Findings from the Field

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HWA Is In OOB And Is Making Its Way North

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Research Article

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HWA Is In OOB And Is Making Its Way North

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Abstract

We have been investigating Hemlock Woolly Adelgid (or HWA) along with many other people and scientists all over the east coast. The area we investigated was Milliken Mills South, in Old Orchard Beach, Maine. We've gone only once, in late fall/early winter. We did find HWA in the woods. HWA is an invasive species, originally from Asia. HWA was first recorded in the USA in Virginia in 1920. So far it has spread from there, south to Georgia, and north to Southern Maine.

Introduction

We are investigating Hemlock Woolly Adelgid (HWA). The following information is from the Vital Signs species ID card. HWA are small insects that infest eastern hemlock trees. HWA has a long mouth tube that they insert into the tree to get sap. They lay their eggs and cover them with a waxy tuft-like substance, which is what we searched for out in the forest. They lay their eggs on the underside of the branch right where the needle connects to the branch. HWA is called 'woolly' because their egg sacs/coverings are a white waxy substance that looks woolly or fuzzy. The insect itself is *not* woolly, they are tiny nymphs, and are a dark brown or black color.

The Hemlock Woolly Adelgid is an important investigation to our community, along with other scientists throughout the eastern USA. The hemlock trees provide shelter, food, protection, and shade for many species. We have a lot of hemlock trees and they are important to our ecosystem. We learned that HWA started in the south and has been making its way north and east. We

explored Maine climate data, and discovered that the winters are getting warmer. Warmer winters mean more HWA surviving the cold season.

Hemlock trees are coniferous evergreen trees that can grow up to 30m tall. The branches on the tree have more of a drooping appearance. The needles on the branches are alternately arranged and are 1.5-2cm long. On the underside of the needle, there are two white “racing stripes” and the needles connect to the branch with a “peg” rather than a “suction cup”. In the spring the hemlocks have flowers, the Male flowers are small and more yellow when the female flowers are small green cones that change into small brown cones.

Our research question is where in our area HWA is and where is it going next? This investigation is important because it helps out other scientists find out where HWA is and where it is moving in Maine. If scientists know what HWA is doing it could help them prevent them from infesting more trees and causing further damage. Originally we thought we would find HWA in Milliken Mills because HWA had spread through most of southern Maine and later we found out we were correct.

Materials and Methods

We went into the Milliken Mills woods on November 30, 2018, to find an eastern hemlock tree, the branches on the tree had to be at least one meter long and it has to start from the trunk. We identified the Hemlock by turning the branch over and seeing if there were two “racing stripes” if the needles connected to the branch with a little stem and not a suction cup, and if the twigs and branches were more flexible. We used the iPad to take four photos of the whole tree, the trunk, a branch segment, and the close up of the needles. We then found a branch within reach to start observing. Once we found a good branch we turned it over to see if there was HWA. For each branch, we first took a photo of a label with the number of the branch. If there was HWA, we would take a clear photo of the specimen on the branch and if there wasn’t we just took a photo of the branch, using the clipboard as a solid color surface. We would then take the piece of the branch that had HWA on it. For every branch, we would record on our data sheet if there was

HWA or not. We did this procedure on 10 branches per tree, marking each branch with flagging tape and the branches number with the marker. We had an HWA guide sheet to ensure that what we saw was HWA and nothing else. The ruler that we had brought was not used but would have been used for measuring the length of the needles.

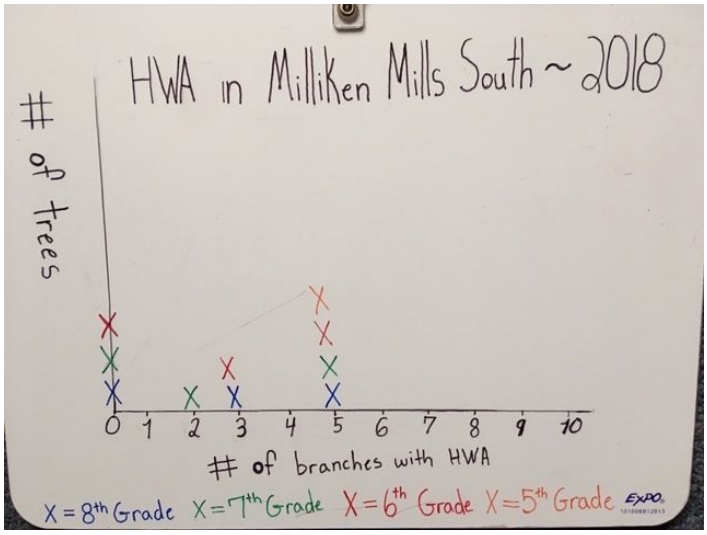
Results

Seven out of the ten trees in Milliken Mills South we looked at had HWA, three out of the ten trees in Milliken Mills South we looked at didn't have HWA, and one out of the two trees we look at as a team had HWA.

The first tree we looked at had two branches where we found HWA, the tree also had one branch where we couldn’t tell if it had HWA or if it was something else. The first two branches we looked at were the ones that had HWA, those two branches happened to be the lowest. It wasn’t very tall and it wasn’t as full as the others. This tree was also near a few more hemlocks and it was in a very shady area.

