

Essex Junction Recreation and Parks Ash Tree Inventory

Malcolm Richardson, Thor Belle, Karla Noboa and Suzanne Trammel

Introduction

Emerald Ash Borer is an exotic and invasive wood boring insect that hails from East and Northeast Asia. It is distinguished from native wood boring insects in that it attacks healthy trees in addition to trees that have been immunocompromised. Such attacks are fatal, and can quickly become systemic on a macro level spelling ruin for entire populations of ash trees (USDA Forest Service, 2013). To curb the spread of the insect, firewood imports have been made illegal by a number of states, including Vermont (Vermont Division of Forestry). Likewise, the threat posed by this insect has created a quarantine on ash products, severely impacting a number of local economies across the eastern United States (Schlesinger).

Emerald Ash Borers will only colonize a living tree, laying their eggs inside the tree until they hatch, chewing their way through the tree's vital tissues until the tree succumbs to these injuries and dies. These injuries are fairly readily apparent, as they cause severe dieback of the crown, damage to the trunk and leave behind characteristic "D" shaped exit holes about a quarter of an inch wide. The death process is slow: it takes up to four years for the tree to die; During this time the Emerald Ash Borer is continuing to proliferate. The only way to stop an infestation from growing and spreading is the removal of infected and potentially infected trees (USDA, 2013).

Emerald Ash Borer is currently found in every American State and Canadian Province bordering Vermont (USDA, 2013). Recognizing this, Essex Junction Recreation and Parks sought out the help of the University of Vermont to prepare itself for the onset of Emerald Ash

Borer within their town's parks. As part of this effort, University of Vermont students educated park employees on how to identify ash trees, as well as signs of Emerald Ash Borer.

Additionally, University of Vermont students went to each of the towns three parks to locate, flag and inventory any ash trees present. This data was processed and delivered to Recreation and Parks as a set of management guidelines to aid them as they move into the future.

The inventory took place at Cascade Park in Essex, Vermont. The park itself was dominated by fields but the southern edge of the park was forested and about 30% of the trees there were ash. The second location surveyed was the forested area of Maple Street Park in Essex. This park included walking trails and dirt bike routes and was dominated by hardwood species that did not include ash. The third and final area studied was Stevens Park in Essex. Stevens did not have any ash trees present and had a sparse understory, therefore a tree survey was not conducted but management recommendations were created.

Methods

In order to conduct the ash tree inventory requested by Essex Junction Recreation and Parks (EJRP) GPS tracking was used to outline forest stand boundaries at two Essex parks, Cascade Park and Maple Street Park. Waypoints taken from a Garmin GPS were transferred onto ArcMap to create basic maps of the forested areas in each park. Next, each stand was methodically surveyed for ash trees by walking back and forth within the stand boundaries from the north end of the stand to the south. In Maple Street Park common tree species were recorded at the request of EJRP.

If ash trees were present in the stand, information was recorded on each tree's diameter at breast height (DBH), percent crown dieback, evidence of decay, evidence of bug activity, and any other relevant notes (i.e. signs of stress or general decline). All ash trees found were flagged

with flagging tape. If signs of Emerald Ash Borer were thought to be present, the tree in question was flagged with multiple pieces of flagging tape to make it easier to identify and locate in the future. Due to the sheer number of ash trees found at Cascade Park, individual ash trees were not marked with a GPS waypoint. Instead, major clusters in the stand were marked with a GPS waypoint (Appendix A).

A third park, Stevens Park in Essex, was also briefly surveyed. Here, no ash trees were found but high levels of erosion were detected. We alerted Essex Junction Recreation and Parks to this situation, and suggested planting some more ground cover to alleviate the problem.

Results and Discussion:

At Maple Street Park, no ash trees were present. Instead of conducting a survey, a map of the forested boundaries and a chart of the common tree species found within them was created.

Maple Street Park Forested Boundaries



Figure 1. A map of the forested boundaries at Maple Street Park.

Common Name	Scientific Name
American Beech	<i>Fagus grandifolia</i>
Paper Birch	<i>Betula papyrifera</i>
Northern Red Oak	<i>Quercus rubra</i>
Sugar Maple	<i>Acer saccharum</i>

White Pine	Pinus strobus
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Figure 2. A chart of the common tree species found at Maple Street Park

At Cascade Park, there was approximately 158 ash trees. At closer investigation, almost 20 trees exhibiting signs of EAB infestation were found. Many of these had D-Shaped exit holes and a few had s-shaped galleries beneath the bark. Approximately 9% of the trees in the park had potential infestations and should be further inspected.

