Winter 2009-2010

MONTANA Naturalist

Natural to Supernatural

Where Did All the Color Go?

Coyotes

Changing Daylight

also
Get Outside Guide, page 9

Montana Natural History Center
Your Base Camp for Discovery

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

Winter 2009-2010

MONTANA Naturalist

Features

Departments

Special Pull-Out Section

Cover photo – A cottontail hunkers down in snow near Wilsall, MT. Photographed with a Nikon SLR camera and zoom lens by Lance Schelvan. Schelvan's advice on photographing nature boils down to 1) wandering around a lot, never without a camera, 2) trying to convey a sense of place and atmosphere, not just the "furry subject" and 3) treating the entire frame as the subject.

Montana Natural History Center
Your Base Camp for Discovery

120 Hickory Street
Missoula, MT 59801
(406) 327-0405
office@MontanaNaturalist.org
www.MontanaNaturalist.org

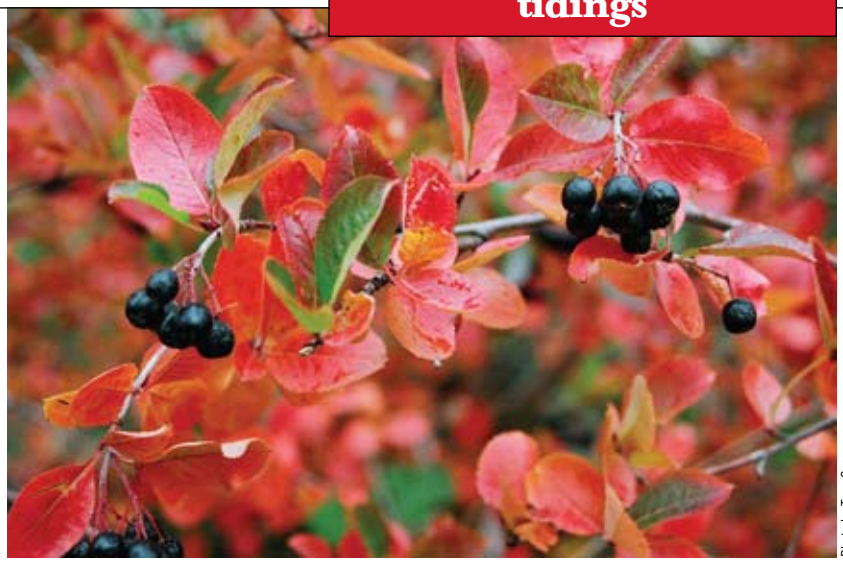


Photo by Tony Cesare

Familiar fall colors contrast sharply to this year's drab display

As this issue of *Montana Naturalist* goes to press, contributor Paul Alaback notes that leaves are still on branches for native elderberries, some snowberries, non-native Norway maples and black locusts in town, approximately a month after they should have fallen or been pushed off by wind. "All of this," he says, "reminds us that plants and animals in nature tend to rely on key climatic or environmental signals to determine when to start and stop growing. For plants, it's a delicate balance between continuing to store more energy and the increasing risk of frost damage."

As the climate changes, with more extreme fluctuations in weather predicted as a result, naturalists can make important contributions to understanding the effects on animal and plant communities by documenting what happens in their area every year. For an example of how you can get involved, go to www.budburst.org.

Time was, people had keener awareness of nature and its powers, as historian Rosalyn LaPier describes in an essay about her grandfather and the traditional Piegan worldview. Today, people connect with nature in a variety of ways and for a multitude of purposes, as other stories in this issue touch on – from counting owl nests on the Arctic tundra to living with wildlife on a farm or ranch. One way to find your connection – with people and with place – is through the Montana Master Naturalist course, offered by the Montana Natural History Center. It's just one of many educational experiences available through MNHC and many other local organizations that can put you in touch with the world outside. Something to think about for the New Year. *Happy Holidays!*

Caroline Kurtz

Caroline Kurtz
Editor

Like everyone else, I wondered a lot this past fall about the trees around town and how they handled the sudden extreme cold temperatures back in early October. What was with all the greenish-grayish leaves that seemed dead but didn't want to fall off? What was happening inside trees and shrubs as a result? How did the early frost affect different species, and what would it mean for the trees next spring?

Photos by Tony Cesare

Where Did All

The story behind this fall's dreary show

"The short answer is, I don't really know," says botanist Peter Lesica. The long answer provides a lot of context for what we saw.

As days get shorter and cooler, Lesica explains, deciduous trees start to withdraw nutrients from their leaves. Once the green is gone the remaining red or yellow pigments are revealed, providing the beautiful fall palette. Then the hormone balance shifts (yes, plants have hormones too) and a scab-like abscission layer is formed at the base of the leaf stem. Enzymes eventually dissolve this layer and the yellow or red leaf falls.

"If the abscission layer was completely unformed when it got real cold, then I suppose it's possible that the whole hormonal sequence might not happen and the leaves will stay on the tree," Lesica says. Some trees do this anyway; oaks often hold their leaves until spring when the expanding buds push them off.

The green ash and boxelder trees in Lesica's yard had already mostly lost their leaves before the cold snap. Perhaps, he says, it's not a coincidence that these are trees native to eastern Montana, where frigid temperatures in October aren't all that strange.

Norway maples are not native to Montana but are some of our most common street trees. "The abscission layers in most of the Norway maple leaves that I checked [after the cold snap] were partly formed," Lesica says, "so I'm guessing that they will come down sometime this fall, but later than usual. Leaves on my apple tree seem to not have an abscission layer yet, so they may not get one and they may hold their leaves all winter. The danger is that we

Photos by Tony Cesare

Photo by Paul Alaback

Some paper birches and silver maples had turned colors before the October frost, and lost their leaves close to the normal calendar date. Western larch, a cone-bearing tree that loses its needle-like leaves for winter, also turned color close to its normal date, presumably because it was more hardened off when the first frosts occurred. But for most of our native species like red osier dogwood, RIGHT, instead of red or yellow or orange, we had stiff brown leaves that didn't come off until a hard rain or wind storm.

will get a wet, heavy snow, and this will break some limbs."

"It's generally true that plants are particularly sensitive to frost in the spring, when tender new leaves and shoots have just formed," writes forestry professor emeritus Paul Alaback in his Project BudBurst blog (www.budburst.org). "But unusual fall frosts can have damaging effects, too. Some data suggest that plants can become more sensitive to frost damage with climate change, because they are not as well prepared (not hardened off) for these cold temperatures when mild or shorter winters prevail."

According to Alaback, what happens as trees and shrubs prepare for winter varies with species and, for the ornamental plants that we might have in our gardens, with

The Color Go?

By Caroline Kurtz

A hard frost is defined as 28 degrees or colder. The 30-year normal first hard frost for western Montana is late October or early November, but we had our first one on October 6. We had hard frosts every day for over a week, including the worst on October 13 at just three degrees. Three more days with temperatures below 10 degrees continued over the next two weeks.

COMPARISONS, FROM TOP: cottonwoods along the Clark Fork River; Norway maples along a Missoula street; red osier dogwood.

