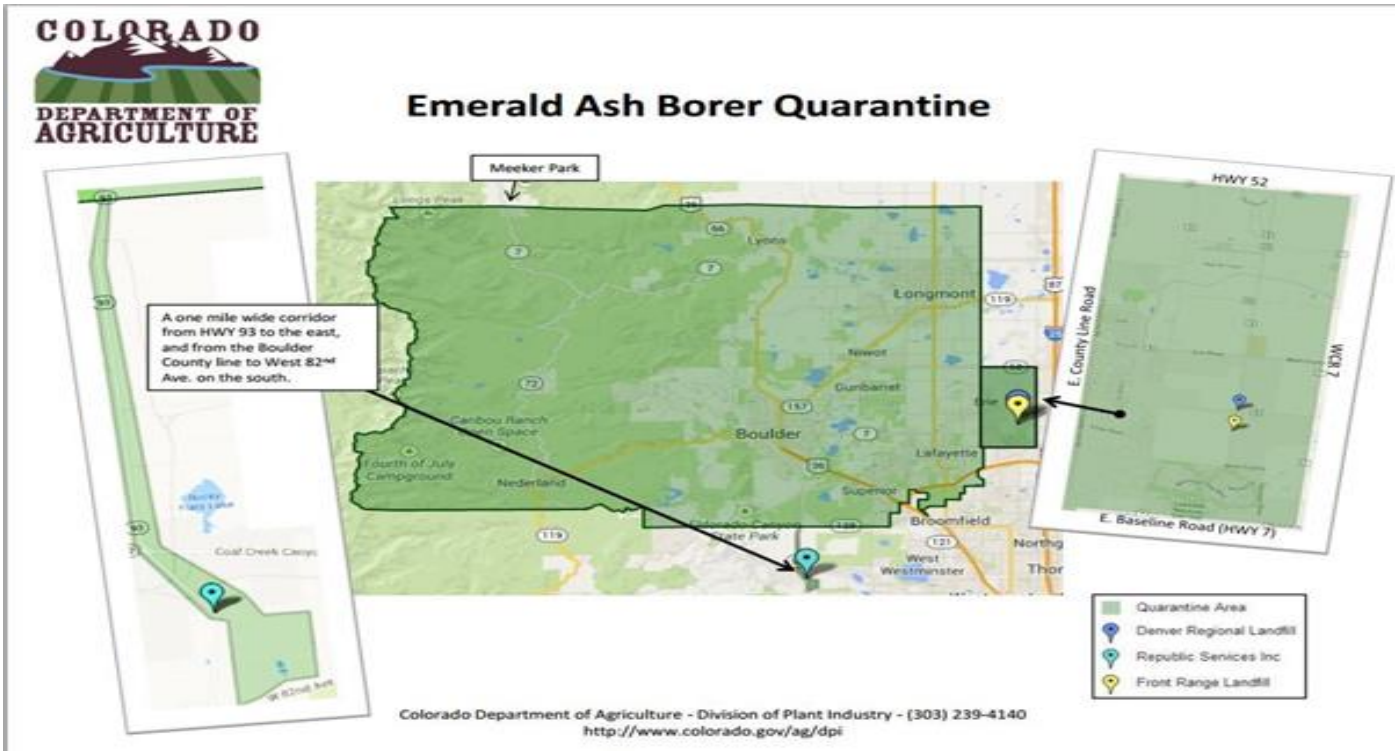
EAB Management Plan/City of Brighton

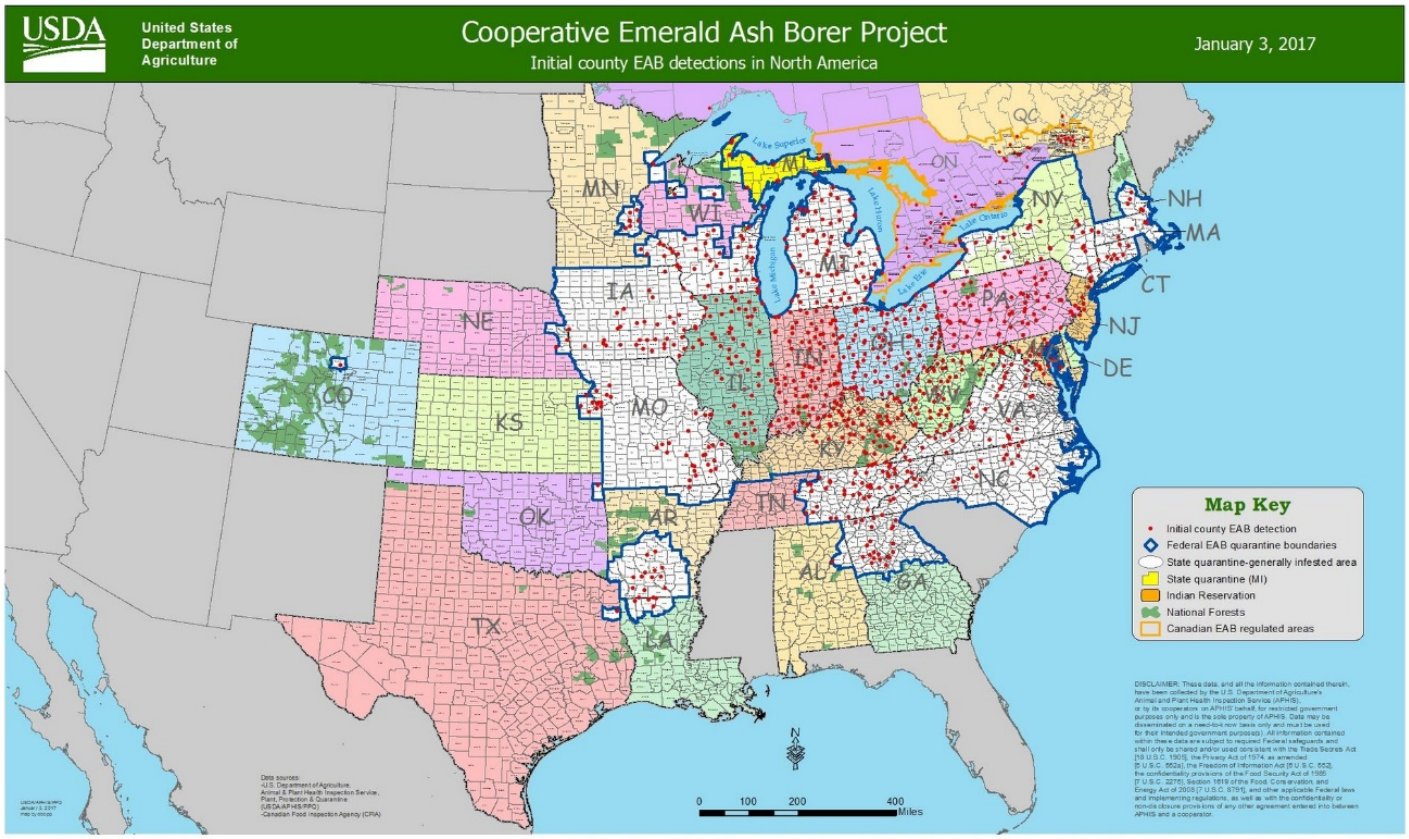
Background

The Emerald Ash Borer (EAB) is a non-native, wood-boring beetle that is responsible for the death or decline of tens of millions of ash trees in the United States and Canada. This insect was first discovered in Michigan in 2002, and since then it has spread to 26 states, including Colorado. EAB attacks all species of ash trees. EAB will not affect such species as mountain ash and wafer ash.

See appendix "A" Ash identification.

EAB was first confirmed in Colorado in September 2013 in the City of Boulder. On November 12, 2013, the Colorado Department of Agriculture, (CDA), established a quarantine zone around Boulder County in an effort to protect Colorado ash trees. At this time, EAB has not been detected in Colorado outside of Boulder County or out of the established quarantine area. EAB was recently confirmed in the City of Longmont on June 8, 2016 and marked the first time that its detection has been confirmed in Colorado outside of the City of Boulder. It was then detected in Gunbarrel July 6th 2016.





2019 UPDATE

August 20, 2019. EAB has been officially detected in the City and County of Broomfield. Broomfield is the first municipality in Colorado outside of Boulder County where EAB has been detected.

