Winter 2013-14

MONTANA Naturalist

Montana Birds on the Move

Montana's Métis People

Not-So-Mighty Moose?

Where Do The Osprey Go?
see Get Outside Guide, page 9

Montana Natural History Center
Connecting People with Nature

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

MONTANA
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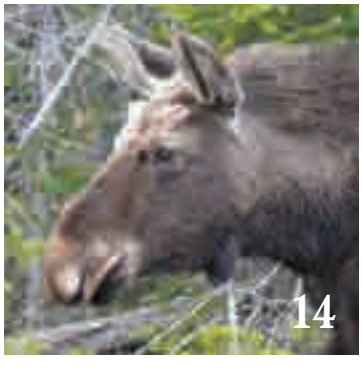
Features

Departments

Cover – A juvenile Cooper's Hawk waits out a snowstorm. Photo by Alan Wilson, www.naturespicsonline.com. Nature's Pics is a beginner's guide to bird, wildlife and natural landscape photography.

Special Pull-Out Section



Montana Natural History Center
Connecting People with Nature

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Photo by Allison De Jong

Winter sunlight filters through the trees along Warm Springs Creek.

Two winters ago, my husband, his parents and I boarded several silvery planes and flew south to 80-degree days and sun-drenched beaches on the Baja Peninsula. Much as I'm saddened to miss any of Montana's lovely snowy season, I did enjoy getting to explore a new landscape. One afternoon, while exploring a wildlife sanctuary, we saw an Osprey perched high in a palm tree. I felt disoriented for a moment, seeing this piece of Montana in an exotic place. I'd known that the sleek M-shaped fish-hawks I watch from my office window in the summer spent their winters in warmer climes, but seeing that familiar shape hanging out above a sandy beach on the Sea of Cortez brought the reality of their migratory life home. Might this very Osprey—using its own wing power rather than the gallons of jet fuel that brought me here—have flown here from Montana?

I learned that Baja has a resident Osprey population, so the bird we saw may have been non-migratory. But that doesn't mean it would be impossible for an Osprey that breeds in Montana to find its way to Baja. In this issue, biologists Kate Stone and Adam Shreading share some of their research on migratory birds (page 6), including Osprey, one of which has made his way for the last two winters to western mainland Mexico, just across the Gulf of California from the Baja Peninsula. Thanks to specialized technology and naturalists with an unquenchable curiosity, we are answering—or trying to answer—ever more of our myriad questions about our feathered friends.

Though winter too often seems like a time when all living things are heading south or holing up, there is still so much to revel in this time of year—birds that fly south to winter here even while our breeding birds have left, long-legged moose stalking through snowy forests, frost crystals forming in intricate patterns on the ground, trees, windshields . . .

This winter, I encourage you to brave the cold (and as I write this the temperatures have dipped below zero—something that may happen less often as our climate continues to change) and see what unique wintry beauty you can discover . . . and then come inside and cozy up with that well-deserved cup of hot cocoa and something (ahem!) to read. Be warmed by learning about the celebrations and traditions of the Métis people and their rich heritage (page 4), or read about some exceptional teachers who infuse their lessons with a love for the natural world, encouraging their students to ask questions—and find answers!—about nature (page 13).

However you choose to spend these wintry days, may you enjoy all the delights of the season!

Allison De Jong
Editor
adejong@MontanaNaturalist.org

Métis Miskihkiya: MÉTIS LIFE IN MONTANA

By Rosalyn LaPier

What happens when two worlds collide? Sometimes there is conflict and one gets conquered, sometimes they learn from each other but remain separate, and sometimes they blend into a new entity. On the Northern Great Plains two worlds collided and out of it emerged a new ethnic group—the Métis.

THE MÉTIS

The Métis are a distinct ethnic group that evolved out of the fur trade during the 18th century. As the European and Native peoples married and intermingled, their cultures, languages, music, art and environmental knowledge also began to blend.

By the time the Métis permanently moved into what is now Montana in the 19th century they had already solidified their status as a separate group within the Northern Great Plains. They even asserted political rights as their own distinct nation-state within what is now Canada.

The Métis usually traveled and settled in large family groups, similar to their Native relatives. Families that began as a mixture of French, Chippewa and Cree evolved into Métis, who developed self-sufficient communities all across the Plains. Their mixed heritage was evident in their language; even into the 20th century the Métis were multilingual, speaking Michif (their own creole language), French, Chippewa, Cree, sometimes other Native languages, and English.

My family, the LaPierres, first came to the Rocky Mountain Front before Montana became a territory. The Rocky Mountain Front of Montana is where the mountains meet the prairies, semi-arid and in some places almost desert-like. In the 1850s Antoine LaPierre moved his entire family there to work, initially as buffalo hunters, but eventually as hands for local cattle ranchers or on their own as wood-hawkers. They ended up settling down near Augusta—an area the Blackfeet called *"Sspiksii,"* meaning "tall groves of trees"—and it was this place, which stood out amongst its stark surroundings, that the Métis came to call home.

Antoine's daughter Clementine LaPierre married a Québécois rancher, Sam Forque, who Americanized his name to Ford. (The LaPierres eventually changed theirs to LaPier.) The home of Clementine, the eldest female of the clan, became the center of Métis life in the region. Family gatherings, community events, weddings and even weekly Mass were held at the Ford family home. Her siblings, Francois, John, Moses, Alec, and Euphrosine, and their spouses and children all lived close by.

