City of Longmont Emerald Ash Borer Management Plan

Last Update: April 2016

Jurisdiction

The management strategies outlined in this plan apply to all ash (*Fraxinus)* on publicly managed properties throughout the City of Longmont. The city ordinances that apply to infested or hazardous ash trees on private property are also referenced herein (also see Chapter 13.24 – Trees & Plants in the Longmont, CO Code of Ordinances).

Implementation

Longmont Forestry Services, A Division of Public Works & Natural Resources, will be responsible for the implementation of this plan, which will change over time in response to new detections of the pest and other new information.

Contacts

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Green ash (*Fraxinus pennsylvanica*)

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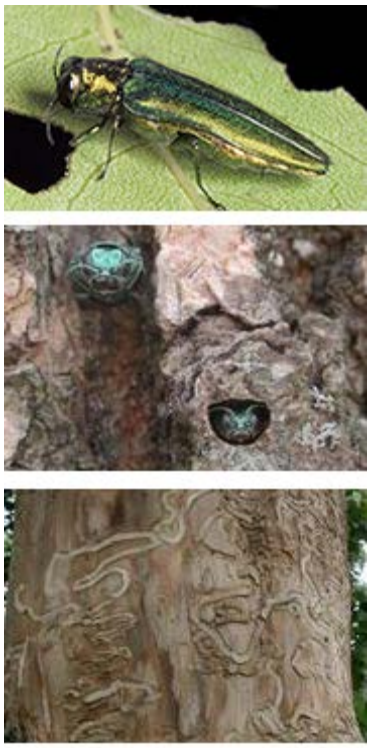
Background



Emerald ash borer (EAB), *Agrilus planipennis*, is a highly destructive invasive insect from Asia that was first discovered in the United States in Michigan in 2002. While relatively benign to trees in its native range – which have developed a natural resistance – EAB is fatal to all North American ash species (*Fraxinus spp.*), killing "nearly 100%" of trees not protected by chemical pesticides.[1]

Since its Michigan detection in 2002, EAB has spread across North America to more than 25 U.S. states and Canadian provinces, leaving tens of millions of dead ash in its wake. According to Michigan State University entomologist Deb McCullough, the number of ash killed by EAB has already surpassed the tens of millions of elms killed by Dutch elm disease in the 1960s and 1970s. "It is now the most destructive forest insect ever to invade North America," McCullough said in a 2011 Time Magazine interview. "We literally cannot keep up with it." U.S. Forest Service entomologist Andrew Liebhold told The New York Times in 2014 that 99% percent of the ash trees in North America "are probably going to die" as a result of EAB.[2]

In 2013, the City of Boulder detected an emerald ash borer infestation, marking the insect's first Colorado detection and its westernmost movement across the U.S. to date. A delimitation survey in the year immediately following that detection revealed EAB to be well-established within central Boulder, and it documented the progressive spread of the pest within the city. As of April 2016, no infestations outside of Boulder have yet been confirmed, but the experience of cities in other EAB-affected states advises that the pest will inevitably spread across into neighboring communities.

Thousands of Longmont ash are threatened by EAB

[1] Klooster WS, Herms DA, Knight KS, Herms CP, McCullough DG, et al. 2013. Ash (Fraxinus spp.) mortality, regeneration, and seed bank dynamics in mixed hardwood forests following invasion by emerald ash borer (Agrilus planipennis). Biol. Invas. doi:10.1007/s10530-013-0543-7

[2] Koerth-Baker, Maggie. "After the Trees Disappear." The New York Times, June 30, 2014.

EAB photo credit: Pennsylvania Department of Conservation and Natural Resources

In coming years, EAB will seriously threaten green, white, and other ash species that are very common in Colorado landscape settings, comprising an estimated 15% or more of Colorado's urban trees.

Predicting EAB's arrival in Longmont and tracking its movement once it's here will be extremely difficult. One reason for this is that the spread of EAB does not follow a readily predictable pattern; while natural EAB movement each year is limited to about a half mile and is bounded by geographic barriers such as mountain ranges, human-assisted transport allows the pest to move unbounded distances via firewood and other infested material. While a federal quarantine restricts the movement of ash wood out of Boulder County, this means that infested wood is moving freely within the county, potentially transporting emerald ash borer from city to city. When EAB does arrive in Longmont – if it hasn't already – it will be very difficult to identify; early detection of this pest is notoriously difficult, with detection commonly lagging the time of infestation by several years. This is because visible symptoms of early infestations are often scarce and mimic the symptoms of other, non-lethal pests.

