



Montana Natural History Center

Fall 2017

MONTANA Naturalist

TO PROMOTE AND CULTIVATE THE APPRECIATION, UNDERSTANDING AND STEWARDSHIP OF NATURE THROUGH EDUCATION

Nature Journaling: Observation, Relaxation, Meditation



Chickadees: Leaders of the Mixed Flock | Saving Sage Grouse | Biking Montana's Backroads | Spider Diaries

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BY CEDAR MATHERS-WINN



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Cover – A Ruffed Grouse perches in a mountain ash in photographer Eugene Beckes' yard, which sits in the foothills of the Mission Mountains near St. Ignatius. See more of Eugene's photos at [flickr.com/photos/61210501@N04](https://www.flickr.com/photos/61210501@N04).

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Connecting People with Nature

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tidings

I've done a lot of hiking this year. From chasing golden larches in the high country last fall to exploring peaks and lakes and ridges this summer, my feet have taken me to a remarkable diversity of places. And no matter how many times

I go hiking, no matter if I go four miles or fourteen, I am always surprised at how much the landscape changes as I take one step after another. The trees shift from ponderosa pine and Douglas-fir to subalpine fir and Engelmann spruce. Curling ferns cover the ground near streams and seeps. While arrowleaf balsamroot and heartleaf arnica are going to seed down low, glacier lilies are blooming in yellow profusion just below snowy ridges. Deep-shadowed forests shift to open, beargrass-filled meadows—and back again. All this within the distance my feet can take me.

Sometimes we forget that we don't have to travel long distances to experience something new. We don't have to fly across the Atlantic or drive across the country—though I love doing both. But there's something deeply powerful about using our own muscles and bones and breath to propel ourselves through the world. Perhaps it's because it's so easy to travel in other, faster ways. Perhaps it's because the human race has, for most of our history, traveled on foot. Or perhaps it's because we feel more a part of the ecosystem, paying attention to the rocks and roots in the trail, grateful for a cedar's shade on a hot day, reveling in birdsong or the sight of a moose.

Slowing down allows us to notice the details, the things we might otherwise miss. Slowing down is an essential practice for naturalists. When artist Nancy Seiler began nature journaling eleven years ago, she found that sitting quietly and simply observing the world around her was a form of meditation (page 4). Stephanie Fisher spent several weeks this summer biking across rural Montana, and discovered a new, richer connection to the landscapes she encountered (page 20). The National Wildlife Federation's sage grouse project brings groups of young people to eastern Montana to do on-the-ground conservation work; the crews walk for miles flagging fences in some of the most remote parts of the state, learning more than they ever would from a book or a lecture, or from just driving through (page 15). Biologist Cedar Mathers-Winn studies communication in birds, taking the time to notice their calls, behavior, and responses to threats and ask questions about why they do what they do (page 6).

I'm inspired by these stories to slow down, to remember the discoveries I make when I walk, when I listen, when I simply take in the world around me. So in the midst of this busy fall season, as we settle into our post-summer routines, take the time to slow down. Go for a walk. See where your feet can take you—perhaps they'll take you somewhere you've never been. Perhaps they'll take you farther than you thought they could. Who knows what you may encounter?

Allison De Jong
EDITOR
adejong@MontanaNaturalist.org



Sitting on the ridge above Heart Lake in the Great Burn, taking a few moments to slow down.

PHOTO BY GREG PETERS



R & R

BY NANCY SEILER

Cottonwood
tree twig

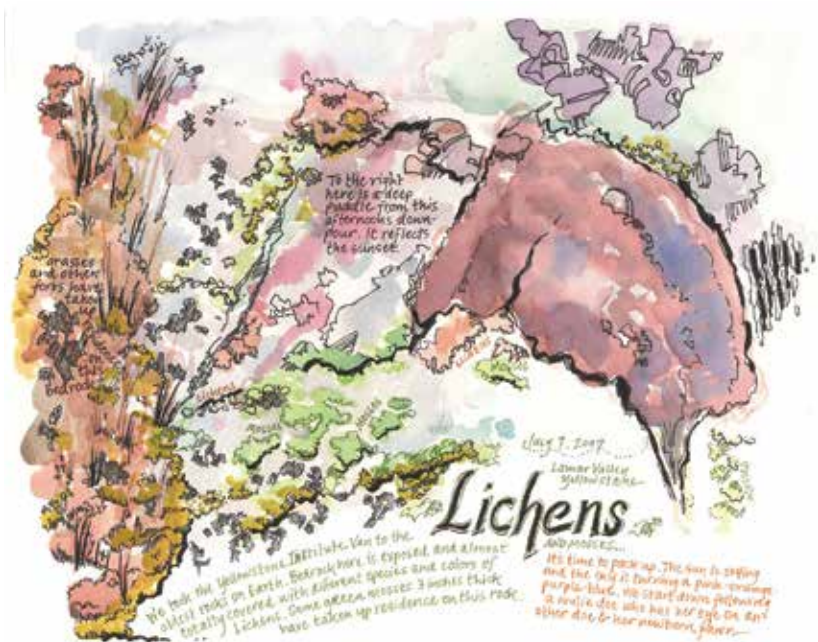
through Nature Journaling

When I begin to teach a nature journaling class I usually include the story of how I was asked to instruct a group of public school teachers on the art of nature journaling in Ovando in 2006. At that time, I did not have a nature journal. With the deadline looming, I got a sketchbook and some supplies and set off for the Mount Jumbo saddle. It was spring and I knew I'd be seeing wildflowers up there—especially arrowleaf balsamroot in full bloom. I didn't get far. A big old ponderosa pine caught my eye. I sat down under its branches and immediately began noticing the birds, plants, and bugs, as well as the tree itself. Soon I was the most relaxed I'd been in a very long time.

It wasn't just random that I was asked to teach that first nature journaling class. I'd been teaching botanical illustration in Missoula since 2003. Previously, while living in Denver, Colorado, I had received a classical botanical illustration certification from The Denver Botanic Gardens by completing sixteen 18-hour classes drawing plants using graphite, watercolor, and colored pencil. With botanical illustration, you draw what's there and don't add an extra petal or leaf because you think it might look nice. It's all about very close observation. Nature journaling is observing closely but is a lot less tense. In fact, after about five minutes, it's a meditation. I've never really been able to sit still long enough to receive the benefits of meditation, but I imagine that nature journaling provides a similar peace of mind.

That first class in Ovando went well. After brief introductions and a demonstration, we traipsed off to a nice spot in a meadow. I suggested that everyone should spread out so they were not tempted to talk to each other. I, too, sat down in the warm grass and focused on drawing a sticky geranium. I clearly remember the other wildflowers—lupine, penstemon, and hyacinth. I still smell the pines, see the butterflies and dragonflies, and hear the birds. The students, too, felt as relaxed and connected to that meadow as I did.

I was hooked.



Lichens on bedrock in Yellowstone National Park

After that day, I could continue to observe plants closely and draw them, but I could complete a drawing in an hour instead of a week—and, as a bonus, each hour was extremely relaxing. I began sharing what I loved about nature journaling with more and more students.

Being asked to teach that first class was a gift. Not only have I found a way to relax, observe, and slow down—I've found a way to connect to nature and the outdoors for the rest of my life. 🐦

—Nancy Seiler has taught botanical illustration and nature journaling at the Montana Natural History Center, Yellowstone Forever Institute, and Montana Osher Lifelong Learning Institute (MOLLI) at the University of Montana since 2003. She is also a Golden Artist Educator with Golden Artist Colors teaching acrylic techniques from her studio in Missoula, Montana. nancyseiler.com



Nancy drawing clarkia on Waterworks Hill, Missoula.



Nancy teaching a Forest for Every Classroom group in the Blackfoot.

Books about nature journaling that may inspire you:

The Laws Guide to Nature Drawing and Journaling, John Muir Laws

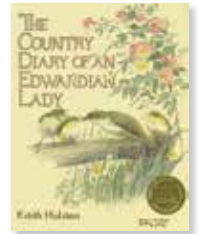
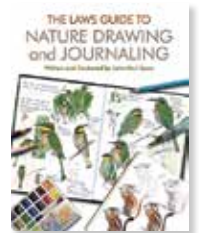
Painting Nature in Watercolor, Cathy Johnson

A Trail Through Leaves, Hannah Hinchman

Little Things in a Big Country, Hannah Hinchman

Keeping a Nature Journal, Clare Walker Leslie

A Country Diary of an Edwardian Lady, Edith Holder



Anyone can nature journal.