MISKIHKIYA

The Métis, in part due to their semi-subsistence lifestyle, viewed food and health holistically—much more so than is typical in modern Western culture. *Miskihkiya* is the Métis or Michif word that best translates into "medicine." But it is a complex translation because it does not necessarily mean "medicine" in the Western sense; rather, it refers to healing generated from plants that come from the earth. These plants are neither strictly medicinal nor edible but their general characteristic is to heal the body, mind and spirit. Therefore, Métis women used a combination of edible and medicinal plants in everyday life to promote health and wellness within their families.

Métis women like Clementine and her sisters were the keepers of plant knowledge. When they lived further out on the Plains—in the areas that are now Manitoba and North Dakota—these Métis women relied on native plants. Fortunately many of these same plants could be found along the Front Range. The women spent their summers gathering a variety of berries and roots to eat and plants for medicine, including herbs used to ease childbirth.

In addition to gathering wild medicinal and edible plants Métis women also grew large home gardens, a skill they learned from their European relatives. They raised and butchered cows, pigs and chickens. They churned their own butter. And instead of picking chokecherries (*Pîkomina* in Métis) to dry and grind into a mixture of meat and fat, known as pemmican, the Métis women canned their chokecherries into jam and syrup. The women also used their unique knowledge and skills to make tools from native woods, such as willow branch *(Lii sol)* pitchforks for moving hay.

Since the Métis men continued to hunt and trap wild animals and fish the streams along the Front, the women smoked the meat and fish to preserve them for future use.

CELEBRATIONS

Celebrations were central to the social life of the Métis. The biggest day of the year was New Year's Day, when the Métis organized a large community dance and feast. The Métis women cooked a huge feast of foods all harvested from the local environment: a dish called rubbaboo (boiled rabbit with flour gravy); bullets (meatballs made from elk or deer); pemmican; fried bread; huckleberry, raspberry and serviceberry pies; and herbal tea. And they invited all their neighbors, no matter their ethnicity, to join in the celebrations.

The New Year's celebration was not complete without a visit from the local Catholic priest. The Métis religion was a blend of Native beliefs and Catholicism. On occasions such as this, the men got together to smoke the inner bark of the red willow *(Kinikinik)*. All of this—celebrating in community, eating wild meats and berries, smoking red willow, dancing all night—and more was what the Métis referred to as *Miskihkiya*.

TRADITION CONTINUES

When the Métis emerged as a new group they blended many aspects of their Native and European heritages. They maintained their Native ecological knowledge of wild plants and animals of the region, and they blended it with European ecological knowledge of domesticated plants and animals that go along with ranching, farming, and gardening. And through all this melding of cultures they maintained a holistic approach, understanding how to balance this varied ecological knowledge to live a healthy life.

Now, five generations later, the Métis tradition of understanding and using native plants and hunting on the prairies continues. My cousin Autumn LaPier, a descendant of Antoine LaPierre, lives on the Rocky Mountain Front, near where her ancestors called home. Autumn now teaches her kindergarten-age daughter, Madeline—the next generation of Métis women—about native plants and health, and so the practice of *Miskihkiya* continues.

—Rosalyn LaPier (Blackfeet/Métis) is a faculty member of the Environmental Studies program at the University of Montana. She also works with the Piegan Institute in Browning.

Special thanks to Dr. Sherry Farrell Racette, a well-known Métis artist and associate professor of Native Studies and Women's & Gender Studies at the University of Manitoba, for allowing us to use her artwork.

FURTHER READING:

Christi Belcourt. *Medicines to Help Us: Traditional Métis Plant Use.* Gabriel Dumont Institute, 2007.

Leah Dorion. *Relatives With Roots: A Story about Métis Women's Connection to the Land.* Gabriel Dumont Institute, 2011.

Rosalyn LaPier, "Métis Life Along Montana's Front Range," in *Beyond...The Shadows of the Rockies: History of the Augusta Area.* Augusta Historical Society, 2007.

MÉTIS ART

Painting by Valentina LaPier

One part of Métis culture that became unique was their incorporation of native floral imagery into their artwork. Initially this began with beadwork and embroidery on buckskin clothing. Métis women became known for these unusual designs and people could easily distinguish their work from other ethnic groups. Even today this distinct style of floral beadwork designs exists. However, in contemporary times, Métis floral art has also evolved to include different types of art such as paintings and even body tattoos.

Valentina LaPier, a Montana Métis artist, incorporates native floral designs into her highly sought-after paintings. She also incorporates Catholic religious icons, another Métis tradition, into her artwork.

Montana Birds on the Move

By Kate Stone and Adam Shreading
Maps by Debbie Leick

A stroll along the river in the winter may seem empty, given the lack of bird song and activity we enjoy during the summer. As biologists working with birds in both our professional and personal lives, one of the most common questions we encounter is: "Where do our birds go in the winter, and how do they get there?" As technology improves and the importance of non-breeding habitat becomes more central to the conservation of bird populations, we are closer to discovering the answers to those questions.

Traditionally, our efforts to understand large-scale individual bird movements have been limited to the recapture of previously marked birds. Though it is routine practice in most studies to attach uniquely numbered aluminum leg bands to study animals, and millions of birds sport these bands, recapture rates for most species are extremely low, with most recaptures occurring locally. Sometimes scientists use auxiliary marking techniques such as wing tags or enlarged numbers on leg or neck bands to gather re-sighting information without trapping or handling. Like recapturing a banded bird, re-sightings based on auxiliary markings are relatively infrequent, and often rely on common citizens to report the information.

Though the chances of long-distance recaptures or re-sightings are low, when they do occur, these observations can amaze us with the distances some birds travel and how fast some of them make their movements (see map). A

Photo by Julie Shaw

Montana birds go everywhere! Points on the map are based on re-captures or re-sightings. Birds captured in the summer months likely breed in Montana, while birds captured in the fall could be migrants passing through the state.

