by Caitlin Potter

Radio tracking turtles, monitoring monarch butterfly arrival dates, studying the health of lakes and rivers, collecting high-quality data on rainfall and temperature - you need a science degree to do those tasks, right? Scientific research is often portrayed as something reserved for folks with pocket protectors, years of formal training, and degrees in '-ology' sorts of fields. However, it is becoming apparent that the contributions of everyday observers, regardless of background, are essential to understanding the world we live in. Professional scientists increasingly rely on the knowledge, skills and observations of community members to answer important questions about the natural world. Citizen science projects allow for this type of collaboration.

What is "citizen science"? The founders of the online science collaboration platform SciStarter write "Science is our most reliable system of gaining new knowledge and citizen science is the public's involvement in inquiry and the discovery of new scientific knowledge." Regardless of your age, education level, time availability or physical location, there's a citizen science project out there for you. Interested in weather and history? Check out the Old Weather project, where community members have already transcribed more than 1.6 million weather records from 19th century sailing ships. Scientists use this data to improve climate models and to understand past weather patterns in the Arctic. Are invasive species more your thing? The U of M Extension coordinates Forest First Detectors, Wasp Watchers, Great Lakes Worm Watch and the Aquatic Invasive Species Detectors to get people like you out in the field and on the front lines to help land managers and policy makers protect Minnesota's wild landscapes. Or maybe you've been dreaming of a safari adventure? Classify African wildlife as part of the U of M's Snapshot Serengeti project - citizen scientists have classified millions of photos over the project's 10 seasons, and their data has contributed to several scientific papers. Incredibly, animal identifications by citizen scientists agree with expert IDs 96.6% of the time! Imagine how long it would take scientists to go through this volume of data without your help, and you'll get a sense for the value of your contributions.

At Cedar Creek, we welcome the contributions of citizen scientists to several long-term datasets. In this newsletter, you'll read about a few opportunities to get involved. Make sure to check out the citizen science pages of the U of M Extension, the MN Pollution Control Agency, and other local organizations for more projects, as well as online platforms and project finders like Zooniverse and SciStarts. There's something out there for everyone, and your contributions are hugely valuable!
Field Notes, Fall 2017

Studyng Seasonal Changes

by Chris Buyarski, Staff Scientist

"From the beginnings of history, people have searched for order and meaning in [seasonal] events, but only a few have discovered that keeping records enhances the pleasure of the search, and also the chance of finding order and meaning. These few are called phenologists." – Aldo Leopold (1947)

Phenology, the timing of seasonal biological events such as when plants flower, birds migrate and leaves change color and fall, has provided the most compelling evidence to date that plants and animals are responding to changes in climate across the globe. Indeed the Intergovernmental Panel on Climate Change recognized that “phenology … is perhaps the simplest process by which to track changes in the ecology of species in response to climate change.” Across Minnesota temperatures have risen by ~2 degrees F over the last 50 years and are projected to rise ~7-9 degrees F by the end of the century. Phenology provides an excellent and tested indicator of climate change response.

Chris and Rebecca also started the Minnesota Phenology Network (MNPN), which is an organization built for citizens and researchers interested in Minnesota phenology. As a result of this project, several citizen datasets have been collected from around the state and published on the MNPN website for public use. If you’re interested in learning more about Rebecca and Chris’s research or Minnesota phenology in general, we encourage you to attend the annual Minnesota Phenology conference at the Itasca field station on Oct. 20-22nd or to become a citizen phenologist in your own backyard using apps like Nature’s Notebook!

As always, get in touch if you have Cedar Creek or citizen science stories to share!

Sincerely,
Dr. Caitlin Barale Potter
612-301-2602, caitlin@umn.edu

To learn more about or get involved with phenology research in Minnesota, visit https://mnpn.usanpn.org/
Red-headed Woodpecker Update

by Candace Stenzel and Jesse Beck, Research Technicians. Photos by Siah St. Clair, Citizen Scientist.

The Red-headed Woodpecker Project’s 2017 field season is coming to an end. Our project goals for this summer season have been to 1) find and monitor active red-headed woodpecker nests, 2) build portholes to extract nestlings from nest cavities, 3) capture adults and nestlings for banding, body measurements, blood sampling, and attachment of geolocator backpacks, 4) track backpacked fledgling movement using radio telemetry, and 5) recapture backpacked adults to retrieve movement data from geolocator chips. We focused on the first three goals more heavily focused during first half of the season (May - July) and shifted our efforts to the last two in August and September.

