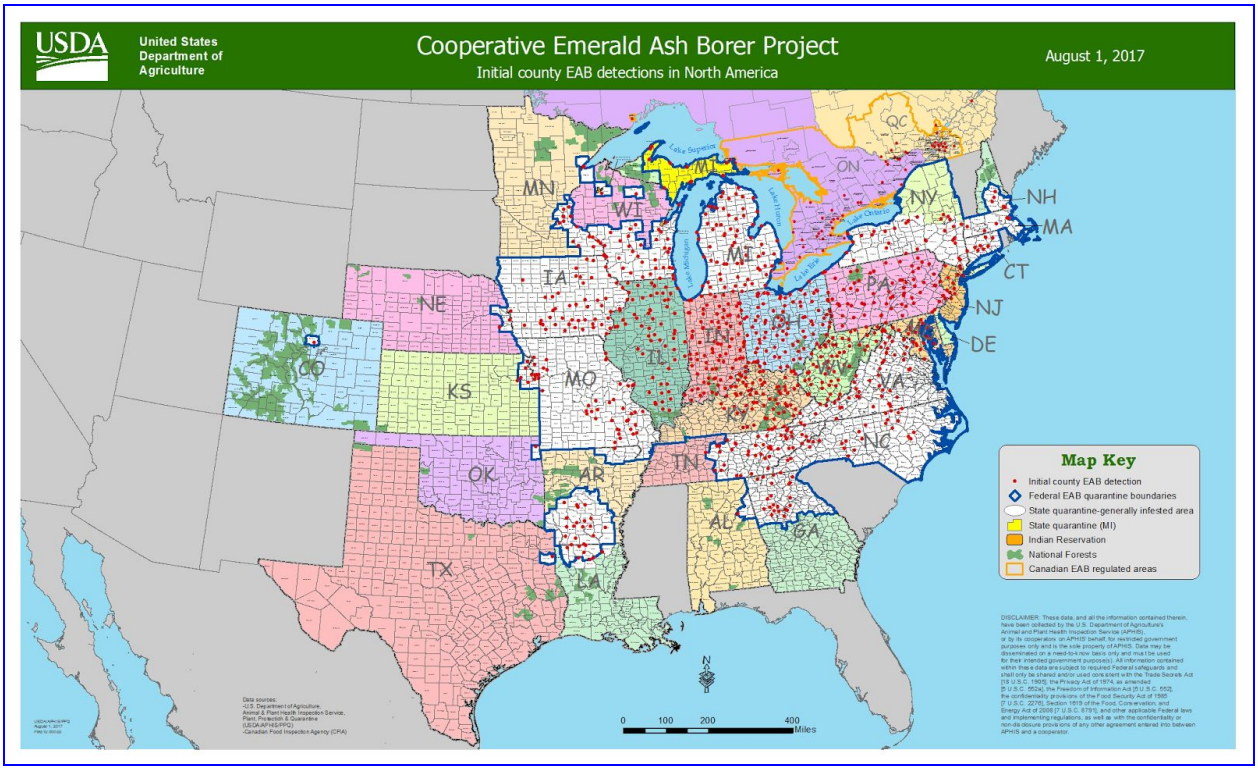
Emerald Ash Borer Management Plan
City and County of Broomfield
revised September 2017

Introduction

The Emerald Ash Borer (EAB), *Agrilus planipennis,* is a beetle native to Asia that was discovered near Detroit, Michigan, and Windsor, Ontario, in 2002. Since then, it has been found in 30 states and two Canadian provinces. The EAB infestation now extends as far east as Massachusetts,north to Minnesota, south to Louisiana and west to Colorado, where it was discovered in Boulder in September 2013.



Emerald Ash Borer is an exotic, invasive, wood-boring insect that infests and kills native North American Ash trees (Fraxinus spp.). Just like Chestnut Blight and Dutch Elm Disease before it, EAB is capable of eliminating an entire tree species from forests and cities throughout the United States.

Based on the Metro Denver Urban Forest Assessment, prepared by the USDA Forest Service for the City and County of Denver, there are approximately 260,000 trees in Broomfield. Seventeen to 20% of those trees (between 44,200 and 52,000 trees) are Fraxinus species.

