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Hemlock Forest Ecosystem

Rosie B.

Abstract:

Hemlock woolly adelgid is a serious issue that will become much worse in the approaching years. If hemlock trees die off it will completely dismantle many ecosystems because it is such a key stone species. If we don't attend to this problem it will affect our plant in countless ways. Despite this there is hope. If we start taking climate change more seriously and make an attempt to come up with a solution we might not lose these amazing trees.

A hemlock is a common conifer tree in Maine. Often identified for its short square like needles. The ecosystem within a hemlock forest is full of life including plants and animals. Some being deer, salamanders, mice, fishers, and owls. These trees are so important because almost all living things in some way rely on these trees for either shelter or food. An animal that relies on them for food is a porcupine. They climb the tree and eat the bark. Another is a deer; they eat the fallen branches. A salamander relies on hemlocks for shelter. These trees are also very important for trout. In the summer the trees keep the water at a nice cool temperature and in the spring they slow the snow melt so the river does not overflow. In conclusion, a hemlock is a very important tree that many living things rely on.

Hemlock woolly adelgid is an invasive species that comes from southern Japan. An invasive species is something that comes from somewhere else and disturbs the ecosystem. They have no natural predators and other organisms have no defenses. It was first found in the U.S. the 1950s but due to climate change the spread is getting worse. When winters are colder the adelgid eggs die and that lower their population. Since the temperature is rising this invasive species can survive with more ease. They also are spreading further north than have ever been to go before. This could be a

problem for hemlock trees all over the eastern U.S. They infest the trees then slowly kill them by sucking out the sap from the base of the needles disrupting the water and nutrients in the tree. Hemlock Woolly Adelgid will also cause a problem for the whole ecosystem because they rely on this tree so much.

Thankfully the data we collected in our woods shows that we don't yet have it here in Bethel, likely because our winters are still cold. On March 30th, 2022 at 9:00am we took many steps to ensure we got valid data. First we identified a hemlock tree that had 10 branches at least one meter long and marked it with flagging tape. Next we took numerous photos of the tree. Thirdly we searched the ten branches for HWA. Lastly we recorded what we found. Nobody in my group or the other groups found HWA in the woods of Bethel. I was not surprised by this because Standish Maine is the closest the adelgid has ever been to Bethel. This is still over 50 miles away.

I think over time hemlock woolly adelgid will spread further north. The data shows that every year since 2003 when HWA first spread into Maine that it has been heading in that direction. In 2010 the spread of HWA exploded up the coast and in 2016 the adelgid moved the most inland it had ever been to Sebago Lake. Climate change is also amplifying the spread. The winters have been warmer in Maine meaning that the eggs are not dying. I predict that in five years there will be HWA in Bethel's forests, in twenty years our forest will be completely infected and some trees will start to die, and in one hundred years if this problem is not fixed most of our hemlock trees will be dead. This will drastically change the food web and ecosystem in Bethel. Many abiotic and biotic factors rely on these trees for food, shelter, and shade.

Hemlock woolly adelgid is a serious issue that will become much worse in the approaching years. If hemlock trees die off it will completely dismantle many ecosystems because it is such a key stone species. If we don't attend to this problem it will affect our plant in countless ways. Despite this there is hope. If we start taking climate change more seriously and make an attempt to come up with a solution we might not lose these amazing trees.

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