This season, we have so far captured 66 individual birds: 50 adults and 16 that hatched this summer. We attached geolocator backpacks on the first 20 adults, and radio-transmitter backpacks on 15 of the 16 juveniles. After attaching the radio-transmitter units, we have been going out at least 3 - 4 times a week to track the movements of the juveniles and to learn about the habitat they use after fledging. Tracking first-year birds is hard! We are currently tracking only four of these 15 birds. Of the 11 other birds, three were eaten by predators (we found piles of feathers surrounding the transmitter units), two of the backpacks fell off after the birds fledged, and six birds mysteriously went missing (we haven’t been able to pick up any signals on the receivers we use for tracking). They may have dispersed out of the range we can track them, or their transmitters may have failed.

Thus, we switched to using mist nets for recapture efforts, which has been working out better, but we still have only captured eight of the 20 backpacked adults. We think that some of the birds may have already begun migration, or shifted to a different area as we haven’t been able to find them for quite some time. For the eight birds that we have recaptured, we have been hooking their backpack units up to a laptop to obtain movement data, and then transferring the data onto GIS for spatial analyses. We hope that come springtime, the professional and citizen scientists on the project will be able to recover the additional birds that we were not able to capture this season.

Goal 5, recapturing the geolocator backpacked adults, has proven to be a larger challenge than what we originally expected. Earlier in the summer, we were effectively using wire traps baited with peanuts. We assumed that this method would be just as effective when recaptures started in August. However, once we began to recapture the birds to collect data from their geolocator backpacks, the birds seemed to have lost all interest in the peanuts and no longer fly into the traps! Perhaps they have enough food this late in the season that they are no longer interested in the peanuts?

While we are sad that this research season is coming to an end, we are nonetheless pleased to have been a part of such an incredible project. We greatly appreciate all of the support and encouragement everyone at Cedar Creek and in the larger Red-Headed Woodpecker Recovery Project has given us, and we hope that we have effectively laid out the ground work for all future efforts.

The Red-headed Woodpecker Recovery Project recruits new volunteers each spring.

Visit redheadrecovery.org for more information.
Musings of a Bee Block Watcher

From the official write-up of the Minnesota Native Bee Atlas project (check out their facebook page @MNBeeAtlas!)

When most people hear the word “bee” they probably start to picture a yellow and black striped honey bee or a big, fluffy bumble bee. Honey bees and bumble bees are easily recognized and play an important role in pollination, but they are a small fraction of the almost 20,000 bee species in the world. In contrast to honey bees and bumble bees, most bees are solitary and build their own nests alone. They may live near other bees of the same species but they do not work together to form one colony. These are the bees the Minnesota Bee Atlas focuses on.

The Minnesota Bee Atlas, a four-year project funded by the Minnesota Environment and Natural Resources Trust Fund (ENRTF), is a citizen science program designed to use volunteer participants to create a state-wide list of native bees found in Minnesota. The last time a survey of Minnesota bees was completed was in 1919 when only 67 species were listed. Scientists suspect that there may be closer to 400 species but we need the help of citizen scientists to find them all. Citizen scientist observations, combined with historical records from the Minnesota Department of Natural Resources and the University of Minnesota Insect Collection, provide important information on the diversity of bee species in Minnesota. The information we gather on species distribution and diversity will be important to help us track if or how bee populations are changing and how those changes might affect land management decisions.

The first nester in the block was a grass-carrying wasp that dutifully made 4-5 chambers or divided cells separated by carefully chosen shreds of grass plugs. I must admit that the anthropomorphic mind pictured the narcotized (paralyzed) tree cricket in each chamber with the wasp larva consuming the soft parts of its tissue (biological niches are never empty!). Other nesters were some still unknown resin bees which were meticulously molding pine tree resin into little resin balls with their jaws and sticking them beside the block holes in order to use them later to make and seal their chambers of pollen and larvae. How they could manipulate pine pitch and circumvent the insect gumming adaptational properties that the trees have evolved is a wonder. Many more anecdotes could be described about the visitors to the bee blocks that time and space do not permit.

One final word: Inspiring.

Interested in studying bees?
Email beatlas@umn.edu to learn about upcoming opportunities to assist!
Cedar Creek Wildlife Survey

by Jonathan Popple and Caitlin Potter, leaders of the Cedar Creek Wildlife Survey

On a beautiful Saturday in mid-September, 11 of us headed out onto the sand roads of Cedar Creek to examine the tracks and sign left behind by the local wildlife. What we found was exciting, heartwarming, and gave rise to many more questions for us to explore in our fall survey on Saturday, October 21.

Our team divided into two groups for the day. One experienced tracker, Donnie, took a small group up the Cedar Bog Lake Trail and around the Lindman Building, while another, Jonathan, accompanied a second group to the north side of the property.

