Montana Natural History Center

Spring/Summer 2016

MONTANA Naturalist

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

MONTANA NATURAL HISTORY CENTER · 1991-2016 · 25 Years · CONNECTING PEOPLE WITH NATURE

Celebrating 25 Years of MNHC

Engaging the World Through Citizen Science | Digging for Gems | Spring Birding on the Prairie

MONTANA Naturalist Spring/Summer 2016

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Cover – A Black Arches Moth caterpillar *(Melanchra assimilis)* feeds on an American saw-wort *(Saussurea americana)* along the Heart Lake trail in the Lolo National Forest.

Photo by Clare Beelman, an avid observer of the natural world who routinely attempts to capture her observations—especially the wee details—through photography. See more of her photos at www.flickr.com/photos/labradorears.

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Connecting People with Nature

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tidings

PHOTO BY ALLISON DEJONG

A gnarled but resilient lodgepole pine—looking very different from those in Montana—clings to its perch above the Pacific.

This spring my husband and I took a road trip to visit the redwoods in northern California, along the Pacific coast. This was my first visit, and for a week I felt as though I had stepped onto another planet, the combination of enormous, ancient trees and endless liquid horizons such a contrast from the familiar rocky mountains and dry, open forests of western Montana.

Though much of what I saw seemed completely other, it wasn't, not really. Among the redwoods and madronas were Douglas-firs and lodgepole pines. And yet, I didn't immediately recognize the Douglas-firs because they were huger than I'd ever seen them, hundreds of feet tall, some rivaling the redwoods in both height and girth. The lodgepole pines, on the other hand, were stunted and twisted, warped by coastal gales. They much more resembled their Latin name, *Pinus contorta*, than do the arrow-straight lodgepoles of Montana.

I realized something anew, looking at those familiar-yet-altered trees: we are changed by the places we live. The same species, set down in two different ecosystems, will look, and be, different. But trees don't have a choice about where they grow. We do.

What does this mean for us? I ponder our choices in terms of outdoors versus indoors—a much smaller thing than Montana versus California. How might we be different if we choose to immerse ourselves in nature rather than in smartphones and offices and televisions and living rooms? How might spending some time in even a city park or our own back yard—much less exploring the wild landscapes so close at hand—shift who we are?

Much of this issue looks at how connecting ourselves to the natural world changes us. Author Sharman Russell finds herself increasingly aware of the world's complexity on a micro level after beginning a citizen science project studying tiger beetles. Almost everywhere she goes, she can't help but look for these fierce and fascinating insects (pgs. 8-10). Wildlife biologist Ken Walcheck feels refreshed and inspired after an early morning spent watching the extravagant courtship displays of waterfowl at a remote prairie pothole marsh in northeastern Montana (pgs. 20-21). The Blackfeet have long known that being connected to the natural world is the only way to be connected to the supernatural one (pgs. 16-17). And artists Claudia Paillao and Karl Knudsen have come to appreciate—and revel in—the intricate details and uniqueness of Montana's wild creatures as they craft an increasing number of woolen representations (pg. 15).

This spring and summer, perhaps we can stretch ourselves a bit. Challenge ourselves to spend more time in wild places than we already do, and see what happens. See how where we choose to spend our time changes who we are.

Happy exploring!

Allison De Jong
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The Montana Natural History Center celebrates 25 years of connecting people with nature in 2016. For these three issues, *Montana Naturalist* will be adding four extra pages to showcase MNHC's history: conversations with founders and long-time supporters, stories and photos from the archives, and fun memories of all MNHC has accomplished over the past quarter century. Join us for our walk down memory lane!

Celebrating 25 Years of the Montana Natural History Center:

A Conversation with Hank Fischer

Hank Fischer has long been a supporter of MNHC. He became involved in the mid-90s, joined the board of directors in 2003, and served as board president from early 2006 to December 2015. I sat down with Hank recently to ask him a few questions about the changes he's experienced at MNHC during his time on the board.

Allison De Jong: Tell me about your early years on the MNHC board. What was going on when you first got involved?

Hank Fischer: It was a turbulent time. Key board members thought our base of operations at Fort Missoula was too far from town. Then the property on Hickory Street became available, and the board agreed we'd make the big step and buy the old Big Sky Brewery building. Unfortunately, MNHC wasn't nearly as financially stable then as it is now. From the beginning we struggled mightily to pay the mortgage and maintain our programs.

About a year after we bought the building I became board president, and within another year the board was faced with a very difficult decision. While the building was perfectly located and an ideal size for anticipated growth, we simply couldn't make the payments and our debt was growing. Reluctantly, the board decided we needed to sell the building. But just at the point where we had a prospective buyer, the Kendeda Fund stepped in and secured the building for MNHC. They threw the life ring that MNHC desperately needed.

ADJ: And here we are. What a time to step in as board president, when no one knew what was going to happen—and what an experience to go from thinking we'd have to sell the building to suddenly owning it outright.

HF: It was an incredible stroke of good fortune—the Kendeda Fund is a huge supporter of kids and environmental education, and has a strong Montana focus. Once MNHC was no longer struggling to pay off a sizeable mortgage, we were able to focus our energies on programs, which led to more members and more supporters. After only a few years our financial situation had changed enough that we were able to plan for remodeling the building to better suit our program needs. We launched a million-dollar capital campaign, and with the support of our members and some hard work by the staff and board, we were able to raise the funds and complete the remodel in two years. And finally we have a home that looks like a real natural history center.

> Once MNHC was no longer struggling to pay off a sizeable mortgage, we were able to focus our energies on programs, which led to more members and more supporters.

ADJ: MNHC was a much smaller organization when you first joined the board. How does what we have done—both with the building and with our programming—compare to your early thoughts of what we could be?

HF: Call me boring, but I'd describe myself as a dedicated incrementalist: I believe in making consistent progress, figuring out the small actions that take you where you want to go. We've had great board members who have been critical in helping us do that. And we've had great staff, too. Arnie [Olsen, MNHC's former Executive Director] was really important; he was an organizer and a stabilizer. Arnie was very good at hiring staff and at building on our successful programs. MNHC made major strides during the time he was here. The key factor with successful nonprofits is solid leadership, and Arnie provided that for a number of years.

ADJ: Tell me more about what you think MNHC's strengths are, both when you started getting involved here, and now. Have they shifted? Has our focus shifted?

Left: Hank Fischer served as MNHC board president from 2006-2015.

Above: Hank (r) helps set up the osprey nesting platform at the Osprey stadium in 2006. The project was a collaboration between MNHC, Northwestern Energy, the Osprey, and Play Ball Missoula.

Opposite page: Board, staff, and supporters tour MNHC's potential new home at Hickory Street in March 2004.

HF: MNHC has always been all about keeping kids and adults in touch with nature, and our programs—while they have grown significantly—continue to reflect that. Our Visiting Naturalist in the Schools program has grown steadily over the last fifteen years. Our Master Naturalist program has really taken off in the last decade. But it's important to examine whether the way we've done things over the last 25 years is still relevant today. Is our model still the right one? We need to question that all the time. Given the changes in technology, it's important to think about ways to reach kids and adults that we haven't tried before. Our recent efforts to reach teachers and kids in rural communities via video conferencing technology is a good example. It's an interesting irony that MNHC likely will increasingly use technology to keep both kids and adults in touch with nature.

ADJ: What's your favorite thing about MNHC and what we do? What's kept you here for 10 years as board president?

HF: Serving on the board of a fledgling nonprofit is a bit like raising a child. You want it to have the right values, and you want it to succeed. And I find it fascinating to help grow an organization. It's a fun thing to do. You meet interesting people who often share common interests. And especially when you have success, the work is rewarding. I get a good feeling when I pull into the parking lot at Hickory Street and see how far MNHC has come in the last twenty-five years. And I also think about all the great people I've gotten to know who helped make it happen.

The challenging part of being a board member—and especially of being a board president—is prioritizing what MNHC should attempt to do given our limited budget. Everybody has ideas, but how does an organization decide what's most important? We try to have planning meetings at least once a year to set priorities, identify new initiatives and try to figure out how we will pay for everything. Once a direction is set, the board chair and the executive director share the responsibility of maintaining the discipline of sticking to the plan. That goes back to the notion of asking, "What are the small steps that lead us to our goals?" It can be difficult when a board member comes up with a great new idea but the organization has already made commitments to other projects. It's essential to deliver on what we as a board and staff agree to do. Doing so builds credibility with members and supporters. That formula has been an important part of MNHC's success during my tenure.