"Lola" the Northern Saw-whet Owl roosting near Chico, CA, 35 days after her original capture near Florence, MT.

Northern Saw-whet Owl banded by the Owl Research Institute in Florence, MT, and recaptured in Big Chico Creek Ecological Reserve, CA, made the approximately 600-mile journey in 35 days, covering about 17 miles per night. A male Calliope Hummingbird travelled the 813 miles between Troy, MT, and Aspen, CO, in just 21 days, averaging 38.7 miles a day.

One way of capturing more information on the movements of birds is by attaching satellite transmitters in addition to leg bands. Using this technology allows us to track short- and long-distance movements of individuals over several years. Though watching the movements of individual birds is captivating and provides us with some interesting stories, when enough transmitters are deployed, we can gain insight into what populations are doing: Do they all use the same migration route? Do they migrate at the same rate or make similar stops? Do individuals travel together? Overwinter in the same location? Return to the same breeding area? What are the causes of mortality? Answering these questions gives us a data-driven foundation for making conservation decisions.

We can gain insight into what bird populations are doing: Do they all use the same migration route? Do they migrate at the same rate or make similar stops? Do individuals travel together?

Who's Migrating and Where Are They Going?

Osprey

In 2012 and 2013, Raptor View Research Institute (RVRI) deployed satellite transmitters on two Osprey families breeding on the MPG Ranch near Florence. The data collected thus far show that Osprey families do not migrate or overwinter together. In both years, the females left the breeding area first, followed by the young, then the males. In the fall of 2012, the farthest-traveling Osprey, a female, took 19 days to travel the 3,300+-mile distance between Florence and the Pacific coast of Nicaragua, flying more than 170 miles a day. Of the three adults that have provided two years of data, all followed roughly similar travel routes along three migration trips. All three adults are currently on the same wintering grounds as last year. (For the story of one of these Osprey, see page 9.)

Fall migration paths of Bitterroot Valley Osprey. Map based on satellite transmitter data from RVRI.

Migration routes, staging areas, and overwintering areas of Long-billed Curlews breeding in Montana. Map based on satellite transmitter data from the Pacific Shorebird Migration Project.

Photo by Kate Stone

Long-billed Curlews

Raptors aren't the only birds that we can learn about via satellite transmitters. Beginning in 2009, partners working with the Pacific Shorebird Migration Project used transmitters to track the migrations of 14 Long-billed Curlews breeding in Phillips County, MT.

On their southbound migration, the curlews generally followed the same path for 900 miles along the Rocky Mountain Front. From northwest Texas and northeast New Mexico, their paths split and individuals traveled an additional 600 miles to one of several overwintering locations, including New Mexico, the Texas Panhandle, the grasslands of Mexico, and the Gulf Coast of Mexico. The curlews commonly spent several days at various stopovers during both fall and spring migration. At some times, they flew up to an estimated 75 miles per hour! Like the Osprey, Long-billed Curlews returned to the same breeding and overwintering areas during the course of the study.

Golden Eagles

Obviously, satellite transmitters can tell us a lot about where our breeding birds go in the winter. But they can also give us important information about birds that breed elsewhere, but winter here. In 2011, RVRI began deploying satellite transmitters on Golden Eagles overwintering in the Bitterroot Valley. Over two years, they have deployed five transmitters on two male and three female overwintering Golden Eagles.

The satellite data reveal that Golden Eagles also tend to return to the same breeding and overwintering areas. Two Golden Eagles have returned to overwinter in the Bitterroot two years in a row, and a third has returned three years in a row. Though these eagles all seem to like southwest Montana in the winter, they breed in very different locations

throughout Alaska and northern Canada. The distance between their breeding and overwintering grounds ranges from around 1,100 to 2,200 miles.

Breeding areas and fall and spring migration paths of Golden Eagles overwintering in the Bitterroot Valley. Map based on satellite transmitter data from RVRI.

originally captured in October 2010 near Lincoln, MT. After providing three years of tracking data, including trips to her breeding grounds in the Brooks Range of Alaska, Elaine was found dead in a snare trap set for coyotes near Ringling, MT. She was one of three Golden Eagles killed by traps within the same week in January 2013.

Golden Eagle with a satellite transmitter released by RVRI on the MPG Ranch near Florence, MT.

Photo by RVRI

Why Is This Information Important?

Why do we go to the lengths we do to understand bird movement, given that some of these methods take a lot of time, a lot of money, and cause stress to the birds involved? Most of the information we have about bird behavior and habitat is generated from research conducted in the breeding season. However, most birds spend the majority of their lives away from breeding territories—either migrating or overwintering. During that time, they may be navigating through unfamiliar or changing landscapes, or concentrating in large numbers in small areas. What risks do they encounter along the way? What sorts of habitats are important while traveling and when they arrive? We can do everything possible to protect birds and their habitat in Montana, but if they face hazards or habitat degradation elsewhere, we may not see sustainable populations here.

Death of our study birds—which we discover either when a band or tag is identified on a dead bird or when we get mortality signals from a transmitter—gives us important insight into the risks birds face during migration and while on overwintering grounds. For example, a Red-tailed Hawk trapped in Florence, MT, and found in Livermore, CA, was electrocuted while feeding on a squirrel on a poorly configured utility pole. After the hawk's death, the utility pole was retrofitted to be safer for raptors.

RVRI's work has documented a high mortality rate for young Osprey. Though we can't account for the causes of all mortalities, one young Osprey was recovered by a rancher along a county road in Texas. The Osprey had apparently collided with either a vehicle or nearby wind turbine, just two months after leaving its nest in Montana.

