



Management Plan and Recommendations For Emerald Ash Borer and the Threat to Essex Junction's Trees

January 8, 2019



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Introduction

Emerald Ash Borer (EAB) was confirmed in Vermont for the first time in late February 2018 in Orange County and now can be found in all 6 New England states. While its arrival here has been anticipated for many years, the hope was that we would have more time before having to implement a strategy in Essex Junction for the long-term management of this devastating exotic insect pest.

This Management Plan was developed with the assistance of the Essex Junction Tree Advisory Committee, Essex Junction Public Works, and the Essex Junction Tree Warden. It is designed to address public safety concerns and minimize the impact to the Village budget by providing a plan to pre-emptively remove ash along the Village right-of-way over the next several years. Goals of the plan include:

- increase species diversity,
- reduce future dead and diseased public trees, and
- address future health and safety impacts to our public trees.

Emerald Ash Borer (EAB) Overview

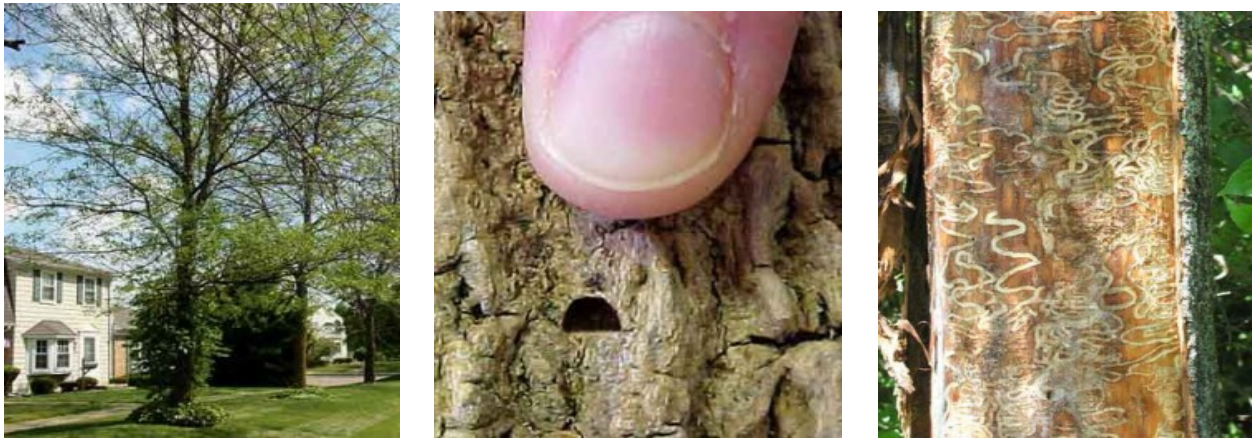
Emerald ash borer, *Agrilus planipennis*, first appeared in the United States in 2002 near Detroit, Michigan. It is believed to have been brought into the country in wooden packing crates from Asia. The adult emerald ash borer is a small metallic green beetle about a half inch long that is known to attack all native species of ash in North America. The adults feed on the leaves of ash before depositing eggs on the bark of the tree. Upon hatching, the larvae burrow through the bark and into the inner bark layer, or cambium, of the tree. There they feed on the phloem and outer xylem forming s-shaped galleries, essentially disrupting the vascular system of the tree causing canopy dieback, rapid decline, and eventual death of the tree. The rapid rate of reproduction of the beetle can lead to very high population levels in a few years following the initial infestation and trees can be killed within two years, if heavily infested. Despite extensive efforts to contain and eradicate EAB in Michigan when it first was detected, the insect has prevailed and has devastated ash populations across the mid-west and northeast killing millions of trees and costing millions of dollars. As of fall 2018 EAB is confirmed in 35 states and 5 Canadian provinces.