Donnie and crew went to investigate a pile of feathers near the boardwalk to Cedar Bog Lake that had been spotted by a child on a school tour. The person spotting the feathers assumed that they were turkey and we had been asked to take a look at them and determine what had killed the bird. The feathers, it turns out, were not turkey. They were from a barred owl.

Donnie reported that the damage to the feathers were consistent with a mammalian predator, but that it did not look like a canid. While the carcass may have been scavenged, we speculated that it may have been killed by a fisher. None of us have any experience with how fisher shear or pluck the feathers off a bird, so this was just a guess. At the same time, there are few things we can imagine predating a barred owl. Fisher seemed like a possibility, and a previous tracking survey (in winter 2016) had documented fisher tracks in the same area. The other likely candidate for predating barred owls seemed to us to be a great-horned owl, which are also known to be in the area (documented in the winter by Earl Bye) — though these feathers did not look like they had been plucked by a raptor. Again, what Donnie’s team saw may have been scavenged. Donnie’s group also identified opossum tracks near the Lindman Building. This is the first time we have identified opossum tracks during one of our surveys. These hearty critters appear to be once again expanding their range after being nearly wiped out in the region during the very cold winter of 2013.

Meanwhile, the second team explored an internal road leading in from one of the county roads. From the moment we walked through the gate, we noticed a dramatic shift in the animal behavior compared to our June survey in the same area. Unlike in June, the deer were not walking down the road in the open — only crossing it from time to time and otherwise sticking to the cover of the woods. Cedar Creek’s buildings and grounds supervisor speculated that this shift could be due to seasonal changes in deer diets — a change from feeding on leaves to feeding on acorns. In addition to deer, the group found tracks from red fox strolling down the middle of the road like they owned the place. With the changing seasons and changing food and habitat options come changes in animal presence and behavior!

Thank you once again to all of you who have shared your time, your curiosity, and your keen observations to help us build this growing and dynamic picture of the wildlife of Cedar Creek. In ancient times, the trackers brought meat home to nourish the people. On our surveys, our citizen scientists are bringing home questions, data and insights that provide a different kind of nourishment— one that is much needed in our modern society. We hope that you can join us for our next Cedar Creek Wildlife Survey on Saturday, October 21, as we continue to explore the story of this very special landscape.

Barred owl feathers. Photo by G. Narayanan

Jonathan sharing his tracking knowledge with another citizen scientist on a recent wildlife survey.

There is a tracking training weekend as well as another wildlife survey day coming up in October!

See the Upcoming Events page for details and information.
Caught on Camera!

Researcher Cathleen Nguyen collecting oak leaves for a new project on oak wilt.

Ph.D student Leslie Forero stops to smell the beebalm while conducting her research.

Visitors meeting Smokey Bear at the Cedar Creek’s 75th Anniversary Celebration event.

Petting a bumblebee with help from the Snell-Rood lab students.

Red squirrel enjoying a hazelnut.

Summer in the biodiversity experimental plots.

5th graders learn about insects with Master Naturalist, insect buff and education volunteer Frank Lintgen.

Monarch caterpillar on butterflyweed!

Ph.D student Jake Grossman shares his research with kids at Booster Day.
Cedar Creek Ecosystem Science Reserve is synonymous with ecosystem ecology -- and for good reason. Since 1942, Cedar Creek has played a critical role in advancing our understanding of how we are affecting the environment and how we might protect it.

The unique convergence of Minnesota's biomes and our world-famous long-term research make Cedar Creek Ecosystem Science Reserve a place unlike any other. It's why researchers and graduate students come here from around the world -- and keep coming back. Cedar Creek also offers the public a unique opportunity to both learn about and experience these ecosystems first hand. Each year, thousands of children have their first hands-on encounter with ecology here.

Be part of this incredible legacy by becoming a member! Your membership at Cedar Creek supports research, education and outreach, including K-12 in-school programs and science field trips, public events, classes and citizen science initiatives, research opportunities for young scientists, and conservation and restoration of threatened ecosystems.

Enjoy member benefits that keep you connected to Cedar Creek Ecosystem Science Reserve. Memberships are annual. Contributions are 100% tax deductible.