Doing a better job of providing nature education in small towns is extremely important; I believe it should be one of MNHC's highest priorities.

ADJ: Here we are in 2016, celebrating 25 years of challenges and successes. What are your wishes for MNHC's next quarter century?

HF: My vision is to see MNHC become a true statewide organization. I'd like to see us reaching not only more Montana cities, but more rural communities. Doing a better job of providing nature education in small towns is extremely important; I believe it should be one of MNHC's highest priorities.

MNHC has come a long way in its first 25 years. I'd say we are now generally recognized as the foremost nature education group in the state. Other groups involved with nature education tend to look to us for advice and leadership. We are now a stable, well-financed organization that clearly is going to be around well into the future. We have a terrific staff and a talented new executive director. I'm enthused to think about what MNHC might become over the next 25 years, and I look forward to being part of it.

We at MNHC are so grateful to Hank for the 10 years he served as board president, and, even though he's stepping down from that leadership role, we're very glad he's continuing on as a board member, sharing his wisdom and experience as we begin the next quarter century. Thank you, Hank!

MNHC PHOTOS

Celebrating 25 Years of the Montana Natural History Center:

Archive Dive: *Field Notes for Kids*

Nathan Monnig recording his Field Note at KUFM

Pileated woodpecker art from 5th grader at Chief Charlo Elementary

Field Notes for Kids was a program for kids, by kids. It ran from 1992-2007. Every episode stemmed from a child's curiosity—kids researched a topic that fascinated them, wrote up what they discovered, and read their *Field Note* on Montana Public Radio, getting to share what they learned with other kids. For several years the program was a regular feature on "The Pea Green Boat" on MTPR.

In looking through our archives, we found this great *Field Note for Kids* written in 1992, by then-3rd grader Nathan Monnig. (His father, Ed Monnig, is currently on the board of MNHC.)

The Pileated Woodpecker

By Nathan Monnig, 3rd grader at Paxson School in 1992

The Pileated Woodpecker has an amazing tongue. It has to be very long so when it pecks it can stick its tongue in to get the bugs that are hidden in the little cracks in trees. Where does it keep such a long tongue? The tongue gets wrapped around the skull and into the nostril! At the end of the tongue are sticky barbs that stick to the bugs. Where the tongue goes into the nostril, there are hyoid bones that are connected to some muscles. When the woodpecker wants to stick out its tongue the muscles contract and let the tongue out.

Why doesn't the Pileated Woodpecker get headaches from pecking? It has a thick skull and padding on the outside of the skull so when it pecks it doesn't hurt its brain.

The Pileated Woodpecker doesn't hold all of its body up with its feet! It has two very stiff tail feathers that it presses against the tree. When the Pileated Woodpecker molts, it doesn't lose its tail feathers all at once because if it did, it couldn't hold itself up.

The Pileated Woodpecker eats wild berries, fruits, nuts, and insects, especially carpenter ants and the wormlike larvae of wood-boring beetles. One day a scientist found a male Pileated Woodpecker that had 469 carpenter ants in its stomach and a female that had eaten 153 ants, a beetle, and 17 wild grapes!

The Pileated Woodpecker, unlike some other animals, is able to adapt to the changing world. You might even see a Pileated Woodpecker in a city park!

In April, the female lays the eggs; they will hatch in about 18 days. After they are hatched, the male and the female share duties of raising their young.

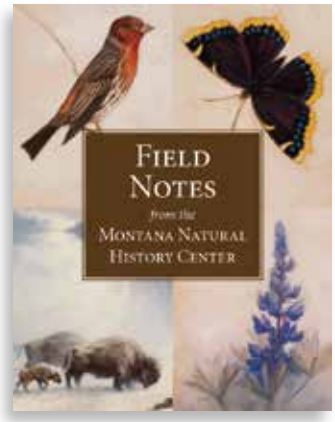
Aired on Montana Public Radio on 9/26/1992.

Field Notes from the Montana Natural History Center

MNHC isn't the only entity celebrating 25 years in 2016. Our longest-running program, *Field Notes* on Montana Public Radio, is also 25 this year. And what better way to celebrate both of these anniversaries than by putting together a book of *Field Notes*, which have educated listeners across our state about the marvelous minutiae of Montana's natural history for a quarter of a century?

We are thrilled to announce the publication of *Field Notes from the Montana Natural History Center*, showcasing more than a hundred of the excellent Field Notes that have been written over the years. Want to know how snowfleas survive the cold? Field Notes can tell you. Did you know that trillium plants can live for 60 years or more? That there used to be lobsters in Montana? That some dragonflies migrate? *Field Notes from the Montana Natural History Center* touches on all of these subjects and many, many more.

Field Notes will be published in the summer of 2016, and can be pre-ordered by contacting us at 406.327.0405. Reserve your copy today!



Archive Dive: *Historic Photos*

1 Kate Davis provides a fun presentation for kids—and grownups!—at the 1994 auction at the Boone & Crockett Club.

2 Founding mother Sue Reel speaks at MNHC's 1996 auction.

3 Executive Director Brad Robinson is ready to ride in the 2004 Homecoming Parade!

4 One of the Visiting Naturalist classrooms from Rattlesnake Elementary visits MNHC's new space in 2006.

5 Hundreds of kids learn about the Clark Fork Watershed at the 2004 Watershed Festival at MNHC's home at Fort Missoula.

6 The MNHC staff pose in the new, still-under-construction building at Hickory Street in December 2004. Merry Christmas! Back row: Anita Maxwell, Caroline Kurtz, Brad Robinson. Center row: Lisa (Moore) Bickell, Charles Miller. Front row: Gabrielle Sivitz, Jessica "Jazz" Rowell

Left: The fierce-looking larva of a Western red-bellied tiger beetle.

Adventures in Citizen Science

BY SHARMAN APT RUSSELL

Right: Tiger beetles are predators, with sharp mandibles to grasp and dismember their prey.

Above: An adult Western red-bellied tiger beetle *(Cicindela sedecimpunctata).*

Above: The Watershed Education Network (WEN) Stream Team consists of citizen scientists ages 16-60.

Above: Citizen scientists with the Wilderness Institute hike into the backcountry to evaluate the human impacts on various wilderness (and potential wilderness) areas.

Below: Citizen scientists are helping WEN study multiple aspects of stream health at Lolo Creek.

Above: A WEN Stream Team member collects data at Lolo Creek.

PHOTO COURTESY OF SHARMAN APT RUSSELL

In southwestern New Mexico, I squat on a sandy riverbank, watching a pack of Western red-bellied tiger beetles eat a dead frog. Although the insects are only two feet away and about a third of an inch long, through close-focusing binoculars they fill my vision, an entirely new and surprising world. Tiger beetles have disproportionately large, sickle-shaped mouthparts, which they use now to stab into the white belly of the frog, slicing and scything and scissoring their mandibles like a chef sharpening his knives. Sometimes the beetles stand completely still, each brown wing cover patterned with seven creamy, irregular dots, the abdomen orange, the head and thorax iridescent in the sun. The beetles flash red and green and blue and gold. Suddenly they are gone. Suddenly they return. Suddenly they stare straight at me, their large, bulging eyes giving them a curious, inquisitorial air.

PHOTO BY TED MACCRAE

Tiger beetles live almost everywhere in the world—Montana has some twenty-five species—and are not for the faint of heart. More often hunters than scavengers, adult beetles typically run down prey like ants and spiders, grab, stab, dismember, drench the victim's body in digestive juices, and suck up the puree with a strawlike mouthpart. Even the larvae of tiger beetles are predators: small pale grubs with an armored head and heavy mandibles who lunge from their burrow holes to grab smaller insects and carry them down to the dark bottom of their tunnels.

PHOTO BY CARY KERST

As a citizen scientist, I have spent the last few years working under the mentorship of two experts on tiger beetles, David Pearson and Barry Knisley, co-authors of *A Field Guide to the Tiger Beetles of the United States and Canada*. My task has been to discover more about the larval biology of the Western red-bellied tiger beetle. In what kind of soil or habitat does the female of this species lay her eggs? After the eggs hatch, what do the larvae look like, exactly? And how long is the cycle from egg to larva to pupa to adult? For two field seasons, I observed tiger beetles, collected tiger beetles, and reared up their larvae. My research has yielded a few answers, and more questions, and a tremendous amount of fun.