Photo by Tony Cesare

where they were bred. Generally plants begin hardening off after the fall equinox, when nights get longer than 12 hours. Night temperatures normally in the 40-degree range at this time also hasten this change in plant chemistry, particularly the balance between starches and soluble sugars, enabling the plant to withstand progressively colder and colder temperatures without tissue damage.

"They continue to harden off from the beginning of fall all the way into the dead of winter, when some trees can tolerate temperatures of -30 degrees or more without visible damage," Alaback says. (This explains why conifers dominate northern or high-elevation forests, because they can withdraw more water from outer areas of their trunks than hardwoods, preventing damage from ice crystals.)

So here in Montana, while temperatures of five or 10 degrees are something that all our plants should be tolerant of by mid-winter, when these same temperatures occur suddenly in early October they can cause a lot of damage.

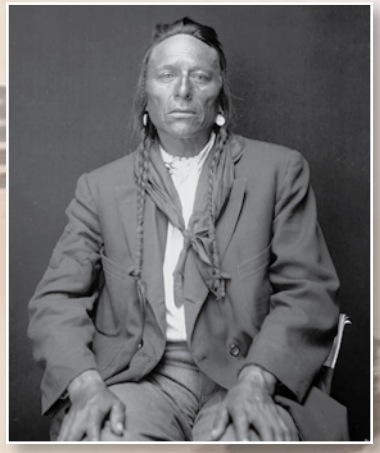
In Missoula, the main effects of several days of early severe frost were easiest to see on ornamental plants that appeared least hardened off when the Arctic front hit. "Leaves went from lush green to sickly gray, brown or black within a day or two," writes Alaback, "and many also had leaves that curled up, but still held firmly onto their twigs and branches."

These, he says, essentially were "freeze-dried" to branches so that leaves dropped weeks, even months, late. In fact, most have had to be pushed off their branches by strong winds, making leaf raking and pick up even more of a challenge.

From the Natural to the Supernatural

Discovering the Piegan people's world view

By Rosalyn LaPier



Aims Back or, in the Piegan language, *Páyotayàkχkumei*, was what historian John C. Ewers called a "buffalo Indian." To Ewers this meant someone who had grown into adulthood before the reservation era, when the Piegan still lived a nomadic lifestyle, hunting buffalo and gathering plants on the prairies. Aims Back was born in a tipi sometime in the 1860s. He traveled by horseback, hunted buffalo, celebrated religious ceremonies and experienced freedom on the northern Great Plains before it was encumbered by boundaries, fences and roads.

By the late 19th century the buffalo were gone and "buffalo Indians" were forced to adopt an alien lifestyle. They had to stop moving with the seasons and stay in one place. They relocated onto enclaves along rivers and creeks within the boundaries of the Blackfeet reservation. Aims Back and his wife, Hollering in the Air, *Kayetsáχkumi*, moved to Blacktail creek on the south side of the reservation with other members of his Skunk band, or *A'pekaïks*.

On the surface, Aims Back adapted to his new reality. By the beginning of the 20th century he had changed the clothing he wore, built a log cabin, dug a root cellar and established a small farm. Because he was unable to have children, he adopted his wife's son and a young boy, my grandfather, who he called *Áukema*. The Catholic Church even attempted to introduce him to a new way of understanding the universe.

Despite these outward vestiges of acculturation into modern American life, Aims Back's belief system had not changed. Aims Back believed that within the world around him – within the natural world – there existed both a visible and an invisible reality. He believed that within nature a person could find avenues to the supernatural world. With the help of the supernatural realm a person could live a long and abundant life. Even more, the Piegan believed that with the help of the supernatural they could alter or change their temporal world. If their horses ran too slowly, they could gain access to supernatural powers that would make their horses run faster. If they went out to pick berries, they could cause the supernatural to intercede in

Aims Back photo courtesy National Anthropological Archives; Tipi image - Edward S. Curtis Collection (Library of Congress), Buffalo hunting - George Catlin, Library and Archives Canada, Acc. No. 1989-292-5

order to stop worms or bugs from eating the berries first.

The common characterization that Native Americans "lived in balance with nature" did not apply to the Piegan. Piegan people believed they could transform the natural world in a variety of ways with the help of the supernatural realm. And although a common misconception is that Native Americans found the supernatural everywhere in nature, the Piegan believed the supernatural dwelt only within specific places, or existed within certain plants, animals, rocks, shells, fossils and other natural elements.

Besides physical objects or places, intangible concepts also were believed to possess supernatural power. For instance, names, when properly conferred, provided a person with supernatural assistance and allowed individuals to live a long life. For this reason children's names were chosen very carefully. Aims Back named his grandchildren based on his own personal interactions with the supernatural realm. He named his oldest grandchild "Holy Thunder Woman" after he was struck by Thunder and the Thunder spoke to him. The Thunder told him that she wanted Aims Back to live a long, wholesome life.

In the Piegan world view, specific objects could provide a person various protections from the human world. The supernatural power imbedded within an eagle headdress made a person impervious to injury inflicted by weapons. Aims Back went to a sacred place within Badger canyon (now within the Badger-Two Medicine area) to capture an eagle and make himself a headdress. One peer of Aims Back's reported that his eagle headdress protected him from bullets and arrows, and he escaped unharmed from several clashes.

For the Piegan, specific designs painted on tipis, clothing or their bodies provided specific abilities or protections. Tipi designs were not benign decorations. These designs possessed the supernatural power of the animal or object depicted. These designs usually were given to humans by the supernatural source itself. All tipi designs had an associated religious ritual. Most tipi designs incorporated the *einiskim*, or buffalo stone, and its ritual. The *einiskim* provided the owners of the tipi with the ability to change the behavior of buffalo, which made the owners more successful at hunting. Aims Back owned a tipi design known as the Big Rock tipi and an *einiskim* bundle most of his life.

In the Piegan belief system, the natural world was not something that an individual had to adapt to, but instead nature was something that could be changed or altered with the help of the supernatural. Like Aims Back, most Piegan people owned a number of different supernatural objects throughout their lives. Whether they were tangible, such as a headdress, or intangible, such as a name or a painted design, the Piegan viewed them as essential to living their lives. Aims Back sought out a relationship with different elements of the supernatural and these forces helped him live a good life, protected him from harm, and made him a successful hunter.

Aims Back was indeed a "buffalo Indian." He believed in a different reality than the generations that came after him. He grew up on the prairies, following the buffalo, and he died on the reservation during World War II, as the U.S. entered the atomic age. He believed that a person had to strive to develop an intimate relationship with the natural world and its connection to the supernatural, and with this help one could live a good life. He named my mother, his third grandchild, *Sépistaki*, or Owl Woman, in honor of the owls that talked to him as he rode his horse along Blacktail creek. When they talked to him they reminded him of their long relationship with the Piegan, saying "we are the ones that take care of you."

—Historian Rosalyn LaPier works in collaboration with the Piegan Institute in Browning, and is the founder of Saokio Heritage, a community organization that seeks to preserve the history, language and ecological knowledge of prairie peoples. To learn more go to www.saokioheritage.com.

