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Hemlock woolly Adelgid is Now Invading Old Orchard Beach

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Teacher: Mrs. Nye

Abstract

Our goal was to find out if hemlock woolly adelgid (HWA) had spread to Old Orchard Beach Maine. The 7th Grade GT science group went out into Milliken Mills South to look for HWA. Our method was to find a hemlock tree that had at least ten branches that we could reach. Then we checked the ten branches for HWA or what was left over from them. We found that it had in fact spread to Old Orchard Beach.

Introduction

We are investigating HWA in Milliken Mills South, a forest in our town of Old Orchard Beach. We went out on November 30, 2018, to see if we could find HWA in Milliken Mills woods. Before we went out, we had to learn about what HWA is, what it looks like, and where it would be.

Hemlock woolly adelgid (HWA for short) is an invasive species, not native to Maine. HWA is an insect from East Asia that hitchhiked here on ships. On the east coast, scientists first found HWA in Virginia in 1950. Since then, it has spread from Virginia along the east coast to southern Maine.

We needed to know what a hemlock woolly adelgid looks like before we went out to look for it so we could better identify it. HWA has three stages in its life. It starts out as an egg which is roughly 0.25 mm long and 0.12 mm wide. Then it's a nymph, and then it's an adult. The adult is about 1.5- 2 mm long and looks like a tiny brown flea and is usually hard to see. The nymph is less than 1 mm long or about the size of a pencil dot. You don't usually see the adults because they are concealed under their white waxy cover produced by female adults. The waxy covers are formed on the underside of a branch, at the base of the needles. The cover can hold up to 200 eggs. It looks fluffy because of how many eggs it holds. We were looking for the leftover waxy cover because we were looking later in the year after the eggs hatched.

Our investigation is important because HWA kills hemlock trees and has negative effects on the ecosystem. Scientists already know that HWA is spreading in Maine. Data on CODAP told us where HWA was in Maine up to 2017. The closest town that had it was Saco, which is our neighbor.

We wanted to find out if HWA is in Old Orchard Beach. We thought we would find it because it had been found near us, and we know it spreads. The data we collected in

Milliken Mills South (MMS) will contribute to scientist knowledge of where HWA is and maybe we can figure out what to do about it.

Methods

The first thing we did was find an Eastern Hemlock tree. We then marked it with the orange marking tape so we knew what tree was ours. We took four photos to show that it was a Hemlock tree. We had to take a photo of the entire tree, a close up of the trunk, the underside of the needle, and the connection between the needle and the branch. We had to make sure that the tree had ten branches in reach. Then we checked the branches for HWA. Then Mrs. Nye double checked them. If we found it or not we took a picture of the number of the branch and the underside of the branch. We adapted the procedure by marking each branch with the orange marking tape so we would not check the branch more than once. We wrote down if it had HWA or not for each branch, on our data sheet.

HEMLOCK WOOLLY ADELGID MISSION DATASHEET

4. Search 10 branches that are at least 1 meter long. If you cannot reach 10 branches, check as many branches as you can reach.

- Take a photo of the # for the branch you are surveying (see attached sheet).
- Take at least 1 good photo of the underside of the surveyed branch, recording whether you found or did not find hemlock woolly adelgid.
- Repeat for all 10 branches (or as many as you can reach).

5. FIELDWORK QUALITY ASSURANCE

I certify that I:

- Checked 10 branches (or as many as I could reach)
- Completed peer review in the field

SURVEY FOR HEMLOCK WOOLLY ADELGID		
Branch (1m long)	Hemlock Woolly Adelgid present?	Photo taken
1	Found/ Not Found / Can't reach	<input checked="" type="checkbox"/>
2	Found / Not Found/ Can't reach	<input checked="" type="checkbox"/>
3	Found / Not Found/ Can't reach	<input checked="" type="checkbox"/>
4	Found/ Not Found / Can't reach	<input checked="" type="checkbox"/>
5	Found / Not Found/ Can't reach	<input checked="" type="checkbox"/>
6	Found/ Not Found / Can't reach	<input checked="" type="checkbox"/>
7	Found / Not Found/ Can't reach	<input checked="" type="checkbox"/>
8	Found / Not Found/ Can't reach	<input checked="" type="checkbox"/>
9	Found/ Not Found / Can't reach	<input checked="" type="checkbox"/>
10	Found/ Not Found / Can't reach	<input checked="" type="checkbox"/>

Results

On the tree that we checked, we found that HWA had been on five of the ten branches. We only found one or two egg sacs per branch. Our graph shows data points from zero to ten for everyone who looked for HWA at that site. The average was 2.8, the data ranges from 0-5. The mode is five, the median is three. Our photo shows what was left after the HWA had been on the tree. We had no outliers.



Conclusions and Discussion

In conclusion, hemlock woolly adelgid was found in Old Orchard Beach. HWA is affecting forests in our region by killing the eastern hemlock trees. We need the hemlock trees to sustain a lot of the wildlife in our state. We think Milliken Mills has a mild infestation because we only found HWA on seven out of the ten trees we checked, and not a lot on each tree. Out of the seven trees our program checked, we found HWA on 2-5 branches. There were no trees we looked at that had it on more than five branches out of the ten we checked on each tree. Several factors may have influenced the data. There could have been more HWA, but the protocol told us to only check ten branches per tree. My group only checked one tree. We didn't see the fifth, sixth, or eighth grade trees. We have to trust their data. We only checked a small percentage of the trees in Milliken Mills. That's important to know because there are many hemlock trees we did not check. We could go back and check trees we did not get to. Collecting more data will give us a better idea of how severe the infestation is in Milliken Mills.

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