PHOTO COURTESY OF WEN

Like many citizen scientists—and scientists, too—I relish the process of gathering data as much as the data itself: this sun pleasantly warm on the back on my neck, the rich smell of willow and river and earth, that flowering white clover fairly winged with pollinators—monarchs, buckeyes, blues, hairstreaks, flies, and bees.

PHOTO COURTESY OF THE WILDERNESS INSTITUTE

And, of course, this ferocious pack of carnivorous, charismatic Western red-bellied tiger beetles at my feet. Perhaps thirty of them feed on the frog's slightly bloated carcass, and I am reminded of lions at a kill—although lions don't look half so fierce.

Citizen science is addictive. As well as my personal project with tiger beetles, I monitor archeological sites near my home in New Mexico, document the phenology of plants for the national program Nature's Notebook, watch clouds for NASA, and occasionally go online to classify galaxies. I am not alone. The sheer number of citizen scientists, combined with new technology, is beginning to shape how research gets done. Over a million people also go online to catalog galaxies or whale songs or cancer cells for citizen science programs featured on the website Zooniverse. A quarter million play the video game Foldit, working with biochemists to synthesize new proteins.

PHOTOS COURTESY OF WEN

More and more citizen scientists are also getting up from the computer and going outside. Mostly they help scientists count things: dragonflies, kestrels, salamanders, hedgehogs, sunflowers, comets, bacteria, roadkill. Two hundred thousand volunteers join the Cornell Lab of Ornithology in tracking birds—and these birders are working hard, with a million observations reported each month on the lab's online checklist. Many citizen scientists double as environmental activists, collecting air and water samples, monitoring invasive species, and documenting climate change.

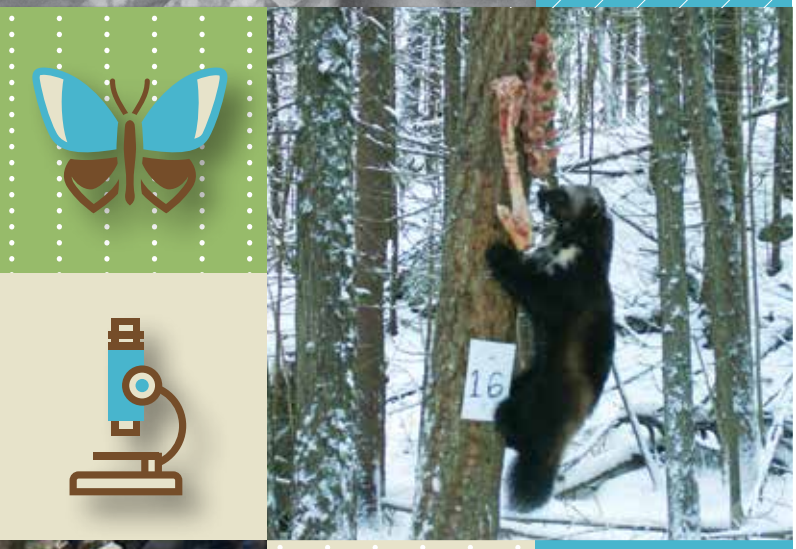
The sheer number of citizen scientists, combined with new technology, is beginning to shape how research gets done.

This last spring, when I came to Missoula to teach writing for a semester in the Environmental Studies Department at the University of Montana, I felt right at home—surrounded by a wealth of citizen science programs as vibrant and robust as the restaurants, bars, and music downtown.

The Watershed Education Network in Missoula (WEN) has a "Stream Team" working now in Lolo Creek. In the spring of 2015 and 2016, three to six citizen scientists went every week and sometimes twice a week to record what the creek looked like after a fire had burned the area in 2013. These community members and students, ages 16-60, collected data on aspects of stream health such as bank erosion and water turbidity. In April of 2016, the Lolo Creek Watershed group and Clark Fork Coalition, along with volunteers and Lolo School students, planted willow up and down the creek. Next year, WEN's Stream Team will go back and see how much these plantings have helped prevent further sedimentation and erosion. Previous WEN projects have included monitoring the water chemistry and macro-invertebrates—insects, crustaceans and worms—along Rattlesnake Creek and sites on the Clark Fork and Bitterroot.

Establishing this kind of baseline data for streams in Montana is clearly important. For the volunteers, though, as program coordinator Rebecca Paquette says, "this is an experience in itself, outside your everyday life, where you can be literally outside, looking at all kinds of things—bobcat tracks in the snow or swirls of insects in the water."

Left: Only 250-300 wolverines are believed to exist in the lower 48 states. Citizen science can help us learn where their territories are and if those numbers are correct.



Above: A wolverine goes for the bait—and gets captured on camera.

Above: Pika surveys are being done by citizen scientists across Montana, from Glacier to Yellowstone and many places in between.

Above: Citizen science opportunities in Glacier National Park range from monitoring mountain goats to recording the presence of invasive weeds.

Similarly, the Wilderness Institute here in Missoula also trains citizen scientists in monitoring the natural world, but this time with overnight summer trips into the backcountry of Montana where the teams evaluate the "character and quality of wilderness" in places like the Hoodoo Mountain Wilderness Study Area. These volunteers are documenting invasive plant species, recreational impacts, and noise and visual "intrusions"—information that can be used by agencies to better manage existing and potential wilderness.

Citizen science is year-round. In winter, citizen scientists ski or walk to remote areas in the Bitterroot National Forest, helping the Wolverine Watchers: Bitterroot Wildlife Monitoring Project learn more about elusive predators like wolverines, fishers, martens, and lynx. In a collaborative effort led by Defenders of Wildlife, program director Kylie Paul coordinates some 150 citizen scientists who monitor over 20 sites set up with good-smelling bait (roadkill deer and scent-soaked sponges) and motion detection cameras. Wire brushes on tree trunks collect animal hair which can be analyzed for DNA.

Kylie notes that only 250-300 wolverines are thought to exist in the lower forty-eight states. So far, her cameras have caught two of them, a male and female. Although no fishers or lynx were drawn to the baits, the Bitterroot Mountains seem to support a high number of martens. The cameras also recorded bobcats, wolves, mountain lions, foxes, weasels, moose, squirrels, and many birds. As Kylie says, this is data collected "on a scale that would have been impossible for the Forest to do on its own."

Further north, at Glacier National Park, citizen scientists conduct field surveys of the population size and reproductive success of the Common Loon. They go into backcountry to record the number and distribution of mountain goats, pikas, and bighorn sheep. And they note the presence or absence of five invasive weeds along hiking trails in the park.

In truth, you can be a citizen scientist wherever you are in Montana—or in the world. If someone hasn't organized a local project, go out in your backyard and watch birds or document plant growth or look at clouds for a national program. For a list of these projects, start with the online clearinghouse SciStarter at SciStarter.com. You might even consider being the first to explore the biology of some obscure insect like the Ghost Tiger Beetle or Green Claybank Tiger Beetle…

I am walking the trails near Missoula, up Pattee Canyon and along Rattlesnake Creek, on the look-out for *Cicindela depressula*, or the Dispirited Tiger Beetle. This seemingly cheerful beetle—usually a bright metallic blue or green—can be found in Montana in the spring, summer, and fall, often where receding snow has left disturbed soil. I walk. I stop. I poke around. Looking for tiger beetles is something I do now almost everywhere I go. Almost everywhere I go, the world is a bit more interesting, being happily filled with tiger beetles. A world made more interesting and complex—that's just one of the many gifts of citizen science.

—*Sharman Apt Russell's* Diary of a Citizen Scientist: Chasing Tiger Beetles and Other New Ways of Engaging the World *has won the 2016 John Burroughs Medal for Distinguished Nature Writing. Her most recent books are the eco-sci-fi* Knocking on Heaven's Door *and the young adult* Teresa of the New World.

PHOTOS COURTESY OF DEFENDERS OF WILDLIFE

PHOTO BY B. CHINN

PHOTO BY JIM GIESE

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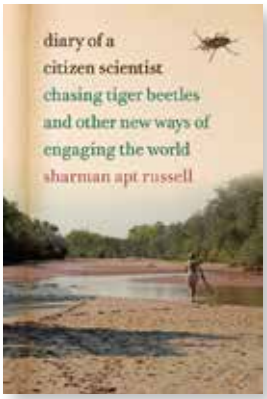


Book Review:

Diary of a Citizen Scientist: Chasing Tiger Beetles and Other New Ways of Engaging the World

Sharman Apt Russell, author, professor, and naturalist, pulls us into the world of beetles and citizen science in this engaging book, which just won the John Burroughs Award for nature writing. As she takes us along on her journey of study and discovery of the Western red-bellied tiger beetle, native to her home in southwestern New Mexico, we not only get to learn about the intricacies of the lives of these small but fascinating creatures, we become inspired to engage and connect with the world in our own ways, in our own places.