Ash Tree Clusters on the Eastern Side of Cascade Park



Figure 3. A map of the ash tree clusters on the eastern side of Cascade Park.

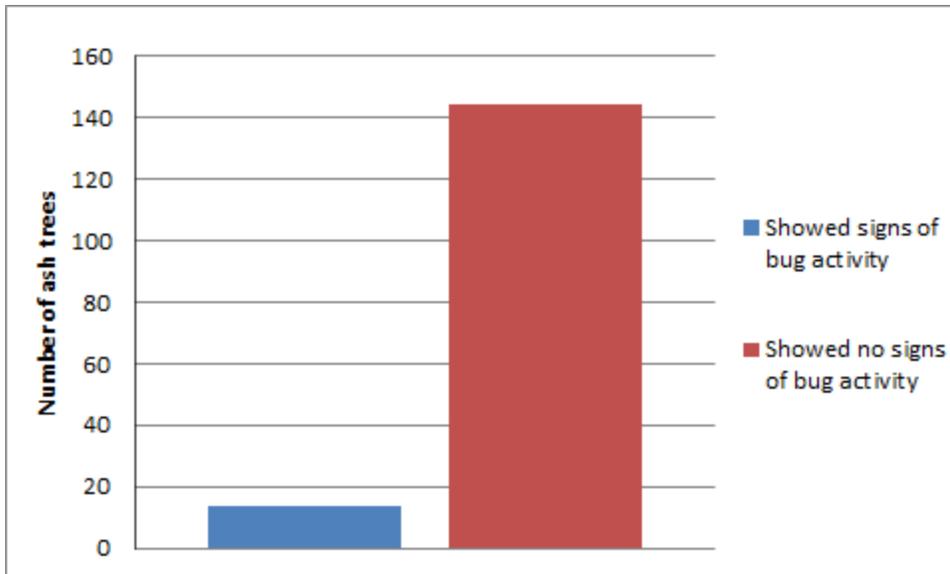


Figure 4. Total number of ash trees showing signs of bug activity at Cascade Park in Essex Junction.

It is possible that Emerald Ash Borer has reached Cascade Park. Multiple ash trees were cut down along the paths at the park, which signaled at movement of wood in the area. The movement of wood from one location to another is the main cause for the spread of EAB. Many of the ash trees at Cascade Park exhibited signs and symptoms of the insect and the abundance of D-shaped exit holes are a cause for concern.



Image 1. S-shaped galleries



Image 2. D-Shaped exit holes and frass filled galleries

Recommendations

At Cascade Park, there is a large possibility of EAB infestation. Approximately 9% of the trees exhibited signs and symptoms of EAB, like exit holes and epicormic shoots. A closer investigation of these trees is necessary and a professional inspection to confirm or deny the presence of this invasive insect is crucial. As far as continuing to survey for EAB, a monthly inspection of the flagged trees should be conducted to monitor for further damage. It is also suggested that the trees currently cut down on the property should not be moved from the area and trees exhibiting signs and symptoms should not be removed from the property.

The current understory at Stevens Park is essentially nonexistent. Cultivating an understory will bring in more wildlife and add to the aesthetic of the park. It will also help make the stand more complex, which helps an area last over time. Adding vegetative growth at ground level will also help slow down and absorb more water, which should work toward solving the

parks erosion problem. Density management can be useful in making an area suitable for understory trees; if trees are never thinned the understory will gradually disappear. This can also be tied into creating artificial canopy gaps. Creating gaps in the overstory would cause greater variation in understory growth rates and allows some growth to form a midstory. Thinning with skips and gaps is a method of variable-density thinning. Artificial canopy gaps have also been linked to increased bird populations.

Another problem we saw at Stevens Park was soil erosion; There are several ways to combat soil erosion. The method of choice depends on budget and manpower. The area undergoing the most erosion at Stevens park is already grassy so a possible simple solution would be to plant vegetation with deeper root systems to hold the soil in place more effectively than the grass.

Appendix

Appendix A.

Several extenuating circumstances limited the extent to which ash tree clusters were marked by GPS in the Cascade Park survey of ash trees. Throughout the project three of our team members incurred injuries from outside the project that limited our manpower and thus the ability to survey certain areas with a GPS. With this in mind an effort was made to clearly mark all ash trees in the park with flagging tape.

References

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