HERE ARE SOME TIPS FOR GETTING STARTED:

- Delve into that blank page by writing down your location, weather, date, temperature, sounds, etc.
- Start small and simple. For example, draw the shape of one leaf.
- You don't need a lot of art supplies; start with a pencil and paper.
- Make notes about texture, size, and color. You don't have to draw everything.
- Squint. This will simplify everything into darks and lights and you can start by drawing those shapes.
- Observe what you are drawing closely. Don't look at your paper much—there's no information on that blank page.
- Practice letting go of expectations and judgment. If you aren't happy with your drawing, just turn the page and try again.
- Put all of your supplies in a bag so that you can grab and go when the urge to draw arises.



Suggested Nature Journaling Supplies

Of course, you don't need anything more than paper and pencil. But if you're interested in exploring further, here are some supplies to consider:

- mechanical pencil or pencil, eraser, sharpener
- journal with thicker paper for water media (such as Moleskine Watercolor Journal)
- waterproof, fine-line black pen (such as Pigma Micron .005 or .01)
- watercolor pencils (such as Derwent Intense) and water brush (such as Niji medium water brush)

OR

- watercolors (such as QoR by Golden)
- round brush that has a fine point (such as Princeton Velvetouch 8 round)
- ...and a bag to put everything into





SAFETY IN NUMBERS (AND SPECIES):

HOW FOREST BIRDS SURVIVE THE WINTER

BY CEDAR MATHERS-WINN

If you ask any birder or naturalist, they will probably tell you that spring is the season for watching birds. Singing, displaying, fighting and breeding—spring is a time of great activity, and it's hard not to take notice. By comparison, winter may seem quite dull. But just watch for a moment, and you'll see that there are fascinating things going on all around you.

It might take a moment of standing silent before we even begin to notice the birds. A few soft contact calls here, a fluttering of wings there; first just one or two, then perhaps a few more in the adjacent trees. Gradually we realize that these birds are not isolated; they are part of a flock, foraging together, picking their way from tree to tree.

Keep watching. Who are these birds moving quietly among the branches? These flocks usually include several different species of birds. Nuthatches, chickadees, woodpeckers, and others may all be found sharing each other's company, foraging and flying together in dispersed groups as they move from patch to patch.

But what makes these flocks especially interesting are the ways these different species interact and even communicate. Looking a little closer, one might notice consistencies in the numbers of species that make up these flocks. While there might be one or two of a given species of woodpecker or nuthatch, there are usually much greater numbers of chickadees, sometimes up to a dozen. And if you were to watch for a little while, you might notice that when the flock moves, it is usually the chickadees that fly first, with the other birds following after. It is fair to say that these chickadees are in fact leading the flock.

Mixed-species foraging flocks are quite common throughout the world. Just about anywhere you go, different species of woodland birds will flock together in the winter. And the similarities don't stop there. Chickadees and their relatives in the family Paridae (which also includes the Titmice and Old World Tits) are the leaders of these mixed wintering flocks wherever they occur. As interested citizens of the natural world, when we see persistent patterns like this, we have to ask—why?

Biologists have been puzzling over this question for decades, and have come up with several explanations for this surprisingly common phenomenon. One compelling idea is that larger groups are safer because any one bird has a lower chance of being singled out and caught by a predator—just like with schools of fish. This certainly applies to mixed flocks as well, but really doesn't explain why birds should so often hang out with other species. Presumably, this “safety in numbers” benefit depends on the size of the group, not so much who's in it. This idea also fails to explain why some species would follow others around.

Birds might also benefit from better surveillance of the landscape, and thus better detection of predators. This idea has the strongest scientific support, and explains a number of interesting patterns we see in mixed-species flocks. Many birds will spend less time looking out for predators when they are in larger groups, and thus can spend more time foraging. This is true especially when there are other species around. Our Downy Woodpeckers, for instance, will spend less time looking for danger in the company of chickadees. The benefit of this is twofold: of course, knowing when there is a predator in the area could save a bird's life. But birds still

need to eat, and more time spent looking for predators means less time feeding. By sharing vigilance duties with the flock, each bird is not only safer, but can also spend a little more time feeding. In winter, it is crucial that birds maintain their fat stores as best they can, so even a little extra time spent foraging could make a huge difference. But still, couldn't this all be accomplished in single-species flocks, without one species “leading” the others? And why should chickadees in particular be the leaders?

To answer these questions, we need to dig a little deeper into just how the flock reacts when a bird actually does detect a predator. Like many other animals, birds give characteristic calls when they sense that they are in danger. These calls can be quite different depending on the particular situation, and as such can cause listeners to respond quite differently as well. These “alarm” calls alert other animals, and often carry detailed information about the predator itself. This information can be useful to any other prey

animal in the area—knowing how to respond to a predator could mean the difference between life and death. The best way to respond to a hunting cat, for example, might be to fly up to an open branch and look around on the ground. But if the predator was a bird-eating Sharp-shinned Hawk, the same escape maneuver would probably put the bird in even greater danger. The appropriate response would probably be to dive for the nearest cover.

A predator might be walking, flying, or stationary; it could be dangerous only to adults, to nestlings, or both; it might have been seen, or only heard—such distinctions can be

critical for survival, and can be communicated with an alarm call. Two of the most common types of alarm calls are given to raptors, and indicate differences in their behavior. “Seet” calls are typically given to flying raptors. A bird-eating raptor in flight is about the most dangerous thing an unsuspecting songbird could encounter—striking silently from the air, these specialists are extremely agile and effective hunters. The response of a songbird must be quick if it is to survive. Accordingly, birds respond to seet calls very strongly; they dive for cover, or, if no cover is available, they freeze. Surprisingly, birds fleeing in response to seet calls will often give seet calls themselves, alerting others that may have been too far away to hear the first alarm.

Seet calls are extremely subtle, and easy to miss for even the most attentive naturalist. They are short, given only a few at a



PHOTO: TRUDY WILKERSON, DEPOSITPHOTOS.COM

time, and extremely high-pitched, outside of the hearing range of many raptors (and many people). Mobbing calls, on the other hand, are given to perched raptors, and are noisy, loud, and given repeatedly, sometimes for as long as five or ten minutes. Perched raptors are not an immediate threat, so birds respond to mobbing calls quite differently than to seets. Instead of fleeing for cover, birds will actually gather around the hawk or owl, giving their own mobbing calls and sometimes even physically striking the predator. This “mobbing” behavior is extremely loud and conspicuous, which seems appropriate, given that the goal is apparently to harass the predator until it leaves. And a lot of the time, it works—the unwanted raptor will leave, and may avoid the area for some time after. Mobbing calls often attract great numbers of birds to the predator, many of whom will join the mob themselves. If you have ever seen a flock of crows, jays, or other birds cawing and diving at a perched hawk, you have seen mobbing in action.


Alarm calls are what make sharing vigilance possible. Because of these calls, members of a flock don't need to look up from feeding to know that there is a predator around, or even how to best respond to it. Many birds give similar types of alarm calls, but some birds call more than others, and some birds' calls convey more information than others'. And this brings us back to chickadees. Black-capped Chickadees, for instance, are especially vigilant, and are often the first birds to sound the alarm. Their alarm calls are also quite complex, and because of this they can communicate highly informative messages about a predator—messages that motivate life-saving behaviors. They probably give these calls primarily to help each other out—chickadees are highly gregarious with their own species—but in doing so, they put some very useful information out into the world, available to anybody who hears



it. Other birds just have to be within earshot. So, to best take advantage of this free information, many other birds will basically follow chickadees around and mooch off of their alarm calls. And while less-social followers like woodpeckers are able to forage more and spend less time looking for danger, the chickadees don't get the same benefits from the woodpeckers—basically, chickadees do all the work, and get very little in return!

This isn't the harmonious picture of nature that many of us are accustomed to, but close

They probably give these calls primarily to help each other out—chickadees are highly gregarious with their own species—but in doing so, they put some very useful information out into the world, available to anybody who hears it.

up nature is rarely so idyllic. Rather, it is messy, unfair, and often brutal. But uneven relationships like these keep everything in balance overall. Without the chickadees, other birds would be much more vulnerable to predators, and might be much less successful as a species. All these different factors and interests are what give us the fascinating, perplexing, and intricate patterns that we see. We are only just beginning to understand what's really going on with these mixed-species flocks, and with alarm calling in general, but we can be sure that these complex relationships will give us much to ponder for years to come. 

—Cedar Mathers-Winn is a biologist and naturalist, a basement composer and recordist of all things audible. He is currently a graduate student at the University of Montana, and studies alarm behavior and communication in local forest birds.

INTERESTED IN LEARNING MORE? HERE ARE SOME ADDITIONAL RESOURCES:

Marler, Peter. “Characteristics of some animal sounds,” *Nature* 176, pgs. 6-8 (1955). (This is a classic paper describing two of the most basic forms of alarm calls, given by many species of birds and some mammals.)