EAB Signs and Symptoms

Early detection of EAB in newly infested trees is difficult, particularly for the general public, because visible external symptoms are minimal in the early stage of infestation until populations build in an area. It can take several years to detect an EAB infestation after it arrives and may

only be noticeable once the first trees begin to die. The first symptoms of EAB are cracks in the bark where the larvae have been feeding within the tree. As populations build, woodpeckers can be seen attacking infested trees in search of the larvae. Woodpecker foraging signs are highly visible and a frequent identifying feature, though usually occur only once EAB is well-established. The general health of infested trees decline rapidly, exhibiting obvious signs of canopy thinning and dieback and epicormic sprouts (water sprouts) (Fig. 1). Most ash trees infested with EAB will die within five years.

The D-shaped emergence holes made by adults are small and hard to detect when infestations are light but are a reliable sign of attack as populations build. For more information on the life cycle of EAB, its identification, and the signs and symptoms of infestation go to VTinvasives.org/eab.



Signs of EAB in ash trees, from left: tree with thinning canopy and epicormic growth at the base, D-shaped exit hole, larval tunnels under bark.

For information on how to identify ash trees go to: vtinvasives.org/land/emerald-ash-borer-vermont/identify-ash-trees.

The Village Ash Trees

The confirmation of EAB in Vermont has significant implications for Essex Junction both financially and aesthetically. Essex Junction has 166 ash trees along its public streets, which currently accounts for about 16.5 percent of its total 975 plus inventoried trees. This information was taken from the Village's public tree inventory which was completed in 2014 by the Vermont Urban and Community Forestry Program with assistance from the University of Vermont Land Stewardship Program. The Essex Junction Tree Advisory Committee now updates and manages the inventory as needed.

Management options include: closely monitoring Village ash trees for signs or symptom of EAB, proactively removing a certain percentage of ash in the current inventory, starting with those that are in the poorest health and planting new trees in their place. Chemical treatment is also an option (see .9 Preventative Treatment, for the Village response). 98% of the ash trees are located in the Southwest quadrant of the Village; they are located in the public right-of-way on the following streets and parks:

<u>Street</u>	<u>Ash Tree Count</u>
Wilkinson Dr.	51
Tyler Dr.	33
Pearl St Median between West St. Ext and Susie Wilson Rd.	27
Lavoie Dr.	26
Hayden St.	14
Main St.	6
Upper Pearl St.	4
Maple St. Park	3
Park St.	2

The average size/diameter of these trees is between 8 and 10 inches, measured 4.5 feet above ground. Fortunately, the Village does not have a high population of large diameter ash trees which will make the removal costs less expensive.

Cascade Park has several ash trees growing in a wooded area south of the baseball field and tennis courts. These trees will be monitored after EAB arrives and any that pose a public safety concern will be removed.

Tree Removal Options

There are two removal management options to respond to EAB:

The first is to remove trees as they die: The Village could wait until EAB arrives and then begin removing ash trees after they begin to die. This reactive strategy puts the Village at a high liability risk for public safety concerns as the majority of our 166 ash trees may all need to be removed within 2 or 3 years or less. The removal costs will be higher because dead and dying ash trees can be hazardous to work on and there will likely be a higher demand on tree companies to remove other ash trees in Chittenden County and the surrounding area. Ash trees lose structural stability rapidly after death by EAB. The wood dries and the brittle tree falls apart. Dead and heavily infected trees will need to be removed promptly. Tree removal costs vary depending on

percent of decline, tree size, site limitations (utilities, other targets, and access), travel time, and wood loading and hauling. Due to the risk involved with removing trees in this condition, the Village would need to contract with qualified commercial tree care companies.