Several Golden Eagles, including two bearing RVRI's satellite transmitters, have perished in traps of some kind. "Elaine" was

Knowing birds' movements also helps us identify what areas or habitats are important to migrating and overwintering birds, and can prompt conservation efforts in those areas. The work done by the Pacific Shorebird Migration Project showed that Long-billed Curlews breeding in Montana preferred agricultural lands while overwintering in places like Texas—places that are currently experiencing some of the highest rates of agricultural land loss. If we want to sustain breeding populations of curlews in Montana, we may have to look south and work on protecting the agricultural lands of Texas and Mexico. And our actions here may very well affect the breeding population of Golden Eagles in Alaska.

Advances in technology are allowing us to uncover more fascinating aspects of the life history of Montana's birds, including information about all of the time they spend elsewhere. It is our hope that this greater understanding will allow us to work towards conservation throughout the range of our Montana birds.

—Kate Stone works as an Ecologist for the MPG Ranch. Adam Shreading works as a biologist for RVRI.

Thank you to the following individuals and institutions for sharing their data for this article:

American Robin: Avian Science Center

Trumpeter Swan: Blackfoot Challenge

Northern Saw-whet Owls: Owl Research Institute, Julie Shaw, Dawn Garcia

Hummingbirds: Ned and Gigi Batchelder

Osprey, Golden Eagles, Red-tailed Hawk: Raptor View Research Institute, MPG Ranch

Long-billed Curlews: Pacific Shorebird Migration Project

Funding for the curlew project was provided by: the David and Lucile Packard Foundation, The Nature Conservancy, World Wildlife Fund, U.S. Geological Survey, the membership of Point Blue Conservation Science, the USFWS Challenge Cost Share Program, the Disney Worldwide Conservation Fund, and the USDA Forest Service, Office of International Programs.

Photos by Margaret Sloan

Dow Chemical Company complex

Osprey 54: Follow That Bird!

By Kate Stone and Adam Shreading
Map by Debbie Leick

Sometimes biologists use a combination of techniques to learn as much as possible about birds and their movement. During the summer of 2012, Raptor View Research Institute (RVRI) outfitted Osprey 54 with both a numbered leg band and a satellite transmitter. (See the map for Osprey 54's route.)

This past October, birders Margaret Sloan and Greg Lavaty were out photographing birds near Surfside, TX, when they realized the Osprey they were watching sported a colored leg band and a satellite transmitter. Through a network of Osprey researchers, they eventually got in touch with RVRI and the University of Montana Osprey Project. Their pictures are providing us with direct observations of Osprey 54's behavior and habitat use.

Of the four young Osprey outfitted with transmitters in 2012, only Osprey 54 is still alive. From Margaret and Greg's photos, we can see that Osprey 54 clearly has no problem catching fish. We also observe that the habitat Osprey 54 is using looks very different from the breeding ground of western Montana. Along with several other Osprey, Osprey 54 frequents the wetlands surrounding a Dow Chemical Company complex along the Gulf Coast of Texas.

Young Osprey typically spend at least two winters in the "south" before returning to their breeding grounds. Osprey 54 has stayed in this general area since November of 2012. Will he return to the Bitterroot Valley in the spring of 2014?

Photo by RVRI

Left: **Osprey 54 with his sibling on their nest near Florence, MT.**

Below: **Osprey 54's flight path based on satellite transmitter data from RVRI.**

Your observations can make a difference! If you happen to see a bird with a leg band there are couple of things you can do. You can report your sighting on the USGS Bird Banding Lab's website: www.pwrc.usgs.gov/BBL/bblretrv/ However, often it's best to try to contact the particular project directly. You can Google "leg band eagle Montana" (or something similar, depending on species) and see what organizations come up. For raptor sightings in Montana, you can simply go to RVRI's website: www.raptorview.org/researchprojects.html.

Special Pull-Out Section: pull out and post these pages for handy reference.

get outside calendar

MNHC Hours:
Tuesday-Friday, 9 a.m. - 5 p.m.
and Saturday noon - 4 p.m.

Admission Fees: $2/adults,
$1/children under 12 (maximum $6)
Free/children under 3 and
MNHC members

January Gallery all month. **Robert Neaves: Mustelids.**

January 2 **miniNaturalists Pre-K Program,** 10:00-11:00 a.m. $3; $1 MNHC members.

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

January 16 **miniNaturalists Pre-K Program,** 10:00-11:00 a.m. $3; $1 MNHC members.

January 22 **Winter Speaker Series,** 7:00 p.m. **Beginning Beekeeping.** $4 suggested donation; MNHC members free.

January 25 **Saturday Kids' Activity,** 2:00-3:00 p.m. **Hibernation Celebration.** $3; $1 MNHC members.

January 29 **Winter Speaker Series,** 7:00 p.m. **Bioclimatology with Ashley Ballantyne.** $4 suggested donation; MNHC members free.

February Gallery all month. **Leah Grunzke: Montana Flowers.**

February 4 **Spring Master Naturalist Course,** 4:00-7:00 p.m. Tuesdays to May 6, with three full-day field trips on February 22, March 8, and April 12. $395; 3 college credits available. Call 327.0405 to register.

February 5 **Winter Speaker Series,** 7:00 p.m. **Naturalist Trivia Night.** $4 suggested donation; MNHC members free.

February 6 **miniNaturalists Pre-K Program,** 10:00-11:00 a.m. $3; $1 MNHC members.

February 6 **Winter Night Nature Walk** with Val Hingston, 7:00-9:00 p.m. $5 suggested donation; MNHC members free.