Sridhar, H. et al. “Why do birds participate in mixed-species foraging flocks? A large scale synthesis,” *Animal Behaviour* 78, pgs. 337-347 (2009).

Sullivan, K.A. “Information exploitation by Downy Woodpeckers in mixed-species flocks,” *Behaviour* 91:4, pgs. 294-311 (1984).

Templeton, C., et al. “Allometry of alarm calls: Black-capped Chickadees encode information about predator size,” *Science* 308, pgs. 1934-1937 (2005).

Spider Diaries

Notes from a visit to Arkansas

●●● Every night before I go to bed, I take a few minutes just to stand outside the front door and see what the night is like. It's been very, very hot here, and very, very muggy, so I stand there in the heat. A few nights ago when I went out, there was a large orb-weaving spider spinning her web a few feet in front of the door. I could see her moving about, attaching the new strands to the "ribs," the basic structure of the web. Her web was about four feet wide! I tried to count the number of rings she had made and there must have been about 60 perfect rings...so neat, so carefully crafted. It was a magical piece of art that this spider had made.

~Ellen Knight

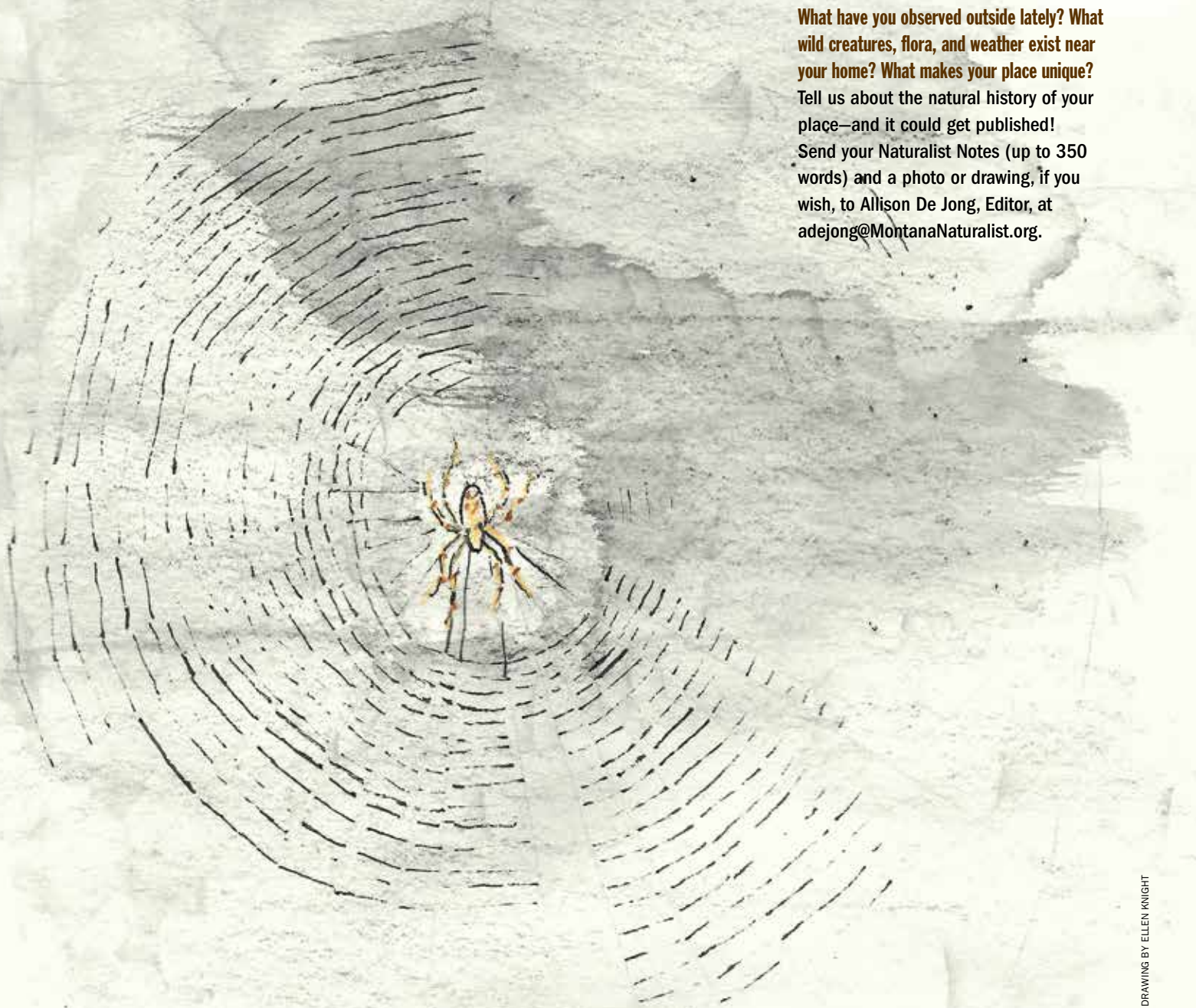


Ellen Knight is a lifelong naturalist who grew up exploring the hills and streams of Arkansas but has now lived for many years in Missoula, Montana, where she continues to follow her curiosity and revel in the intricacies of the natural world.

●●● **What have you observed outside lately? What wild creatures, flora, and weather exist near your home? What makes your place unique?**

Tell us about the natural history of your place—and it could get published!

Send your Naturalist Notes (up to 350 words) and a photo or drawing, if you wish, to Allison De Jong, Editor, at adejong@MontanaNaturalist.org.



Kids' Corner

Last spring, Kevin Cashman's 4th-grade class at Chief Charlo Elementary took a field trip to the Lewis & Clark Caverns. Here are a couple of "Field Notes" his students wrote about what they learned!

Caves

By Janelle Taylor

Have you ever wondered...how do caves form?
I'll tell you.

Caves are found all over the planet and some may still need to be found.

Caves are tunnels going through the ground. Caves are a natural tunnel below the ground made by water, sulfuric acid, or flowing lava.

Steps of how caves are made:

Step 1: Rain tunnels through the surface of earth.

Step 2: The gas CO_2 is released by dying veggies in earth.

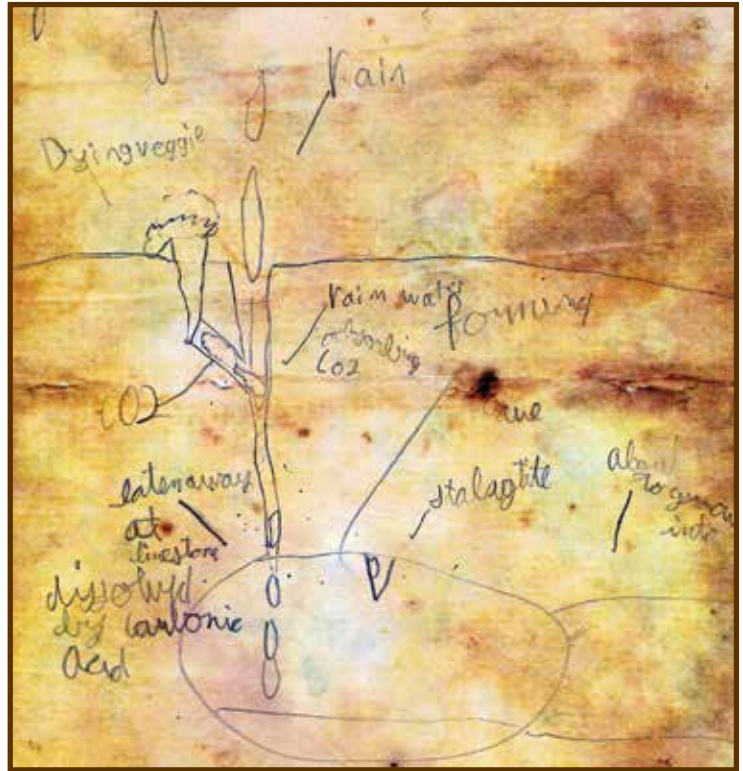
Step 3: The rain absorbs the CO_2 .

Step 4: A chemical reaction starts that makes water into weak carbonic acid.

Step 5: The carbonic acid eats away at rocks by dissolving the limestone.

Step 6: A cave is formed.

The students wrote and drew their Field Notes in their naturalist journals, which they used throughout the year for field trips, saunters, and garden visits.