By Christine Wren

changing daylight

How a weasel turns white

Lately I've been watching the sun, paying attention to its path across the foothills near my home. It turns out that changing daylight is the answer to a question that's needled me for a while – just how do certain animals know when to change color?

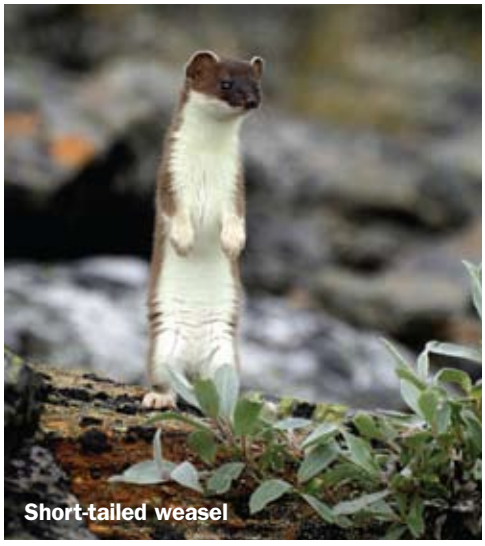


Photo: © Naturablichter | Dreamstime.com

Short-tailed weasel

I started pondering this question in the fall during a hike along a small creek in the Bitterroot Mountains near the Montana/Idaho border. Late fall, but no snow on the ground. Instead, a brown understory of rotting leaves, bare shrubs, and downed timber. Out of this earthy landscape a small, white shape caught my eye. Then it moved! A short-tailed weasel – called an ermine when winter white – tiny but long, with its signature black-tipped tail. It skirted the creek bank, darting between bushes, and then, amazingly, moved toward me as it crossed a fallen log that spanned the creek. Mid-way across it stopped, raised up on hind legs, eyes fixed in my direction. Just as quickly, it disappeared under a rotting wood cabin along the creek bank.

I was dumbfounded. Without the color contrast, I wouldn't have seen it. The benefits of camouflage, and the hazards without it, were clear. Ermine have the ability to change the color of their fur to match different seasonal environments. Switching from brown to white in winter, then back to brown again in spring, this animal survives by blending into both landscapes. But why had it turned white prematurely, before the first snow arrived? Changing too soon, it becomes easy prey for a fox. So just how does an ermine know when to change color?

Animals respond to seasonal change in a variety of ways in order to survive. Some hibernate, some migrate, some stick around and grow thicker fur. A few special animals change the color of their fur or feathers to match changing camouflage needs. It turns out that ermine, like ptarmigan and snowshoe hare, change color because of a physical reaction to the photoperiod, or number of daylight hours. For these animals, decreasing amounts of daylight in late fall trigger hormone reactions that cause changes in the production of natural pigments in their bodies. Reduced daylight causes a chemical reaction that decreases levels of dark, melanin-containing pigments. As new fur or feathers grow in, a white coat gradually replaces the brown one. In spring, the reverse happens. Increased daylight hours cause dark pigment levels to rise, meaning brown fur starts to grow again. Temperature shifts play a role, but the amount of daylight is key to this amazing color transformation.

So, I want to retrace my footsteps along that creek this spring, keeping an eye out for a brown short-tailed weasel. Will the increased daylight coincide with a complete snowmelt? Maybe yes, maybe no. Snowfall patterns vary from year to year, but nature is constant in the time she keeps, in her annual cycles of darkness and light.

—Christine Wren is a former elementary school teacher who loves introducing children and others to the nature of Montana.

Daylength triggers seasonal coat change in snowshoe hares, regardless of snow cover.

Photo by Lance Shelvin

Photo by Kate Davis

field note

Sharp-shinned Hawk

By William Gross

When you think of a bird and what it eats, what comes to mind? An osprey snagging a rainbow trout out of a river? A red-tailed hawk grabbing a cottontail from a field? Or perhaps a rufous hummingbird sipping from a mountain flower, or even a robin pulling up an earthworm from your garden?

Birds eat a variety of things, including other birds – and sharp-shinned hawks are one of these. "Sharpies" are the smallest of the North American accipiter group, which also includes Cooper's hawks and northern goshawks. "Sharp-shinned" refers to its thin, flattened tarsus or leg shank. The sharp-shinned hawk's chest is lightly speckled brown over a gray-white background, and its relatively long tail has three prominent black bands and a white tip when seen from below. Their short, rounded wings span about two feet.

Sharp-shinned hawks are quick and agile fliers in dense cover or in open fields. This small hawk targets its prey in trees or on the ground, making quick, surprise attacks rather than sneak approaches. Females often concentrate on flickers and robins, while the even smaller male will go after sparrows and chickadees. But they've been known to prey on everything from a three-inch-long Anna's hummingbird to a foot-and-a-half tall ruffed grouse.

Sharp-shinned hawks are fairly common year-round in western Montana, and can be seen a variety of places such as near rivers, parks and fields, even backyards. Birdfeeders attract a number of smaller birds that sharp-shinned hawks may target.

—This Field Note was written in the Honors Science Writing Class at the University of Montana.

What is it?

By Byron Weber

One of the sure signs of the arrival of autumn is the increase in numbers of wool shirts and hats we see around town. But humans aren't the only creatures that pull the wool on when the temperature drops. Around this time you may notice the annual fall swarming of the wooly aphid, an insect about the size of a pinhead, flying about our yards dressed in a white coat of wool.

There are many different species of wooly aphid, each specific to a host tree. They inhabit alder and maple trees, ash trees and birch trees, like the paper birch my yard. The "wool" on the aphid's body is really wax secreted from small glands, which causes the aphid to resemble a miniature cotton ball. It is this white speck moving through the air that attracts our attention. I have noticed that usually around the third week of September, there will be first one or two wooly aphids, then more, and finally one day a large swarm of these tiny insects will be visible. The swarming process takes about two weeks to complete. If there is a cold period, however, the aphids will not appear, having died or disappeared into the leaf litter.

Photo by Donna Race

Wooly aphids look like pin-sized bits of cotton

Swarming wooly aphids are the result of a most peculiar life cycle. In the spring, only females hatch, which then proceed to give rise to many more generations of both wingless and winged females. The first wingless nymphs I notice on the leaves of the paper birch occur around the first week in June. The females produce more females until colder weather stops the growth of green plants. Then a generation of males is produced. These males lack even mouth parts – they will not be around long enough to dine. Their sole purpose is to mate with a different generation of females and die. The fertilized female aphids produce eggs that overwinter on the bark of host plants and the cycle continues the following spring.

This life cycle, dominated as it is by generations of females, might sound unbelievable to some, but rest assured – I'm not pulling the wool over anyone's eyes.

—This essay first aired as a Field Note on Montana Public Radio in September, 1992.

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

get outside calendar

January 5 **Volunteer Naturalist Training,** 4:00-5:00 p.m. **Winter Adaptations.** Volunteer training for Visiting Naturalists in the Schools January class visits. No experience necessary.

