

2015

The Town of Williston



EMERALD ASH BORER PREPAREDNESS PLAN

The *Agrilus planipennis*, commonly known as the Emerald Ash Borer or EAB, is an exotic beetle that was discovered in southeastern Michigan in 2002 and feeds exclusively on trees in the genus *Fraxinus*. Native to Asia and Eastern Russia, this tiny green beetle has killed 150-200 million ash trees in 22 states and 2 provinces, causing devastation rivaling that of Dutch Elm Disease and Chestnut Blight. This insect will inevitably destroy most, if not all, ash trees left untreated by insecticides and will pose significant human health and safety risks. Though not yet discovered in Vermont, EAB infestations have been confirmed north, south, east and west of us in Concord, NH, Dalton, MA, Albany, NY, and just 30 miles north of the Vermont border in Quebec, so it's not a matter of if EAB reaches Vermont, but when. Williston is an area of particular risk as approximately 43% of publically owned trees are ash. Publically owned trees include those on municipal properties (community parks, library, etc.) as well as within the right-of-way (ROW) along town roads. The purpose of this document is to describe the scope of the threat to public property and to provide recommendations to mitigate the impacts of EAB.

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Purpose

This Emerald Ash Borer (EAB) Preparedness Plan was developed with the assistance of the Williston Conservation Commission, Town of Williston Department of Public Works, Chittenden County Forester, and VT Department of Forests, Parks, and Recreation. It is designed to address public safety concerns and minimize the impact to the Town budget by providing a plan to pre-emptively remove ash along the Town right-of-way over the next 10 years. The roadside removal of ash has three goals: (1) to increase species diversity, (2) reduce the future visual impact of dead and diseased roadside trees and (3) to deal with future impacts to public health and safety.

Administration

The Town Tree Warden and Williston Department of Public Works have oversight of the plan implementation and will use staff and contractors to conduct the work. The Planning Department and Williston Conservation Commission will assist with public education and outreach, inventory assistance and management of the Country Parks. All staff and volunteer boards are managed by the Town Manager and Selectboard.

Executive Summary

All tree removals and replacements are at the discretion of the Tree Warden. However, in general, trees will be prioritized for removal in the following ways:

- 1) Prior to infestation
 - a. Ash trees that are in poor condition
 - b. Ash trees that are located on streets with a high percentage of ash trees, compared to other species.
- 2) During Infestation
 - a. Ash trees that constitute a public health and safety concern
 - b. Visibly diseased or damaged trees

Authority

Trees in the Town-owned right-of-ways, parks, and natural areas are covered by this Plan, whereas trees on private lands are the responsibility of landowners. Trees within the State right-of-way are the responsibility of the State of Vermont.

Work within the Town right-of-way is governed by the Williston Public Works Specifications, the Unified Development Bylaw, and other relevant Town ordinances and State regulations. The Town of Williston currently has no local Tree Ordinance. The authority and responsibilities of the Tree Warden are defined under 19 V.S.A. §904, 24 V.S.A. §2291 (3), and 24 V.S.A §2502-2511. State and Federal quarantine regulations may apply once an infestation becomes established.

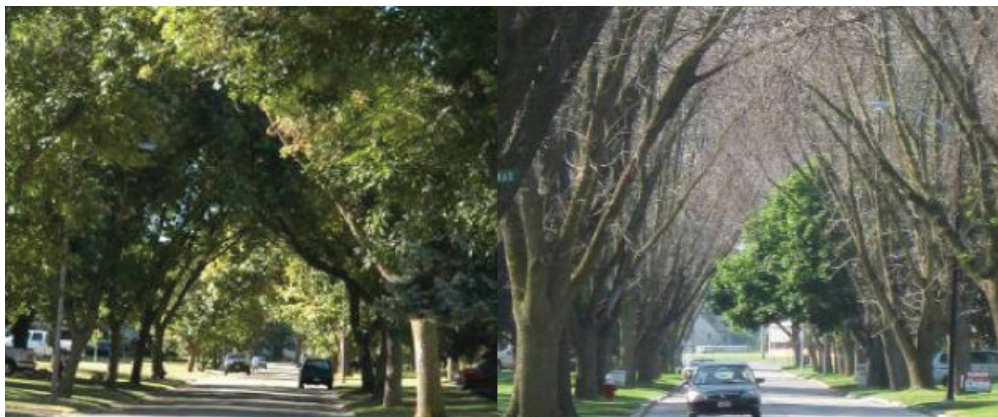
Background Elements

What is the Emerald Ash Borer?