An updated inventory in 2015 of public trees in the City of Longmont revealed that about 2,800 trees - 13% of the City's public tree inventory – are ash species. According to the Guide for Plant Appraisal (9th Edition), the estimated value of Longmont's ash trees is more than $8 million. In addition, tens of thousands of additional ash are estimated to exist on privately-owned land within the City.

Unfortunately, EAB's impact to urban forests may be even worse than simple inventory counts like these suggest when the age of these trees and their contribution to overall tree cover is taken into account. A 2016 iTree Eco study of Fort Collins' urban forest, for example, showed that while ash make up about 15% of the public tree inventory by tree count, they account for over 30% of the city's actual canopy cover and contribute more than 25% of that urban forest's total carbon sequestration.

Trees Provide…

Economic benefits, lowering energy demand through shade and wind block. They also increase home prices and reduce the need for costly grey infrastructure.

Social benefits. Greater tree canopy levels are associated with a reduction in violent crime and a greater sense of civic pride. They also act as visual and sound buffers.

Environmental benefits. Trees improve air and water quality, sequester carbon, reduce soil erosion, and promote biodiversity.

Management Goals

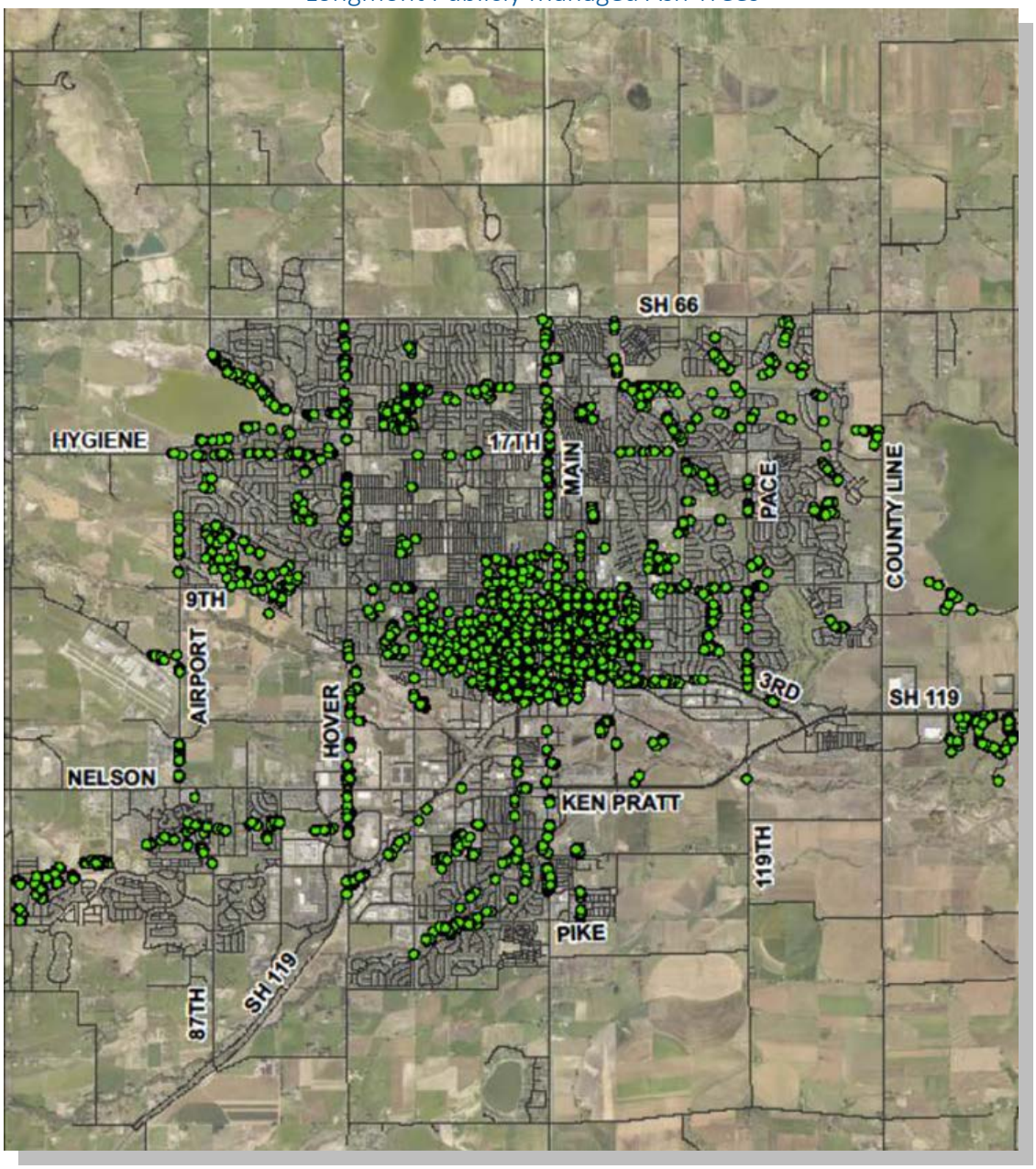
The management of emerald ash borer in the U.S. has been confounded by the movement of infested wood as well as difficulties in early detection, limitations in control options, and scarcity of available resources. Because of this, the eradication of emerald ash borer is highly unlikely. However, it is possible to mitigate much of the harm caused by this pest. Through the strategies and tactics outlined in this plan, the City aims to: protect people and property from hazard trees, protect the city's highest-value ash trees, minimize annual and long-term management costs, restore lost canopy and improve forest resiliency to future pests.

