This is Wisconsin Water News, a production of the University of Wisconsin Sea Grant Program. I'm your host, Marie Zhuikov. Today's episode is:

The Stories Trees Tell

On a cool, sunny spring morning among the pines on Wisconsin Point along Lake Superior, a mix of Native and non-native people gathered in a circle with the scent of wood smoke and sage in the air. The small group was performing an opening ceremony for "Nimaawanji'idimin Giiwitaashkodeng." This is the Anishinaabe name for a Wisconsin Sea Grant-funded research and outreach project designed to explore how the Anishinaabe people connected to and homesteaded the lands of "Zhaagawaamikong Neyaashi" (Wisconsin and Minnesota points) and how they used fire to manage the landscape. The project name translates into "We are all gathering around the fire."

Melonee Montano, a Red Cliff tribal member and a University of Minnesota graduate student who is one of the investigators leading the project, described why the ceremony was held.

"…to basically let the animals and plants and trees and the spirits there know what our intentions are as far as the research. We were asking for permission to be able to carry out that work there from those beings that are there and also just asking for any guidance that they could potentially give us moving forward so that we do things in the right way."

Montano said that as the ceremony continued, a deer emerged and stood at the tree line, looking at the group for at least 20 minutes.

"She just hung out for a long time, checking us out, wondering what we were doing. For me, that was a real good sign that what we're doing is OK, and especially in reflection of how much support we've gotten for this too, so it just keeps feeling like this is an OK thing. It should happen."

Later, in June on the first day of summer, a larger ceremony was led by Ricky DeFoe, Fond du Lac Elder and spiritual leader. The ceremony brought over 30 members of stakeholder groups together to publicly open the project. It included representatives from the cities of Superior and Duluth, the Great Lakes Indian Fish and Wildlife Commission, University of Wisconsin-Madison Extension, the Douglas County Board, Sea Grant and the Fond du Lac Band of Lake Superior Chippewa. As the group stood around a sacred fire, DeFoe talked about the need to reconcile history and come together to heal people and the land.

Wisconsin and Minnesota points were home to the Anishinaabe people for hundreds of years before the forces of settler-colonialism began threatening their relationship to the area. Treaties and federal legislation drew explicit lines around reservations and industrial interests began to covet Zhaagawaamikong Neyaashi.

As the Anishinaabe presence diminished, their influence on the land weakened as well, including a decline in their use of "Ishkode" (fire). Settlers suppressed Ishkode and the landscape changed, losing biodiversity and resilience.

Research project reaches into the past

Managed by Evan Larson, professor of geography and a dendrochronologist with the University of Wisconsin-Platteville, the Nimaawanji'idimin Giiwitaashkodeng Project seeks to combine tree-ring data

with Indigenous Experiential Knowledge. That's the deep understanding that Indigenous people have developed through millennia of close observation of and engagement with the ecological webs of the Great Lakes Region. This understanding, sometimes also referred to as Traditional Ecological Knowledge, puts data derived from tree rings into context in terms of Ishkode as an ecological and cultural process. The ultimate goal is to restore the cultural use of Ishkode to increase the resilience of the ecosystem and to maintain "miinan" (or blueberries), a key traditional food source among the Anishinaabe.

Montano said miinan are one of the important first foods for the Anishinaabe, along with strawberries, wild rice, maple syrup, deer, rabbits and others.

"We've, of course, moved away from blueberries and the other first foods these days for multiple reasons like government commodities and smaller land bases, but also some of our connections or knowledge on how to gather them or the importance of them has decreased over time."

In October, Larson and a team of four undergraduate students from Fond du Lac Tribal and Community College and the University of Minnesota Duluth visited Wisconsin Point to search for downed and dead trees to sample for the project. They were seeking signs of past Ishkode or tool marks etched into the rings of trees that could be used to learn more about the history of the place.

They gathered at the Lake Superior Estuarium in Superior, which housed slices of wood they had collected on two previous outings. Mocha Reynolds, an environmental science major, pointed to places on the samples where the tree rings had been interrupted.

