

## Transcript:

Have you ever considered the complexity of Oregon's forests? This past summer I had the opportunity to dive deeper into the complexities of Oregon fire ecology from a sustainability standpoint. I worked on three different Ph.D. student projects to explore these connections and how their research can impact the future of research and forest management.

I would like to take a moment to thank these students, Claire Tortorelli, Graham Frank, and Andrew Merschel. As well as my mentor, Meg Krawchuk for providing me with this unique opportunity to explore fire ecology more. I would also like to thank the College of Forestry Forest GUMP program for providing funding.

Sustainability is the ability to provide for the needs of the present without compromising the needs of the future through the integration of social, economic, and environmental factors. In forestry, managers and researchers tend to place most focus on the environmental dimension, but there are many social and economic factors that need to be considered when managing an ecosystem. The services provided to us by forests could prove to be impossible to quantify. These projects focus on understanding the environmental side in order to make sound decisions that benefit economic and social values. While fire may seem dangerous, and the fire happening in Oregon right now is. We need fire in order to protect our forests and communities, we just need lower severity and more frequent fire. Many species depend on fire for reproduction, habitat creation and diversity, fuels reduction and so much more. But we also understand the dangers and that's why we need more comprehensive studies and to approach fire ecology from a sustainability standpoint.

The first project I worked on focused on understanding factors that lead to a non-native plant's ability to establish in an ecosystem. This knowledge will help to prevent future invasions from similar species in similar ecosystems as well as understand how to control it when invasions do occur which saves money and species from being threatened. We can also educate the public about the implications of non-native species and how to manage for them

Next, I worked to identify ground beetle species to determine species diversity and abundance. These species establish in ecosystems after a disturbance such as fire or a clearcut. The species presence can indicate the ability of an ecosystem to recover and function because they have a wide variety of habitat requirements and life history strategies. I also pinned ground beetles for a collection to vouch for our identifications and provide permanent records of the occurrence of the carabids. Something cool from this research is the collection of the beetle pictured on the left. *Stomis termitiformis* is a carabid that has only been collected 13 times since its discovery. 3 of which were found during this study!

Last, I have been working to measure tree rings on cross-sections and cored samples to help with the reconstruction of historical fire regimes. There are patterns from climate in tree rings that are visible across landscapes. The tree rings will also scar when there is a fire. Using the combination of the measurements and fire scars, a story can be told about what Oregon's

forests previously looked like. This research will help us to understand how often fire should be on the landscape and create management plans that lead to a healthier forest and prevent mega-fires like we are seeing right now.

To make the connections between these projects and sustainability, I applied systems thinking. Systems thinking is thinking of every possible connection you can to an idea. In this case, I connected fire ecology and sustainability. Over the summer, my involvement in the research projects consisted of menial lab data collection which gave me a lot of time to think about their importance to the research and how the research will affect fire ecology. Only a sample of the connections I made are illustrated in this systems map. An idea that I found interesting to ponder was clearcutting and timber. This idea leads to economic and social benefits from wood production and jobs, but clearcuts also lead to some ecological downfalls. These pros and cons must be weighed when making decisions on approaching fire ecology. I found that almost every idea that connected to fire ecology also connected to sustainability. Leading me to conclude that as a future natural resource manager it will be vital to consider sustainability whenever I am thinking about fire ecology in order to work towards an ecosystem that will provide for future generations.