Management Strategies

Inventory Updating & Analysis

A critical element of any EAB management plan is to confirm the number and location of ash trees to be managed. To this end, the City of Longmont updated its inventory of more than 21,000 public trees (not including natural areas) in 2015. The inventory collected updated information about each tree's size, condition, and other characteristics. The 2015 tree inventory identified 2,791 ash trees which are publicly managed and account for 13% of Longmont's public tree population.

Longmont Publicly Managed Ash Trees



Detection & Monitoring

While the early detection of EAB is very difficult to achieve, the City aims to detect any infestations as early as possible and to monitor EAB's spread using a variety of tools. The tools used will depend on the infestation level, the location, and the time of year.

Visual survey – This method has been employed in Longmont since prior to EAB's initial detection in Boulder. Longmont staff will continue to monitor for a variety of EAB symptoms – including canopy thinning, leaf size shrink, wood pecker damage, and D-shaped exit holes.

Trap trees – To lure nearby EAB to specific tress, already-declining trees can be girdled, cutting off the flow of nutrients. Studies suggest that EAB may be attracted to these injured trees, allowing City staff to detect them via rearing cages or branch peeling. Attracting and concentrating EAB populations in this way would also allow City foresters to destroy EAB larvae during the fall and winter before the next generation of adults emerges. Trap trees have been used in Longmont for detection purposes since the spring of 2014.

Plastic traps and chemical lures – Working in collaboration with the Colorado Department of Agriculture, purple pheromone traps have been placed in ash trees annually for the past six years. In light of a 2015 study by Colorado State University Entomologist Dan West suggesting Colorado's EAB respond better to green traps, the city has ordered 10 green traps for spring 2016.

Rearing cages – Over the winter of 2015-2016, branches from poor condition ash trees in Longmont were placed in 10 separate rearing cages under a program managed by CSFS. The cages are located in both indoor and outdoor locations at Forestry Services to evaluate the effect of temperature on emergence timing. Staff inspect the traps weekly; any EAB adults that emerge will be detectable within the cages.

Branch peeling – Branches from trees sampled in fall or winter will be peeled with draw knives in search of EAB feeding galleries and larval life stages under the bark.

Private tree monitoring – In some circumstances, the City may decide to enforce municipal codes that allow the city to inspect private ash trees located on private land. See Chapter 13.24 in the Longmont, CO Code of Ordinances.

Contractor reporting - Once discovered in Longmont, the City will monitor EAB spread as reported by private licensed tree contractors. A Longmont map detailing the spread of EAB will be posted online and will be periodically updated. While the final details of this map have yet to be determined, the city could use such a map to highlight ash population changes over time and display the sites of planned treatments, proactive removals, and reactive removals.