The second is pre-emptive tree removal: The proactive removal strategy would involve removing all of the ash trees in the right-of-way prior to the arrival of an EAB infestation in Essex Junction. This strategy allows greater budget flexibility to manage EAB. It also allows the Village to remove live trees, which will be less expensive and safer to work on. The pre-emptive removal of ash trees would also allow replacement plantings to occur over time, both increasing size class diversity in Essex Junction's urban forest and lessening the aesthetic and environmental impacts of losing all of the ash trees in a short period of time. There are two possible options for removing live trees. The Village could either contract with a qualified tree care company or work with the Public Works Department crew to remove the trees. The Village Public Works Department has indicated a willingness to participate in ash tree removal.

Removal Cost Estimates & Recommendations

Contract Tree Removal: Some cost estimates are presented based on average tree size and removal time. The actual cost per tree will vary greatly, but figures presented below allow for budgetary planning. Removal prices were received from 3 local tree care companies and averaged for the estimate. The average contract cost estimate to remove the 166 Village ash tree is \$151.00/tree totaling \$25,066 for all trees.

PW Crew Tree Removal: The Village PW crew would remove the trees during their regular working hours. With this option there would be no direct labor costs to the Village. They will need to rent a brush chipper which would cost \$1,100 per week. They have all the other equipment needed for the task.

The Essex Junction Tree Advisory Committee (EJTAC) recommends working with the Village Public Works crew to remove the trees. The goal would be to remove 15 trees each year for the next 11 years. Tree removal would start in the Hayden, Lavoie, Tyler & Wilkinson neighborhoods. The Village would remove a few trees (3 to 4) on each street and replant new trees in their place. The removals would be staggered so there wouldn't be several trees in a row removed. This approach retains the existing tree canopy height for a longer period of time as you drive through the neighborhoods.

Stump Grinding

After the dead trees are removed, we will need to make space for new trees in our greenbelts by grinding out the stumps. This involves grinding the stump with a machine, hauling away the

grindings, and refilling the hole with topsoil. There are two possible options for grinding stumps. The Village could contract with a qualified tree care company or work with the PW crew to grind the stumps.

Contract Stump Grinding: Stump grinding prices were received from 3 local tree care companies and averaged for the estimate. The average contract cost estimate to remove the 166 ash tree stumps is \$115.00/stump totaling \$19,090 for all stumps.

PW Crew Stump Grinding: The Village PW crew would remove the stumps during their regular working hours. With this option there would be no direct labor costs to the Village. They will need to rent a Stump Grinder which would cost \$900 per week. They have all the other equipment needed for the task.

The EJTAG recommends working with the Village PW crew to remove the stumps.

Table A: Costs Associated with Removal-Essex Junction Public Works

Year	Trees	Brush Chipper Rental	Stump Grinder Rental	Tree Replacement	Year Total
2019	15	\$1,100	\$500	\$9,750	\$11,350
2020	15	\$1,100	\$500	\$9,750	\$11,350
2021	15	\$1,100	\$500	\$9,750	\$11,350
2022	15	\$1,100	\$500	\$9,750	\$11,350
2023	15	\$1,100	\$500	\$9,750	\$11,350
2024	15	\$1,100	\$500	\$9,750	\$11,350
2025	15	\$1,100	\$500	\$9,750	\$11,350
2026	15	\$1,100	\$500	\$9,750	\$11,350
2027	15	\$1,100	\$500	\$9,750	\$11,350
2028	15	\$1,100	\$500	\$9,750	\$11,350
2029	16	\$1,100	\$500	\$10,400	\$12,000
Total	166	\$12,100	\$5,500	\$107,900	\$125,500

Table B: Costs Associated with Removal-Private Contractor

Year	Trees	Tree Removal	Stump Grinding	Tree Replacement	Year Total
2019	15	2265	1725	9750	13740
2020	15	2265	1725	9750	13740
2021	15	2265	1725	9750	13740
2022	15	2265	1725	9750	13740
2023	15	2265	1725	9750	13740
2024	15	2265	1725	9750	13740
2025	15	2265	1725	9750	13740
2026	15	2265	1725	9750	13740
2027	15	2265	1725	9750	13740
2028	15	2265	1725	9750	13740
2029	16	2416	1840	10400	14656
Total	166	25066	19090	107900	152056

Tree Replacement

The EJTAC recommends replacing the 15 trees removed each year with 15 new trees; these will be included as part of the Village’s ongoing tree planting program. Trees are planted in late April or early May. So, trees removed in the summer or fall would be planted the following spring. The Village will contract with a qualified landscape contractor to plant the new trees.

