



CITY OF CONCORD

REPORT TO THE MAYOR AND CITY COUNCIL

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SUBJECT: Impact of invasive insect species within the City of Concord

Background

Recently, the Concord area has been subject to invasive insect species that will have a major impact on the tree populations within the City. The species include the **Emerald Ash Borer**, **Hemlock Woolly Adelgid**, and the **Red Pine Scale**. All three species are fatal to the infected trees though it may take several years for the trees to succumb after the initial infestation. Based on these three species it is estimated that approximately 20% of the trees on City owned parks, and cemeteries will succumb to invasive insects in the next 5 years. This 20% is in addition to normal loss of trees due to natural tree decline and weather related damages. All ash trees within the City will succumb to EAB by 2020-2023. Because of this it is imperative that the City establish a framework for invasive insect species management to detect, contain, and mitigate the impacts.

Of the three, the Woolly Adelgid is the most treatable, mainly by “painting” the tree trunks with an insecticide. The Emerald Ash Borer can also be treated by an insecticide, but involves an injection system which can be expensive over time and is usually focused on trees of historic significance or where the cost of removal outweighs the cost of treatment. Some predators of the Emerald Ash Borer have recently been released in the Concord area by the New Hampshire Division of Forests and Lands Forest Health Program, but it is too early to assess any results. There are no recommended treatments for trees infested with the Red Pine Scale, though small ornamental shrubs could be treated with certain pesticides. Harvesting infected trees during winter months will prevent spread of the scale.

The Emerald Ash borer was discovered in Concord in 2013 and early hopes that it was a very limited infestation proved to be short-lived. Subsequent investigations found infestations throughout Concord and several surrounding Towns. Merrimack County is an Emerald Ash Borer Quarantine Zone. In collaboration with the State of NH, the City’s General Services Department treated Emerald Ash Borer infested trees at Thompson Park, White Park, McKee Square and the Arena by injecting to slow the impacts of the infestation. However, the City

recognizes that this treatment will only prolong the inevitable loss of these trees. Infested trees were removed from the Winant Park parking lot due to the potential hazard to park users; however, additional infested trees remain within the park.

A small infestation of Woolly Adelgid was found on the Penacook Lake watershed along District 5 Road in 2014. The Division of Forests and Lands Forest Health Program personnel treated the site but some Adelgid was again found there in 2015. The State will look at the site in the Spring of 2016, but numerous infestations recently found in Merrimack County indicates that the pest has apparently become established in central New Hampshire.

In 2015, it became apparent that many of the Red pines along Interstate 93 and the red pine plantation at Rollins Park were infested with the Red Pine Scale. Unfortunately, many of the red pines in the Concord area are found in groups that were planted for either aesthetic or reforestation purposes and the red pine scale spreads very rapidly in such situations. The Parks and Recreation Department plan to address the infestation at Rollins Park is to remove the over 200 infected trees and replace with a diversified selection of species.

In response to the infestation and future impacts to the landscape of Concord, in January 2016 several City Departments, including General Services, Parks and Recreation, and Community Development met to address the infected tree issues within the City and develop a response.

Discussion

Hemlock Woolly Adelgid

This small, wingless, sap-sucking insect attaches itself to the base of the hemlock needles and sucks out the nutrients carried in the water/sap as part of the tree's evapotranspiration process. A heavy infestation will eventually defoliate the tree which stops the photosynthesis process and kills the tree. In the past, frigid winter weather had kept the Adelgid from moving into New Hampshire, but warmer winters due to climate change have allowed the Adelgid to move north and it has become established in southern New Hampshire.