February 7 **First Friday Gallery Opening,** 4:30-6:30 p.m.

February 12 **Winter Speaker Series,** 7:00 p.m. **Owls with the Owl Research Institute.** $4 suggested donation; MNHC members free.

February 15 **Saturday Kids' Activity,** 2:00-3:00 p.m. **Montana's Canine Club.** $3; $1 MNHC members.

February 19 **Glacial Lake Missoula Chapter Meeting,** 4:00 p.m. Free and open to the public.

February 20 **miniNaturalists Pre-K Program,** 10:00-11:00 a.m. $3; $1 MNHC members.

February 22 **Saturday Discovery Day,** 10:00 a.m.-12:00 p.m. **Family Winter Ecology Walk.** $3; $1 MNHC members.

February 26 **Winter Speaker Series,** 7:00 p.m. **Grizzly Bears with Jamie Jonkel.** $4 suggested donation; MNHC members free.

March Gallery all month. **Leah Grunzke: Montana Flowers.**

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		January				
			1	**miniNaturalists Pre-K Program,** 10:00-11:00 a.m. 2	**January Gallery,** all month. **Robert Neaves: Mustelids.** 3	4
5	6	7	8	9	10	*Ravens active, foraging in all kinds of weather* 11
12	 Caleb Slemmons, University of Wisconsin, Stevens Point, Bugwood.org		**Glacial Lake Missoula Meeting,** 4:00 p.m. 15	**miniNaturalists Pre-K Program,** 10:00-11:00 a.m. 16	17	18
Moose forage for willow twigs 19			**Winter Speaker Series. Beginning Beekeeping,** 7:00 p.m. 22	23	24	**Saturday Kids' Activity. Hibernation Celebration,** 2:00-3:00 p.m. 25
26	27	28	**Winter Speaker Series. Bioclimatology,** 7:00 p.m. 29	30	31	1
February 2	3	**Spring Master Naturalist Course,** Tuesdays to May 6, 4:00-7:00 p.m. 4	**Winter Speaker Series. Naturalist Trivia Night,** 7:00 p.m. 5	**miniNaturalists Pre-K Program,** 10:00-11:00 a.m. **Winter Night Nature Walk,** 7:00-9:00 p.m. 6	**February Gallery,** all month. **Leah Grunzke: Montana Flowers. First Friday Gallery Opening,** 4:30-6:30 p.m. 7	8
 USFWS Photo		11	**Winter Speaker Series. Owls,** 7:00 p.m. 12	13	14	**Saturday Kids' Activity. Montana's Canine Club,** 2:00-3:00 p.m. 15
		18	**Glacial Lake Missoula Meeting,** 4:00 p.m. 19	**miniNaturalists Pre-K Program,** 10:00-11:00 a.m. 20	21	**Saturday Discovery Day. Family Winter Ecology Walk,** 10:00-12:00 p.m. 22
23	*First blue-birds, robins, red-wing blackbirds return* 24	25	**Winter Speaker Series. Grizzly Bears,** 7:00 p.m. 26	27	28	**March Gallery,** all month. **Leah Grunzke: Montana Flowers.** 1

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

March

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
2	3	*Great blue herons return to nests* 4	5	miniNaturalists Pre-K Program, 10:00-11:00 a.m. 6	7	8
9	 Joy Viola, Northeastern University, Bugwood.org		12	13	14	Saturday Kids' Activity. Rocks, Crystals, and Gems, 2:00-3:00 p.m. 15
16			Glacial Lake Missoula Meeting, 4:00 p.m. Winter Speaker Series. Hornaday's Bison, 7:00 p.m. 19	miniNaturalists Pre-K Program, 10:00-11:00 a.m. 20	21	Saturday Discovery Day. Snow Geese at Freezeout Lake, 7:00 a.m.-6:00 p.m. 22
23	*Aspen catkins swell and open* 24	25	Winter Speaker Series. Flying Squirrels, 7:00 p.m. 26	27	28	29

April

 J Schmidt, YNP		1	2	miniNaturalists Pre-K Program, 10:00-11:00 a.m. 3	April Gallery, all month. Stephanie Frostad. First Friday Gallery Opening, 4:30-6:30 p.m. 4	5
8			9	10	11	Saturday Kids' Activity. Beginning Birding for Kids, 2:00-3:00 p.m. 12
13	14	15	Glacial Lake Missoula Meeting, 4:00 p.m. 16	miniNaturalists Pre-K Program, 10:00-11:00 a.m. 17	18	19
20	21	22	Volunteer Naturalist Training, 3:30-5:00 p.m. 23	*Wolf cubs are born* 24	 USFWS Photo	
27	28	29	30			

get outside calendar

March 6 **miniNaturalists Pre-K Program,** 10:00-11:00 a.m. $3; $1 MNHC members.

March 15 **Saturday Kids' Activity,** 2:00-3:00 p.m. **Rocks, Crystals, and Gems.** $3; $1 MNHC members.

March 19 **Glacial Lake Missoula Chapter Meeting,** 4:00 p.m. Free and open to the public.

March 19 **Winter Speaker Series,** 7:00 p.m. **Hornaday's Bison with Doug Coffman.** $4 suggested donation; MNHC members free.

March 20 **miniNaturalists Pre-K Program,** 10:00-11:00 a.m. $3; $1 MNHC members.

March 22 **Saturday Discovery Day,** 7:00 a.m.-6:00 p.m. **Snow Geese at Freezeout Lake.** $60; $50 MNHC members.

March 26 **Winter Speaker Series,** 7:00 p.m. **Flying Squirrels with Alex Badyaev.** $4 suggested donation; MNHC members free.