The Emerald Ash Borer is a half inch long, bullet-shaped, metallic green beetle that feeds only on ash (trees in the genus *Fraxinus*). Adult beetles lay their eggs in the folds beneath ash bark where the larvae tunnel through the bark into the cambium and feed on the phloem, which is the vascular tissue responsible for transporting sugar and nutrients throughout the plant. As larvae feed on this vascular tissue, the ash becomes less able to transport nutrients to the top of the tree, killing the tree from the top down in a span of 2-5 years depending on the size and health of the tree. Mature larvae emerge in the spring from D-shaped exit holes where the adult beetles feed on foliage in the upper part of the tree.

Tethered flight in laboratory conditions suggests that a mated female may fly more than 20km (Taylor et al. 2006). Human assisted dispersal of EAB can be much greater and is the primary reason for establishment of satellite populations (USDA). The spread of this population has been facilitated through human transport of firewood and nursery stock. Quarantines extend to dead, cut and living materials, including stumps, logs, roots, branches, and both composted and uncomposted ash chips. Firewood quarantines are in effect in most eastern states to try and prevent further spread of EAB.

Another factor in facilitating the spread of the EAB has been the lack of natural ash tree resistance and natural predators. Ash trees in Asia have co-evolved natural defenses to deter EAB, and parasitoid wasps have kept EAB populations in check. The USDA Animal and Plant Health Inspection Service (APHIS) is currently rearing and researching the effectiveness of three species of exotic parasitic stingless wasps, *Spathius agrili*, *Tetrastichus planipennis*, and *Oobius agri*, as a means of controlling active emerald ash borer infestations. Colonies of these wasps have been established in other areas of the United States infested with EAB and a comprehensive report of the findings of their research is expected within the next year or two. Research and trials are being actively conducted by USDA-APHIS.



TOLEDO STREET BEFORE AND AFTER EMERALD ASH BORER

BEFORE: JUNE 2006

PHOTO COURTESY OF DAN HERMS, OSU

AFTER: AUGUST 2009

Identifying Ash and Signs of Infestation

Ash trees are most easily identified by their compound leaves (composed of 5-11 leaflets) and opposite branching pattern, where twigs and buds grow directly across from each other as opposed to staggered or alternate branching. The bark on mature ash trees is tight with a distinct pattern of diamond-shaped ridges, while the bark on young trees is relatively smooth. The only other tree species with an opposite branching pattern and compound leaves in this area is the boxelder (*Acer negundo*), which almost always has three to five leaflets.



Green ash compound leaf



Mature ash bark



Opposite branching

Signs of EAB infestation are difficult to detect in the early stages and at low densities, but evidence of increased woodpecker foraging may be an early sign of infestation. Often the first noticeable signs are canopy dieback in the upper 30% of the canopy, bark cracking, and epicormic shoots (new growth sprouting at the base of the tree), but these symptoms only become apparent when the beetle has reached moderate to high densities. Serpentine under-bark galleries and D-shaped exit holes are also tell-tale signs of EAB infestation, though other native borers can leave similar tunneling or exit hole patterns.

Affected trees will gradually lose foliage from the top down until they eventually are unable to produce leaves. This is a rapid process and trees that seem to be in decent health going into the winter may be observed not producing any leaves the next spring. Routine tree trunk insecticide injections can increase the longevity of high-value trees for a number of years, but they cannot reverse damage already done.



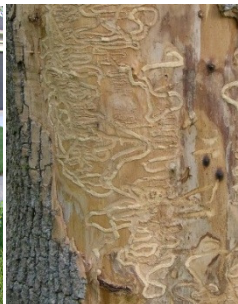
"D-shaped" exit hole



Crown dieback



Epicormic shoots



Serpentine galleries



Woodpecker foraging

Management Strategies

Ash Tree Removal

To date, communities in North America have not successfully eradicated EAB once detected. Symptoms of EAB are slow to appear, making initial infestations hard to detect. Once EAB is found, it is usually estimated that it has been present for 3-5 years. As the population builds, EAB eventually infests and kills all varieties of ash trees in the area. Once ash trees are infested with EAB, they typically decline and die over a period of 2-3 years, at which point they often become unacceptable hazards to property, infrastructure, and to the public. The burden of dealing with hundreds of dead and dying trees in a short period of time can place an enormous strain on a Town's budget, personnel, and resources.