Proposed Plan

The intent of this plan is to guide the City and County of Broomfield in the mitigation of the disruption to the urban forest caused by the pending infestation of Emerald Ash Borer; to develop strategies that will effectively distribute the costs of the infestation over a period of time; and to lessen the social and economic impact that such an extensive loss would have on the property values and quality of life in our community. Seven management tools—**Tree Inventory, Monitoring and Detection, Removal and Treatment Options, Tree Planting and Replacement, Wood Utilization and Disposal, Public Outreach and Assistance, and Budget Development**—have been developed to assist in the mitigation of EAB.

Applicability

This plan will apply to all Ash trees currently growing on City and County of Broomfield properties as well as Ash trees growing on private properties that have the potential to adversely impact adjacent private properties, public rights-of-way, or other public properties. The actions recommended in the EAB Management Plan are in addition to the tree maintenance programs that are currently in place for the management of Broomfield's urban forest. Additional personnel and financial resources will be required to enact these additional programs.

Tree Inventory

In December 2015, Broomfield completed the GIS-based tree inventory that shows all the trees locations on Broomfield properties. This inventory will provide data on the total number of trees and their location, species population, size, health, and other attributes. This data will be used to project the effect the EAB will have on Broomfield's urban forest; to project tree removal, treatment, and planting costs; and to provide a value on the benefits these trees provide our community using i-Tree, software developed by the United States Forest Service that quantifies and places a dollar value on the annual environmental and aesthetic benefits of trees.

In 2015, the tree inventory contained data on 24,562 trees growing on Broomfield properties. Of that number, there were 2,338 Ash trees growing in Broomfield, making up 9.1 % of the total tree population. The number of Ash trees growing on Broomfield properties has been reduced by 387 trees to a total of 1,794, or 7.3% of the total tree population.

Year	Number of Trees in Inventory	Ash Tree Population	% of Total Tree Population
12/2015	25,562	2,338	9.1%
12/2016	24,441	1,948	8.0%
8//2017	24,708	1,794	7.3%

The tree inventory will be regularly updated to provide accurate and current data on Broomfield's tree population. In addition to adding data on newly planted trees, 20% of the current tree inventory will be updated annually.

Early Detection and Monitoring

The Emerald Ash Borer is very hard to detect. By the time Ash tree shows symptoms of EAB, a large population of the insect exists and the neighboring Ash could be infested. Early detection and monitoring is a tool that will allow for the discovery of EAB before the Ash show signs of infestation. The sooner EAB is found, the sooner the management plan can be enacted.

Broomfield currently uses pheromone traps and EAB rearing cages for the detection of EAB. Starting in 2017, twenty pheromone sticky traps were deployed throughout Broomfield. The use of the pheromone traps to assist in the detection of EAB will continue until they are no longer a viable method of detection or detection is no longer needed. These traps are inspected three times a season for EAB. The EAB rearing box are large boxes covered with black cloth and housed in an heated storage room. Branch samples taken from Ash trees are placed in these boxes where they are monitored for the emergence of the adult Emerald Ash Borer and other insects.

A delimited survey is another method that can be used to locate EAB populations. This method is not currently being used in Broomfield because of limited staff and time constraints.

If EAB is discovered, the Colorado Department of Agriculture will be notified. Trees located near the infested tree also will be sampled for EAB. If the Colorado Department of Agriculture confirms EAB in Broomfield, a quarantine prohibiting the movement of Ash trees, firewood, mulch, and lumber out of Broomfield may be enacted.

Removal and Treatment Options

The main goal of treating Emerald Ash Borer is to preserve and maintain the health and safety of Broomfield's urban forest. Removal and treatment options include the use of systemic pesticides or the removal of infested trees with the proper disposal of the wood. Ash trees will be assessed to determine if a tree is a candidate for removal or an insecticidal treatment.

Removal

The early, strategic and systematic removal and replanting of Ash trees is a cost-effective control measure prior to the detection of EAB in Broomfield. As of 2016, 1,513 of the 2,338 Ash trees in Broomfield are in poor health or have a trunk diameter of less than eight inches and should be removed prior to infestation of EAB and replaced with a suitable species within the next 10 years. It is vital that these trees be removed in a timely manner. If the Ash is allowed to die, it will become brittle, drop branches, and be high risk to the community. Should these trees fail, they could damage buildings, cars, and severely harm or kill park users and their pets. It is safer and less costly to remove the Ash tree while it is still alive. The removal includes grinding the stump in preparation for replacing the tree.

