

Pacific Northwest

Colville Tribes: Climate Change and a Growing Wildfire Threat



In 2000, the Confederated Tribes of the Colville Reservation in eastern Washington struggled with the impacts of an 80,000-acre forest fire. In 2015, forestland in and around Colville was struck again, this time burning over 200,000 acres. On the heavily forested reservation, climate change has likely contributed to long-term drought, which brings fire, choking air, property destruction and other threats to the community. Rains after an intense wildfire has baked the soil and stripped

away vegetation usually result in floods. A tribal member's house lying tilted and broken in a local creek serves as a poignant reminder of the growing peril the changing climate brings to the Colville community.

Forest Fires: Immediate and Lingering Impacts

In mountainous country, where absorbent vegetation and soil are crucial to water retention, flooding nearly always follows an intense fire. The house that was ripped from its foundations and carried into an over-swollen creek represents just one aspect of the risk. Deluges that often follow intense wildland fires close roads, barring access to schools, workplaces and health facilities. Runoff taints nearby soil and water supplies as it distributes toxic animal wastes and a rank stew of modern-day chemicals. Vegetation-absorbing topsoil is baked, stripped away and carried downstream along with tons of debris that settles in unwieldy clumps. Streams and other watercourses are rendered less supportive to aquatic life.

"Forest health is directly tied to climate," says Kris Ray, the tribes' Air Quality Program Manager. "If you get a stressed forest, it burns easier. There are a lot of factors that cause large fires—most are lightning-caused, but stress from changing precipitation patterns, longer droughts and higher temperatures in summer increase the likelihood of a major burn, all factors expected to be exacerbated by climate change. We're also seeing bug invasions [bark beetles, which weaken trees] that are likely tied to climate. Our firefighters are the best in the world, but we haven't had the resources to get them out to all the fires. That will continue until there's more funding for fire control, both on- and off-reservation."

***Kris Ray:** Colville's Air Quality Program Manager, has helped create a "Smoke-Ready Tribal Communities" education program that helps tribal members and others understand the impacts of wildfire and presents ideas on how they can reduce their exposure to air pollution before, during and*



after fires. Photo courtesy of Colville Tribe.

Breathing Spaces

Air quality takes a major hit during any forest fire, especially a large, extended one. Ray measured particulate pollution inside tribal buildings during the 2015 fire and found that even by sheltering indoors, residents were exposed to high levels of smoke. A big part of his job these days is helping people prepare for and deal with wildfires. That includes educating them on ways to minimize smoke inhalation during fires as well as reducing air pollution between those events by means such as increasing woodstove efficiency and carefully planning backyard and agricultural burning. By presenting such "Smoke-Ready Tribal Communities" concepts to community members, he says, "we can cut down on our yearly smoke load, because it does affect peoples' health."

Water and Climate

The Colville Tribes' Wildlife Policy Analyst, Sheri Sears, describes some of the numerous impacts of uncontrolled blazes on the natural world in and around the reservation: "The 2015 fires took out a lot of timber at very high intensity, causing hydrophobic soils; it's estimated that the sediment discharge into the Okanogan River was about 50,000 times greater than what we usually see." Such changes can severely stress aquatic creatures that rely on clear waterways and their estuaries.

Climate-linked weather changes can attack water dwelling wildlife in other ways. "The water is getting warmer," Sears points out. "We're getting data on how our streams and lakes will change by 2040 and 2080; there will be a significant amount of warming in which the temperatures could be lethal to fish." Those conditions are aggravated by burns that denude streamside vegetation, which cloud water and reduce shade, further increasing the rate of stream warming. "We've also had stream courses shifting more than usual," she says.

The Case for Beavers

In the 1800s, biologists estimate, some 50 million beavers lived throughout the Pacific Northwest. Trappers eliminated most of them before the turn of the century, and with the loss of nature's premier engineers went a crucial piece of the ecosystem's balancing act. At Colville, the value of those wild neighbors is more apparent as climate change impacts conditions in the high country, decreasing snowpack in favor of rain events, and intensifying warm-season rains, which can result in flooding and erosion.