April Gallery all month. **Stephanie Frostad.**

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

April 4 **First Friday Gallery Opening,** 4:30-6:30 p.m.

April 12 **Saturday Kids' Activity,** 2:00-3:00 p.m. **Beginning Birding for Kids.** $3; $1 MNHC members.

April 16 **Glacial Lake Missoula Chapter Meeting,** 4:00 p.m. Free and open to the public.

April 17 **miniNaturalists Pre-K Program,** 10:00-11:00 a.m. $3; $1 MNHC members.

April 23 **Volunteer Naturalist Training,** 3:30-5:00 p.m. **VNS Spring Field Trip Training.** Learn how to teach kids about the flora and fauna of western Montana during the May VNS school field trips. No prior experience necessary.

Flowers and Insects and Birds, Oh My!

Sign up for our Spring 2014 Montana Master Naturalist Course and learn all about the trees, flowers, birds and insects of the place we call home. Taught by MNHC Naturalist Brian Williams, our popular 12-week course will be offered on Tuesday evenings from February 4th to May 6th, with three full-day Saturday field trips. For complete details, see the Calendar, call 327.0405, or visit our website at www.MontanaNaturalist.org.

Look for these program symbols in *Montana Naturalist* and on our website at www.MontanaNaturalist.org.

- **Adult Program**
- **Youth Program**
- **Volunteer Opportunity**

Visit www.MontanaNaturalist.org for directions. To register or to learn more, call MNHC at 327.0405.

Photos by Allison De Jong

Fabulous Frost!

Frost is created when water vapor in the air condenses directly to its solid state, forming ice crystals on grass, trees, fences, windows—basically any solid surface. Frost is very much like snow, except that it forms close to the ground rather than on tiny particles high in the clouds. When the temperature of the various surfaces—rocks, trees, etc.—drops below the dew point and below freezing, voilà! Frost!

From a distance, frost looks white (because the tiny crystals scatter light), but if you look closer, you'll see that it's translucent—and that the crystals come in many different shapes and sizes. Here are some pictures of frost seen on the talus slopes along Bear Creek on an early winter hike.

Book Corner:

Wintry Books for Kids:
Great Books to Snuggle Up With

A Kids' Winter EcoJournal: With Nature Activities for Exploring the Season by Toni Albert

The Longest Night by Marion Dane Bauer

A Perfect Day by Carin Berger

Snowmen at Night by Caralyn and Mark Buehner

Dream Snow by Eric Carle

The Story of Snow: The Science of Winter's Wonder by Mark Cassino with Jon Nelson, Ph.D.

Here is the Arctic Winter by Madeleine Dunphy

Winter Eyes by Douglas Florian

Not a Buzz to be Found: Insects in Winter by Linda Glaser

The Snowy Day by Ezra Jack Keats

Backyard Birds of Winter by Carol Lerner

Over and Under the Snow by Kate Messner

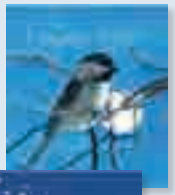
Big Tracks, Little Tracks: Following Animal Prints by Millicent E. Selsam

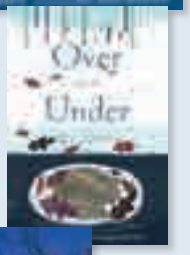
Snow by Uri Shulevitz

Animals in Winter by Henrietta Bancroft and Richard G. Van Gelder

The Long Winter by Laura Ingalls Wilder

Owl Moon by Jane Yolen





Winter Naturalist Word Search

COOPER'S HAWK
CURLEW
EAGLE
HABITAT
LEG BAND
MEDICINE
METIS
MISKIHKIYA
MOOSE
OSPREY
OVERWINTER
RADIANT
RUBBABOO
SAW-WHET OWL
TRANSMITTER
UNGULATE
WINTER TICK

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

Snowy Owl
by Harriet Reese Winterer, Sussex School

Photo by Brian Williams

Exceptional Educators

MNHC's 2013 Educator of the Year Awards went to three teachers from two Missoula schools: Michele Riordan, a 4th grade teacher from Hawthorne Elementary, and Jennifer Carlson and Susie Graham, 4th grade teachers at Chief Charlo Elementary. We honored these three teachers for the countless hours and extraordinary energy they have put into piloting an extended version of our Visiting Naturalist in the Schools (VNS) program. Not only have they invited MNHC naturalists into their classrooms for additional visits every month, they have also reshaped their own curricula to dovetail with and expand on the VNS lessons. Their hard work exponentially magnifies the positive impact of the Montana Natural History Center on the lives of Montana children.

Photo courtesy of Susie Graham

Photo courtesy of Jennifer Carlson

Top: Michele Riordan with her class's "seasonal round" project.
Above: Susie Graham taking kids on an outdoor exploration.
Right: Jennifer Carlson

Here's a little bit about our winners:

Michele Riordan

Michele's classroom is a place where each child is given the support, the structure, and the challenge to reach for her full potential. Because of this, and because of Michele's unwavering dedication to excellence, she has been an invaluable partner for the Montana Natural History Center. She helped shape and pilot MNHC's extended VNS program, and, every year, works to find new ways to help MNHC naturalists sharpen their lessons as well infuse naturalist ideas in her classroom.