Proactive & Reactive Removals

The city has begun the proactive removal of declining or low-quality ash trees on public property. Many of the trees slated for proactive removal have already been heavily damaged by lilac/ash borer or other pests (see Iowa State University Extension's, Common Problems of Ash Trees), and are rated as being in dead/dying, very poor or poor condition. Ash trees in poor health do not typically respond well to insecticidal treatments.

Small diameter ash of less than 10" will also be candidates for removal in order to avoid the financial and environmental cost of chemical insecticide treatments over the duration of these trees' remaining lifetimes. Studies suggest that it is generally more cost effective to replace smaller-diameter ash rather than treat them indefinitely. Ash growing in conflict with overhead power lines will also be candidates for removal.

This proactive removal strategy will reduce the amount of available food for EAB populations, allow time for new trees to begin to establish, and better allow the City to keep pace with the removal of infested, dead or hazardous trees.

The City will continue to remove poor condition ash after EAB is detected within city limits to protect public safety and property and make room for new trees. Prompt removal of heavily infested ash can also aid in reducing the spread of EAB by destroying larvae before they can emerge and infest new trees. Property owners adjacent to any planned public ash removals will be notified in advance by letter.

Integrated Pest Management (IPM)

is an effective and environmentally sensitive approach to pest management **that relies on a combination o**f common-sense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment along with information about the best available preventative, mechanical, and biological pest control methods to manage pests economically and with the least possible hazard to people, property, and the environment. The City of Longmont will strive to follow this approach in its management of EAB.

USDA Western IPM Center

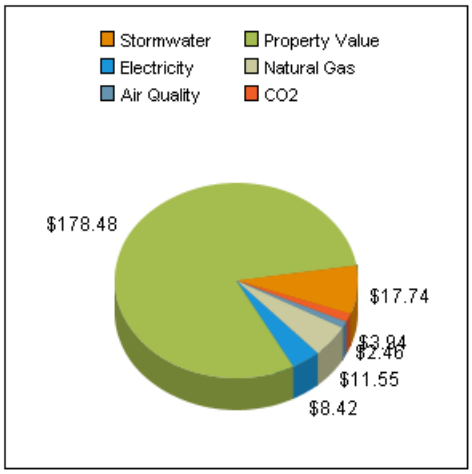
The City's municipal code requires that property owners with infested, dead or dangerous trees to be removed (see Chapter 13.24 – Trees & Plants in the Longmont, CO Code of Ordinances). Code Enforcement staff will be actively involved with this process. However, as the City is hit with peak infestation and ash fatality levels, resources will be limited and response times may be longer than usual.

Chemical Treatments

To protect high-value trees, slow EAB's spread, and minimize costs while also minimizing environmental impacts, the City of Longmont plans to use TREE-äge (emamectin benzoate) trunk injections. This option allows the City to apply the treatment directly into the tree versus more indirectly via sprays or soil drenches. Emamectin benzoate, derived from a naturally occurring soil bacterium, has been registered for more than 10 years as an EPA Reduced-Risk insecticide.[3] Recent studies show that these injections will provide 2-3 years of effective protection.[4] As such, the City plans to begin treating high-value, good-condition ash trees in the spring and early summer of 2016 or 2017. Initially, a portion or all ash target ash trees will need to be treated depending on what is discovered in 2016. Ideally, the plan would be to treat one third of target ash trees the first year and in each subsequent year on a three-year rotation. This action will help to retain the social, economic and environmental benefits these trees provide until replacement trees begin to establish. It will also help to stretch the death curve of thousands of trees across a more manageable time period, helping the city to more effectively manage hazard trees and minimize annual budget impacts.

An Average Longmont Ash Tree: Benefits Snapshot

Longmont trees provide many benefits, including storm water management, energy savings, carbon sequestration, and property value inflation. The average ash tree in Longmont has a diameter at breast height (DBH) of about 14 inches; a tree this size provides $223 in benefits each year.[5] As the tree grows, the value of the benefits it provides will continue to increase.



[3] McCullough, Deborah G., Jeffrey Hahn, and Daniel A. Hermes. "Frequently Asked Questions Regarding Potential Side Effects of Systemic Insecticides Used To Control Emerald Ash Borer." February 2011.