Although the detection occurred outside the existing quarantine, which is intended to prevent the human-assisted spread of EAB via ash nursery stock, firewood and other wood that may contain the pest, the quarantine boundaries will not change at this time. This is because no symptomatic trees were observed in connection with the specimen – a requirement for quarantine changes from the USDA Animal and Plant Health Inspection Service, which oversees federal EAB quarantines nationally.

Before this latest detection occurred, the Colorado Department of Agriculture and APHIS had been preparing to repeal the EAB quarantine this winter, with a formal process to begin later this month. This action is based on several factors:

• EAB adults move to new areas naturally, and their spread is imminent, as they do not rely on humans moving infested wood as a sole means for population expansion.

• Ending the quarantine will allow already-affected communities more options for utilizing and disposing of removed trees.

• Other means are now in place to help slow the spread of EAB in Colorado, including: thousands of ash trees are now chemically treated in affected communities, which will help blunt insect population growth; biocontrols that prey on EAB were released and are now established in Boulder, which likewise should help

check future EAB population growth; and long-term, interagency outreach efforts are ongoing, enabling more rapid new detections.

"The primary purpose of this quarantine has been to slow the spread of EAB in Colorado, and we believe this is one reason it's taken so long for the pest to be confirmed outside Boulder County," said Laura Pottorff, a CDA plant health and certification section chief and lead member of the Colorado EAB Response Team. "Based on recent data from the eastern U.S., our expectation is that EAB cannot be prevented from leaving the quarantine. We're just glad we've given Front Range communities more time to better plan and prepare for its arrival."

EAB has **NOT been detected within the City of Brighton to date.

The City of Brighton Parks Dept. has actively monitored the threat of EAB and has enacted several proactive measures over the last ten years to combat its spread. This includes:

- City of Brighton Parks staff has only planted about 10 ash trees in the last decade
- The City has highly discouraged and has been very successful in convincing developers to not plant ash species within city limits through the Community Development Department and the Design Review Committee process.
- Numerous articles, videos and press releases have been released to the public to educate people on the EAB threat through various media outlets.
- Staff has attended frequent EAB related classes and workshops to become better educated and prepared for an eminent EAB outbreak in Brighton.
- Parks staff has begun removing ash species in poor condition and have been replacing them with different species of trees when possible.

Purpose

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 (pipes, pumps, ditches, and detention ponds engineered by people to manage storm water).
- **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.

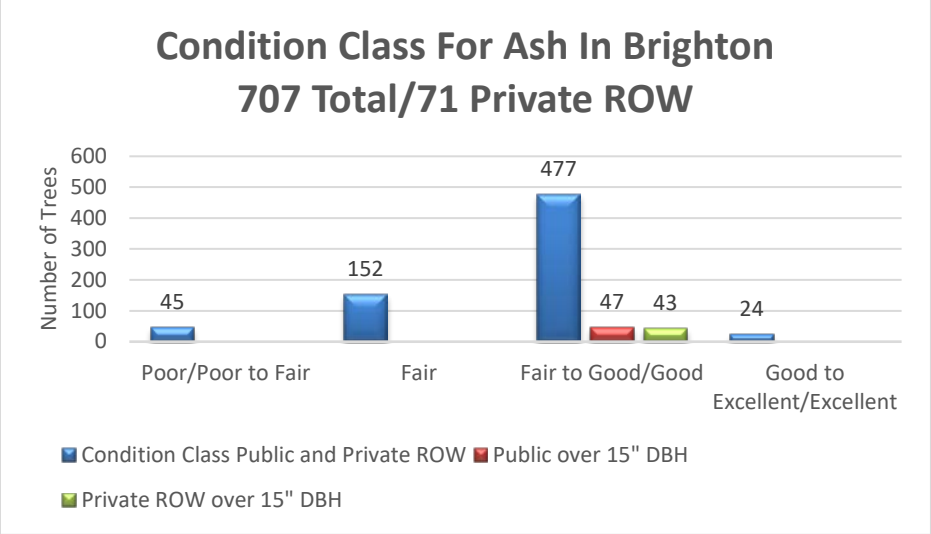
(Trees should absolutely should be incorporated into any municipal sustainable program for these reasons.)