New replacement trees will be 2” caliper, with a wholesale price of \$240.00, costing \$650.00 dollars to install and water for one year by a landscape contractor. The cost for replacing all 166 trees will be \$107,900.

The EJTAC will be responsible for selecting the replacement trees, contracting with a qualified landscape contractor and overseeing the tree installations.

The tree replacement process should be done each year for the next 11 years to fill in the gaps created by removing the infected ash trees. The ultimate goal is to recreate the tree canopy that is seen on the streets today. Based on tree replacement estimates, the annual replacement cost estimate is \$9,750. This cost may vary based on tree costs and the chosen contractor.

Preventative Treatment

Ash trees can be treated with insecticides to prevent EAB. However, this option is a long-term commitment and the insecticide needs to be reapplied every 2 years. This is an expensive option and is recommended for specimen high value trees in good condition. The State of Vermont recommends two insecticide options for use in protecting ash trees; emamectin benzoate and azadirachtin; both are applied via systemic trunk injection and can only be applied by a certified pesticide applicator. Currently the average treatment cost is \$12.00 per inch of trunk diameter. For more information go to vtinvasives.org/eab.

The EJTAG does not recommend insecticide treatment of ash trees in the Village right-of-way and parks because of the long-term expense and commitment; if treatment ceases, the trees will be prone to EAB. Also, the EJTAG would have a difficult time supporting this expense to preserve a monoculture of ash when there's an opportunity to correct it and to diversify the urban forest in the Village.

Wood Utilization and Disposal

There will be a small amount of wood chips and a few firewood chunks available as the Village's ash removal plan is implemented. We do not anticipate any saw logs from the Village trees because of their small diameter size. One option would be to haul the woodchips to the McNeil wood-fired generating station in Burlington to generate power. The Village could also locate a disposal site where residents could pick up the woodchips free for use as mulch. Vermont is now within the US Department of Agriculture (USDA) quarantine boundary. There is a national quarantine to limit the spread of EAB. Firewood and ash tree products cannot be moved from inside the quarantined area to areas outside the infested area. It is currently legal to repurpose infested ash trees and products if they stay within the quarantined area. For more information and current USDA quarantine updates on wood utilization and disposal go to: vtinvasives.org/land/emerald-ash-borer-vermont/slow-spread-of-eab.

Private Property Ash Trees

Residents with an ash tree(s) on their property should make a plan; the management options for private property in the Village are:

Treatment: High value ash trees in good condition can be considered for insecticide treatment. Contact an ISA Certified Arborist to assess whether your tree is suitable for treatment. Treatment of high value ash trees is a long-term commitment. Treating in June or July is preferred to minimize damage. Once EAB has been detected within 15 miles of the property,

treatment should begin. Insecticide applications can only be done by a certified pesticide applicator.

Removal: Dead and dying ash trees will become high risk for public safety. Remove and replace untreated ash trees with a different species. Doing nothing may put you, your property, and public safety at risk. It is recommended that removals only be done by a certified tree care company. For more information go to: vtcommunityforestry.org/resources/tree-care/hiring-arborist.

Retaining ash: If you have ash trees on your property that will pose no threat to public safety, property, or Village infrastructure, they could be left alone. Over 99% of ash trees will be killed by EAB, but a small percentage exhibit resistance to the pest. These “lingering ash” will be important to future efforts of breeding EAB-resistant ash trees. It is worth reiterating that this option is only appropriate for ash trees in remote and wooded locations, and not within proximity to any road, trail, home, building, or any other location where it might cause personal or property damage.