Citizen science is not a new concept, but never has it been so widespread in this era of unlimited access to information and instant communication, and Russell finds multiple projects that pique her interest. Along with delving into the world of tiger beetles, she tracks phenological data near her home along the Gila River for Nature's Notebook, an organization that uses volunteer scientists to study the effects of climate change on plants and animals. She inspires her daughter's third-grade students to get excited about archaeology and paleontology. She explores the desert landscape while monitoring archeological sites for illegal digging. And through all of these projects, she becomes more connected to her place—not just the flora and fauna and history, but the people, too.

The crux of this lyrical, insightful book is this: that anyone, anywhere, can be a citizen scientist. All we need is curiosity, a bit of time, and a desire to know our world just a little better.

—Allison De Jong

Citizen Science Projects:

So Many Ways of Engaging the World!

Western Montana Projects:

Watershed Education Network "Stream Team": www.montanawatershed.org/streamteam/

Lolo Creek Watershed Group: lolowatershed.org/get-involved/

Clark Fork Coalition: clarkfork.org/get-involved/volunteer/

Backcountry citizen science trips with the Wilderness Institute: www.cfc.umt.edu/wi/education/citizen-science/

Wolverine Watchers: Bitterroot Wildlife Monitoring Project: www.defendersblog.org/2015/06/wolverine-watchers/

Bird-related citizen science opportunities with Montana Audubon: mtaudubon.org/birds-science/citizen-science-opportunities/

Citizen science projects in Glacier National Park: www.nps.gov/glac/learn/nature/ccrlc-citizen-science.htm

Report on roadkill, microbes, snow and more for Adventurers and Scientists for Conservation: www.adventurescience.org/current-projects.html

Projects you can do anywhere:

Record phenological data (when plants flower, insects emerge, birds migrate, etc.) for Nature's Notebook: www.usanpn.org/nn/become-observer

Watch clouds, classify galaxies, and other NASA projects: science.nasa.gov/citizen-scientists/

Cornell Lab of Ornithology: www.birds.cornell.edu/citscitoolkit/projects/find

Solve puzzles for science with Foldit: fold.it/portal/

And check out the following sites for lists of dozens more projects of all kinds:

SciStarter: scistarter.com
Zooniverse: www.zooniverse.org

Kids' Corner

Nature drawing submitted by Gus M., age 5.

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

Visit MNHC for FREE this summer! As part of our 25th anniversary celebrations, we are offering FREE admission in June, July, and August!

Programs for Kids

April 21 **miniNaturalist Pre-K Program,** 10:00-11:00 a.m. $3; $1 MNHC members.

April 28 **miniNaturalist Pre-K Program,** 10:00-11:00 a.m. $3; $1 MNHC members.

May 5 **miniNaturalist Pre-K Program,** 10:00-11:00 a.m. $3; $1 MNHC members.

May 12 **miniNaturalist Pre-K Program,** 10:00-11:00 a.m. $3; $1 MNHC members.

May 19 **miniNaturalist Pre-K Program,** 10:00-11:00 a.m. $3; $1 MNHC members.

May 20 **Endangered Species Day Celebration,** 2:00-5:30 p.m. Plant milkweed and help create a butterfly waystation in our new Nature Adventure Garden at MNHC. Free.

May 26 **miniNaturalist Pre-K Program,** 10:00-11:00 a.m. $3; $1 MNHC members.

May 28 **Saturday Kids' Activity,** 2:00-3:00 p.m. **Flower Power.** Program free with admission.

Adult Programs

April Gallery, all month. **Jenah Mead: Fawns Have Spots and Other Observations.**

April 20 **Glacial Lake Missoula Chapter Meeting,** 4:00 p.m. Free and open to the public.

April 20 **Evening Program,** 7:00 p.m. **Naturalist Trivia.** $4 suggested donation; MNHC members free.

April 29 **Evening with a Naturalist: Emily Graslie** hosted by Hank Green, 7:00 p.m. $60.

May Gallery, all month. **John Ashley: Natural History of the Night.**

May 6 **First Friday Gallery Opening,** 4:30-6:30 p.m. **John Ashley: Natural History of the Night.** Lecture at 6:30 p.m.

May 14 **Naturalist Field Day,** 9:00 a.m.-5:00 p.m. **Fire Ecology with Greg Peters.** $80; $70 MNHC members.

May 18 **Glacial Lake Missoula Chapter Meeting,** 4:00 p.m. Free and open to the public.

May 18 **Native Plant Garden Program,** 5:30-7:00 p.m. **Weed Walk and Talk.** $4 suggested donation.

May 20 **Endangered Species Day Lecture,** 5:30-6:30 p.m. Missoula Butterfly House and Insectarium presents **Monarchs and Milkweed.** Free.

SUN	MON	TUE	WED	THU	FRI	SAT
April **April Gallery,** All month. **Jenah Mead: Fawns Have Spots and Other Observations.** 17	18	19	**Glacial Lake Missoula Chapter Meeting,** 4 p.m. **Volunteer Naturalist Training,** 4-5:30 p.m. **Evening Program,** 7 p.m. **Naturalist Trivia.** 20	**miniNaturalist Pre-K Program,** 10-11 a.m. 21	22	23
24	27			**miniNaturalist Pre-K Program,** 10-11 a.m. 28	**Evening with a Naturalist: Emily Graslie,** 7 p.m. 29	30
May **May Gallery,** All month. **John Ashley: Natural History of the Night.** 1	2	3	4	**miniNaturalist Pre-K Program,** 10-11 a.m. 5	**First Friday Gallery Opening,** 4:30-6:30 p.m. **John Ashley: Natural History of the Night.** 6	7
8	9	10	11	**miniNaturalist Pre-K Program,** 10-11 a.m. 12	13	**Naturalist Field Day,** 9 a.m.-5 p.m. **Fire Ecology with Greg Peters.** 14
Cutthroat trout lay eggs 17			**Native Plant Garden Program,** 5:30-7:00 p.m. **Weed Walk and Talk.** **Glacial Lake Missoula Chapter Meeting,** 4 p.m. 18	**miniNaturalist Pre-K Program,** 10-11 a.m. 19	**Endangered Species Day Celebration,** 2-5:30 p.m. **Endangered Species Day Lecture,** 5:30-6:30 p.m. 20	**Naturalist Field Day,** 9 a.m.-5 p.m. **Lichens with Tim Wheeler.** 21
29	30	31	25	**miniNaturalist Pre-K Program,** 10-11 a.m. 26	27	**Saturday Kids' Activity,** 2-3 p.m. **Flower Power.** 28
			June **June Gallery,** All month. **25 Years of MNHC.** 1	**Native Plant Garden Program,** 5:30-7:00 p.m. **Waterwise Gardening.** 2	**First Friday Gallery Opening,** 4:30-6:30 p.m. **25 Years of MNHC.** 3	4
5	6	7	8	9	10	*Coyote pups emerge from dens* 11
	Summer Outdoor Discovery Camps **Trail Blazers** *June 13-17* 13	14	**Montana Master Naturalist Class,** 8 a.m.-4 p.m. ***June 15-21*** **Glacial Lake Missoula Chapter Meeting,** 4 p.m. **25th Anniversary Community Celebration,** 5-7:30 p.m. 15	16	17	18

Programs and events held at MNHC - 120 Hickory Street - unless otherwise noted.

Summer Outdoor Discovery Day Camps See Imprints for details, page 18.