"This one, you can see where people have like peeled the bark away. The tree healed then and like grew around it. But the scars are still evident in the like growth record. And you can also see like there's been a couple of fires that have touched this tree in its life. And we feel like there's a pretty good chance that those were prescribed burns. Those were like the Anishinaabe."

The samples will be sanded and polished to make it easier to see individual growth rings and any interrupting patterns that tell of past fires or peel scars.

Of food, medicine and resin

Larson explained that people might have peeled the bark off the tree for a variety of reasons. Sustenance is one. During starvation periods, the starchy inner bark of trees can be used for food. Different parts of the inner bark might also be incorporated into medicines.

He also said that the provisions provided by trees on the points were likely linked to the daily lives of the Anishinaabe, particularly how they traveled in the area in birchbark canoes.

"One of the very utilitarian purposes is that after the bark is scraped off these trees and the resin starts infusing into the wood, a lot of times, that will boil up to the surface and you can gather that resin and then that's one of the ingredients that goes into the gum that you would use to build and repair birchbark canoes. So, those black seams that you see on canoes, part of that black material, that is resin from pines or other species. But a lot of times, it was pines."

Each sample that Larson and the students collected was labelled. Using the techniques of dendrochronology (or tree-ring science), the team will be able to determine exact calendar years of each Ishkode and peel scar from the samples.

"That information then can be used to understand, okay, when there was a fire, did it burn the whole point, or did you have a small fire over here one year, and a small fire over there another year? That will start to give us a sense of the spatial aspects of how fire and people interacted with the landscape."

Larson compared the process the research team uses to find collectable trees to instructions he saw once on a chocolate truffle package.

"It said to truly experience the truffle, first you look at it, then you smell it. In a way, these are the same because of that resin that Mocha was talking about. It's just infused throughout the wood. So, these stumps, they're from trees that have been dead for 100 years or more in some cases. And on that first draw of the saw, the wood chips fly and all of a sudden you just like, (sniff), *you can just smell the resin. And that's … yeah."*

Reynolds: *"It's a really good smell."*

Red pine and white pine reproduction

Sound of people walking through underbrush

The team then drove to the end of Wisconsin Point, where a lighthouse and shipping canal are located. After making a tobacco offering to Lake Superior, Larson and crew traipsed inland into a red pine forest. During the hike, Larson offered his perspective on the current landscape.

"You can still see the legacy of fire here, like blueberries and red pine. But if you look at the lower layer now, there's no red pine and a lot of hazel. All of the new pines coming up are white pine, which is more shade-tolerant than red pine. White pine seeds can get through a little bit of duff. Red pine seeds, when they fall on this, they just land on the needles and litter there. They can't get to the mineral soil to germinate. So, all these red pines will cast seeds for the rest of their lives, but they will very likely never actually result in a baby pine tree until there's a fire."

The students had already mapped some stumps and downed trees to investigate. When they rediscovered one, Reynolds did something surprising. She kicked it. She explained this is done to make sure the stump or snag is solid. That indicates the tree had scarring during its life and had produced resin to heal. The resin makes the tree sturdier. So far, so good.

Larson pointed out a triangular wound that began on the trunk and extended wider to the base at ground level.

"And so what that generally is, is the healing mode of a tree that's been damaged by fire or peel and it's starting to heal over that wound."

He chainsawed though the tree and extracted an inch-thick sample. Valerie Zhaawendaagozikwe, an environmental science major, noted an Ishkode scar. Larson pointed out three more, possibly from a peel and other fires.

Anishinaabe Chief Osaugie was one person connected to Wisconsin Point in the past. He was a renowned canoe-builder and must have gathered resin to make the gum for the canoes.

"So, to see a peel scar on this stump – to all of a sudden realize that, I mean, we don't know who made that peel, but it could've been him. So that history is like, right there, in y'all's hands, covered in moss. So,

those are the stories that we're engaging with through the help of the trees right now. That's heavy. That's pretty cool stuff."