Public Education on EAB

The Village will make a conscious effort to educate the residents regarding EAB and its community impact. An emphasis will be placed on notifying residents in neighborhoods whose streets contain the largest concentrations of ash trees. These areas will see the most significant change to the neighborhood streetscape.

The Village will use Front Porch Forum, Facebook, and the Essex Reporter, as well as hosting EAB forums to disseminate information. Where applicable, the Village will contact a Homeowners Association directly. Before tree removal begins in the right-of-way, homeowners will be contacted directly by a letter from the Village or by canvassing the affected streets.

The Village Tree Advisory Committees website (www.essexjunction.org/boards/tree-advisory-committee/) will post pertinent information regarding EAB and serve as a resource for residents.

Community Cost Sharing Possibilities

The Village should explore opportunities for cost-sharing with neighboring municipalities in an effort to save money. Some of the major costs associated with EAB management efforts are dealing with tree removal, stump grinding, and replanting. This may become costly, especially if communities are not prepared and have large numbers of trees that need immediate removal. A number of options exist, each with their own associated costs. Collaborating with surrounding communities may allow for better annual budget management to deal with EAB responsibly.

Contacts for more information regarding the EAB

- Vermont Urban & Community Forestry Program Technical Assistance Coordinator, Vermont Dept. of Forests, Parks & Recreation:
Elise Schadler, elise.schadler@vermont.gov (802)-522-6015
- Vermont Urban & Community Forestry Program Manager, Vermont Dept. of Forests, Parks & Recreation:
Danielle Fitzko, danielle.fitzko@vermont.gov (802)-598-9992
- Chittenden County Forester, Vermont Dept. of Forests, Parks & Recreation:
Ethan Tapper, ethan.tapper@vermont.gov (802)-585-9099
- District Urban and Community Forester, Vermont Dept. of Forests, Parks & Recreation:
Matt Leonard, matt.leonard@vermont.gov (802)-279-1371
- State Pest Survey Coordinator, Vermont Dept. of Agriculture, Foods & Markets:
Emilie Inoue, emilie.inoue@vermont.gov (892)-505-0217
- Essex Junction Tree Warden:
Warren Spinner, wspinner@comcast.net (802) 316-0785
- Essex Junction Tree Advisory Committee Chair:
Nick Meyer, nmeyer52@aol.com (802)-233 9493

An observation of EAB can also be reported online at www.vtinvasives.org/eab-photo-submission-form or by phone at 1-866-322-4512.

Sources Consulted

- Town of Johnson, VT Emerald Ash Borer Preparedness Plan (2014):
http://townofjohnson.com/wp-content/uploads/2014/02/Johnson_EABPreparednessPlan_final.pdf
- Town of Williston, VT Emerald Ash Borer Preparedness Plan (2015):
https://www.town.williston.vt.us/vertical/sites/%7BF506B13C-605B-4878-8062-87E5927E49F0%7D/uploads/EAB_Plan_Draft2_-_JLM_edits.pdf
- Vermont Invasives: <https://www.vtinvasives.org/>
- Vermont Urban and Community Forestry Program, Emerald Ash Borer Management: <https://vtcommunityforestry.org/community-planning/tree-pests>
- Emerald Ash Borer Information Network: <http://www.emeraldashborer.info/>
- Vermont Dept. of Agriculture, Food & Markets, EAB Information: https://agriculture.vermont.gov/Emerald_Ash_Borer

Appendix A: Photographs

Ash Trees on Hayden Street



Photo Credit: Warren Spinner

The public ash trees are on the left side of the street (non-sidewalk side).

Ash Trees on Wilkinson Drive



Photo credit: Warren Spinner

The public ash trees are on the right side of the streets (non-sidewalk side).

Ash Trees on Tyler Drive



Photo credit: Warren Spinner

The public ash trees are on the left side of the street (non-sidewalk side).