SUN	MON	TUE	WED	THU	FRI	SAT
	Art and Nature Adventures *June 20-24* 20			23	24	**Naturalist Field Day,** 8 a.m.-4 p.m. **Butterflies with Brian Williams.** 25
	Fantastic Fish and Where to Find Them *June 27-July 1* 27	28	29	30	**July** **First Friday Gallery Opening,** 4:30-6:30 p.m. **Sally Hickman: Backyard Bird Project.** 1	2
	Incredible Invertebrates *July 5-8 (no camp on July 4th)* 4	5	6	**Native Plant Garden Program,** 5:30-7:00 p.m. **Sun Prints and Print Making.** 7	8	*Alpine flowers bloom* 9
	Birding Bonanza! *July 11-15* **Amazing Animal Educators Middle School Camp** *July 11-15* 11	12	13			23
	Outdoor Adventurers *July 18-22* 18	19	**Glacial Lake Missoula Chapter Meeting,** 4 p.m. 20			
	Rockin' Rocks *July 25-29* 25	26	*Huckleberries ripen* 27	28	29	30
	Amazing Animals Grades Pre-K-K & 1-2 Camps **Animal Adventurers** Grades 3-5 Camp *August 1-5* 1	**August** **August Gallery,** All month. **Sally Hickman: Backyard Bird Project.** 2	3	**Native Plant Garden Program,** 5:30-7:00 p.m. **Seed Collecting.** 4	**First Friday Gallery Opening,** 4:30-6:30 p.m. **Sally Hickman: Backyard Bird Project.** 5	**Naturalist Field Day,** 9 a.m.-5 p.m. **Nature Journaling with Nancy Seiler.** 6
	Wild about Wetlands! *August 8-12* 8				12	13
	Nature's Greatest Hits *August 15-19* 15	16	17	18	19	20

MNHC PHOTOS

May 21 **Naturalist Field Day,** 9:00 a.m.-5:00 p.m. **Lichens** with Tim Wheeler. $80; $70 MNHC members.

June Gallery, all month. **25 Years of MNHC.**

June 2 **Native Plant Garden Program,** 5:30-7:00 p.m. **Waterwise Gardening—Rain Barrels and More.** $4 suggested donation.

June 15 **25th Anniversary Community Celebration,** 5:00-7:30 p.m. Come one, come all! Join MNHC in celebrating 25 years of connecting people with nature. Enjoy live music, drinks, and food from the Big Dipper and other Missoula food trucks. Free.

June 3 **First Friday Gallery Opening,** 4:30-6:30 p.m. **25 Years of MNHC.**

June 15-21 **Montana Master Naturalist Class,** 8:00 a.m.-4:00 p.m. $395.

June 15 **Glacial Lake Missoula Chapter Meeting,** 4:00 p.m. Free and open to the public.

June 25 **Naturalist Field Day,** 8:00 a.m.-4:00 p.m. **Butterflies with Brian Williams.** $80; $70 MNHC members.

July Gallery, all month. **Sally Hickman: Backyard Bird Project.**

July 1 **First Friday Gallery Opening,** 4:30-6:30 p.m. **Sally Hickman: Backyard Bird Project.**

July 7 **Native Plant Garden Program,** 5:30-7:00 p.m. **Sun Prints and Print Making.** $4 suggested donation.

July 20 **Glacial Lake Missoula Chapter Meeting,** 4:00 p.m. Free and open to the public.

August Gallery, all month. **Sally Hickman: Backyard Bird Project.**

August 4 **Native Plant Garden Program,** 5:30-7:00 pm. **Seed Collecting.** $4 suggested donation

August 5 **First Friday Gallery Opening,** 4:30-6:30 p.m. **Sally Hickman: Backyard Bird Project.**

August 6 **Naturalist Field Day,** 9:00 a.m.-5:00 p.m. **Nature Journaling with Nancy Seiler.** $80; $70 MNHC members.

Volunteer Opportunities

April 20 **Volunteer Naturalist Training,** 4:00-5:30 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 May VNS school field trips for 4th & 5th graders. No prior experience necessary.

Kids and adults alike have a great time hunting for gems on site at Gem Mountain in Philipsburg!

PHOTO COURTESY GEM MOUNTAIN

Want to Dig Your Own Montana Gems?

There are many dig-your-own mines in Montana. Spokane Bar Sapphire Mine outside of Helena on Hauser Lake, Gem Mountain Sapphire Mine in Philipsburg, and Gem Valley in Livingston are just a few. Open from May to September/ October, hunting for sapphires at these mines is a great family summer activity. There are a few ways to participate: you can visit the facility and purchase "sapphire gravel," you can dig for sapphires on site, and some mines even have an option to purchase "sapphire gravel" online.

Happy gem hunting!

Gem Mountain
Philipsburg, MT
Visit GemMountainMT.com or call 406.859.4367

Spokane Bar Sapphire Mine and Gold Fever Rock Shop
Helena, MT
Visit Sapphire Mine.com or call 406.226.8989

Gem Valley
Livingston, MT
Visit GemValleyMT.com or call 406.222.2193

Finding Gems in the Treasure State

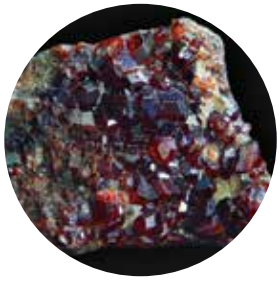
BY CRYSTAL SYKES

Montana's official nickname is "The Treasure State," so named because of our rich mineral reserves. Gold and silver mining has a long history in our state, but Montana has an amazing wealth of gems, too. The long list includes amethyst, beryl, obsidian, smoky quartz, quartz crystal, tourmaline, jasper, serpentine, dark green jade, hematite, yellow quartz, brown and white agates, moonstone, and ruby. Three of our most prominent gems, however, are sapphire, garnet, and agate—in fact, in 1969, sapphire and agate were named Montana's official gemstones.

Gemstones are formed when magma rises into the crust from the earth's mantle. With heat, pressure, water, time, and cooling, elements are formed into gemstones. As the magma cools, the atoms form into crystal structures. Most gemstones are found in the crust, the depth of which ranges from three to twenty-five miles. Peridots and diamonds, on the other hand, are formed in the earth's mantle, then rise to the crust.

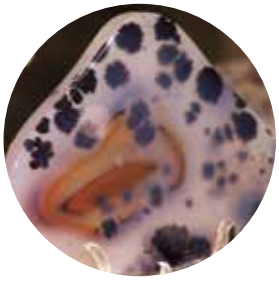
Sapphire

Sapphires are found in all colors, but they are most prized for a deep blue color. Yogo sapphires, found only in Montana, are light blue. The sapphire is the second hardest gemstone, with a 9 on the Mohs Hardness Scale. (A diamond has a hardness of 10, which is the highest on the scale.) Sapphires have a hexagonal crystal system, meaning the atoms are arranged in a hexagonal pattern, with six sides. Sapphires have a vitreous luster, meaning they have a reflection like glass, and they are transparent, which means you can see through them.



Garnet

Garnets are best known for their red to deep maroon color, but they are also found in green, yellow, orange, brown, pink, purple, gray, and black. They are softer than sapphires, with a Mohs Hardness of 6.5 - 8.5. Their crystal system is isometric, meaning the axes are 90 degrees and equal on all sides, like a cube. Like sapphires, they also have a vitreous luster and are transparent.



Agate

Agates come in all colors, including multicolored. Montana is known for its moss agates, named for the moss-like patterns in the stone, which are caused by iron inclusions. They have a Mohs Hardness of 7, and a hexagonal crystal system like a sapphire. Their luster is vitreous, and their transparency is translucent, meaning they are cloudy and don't allow as much light to pass through as sapphires or garnets.

SAPPHIRE PHOTO BY KLUKA, GARNET PHOTO BY LECH DARSKI, AGATE PHOTO BY BROOKS BRITT

Any bird or animal you want, Claudia and Karl can make, from grizzlies to grouse to cutthroat trout.

The Works of Patagonian Hands:
A Gorgeous Fusion of Art and Nature

BY ALLISON DE JONG

You'll find them in the Cornell University Lab of Ornithology gift shop in Ithaca, New York. And in a gift shop in West Glacier, an art gallery in Augusta, and at craft fairs in western Montana and beyond. They're birds, mostly, nuthatches and chickadees and owls, but other animals, too—mammals and fish and even insects. They are colorful, captivating, and amazingly lifelike. And they're all made of wool.

Claudia Paillao and her husband, Karl Knudsen, have been making these beautiful creations for more than two years now. Using wool from Montana and driftwood from the banks of the Clark Fork River, their handmade animals are made with local, natural, sustainable materials, and are so accurately depicted that Claudia and Karl receive compliments from ornithologists and taxidermists alike.