The two main types of management strategies are proactive and reactive removal of ash trees. Proactive removal involves cutting down ash trees prior to the discovery of infestation. This allows for greater flexibility in the tree budget and can potentially diminish the movement of EAB across the landscape as it limits host trees. Reactive removal involves cutting down trees only after 50% of the canopy has died and they pose a public safety risk. The advantage of reactive removal is that no healthy ash trees will be removed, providing the greatest aesthetic and ecologic value of the ash before they die. The issue with reactive removal is that it condenses almost all removals into a 2-3 year period. If not properly planned for, the burden of dealing with all trees in such a short period of time can leave the town without the proper finances or manpower to remove them, leaving the streets lined with hundreds of potentially dangerous trees. Cutting down already dead trees is also more expensive due to the unpredictable nature of dead wood, the added strain on equipment, and added clean-up costs due to splintering.

Preventative Treatment

Insecticide treatments are available and have been found effective in protecting ash trees from EAB. These are only recommended for trees 10" diameter and larger. These treatments are only effective as a preventive measure and do not reverse any harm already done by EAB. Treatments need to be done every two years by an arborist certified to apply those pesticides. Treatments with systemic insecticides must be started while the tree is still healthy, as the circulatory system of that are already dying cannot adequately distribute the insecticide throughout the tree's tissues.

At this time available chemical treatments are not cost effective for large scale implementation. Therefore, the USDA does not recommend chemical control on a large scale. However, depending on beetle population densities, research suggests individual trees may be effectively treated (Herms et al. 2009).

Inventory

This section presents information about public ash trees, which includes ash trees on Williston Town-owned property and along Town-owned roads. Not included in this inventory are:

- Trees in Town-owned parks and along trails
- Trees on conservation land controlled by the Town
- Trees along private roads
- Trees on private property
- Trees along State right-of-ways and on State-owned land

Ash trees were first inventoried in the *Williston Urban Street Tree Inventory & Assessment Report* conducted by Trees New England LLC in 2005. The ash specific tree inventory, represented in Table 1, was conducted in summer 2014 by Williston's environmental planning intern using the 2006 report as a guideline. Survey results enumerated approximately 494 ash trees, indicating that approximately 51% of Williston's public street trees are ash. The Town library has several large specimen trees (average DBH of 21.28 inches), making these trees strong candidates for insecticide treatment.

Table 1: Williston's public ash tree inventory, conducted in 2014

Street	Number of ash trees	Percentage of trees that are ash	Average DBH* (inches)	Average distance from other trees (ft)
Barrett Lane	17	30.35%	8.1	53
Brennan Woods	44	29.70%	8.24	55.5
Chamberlin Dr	25	60.90%	5.87	53
Chatham Woods	17	26.15%	5.61	51
Hanon Dr	15	11.80%	7.74	50
Harvest Lane	134	93.70%	10.73	56
Maple Tree Place	39	45.80%	6.78	25
Marshall Ave	71	68.90%	10.235	60
Sadler Lane	9	32.10%	6.57	52
Wildflower Circle	106	99.07%	10.89	60.25
Zephyr Drive	0	0%	N/A	N/A
Other	Number of ash trees	Percentage of trees that are ash	Average DBH (inches)	Average distance from other trees (ft)
Community Park	10	14.70%	9.36	25
Library	7	11.80%	21.28	N/A

*DBH is Diameter at Breast Height, or more simply, the width of the tree trunk

Williston prohibited the use of ash trees in approved landscape plans in 2009 with the adoption of Williston Development Bylaw (WDB) Chapter 23. It is recommended that the inventory above be expanded to include any ash trees that may have been planted on Town land between 2006 and 2009.