[4] Smitley, David R., Joseph J. Doccola, and David L. Cox. "Multiple-year Protection of Ash Trees from Emerald Ash Borer with a Single Trunk Injection of Emamectin Benzoate, and Single-year Protection with an Imidacloprid Basal Drench." Arboriculture & Urban Forestry 2010. 36(5): 206–211

[5] "National Tree Benefit Calculator." TreeBenefits.com. Accessed 2016. http://www.treebenefits.com/calculator/ReturnValues.cfm?climatezone=North.

Communication

Internal & Intra-Agency

Other EAB-impacted states in the Midwest have learned valuable lessons from their experience with EAB, and there are many ongoing studies there and in Colorado that will improve our ability to confront this pest. Because of this, City staff must continue to work with external organizations through meetings, trainings, and other events to stay apprised of the latest EAB management and outreach strategies.

Two important avenues for intra-agency communication are the Colorado Emerald Ash Borer Response Team and the Emerging Pests In Colorado committee. These groups consist of local experts in entomology, pathology, researchers and tree managers. Representation from Colorado State University (CSU), Colorado State Forest Service (CSFS), United States Forest Service (USFS), Colorado Department of Agriculture (CDA), United States Department of Agriculture Animal and Plant Health Inspection Service (USDS-APHIS), municipal forestry individuals and private tree care companies regularly attend these meetings.

The city will also host internal trainings, take part in workshops, and attend Front Range Urban Forestry Council meetings, EAB University, and other events.

External

To date, the City has utilized the local media, the City's website, utility bill inserts, social media, tree wraps, and other media to raise awareness of EAB and to encourage local residents to make a plan for their trees. EAB awareness presentations have also been delivered to HOAs, garden clubs, and service groups. The map mentioned above, an EAB-focused Arbor Day, and the hosting of a screening of the documentary "Trees in Trouble" are also in the works.

In the course of outreach efforts, the City is taking advantage of the wealth of outreach materials that already exist to spread the word about EAB; see the Additional Resources Section for links.

PERSPECTIVE

Letters
UNREST IN JEFFCO
Hiring of new superintendent

INSIDE: In Boulder, a case of elk behaving badly?

A return to Prohibition, or at least a prohibitive alcohol tax

Emerald Ash Borer

Urban forest under siege

Costs & Resources

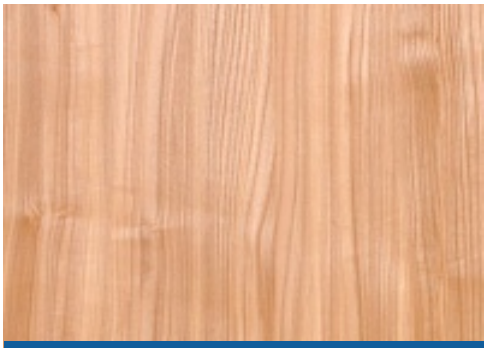
Emerald ash borer will significantly impact the staffing and budgetary needs of the City over the next number of years. The City will focus on the goals outlined in the previous section to prioritize spending, and will use infestation stage information to focus on the most timely priorities. These stages include pre-detection, early infestation, mortality phase, late infestation, and canopy reestablishment. To some degree, all tactics of the management plan will take place each year, but the proximity of new infestations and the severity of those infestations will determine annual priorities.

For example, detection activities and proactive removals may dominate spending pre-detection, while spending may shift more heavily to chemical treatments, reactive removals, and replanting as the infestation progresses. Because early detection is so difficult, and because other EAB-affected cities in the Midwest have emphasized the importance of early treatments, there is an inherent risk in not providing treatment in advance of the confirmed presence of EAB. However, as premature chemical treatments are an inefficient use of city resources and have a greater environmental impact, the city will closely monitor EAB advancement to determine the most ideal time to begin treatments.

The City will strive to continue to provide its valued core services while effectively managing all other elements accompanying an EAB outbreak, including hazard trees. Because of this added workload, residents can expect delays in service and responses.

Wood Handling & Utilization

Some of the excess wood material the City expects to result from the EAB infestation will be milled and utilized by partner organizations such as Singing Saw, TC Woods, and Baldwin Hardwoods as a way of reducing waste and supporting local businesses. Ash wood can be used for a variety of purposes, including furniture, cabinets and flooring.[6]



Ash wood grain looks similar to oak.