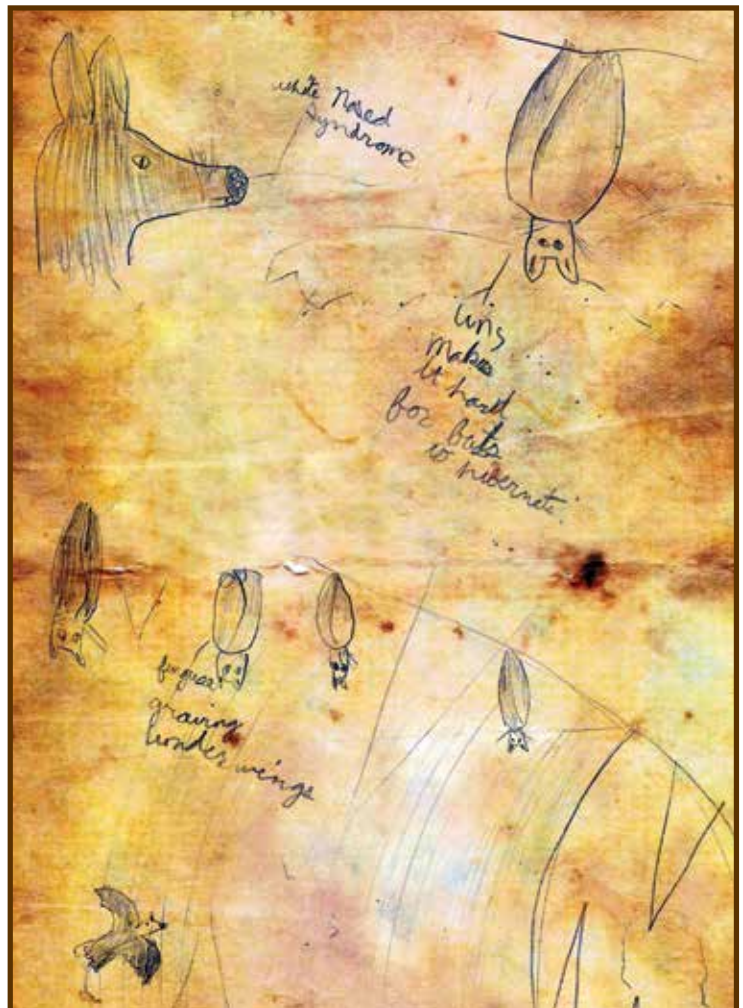


Bats

By Katrina Brown

Have you ever said that bats are scary and dangerous? You may be scared of bats but bats are very important.

- Bats spread seeds around the lands and replant them. One nickname for bats is the "farmer of the tropics."
- You may not be able to eat tropical fruits if it weren't for bats. Bats are in the pollinating family.
- Bats eat tons of bugs each day. Bats eat mosquitoes and other bugs that can be dangerous.
- Bats are disappearing because of white-nose syndrome. The infection makes it hard for bats to sleep during hibernation and eventually kills them.
- We can try not to disturb bats during hibernation. White-nose syndrome is very dangerous to bats. But we can try to do the best we can to help.



get outside calendar

MNHC Hours:

Tuesday-Friday, 9 a.m. - 5 p.m.

Saturday, noon - 4 p.m.

Admission Fees: **\$3**/adults (18+),
\$1/children (4-18), **\$7**/family rate
Free/children under 4 and MNHC members

Programs for Kids

September 7, 14, 21, 28 **miniNaturalist Pre-K Program**, 10:00-11:00 a.m. Program free with admission.

September 30 **Saturday Kids' Activity**, 2:00-3:00 p.m. **Nature's Treasure Map**. Program free with admission. At the Fort Missoula Native Plant Garden.

October 5, 12, 19, 26 **miniNaturalist Pre-K Program**, 10:00-11:00 a.m. Program free with admission.

October 28 **Saturday Kids' Activity**, 2:00-3:00 p.m. **Slimy!** Program free with admission.

November 2, 9, 16, 30 **miniNaturalist Pre-K Program**, 10:00-11:00 a.m. Program free with admission.

November 18 **Saturday Kids' Activity**, 2:00-3:00 p.m. **Under the Microscope**. Program free with admission.

December 2 **Saturday Kids' Activity**, 2:00-3:00 p.m. **Wild Gift Workshop**. Program free with admission.

December 7, 14, 21 **miniNaturalist Pre-K Program**, 10:00-11:00 a.m. Program free with admission.

Adult Programs

August Gallery, all month. **Monte Dolack and Mary Beth Percival**. All pieces are for sale, with 30 percent of the proceeds donated to MNHC.

September Gallery, all month. **Laura Palmer: The Land and Beyond**.

September 1 **First Friday Gallery Opening**, 4:30-6:30 p.m. **Laura Palmer: The Land and Beyond**.

September 13 **Northside Kettlehouse Community UNite**, 5:00-8:00 p.m. 50¢ from every pint sold goes to MNHC.

September 15 **Community Discovery Day: Glacial Lake Missoula Tour**, 9:00 a.m.-2:00 p.m. \$15.

September 20 **Glacial Lake Missoula Chapter Meeting**, 3:30 p.m. Free and open to the public.

September 20 **Evening Program**, 7:00 p.m. **Navigating a Changing World Lecture Series: Business Innovations Inspired by Nature: Biomimicry with Jakki Mohr**. \$5 members; \$10 non-members. Students FREE.

September 27 **Evening Program**, 7:00 p.m. **Conserving Mangrove Forests, Protecting Sea Turtle Habitat, and Sustaining Agriculture in El Salvador with Karolo Aparicio**. Free.

September 30 **Annual Banquet and Auction**, 5:00-9:00 p.m. at the University Center Ballroom. Bid on naturalist experiences, exciting trips, and other fun items in our live and silent auctions, enjoy a delicious dinner, and celebrate with us as we wrap up another great year! \$50.

October Gallery, all month. **Laura Palmer: The Land and Beyond**. No First Friday Gallery Opening.

October 7 **Community Discovery Day: Pattee Canyon Nature Walk**, 9:00-11:30 a.m. Free.



October 11 **Sip and Sketch with Nancy Seiler: Bones**. 7:00-9:00 p.m. \$30; \$25 for members.

October 18 **Glacial Lake Missoula Chapter Meeting**, 3:30 p.m. Free and open to the public.

October 18 **Evening Program**, 7:00 p.m. **Navigating a Changing World Lecture Series: Biodiversity in a Changing Climate with Jedediah Brodie**. \$5 members; \$10 non-members. Students FREE.

SUN	MON	TUE	WED	THU	FRI	SAT
August  August Gallery, all month. Monte Dolack and Mary Beth Percival . 			September  First Friday Gallery Opening , 4:30-6:30 p.m. Laura Palmer: The Land and Beyond . Show up all month.			
27			30	31	1	2
3			6	7	8	9
			 Northside Kettlehouse Community UNite , 5-8 p.m.  miniNaturalist Pre-K Program , 10-11 a.m.  Community Discovery Day: Glacial Lake Missoula Tour , 9 a.m.-2 p.m.			
10	11	12	13	14	15	16
			 Glacial Lake Missoula Chapter Meeting , 3:30 p.m.  Evening Program , 7 p.m. Navigating a Changing World Lecture Series  miniNaturalist Pre-K Program , 10-11 a.m.  Volunteer Naturalist Training , 4:30-5:30 p.m.			
17	18	19	20	21	22	23
		Snakes begin to den up	 Evening Program , 7 p.m. Conservation and Agriculture in El Salvador  miniNaturalist Pre-K Program , 10-11 a.m.			 Saturday Kids' Activity , 2-3 p.m. Nature's Treasure Map .  Auction Volunteer Briefing , 4-4:30 p.m.  Annual Banquet & Auction , 5-9 p.m.
24	25	26	27	28	29	30
				 miniNaturalist Pre-K Program , 10-11 a.m.		 Community Discovery Day: Pattee Canyon Nature Walk , 9-11:30 a.m.
October  October Gallery , Laura Palmer: The Land and Beyond . No First Friday Gallery Opening. 			3	4	5	6
			 Sip and Sketch with Nancy Seiler: Bones , 7-9 p.m.	 miniNaturalist Pre-K Program , 10-11 a.m.		
			11	12	13	14
			 Glacial Lake Missoula Chapter Meeting , 3:30 p.m.  Evening Program , 7 p.m. Navigating a Changing World Lecture Series  miniNaturalist Pre-K Program , 10-11 a.m.			
15	16	17	18	19	20	21
			 Evening Program , 7 p.m. Naturalist Trivia Night!  miniNaturalist Pre-K Program , 10-11 a.m.			 Saturday Kids' Activity , 2-3 p.m. Slimy!
22	23	24	25	26	27	28

