

2022 Emerald Ash Borer Management Plan



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Executive Summary

Although emerald ash borer (EAB) has not been discovered in Vancouver as of 2022, a management plan is important because all ash trees are susceptible to EAB. This EAB Management Plan is designed to be dynamic, as detections and infestations of EAB are rapidly changing. Some components may only be applicable to specific phases of an infestation; pre-detection, initial confirmation of infestation, and active spread and mortality. Experts agree that EAB will eventually make it to Vancouver, so it is critical to have a planned response.

The **goals** of the EAB Management Plan are to:

- Minimize the impact of EAB on the health of Vancouver's urban forest
- Utilize the best management practices available
- Pursue efforts that are as cost effective as possible

This plan summarizes Vancouver's response to EAB and the management strategies that will be used to mitigate the anticipated loss of canopy and associated benefits and maximize the available resources. Vancouver's plan includes the following:

- Monitor ash trees for symptoms of EAB
- Slow the movement of EAB
- Chemically treat suitable trees
- Remove ash trees that are not suitable for treatment
- Replant with quality trees
- Communication to stakeholders

Introduction

The City of Vancouver is committed to the continued protection and enhancement of the urban forest as part of our region's valuable natural resources. Vancouver is proud to have been recognized as a Tree City USA since 1989. Vancouver has a long history with trees and considers trees community assets that provide multiple public benefits, including clean water.

[Emerald ash borer](#) (EAB) (*Agrilus plannipennis*) has devastated many communities since its first detection in Detroit, MI in 2002. EAB is a wood boring beetle that affects all species of ash (*Fraxinus spp.*) and was introduced to the United States and Canada from Asia through wooden shipping materials originating from China. Since its introduction, it has killed over 20 million trees in Michigan, Ohio, Indiana, Maryland, Canada and has moved west and resulted in billions of dollars in lost benefits from trees.

In June 2022, EAB was found in Forest Grove, Oregon for the first time and has not been identified in Washington at this time. Forest Grove, OR is approximately 35 miles from Vancouver, WA. EAB is difficult to detect, especially in newly infested trees. In both Michigan and Illinois the observation of tree death didn't occurred until two or more years after initial infestation. This delay between infestation and detection is what makes eradication so difficult. EAB, on its own, spreads at a rate of $\frac{1}{2}$ - 2 miles per year. With the imminent migration of EAB to the City of Vancouver and surrounding communities, it is essential that a proactive plan of action be put in place ahead of its arrival. As the borer has proven to be fatal to an entire genus (*Fraxinus spp*) of ash trees, an unavoidable and significant obligation will be incurred by the city, our community and property owners.

An EAB Management Plan can help managers decide on goals for treatment, removal and replacement of ash trees, as well as identify the necessary resources required to implement an affective EAB management strategy. The success of developing and implementing an EAB Management Plan will require interdepartmental collaboration and support in order to reduce risk, minimize impacts and respond effectively. It may call for delegates from the city to participate with municipal, county and state agencies to exchange strategies and remain attuned to infestation updates. Continual education and disclosure to the public will be essential to advance the plan. A holistic approach will best aid successes with 'lessons learned' to be applied to Vancouver's response throughout the process.

The value of shade trees to Vancouver residents (appraised value and benefits value) greatly exceeds their costs. Trees provide shade and lower summer temperatures. Leaves transpire water which provides additional cooling. Trees intercept storm water, prevent erosion, sequester carbon, remove air pollutants,

and release oxygen. These are qualities that can be quantified. Trees can also have a positive psychological and sentimental value that is more difficult to quantify.

EAB Biology and Morphology

All species of ash are susceptible to EAB. The metallic green wood boring beetle (flat-headed borer) damages trees by tunneling under the bark, which results in girdling that interferes with movement of water and nutrients. Eventually, the lack of water and nutrients results in the decline and death of the tree.

