May 2023

Notes of a Naturalist

A newsletter bringing you the species, landscape, history, and happenings of the Taft-Nicholson Center

Trees on the Brink

Some species push the limits of where a tree can grow. In the Centennial Mountains and nearby ranges, one of these high-elevation superlatives is the whitebark pine. These trees are known for their ability to grow closer to the treeline than most other species. On exposed mountain slopes, they have to contend with heavy snow loads and high winds. Here, whitebark pines grow gnarled and twisted, a formation known as krummholz. They grow slowly in this environment, taking a long time to reach maturity. The oldest recorded whitebark pines are over 1,000 years old. But the most impressive aspects of these trees might not be their age or their durability, but the important roles they play in this rugged ecosystem.

Whitebark pines are a keystone species, meaning they provide crucial ecosystem services and without them, subalpine habitats in the northern Rocky Mountains would drastically change. They have nutrient-packed seeds that are a prized food source for many animals, including several bird species like Clark's Nutcracker, small mammals, and even grizzly bears. With their high fat and protein contents, the seeds are highly sought after as a pre- or post-hibernation snack for bears.

But these trees provide much more than buffets for local fauna. Wildlife also find shelter among whitebark pine communities, including elk in their summer ranges. They provide necessary protection for other plants, providing them with a chance to survive in harsh habitats. They even play an important role in local watersheds. Shade from these trees helps retain snowpack later into the season. This contributes to more sustained waterflows through the summer, which is crucial for the drought-ridden landscapes found throughout the intermountain west.

Photo Credit: USFS/ Richard Sniezko

Sadly, these trees are in decline throughout much of their range. A study in 2016 estimated that of all standing whitebark pines throughout their range, 51% are dead. This past winter, the US Fish and Wildlife Service officially listed the whitebark pine as a threatened species, noting the various risks they face. Most notable among these is white pine blister rust, an introduced species of fungus that spreads from currants (*Ribes* species) to pines. Like many other pine trees in the region, they are also threatened by increases in mountain pine beetle populations. Extreme drought lowers their defenses and leaves them more vulnerable to fungal infection and bug infestations. And changes in fire regimes have caused these sun-loving trees to be overcrowded by other, more shade-tolerate species and have led to larger and more catastrophic wildfires. Among these other threats, the future of this iconic and necessary tree species is uncertain in the face of climate change.

This past winter, the US Fish and Wildlife Service officially listed the whitebark pine as a threatened species. While this designation alone won't save these iconic trees, it does provide more protections and pave the way for more collaborative conservation efforts.

Whitebark pines share a unique relationship with Clark's Nutcrackers. These jay-like birds will feast on a variety of foods, but they are whitebark pine seed connoisseurs. Their strong, sharp bills are made for prying cones open to retrieve the nutritious morsels within. Every summer and fall, these birds stock up on pine seeds and stash them for the winter. An individual bird will have thousands of cache sites containing about 5 seeds each, up to 20 miles away from the parent tree.

They can locate their stash sites with impressive precision using nearby landmarks and objects to create a mental map. They can remember the locations of these individual sites up to 9 months after their initial hoarding, which allows them to keep themselves fed throughout the winter. Because of this reliable winter food supply, nutcrackers are able to breed earlier than most bird species in the region, as early as January or February, even while everything is still blanketed in snow.

Clark's Nutcracker Photo Credit: NPS/ Jim Peaco

But even their photographic memory forgets a few things, and a nutcracker's misplaced seeds become the next generation of whitebark pines. Because they tend to fly long distances with their stash and bury their seeds at an ideal depth for germination requirements, nutcrackers are fantastic seed dispersers. So much so that whitebark pines almost exclusively rely on these birds to distribute their seeds. This unique relationship means that the future of whitebark pines also depends on these birds.

Early Season Updates

We have some exciting new additions to campus: SAGE wildlife and weather sensors. Installed late last fall, these sensor arrays are part of a larger network that includes 108 locations across the country. They collect and process nearly instantaneous data, including temperature, precipitation, air pressure and air quality measurements. Cameras and microphones that detect bird calls also help track wildlife presence and annual migrations. As an added bonus, they're a great way to catch up on Centennial Valley sunrises from afar.

Follow this link to check out the data and images the SAGE sensors have been collecting.

Meet the Artist: Sandy McDermott

We are excited to be kicking off our Artist-in-Residence season! Our first artist, Sandy McDermott, will be staying with us from May 20-June 15.

"I was raised in New England where I received a BA in Art from Salem State University with a minor in Biology in 1991. I next received a Graduate Certificate in Natural Science Illustration from the University of California at Santa Cruz, leading to an internship at Bryce Canyon National Park in 1992. I pushed my education further by completing Mass Audubon's Birder's Certificate program in 2013.

Early career projects include book illustration, t-shirt designs, business identity logos, signage, brochures, murals, and magazine articles. As a teaching artist since 1998, I have been sharing a passion for connecting with the natural world through observational drawing and keeping a field journal, and have been practicing as a freelance Natural Science Illustrator since 1992.

Much of my mid-career ambitions were focused on exploring and establishing a painting style. That pursuit began with four years studying under two New England watercolor masters. In practice, it's a life-long pursuit!

My identity as an artist is deeply woven into my love for natural history, led by a sense of curiosity, stewardship and joy. I love being outdoors and feel honored when a moment is shared with another creature. No matter what direction my art moves, it will always be entwined with nature, whether through form, color, subject, or medium. My intent is to bring colors, shapes and movement together in an abstract representational way that gives life to my paintings.

Recently, writing has woven its way into my work. I have long wanted to write and illustrate my own books. Two are currently on my worktable; one connecting me to Alaska, the other connecting me to the phenomena of bird migration.

After raising our daughter on the seacoast of New Hampshire, my family moved up to the Mount Washington Valley in the northern part of the state for three wonderful years. My husband and I are now living in Alaska for a time. Who knows where next? My field journal is always ready to explore the place where I am.

You can follow my work on social media and/or sign up for my monthly newsletter sharing exclusive journal work as I explore Alaska and beyond with my field journal."

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Artist photo courtesy of Sandy McDermott