Ladybugs hibernate under logs and leaves

SUN	MON	TUE	WED	THU	FRI	SAT
<p>Grizzlies may start to hibernate</p>			<p>November</p>			
29	30	31	1	2	3	4
5	6	7	8	9	10	11
 <p>Orion visible in the night sky</p>			14	15	16	17
			22	23	24	25
			26	27	28	29
3	4	5	6	7	1	2
 <p>Small mammals tunnel under snow</p>			12	13	14	16
			20	21	22	23
			24	25	26	27
28	29	30				

MOUSER, CC

U.S. FISH AND WILDLIFE SERVICE HEADQUARTERS

TOMI TAPIO K, WWW.FLICKR.COM

October 25 **Evening Program**, 7:00 p.m.
Naturalist Trivia Night! \$5 suggested donation; MNHC members free.
 November Gallery, all month. **Alan McQuillan: Trees.**
 November 3 **First Friday Gallery Opening**, 4:30-6:30 p.m. **Alan McQuillan: Trees.**
 November 8 **Evening Program**, 7:00 p.m.
Navigating a Changing World Lecture Series: Knowing Earth, Loving Earth: Ethics and Science in the Anthropocene with Dan Spencer. \$5 members; \$10 non-members. Students FREE.
 November 10 **Members-Only Discovery Day**, 3:00-5:00 p.m. **UM Zoological Museum Tour.** Free.
 November 15 **Glacial Lake Missoula Chapter Meeting**, 3:30 p.m. Free and open to the public.
 November 15 **Evening Program**, 7:00 p.m.
Naturalist Trivia Night with the Missoula Insectarium! \$5 suggested donation; MNHC members free.
 November 29 **Evening Program**, 5:00 p.m.
Wreath-Making Workshop. \$15; \$10 MNHC members.
 November 30 **Evening Program**, 5:00 p.m.
Wreath-Making Workshop. \$15; \$10 MNHC members.
 December Gallery, all month. **Claudia Paillao: Felted Birds.**
 December 1 **First Friday Gallery Opening**, 4:30-6:30 p.m. **Claudia Paillao: Felted Birds.** Claudia will also be selling her various crafts, just in time for the holidays. Purchase beautiful hand-crafted Christmas gifts for family & friends!
 December 6 **Evening Program**, 7:00 p.m.
Naturalist Trivia Night! \$5 suggested donation; MNHC members free.
 December 13 **Sip & Felt with Claudia Paillao: Snowy Owls**, 7:00 p.m. \$30; \$25 for members.
 December 20 **Glacial Lake Missoula Chapter Meeting**, 3:30 p.m. Free and open to the public.

Volunteer Opportunities

September 7 **Volunteer Naturalist Training**, 4:30-5:30 p.m. **Introduction to volunteering with the Visiting Naturalist in the Schools Program.** No prior experience necessary. Training will be at the Fort Missoula Native Plant Garden, followed by our annual Volunteer Appreciation Dinner.
 September 7 **Volunteer Welcome & Appreciation Dinner**, 5:30-7:00 p.m. Volunteers, this event is for you! We couldn't do what we do without you. Join us at the Fort Missoula Native Plant Garden for good food, conversation, and celebration with MNHC staff and your fellow volunteers.
 September 21 **Volunteer Naturalist Training**, 4:30-5:30 p.m. **Visiting Naturalist in the Schools Field Trip Training.** Learn how to teach kids about the flora and fauna of western Montana during the October VNS school field trips for 4th & 5th grades. No prior experience necessary. Training will be at the Fort Missoula Native Plant Garden.
 September 30 **Auction Volunteer Briefing**, 4:00-4:30 p.m. We need ~20 volunteers to assist with our Annual Banquet & Auction on September 30. At this brief training the afternoon of the event, we'll go over the evening's schedule and give an overview of the various duties. Briefing and auction will be at the UC Ballroom at the University of Montana.
 November 3 **VNS Volunteer Thank You Breakfast**, 8:00-10:00 a.m. Drop in and enjoy good food and conversation with MNHC staff and your fellow MNHC volunteers in appreciation of your time and effort in helping out with our October VNS field trips!

get outside guide

Get Wild with WildFest!

Friday & Saturday, September 8-9

The Montana Wilderness Association's annual WildFest is in Missoula this year! Enjoy a weekend of outdoor adventures, live music, hikes, family activities, gear demos, and delicious food and drinks. This is a great opportunity to learn about and celebrate our wild places. Spend Friday afternoon hearing conservation stories and learning what we can do to protect our public lands, and enjoy the evening reception with drinks, appetizers, live and silent auctions, and guest speaker Pete Fromm. Spend Saturday hiking, learning about local conservation history at the Ninemile Ranger Station, and enjoying a fun afternoon and evening of gear demos, kids' activities, films, and live music. See the full schedule and sign up for hikes and other activities at wildmontana.org/join-us/wild-fest/.

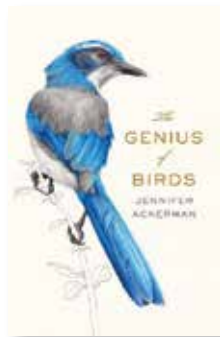


BOOK REVIEW: *The Genius of Birds*

by Jennifer Ackerman

In this fascinating, insightful book, science writer Jennifer Ackerman travels the world to compile the latest research in avian intelligence. From corvids to hummingbirds, from bowerbirds to mockingbirds to sparrows, Ackerman looks at myriad bird species and the ways in which they prove that being called "bird-brained" is actually a compliment. Birds recognize human faces, use tools, solve problems, play games, navigate migratory paths, learn by example, create elaborate nests, and communicate complex information [see Cedar Mathers-Winn's feature on pages 6-9 for one intriguing example]—and so much more. In addition to delving into the ways birds demonstrate intelligence, Ackerman also looks into what scientists have discovered about the bird brain itself. Avian brains are smaller and wired differently than mammalian brains, yet they process information in a sophisticated way that is remarkably similar to our own. Full of entertaining stories, surprising observations, and the latest avian research, *The Genius of Birds* is a delightful, informative read for anyone interested in learning more about our feathered friends.

This book is available for checkout at the MNHC library.



Naturalist Word Search

H K Y R L F F O S S I L S D P
X R G E A H S U R B E G A S P
G A O V N E S R L F R O S T K
L L L N R S P T F Q L T O U A
L W O M U Z A Y A Y E O S S R
A O E U O N D G L B K Z P O C
C D G T J I I F E K R Z R M H
M A H U E S T A L G C X E V I
R E L A R O E S R O R I Y H C
A M E M U U K V R B C O R W K
L R S E T I U L A O D K U P A
A R B J A Q F B U C L R E S D
K O N U N C E D A R S T I Q E
C O N S E R V A T I O N W B E
Y U C C A R E D I P S B R O X

Alarm Call
Autumn
Bats
Bird Brain
Caves
Cedars
Chickadee
Conservation
Flock
Fossils
Frost
Geology
Lek
Meadowlark
Nature Journal
Orb Spider
Osprey
Prickly Pear
Sage Grouse
Sagebrush
Yucca



PHOTO BY ALLISON DE JONG

Revel in the Ancient Beauty of the Ross Creek Cedars

Looking for a fun family-friendly excursion this fall? Take a drive to northwest Montana and visit the Ross Creek Cedar Grove in the Kootenai National Forest. The Ross Creek Scenic Area was established in 1960 to protect the ancient (500-plus-years-old) western red cedars found along the banks of Ross Creek. The mile-long nature trail winding through the cedars is magical for people of any age, and while the enormous, fragrant trees are stunning in and of themselves, experiencing the diverse ecosystem in which they live makes the walk equally enjoyable. Marvel at the huge leaves and spines of the devil's club plants, some of which are taller than a person. Walk among the ferns and western hemlocks, enjoying the shade and quiet beauty.

There are also plenty of great hiking trails in the Cabinet Mountains, and nearby Bull Lake has a couple of Forest Service campgrounds as well as a public boat dock and day use area.

How to get there: from Missoula, it's about a three-hour drive. Take I-90 west to 93 North, and at Ravalli, go west on Highway 200, which you'll travel for 140 miles. A few miles past Noxon, go north on Highway 56. In 16 miles, take a left onto Forest Service Road 398, and enjoy the winding, scenic drive to the cedars!

Flagging Fences, Saving Sage Grouse:

Montana Youth Get Involved in Hands-on Conservation

BY ALLISON DE JONG

Spending long days with a heavy pack beneath the unrelenting summer sun in eastern Montana might not be many people's idea of fun, but for a group of Montana Conservation Corps (MCC) teens and young adults, it's how they've chosen to spend a few weeks of their summer.