Adults lay eggs between layers of bark and in bark crevices from June-August. Larvae hatch and bore into the tree where they feed on the inner bark and phloem, creating “S” shaped galleries. Adults emerge through “D” shaped exit holes in May and early June. Adults are active during the day particularly on warm sunny days on trunks and in the canopy. Adults feed on ash foliage, usually in small patches along the margins of the leaves. Adults live for approx. 3 weeks and are present into mid-August.

When EAB is first introduced and population numbers are low, detection is very difficult. Often, EAB can go for several years before being detected because the visual symptoms of an infestation present themselves after the population of EAB in the tree builds up. Visual signs and symptoms of the infestation include thinning of leaf canopy, epicormic shoots at the base of the tree or on branches, bark splits with ‘S’ shaped galleries, woodpecker damage, and ‘D’ shaped exit holes.

Stressed trees, or trees in poor health are especially vulnerable to EAB. Yet, even vigorous and healthy ash trees are still susceptible and can easily be overwhelmed by EAB and rapidly decline and die.

Detection & Monitoring of EAB

In communities, like Vancouver, where EAB has not been confirmed yet, monitoring the ash tree population for symptoms of EAB may be helpful for detecting the pest. Vancouver will continue to monitor for EAB within the community until it is apparent that it is likely present throughout.

Detection Efforts

- Washington Department of Agriculture has set up EAB traps and dispersed the traps throughout the community to monitor the presence of EAB.
- There are numerous stressors that impact ash trees in Vancouver and result in similar symptoms to those that are exhibited as a result of EAB. To reduce the likelihood of false identification, Vancouver will provide education to staff on the signs of symptoms of EAB in ash trees, to effectively evaluate suspect trees.
- Communication to arborist, landscapers, and others to make them aware of the presence of EAB and information on what to look for.

Inventory

- Update the tree inventory to reflect locations of ash trees and those removed for replanting with quality trees.
- Work with Greenway managers regarding extent of native Oregon Ash populations.
- Evaluate health and condition of existing ash trees on city property and develop a systematic removal/replacement program focusing on those trees already in poor condition and preventative treatment where feasible of high value ash.

Monitoring

- Contact golf course managers, Clark Public Utilities, arborists and landscapers regarding EAB and monitoring ash trees.
- Inform community to report suspected EAB sightings to [Washington Invasive Species Council \(invasivespecies.wa.gov\)](http://WashingtonInvasiveSpeciesCouncil.org) or report to APHIS call 1-866-322-4512
- Urban Forestry staff will monitor ash trees in day-to-day work and will work with property owners on declining ash tree permits.

Slow Movement of EAB

The most likely method for introduction of EAB is through the movement of people, infested logs, firewood or nursery stock. This plan strives to slow the spread of EAB.

1. Proper disposal of infested ash trees

- Identify marshal yard for proper disposal of infested ash trees if necessary.

Removals associated with EAB are expected to generate a significant amount of wood debris. There are also costs that result from the release of carbon that is currently stored in the wood of these trees that might be burned. In anticipation of tree removals as a result of EAB, Vancouver could establish a wood processing area or marshalling yard to separate ash material from other wood waste. Once tree debris enters this facility, it will remain onsite until it is transported to a wood recycling station or repurposed. To reduce carbon emissions and limit the volume of material entering recycling stations and associated dump fees, Vancouver, will explore developing a wood utilization program. If a marshal yard is utilized, this site could also be used for disposal of other diseased or infested trees. Possible sites would be Westside Wastewater Treatment Plant (westside) and English Pit (eastside).

- Minimize movement of ash tree parts. Encourage chipping (to 1”) all tree parts and leaving chips onsite. Debark logs where feasible, leave logs onsite as large woody debris or take to H&H Wood Recyclers, West Van Transfer Station, McFarlane’s Bark, City Bark or Triangle Resources for proper disposal daily.

2. Control of firewood and movement of ash tree parts

- Identify all firewood vendors in Vancouver and develop education and information program for them on EAB.
- Identify firewood users (such as campers). [Don't move firewood](#), which spreads EAB. Purchase firewood locally.
- Limit movement of any ash tree part within the city limits except proper disposal.
- Identify those in the Vancouver area who operate sawmills and develop education and information program for them on EAB.
- Communication to arborist, landscapers and others not to move ash tree parts.