January 9 **Saturday Kids Activity. Hibernation Celebration,** 2:00 p.m. For ages 5-10; kids must be accompanied by an adult. $2/child for non-members; MNHC members free.

January 13 **Evening Lecture,** 7:00 p.m. Join wildlife filmmaker Bob Landis for a preview of **"Clash: Encounters Between Bears and Wolves,"** a new documentary for PBS' Nature series, followed by a Q&A session and reception. $4 suggested donation; MNHC members free.

January 23 **Saturday Kids Activity,** 2:00 p.m. **Winter Ice Painting.** For ages 5-10; kids must be accompanied by an adult. $2/child for non-members; MNHC members free.

January 23 **Saturday Discovery Day,** 9:00 a.m.-4:00 p.m. **Winter Tracking Workshop** with Northwest Connections. Call 327-0405 to sign up.

February 2 **Volunteer Naturalist Training,** 4:00-5:00 p.m. **Bone Detective!** Volunteer training for Visiting Naturalists in the Schools February class visits. No experience necessary.

February 5 **First Friday Open House,** 5:00-8:00 p.m. Glacier National Park Centennial Art Display.

February 10 **Evening Lecture,** 7:00 p.m. **Flammulated Owls,** presented by Mat Seidensticker. $4 suggested donation; MNHC members free.

February 11 **Master Naturalist Class,** 4:00-7:00 p.m. Thursdays through May 6. Space is limited; call 327-0405.

February 13 **Saturday Kids Activity,** 2:00 p.m. **Planets, Moons and Stars.** For ages 5-10; kids must be accompanied by an adult. $2/child for non-members; MNHC members free.

February 16 **Master Naturalist Class,** 4:00-7:00 p.m. Mondays through May 10. ***NOTE:*** *First class is on Tuesday due to President's Day.* Space is limited; call 327-0405.

February 19 **Project Learning Tree Educators Workshop** applications due. See entry, next page. Six OPI credits available; go to www.montananaturalist.com to download form. Contact Leah Grunzke at (406) 493-0544 or miss_grunzke@yahoo.com for information.

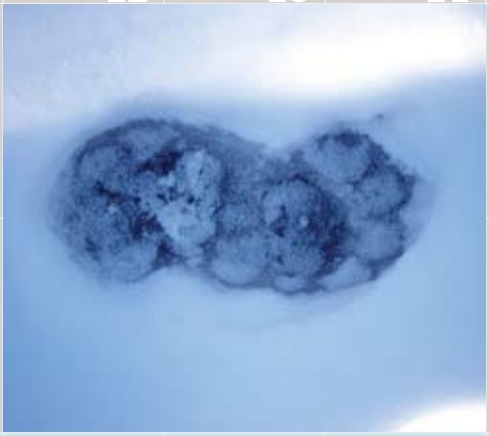
February 24 **Evening Lecture,** 7:00 p.m. **Climate Change and the American Pika,** presented by Shannon Hilty, University of Montana undergraduate student. $4 suggested donation; MNHC members free.

February 27 ***Special*** **Saturday Kids Activity**, 2:00-3:30 p.m. **Track Detective** with Elliott Parsons, tracker extraordinaire. Tracking fun and games, with outside tracking time followed by snacks and hot cocoa. For ages 5-10; kids must be accompanied by an adult. $2/child for non-members; MNHC members free.

March 3 **Volunteer Naturalist Training,** 4:00-5:00 p.m. **An Experiment in Lift.** Volunteer training for Visiting Naturalists in the Schools March class visits. No experience necessary.

March 13 **Saturday Kids Activity,** 2:00 p.m. **Rad Reptiles (with Live Animals)!** For ages 5-10; kids must be accompanied by an adult. $2/child for non-members; MNHC members free.

January

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
MNHC Hours: Tuesday-Friday, noon - 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.					1	2
3	4	**Volunteer Naturalist Training,** 4:00-5:00 p.m. **Winter Adaptations.** 5	6	*Ravens active and forage in all kinds of weather* 7	8	**Saturday Kids Activity. Hibernation Celebration.** 2:00 p.m. 9
10	11	12	**Evening Lecture Series. "Clash: Encounters Between Bears and Wolves".** 7:00 p.m. 13	14	15	16
17	*Non-hibernators leave tell-tale tracks in snow* 18	 Photo by Jim Peaco, YNP			22	**Saturday Kids Activity. Winter Ice Painting.** 2:00 p.m. **Saturday Discovery Day. Winter Tracking Workshop.** 9:00 a.m.-4:00 p.m. 23
24	25				29	30

February

31	1	**Volunteer Naturalist Training,** 4:00-5:00 p.m. **Bone Detective!** 2	3	4	**First Friday Open House,** Glacier National Park Centennial Art Display. 5:00-8:00 p.m. 5	*Great horned owls begin nesting* 6
7	8	9	**Evening Lecture Series. Flammulated Owls,** 7:00 p.m. 10	**Master Naturalist Class,** 4:00-7:00 p.m. *Thursdays through May 6.* 11	12	**Saturday Kids Activity. Planets, Moons and Stars.** 2:00 p.m. 13
		**Master Naturalist Class,** 4:00-7:00 p.m. *Mondays through May 10.* 16	17	18	**Project Learning Tree Educators Workshop** applications due. 19	20
		Midges are food for early arriving bluebirds, trout and whitefish as well 23	**Evening Lecture Series. Climate Change and the American Pika,** 7:00 p.m. 24	25	26	**Saturday Kids Activity. *Special* Track Detective.** 2:00 p.m. 27

Midge image: Norman E. Rees, USDA Agricultural Research Service, Bugwood.org

Programs and events held at MNHC's new home - 120 Hickory Street - unless otherwise noted.

March

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
28	1	2	3 **Volunteer Naturalist Training,** 4:00-5:00 p.m. **An Experiment in Lift.**	4	5	6
7	8 *Great blue herons return to nests in rookeries*				12	13 **Saturday Kids Activity. Rad Reptiles (with Live Animals)!** 2:00 p.m.
14	15				19	20 **Saturday Kids Activity. Springtime Eggstravaganza!** 2:00 p.m.
21 **Sunday Discovery Day. Snow Geese Migration at Freezeout Lake,** 7:00 a.m.	22	23	24 **Evening Lecture Series. Forensic Geology** 7:00 p.m.	25	26 *Marmots come out of hibernation*	27

Steven Katovich, USDA Forest Service, Bugwood.org

April

28	29	30	31	1	2	3
		6 **Volunteer Naturalist Training,** 4:00-5:00 p.m. **Fill the Bill.**	7	8	9	10
		13 **Volunteer Naturalist Training,** 4:00-5:00 p.m. **Field Trip Orientation.**	14	15	16	17 **Project Learning Tree Educators** 9:00 a.m.-3:45 p.m. **Schoolyard Gardens.**
18 *Bitterbrush leaves appear; Alder catkins grow bigger*	19	20	21 **Volunteer Naturalist Training,** 4:00-5:00 p.m. **Field Trip Orientation.**			24
25	26	27	28 *Hungry bears feed on new green shoots of many plants*			

Photo William M. Ciesla, Forest Health Management International, Bugwood.org

Photo by Jim Peaco, YNP

get outside calendar

March 20 **Saturday Kids Activity,** 2:00 p.m. **Springtime Eggstravaganza!** For ages 5-10; kids must be accompanied by an adult. $2/child for non-members; MNHC members free.