Montana's sagebrush-steppe ecosystem may seem bleak to the casual observer. But for those who take the time to look more closely, this sparse-seeming landscape reveals a diversity of life, more than 350 species of plants and animals, in fact. And it is one component of this great diversity that has inspired a few dozen young people from MCC, in collaboration with the National Wildlife Federation (NWF), to spend the hottest weeks of summer in some of the most remote parts of our state. The creature? Greater Sage-Grouse, known for their elaborate mating displays, who are found only in the sagebrush steppes of the American West and depend upon it for their survival.

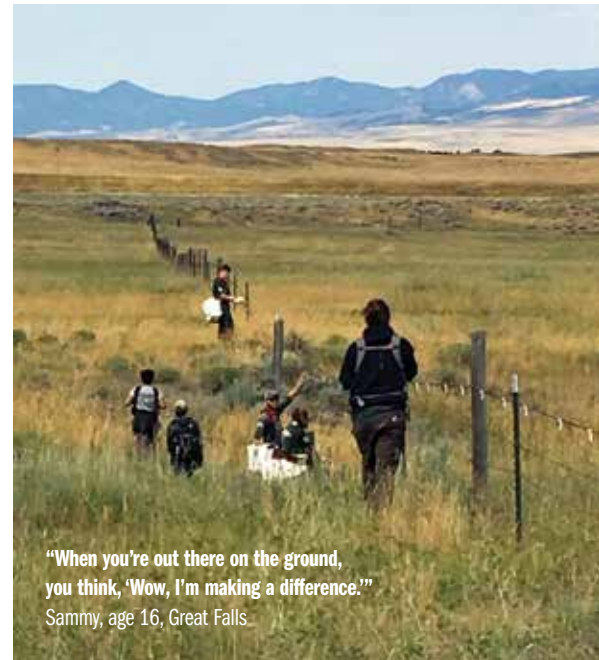
Having narrowly escaped being listed under the Endangered Species Act two years ago, sage grouse still face many challenges, one of the largest being habitat loss and habitat fragmentation. Barbed wire fences stretch across sage grouse habitat, and can prove fatal to the birds as they fly into their leks, or breeding grounds, in the dim light before dawn. While comprehensive long-term efforts need to be implemented for the sage grouse's continued survival, NWF has found an immediate and tangible way to help this iconic species: bringing groups of young people into sage grouse habitat to hang small squares of tough white

plastic on barbed wire fences to prevent collisions.

The concept of making the fences more visible is straightforward enough, but the process is not as simple as it sounds. Hayley Connolly-Newman, NWF's sage grouse project coordinator, sums up the challenges: "It is hot. It is remote. You have to drive twenty miles on a dirt road to get to the mile of fence you've got to flag." And then there are the droves of mosquitoes, the absence of shade, and the unforgiving weight of the hundreds of small plastic markers.


In spite of the challenges, the benefits make the effort worthwhile. Flagging high-risk fences—those within one to four miles of a lek—has been shown to reduce sage grouse deaths by up to eighty-three percent. For every mile of fence flagged, 1.2 sage grouse are saved per year. Over the past three summers, NWF's work crews have flagged 150 miles of fence on private, federal, state, and tribal lands, with more to come. "The kids can wrap their heads around these numbers," Hayley says. "'We flagged 26 miles of fence this week. We saved 26 birds per year.' They can see, with every flag they're placing, that they're doing something concrete."

Most of the young people participating in this project had never been to eastern Montana, and most didn't know anything about the sagebrush ecosystem. Because part of the project's focus is education, NWF brings a variety of professionals—state parks managers, biologists, conservation writers, and more—out to the field to talk with the crews, teaching



"When you're out there on the ground, you think, 'Wow, I'm making a difference.'" Sammy, age 16, Great Falls

them about this ecosystem and showing them that there are many ways to facilitate conservation work. By the end of their hikes these young people have learned a great deal about sage grouse, sagebrush, and other flora and fauna of this place that once seemed little more than a harsh expanse of monotony. They are engaged and curious and constantly asking questions.

"It's great to be exposing the kids to this important part of our western landscape," says Hayley. As they deepen their ecological understanding they are also helping land managers accomplish time-demanding and labor-intensive conservation goals with a proven record of success. "It's win-win all the way around." 

For more information, visit nwf.org/Northern-Rockies-and-Pacific-Region/Northern-Rockies.aspx or watch "Operation Sage Grouse 2017" on YouTube.

imprints



Wings Over Water Soars Off the Ground

The Wings Over Water (WOW) Osprey program is off to an amazing start. In June, we welcomed the program's first participants: five exceptional teacher-leaders from all over Montana, including Polson, Seeley Lake, Hardin, Stevensville, and Dixon. During the week-long WOW teacher training workshop at UM, teachers worked with scientists to improve their knowledge and teach advanced STEM (science, technology, engineering, and math) lessons in their classroom. Teachers gained new knowledge in the most exciting ways possible: they got face to face with wild Ospreys, flew drones high above the Clark Fork, invented new designs for Osprey platforms, took the controls in a small plane, built a working wind tunnel, designed satellite constellations for tracking wildlife, and finally, they shared their new STEM expertise with students from the community.

Our exciting new program will continue into the school year, as we bring STEM experts to each WOW teacher's classroom, lead field trips to local Osprey nests, and connect for interactive distance learning experiences using MNHC's advanced green screen technology.

If you are a middle or high school teacher, and are interested in participating in the WOW program next summer, contact Jenéle Dowling, Wings Over Water Program Coordinator: jdowling@montananaturalist.org, 406.327.0405 x201.

(l-r) **Erick Greene (UM)**, **Rich Montoya (Hardin High School)**, **Colleen Cooper-Vanosdell (Stevensville)**, **Lee Coble (Polson)**, **Caitlin Webb (Dixon)**, **Patti Bartlett (Seeley Lake)**, **Jenéle Dowling (MNHC)**



Reserve Your Ticket for Our Annual Banquet and Auction!

**Saturday, September 30, 2017
5:00-9:00 p.m.**

University Center Ballroom

Join us to support and celebrate the Montana Natural History Center with dinner, drinks, conversation, and bidding on our fabulous live and silent auction items! Bid on everything from a Galapagos cruise to a gorgeous painting by Nancy Seiler to a weekend watching wildlife in Yellowstone. Reserve your tickets today by going online to MontanaNaturalist.org or calling 406.327.0405. \$50 per person (\$60 per person after September 20th).

SPOTLIGHT:



PHOTO COURTESY HEATHER MCKEE

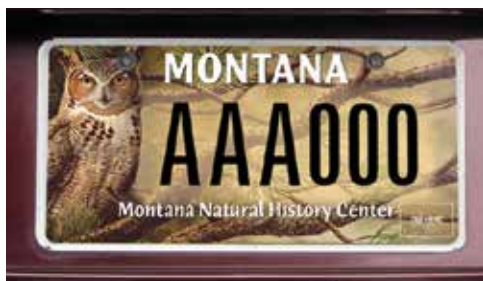
Introducing Heather McKee

We are thrilled to welcome naturalist and educator Heather McKee as our Wings Over Water Program Assistant for the upcoming school year. Heather earned her B.A. in biology at Pomona College. She was inspired to pursue a career in environmental education after she developed the natural history and resource conservation programs for a backcountry lodge in the southern Appalachian mountains. She obtained her M.S. in Environmental Studies from the University of Montana, where she now teaches nature writing each spring. Her free time is spent seeking out the ecologically unusual in Montana—wet cedar forests, charcoaled remains of forest fires, and mineral-crusted lakes hosting masses of migrating snow geese and swans. Heather is excited and honored to work with the educators at the Montana Natural History Center and researchers at the University of Montana to help implement the innovative WOW program in public schools.

Want to Leave a Legacy? Consider Planned Giving!

By including the Montana Natural History Center in your estate plans, you can help connect people of all ages to the amazing natural places we live so they will gain appreciation, passion, and commitment to environmental conservation. Your legacy gift will help us do this in perpetuity, allowing us to continue connecting people with nature for generations to come. Please remember the Montana Natural History Center in your will, retirement plan, and/or life insurance policy.

If you have any questions concerning planned giving opportunities or if you would like to make a gift, please contact Thurston Elfstrom, MNHC Executive Director, at 406.327.0405 ext. 202, or visit our website to learn more: MontanaNaturalist.org.



Show Your Support with an MNHC License Plate!

You've probably seen those beautiful Great Horned Owl license plates around...and now is a great time to get your own! MNHC license plates are available at your local County Treasurer's Office. Purchasing this lovely plate is yet another way to support your favorite Montana non-profit! Our plate features artwork by Bitterroot artist Joseph Thornbrugh and design by Missoula's Eileen Chontos.