Ash Management Plan

The management plan will vary within different areas of Town:

- 1) Ash trees within the Town right-of-way
 - a. Implement a plan to pre-emptively remove ash trees and replace them by planting other tree species, over a period of ten (10) years.
- 2) Large specimen ash trees on public property (Town Library)
 - a. Conduct preventative treatment using insecticide. Begin treatment in advance of EAB infestation.
- 3) Ash trees in Town parks and on Town-controlled conserved lands
 - a. Trees to be left alone. Trees along public paths should be monitored and threats to public health and safety should be cleared. Remember that trees affected by EAB begin their decline as crown die-off.
- 4) Ash trees on private property
 - a. Town is not involved in direct removal of trees, unless there is an immediate threat to public safety. Set up community locations for dropping-off harvested trees and sharing chipping equipment. Provide public outreach to help property owners understand how to identify and deal with ash tree die-off.
- 5) Ash trees within the State right-of-way
 - a. Town is not involved. Develop contacts within State agencies to inform them of hazard trees that pose a threat to public safety.

Planting Specifications

Williston's Community Forestry Plan, which was adopted as an Appendix to Williston's 2011 *Comprehensive Plan* and the Williston Public Works Specifications recommend that all new tree plantings have a DBH of at least 2". As a general rule of thumb, street tree populations should consist of no more than 10% of any one species, 20% of any one genus, or 30% of any one family of trees. Currently, maple and ash are overrepresented in Williston's Town right-of-way. New tree plantings should continue to support the goal of diversification of the community tree population.

Community Education and Outreach Strategy

The removal of street trees and decline of the ash tree population can have a stressful effect on the community. A community education and outreach strategy should be part of the EAB preparedness response, which involves the following key elements:

- Community education and outreach about the extent of the EAB threat and the appearance and fate of infected street trees,
- Direct notification of neighbors well in advance of ash management activities
- Involving the community (young and old!) as extensively as possible in the ash management plan outlined in this document.
- Consistent notification and outreach to the community, throughout the duration of the plan implementation process
- Utilization of existing communication networks and engagement of local community groups.

The following are implementation goals to be developed and undertaken by Conservation Commission:

- Engage partners to lend technical expertise- e.g. University of Vermont Extension, VT Department of Forestry, Parks and Recreation, Chittenden County Forester, Chittenden County Regional Planning Commission.
- Locate specialized target audiences such as local homeowners' associations, civic organizations, schools, etc. and begin to develop opportunities for grassroots level leadership and participation.
- Develop key messages to support regulatory activities and program initiatives
- Develop or collect outreach materials to meet program needs and reach multiple audiences
- Seek out unique opportunities for direct communication (fairs, home & garden shows, etc.)
- Develop and maintain an EAB webpage as a source of current info on EAB, quarantines, survey & monitoring results, initiatives, key contacts, arborists, landscapers, local regulations, etc.
- Once a webpage is established, develop and maintain a presence on Front Porch Forum and in the Williston Observer referring to the webpage as a source of up-to-date information on EAB
- Develop and market a cost-share program in cooperation with the Williston Selectboard for funding tree replacement on private parcels
- Assist the Tree Warden as needed, to coordinate property owner notifications about planned tree removal and/or tree replacement activities
- Develop and arrange for news releases via local media
- Schedule public meetings and open houses as necessary or appropriate
- Maintain positive relationships with the department of public works and the Selectboard, and represent them well to the public.

Budget

Proactive removal of ash trees is recommended for the Town of Williston at a removal rate of 10% per year over 10 years (roughly 47 trees per year). The annual cost of this ash tree removal and replacement program over 10 years would be approximately \$17,000 to 24,000 per year. These costs were calculated using in-house estimates as well as the Emerald Ash Borer Cost Calculator developed at Purdue University (<http://extension.entm.purdue.edu/treecomputer>). Further refinements to the annual budget can be made at the start of the program using actual cost data from pilot projects.

This plan encourages treatment of several large specimen ash trees in front of the Town Library. The Purdue Cost Calculator estimates treatment costs of approximately \$7. per inch DBH (diameter at breast height). The cost of treating the three largest trees (24.8", 25.6", 26.7" DBH) at \$7/in of DBH would be \$550 biennially, or \$890 biennially to treat all six for the duration of the risk of infestation.