**$25 level:** Cedar Creek's quarterly newsletter “Field Notes“ and an invitation to an annual members-only event

**$50 level:** all of the above, plus discounts on fee-based outreach programs and a set of Cedar Creek greeting cards.

**$150 level:** all of the above, plus a personal staff-led tour of Cedar Creek.

Join online at [z.umn.edu/cedarcreekmembership](http://z.umn.edu/cedarcreekmembership) or pick up a membership brochure onsite!
Upcoming Events

October 2nd, 6 - 7:30pm: Minnesota's Changing Climate (OFFSITE). Join scientists from Cedar Creek at the Johnsville Library in Blaine as they discuss climate science, Cedar Creek research, and projected impacts on Minnesota. Meet at the library: 12461 Oak Park Blvd NE, Blaine, MN 55434. (free, adults recommended)

October 10th, 6:30 - 8pm: Ecology Book Club at Cedar Creek. This month’s Ecology Book Club will meet at the Lindeman Center to discuss "The World Without Us" by Alan Weisman. This book addresses the legacy humans are leaving behind on Planet Earth and what will happen if we are no longer here to maintain what we have created. No need to have finished the book to join in and no science background necessary. Questions? Email cedarcrestbookclub@gmail.com. (free, adults recommended)

October 14th and 15th: Wildlife Tracking Training (OFFSITE). Did you miss the June training weekend for the Cedar Creek Wildlife Survey? Or are you generally interested in learning how to identify animals through track and sign? Join project co-founder Jonathan and other members of the Minnesota Tracking Club for a peek into the secret world of animals. Workshop takes place at Fort Snelling State Park. More info and registration details available online. REGISTRATION REQUIRED: REGISTER ONLINE OR BY EMAILING KRISTA (krista.jensen@state.mn.us). Questions? Email Jonathan (poppele@umn.edu). (free, adults and teens recommended)

October 19th, 2pm - 4pm: Red-headed Woodpecker Hike. This year’s large acorn crop means some of our red-headed woodpeckers are sticking around for winter! Join birding expert and long-time Cedar Creek scientist Jim Howitz for the fall version of his well-loved bird walk. Meet in the Fish Lake Nature Trail parking lot where Jim will give you further parking directions. RSVP to CAITLIN (caitlin@umn.edu). (free, adults recommended)

October 21st: Cedar Creek Wildlife Survey fall survey day. Join fellow trackers and citizen scientists for our fall survey. We’ll be out on the property looking for tracks and documenting what animals are using our natural areas! More info online. RSVP TO CAITLIN (caitlin@umn.edu) OR JONATHAN (poppele@umn.edu). (free, adults and teens recommended)

November 4th, 9am - 11am: Red-headed Woodpecker Hike. Come watch the red-headed woodpeckers get ready for winter! As the leaves fall, these charismatic birds and their preparatory behavior become easier to spot. Join birding expert and long-time Cedar Creek scientist Jim Howitz for the weekend version of his well-loved bird walk. Meet in the Fish Lake Nature Trail parking lot where Jim will give you further parking directions. RSVP to CAITLIN (caitlin@umn.edu). (free, adults recommended)

November 14th, 2pm - 4pm: Red-headed Woodpecker Hike. Can’t get enough of the red-headed woodpeckers? Join bird expert Jim Howitz for this fall’s final bird walk. Meet in the Fish Lake Nature Trail parking lot as usual. RSVP to CAITLIN (caitlin@umn.edu). (free, adults recommended)
Upcoming Events

December 2nd: Minnesota Ornithological Union Paper Session (OFFSITE). Interested in learning more about bird work taking place across Minnesota? Have you been wondering what the woodpecker citizen scientists really do? Attend this annual event at the Landscape Arboretum for talks, poster sessions and lots and lots of fellow bird nerds! More information and registration details on the MOU facebook page. (fee, adults recommended)

December 17th: Annual Christmas Bird Count. 2017 is Audubon's 118th Christmas Bird Count, and we're excited to have Cedar Creek involved once again! Join fellow birders to count birds on designated routes across the property. SPACE IS LIMITED; PLEASE RSVP TO STEVE at sweston2@comcast.net (free, adults recommended)

February 6th and 8th: An Intro to Climate Science for Minnesotans. Interested in learning about the science behind climate change? Join atmospheric scientist Dr. Sam Potter for a two-night class to deepen your understanding of the climate system! Night 1 will cover the basics of climate science, both historically and in the present day. Night 2 will focus on the impacts of climate change on Minnesota. All topics will be presented for a general audience and no science degree is necessary. Attendance at both sessions is required. REGISTRATION REQUIRED. Email Caitlin (caitlin@umn.edu) to get on the information list ($30, adults only).

February 14th and 17th: Winter StoryWalk with the Anoka County Library. Come celebrate winter with your friends and neighbors! Cedar Creek education staff will team up with Anoka County Library librarians to share some favorite winter books, arts and crafts, and hot drinks! Dates coming soon. (free, families welcome)

Let us know if you can attend by contacting Caitlin at caitlin@umn.edu or 612-301-2602