Ash Trees on Lavoie Drive



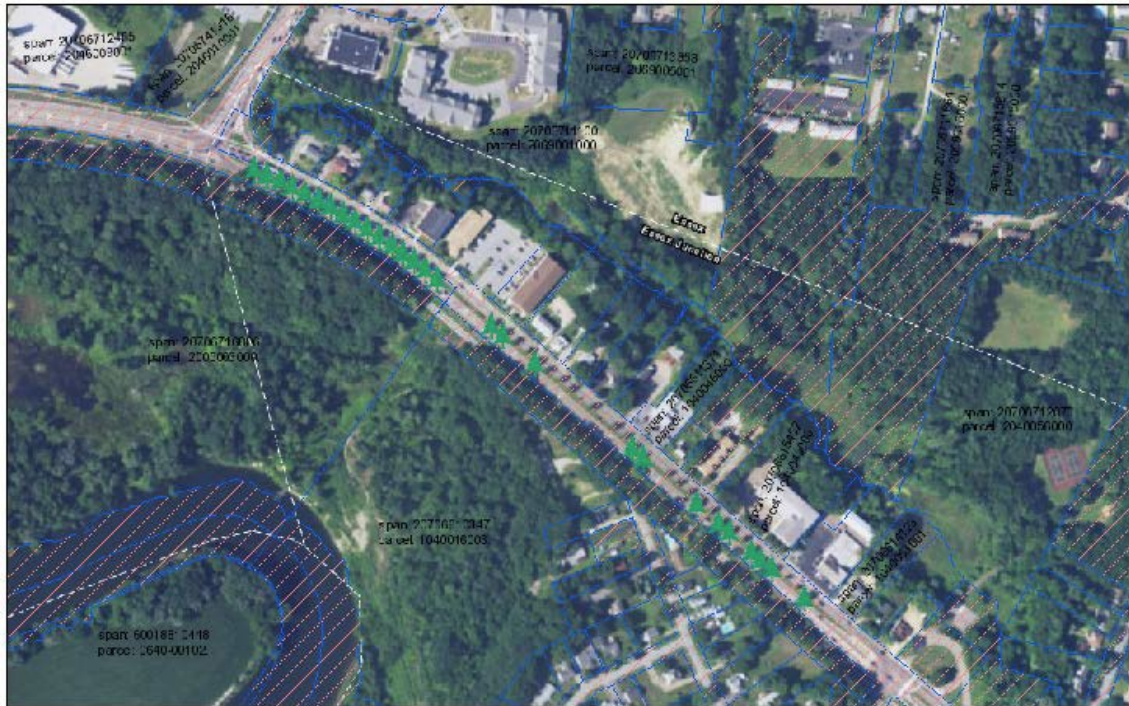
Photo credit: Warren Spinner

The public ash trees are on the right side of the street (non-sidewalk side).

Appendix B: Maps

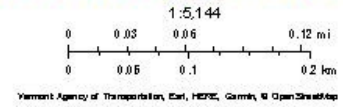
Ash Trees on Pearl Street

Public Ash Trees on Lower Pearl Street



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- Essex Urban Trees Parcels
- Span Missing
- Good
- Has Span
- VTrans Parcels



Essex Tree Expert
Application built and developed for the town of Essex by the Vermont Agency of Natural Resources.

Public Ash Trees on Hayden St., Wilkinson Dr., Tyler Dr., and Lavoie Dr.

Public Ash Trees on Hayden St, Wilkinson Dr, Tyler Dr & Lavoie Dr



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Essex Urban Trees

Good

Fair

Poor

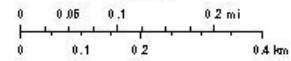
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VTrans Parcels

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Vermont Agency of Transportation, Esri, HERE, Garmin, © OpenStreetMap

Essex Tree Expert

Application built and developed for the town of Essex by the Vermont Agency of Natural Resources.