March 21 ***Sunday* Discovery Day,** 7:00 a.m.-6:00 p.m. **Snow Geese Migration at Freezeout Lake.** Cost is $40; $30/MNHC members.

March 24 **Evening Lecture,** 7:00 p.m. **Forensic Geology,** presented by Raymond Murray. $4 suggested donation; MNHC members free.

April 6 **Volunteer Naturalist Training,** 4:00-5:00 p.m. **Fill the Bill.** Volunteer training for Visiting Naturalists in the Schools April class visits. No experience necessary.

April 13 **Volunteer Naturalist Training,** 4:00-5:00 p.m. **Field Trip Orientation.** Learn how you can help teach kids about the flora and fauna of Western Montana during our May Visiting Naturalist in the Schools field trips. Only one orientation meeting is necessary to participate.

April 17 **Project Learning Tree Educators Workshop,** 9:00 a.m.-3:45 p.m. **Schoolyard Gardens: Connecting Children with Nature through Native Plant Education.** Project Learning Tree (www.plt.org) is an award-winning environmental education program of the American Forest Foundation that teaches students how to think, not what to think. Educators are invited to attend a one day workshop in which we'll explore ways to use PLT curriculum to introduce students to native plants, pollinators, invasive weeds and conservation principles. Registration fee includes all materials, a K-8 PLT curriculum guide, lunch and snacks. Six OPI credits available. Meet at Fort Missoula Nature Adventure Garden; cost is $13. Applications due Feb. 19; go to www.montananaturalist.com to download form. Contact Leah Grunzke at (406) 493-0544 or miss_grunzke@yahoo.com for more information.

April 21 **Volunteer Naturalist Training,** 4:00-5:00 p.m. **Field Trip Orientation.** Learn how you can help teach kids about the flora and fauna of Western Montana during our May Visiting Naturalist in the Schools field trips. Only one orientation meeting is necessary to participate.

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.

MNHC photo

Master Naturalist

A few spaces remain open for the Spring 2010 Master Naturalist class, offered either Mondays or Thursdays from 4 p.m. to 7 p.m., beginning in February. There are three Saturday field trips for each section as well. Classes are held at MNHC, 120 Hickory St. Call 327-0405 to find out about cost and to register, or go to www.MontanaNaturalist.org.

Photo by Leah Grunzke

The Harrington Memorial Native Plant Garden shone last summer, thanks to the efforts of Leah Grunzke, Marilyn Marler and many volunteers and interns. Species represented in the garden include columbine, prairie smoke, penstemon, fringed sage, June grass, Idaho fescue, yarrow, shaggy fleabane and more. In October, volunteers gave tours of the garden and sold native plants to benefit local plant restoration and education projects.

FUN FACT: Deer mice sometimes use bird nests as winter larders, to store seeds and nuts

Lessons from Nature

Act like animals to stay warm

Can you match the animal and human behaviors?

In early winter, raccoons stay in dens if temperatures fall below mid-20s

Wear warm layers of clothing, down-filled is especially good

Ducks and muskrats coat feathers and fur with water-repelling oil from special glands to keep skin dry

Cover up head, face and fingers with hat, scarf and mittens to stay warm

Birds puff up downy feathers, trap warm air against skin

Bring snacks along during outdoor activities to keep energy levels up, internal furnace functioning

Foxes, squirrels and coyotes wrap tails around feet and noses while resting

Stay inside if it's too darn cold!

Chickadees eat 20 times as much during colder months than warmer months

Wear moisture-wicking under-layers, change out of wet clothes ASAP

Raccoon: © Martin Vallière, istockphoto.com; geese: clipart.com; nuthatch: Jim Peaco, YNP; fox: Jim Peaco, YNP; chickadee: © Sian Cox, istockphoto.com; child: clipart.com; mittens: clipart.com; snacks: clipart.com; window: © Matthew Porter, istockphoto.com; frozen girl: © Colleen Butler, istockphoto.com. Mouse illustration: clipart.com

Denver Holt and snowy owl

Why are Snowy Owls White?

And other questions from the field

By Caroline Kurtz

It's only taken Denver Holt two decades of summer field work on snowy owl breeding grounds in Alaska to come up with this question. And it's actually an original one, something that's hard to do in wildlife biology, he says, nearly impossible without spending major time on the ground observing animals in their natural environment.

Field work defines Holt's career as an owl researcher – more than a scientist, he's an owl naturalist, an aficionado who opted out of a career in a university or agency setting because he felt that too many people who do so end up behind a desk, unable to spend time outside after their graduate work. Instead, Holt and students and volunteers at the Owl Research Institute near Charlo, are in the field 12 months a year, conducting some of the longest-term studies of owls in the world – closing in on 25 years for long-eared owls and their prey, and pushing 20 years for snowy owls. In addition, they do ongoing studies of most of the 15 species of owl that reside or spend time in Montana.

The main reason people study wildlife "is because we love it," says Holt, "we think it's cool. After that, we do it to provide information for conservation reasons, to help make decisions about land protection for instance."

Holt himself has an abiding interest "in big, white Arctic animals" and in spending time in that vast wilderness. But he doesn't do it alone. Over the years he's trained dozens of field assistants in the art of locating snowy owl nests, taking field measurements of the birds, observing behavior, tracking nest success and more.

"Every time we take on a study, it has to be for at least five to 10 years," Holt says. "It takes time to become a good field researcher."

ORI and its offspring, the Ninepipes Center for Wildlife Research and Education, provide high-school and college students and volunteers of any age with rich opportunities to learn about owls, ecology and practical research techniques. But those who seek out these opportunities must be very motivated and self-directed. It's not for everyone; Holt admits he can be a tough taskmaster. "But for those who like it, we have a lot of fun," he says.

Holt is generous with his time, frequently taking groups of kindergartners to retirees into the field for an "owl afternoon" or other presentation. He especially is keen on adult learners because they bring such varied life experiences to a project and "ask challenging questions."

"From grade-school kids to adults, this is the best thing we're doing," says Holt, "actively involving people in doing research," all in support of better understanding natural history.

In Holt's opinion, this understanding takes place on a spectrum. At one end, he says, are the "naturalists" – people who spend a lot of time outside – hunters, ranchers, birders, anyone who loves being outdoors making informal observations about nature over time. At the other end are academic and agency researchers who have deep knowledge about very specific subjects, who attempt to explain observations by applying the scientific method, but perhaps can't spend that much time in the field.

"I see ORI and similar non-profits as a bridge in the middle," he says. "Good field observations lead to good research questions, to be investigated over many years and the results shared with professionals and lay people alike, all in service of advancing our knowledge of the natural world."