The first-time cost is \$40, which includes a \$20 donation to the Montana Natural History Center. Renewal fee is only \$20, all of which goes to MNHC!

You don't have to wait until your current plates expire, so buy today!

MNHC PHOTOS



Join Us in Navigating Our Changing World

We're continuing our climate change lecture series! We know that humans are changing Earth's natural systems in rapid and unprecedented ways. This has propelled our planet into a new geologic era: the anthropocene. How do we navigate these changes we've caused, where can we have positive impacts...and where do we find hope? This fall we're bringing in three more experts with a diversity of perspectives to speak on these very things. Join us!



Upcoming speakers:

Jakki Mohr, September 20th: BUSINESS INNOVATIONS INSPIRED BY NATURE: Biomimicry

Jedediah Brodie, October 18th: BIODIVERSITY IN A CHANGING CLIMATE

Dan Spencer, November 8th: KNOWING EARTH, LOVING EARTH: Ethics and Science in the Anthropocene

\$10; \$5 members; students FREE. Ticket includes free beer/wine/soda from The Dram Shop.

For more information and to purchase tickets, visit MontanaNaturalist.org/climate-change

Become a Member of the Montana Natural History Center!

MNHC members get all kinds of great benefits: free admission to our Center; an annual subscription to Montana Naturalist magazine; discounts on MNHC classes, programs, and summer camps; and, through our participation in the Association for Science-Technology Centers' passport program, reciprocal admission to more than 300 science centers in North America! Check out astc.org for a complete list of participating centers.



We offer three membership levels: \$35 individual membership, \$60 family membership, and our \$75 grandparent membership, which is a great option for the whole family—it includes you, your children, grandchildren, and any other family/visitors.

**Join us...renew
your membership
or become a
member today!**



As To The Mission

Getting the Word Out

In case you don't know, or perhaps you've forgotten, the Montana Natural History Center has for a long time been producing content—magazine articles, a radio program, blog posts, classes, lectures, kids' activities, and more—that informs. To state our mission another way, we get the word out about nature.

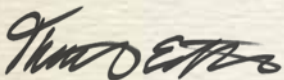
Field Notes, our radio program in partnership with Montana Public Radio, is a perfect example. This short-form radio program is an examination, usually from a layperson's point of view, of why something in nature works or appears as it does. These radio shorts are extremely effective at informing, because *Field Notes* is a genuine communication that is easy to consume—almost like snacking on natural history information. It's exciting, and you always learn something new about the natural world.

This same concept is evident in the miniNaturalist Pre-K Program. This early-education program uses singing and coloring and other hands-on activities to engage kids in learning about the natural world. miniNaturalists is just fun: you can see that kids are not only learning, but that they want to be there, they want to know more. They are satisfying their craving for knowledge.

Knowledge is the conduit that leads to caring about something. That care is what we need today to help conserve the places we hold dear. Senegalese forester and environmentalist Baba Dioum put it eloquently:

"In the end we will conserve only what we love, we will love only what we understand, and we will understand only what we are taught."

I invite you to do more than just snack on information about nature and the world we are a part of. Begin by joining us for a lecture or a Naturalist Field Day, or simply exploring our stunning Montana landscapes. But then take the next step—share your own discoveries about the world we live in. Get the word out.



Thurston Elfstrom,
Executive Director

Kudos to Ron Clausen & Friends!

We want to give a heartfelt thanks to Ron Clausen and all of the generous Montana Extravaganza 2017 participants! To date, Ron and his friends have helped us purchase much-needed buses, hire a teaching naturalist to reach more children, and, this year, support our Virtual Naturalist in the Schools Program so that we can reach 300 students in rural communities across Montana. With 1,700 students in our regular Visiting Naturalist program, we'll be reaching over 2,000 4th and 5th graders this coming school year! Ron continues to be a tireless champion of Montana's outdoor places and is committed to making sure children have the opportunity and resources they need to get outside and experience the wonder and beauty of the natural world. We so appreciate Ron and his many friends who have helped MNHC as we grow and expand to carry out our mission of connecting people with nature. We are very humbled by our partnership. **Thank you, Ron!**



MNHC has a great time getting people of all ages outside and learning about the natural world!



Ron Clausen and son Tyler at Montana Extravaganza 2017.

Sherri Lierman

BY ALLISON DE JONG

This past spring the Montana Natural History Center instituted a new award for exceptional volunteerism, naming it for its inaugural recipient, a deeply passionate and engaged volunteer who has given so much to MNHC over the past three years: Sherri Lierman.

Sherri has been a mainstay of the Montana Natural History Center since she began volunteering with us in the summer of 2014. “I initially got involved to give myself something to do,” she says. “But that grew so much—it opened up a whole new world to me. I can’t tell you the amount of friendships I’ve made with the special people here.” And we knew she was special, too, right from the beginning. With a wide knowledge and longtime love of geology and fossils, one of the first things Sherri did was invite a couple of the staff to take a look at her incredible rock and fossil collection, which, along with a fascinating array of historical and archaeological items, takes up the entire basement of her home, museum-style. Next she helped us put together a gorgeous display case of some of her unique Montana fossils, which have been thrilling and educating visitors for the past three years.

But that was only the beginning. Sherri also has an amazing rapport with children, and has found deep satisfaction in working with all of our children’s programs, from our Visiting Naturalist in the Schools classroom lessons and full-day field trips to our miniNaturalist preschool program to our summer camps. “I just love kids,” she says. “Working with them gives me an opportunity to be a kid.” She sings songs, tells stories, leads nature hikes, reads books, dresses up—and the children love it, and they love her. Sherri’s curiosity and passion for the natural world are unending and infectious. She has inspired dozens of kids (and their parents!) with her stories, her knowledge, and her enthusiasm.

And they have inspired her, too. One of her most special moments of volunteering happened during a spring Visiting Naturalist in the Schools field trip. She had set up her group of students at their individual spots along the trail, each to study a different natural history topic, and when she went back to check on the first boy in the group, he was crying. She asked him what was wrong, and he told her, “I just moved here from Cincinnati, and I’ve never heard silence before. I’ve never been this close to nature, to a real tree, and nobody else around.” Then he asked, “...could I just sit here a moment?” Sherri told him yes, of course, he could. And in that moment she realized anew the importance of appreciating this special place we live. “Sometimes we take it for granted,” she says, “but this young man really made me appreciate it all again. It’s those insights I

TOP RIGHT:
Sherri in her museum, sharing her love of geology.

BELOW RIGHT:
Sherri dressed up for a miniNaturalist lesson. “I am a kid,” she says, with a twinkle, “so it’s good for me to have this outlet.”




And we knew she was special, too, right from the beginning.



get from the kids that make this experience so rare and special.”

Earlier this year Sherri was diagnosed with terminal lung cancer, and she is choosing to make each day rich and meaningful, continuing to give of herself as much as she can. “I think [volunteering at MNHC] is one of the reasons I’m doing so well,” she says. “These kids, this place, give me something to fight for—I don’t want to have to give up working with kids. These have been the best few years of my life. It’s filled an empty spot in my heart, to be sure.”

And she’s filled a big place in our hearts, too. 

PHOTOS COURTESY SHERRI LIERMAN

COSTUME PHOTO: MNHC



Rural Montana by Bike

STORY & PHOTOS BY STEPHANIE FISHER

Each summer the Wild Rockies Field Institute hosts a month-long biking tour called ‘Cycle the Rockies.’ During their self-supported trips university students from around the U.S. pedal back roads investigating power production and climate change in Montana. From Billings to Whitefish, the participants navigate 760 miles of breathtaking landscapes and reach out to rural western communities. This year’s group consisted of six women participants—including myself—plus two leaders. Over the duration of the trip, my sense of place deepened. I owe much to Montana’s rural places, its people, and their crossroads. Throughout the journey, I found myself marveling at the joys and challenges each day brought. Cycling through rural Montana allowed time for me to notice so many things I would otherwise have quickly passed by. Here are a few glimpses of our state through the lens of a cyclist, student, and naturalist.