Hemlock is considered a low value timber species in today's markets and has been for quite some time. However, hemlock has tremendous value as winter shelter for a variety of wildlife species including deer, rabbit, ruffed grouse, turkey and smaller songbirds. According to a report from the City Forester (see attached report), there are many Stands of hemlock found throughout the City Forests, though the pure Stands tend to be located on wetter sites or on the northern aspect of steep hillsides. Hemlock Stands found on drier sites are typically managed for wildlife habitat and wet sites are avoided in harvest operations on City land to protect the watersheds. Therefore, as a result, the loss of hemlocks due to the Woolly Adelgid will have a minor economic impact to the City Forest program, but will have a major impact to wildlife habitat.

Emerald Ash Borer

The Emerald Ash Borer (EAB) lays its eggs in the bark of the three ash species (White, Green and Black) found in the Concord area. As the eggs hatch, the larvae eat the cambium layer just under the bark and eventually girdle the tree preventing the passage of nutrients. The NH Department of Agriculture has identified the EAB as the most destructive forest pest in North America, and infestations can kill ash trees in just 3 to 5 years. The City of Concord is included in the Quarantine imposed by the State which states that no hardwood firewood, ash nursery stock and ash wood products may leave Merrimack County.



Of the three species, white ash timber is the most valuable and is considered medium to high in value. It is mainly found on damp sites and in drainages. White ash makes up a very small component of the City Forests and is often associated with riparian zones where harvesting is restricted, though scattered stems can be found on upland areas. Unfortunately, white ash has been planted throughout the City proper for ornamentals and shade trees. Green ash is limited to the floodplain along the Merrimack River and is part of a floodplain forest ecosystem that also contains silver maple and American elm, though most of the elm has since died off from the Dutch elm disease. The City owns several tracts along the Merrimack River that contain green ash, though the stocking levels of the ash vary greatly. Lastly, black ash is fairly rare in the City and limited to bog-like ecosystems. Because black ash is found in bogs and seldom grows to sawlog size, it is not considered a timber species.

Whereas white ash tends to like wetter sites or is found along streams and wetlands, very little has been harvested on City Forests in order to protect the riparian zones. But since the discovery of the Emerald Ash Borer, white ash has been marked to be harvested as part of the more recent City Forest timber sales as long as their removal does not negatively impact wetlands. To date, harvested white ash volumes have been quite minimal due to the low overall stocking in the uplands on City Forests. Heavy stockings of green and white ash can be found in Healy Park and Terrill Park. The other parks and City Forests along the Merrimack River contain both white ash and green ash, but not in significant quantities.

The Division of Forests and Lands Forest Health Program has set up an EAB infestation study site at Terrill Park. They have created an entrapment site in an un-used part of the Park and have treated ash trees in the more developed portions with an insecticide. Program Administrator Kyle Lombard has requested that the ash trees be left alone in the Park unless they become hazardous. The Program has also released insect predators of the Emerald ash borer in the Concord area. It is too early in that study to assess the results, however, the intent of the predator release is to build up the parasitoid population enough to slow the spread of the ash borers to outlying Towns, not to stop the outbreak in Concord.

Red Pine Scale

This insect attacks the tree in a manner similar to the Woolly Adelgid, but then allows another insect, the turpentine beetle, to infest the weakened tree and bore into the tree trunk causing staining of the wood, making it worthless for sawtimber. Although red pine is native to the area, it was a relatively minor species and typically quite scattered throughout the County. Red pine plantations were planted as a substitute for White Pine, which was susceptible to the white pine blister rust fungus and the white pine weevil. Unfortunately, it was eventually discovered that the *fomes annosus* fungus infected red pines. The plantation scenario provided ideal conditions for the spread of the disease and many red pine plantations became infested after they were thinned. Eventually, planting red pine was discontinued or limited to aesthetic uses such as ornamentals or for buffer zones.

There were several red pine plantations on the City-owned lands but until the mid to late 1980's there was not much of a market for small diameter red pine stems. As a result, the plantations were not thinned and tended to be heavily overstocked. The Red Pine plantation behind the Waste Water Treatment Plant on Hall Street was thinned in 2006 when it was noticed that it had become infected with the *fomes annosus* fungus, and eventually clear-cut in 2015 when it was discovered to be infested with the *fomes annosus* fungus and Red Pine Scale. A plantation located off Hutchins Street in Penacook was thinned in 2010 and is so far disease free, but is being monitored and will be clear-cut if and when it becomes infected.

