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The Hemlock Woolly Adelgid and the Eastern Hemlock Ecosystem

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Hemlock Woolly Adelgid

Bear O.

Abstract:

The hemlock woolly adelgid has been rapidly spreading since 2003 and is posing a large threat to our native eastern hemlock trees along with the animals that live off them. If we don't find a way to execute our solutions soon, the hemlock woolly adelgid (HWA) will continue to make its way further inland and continue negatively affecting our eastern hemlock environments.

A hemlock tree is a common tree in Maine that provides a large ecosystem for many organisms. You can identify one by its short needles that are square/or flat. The ecosystem has a wide variety of plants, fungi, bacteria, and animals that rely on the hemlocks to survive. For example, porcupines eat the branches of the trees as food and when the branches fall to the ground the deer eat them up and it's an ongoing circle. Plus, many birds live in the forests like black capped chickadees. Lastly, another major factor to keep in mind that the hemlock forests provide is cool environments during the summer which helps the aquatic life by keeping the rivers cool so that brook trout can live in them.

Hemlock woolly adelgid, (HWA) is an invasive forest insect that poses a serious threat to the native forests and hemlock trees in the eastern U.S. It came here from southern Japan where it is a native hemlock pest. HWA has been present on the east coast since the 1950s and likely got there from infested nursery stock. HWA damages hemlocks by their feeding mechanism. When the adelgid inserts its straw into the tree and when it sucks out the tree's sap, it ends up leaving wounds in the tree's tissue/bark causing the tree to drop all its needles on that branch. The cold winters are what kills the eggs and keeps them from spreading north. However, because our winters have been so warm, the eggs don't die and this enables the adelgid to spread north. The HWA is an invasive species because it came from a foreign land and it disrupts the hemlock environment. They have no natural predators in New England so the eastern hemlocks have no defense against it. This is why the hemlock woolly adelgid is a major threat to our native lands.

Once we learned enough about the hemlock trees and the hemlock woolly adelgid (HWA), we knew how to identify the trees and the HWA so we were able to conduct a survey on

the hemlock trees for the Gulf of Maine Research Institute. On March 31 at 8:50 all our groups walked through the woods all looking for a hemlock tree that they could survey. The tree needed to meet a certain number of requirements in order to be surveyable; the first one was that it needed to be a hemlock in the first place. We identified the trees by their rough, scabbed bark and their centimeter long needles that grow in a way that makes them flat, and lastly, it had to have 10 branches that were over 3ft long and were reachable. When each group found their tree, they wrote down the coordinates of the tree and flagged it. We looked closely at the branches the next day and found zero adelgid and we reported our data to the Gulf of Maine Research Institute's website.

I predict that if we don't figure out a way to slow down climate change, the adelgid will continue to spread north like it has since 2003. In 2003 the adelgid was spreading slowly and naturally and this was the first natural occurrence of adelgid in Maine. In 2010, the adelgid spread very far up the coast of Maine all the way to Bristol. The HWA likely got there from boarding cars and traveling on them down the highway. By 2016, the adelgid was actually found on an island in Sebago Lake and got there by hitchhiking on a ferry across. They likely will continue to spread for at least 10 years before we figure out a way to slow down climate change. In 5 years I think Bethel will have a little HWA if not none. In 20 years, Bethel will likely be infested with adelgid because of the rate they are already spreading at. I predict the food web will change greatly over these years because all the animals that rely on the eastern hemlocks will become less inhabitant of the area near the hemlock trees because they will be infested with adelgid and will be dying off. There will be less deer, porcupines, brook trout, squirrels, birds, and many other species.

As you can see here, the hemlock wooly adelgid is posing a large threat to our native eastern hemlock trees and the animals that live off them. If we don't find a way to execute our solutions soon, the hemlock wooly adelgid (HWA) will make its way further inland and continue negatively affecting our eastern hemlock environments. There is a way you can help though! You can survey a hemlock tree near you that has to meet all the requirements that I noted

earlier in the essay. Upload the data to the Gulf of Maine Research Institute's website to help them track the adelgid and figure out a way to stop it!

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