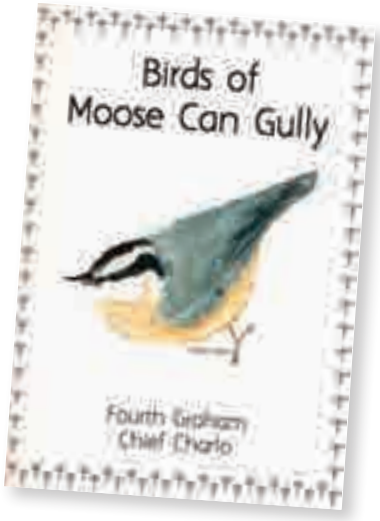
Since earning her degree at MSU, Michele has taught for 20 years. For the last seven years, she has taught 4th grade, where she has been part of the VNS program the entire time.

The students in Michele's classroom don't just work towards the goals of the Visiting Naturalist program on the days the naturalists visit, but on every day of the year, when they are integrated into science lessons, social studies lessons or reading lessons. One small story illustrates how well Michele integrates her curriculum: about a month after MNHC naturalist Brian Williams taught students how to ask their own Testable Questions to design experiments (an amazing feat for a fourth grader), the class was working with microscopes, and one student asked, "Will this break if I drop it?" Before Brian could answer, another student piped in, "That's a testable question!" And so it was (but, fortunately, one that did not get tested that day!).

Susie Graham and Jennifer Carlson

Susie Graham and Jennifer Carlson are a team in the best sense of the word. Each of these teachers brings a unique personality and special talents into her own classroom, but it is together that they truly shine as educators.

Jennifer grew up and earned her undergraduate and Master's degrees in San Diego, and moved to Missoula six years ago. She has taught for 17 years, all of them in 4th grade, and the last six at Chief Charlo Elementary.



Cover art by Jaiden Hettick

Susie is a Montana native, a graduate of Sentinel High School and UM and a Montana Master Naturalist. She has taught for 24 years, all in Montana, and in every grade from 1st-8th.

In partnership, these two teachers are masters at the sublime skill of translating a connection with nature into quality academic performance. To detail just one example, Susie and Jennifer took a simple birding trip in Moose Can Gully and turned it into a season-long learning expedition. Their students researched in the field and classroom to hand-create a field guide to the local birds and plants, then capped off the experience by guiding the members of the South Hills Neighborhood Council on a nature hike. Incredible.

We are so grateful for the good work these teachers do in our community. Thank you, Michele, Jennifer, and Susie!

Photos by Dan Bergeron

Moose's Bane: The Winter Tick

By Alyssa McLean

Moose are one of the reasons my husband and I are together today. In January 2003, Chris and I were in northern New Hampshire, working on a project tracking moose and investigating the causes of winter mortality. The temperature was -20°F and we had been following a cow for several chilly hours. Coming in late to the project as a temporary volunteer, I'd never even seen a moose in the wild. After tramping around in the freezing cold, trying to get a visual on the moose, I finally announced that if he didn't find her for me soon, I was leaving him. We'd just started dating, and not sure if I was kidding, just cranky, or done with the whole situation, Chris found the moose within a half an hour.

"There she is," he said.

I looked, but didn't see anything for a few minutes. I would have thought something that large would be fairly obvious in a forest of conifers and white snow, but she was camouflaged perfectly against the stark trees. She moved, and the first thing I noticed was how huge she was. And how close. All the stories of people being stomped by moose started to make sense in a way they never had before. I'd like to say she was majestic, but if you've ever seen a moose, you know how goofy they look. But it was still a magical moment to see another creature that big, spooky, and silent so close to us. We looked at her for a few minutes in that still, cold forest, and then she meandered off.

Many years, jobs, and states later, Chris and I are living in Montana and often see moose tracks and moose together. It's always a special treat to see these huge animals appear out of the forest, and I'm always amazed by how silly they look. Moose have almost comically long faces with huge nostrils, providing them with a good sense of smell, and they have a prehensile lip to help them grasp vegetation. That funny little flap of skin that sways below a moose's chin is called a dewlap, and there are a few theories about its function; during the rut, the male rubs his chin against a cow, leaving his scent on the female, which may deter other bulls. Dewlap size may be also be an indicator of dominance in males, although both males and females have dewlaps.

One would think that moose, with their enormous size—they can weigh up to 1800 pounds—would have little trouble surviving the winter as long as they could find enough food. I was surprised to learn that one of their biggest challenges in winter comes from a tiny organism: the winter tick.

Winter tick, or *Dermacentor albipictus*, is one of the main causes of winter mortality in moose. In small numbers, winter ticks don't

cause problems for these big ungulates. However, when a single moose is infested with 40,000 winter ticks—or, in a particularly bad year, up to 150,000—the moose is in for a hard winter.

Winter ticks live for a year, and parasitize one host animal (interestingly, this makes them unable to carry diseases, since they don't feed on multiple hosts). In the spring, female adult ticks lay eggs in the ground. The eggs hatch, the larval ticks eventually climb up on vegetation in September and October, and then attach to host animals such as moose, elk, bison, and deer. The larvae take some blood from the animal, molt into nymphs and stay dormant until January, when they help themselves to another meal and molt into adults. During March and April, they continue taking blood from the host animal, mate, and then fall off the animal to lay eggs. No ticks remain on the host animal come May, and none re-attach until September.

Unfortunately for moose, this life cycle occurs at a tough time of year. A moose covered with ticks in the winter will lose quite a bit of its hair—up to 80 percent—as it rubs and scratches to try to rid itself of the itchy parasites infesting its body. This hair loss results in fat reserves being depleted as the moose struggles to stay warm, expends more energy removing ticks from its body, and spends less time feeding since it is so busy removing ticks. If enough ticks are feeding on the moose, the resulting blood loss can cause anemia, since the moose will have a tough time finding enough food between itching to replenish the blood taken by the ticks.