I visited their home recently to hear firsthand the story of how a Chilean ESL teacher and a Montanan landscaper came to make a living through art. It all started, Claudia told me, when she moved to Montana in 2012 and had nothing to do but fill out immigration forms. She started exploring art—painting, mosaics, weaving—but none of it really spoke to her. Then Claudia turned back to her roots. She grew up on a sheep farm in Patagonia, with a grandmother who wove rugs and blankets, so she had always been familiar with wool. And when she experimented with needle felting, she knew she'd found her perfect medium.

A felting needle is very much like a sewing machine needle but with a few tiny barbs along its length, and it is those barbs, Claudia told me, that make the magic. She took out a flat length of cream-colored wool and pulled off a small piece. It was very fluffy, almost falling apart. She folded it up into an egg shape about the size of her fist and began rapidly poking the wool with her needle, explaining that the barbs push and compress the fibers. Already the ball began to look tighter, more condensed. "It's the animal protein of the wool that gets agitated," she told me. "Each hair of the wool has little barbs, too, and they kind of wake up and start interlocking." After a few hours under the needle that loose ball of wool will be transformed into a solid shape, which can include legs, beak, tail, and more, all without glue or stitches.

In their partnership, Karl roughs out the shape of the birds or animals, and Claudia uses her meticulous eye to add the details. Their colorful creations cover a table against the wall of their living room—there are owls, ducks, chickadees, nuthatches, and a tall, elegant Sandhill Crane. All of them look exactly right, from their shape to their eyes to their markings.

As they research a species and then create their next beautifully-detailed fiber sculpture, Claudia and Karl not only learn about sage grouse or tree frogs or Northern Pygmy Owls, they come to appreciate them in a new way. The couple's goal has become twofold—making gorgeous works of art, and, Karl tells me, "raising awareness about habitat fragmentation, the loss of indicator species, and the need to protect and conserve Montana's wild lands." Through their fusion of science and art, Karl and Claudia encourage people to learn about—and appreciate!—native species, reminding us of the wildness and beauty that exist in our world.

Karl's and Claudia's creations will be available at the Wings Across the Big Sky Audubon Festival in Missoula from June 3-5. You can also purchase their work (or request a custom project) through their website: www.patagonianhands.com.

PHOTOS COURTESY PATAGONIAN HANDS

Photographer Walter McClintock called all Blackfeet women botanists for their extensive plant knowledge. Taken c. 1890, this image is a glass lantern slide hand colored by Annette Karge.

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ERIKA TASNADI, THINKSTOCK.COM

SMUDGING:
Plants, Purification and Prayer

BY ROSALYN LAPIER

The Blackfeet superhero *Poia*, or Scarface, began his epic journey as a young man who was seeking the help of *Naató'si,* the Sun. From Blackfeet country on the Northern Great Plains *Poia* traveled east to the home of *Naató'si*. After traveling a long time *Poia* finally made it to the land of the Sun. *Poia* met first *Iipisówaahs*, the Morning Star, the son of *Naató'si* and *Ko'komíki'somm*, the Moon. Luckily for *Poia*, *Iipisówaahs* agreed to take him to his parents' home.

The Moon welcomed Morning Star's new friend Scarface into her home. She was well known for her benevolent nature. However, the Sun had the opposite reputation. The Moon warned *Poia* that the Sun might not welcome him. As the Sun came near their home after his long day's work he realized that a human was present. "What is that smell?" he growled. The Moon quickly instructed *Poia* that it was necessary to smudge himself before meeting the Sun. Then she showed him how to do it.

It is from this story of *Poia* and his encounter with the supernatural deities of the Sky World that the Blackfeet first learned about smudging, which they and other Native American groups use as a method of purification. They believe that it is necessary for humans to purify themselves before interacting with the supernatural.

WHAT IS SMUDGING?

Smudging is the process of burning dried plants or other natural elements and then using the smoke to cleanse themselves, objects, or even places. Usually the dried plants are burned over a hot coal placed in a large shell or on the ground. The person places both hands over the smoke, takes the smoke within her hands, and beginning with her head and continuing downward, "washes" her entire body with the smoke. Elders say that smudging both decreases human odor and purifies and prepares a person to communicate with the supernatural. Some say it helps humans transcend into the supernatural realm.

The word "smudge" is, of course, an English word; the Blackfeet and other Native American groups had their own unique words for this process. One Blackfeet word for smudging is *ssiiyaki*, which translates as "to cleanse or purify" for a religious activity. It shares the same root as *ssiini*, "to erase or wipe off," and *ssiistsi*, "to take a bath or wash."

WORLDVIEW AND HISTORY

The Blackfeet believe that there exist in the universe three separate but interconnected worlds, which they call the Sky World, the Water World, and the Below World. The Blackfeet believe that

within these three worlds live both natural and supernatural beings and deities. These beliefs were set forth millennia ago in stories that continue to be passed down today. Through these stories, the Blackfeet learned to purify themselves, objects, and places—by smudging before interaction with these other worlds, as part of their daily purification and prayer, with the turning of the seasons, and during specific rituals and ceremonies. The Blackfeet used a wide variety of dried plants and natural elements found across their vast landscape as materials for purification.

Unfortunately, when the Blackfeet became relegated to a small portion of their original territory in the late 19th century, they lost access to many of the plants and natural resources they used in their religious practices.

LEARNING FROM THE ELDERS

Elders say that in the past the Blackfeet saw their religious practice as a process: first purification, and then prayer. When my mother was growing up, her grandmother, Hollering In the Air, or Old Lady Aimsback, began each day by telling her grandchildren, "Come here, I am going to smoke you folks." After she smudged her grandchildren with *pisstááhkaan* (tobacco) smoke she prayed to her supernatural allies. Today, however, many people think of smudging as a ritual in itself rather than a preparation for interacting with the supernatural.

While visiting with elders as I began to document the various uses of plants, especially those not used anymore, elders in my family and in the community were concerned that many people today believe that the Blackfeet only used three plants for purification: *sipátsimo*, or sweet grass *(Hierochloe odorata); ka'ksimó,* or sage *(Artemisia sp.);* and *kátoyiss,* or sweet pine *(Abies lasciocarpa)*. They insisted that the Blackfeet used many other plants—and other natural materials as well—for purification.

I looked in museums and archives to learn what elders of the past shared with visitors to the Blackfeet reservation 100 years ago. With the help of both contemporary elders and elders of the past, I learned that the Blackfeet used over two dozen different plants and natural elements for purification, not just the few used today. The elders were correct.

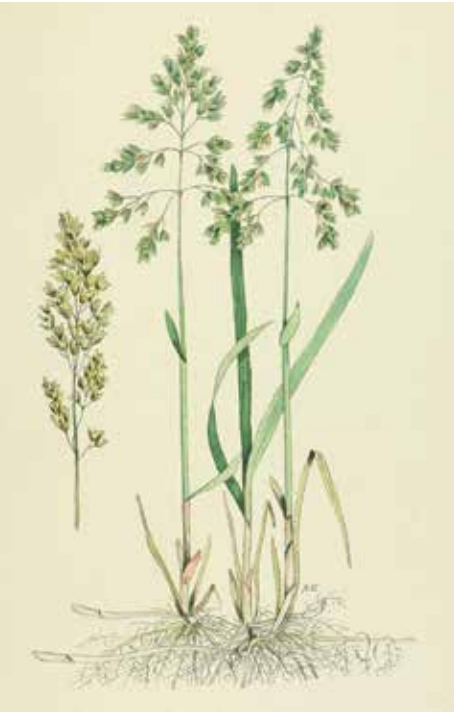
NATURE'S BOUNTY

The Blackfeet used every part of various plants, drying the flowers, seeds, berries, leaves, stems, sap, and roots. They used fungi, minerals, and animal fur. The Blackfeet also used cold water and hot steam for purification. All of these bounties of nature can be found across the original territory of the Blackfeet.

The Blackfeet's intricate system of relationships with supernatural beings across three worlds required a complex variety of purification practices. The Blackfeet used the myriad plants and natural elements at different times of the year, for different purposes, because each plant and natural material had a unique meaning and reflected a special relationship with the supernatural.

The concept of achieving purity before interacting with the supernatural is not unique to the Blackfeet. Many religions around the world believe that humans need to be pure or blessed before interacting with the sacred. Catholics, for example, bless themselves with holy water as they walk into church. And *Poia* learned to purify himself before meeting in *Naató'si* and *Ko'komíki'somm's* home. Though much has changed today, we now know: there were a wide diversity of plants and other natural elements used for purification. The elders remind us that plants are necessary for purification, purification is necessary for prayer, and the natural and the supernatural were—and continue to be—inextricably linked.