Ash species play a crucial role in providing Brighton with these benefits as they consist of approximately 20% of our overall canopy. This management plan is created to minimize the EAB outbreak as much as possible while preserving as many ash trees as feasibly possible.

Ash Population/Inventory

To date parks staff has inventoried approximately 2,594 public trees within Brighton city limits. Amongst many different attributes, inventoried trees are given a condition class rating, “poor,” “poor to fair,” “fair,” “fair to good,” “good,” “good to excellent” and “excellent”. This condition rating will help staff in determining the management strategies of each tree. 707 of these trees (about 27%) are ash species. Forty five of these ash trees are classified as being in poor or poor to fair condition. The inventory of publically owned ash trees is 100% complete but the overall City tree inventory is not. Once the overall inventory is complete the percentage of ash to other species should go down to about 20% in Brighton. Of the almost 80 different species found in Brighton, 1 in 5 trees are ash!

The chart below shows the condition class for all of Brighton’s publically owned trees. Trees in good condition and over 15” in DBH could be worth saving and are decent candidates for treatment options. There are 47 such trees in Brighton with this designation. Trees with the label “Private ROW” are public owned trees on City right-of-way which are to be maintained and cared for by the adjacent property owner per Municipal Code 8-8-140. There are about 71 “Private ROW” ash trees in Brighton, 43 of those are in fair to good /good condition and are also candidates for treatment options.



A major concern facing Brighton is how to address ash trees located on private properties. Ash trees are abundant on private property and have been a popular choice of landscape architects and developers as Brighton has grown. It is difficult to assess but one can estimate that there are three to four times as many privately owned ash trees as public ash trees. As far as spreading a message of treatment for all private property owners, the decisions about removal versus treatment is an emotional and subjective decision that is addressed on a case-by case basis.

Management Plan

Brighton Parks Staff will attempt to be as proactive as possible when dealing with the EAB threat and follow existing BMP's, (Best Management Strategies.) The overall goal is to prolong the life of not only the healthiest, largest, most notable ash trees but trees that provide the greatest economic, social, and ecological benefits to the City's public owned properties.

This management plan is preliminary and is subject to change as the EAB situation evolves and as resources allow.

1. **Active Monitoring**
    a. Strategies employed to aid in early detection:
        i. **Visual survey** – Forestry personnel will continue to monitor for a variety of EAB symptoms including canopy thinning, leaf size shrinkage, wood pecker damage, and D-shaped exit holes.
        ii. **Plastic Traps and Chemical Lures** – Working in collaboration with the Colorado Department of Agriculture, pheromone traps have been placed in ash trees in Brighton annually for several years. It should be noted the funding to provide these traps has ceased at the Federal level and Brighton, therefore, will no longer be receiving traps from the CDA as it is not in the quarantine zone. Traps were not set in 2016 or 2017.
        iii. **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.
        iv. **Private Tree Monitoring** – Forestry personnel is currently responding to citizen reports of potential infestations of ash trees located on private and HOA-maintained properties.
2. **Pesticide Treatment**

    Due to several factors, chemical treatment of ash trees will not be conducted in Brighton until EAB is confirmed within five miles of the City. This decision is based on a Colorado Department of Agriculture and a Colorado State University recommendation. When EAB is indeed discovered within five miles of Brighton treatment of select trees will be dependent on the time of year and whether treatment will yield desirable results as well as financial resources available. Trees that meet treatment criteria will be completed on a three-year rotation to disperse costs.

    Criteria for treatment - ash trees that are greater than 15" D.B.H. and receive a rating of "fair to good" or better would be eligible for treatment options.

    The cost of treating smaller trees under 15" DBH over the course of their lifespan is far more expensive than removing them and replacing with a more suitable species.

    Treatment of smaller ash trees also creates other problems as well. For example, ash trees under 15" DBH require different treatment methods than larger trees. The most common method is using the chemical imidacloprid. There is a lot of research showing that imidacloprid could be a major factor in honeybee decline over the last 20 years and therefore, isn't necessarily an environmentally good decision to use this chemical in abundance.