One would think that moose, with their enormous size, would have little trouble surviving the winter as long as they could find enough food. I was surprised to learn that one of their biggest challenges in winter comes from a tiny organism: the winter tick.

Although winter ticks aren't picky about which ungulates they spend the winter on, they seem to be the most detrimental to moose, perhaps due in part to the grooming habits of moose. Deer, bison, and elk groom extensively in the fall and early winter, removing many of the winter tick nymphs early before they molt into adults and therefore reducing hair, blood, and fat reserve loss later in the winter. Moose, on the other hand, don't begin intensive grooming to remove ticks until February and March when the adult ticks become active, and thus lose hair and fat reserves later in the winter when high-energy foods are less available and the animals have been through a few harsh months of winter already. In some cases, when enough winter ticks afflict moose, the animals die from the stress and starvation caused by these infestations.

Will this year be a bad one for moose? Winter tick numbers are related to temperature and precipitation, as well as moose densities in an area. Warm winter weather, lack of snow, and low precipitation in April seem to favor winter tick survival, while excessively warm weather in the summer may decrease tick survival. As winter progresses this year, I'll keep looking for those moose tracks and rooting for the moose to make it through a relatively itch-free winter.

—Alyssa McLean has been a Naturalist at the Montana Natural History Center since June 2009. She has worked with a variety of wildlife, including moose, prairie dogs, coyotes, bobcats, salamanders, fish, mice, and migratory songbirds. Alyssa enjoys learning about the natural world and sharing that interest with the kids she is lucky enough to teach.

Photo by Lev Frid

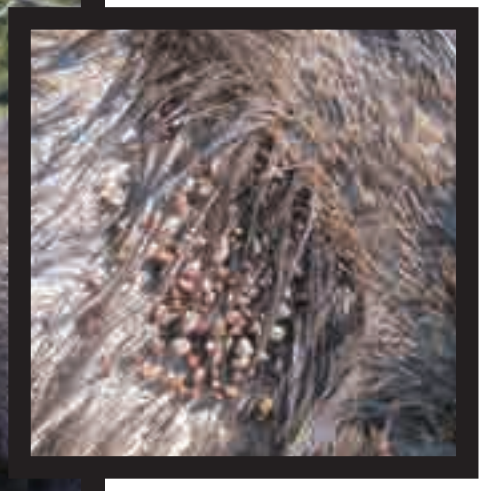


Photo by Ron Moen

Opposite page: Moose in various stages of tick affliction.
Left: When moose attempt to scratch off the ticks, they end up scratching off much of their hair as well.
Above: Winter ticks, which can grow to the size of a grape after feeding, infest moose in the tens of thousands and don't drop off until spring.

imprints

News from the Montana Natural History Center

MNHC Photo

On October 4th, we unveiled our beautiful mural, "Radiant," designed by Missoula artist Stephanie Frostad. If you haven't seen it yet, please stop by!

Director's Award: Mindy Goldberg

Photo courtesy of Mindy Goldberg

Mindy has been an enthusiastic supporter of MNHC since joining the board six years ago. It didn't take long for her to volunteer to preside over the annual Celebration and Auction. While head of this annual fundraiser she set a new standard for quality and success that continues to inspire us. While Mindy left the board a couple of years ago to focus on her family and two young children, she still generously contributes plants and fall decorations for each annual event and has remained, with her husband Stuart, an ongoing supporter of MNHC.

Mindy's generous spirit also led her to host our first annual Women's Scholarship Luncheon this past spring. It was a wonderful and successful event—a fundraiser for the MNHC scholarship fund to benefit needy kids and schools—and we already have feedback from folks who can't wait to attend next spring. For all she has done and continues to do on our behalf: *Thank you, Mindy!*

Volunteer of the Year Award: John & Shermy Bremer

Photo courtesy of John Bremer

John Bremer began volunteering at MNHC three years ago. He's spent much time and energy helping out at the Native Plant Garden, but the other task he took on was managing the Ralph Lee Allen Environmental Education Library, taking over from long-time volunteer librarian Minie Smith. A few months after John began working in the library, his wife **Shermy** joined him, and for the past couple of years the two of them have been familiar figures at MNHC. For a few hours each week they'd come in to inventory our collection, clean and organize the library area, and process new books. Together they've kept the library in good order, and they shared our excitement about MNHC's building project and new library space, even as they helped box up the 3,000+ books to be put in storage for the next few months.

Then, this past spring, Shermy and John discovered that the cancer Shermy had survived a few years ago had returned, and she passed away this past July. We miss her—her sense of humor and compassion and kindness. John continues to help with our garden programs and with the library collection, and he's looking forward to helping us unpack all the books in our new space next spring.

We are so grateful for John and Shermy, for all the time they've given to MNHC these past years. *Thank you, John and Shermy.*

So Much To Celebrate!

Once again, we'd like to convey our sincere thanks to everyone who attended MNHC's Fall Celebration and Auction at the DoubleTree Hotel on October 11th. Some 235 people helped us raise $86,000 in support of nature education for children and adults. We are especially grateful for your outstanding response to our Visiting Naturalist in the Schools challenge, which will enable us to continue providing quality natural history education to area schoolchildren in 2014 and beyond. And, of course, we couldn't have done it without the following businesses and individuals whose generosity and hard work made the whole event possible. (Please accept our apologies for any missed names.)

Thank you!

Photo by Leah Grunzke

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Vanguard Endowment Program

Winter Trees

by William Carlos Williams

Photo by Allison De Jong

All the complicated details
of the attiring and
the disattiring are completed!
A liquid moon
moves gently among
the long branches.
Thus having prepared their buds
against a sure winter
the wise trees
stand sleeping in the cold.

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