

In its first season, the Clark's Nutcracker Citizen Science Project produced scientific data and meaningful learning opportunities. Over two hundred students from the National Outdoor Leadership School (NOLS) and Teton Science Schools (TSS) participated in surveys spanning the length of the Wind River Mountains. Now, Dr. Taza Schaming is putting these data to work for conservation as she investigates the habitat use of a seed-dispersing bird that's intricately linked to the health of our high-elevation forests. Preliminary results indicate that NOLS-powered Clark's nutcracker habitat models are comparable to those run with professionally collected data.

56



SURVEYS FOR NUTCRACKERS in Wind Rivers and Tetons



>48



TOTAL HOURS SPENT LISTENING for birds in the mountains



Navicula boyntonia, a diatom species named after citizen scientist Bev Boynton

What is Citizen Science?

Citizen science is a growing field in which non-scientists contribute to research. As shown by the 2007 discovery of a <u>new astronomical object</u> by a Dutch schoolteacher, everyday people can accelerate scientific outcomes every day. Closer to home, a scientist named two <u>new algae species</u> for the farranging Wyoming woman who volunteered water samples from her travels in the Wind Rivers and the Arctic. Nationwide, citizen science plays an increasingly critical role in <u>monitoring</u> <u>bird populations</u>. Unfortunately, reliable citizen-driven efforts such as the Christmas Bird Count may not capture the population status of birds in remote locations.

This summer, NOLS and TSS made a difference for birds in the wilderness.

Scientific Perspective from Dr. Taza Schaming

"I have been studying Clark's nutcrackers in the Greater Yellowstone Ecosystem since 2009. But even with the help of dedicated field assistants, I am only able to collect so much data. By participating in this project, NOLS students and instructors directly aided my ongoing research which is critical to conservation of both Clark's nutcrackers and whitebark pine. The data collected last summer allows me to test my models of the relationship between Clark's nutcracker occurrence and habitat over a much larger area. This is particularly important because Clark's nutcrackers move over an extensive area, and like passenger pigeons, large declines of these important seed dispersers may go undetected because of their movements. Long-term citizen science data will enable me



Dr. Schaming works with the Cornell Lab of Ornithology out of Ithaca, NY

to better understand how declining whitebark pine habitat is impacting Clark's nutcracker populations."



Citizen Science as a Teaching Tool

"I would say that citizen science is a valuable tool to help us provide great experiential education that connects to our student's lives. But I wouldn't say that it's a silver bullet—like any tool, what matters most is how you use it to accomplish your goals." – John Gookin



Last summer, we conducted interviews and sent out online surveys with the intention of improving the Clark's Nutcracker Project. If the people behind citizen science projects better understand the goals of instructors, then they can design projects with greater potential to inspire participation, serve students, and stick around.

Likelihood of Participating Next Year

(35 instructor responses)



Next Steps for Summer 2017

"From my perspective, one of the things that I really want us to be doing on NOLS courses is fostering a sense of stewardship amongst our students for wild country. " – Andy Blair

"That's where we shine is when we find ways to engage our learners in a process rather than just telling them about something." – Jamie O'Donnell

"NOLS is great at getting people out there, and now we need to do something. We need to do more while we are out there."–**Clair Parrish Smith**

Though the specifics won't be finalized till we finish crunching data, we intend to make some changes for next season. The habitat assessment will be greatly simplified and reduced. Also, we hope that program supervisors will ask a specific question about the citizen science experience in debriefs to help us assess how students are benefitting from the project. In 2016, instructors showed an amazing willingness to report GPS coordinates for the nutcrackers they encountered outside of surveys, but we will keep the ten-minute survey because this systematic approach to data collection has an immediate application in conservation research. However, after consulting with the Forest Service, we will people to report their sightings of red-needled, dying whitebark and exceptionally healthy, conebearing trees when convenient.



Citizen Science: Respected by Land Managers

"I do think there is a big role for citizen science to not only generate data, but also develop people's connection to the land. If people are paying attention to what's around them, they are more likely to care about that place and develop a relationship with that place."

– Linda Merigliano, USFS

Merigliano received the 2016 Aldo Leopold Award for Wilderness Stewardship for her role in managing wilderness areas in the Bridger-Teton National Forest.

The Clark's Nutcracker Project is high-elevation education with a mission.

Together, a boisterous bird and a tough tree bring life to the mountains and can bring mountain classrooms to life. Under the canopy of a whitebark pine forest, students can grasp the sturdy tree trunks, the sticky purple cones, and the concept of a keystone species. Whether or not they remember the word "symbiosis," students won't forget the raucous calls of the Clark's nutcracker and its role as a seed-dispersing champion for the trees. As they weather storms, summit peaks, and look down on swaths of dying trees, we hope students realize that Wyoming's mountains are equal parts impressive and imperiled. Participating in scientific research in remote places is one concrete way for the outdoor education community to contribute to the health of wilderness ecosystems.

Thank you to the instructors, program supervisors, and other administrators for showing excellent leadership in service to wild places through citizen science!