3. Control of nursery stock

- Identify all nurseries in Vancouver area and determine extent of ash tree inventory.
- Refrain from planting *Fraxinus* species.
- Remove *Fraxinus* species from approved tree selection lists.

4. Awareness Campaign

- Vancouver will conduct EAB awareness outreach and workshops for residents.

- Update website to educate residents about the city's EAB strategy and to provide information for the community to make informed decisions about treating trees on private property.
- Educational resources for Washington State University Vancouver, Clark College and High School Hort Programs: the city will work to promote EAB awareness.
- Share press release and newsletter articles to be published internal and partner newsletters
- Implement social media campaign to raise awareness of EAB in the community through social media channels
- Implement other creative outreach strategies as identified

EAB and Urban Forest Management

Public Trees

Having an inventory of all public trees is important for effective management and maintenance, but it is especially important when managing invasive pest such as EAB. Vancouver's tree inventory identified fewer than 500 individual ash trees on public property which is 3%. However, the tree inventory is only a partial inventory and does not include all street trees, natural areas nor ash trees on private property. The data collected for each tree within the inventory includes: Species, Diameter at breast height (DBH) and Condition.

Preventative Treatment Strategies

Chemical treatments can control EAB in trees if infestations are detected early. Treatments are most effective in healthy trees and is the only management strategy that can protect mature ash trees. Considering the available options, Vancouver intends to use systemic trunk injections on high value ash trees that are considered suitable (> 20" DBH) for chemical treatment on a 3-year cycle. Applications should occur in spring prior to bud break.

- List of Public Trees to treat include but not limited to: Heritage Trees, Witness Trees, City Hall, and Columbia Renaissance Trail.

Public Tree Removal

Remove ash trees in poor condition to reduce risk of infestation. Mark declining ash trees and schedule removals between Oct 1st and March 31st when adult EAB is not flying. Strive to remove ash trees that are less than 10 inches to replace with another quality shade tree. This allows the costs of ash tree removal to be spread over more years and removal of possible EAB habitat.

- Remove and properly dispose of ash trees on city property
- < 12 inches- chip entire tree leave chips onsite
- > 12 inches-chip branches leave chips onsite, leave log onsite (solarize for at least one year) or properly dispose of logs.
- In natural areas, leave dead trees for habitat value when they do not pose undue risk or hazard.

Utilization of Trap Trees

For trees identified to be removed, explore feasibility to utilize these trees as trap trees prior to removal. Trap trees are trees that will be ultimately removed but prior to removal they are girdled by removing approx. 2 feet of bark around the tree at approx 4.5 feet from the ground. When a tree is girdled, the bark is peeled off all the way around the tree, stressing the tree. A stressed ash tree releases compounds into the air that attracts EAB in the surrounding area. Girdled trees are removed the following fall or early winter and disposed of properly.

What/when should trap trees be considered?

- Any species of ash (*Fraxinus* spp.) can be used (not mountain ash).
- Trees that have at least one side open to *sunlight* such as those at the edge of road, field or stream, or are above the canopy, are much more attractive to EAB and make better trap trees.
- Tree should be *healthy* prior to girdling.
- Tree stem should be 4 to 10 inches diameter at about 4.5 feet from ground level. Larger trees can be used but are harder to process.
- Trees should be girdled between mid-May and early-June.

Cultural Control Strategies

Although chemical control is the only effective means of protecting trees from EAB, the use of biological controls (parasitic wasps) may help reduce the population of EAB.

Private Trees

Vancouver strongly recommends that private owners remove ash trees in poor condition on their property. Vancouver will not require any private property owner to remove their ash trees unless it becomes a public safety issue.