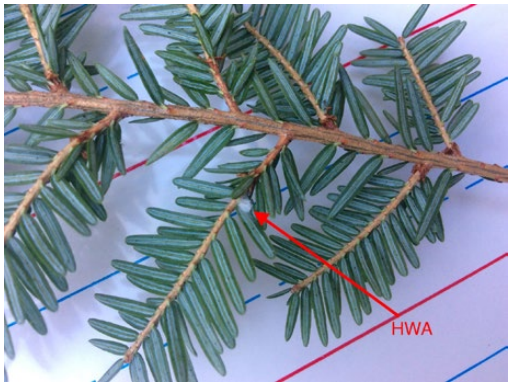
The second tree we looked at had no HWA on it, it was not near any other hemlocks, and it was in a very open, sunny area. The tree was very tall and wide, and unlike the other trees we looked at this Hemlock had small pinecones.

The range of the data was from 0-5, the mean of the was 2.8, the median was 3, and the mode was 5. The data is mostly clustered towards the lower end of the chart.

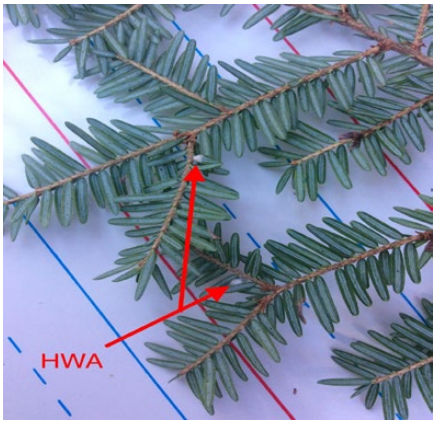


Chart

Tree 1



Branch 1, Tree 1



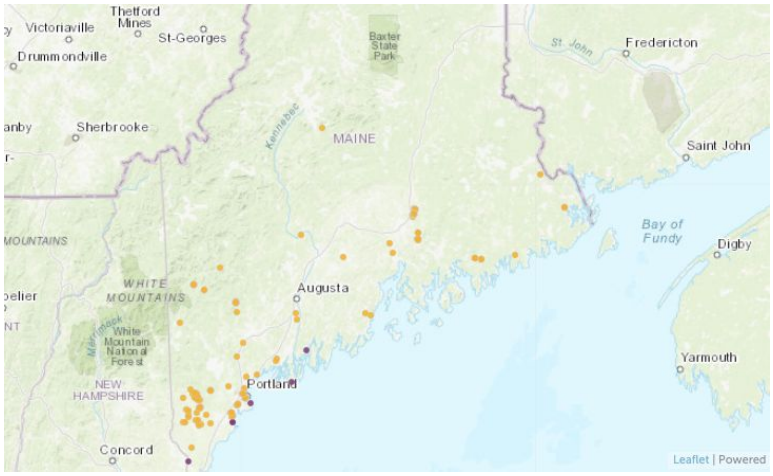
Branch 2, Tree 1

Tree 2

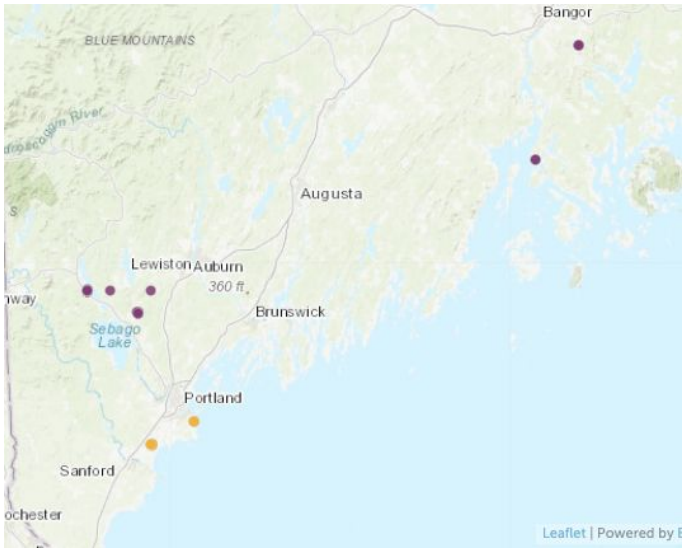
Tree 2 branch

Discussion and Conclusion

Based on the data that we found we can tell that Milliken Mills in OOB ME has a mild infestation of HWA. How we could tell it was mild was because 7 out of the 10 trees that we surveyed had HWA but each branch that had HWA only had one or two small spots. Also from looking at our data and the CODAP website we can predict that HWA will most likely keep making its way up north. Quite a few towns in northern Maine still haven't done this investigation so HWA could possibly already be more northern than we may think. If more towns in northern Maine went out and did this investigation, our conclusion would be more accurate. Our class didn't check every tree from each class so we have to trust that they were accurate and precise. The CODAP website has a map that shows where HWA has been found and where it hasn't found. The map helped us the most with our research question because it showed where HWA could possibly be going next by looking throughout the years. In the first photo, it shows in some areas there are only yellow dots but in the second photo, it shows that some of those areas now have purple dots. After all of this, our question has been answered, we know that HWA is now in OOB and we can predict that it will keep moving more and more northern.



(2009-2017) Purple: found Yellow: not found



(2018) Purple: found Yellow: not found

(OOB is not on the map yet because not all the data has been entered)

Sources:

CODAP

Vital Signs