	Active Ingredient (AI)	Product	Rate	Maximum per Acre		Max. per acre in DBH or # of 10" DBH trees	
			Product/ in. DBH	Ounces Product	Lbs AI	DBH	10" DBH
For Trees with DBH < 15"	**Imidacloprid**	Merit 2F	0.2 fl oz	25.6	0.4	128	13
	Imidacloprid (IN, OH, MI)	Merit 2F (24c)*	0.2 fl oz	51.2	0.8	256	25
	Dinotefuran	Safari 20G	0.42 oz	43.2	0.54	103	10
For Trees with DBH > 15"	**Imidacloprid**	Merit 2F	0.4 fl oz	25.6	0.4	64	6
	Imidacloprid (IN, OH, MI)	Merit 2F (24c)*	0.4 fl oz	51.2	0.8	128	13
	Emamectin Benzoate	TREE-äge™	1 to 8 ml	none	none	unlimited	unlimited

3. **<u>Proactive Ash Tree Removal</u>**
    a. Proactive ash removals are being performed to reduce the population of ash trees on pubic owned properties. Ash trees meeting one or more of the following criteria are considered for removal: small trees (under 3" in DBH); dead, unhealthy, and non-vigorous ash trees already in decline from other factors or showing signs of stress and receiving "Poor" or "Poor to Fair" condition rating; trees with utility or pavement conflicts; trees with limited space for growth and/or planted in poor sites; or naturalized ash trees in open spaces.
    b. Forestry personnel will remove any and all infested ash trees, regardless of size, located on City-maintained properties that are unsuitable for treatment to mitigate potential hazards and slow the spread of the pest.
    c. Trees on public right-of-way that are classified as being in "poor" or "poor to fair" condition will be enforced on to be removed as well. The property owners of said trees will have the option to participate in the Cost-Share program in which half the cost for removal will be paid for by the City.
4. **<u>Ash Tree Replacement with Non-Ash Species</u>**
    a. All ash trees that are proactively removed are in the process of being or have been replaced with a diverse palette of tree species that are conducive to individual planting sites, while also taking into consideration form, function, mature size, and design intent. Species diversity in Brighton's canopy is key moving forward, to avoid situation like this from occurring again. There is no ONE species that should replace ash.
    b. Long-term Plan for Tree Canopy Care Diversity plays an essential role in the long-term stability of an urban forest. An overabundance of any single tree species increases the susceptibility of the tree to diseases or pests. A general guideline for urban forest diversity promotes the 10-20-30 rule. This rule states:
        - No single tree species should make up more than 10% of the total tree population
        - No single genus should make up more than 20% of the total tree population
        - No single family should make up more than 30% of the total tree population
    c. There are almost 300 trees along the right-of-way adjacent to the Prairie Center that the City now owns. As all these trees are under 15" in DBH it is recommended that they eventually be removed and replaced with more suitable species. As there are so many ash in one area it is recommended that the trees be removed in phases over the course of five to seven years to minimize the impact of removing them all at once.

5. **Public Outreach**
    a. Forestry personnel have identified key areas to focus on improving and expanding Brighton's EAB Management Plan:
        i. Update community forestry webpage with EAB awareness emphasis
        ii. Provide and distribute EAB educational materials (hard copy and electronic) to help disseminate information to the public and amongst City departments
        iii. Create and periodically update a Frequently Asked Questions (FAQ) and answers document
        iv. Hold public workshops/open houses on EAB for residents, civic groups, HOAs, etc.
        v. Involve public media agencies (articles and advertisements)
            1. Newspaper
            2. Radio
            3. TV
            4. Bus Benches, Billboards, etc…
        vi. Direct citizens and interested parties to the Colorado EAB website: www.EABColorado.com
        vii. Develop a City of Brighton EAB website
        viii. Hold educational workshops to emphasize impact and how to inspect for the pest, and also what to do if a suspicious sample is found.

Budget

Parks staff will submit recommendations for new EAB financial assistance programs once EAB is either confirmed in Brighton or is found within a five mile radius of the City. All of the proposals will need to have monies allocated in the budgeting process and would require support and approval from City Council. A brief summary of the proposals that will be submitted:

- Look into restructuring the Cost/Share program to include one of these three options:

Option A: Help pay for the cost of treatment and/or removals of ash trees on private property

Option B: Help pay for the cost of treatment and/or removals of ash trees on private property including HOA maintained properties.