Preventative Treatment

Treat viable healthy well-structured ash trees. Trees with trunks greater than 20" diameter at breast height should be treated by a professional

applicator. Healthy trees can be preventively treated with pesticides and protected from EAB when known EAB infestations are within 10-15 miles. Chemical treatments that begin too early waste money and increase the risk of affecting non-target organisms. Delay treatment until positive identification of EAB in the community, then treat on a 3-year cycle.

Private Tree Removal

Remove and properly dispose of EAB infested trees on private property. Remove high-risk ash (i.e., trees in poor condition, trees in the wrong place, etc.) from October 1st-March 1st. Chips should be left onsite, debark logs were feasible, or leave logs left onsite to solarize for at least one year or properly dispose of logs. The movement of ash wood and debris between April 1st and September 30th is highly discouraged due to EAB adult emergence and flight.

Replanting Strategy

Replanting with other large quality shade trees is vital to public health. Vancouver has a diverse tree lists to reduce reliance on ash. Reduce vulnerabilities to EAB by planting non-ash species and develop programs to encourage replanting with large shade trees.

- Replant removals with alternative trees through a “right tree, right place” approach.
- Promote shadow plantings near ash trees in anticipation for their removal. In areas where ash trees are currently growing, in anticipation of eventual removal due to EAB or other stressor, utilize shadow planting, the planting of trees other than ash species under or near existing ash trees will be used to avoid disrupting the benefits stream.
- Work with nurseries to promote alternative species through the [City’s TreeFund Program](#).
- Continue to work with [Friends of Trees](#) to target impacted neighborhoods.
- Select large shade trees, native conifers and climate adapted trees as part of the annual [Tree Giveaway Program](#).
- In natural area settings utilize red alder, black cottonwood, bigleaf maple, garry oak, and willow to replace native ash.

Other Management Strategies

When it comes to managing EAB, urban forest management becomes increasingly important as the loss of ash trees will have significant ecological and economic impacts. Community aesthetics and overall benefits of trees will be affected. The following summarizes Vancouver's response to manage the greater urban forest:

- Provide education to staff about proper identification of EAB and other pests/pathogens.
- Expand public outreach on EAB and other stressors on the urban forest.
- Distribute materials to property owners about EAB management options.
- Provide EAB information through the website.
- Explore the establishment of a fund to assist in management of private ash trees.

Management Costs

EAB is costly. Not only are there costs associated with the treatment and removal of ash trees, but also with replacing trees, wood processing/utilization, deferred maintenance, and loss in benefits provided by ash trees to the community. Once a tree is treated for EAB, to continue to protect that tree against EAB, it must be treated as long as emerald ash borer is present in the community.

Treatment Costs

Current chemical application costs are between \$7.00 to \$10.00 per inch for in-house applications or \$10-20.00 per inch if hiring a contractor. A 10-inch diameter tree could cost \$100 for one treatment, on a 3-year cycle or a 20-inch tree could cost \$400 on a 3-year cycle if applied by a contractor.

Removal and Replanting Costs

Removing ash trees that are in poor condition can help reduce the spread of EAB as these trees attract EAB adults. Not all trees are worth treating chemically to prevent EAB. It is important to understand that ash trees that are heavily infested with EAB need to be removed promptly, as research suggests that dead or dying ash trees become brittle and if left standing are a concern for public safety.

Ash trees provide numerous environmental benefits to Vancouver. The loss of these trees will result in a loss of these benefits provided to the community. Replacing trees that have been removed and incorporating new trees is critical

for mitigating the loss of these benefits. New trees can cost between \$300 to \$400 (includes tree and installation), but there are also costs associated with the long-term management of these trees, as well (irrigation, structural pruning, routine maintenance, removal).

Table 2: Estimated Removal and Replanting Costs

	Number of Trees	\$ to Remove	\$ to Plant	Total \$
Remove	400	800,000*		800,000
Replanting	500		175,000**	175,000
Total	900	800,000	175,000	975,000

* Estimated removal costs average 20" DBH

**Estimated replanting costs.

Communication Strategy

New invasive pest and disease outbreaks can be challenging and difficult to manage due to lack of information and awareness of the issue. Being adaptable and having a clear communication strategy is key to mitigating the impacts of these disasters and keeping the community informed on actions they can take.