Beaver: *Beavers at Colville are being trapped and transplanted from lower parts of the reservation to the high country, where their dams can help manage climate-related changes in precipitation and seasonal runoff. Photo source: Wiki Creative Commons.*

"Beavers are a keystone species," says Sears. "They change stream patterns and store tremendous amounts of water high in the watershed, keeping it from running down rapidly as rainfall. The beaver dams store water, but they don't hold it; it trickles out in slow amounts in summer through fall, so the streams stay fuller and cooler. Beaver dams collect sediment, too, and fish can move through them."

The industrious, dam-building critters—often considered nuisances due to the trees they down and the congestion they sometimes cause in and around local waterways—offer a natural advantage to the Colville community. "We've been trying to capture beavers in 'bad' locations—near roads, homes and other places—and move them up the mountain. The goal is to keep the water as high as possible for as long as possible. Beavers are excellent at it; they've been doing it forever. So why not get them back where they belong?"

Solutions Old and New

Returning beavers to their high-country homes is one example of the tribe's use of Traditional Ecological Knowledge to address climate-related problems. "We have a TEK group that meets regularly," says Sears. "We'll be putting a survey online with questions for tribal members to answer. We'll also be going out to senior groups in the different communities and talking to elders directly, asking them about changes they've seen and ideas they have on climate change. That will be included in our Adaptive Management Plan."

The University of Washington's Climate Impacts Group is assisting in the search for climate-related solutions. "Their climate assessment will help us understand what to expect in the future based on temperature and precipitation. We have questions about wildfires and weather, and we've selected several plants [for the assessment]—medicinal and food species—and several animals. Each added species costs more [to manage], so we're aware of that and have tried to group them into guilds of animals that use the same types of resources. That way we'll get more for our dollar."

Amelia Marchand of the Colville Tribes' Environmental Trust is pursuing another climate-related angle with the development of a tribal Food Policy Council. Marchand says, "I've heard from different food gatherers that the roots are coming in at different times than before. The Camas plant is a good example—that's an important plant in our area. Even though they might be ready for harvest, the weather makes it difficult for people to actually do the harvest. A lot of berries are coming in later, too." Tracking such changes will help the

Council to develop harvest calendars and identify other factors such as invasive species, such as encroaching Scotch Broom, that might threaten local plants important to the tribes.



Camas: *Camassia*, a tuber commonly known as camas, is an important food source for Northwest indigenous people. Photo source: Wiki Creative Commons.

"We have right now an Integrated Resource Management Plan," Marchand says of the tribes' evolving approach to climate adaptation, which includes analyzing tribal codes and cultural practices to find more-adaptive responses, such as specifying where new homes can be built in relation to streambeds and teaching tribal youth to prepare and store traditional foods (e.g., canning berries) to access in times of emergency.

By blending ancient approaches and newer ecological understanding, the tribe is working toward comprehensive solutions to the climate stresses that are sure to come. Marchand says of integrating the new with the old, "We're hoping that as new science is learned and applied, we'll integrate some that information into our existing plan to make our reservation, our resources, our communities more resilient and adaptive."

This profile was developed in 2018 by Dennis Wall, Institute for Tribal Environmental Professionals, Northern Arizona University, with financial support from the Bureau of Indian Affairs. The profile is available on the Tribes & Climate Change website:

www7.nau.edu/itep/main/tcc/Tribes/. The tribal climate change profiles featured on the website are intended to be a pathway to increasing knowledge among tribal and non-tribal organizations interested in learning about climate change mitigation and adaptation efforts.

For more information please contact:

Nikki Cooley, Co-Manager

- ☐ 928/523-7046
- ☐ Nikki.Cooley@nau.edu

Karen Cozzetto, Co-Manager

- ☐ 928/523-6758

□ Karen.Cozzetto@nau.edu

Citation: Wall, D. (2018) Colville Tribes: Climate Change and a Growing Wildfire Threat, April 2018.
Climate Change Program, Institute for Tribal Environmental Professionals, Northern Arizona University.
Available at: www7.nau.edu/itep/main/tcc/Tribes/pn_colville

© 2018 Arizona Board of Regents
Northern Arizona University, South San Francisco Street, Flagstaff, Arizona 86011