To learn more about volunteer opportunities and the research programs at ORI/NCWRE, go to www.owlinstitute.org or call (406) 644-3412.

So why *are* snowy owls white?

At a basic evolutionary level, the answer probably is: to blend in with a snow-covered landscape, like other white animals do. But that may not be all that's going on with adult male snowy owls.

Snowy owls live most of their lives in a wintery environment; the exception is during the summer breeding season when snow melts off the tundra. Both males and females start out heavily marked with brown; as they age, both sexes become whiter. Females, though, remain speckled to some degree, looking exactly like lumps of melting snow when they are sitting on nests on the ground. Males, however, can become almost fluorescent white, standing out like beacons a mile away across the flat, brown-green tundra. This seems the antithesis of camouflage. But based on many seasons of observations and other work, Holt surmises that brighter white males have been sexually selected for over time. They are older and therefore have survived longer, successfully finding food and defending territories. So it seems, at least among snowy owls, that older, white males really do have an advantage.

Coyotes on Our Doorstep

Photo by Jim Peaco, YNP

By Lili DeBarbieri

An advanced system of communication, complex social structure and keen intelligence. The ability to live in nearly any environment on earth. Sound familiar? No, not *homo sapiens*. *Canis lantrans* – the American coyote – also fits this description. Historically found on the Great Plains, the American coyote has expanded its range over the last century largely in response to the niche left by wolves and human modifications of landscapes.

Though often eclipsed in the media by wolves, their larger relatives, coyotes play an important ecological role in their environments by maintaining healthy ecosystems and species diversity. As a top carnivore, coyotes help regulate the number and density of smaller carnivores, such as skunks, raccoons and foxes.

In Montana, coyotes can be found in diverse habitats and landscapes across the state. It is this adaptable, opportunistic nature that often creates conflict with people. On ranches and farms, coyotes are viewed primarily as threats to livestock. Cattle and other grazers trample and consume vegetation that a coyote's prey rely on – so coyotes look to sheep and other domestic animals as a food source. Currently, coyotes are the most abundant livestock predators in the country. "We mostly worry at calving season," says Eve DeMarco, owner of Happy Hollow Farm in Marion, Montana. Happy Hollow prides itself on certification as "predator friendly," using humane practices to keep livestock safe and wildlife alive.

Some, admittedly few, stockgrowers, even embrace the presence of Wile E Coyote. "We enjoy

Photo by John Good, YNP

ABOVE, coyote pups are born in April.
RIGHT, bison and coyotes co-exist at Wild Echo Bison Reserve, as they have for millennia.
OPPOSITE PAGE: A coyote prepares to pounce on rodent prey.

Photo: Bison Quest Adventures on the Wild Echo Bison Ranch, www.bisonquest.com

seeing coyotes immensely and love having them on our ranch. Of course, raising a native ungulate that can take care of itself, like our bison, is an easy way to co-exist with the rest of our native wildlife," says Pam Knowles of Bison Quest Adventure Vacations in Townsend.

Coyotes tend to become more active, vocal and territorial during their pupping season, when food requirements are at a high. Females have one litter per year, typically in April, and the parents bring food to the pups until they are old enough to join them hunting. During this time, negative encounters between humans and coyotes can increase and intensify. Since ranchers often dispose of dead livestock and afterbirth in forests and fields, "this attracts coyotes and gives them a taste for domestic animals," DeMarco says. Although most coyotes naturally fear humans, coyotes that associate humans with food can become unhealthily habituated to their presence. "Domestic livestock are at times easy prey when the owner is not around to protect the young and the older animals," she continues. "We bring our cattle in near the house during calving to keep an eye on them. We have a bear dog, and llamas to alert us if the coyotes come in."

Ranchers like DeMarco may benefit from work that the Blackfoot Challenge, a group that focuses on land use and conservation issues in the Blackfoot valley, is doing with grizzly bear and wolves. "We remove approximately 235 livestock carcasses each year from what once were "boneyards," or pits where livestock carcasses were deposited during the calving season," says researcher Seth Wilson. "This may help reduce the likelihood of having coyotes spend time near calving areas, since "attractants" like dead calves or mother cows have been removed to a carcass composting facility," he explains.

However, Brian Giddings, of Montana Fish, Wildlife & Parks states that coyotes mostly are little threat to grown animals, "although they could take down any age sheep."

"In some cases a pair of coyotes will keep their distance from farms and ranches – these are considered "good" coyotes that should be left alone because, being territorial, they will keep out other or new coyotes that could cause problems."

Coyotes do provide a highly beneficial and popular service to farms and ranches, according to Giddings – the ability to "eat a lot of unwanted rodents."

"Coyotes are efficient predators of small mammals such as mice and voles," he says. "I have often seen coyotes mousing in a field adjacent to livestock. When the weather turns very cold it's not that difficult to find coyotes out in the daytime, catching mice."

That coyotes "control" rodent populations is a common misperception, however. "Rodents have high reproductive rates in general, and coyotes often just harvest the surplus, taking what's easiest to catch. There's very little evidence in the scientific literature that predators such as coyotes, foxes or bobcats can actually have a significant impact on a rodent population," says Robert Timm, wildlife specialist at the University of California.

Hunting proclivities aside, unexpected moments spent observing this charismatic omnivore yield intriguing insight into their behavior. "Once I was playing ball with my border collie out in the field," rancher Eve DeMarco recalls. "The coyote was very interested. He eventually sat down at a good vantage point and just watched the show. After a while he got up and headed away, I am sure to tell his pack what he had seen.

"Most people just assume coyotes are aggressive killers," she muses. "I just think they need to hire a really good PR agent."

With at least 19 subspecies roaming throughout North America, coyotes are a vital part of both wilderness and urban environments. "That coyotes have withstood and even thrived under intense persecution over the last century is a testament to their adaptability, resilience and intelligence," says Camilla Fox, founding director of Project Coyote, a national non-profit organization. "We must learn to coexist if for no other reason than that the coyote has proven time and time again she will persist".

"That coyotes have withstood and even thrived under intense persecution over the last century is a testament to their adaptability, resilience, and intelligence."

Photo by J. Schmidt, YNP

—Lili DeBarbieri is a freelance writer specializing in travel, environmental issues and wildlife. Her work appears in Terrain, Earth Island Journal and Nature Alberta*, among other publications.*

Glacier National Park

Centennial Celebration 1910-2010

In the late 1880s, painters and photographers regularly accompanied surveying expeditions to the unexplored West, bringing back sublime images of Glacier, Grand Canyon, Yellowstone and Yosemite, among other places. The Great Northern Railway also commissioned artists through the "See America First" campaign.

Artists took on this call in words, paint and photography. Charlie Russell, Winold Reiss, John Ferry and TJ Hilemann captured scenes from natural and cultural history that could be found in Glacier and under the "Big Sky."