Main Messages:

- EAB is an invasive pest that threatens to devastate all of Vancouver's ash

trees.

- Learn about the [signs and symptoms of EAB infestations](https://www.emeraldashborer.info) [www.emeraldashborer.info](https://www.cityofvancouver.us/urbanforestry) or www.cityofvancouver.us/urbanforestry
- Your support is imperative if we are to slow the spread of this invasive pest in Vancouver and the rest of Washington State.
- Your support with monitoring, mitigation (treat or remove) and not moving ash wood, is needed to prevent its spread.

Key Messages to Share with Media and Community

- EAB is not a threat to human or pet health, nor does it damage wooden homes or structures, but it does threaten our riparian forests and urban tree populations.
- EAB is 100 percent fatal to our ash trees of any size, age, healthy or unhealthy.
- The larva (the immature stage of EAB) spends its life inside ash trees, feeding on the inner bark where we cannot see it. It can take several years before an ash tree is discovered to be infested with EAB.
- On its own, the beetle will only fly a few miles. However, it is easily and quickly transported to new areas when people inadvertently move EAB larvae inside infested firewood, ash nursery stock, and other ash items.
- Everyone can take steps to slow the spread of emerald ash borer (EAB) and other pests and diseases in Vancouver and other forested and urban areas. When camping, leave firewood at home so you don't spread pests. Use only local sources of firewood.
- EAB is not a "business as usual" tree pest. It kills quickly and thoroughly. If left unchecked, EAB will destroy Vancouver's ash trees and the many benefits they provide, including shade, wildlife habitat, and contributing to air and water quality.
- Insecticides
 - Start considering treatment. Use of insecticides is not recommended until an EAB infestation has been found within 15 miles of your location. Otherwise their use is a waste of money and an unnecessary chemical load on the environment. The only approved chemicals for EAB treatment are applied to the soil or injected directly into the tree. Please advise ash tree owners that foliage applied chemicals will not work.
 - Before applying insecticides, think about the long-term. Once EAB arrives, insecticides are the only thing keeping ash trees alive, so insecticide use could become a 20 to 30-year commitment. Typically, treatments are on a 3-year cycle.
 - Insecticide use should be reserved only for high value ash trees that provide increased benefits (shade, energy savings, or aesthetics) or to keep ash alive until replacement trees are large enough to

- provide shade or future advancements find a better solution.
- Long-term, personal management
 - Plan now for how you are going to manage your ash trees in the future.
 - EAB arrival is inevitable. Plan now how to spread out over several years the costs of managing desirable ash trees, removal of poor trees, and introducing other species as replacements.
 - Think about the long-term value of each tree. If an ash is in poor health or form, it could be removed now and replaced with a different, high quality species. Ash in good or fair health can be monitored and treated while retaining benefits provided by the tree.
 - When selecting trees to plant, select a diversity of tree species. Avoid having too many trees of one kind that might be threatened by new invasive pests or climate change.

Conclusions

EAB will have a significant impact on Vancouver. Vancouver has approx. 3% ash trees that will be impacted by EAB, either requiring long-term treatment for EAB or removal. Having a plan for management of EAB before the pest arrives allows for preservation of significant ash trees and temporary treatment of ash trees to slow the spread of EAB and spread costs of removals over a longer period. EAB can go for several years without detection, which requires an integrated approach to management, combining removals, with treatment, and replanting.

While EAB is a highly destructive and costly pest, an EAB Management Plan provides an opportunity to plan for the resources needed to preserve as many large, high value ash trees as possible, while also balancing the anticipated impacts of the loss in benefits from ash trees that will be removed. With this EAB Management Plan, Vancouver is in a position to better prepare for EAB, but also anticipate future significant pests.

In addition to identifying Vancouver's strategy for managing EAB in public trees, this EAB Management Plan is critical for communicating this response strategy to the community and serves as a tool to educate private property owners about the pest and the management options available for private ash trees.