Emily Lockling, a geographical information science student, carefully mapped the sample's location.

As they searched for another sample, Zhaawendaagozikwe explained what drew her to participate in the project.

"I grew up on the West Coast, so I grew up seeing culturally modified trees, like the cedar trees. People still peel them for hats, and baskets, clothing and stuff. So, when I grew up out there, I was always like, 'Oh, you can tell that that tree's been peeled by the Natives, you know.' When I came here, I got an email about it. Seeing them talk about culturally modified trees, I didn't know that that's what it was called. But when I read into it, I'm like this is really cool. I would enjoy this work because I already had an idea of what it is. I also being outside."

Sound of sawing and an eagle calling.

The team crossed a road on the point, moving closer to the lake. As Ashla Ojibway, another environmental science major, demonstrated how they use a hand saw to get samples from stumps, a bald eagle called above her. Remember the deer from the beginning of the story? The eagle, it seemed, approved of the project as well.

The importance of capturing stories

Just as the landscape chronicles the past, stories held by people are also important for understanding this place more completely. As snow begins to cover the land, Montano will be working with Elders and community members to gather memories and stories of Zhaagawaamikong Neyaashi, Ishkode and miinan.

To ensure that information from the project reaches a broad audience and engages in societal change, Montano and Larson are creating an illustrated children's book with the help of Robin Wall-Kimmerer, noted author of "Braiding Sweetgrass," and distinguished professor and director of the Center for Native Peoples and the Environment at the State University of New York. The book will be published by Black Bears and Blueberries Publishing, a Native-owned company, and will be distributed to teachers and students through another Sea Grant-supported project called Rivers2Lake.

Montano is applying her interviews with Elders to the children's book but also to her graduate research about the relationships between Ishkode and people. She described the topic of her interviews as,

"Basically, looking at who fire is as a being rather than what fire is."

The Anishinaabe believe that Ishkode has a spirit, similar to their beliefs about animals and other aspects of nature.

To reach scientific audiences, Larson and his students will present their results at the American Association of Geographers Annual Meeting in spring 2023. Montano, Larson and students will also be giving a public-friendly presentation for the River Talk series in January 2023.

Back on the field trip, the team wasn't as lucky with the last sample they collected. Although the stump passed the "kick test," the inside heartwood was completely decayed and there weren't enough intact rings.

"From a tree-ring perspective, we don't have enough material to work with this sample. We know it was a peel. We know it holds that information. But for this study, that's as far as we can go, which also really shows the urgency of doing this work now because these injuries and these scars on these trees are from a time hundreds of years ago that is an expression of people and their connection to place.

"Through a huge range of reasons -- legislation, boarding schools, treaties, the systemic racism that has engendered a systematic approach to what boils down to genocide in a lot of ways, has taken this relationship and put it on pause. So, these trees have been living on this land, carrying this story and these relationships in their rings for all this time, but trees die, too. These trees are now old. That story is long enough ago that these trees are the last vestiges of that tangible legacy. That's why we're doing the work now so that we can capture that story now before it turns into dust."

Other partners in the project include representatives from the Minnesota Department of Natural Resources, the Lake Superior National Estuarine Research Reserve, the Lake States Fire Science Consortium, the University of Minnesota Cloquet Forestry Center, and St. Anthony Falls Communications Manager Clare Boerigter, retired Wisconsin State Archaeologist John Broihahn and Duluth-based visual artist Moira Villiard.

That's it for this episode of Wisconsin Water News, just one of the ways that Wisconsin Sea Grant promotes the sustainable use of Great Lakes resources through research, education and outreach. Listen and subscribe to us through I-Tunes and Google Play or at seagrant.wisc.edu. Thank you to Melonee Montano, Mocha Reynolds, Evan Larson, Emily Lockling, Valerie Zhaawendaagozikwe and Ashla Ojibway, and thank you for listening.