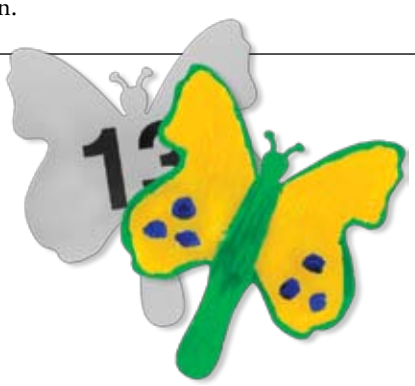
Today, artists from around the world are just as influential in the continuing preservation of Glacier National Park through their inspiring personal connections with the place. Fourteen pieces of art have been selected for a show in honor of Glacier National Park's Centennial celebration, and will be on tour throughout the state. "The Art of Preservation: Official Centennial Art of Glacier National Park" will be on display at MNHC from January 14 – February 24, 2010. Call 327-0405 or go to www.MontanaNaturalist.org for information on hours and location.

"The Crown Jewels" by Nancy Cawdrey, Dye on Silk. Photo courtesy of GNP.

Auction Super Stars

Through the generous contributions of these sponsors and auction items donors, along with those of everyone who attended, our annual fall Dinner & Auction fundraiser was a resounding success. With your help we raised more than $40,000 in support of nature education.

With thanks to:



Sponsors

Big Sky Brewing
Boyle, Devaney & Meyer
Buckley Builders
First Security Bank
Garlington, Lohn & Robinson
Gary & Judy Matson
Good Food Store
Greg Schmautz & Alan Okagaki
Jim & Laurie Randall
Julie Garnder/Lambros Realty
Kathy & Jack Ward Thomas
Merrill Lynch
Montana Cancer Specialists
Oncken Family Partnership
OZ Architects
Robert Korenberg
Sandy & Pam Volkmann
Scooterville
Tamarack Construction
Trappings Studio
Twin Cranes Dental Group
WGM Group

Auction Donors

Adrienne Veseth
Alan Okagaki
Animal Wonders, Inc.
Annie Garde
April Christofferson
APS Healthcare
Arnie Olsen
Barbara Compton
Barnes & Noble
Bernice's Bakery
Betty's Devine
Blackfoot Communications
Blue Damsel Lodge
Brandt Evans/Blue Canyon
Brian Williams
Butterfly Herbs
Butterfly Properties Garden Coaching
Caras Nursery
Coldstone Creamery
Crackle Bingham
Depot Bar & Restaurant
Earth & Wood
El Diablo
Eshbaugh Family
Fact & Fiction
Famous Dave's
Fiesta En Jalisco
Go Fetch
Hank & Carol Fischer
Harlan Ockler
Hob Nob
Home Resource
House Design Studio
Jack Tawney
Jaker's
Jay Gore
Jeff Freeman
Jim Randall
John & Sue Talbot
John Perry
Kesel's Fly Shop
Kristen Cherubini & Breanne Black/Main Street Pilates
Kristy Beck-Nelson
LA Design
Lance Schelvan
Larry Aumiller
Laura Snyder
Laurence Coffman
Lavender Lori
Lee Whittlesly
Lewis & Clark Trail Adventures
Lisa & Dale Bickell
Lolo Elementary School
Mae Nan Ellingson
Marchie's Nursery
Maureen Bush
Michael Leach
Missoula Art Museum
MNHC Staff
Montana Fish, Wildlife & Parks
Moonlight Basin
Mountain Press
Nancy Bugbee
Nancy Stoverud
Nature Boy
Northern Lights Development Co.
Noteworthy
Paul & Jeanne Mosely
Peak Health & Fitness Center
Pearl Cash
PEAS Farm
Pink Grizzly
Red Bird
Red Rooster
Runner's Edge
Sar & Theresa Dougherty
Scooterville
Scotty's Table
Silk Road
Steve & Diana Goldberg
Stuart & Mindy Goldberg
Subway at Southgate Mall
SuzAnne Miller/Dunrovin Ranch
The Kingfisher
The Mercantile
The Old Post
The University of Montana Natural Areas Program
University Golf Course
Walking Stick Toys
Wendy Brown
Whippersnappers

Supporting our Voice

Thirteen foundations and one major business sponsor voiced their support of MNHC in 2009 by providing funding for nature education through major program support, curriculum development, Discovery Trunk upgrades and more. We are grateful to the following:

Cadeau Foundation
Master Naturalist course development

Cinnabar Foundation
General operations

Dennis and Phyllis Washington Foundation
Final curriculum development and upgrades to the Mining/ Geology Discovery Trunk

Humanities Montana
Evening Lecture series

Kendeda Fund
Visiting Naturalist in the Schools

M.J. Murdock Charitable Trust
Summer Science Discovery Camps and Visiting Naturalist in the Schools

Montana Community Foundation
Visiting Naturalist in the Schools

Mountaineers Foundation
Master Naturalist course development

Norcross Wildlife Foundation
Educational equipment and furniture

Pleiades Foundation
General operations

Plum Creek Foundation
Kayak trailer and classroom furniture

PPL Montana Community Fund
Educational equipment and classroom furniture

Southgate Mall
General Discovery Trunk support

William H. and Margaret M. Wallace Foundation
Visiting Naturalist in the Schools

For Inspiration, Leadership

At MNHC's 2009 Dinner & Auction, the following individual and organization were recognized for their unique contributions to promoting understanding of and connections with nature:

The **2009 Director's Award** went to Donna Gaukler, director of Missoula Parks & Recreation Department. Under her leadership the department has launched a variety of policy initiatives and educational programs targeted toward the community's enjoyment and stewardship of open/ green spaces. In addition, she played a leading role at the 2008 statewide Montana Children & Nature Summit, and in holding a Missoula Children & Nature Summit last winter. She has been instrumental in developing the Missoula Children & Nature Network, which partners numerous organizations in the community to get more children outside, playing and exploring their local parks and natural areas.


Donna Gaukler

Photo courtesy of Donna Gaukler

"I strongly believe that play outdoors stimulates the mind, comforts the soul and makes us happier individuals more likely to contribute to social and environmental issues," Gaukler said. "By connecting children with nature, we are providing them with a lifetime of mental, physical and spiritual wellness."

The **2009 Natural History Educator Award** was presented to Montana Audubon, which, has been promoting the appreciation, knowledge and conservation of native birds and other wildlife and their habitats across the state for 30 years. Montana Audubon has built effective programs in public policy, education and bird conservation to serve its members and Montana's nine community-based chapters. Four years ago, Montana Audubon launched an effort to establish the Montana Audubon Conservation Education Center in Billings. This is a visionary project to restore a gravel pit along the Yellowstone River into habitat for wildlife and an outdoor classroom for the community. Through programs at the center and throughout the state, Montana Audubon has furthered the knowledge of thousands of people about birds, birding and other wonders of the natural world.

spotlight:


Photo courtesy of Allison De Jong

Allison De Jong, Volunteer Coordinator

When Allison De Jong stepped into the job of Volunteer Coordinator last March, she had never stepped through the doors of the nature center before. "But I had a lot of friends and roommates who had," she says, "and I was very interested in working with a non-profit organization."

In the months since, she has learned a lot about local natural history and is excited to be in a place where there are so many opportunities to learn and be outside. "I think it's important for kids, and also for adults who are looking for ways to connect with something outside of work or school," she says.