It was discovered in the summer of 2015 that a red pine plantation located on the tract of land north of West Locke Road recently acquired from UNITIL in a land swap was heavily infected with the red pine scale and had already suffered some mortality. The remaining red pines were harvested in conjunction with an adjacent agricultural field improvement operation. Whereas red pine is considered a low to medium valued species and is now limited to the plantation on Hutchins Street, the loss of the species will have a very minor impact to the City Forest program. However, it will have a major impact to the ornamentals planted within the City's parks and along local roads and highways.

The clear-cut approach is currently being employed by the State and other municipalities in NH. Most notably, approximately 225 acres of red pine were harvested from Bear Brook State Park from 2013-2015. In addition, the City of Manchester Water Works plans to cut 400 acres of impacted Red pine timber in the Massabesic Watershed over the next four years.

Public Outreach and Education

According to the US Forest Service, regulatory measures coupled with robust outreach and public education activities are the most effective tools currently available for early detection and to prevent human assisted movement of invasive insects. In addition, education is important to help Concord residents understand how and why the landscape of Concord will drastically change in the near future. Further, the issue of infestation is not confined to City-owned land, and it is

important for residents to understand their responsibility for addressing infested trees on their private property.

The outreach can be accomplished through the distribution of fact sheets (see attached for examples), public information sessions, and graphic visualizations of the anticipated change in the landscape. The City should work closely with the Concord Monitor to develop periodic news releases and updates. Additionally, the City should work with local, state and Federal agencies for advice and assistance.

Residents concerned about insect infestations on their private property should contact the UNH Cooperative Extension Forestry and Wildlife: <http://extension.unh.edu/Natural-Resources/Forests-Trees>, or contact the Merrimack County representative Tim Fleury at 603-796-2151, tim.fleury@unh.edu. **UNH Extension is scheduled to provide a Community Workshop about Emerald Ash Borer in on May 4, 2016, at 6pm at the Heights Community Center (former Dame School).**



Red Pine Scale infested trees



EAB infested tree



EAB infested tree

Recommendations

We recommend that Council direct City staff to develop a framework for invasive insect species management within the City. This framework is based on the U.S. Forest Service national strategic framework.

1. Prevention and Detection

Organize and implement public outreach program, collaborating with state and federal agencies. This program should also include education for private property owners. While only the three infestations identified in this report have been found in Concord, there are

other insects found in New England, including the Asian Longhorned Beetle, which could potentially move into Concord. It is best to educate the public about these threats to prevent the spread of these devastating infestations.

2. Control and Management

Implement response for new infestations to rapidly suppress invasive insect species populations and minimize the impacts. Develop tools, methods and budgetary process to prioritize and implement effective invasive insect species management and eradication.

3. Restore and Rehabilitate Infested Areas

Develop a budget to replace the urban trees that are affected and will eventually have to be removed. Proper species selection and diversification is important to the health of these areas in the future. Maintaining the health and diversity of plantings provides greater resilience to future insect and disease infestations.



Before: Ashes along D'Amante Dr.



After: D'Amante Dr. if ashes are lost to EAB without a restoration plan in place

In addition, we recommend that City Council support the plan to restore and rehabilitate the Red Pine Scale infested plantation at Rollins Park. This plan will include a public meeting, educational materials notification and graphics to help visualize the new landscape. The scope of the project is to remove more than 200 Red Pines. The area will be re-vegetated with a diverse species of trees and groundcover to create passive park land.

In addition, we recommend that the City Council support an injection program for Ash trees that have been treated by the State in the summer of 2015 as a test program.

ATTACHMENTS

*Report from City Forester
City Map*

*Report from Tree Supervisor
Rollins Park Map*

Fact Sheets