Option C: Help pay for the cost of treatment and/or removals of ash trees on public-right-of –way only

**Council may decide it is unreasonable and financially unsound to provide financial assistance to the privately owned trees. It should be noted most municipalities in the Front-Range have chosen this route. A strong dose of education and outreach is often a suitable tactic when it comes to dealing with privately owned trees.

Using an official EAB cost calculator staff has determined approximate costs of different management approaches for Brighton's ash trees over the course of 10 years. This estimate does not include the cost for privately owned trees.

Cost calculator summary

Timespan (years) 10

Total Trees Removed	707
Total Removal Cost	$276,700.00
Total Planting Cost	$82,250.00
Total Removal + Planting Cost	$358,950.00
Total Treatment Cost	$175,924.50

Tree Summary		
DBH	**Count**	**Cost ($)**
0-3"	78	994.50
3"-6"	220	8,415.00
6"-12"	212	16,218.00
12"-18"	84	10,710.00
18"-24"	59	10,531.50
24"-30"	35	8,032.50
>30"	11	3,740.00

Challenges and Future Needs

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

A major consideration and potential problem is determining what level of involvement and commitment that the City is willing to invest in dealing with this threat to the urban forest resources on **private property**. Once again, the largest impacts associated with EAB will be on private properties. An estimated 20-25% of all trees located wholly on private properties in Brighton are ash trees or one in five trees in the overall canopy are ash.

Private properties with an infected ash tree larger than 15 inches in diameter and in good health can hire a professional to treat it with insecticide or they can choose to remove the tree and dispose of it in the pre-determined ash tree drop-off site. If the tree is smaller than 15 inches in diameter, residents can choose to treat otherwise healthy trees themselves. If the tree is in poor health, it may need to be cut down and taken to the disposal site. Keep in mind that it could take up to three years for a tree infected with the insect to show signs of decline, so regular checks are recommended

EAB populations take some time to build up. But once they are established in high numbers, affected communities experience rapid ash tree death. Depending on the health of the tree and the degree of infestation, an untreated ash tree will die within two to five years of being infected with the EAB. Studies have shown that affected communities will generally have all of their untreated ash trees die within ten years of the first signs of infestation -- slowly at first but with a dramatic increase in annual tree loss after year five. This is known as the Ash Tree Death Curve. Dead ash trees become brittle as a result of EAB infestations and will quickly become hazards.

The enforcement of the municipal code will be necessary to mitigate hazards posed by the EAB and to control and slow the spread of the insect once it becomes established in Brighton. Existing municipal code will greatly aid the City in facilitating the enforcement of trees infested with EAB. Enforcement will be extremely time-consuming due to the sheer number of ash trees in the community and this demand will exponentially rise as the Ash Tree Death Curve ramps up in the future. The City may want to look into establishing a marshalling yard for ash debris in the future as the infestation spreads.

The City of Brighton currently has a tree limb drop-off site located at the City's Wastewater Facility. The site is open to the public on an appointment basis. The material is processed twice a year into wood mulch and is utilized by residents, Brighton Park Staff, and sometimes contractors. The cost for tub grinding is about $4500 each time the pile is ground.

After EAB is detected in Brighton, 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 that will exponentially increase the death rate of the Ash, resulting in changes in the services provided through the tree limb disposal site.

These changes may include but are not limited to:

- Increased amount budgeted for contracted grinding services from an estimated 40% to 50 % 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.

- An expansion in the hours of operation due to the increased demand for limb drop off services
- An increase in staff hours to maintain and clean the drop-off site and to check for Brighton residency due expanded hours
- Explore wood dispersal and utilization options of ash wood

JURISDICTION

The City of Brighton has existing municipal code that addresses many issues that an EAB attack poses.

Code states that any dead tree on public or private property shall be removed. (Sec. 8-8-160)

Code states that the City is authorized to enter any property and inspect all living as well as dead trees for diseases or insect infestations and can enforce on removing or treating them if deemed necessary in order to control and/or eliminate such disease or infestation. (Sec. 8-8-170)

When EAB reaches Brighton City limits there will be an increased demand for tree care and tree companies to perform treatments and/or removals. Per Municipal Code 5-68-10 – 5-68-40, tree companies must submit an application to the City to perform tree related work. They must be licensed, insured and pass a competency test in order to get their application approved. This is very important as when EAB is at its peak in Brighton, many people will be in need of good, credible tree care.