—Rosalyn LaPier (Blackfeet/Métis), Ph.D., is an Assistant Professor of Environmental Studies at the University of Montana and author of the forthcoming book, Invisible Reality: Storytellers, Storytakers and the Supernatural World of the Blackfeet, *from the University of Nebraska Press, expected 2017.*



Sweet grass *(Hierochloe odorata)*

Sage *(Artemisia sp.)*

Tobacco *(Nicotiana quadrivalvis)*

PHOTOS PLANTILLUSTRATIONS.ORG; MISSOURI BOTANICAL GARDEN, ST. LOUIS, U.S.A.

imprints

MNHC summer campers explore riparian areas, make rock art, learn about animals, and so much more. We love connecting kids to nature!

Summer Outdoor Discovery Day Camps:
17+ Years of Connecting Kids to Nature

The Montana Natural History Center has been offering summer camps for more than 17 years. And they've grown—my, how they've grown! And over all these years of getting kids outside, we've learned a lot about what's important about connecting kids to nature.

Time to explore. Kids need time to look, listen, crawl through the underbrush, and dig in the dirt. They need to ask questions and be curious and wonder. This is science at its core. And every day in summer camp, we explore.

Free play. Kids need unstructured play time, too. Research tells us that this is essential in child development. So MNHC has found ways to ensure that unstructured play can happen in our structured program...and it's pretty fun.

Relationships. Caring for one another is an important part of being in a community. We make this an important part of our summer camp community, too.

Mentors. Kids also need grownups who mirror their excitement. Adults who can crawl through the underbrush, too. Kids want to be asked what they think by someone who wants to hear what they have to say. Kids need someone to wonder—and wander!—about the natural world with them. The most valuable thing we can give a child is our time.

Quiet time. There is so much noise around us that sometimes we forget that quiet time is important, too. Kids need to slow down and have time to just...think. Reflect. BE. And where better to find quiet places than out in nature? So we figure out how to make that possible—even in the fun, full days of summer.

There is a stream of research focused on the importance of connecting children with nature. We have learned that there are tremendous mental and physical health benefits associated with time spent in nature. At MNHC, we pay attention to this and we work to include the most important elements into our summer camp program. Each summer we have the joyous opportunity to share the natural world with nearly 400 young naturalists. And we take this charge seriously. We create experiences that let kids delve into natural history through natural objects, play, music, games, stories, and art, exposing children to the excitement of exploring the natural world to help foster appreciation and curiosity as they grow.

MNHC PHOTOS

2016 Summer Outdoor Discovery Day Camps

Trail Blazers
June 13-17

Art and Nature Adventures
June 20-24

Sponsored by
Hellgate Hunters & Anglers
Fantastic Fish and Where to Find Them
June 27-July 1

Incredible Invertebrates
July 5-8 *(no camp on July 4th)*

Birding Bonanza!
July 11-15

Outdoor Adventurers
July 18-22

Rockin' Rocks
July 25-29

Amazing Animals
(Grades Pre-K-K & 1-2 Camps)
August 1-5

Wild about Wetlands!
August 8-12

Nature's Greatest Hits
August 15-19

Special camps in partnership with Animal Wonders:

Amazing Animal Educators Middle School Camp
July 11-15

Animal Adventurers Grades 3-5 Camp
August 1-5

New for 2016!

Each week, all camps will focus on the same nature-related topic, but students will be divided into age groups, and activities will be geared towards students in a specific grade range (Pre-K-K, grades 1-2 and 3-5).

To learn more and to register, visit www.montananaturalist.org/summer-camps.

The Montana Natural History Center has new membership benefits!

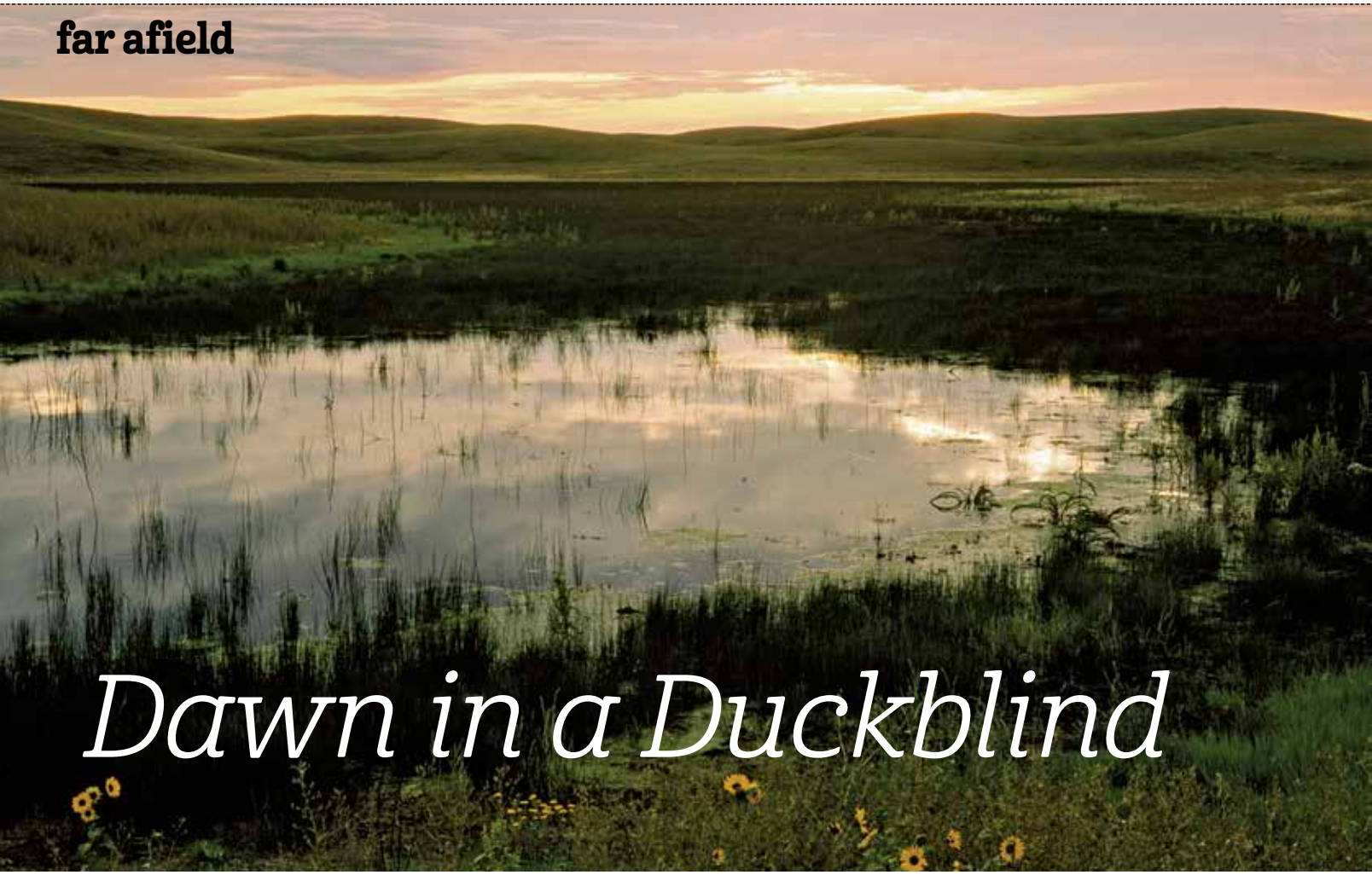
This spring, MNHC became a member of the Association for Science – Technology Centers, which means that our annual membership benefits now include reciprocal admission to more than 300 science centers in North America (as well as several dozen on other continents), including Museum of the Rockies in Bozeman and ExplorationWorks! in Helena. Check out astc.org for a complete list of participating centers.

We've also added another level to our membership options. In addition to our $35 individual membership and $60 family membership, we now offer a $75 grandparent membership, which is a great option for the whole family—it includes you, your children, grandchildren, and any other family/visitors. All memberships include free admission to our Center, an annual subscription to *Montana Naturalist* magazine, and discounts on MNHC classes, programs, and summer camps.

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

Come visit our new Nature Adventure Garden!