Broomfield's Forestry staff propose to annually remove 250 Ash trees and replace them with 200 trees of a more suitable species. It will take six years to remove trees in poor health or have a trunk diameter of less than eight inches. These trees would be removed by a contactor or Forestry staff and replanted the next growing season. After EAB is detected in Broomfield, the removal of the Ash trees would be concentrated in the areas around location(s) where the borer is found. From the conception of the Emerald Ash Borer Management Program, 542 Ash trees have been removed.

Treatment

Pesticide treatment must be done on an annual or triennial basis for the life of the tree. Ash trees in good health with a trunk diameter of 8 to 18 inches are the best candidates for treatment. Trees with up to a 30% loss in their canopy respond well to treatments. Larger trees also can be treated, but a health and risk evaluation should be done to determine if a tree is a good candidate for treatment. Research has shown that pesticides that are applied through trunk injection are the most effective treatment for EAB and will persist in the tree for up to three years. Soil drenches and injections are effective, but these treatments only persist for one year. Ash trees that are within 10 to 15 miles of a known EAB infection are at risk of being infected.

There is an estimated 825 Ash trees with a diameter of greater than eight inches that are in good to fair health and are considered to be high-value trees. Treatment of these trees will preserve the existing tree canopy and the benefits these trees provide. The trunk injection treatment method with a systemic insecticide has been selected for these trees. One third of the high-value Ash, or approximately 275 trees, will be treated annually. The treatment will continue for nine years. At that time, the program will be evaluated to determine if it should be continued. Treatment for EAB may have to continue for the life of the tree, until the treatment program is not viable, or until EAB has been eradicated. New treatment methods will be evaluated as they are discovered to see if they are an effective control of EAB.

The treatment of the high-value Ash for EAB began in May 2016 with the completion of the first round of treatments in 2018. As of September 2017, 545 trees have been treated.

Treatment of trees less than eight inches in diameter may be required when the EAB is detected in Broomfield. These treatments will flatten the exponential death rate of the Ash, allowing for the tree removal and replanting to be kept on the projected timeline and meet budgetary constraints.

The tree inventory will be used to select the trees that meet the stated criteria. A licensed contractor or Broomfield Forestry staff will treat the trees.

Tree Planting and Replacement

To maintain the integrity of the urban forest, it is vital to replant trees that have been removed due to EAB or any other disease, insect, or weather event. Trees are an integral part of what defines a community. Removing the Ash to manage the EAB infestation is one step in the management plan; the next is replacing the trees that were removed.

Trees that are adapted to the growing conditions of Colorado will be selected to replace all removed Ash trees. The new trees will promote both age and species diversity in Broomfield's urban forest. A contractor will plant the replacement trees at locations specified by the City

Forester. From the conception of the Emerald Ash Borer Management Program in 2016, 400 Ash trees have been replaced.

Wood Utilization and Disposal

Broomfield's Tree Branch Recycle Program (TBRP) collects woody tree and shrub plant material from Broomfield residents. The material is processed into wood mulch and utilized by residents, Broomfield's staff and contractors. In 2016, the TBRP diverted 18,000 cubic yards of woody material from the landfill. After EAB is detected in Broomfield, it will take two to five years for the insect's population to increase to a level that will impact the health of the community's Ash trees. The death rate of the Ash will exponentially increase resulting in changes in the services provided through the TBRP.

In 2018, Broomfield will move the TBRP drop off site to a new location. This larger site will allow Broomfield to better meet the residents' need for wood utilization and disposal of Ash and other urban woods

These changes may include but are not limited to:

- Increased amount budgeted for contracted grinding services from an estimated 20% to 30 % increase in woody material collected due to an increase in dead trees. The time required for each grind will double because the mulch will need to be processed to a size of less than one inch by one inch to meet quarantine requirements. Currently, the mulch size is three inches by one inch after one grind.
- The processing of logs larger than 10 inches in diameter into lumber that would be used by cabinet and furniture makers. This would be a contracted service.
- An expansion in the hours of operation due to the increased demand for TBRP services
- A staffing increase to maintain and clean the drop-off site and to check for CCOB residency due expanded hours.

Public Outreach and Assistance

Broomfield has actively provided public outreach through educational programs on Channel 8 and other education programs such as classes on EAB, tree care and selection, residential tree consultation, and tree care information on the Broomfield website.

Budget Development

The items listed in the EAB management plan are actions that are intended to limit the financial burden to the City and County of Broomfield. However, it is recognized that these programs cannot be enacted without additional personnel and financial resources.