TINY MESSENGERS VIDEO TRANSCRIPT

Hi, Conservation Nation Academy. My name is Zabreya Okyere and I'm a biology major at Smith College. I'm also a Conservation Nation Chrysalis Scholar and I have a guest with me today.

Hi, I'm Mariana Abarca. I'm an assistant professor of biological sciences at Smith College. I'm an insect ecologist, and I study how global change affects the relationships among plants, insects, and their predators.

My interest in nature and the world around me spiked when my parents started taking me on field trips across Ghana. I visited places like a Abure Botanical Garden, Achimota Forest, and Akosombo Dam in Senchi.

Throughout middle and high school, I enjoyed my biology classes and when I came to college, I knew I wanted to pursue a major in biology.

I got interested in nature very young. I had a book of animal photographs that I looked at over and over throughout the years. I grew up in Mexico City, and this book showed a variety of pictures that opened the world to me, like a snow leopard in a tundra, a large ant colony in a tropical wet forest, and penguins at the South Pole.

I would imagine all these animals living their lives in landscapes that look very different from my own. Of these animals, I was most intrigued by insects, so I eventually became an insect ecologist.

Did you know that right now there are about 10 quintillion individual insects living around the world or that 80% of the known species on earth are, you guessed it, insects?

What do they have in common? All insects have three body parts known as the head, thorax, and abdomen.

They are all hexapods, which means they have six legs.

Insects are rich in protein and that's why they are important food sources for wildlife.

My project at Smith College involves restoring the plant communities that insects need to survive and thrive at the MacLeish Field Station in western Massachusetts with the help of Mariana and many more students like me. The field station is part of the Smith College campus and my project focuses on measuring the importance of native plants on local insect populations.

Native plants are plants that are naturally found in this ecosystem.

After working in the lab and learning about many projects, I decided to lead the establishment of a restoration plot at MacLeish.

It is an area of land that was an abandoned orchard, where they used to grow fruit trees, but it is now home to a mixture of invasive and native trees.

Invasive plants like autumn olive and multi flora rose do not naturally occur here. They have been introduced to this landscape by humans, and they displace or crowd out the native plants.

These invasive plants create a problem for native trees, like hemlocks, birches, and pines that are naturally found in this area and in fact have evolved here with the native wildlife for thousands of years. When they are crowded out by invasive plants, the whole forest community suffers.

That's the problem with invasive plants. My study is part of a long-term project to restore abandoned pastures in MacLeish Field Station by removing invasive plants and replacing them with native species, such as black cherry and white oak.

These are species that are very important to an ecosystem.

Did you know that many trees supply the food for caterpillars that grow into butterflies and moths?

Along with many other plant feeding insects, caterpillars are herbivores. Animals that eat plants.

Some tree species like oak and cherry support hundreds of herbivore species. Along with the spiders, wasps, ants, and assassin's bugs that prey upon them.

By replanting these native trees, we hope to bring back or restore the community of insects to this plot of land. Restoring insects is important because insects are an essential food source for wildlife, such as birds and bats.

We expect this plot to change over time as the native tree species are restored. Specifically, we expect that this land will go from hosting a small and relatively poor insect community to hosting a rich abundance of many insects.

I have been collecting leaf litter samples which are composed of fallen leaves, small twigs, seeds, and other debris that accumulate on the ground and forests. I bring these samples back to the laboratory and from them I collect all the invertebrates larger than 1 millimeter and identify them using a microscope.

As the native trees are planted and begin to grow, we expect to find more and different types of invertebrates in the leaf litter samples. We hope that future students will continue to collect the leaf litter data so we could see how things change over time.

Maybe you will be one of those students.

Over millions of years, insects have found homes on every continent on Earth, using all different types of food sources and performing a variety of ecological roles or ecosystem services, including providing food for other animals, breaking down or decomposing dead things, pollinating plants, and even helping to form new soil.

Trees provide critical ecosystem services for people, such as stabilizing the local temperatures, conserving water, reducing air pollution, and providing places for people to hike, ride bikes, and enjoy wildlife.

Removing invasive plants and restoring the native ones along with the insects and other animals that rely on these native plants improves the health of the forest, which in turn enhances the health, well-being and quality of life for people.

What do you think are some things that threaten the life of insects?

Recently, scientists have been alarmed to see that the number and diversity of insects have declined all around the world.

The growth of cities and cutting down forests to grow food have directly threatened the lives of insects. Forest land is being destroyed rapidly and often replaced with crops such as oil, palm and soybeans. At the field station, the natural forest was once cut down to make orchards for growing fruit. This happens all over the world and the consequences affect us all.

Around the world, climate change has also played a role in harming insect biodiversity. Scientists who study insects called entomologists, often refer to the causes of insect declines as death by a thousand cuts. It is the combination of multiple stressors that together cause insect populations to decline.

Some of these stressors include the overuse of chemicals like pesticides and fertilizers in agricultural fields and in people's yards, light pollution in cities and towns that confuses night flying insects and makes them more vulnerable to nocturnal predators.

The introduction of invasive species like the beetle known as the emerald ash borer that kills native plants and the animals that depend on them and the increase of severe weather due to climate change. Events like storms, droughts and the wildfires that result from them are becoming more frequent and can knock back insects.

But how can you help insects? Insects require specific survival conditions during different stages of their life. Hidey holes and shady brush piles that provide shelter, moisture, food, and protection. If possible, people at home should manage their green spaces in a way that meets the needs of insects. Putting a small pile of rocks in a corner of your yard also provides crevices even in dry weather to make good homes for many different insects. Additionally, planting native plant species in yards and other green spaces is an effective way to provide an ideal habitat for insects. Avoiding the use of pesticides is strongly recommended.

A great place to start is by doing a study of your schoolyard to see it from the perspective of an insect. Does your schoolyard have any native trees or does it have native flowers?

Remember that a healthy ecosystem is the best home for insects. We hope you can share what you've learned with your family and friends. Remember to protect our little but mighty friends and keep on learning with Conservation Nation Academy!