Wood Disposal and Utilization

While the Emerald Ash Borer kills trees in a short period of time, the timber is still usable until it starts to rot; usually one year after the ash no longer produces leaves. Trees with a DBH of 12" or greater may have some value as sawlogs, and Williston could choose to sell the trees as sawlogs, firewood, or woodchips to reclaim a small percentage of the cost of removal. McNeil generating plant is a potential location for woodchips. Firewood or woodchips for use as mulch could also be given away for free to low-income residents or to residents who lost ROW trees adjacent to their property. Public education will need to be conducted, to reduce the risk of offsite transport of wood materials that could spread the infestation to areas not yet affected. Inter- and intra-state movement of ash materials needs to follow quarantine regulations governing the program area:

http://www.aphis.usda.gov/import_export/plants/manuals/domestic/downloads/emerald_ash_borer_manual.pdf.

Contacts

Chittenden County Forester:

Keith Thompson, keith.thompson@state.vt.us (802) 879 – 5694

State Urban Forestry Coordinator, Dept. of Forest, Parks & Recreation:

Danielle Fitzko, danielle.fitzko@state.vt.us (802) 598-9992

www.vtcommunityforestry.org

Urban & Community Forestry Outreach Coordinator, UVM Extension:

Elise Schadler, elise.schadler@uvm.edu (802) 656-2657

The toll-free National EAB Hotline is 1-866-322-4512. The hotline is staffed by knowledgeable and trained personnel who can answer questions about the USDA EAB Program and direct callers to appropriate program personnel.

www.emeraldashborer.info was developed by the Cooperative EAB Program and funded by the US Forest Service as a link to Federal and State information.

Citations

- Ash Management Guidance for Forest Managers. (2012, April 1). Retrieved July 30, 2014, from <http://www.vtfpr.org/protection/documents/ashmanagementguidanceforforestmanagers.pdf>
- BenDor, T. K., Metcalf, S. S., Fontenot, L. E., Sangunett, B., & Hannon, B. (2006). Modeling the spread of the emerald ash borer. *Ecological modelling*, 197(1), 221-236.
- Donovan, G. H., Butry, D. T., Michael, Y. L., Prestemon, J. P., Liebhold, A. M., Gatzliolis, D., & Mao, M. Y. (2013). The relationship between trees and human health: Evidence from the spread of the emerald ash borer. *American journal of preventive medicine*, 44(2), 139-145.
- Emerald Ash Borer. (n.d.). *Emerald Ash Borer*. Retrieved July 30, 2014, from <http://www.emeraldashborer.info/#sthash.KZZk0Rao.dpbs>
- Gould, J., Bauer, L., Lelito, J., & Duan, J. (2013, May 1). Emerald Ash Borer Biological Control Release and Recovery Guidelines. Retrieved June 19, 2014, from http://www.aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b/downloads/EAB-FieldRelease-Guidelines.pdf
- Kovacs, K. F., Haight, R. G., McCullough, D. G., Mercader, R. J., Siegert, N. W., & Liebhold, A. M. (2010). Cost of potential emerald ash borer damage in US communities, 2009–2019. *Ecological Economics*, 69(3), 569-578.
- Liu, Houping (2013). Emerald Ash Borer Plan for Pennsylvania Communities. Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry.
- Minnesota Extension, Univ. of and the Minn. Department of Natural Resources; Ash Management Guidelines for Private Forest Landowners; June 2011. <http://www.myminnesotawoods.umn.edu/2011/07/emerald-ash-borer-and-your-minnesota-woodlands/>
- USDA-APHIS.2013. *Emerald Ash Borer Program manual, Agrilus planipennis* (Fairmaire), USDA-APHIS-PPQ-Plant Health Programs – Pest Management, Riverdale, Maryland. http://www.nyis.info/slideshow_eab/EAB_9000019b.jpg
- <http://www.patriottreeco.com/Site/images/Before%20and%20After%20EAB.png>
- <http://labs.russell.wisc.edu/eab/files/2011/06/Declining-ash-due-to-Emerald-Ash-Borer.jpeg>
- http://dnr.wi.gov/images/news/20140520_epicormic_sprouting_large.jpg
- <http://www.barrtreecare.com/wp-content/uploads/2011/04/S-Galleries.jpg>
- <http://labs.russell.wisc.edu/eab/files/2011/06/D-shaped-exit-holes.jpeg>