**Sunday,
June 18th**



Our journey begins as we depart Billings and head for Steve Charter’s ranch outside Shepherd. It’s a grueling first day battling dehydration, headwinds, and sun exposure. My muscles feel tight as I swing my leg over a heavily packed bike, but my eyes and soul are met by breathtaking views. I see a field of golden native grasses,



mint-green sagebrush, and bright white blooming yucca beneath a seemingly endless sky. The prickly pears are currently dropping their flowers, and their fruits are beginning to ripen. Our horizon slowly changes and mesas now jut from the steep Bull Mountain Range ahead. When we stop for the evening, I learn that the yucca flowers lining these beautiful hillsides are edible. I feel rejuvenated by the presence of silver sage and the sound of a Western Meadowlark’s call while savoring this newfound yucca flavor. The clouds display blue and purple hues with the sun’s dramatic rays reflecting orange and pink while refreshing breezes help usher in a very welcome night’s sleep. As I lay my head down and look out towards the first stars, a Common Nighthawk swoops and dips across my sleepy gaze. When I finally close my eyes, images from the day flash through my mind—already I’m beginning to feel that Montana is that much more of a welcoming home.

**Friday,
June 30th**



We have biked 300 miles in the past twelve days. Today we pedal along Chevallier Drive on our way to Wolf Creek and I notice that my cheeks hurt slightly more than my legs, probably from smiling so much. This wind-swept rocky terrain is challenging to navigate with a weighted load, but the long-reaching views help keep my spirits high. A seemingly-deserted gravel road now guides us through

Above: Scenic Chevallier Drive.
Below: Bull Mountains and grassy plains around Shepherd, Montana.
Right: Ever-changing landscape along Little Prickly Pear Creek.
Far Right: Lake McDonald Mergansers.
Left: Cycle the Rockies route, from Billings to Whitefish.



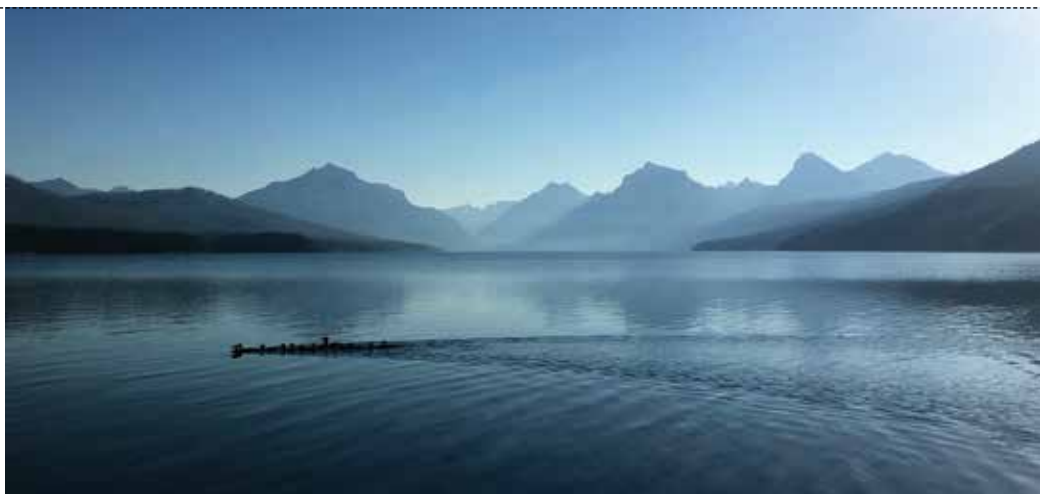
deep mountain valleys towards the banks of Little Prickly Pear Creek. The creek is lined with spring willow growth and my stomach flutters at the thought of a possible moose sighting. This is one of the few times we are the only people out on the road, and the quiet time offers a safe space to enjoy the landscape, flora, and fauna without interruption. The sun is hot but a few clouds and passing trees offer shady reprieve. With every changing mile, the landscape evolves, and soon we are approaching the Rocky Mountain Front. This landscape is constantly posing new physical challenges; each uphill battle demands respect for this place.



**Saturday,
July 1st**

I am now somewhere

between Wolf Creek and Augusta, and even the early morning heat is already unbearable along Highway 287. The sky is crystal clear, the days are growing warmer, and the winds pick up right on schedule. Dehydration is about to settle in. Feeling constantly fatigued and thirsty is new to me and so too is deciding how best to cope with unfamiliar levels of exhaustion. Our group pushes along shortgrass prairie terrain void of trees. We hear the unmistakable song of Western Meadowlarks all around us. I suddenly spot an Osprey with a fish clasped in its talons and almost miss noticing a cricket working its way to the road's edge.



There are purple lupine reaching for the sky as the hot sun evaporates the Dearborn River, their seasonally-flowing lifeline. I know this newfound meditative state won't last forever—but now that I've experienced it, I know I'll be able to return to this state of mind, body, and connection with place again.



**Saturday,
July 8th**

Tonight we are

in Glacier National Park, pedaling up the Going to the Sun Road and returning under moonlight. On the night of every full moon in the summer, cyclists dominate the heavily-driven road and eagerly approach Logan Pass as the moon rises. As we pass the inlet to Lake McDonald a dripping black bear runs out of the river, crosses the road, and disappears into the woods in front of me. I ride over its water trail feeling lucky. As we pass the Weeping Wall, I'm energized by knowing there are only three more miles to go. The sky is black now and the moon has not quite breached the summits above the Garden Wall. I notice a small deer mouse scurrying alongside me, paralleling my path for a moment and then going on its way. We press on and through our last bend before Logan Pass with the moon bright and shining before us. In a burst of adrenaline, I reach the top of the pass, the light drawing me upward.

**Monday,
July 10th**

As we approach Whitefish

I begin to feel bittersweet closure ahead. An all-too-familiar smoky fragrance penetrates the fresh clean air we so gratefully breathed

The Crew: Left to Right - Rachel Woods-Robinson (Instructor), Liv Sears, Mia Tompkins, Beth Porter, Stephanie Fisher, Ben Johnson (Instructor), Emma Thompson, Morgan Krakow

over the past 760 miles. I'm happy to have finally reached this point but unpleasantly surprised by how early the smoke arrived this year. After three weeks of cycling, what I once considered to be big climbs now seem small, and the mere mile that lies between our group and Whitefish State Park is nothing at all. As we ride into the park, my stomach sinks and flutters in a mix of excitement and dismay. I can't quite take in the reality that we're finished, that I have accomplished my goal, cycling 760 miles across Montana! I take off my helmet and shoes one last time, reflecting on how much I have changed over this short period. My body is stronger, my mind calmer, and I feel a deeper reverence for and understanding of the natural world.

I'm already looking forward to my next journey by bike. 🦋

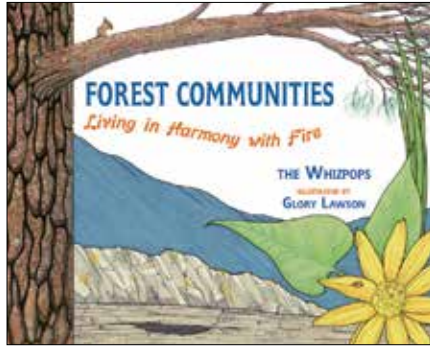
—Stephanie Fisher is a graduate student at the University of Montana. She will be graduating with her MS in Environmental Studies with a focus in education in 2018.



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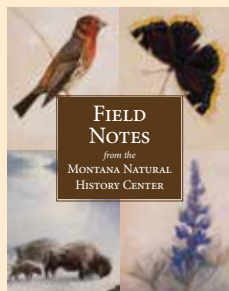
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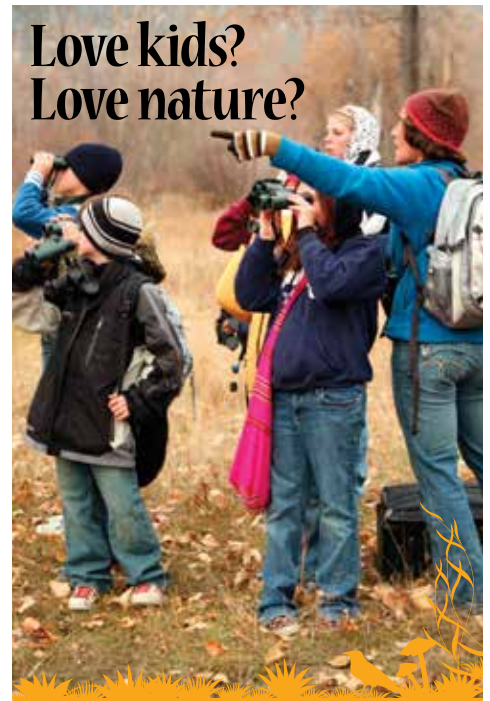
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BY ADELAIDE CRAPSEY

Listen. . .

With faint dry sound,
Like steps of passing ghosts,
The leaves, frost-crisp'd, break from the trees

And fall.



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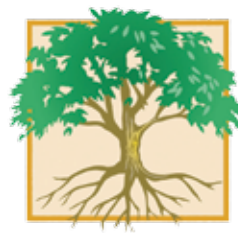
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