Appendices

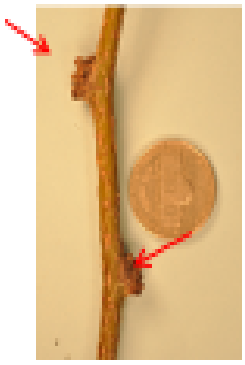
Appendix “A”

Identify Ash from other Common Shade trees by Leaf Arrangement and Type

1) Bud\Leaf Arrangement

A. Alternate\Whirled-

Not an Ash- Oaks, Lindens, Hackberries, Elms, Poplars, Cottonwoods, Legumes, Catalpas, Apples, Pears and Stone Fruits, Walnuts, Mt. Ashes (not true Ashes)

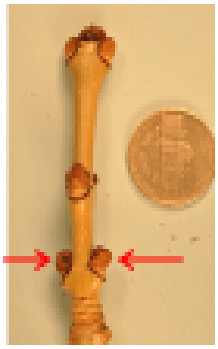


Alternate leaf arrangement

B. Opposite

Could be an ash go to column 2-

Ashes, Maples, and Buckeyes\ Horsechestnuts



Opposite leaf arrangement

2) Leaf Type

A. No leaves present

Go to Page 2

B. Simple leaf

Not an Ash-Most Maples

Simple leaf- one leaf per bud

C. Compound leaf

Could be an Ash go to column 3-

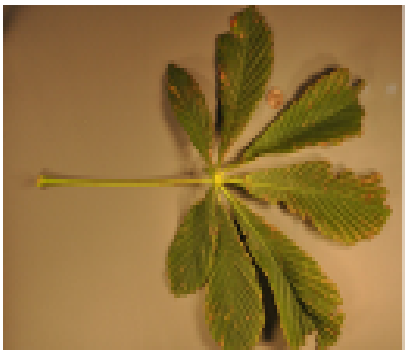
Ashes, Buckeyes\Horsechestnuts and Boxelder

Compound leaf- multiple leaflets per bud

3) Type of Compound Leaf

A. Palmately Compound Leaf

Not an Ash- Buckeyes\ Horsechestnuts



Palmately Compound Leaf- Leaflets arranged like fingers on a hand

A. Pinnately Compound Leaf

Ash- Green and White Ash and their clones are most common- all of which are susceptible to Emerald Ash Borer.

Pinnately Compound Leaf- Leaflets arranged like a feather

EAB Signs and Symptoms

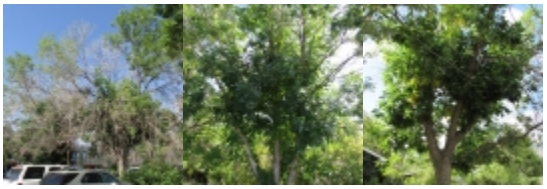
- Sparse leaves or branches in upper part of the tree. (Click a thumbnail to see a larger image - Photos by Kathleen Alexander)

- Vertical splits in the bark. (Click a thumbnail to see a larger image - Photos by Kathleen Alexander)

- Winding S-shaped tunnels under the bark, often visible within vertical bark splits. (Click a thumbnail to see a larger image - Photos by Kathleen Alexander)

- D-shaped exit holes about 1/8 inch wide. (Click a thumbnail to see a larger image - Photo on left by Laura Potorff and the Photo in the middle and on the right are by John Kaltenbach)

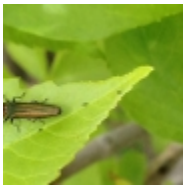
- New sprouts on the lower trunk or lower branches. (Click a thumbnail to see a larger image - Photos by Kathleen Alexander)



- Increased woodpecker activity. (Click a thumbnail to see a larger image - Photos by Kathleen Alexander)

- Leaf feeding damage (Click a thumbnail to see a larger image - Photo by Laura Pottorff)

- Adult EAB on leaf (Click a thumbnail to see a larger image - Photo by Laura Pottorff)



EAB videos

https://www.youtube.com/watch?v=PMfORKbEivc