The Waste Diversion Center will continue to be a drop site for wood debris. Wood dropped off at this location will be ground to CDA standards should the ground material be taken out of the quarantined area. Some of the ground wood will be used as mulch for trees and landscape beds on public property, therefore keeping it within the quarantine area.

Residents may also utilize wood for other purposes within the quarantine area, chip it and leave it on-site, or take it to one of three landfill sites within the quarantine area. See eabcolorado.com for more information on the ash wood quarantine.

It is very possible that during the peak period of infestation, Waste Diversion Center will not be able to handle the volume of ash material. An alternate site may be needed to store and treat infested ash logs and

[6] BaldwinHardwoods.com (information and image source)

to salvage large logs from public tree removals for milling operations. In addition, the City will continue to evaluate options for wood utilization and seek out new partnerships to better utilize this renewable resource.

Urban Canopy Resiliency & Renewal

Reforestation is a critical component of the management plan, helping to restore many of the lost tree benefits caused by EAB-related deforestation. As such, the City will make every effort to replace removed trees on public property. The City also recognizes the need for canopy renewal as an opportunity to improve overall urban forest health, helping to avoid future insect and disease epidemics. High levels of international trade and travel have caused invasive pathogens and pests such as Chestnut Blight in the early 1990s, Dutch elm disease in the 1960s, and now EAB to decimate urban landscapes, costing billions of dollars in damage. Natural resources experts describe future occasions of this scenario as inevitable. Because non-native pests can have unpredictable results when they first encounter local host species, it can be difficult to predict which tree species might become the next victims.

Experience has shown us, though, that because pests are often species- or genus-specific, limiting how many trees we plant from any given species or genus can limit the spread and overall impact of future pests. According to the University of Melbourne, "Diversity in our urban tree population can increase their overall resilience to drought, heatwaves, storms and the rise of pests and diseases."[i7]

"Diversity in our urban tree population can increase their overall resilience to drought, heatwaves, storms and the rise of pests and diseases."

Several years prior to EAB's discovery in Boulder, the City ceased planting any ash species. Moving forward, the City will aim to plant less than 10% of trees from any one genus to limit the impact of future pests. To assist with tree selection, the City will use the most current diversity information and species palettes available to select replacement trees to replace removed or fallen ash, including The Colorado Ash Tree Replacement Selection Tool, which was designed to help foresters set diversity goals and select ideal shade tree replacement species for ash. The City will also use the Front Range Tree Recommendation List to further diversify the species planting palette.

Summary

EAB will have a significant impact on Longmont's landscape. It is important to have a plan in place or EAB will dictate the plan of thousands of dead ash trees in a short time frame. Because the impacts of EAB can be acutely high, a well-planned response can help by spreading out costs over time. Public education and outreach to Longmont residents will be a priority, as will a comprehensive, proactive approach to detecting this pest as early as possible and mitigating its impact once it arrives.

[7] Livesley, Stephen. *2ND INTERNATIONAL CONFERENCE ON URBAN TREE DIVERSITY*. Melbourne, 2016.

Additional Resources

City of Longmont

City of Longmont emerald ash borer information page

City of Longmont licensed tree contractors list

Social Media

City of Longmont Facebook page

City of Longmont Twitter page

EABColorado.com

This website, managed by the Colorado Department of Agriculture and the Colorado EAB Response Team, contains a wealth of resources for public- and private-sector individuals and groups affected by EAB. The resources listed below are available via this site, but are also listed here for your convenience.

Managing Emerald Ash Borer: Decision Guide

Colorado Department of Agriculture EAB newsletter sign-up page

Emerald Ash Borer FAQs document (Colorado Emerald Ash Borer Response Team)

Insecticide Options for Protecting Ash Trees from Emerald Ash Borer

Control Option for Emerald Ash Borer in Colorado

Emerald Ash Borer Cost Calculator 2.0

Results of the 2015 EAB Community Update Survey report

Other Resources

Boulder County EAB page

EAB University

Don't Move Firewood website (free "Burn it Where You Buy It" outreach materials)

Green ash (*Fraxinus pennsylvanica*)

FOR MORE INFORMATION, CONTACT

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