This spring and summer we're busy transforming the patch of grass and weeds on the east side of our building into a Nature Adventure Garden, full of spaces for play, exploration, and learning. Right on the river trail, it will be used by MNHC's summer camps, class visits, and the community, offering a space for kids (and kids at heart) to connect to nature. Stop by and enjoy!



Dawn in a Duckblind

BY KENNETH C. WALCHECK

It is early May and the diffused light from distant stars serves as a lantern in guiding us toward a glaciated pothole marsh in northeastern Montana. Shifting black shadows lace the terrain as my wife, Priscilla, and I wade through a wind-swept sea of prairie grasses. The region's stark beauty almost persuades us that we have been whisked to another planet. As we near the marsh, a waterfowl observation blind looms in the dim light, a seething intrusion on the rolling prairie landscape.

We have sneaked into the blind quietly without disturbing the flocks of birds resting on the water. A couple of five-gallon pails provide welcome seats as we face the white wake of the eastern horizon. A sense of time lies thick and heavy on the marsh. Since the last continental ice age, this place has awakened to the yearly clangor of returning waterfowl and other marshland residents. I remove a thermos from my rucksack and, as we sit with steaming cups of coffee resting on our knees, the first flush of color tints the scalloped clouds edging the horizon. With notebook and pencil ready, we patiently wait for the curtain to rise on Act One of this annual performance.

The show starts promptly at 4:50 a.m. as male Red-winged Blackbirds sound their zestful "on-ker-ees" announcing their territorial boundaries. As if on cue, other red-wingeds within earshot recite their respective holdings.

From the north a small band of Blue-winged Teal—three drakes and a hen—swing over the blind in erratic flight and alight at the reeds at the edge of the open water. The courting drakes mill around, shrilly peeping, bowing and bobbing their heads. In a moment, they are up and away again.

A few minutes later, a loud scolding whine reaches our ears. Suddenly, two Canvasbacks, a drake and a hen, whip by at breathtaking speed. The drake heels closely behind the female and, as they pass in front of the blind, he catches her tail in his bill, holding on briefly. She turns sharply to free herself, and the drake follows in swift, crowded flight.

It's quiet—for the moment—at this prairie pothole marsh in northeast Montana.

PHOTO BY HAROLD MALDE

Silence again. Before I can note my observation, two Gadwall drakes zoom over in pursuit of a hen. The three twist and turn, rise and fall, like cabbage butterflies over a garden. She quacks loudly, and the males utter whistling calls as they whisk across the marsh.

The various courtship displays we are watching are intricate, individual scenes in a serious and complicated drama. Just as the seasons swing back and forth between the bleak sterility of winter and the green fruitfulness of spring and summer, so also do the lives of birds oscillate between the relative quiescence of the resting season and the impetuous excitement of the breeding season. The extravagant courtship displays that seem so exaggerated to human eyes reflect the special needs of the birds' way

of life. As we watch the strange and wonderful ways that male birds court their mates, we are reminded that in basic fundamentals, avian and human courtship patterns are not widely divergent.

My watch says 5:31 and all bedlam breaks loose. Our cast of performers flashes from one scene to another. A female Mallard startles us with her harsh quacks; the male answers with his mellower voice. The laughter of Franklin Gulls and the whistle of a goldeneye's wings pierce the morning stillness. Next, the bubbling, gurgling notes of the Long-billed Marsh Wren drift from weeds in front of the blind. A Killdeer flies over, sounding its name. On the far side of the marsh, a garrulous flock of male Redheads is splashing and calling hoarse, guttural "carr-carr" sounds.

Out of some far recess of the sky, 14 geese head straight toward us, their high-pitched honks loud and clear. When the flying wedge disappears, I think of naturalist Francis A. Kortright's tribute: "Sagacity, wariness, strength, and fidelity are characteristics of the Canada Goose which, collectively, are possessed in the same degree by no other bird. The Canada in many respects can serve as a model for man."

In a small slough to our left, last year's growth of reeds and bulrushes form a backdrop for the courtship of a pair of Ruddy Ducks. The drake swims around the female with his fan-shaped tail cocked upright. With a slap of his broad blue bill against his puffed-up ruddy chest, he pumps out a labored "ip-ip-ip-ip-u-cluck…cluck," producing it with such effort that the vertical tail presses forward over his back. When the call is finished it returns to the vertical position.

Goldeneye

Ruddy duck

The various courtship displays we are watching are intricate, individual scenes in a serious and complicated drama.

Coots

Western Grebes

PHOTOS BY ALAN AND ELAINE WILSON, WWW.NATURESPICSONLINE.COM

It's nearly 6 a.m. and it remains difficult to decide which set of performers to watch. In front of us, two male coots are rapidly backing water with flapping wings. Sitting on their tails, they viciously slash at each other with long, taloned claws. Each tries to protect himself by seizing the feet of his antagonist and thrusting savagely with his white, chicken-like beak. A variety of grunting, croaking and squawking notes which sound like bullfrog plunks accompanies this performance.

On our right, a second set of performers steals the thunder from the coots. Two Western Grebes swim side by side; they dip their bills into the coffee-colored water and shake them with a rapid clipping. Suddenly, both stand upright, arch their wings, bend their necks in an S curve and spurt ahead on top of the water for 20 or 30 feet—a scene that lingers in my mind.

As the morning sun climbs higher, the prairie marsh seems to float lightly in a world of sky. My watch says 6:15 and a sharp, bitter wind stirs. It signals a brief intermission for our performers and, for us, a departure from the blind. These players in a marshland drama have entertained us for nearly two hours, charging us with excitement and wonder, giving us a vision of the rhythmic patterns in the collective ways of the marsh. We leave, assured that there still exists a solitude as wild and clean and fresh as the most remote wilderness peak.

—Ken Walcheck is a retired wildlife information biologist, and currently remains active in researching Montana natural history documentations with a main interest in the Lewis and Clark journals and the explorers' natural history discoveries.

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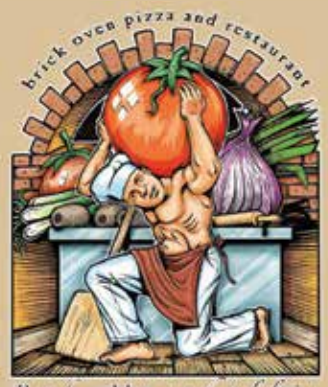

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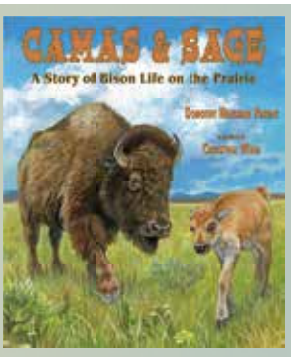

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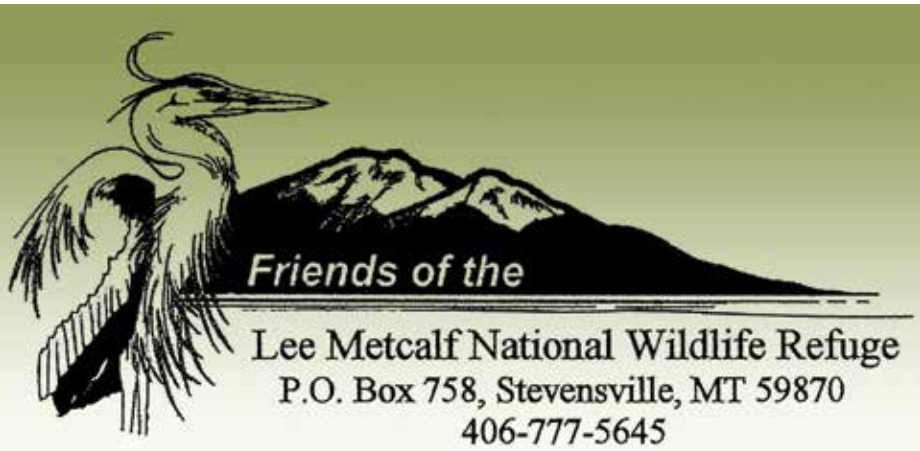

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Jenah Mead is a senior at the University of Montana, majoring in Wildlife Biology and minoring in Nonprofit Administration. She is a mostly self-taught artist who works primarily in oil. Her work celebrates the blurred lines between science and art; both disciplines devote themselves to understanding the natural world through careful observation. Each piece is an intimate look into the different ways wildlife navigate their environments.

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