De Jong grew up in a "tiny northwest Iowa town," where spending time outside in the quiet under the stars was essential to her. But she was always attracted to the West and its mountains, so she came to Missoula for a master's degree in environmental studies. She and newlywed husband, Greg Peters, a botanist and biology teacher at UM's College of Technology, spend as much time as possible hiking and exploring the area, and also contra dancing!

The best aspect of her job, she says, is "getting to sit down with people, find out about them, hear their stories" and help them get involved. As someone who grew up looking for service opportunities as a way to stretch herself and learn more about the world, De Jong knows the power of volunteering. Currently she's the contact for 40 to 45 volunteers, getting each set up with the sort of activity he or she is interested in. Many want to work with kids, and there is plenty to do with the Visiting Naturalist in the Schools program and Saturday Kids Activities. There's also need for office help, exhibits, *Field Notes* on Montana Public Radio and more. De Jong tries to be a presence in the community and keep up active communications with volunteers. "There's a lot of room for creativity here," she says. "I like figuring out what needs to be done, how it can be organized, get feedback, send out updates. It fun to see all the different kinds of people we attract [at MNHC], it's a good group of folks."

—To find out about volunteer opportunities or internships at MNHC, contact Allison De Jong at 327-0405 or adejong@MontanaNaturalist.org.

Junior Photographers

Send in your nature photos!

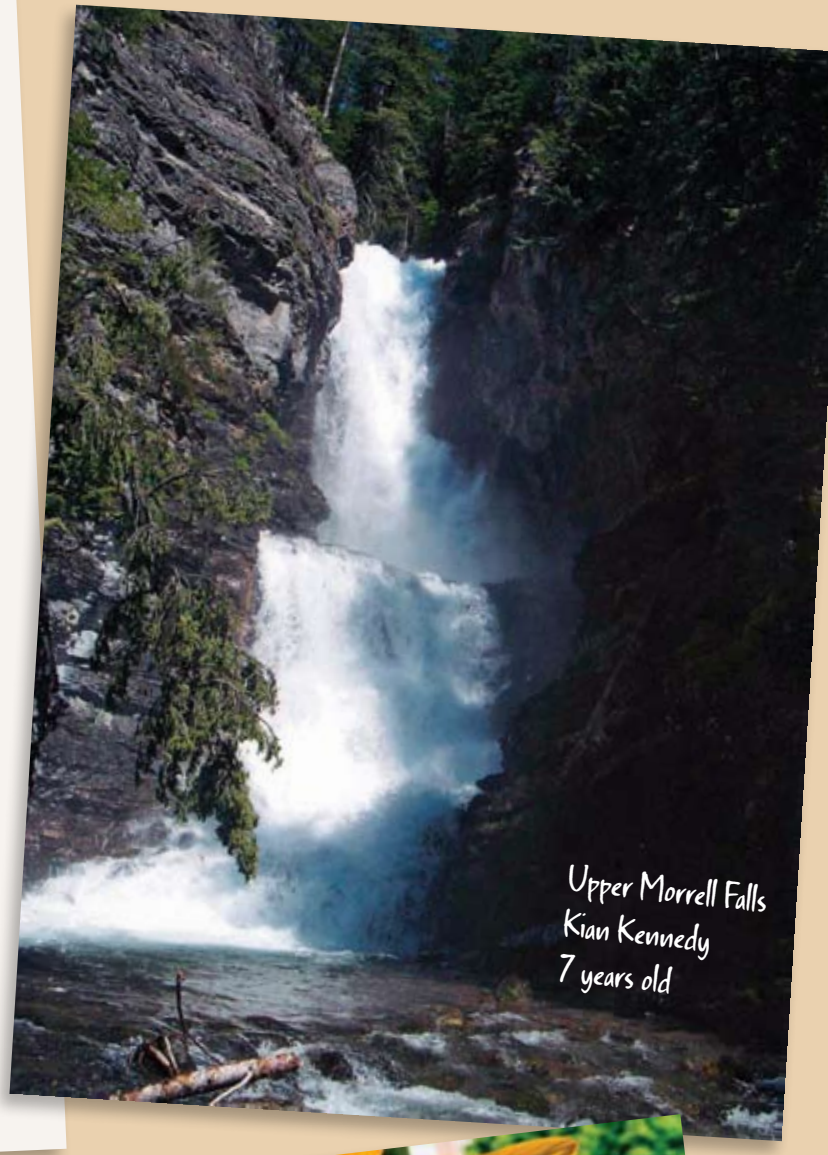
Are you between 7-12 years old? Do you like to take photos of nature? Send us your favorite picture (that you took!) and we will display your work at the nature center! Top photos will be published in the next issue of *Montana Naturalist*.

This winter, while you are on vacation, visiting friends or relatives, or just messing around at home think about what you like best about the outdoors and see if you can capture it in a photograph. Send it in between now and March 15. Photos judged best by age and other categories (depending on submissions) will appear in our magazine. Only ONE photo per entrant, please!

You can mail 5 by 7-inch or larger prints to Editor, Montana Naturalist, MNHC, 120 Hickory St., Missoula, MT 59801. Or email digital pictures as jpegs to editor@MontanaNaturalist.org. Jpegs need to be saved at 300 dpi at 5 by 7 inches at least.

Montana Natural History Center
Your Base Camp for Discovery

Our mission is to promote and cultivate the appreciation, understanding, and stewardship of nature through education



Upper Morrell Falls
Kian Kennedy
7 years old

Sunflower
Noah George
9 years old

"The world will never starve for want of wonders, but only for want of wonder"

—G.K. Chesterton

Montana Natural History Center
Your Base Camp for Discovery

120 Hickory Street
Missoula, MT 59801
www.MontanaNaturalist.org

NON-PROFIT
ORGANIZATION
US POSTAGE
PAID
PERMIT 569
MISSOULA, MT

Montana Natural History Center is an equal opportunity service provider.
Montana Natural History Center trips are permitted on the Lolo National Forest (Clause VII.B).

Yes! I want to become a member and support the Montana Natural History Center. *All memberships are annual.*

☐ Basic Membership: $50 ☐ Student Membership: $25

☐ Business Membership: $250 ☐ Explorers Club Membership: $1,000

All gifts are tax deductible to the full extent of the law.

☐ I am enclosing payment by check.

Name _____

Address _____

_____

City _____ State _____ Zip _____

Phone _____

☐ I would like to pay with credit card (circle one): AMEX VISA Mastercard

Account Number _____ Exp. Date _____

Signature _____

☐ Sign me up for the monthly email newsletter.

Email address: _____

☐ I want to volunteer! Send me a volunteer application.

☐ I would like more information on making a planned gift or gift of stock.

*Make us your base camp for discovery with a visit to our website – **www.MontanaNaturalist.org**. Become a member on-line, explore our programs and discover where the Montana Natural History Center can take you!*

Fill out and mail to Montana Natural History Center, 120 Hickory Street, Missoula, MT 59801 or Fax: 406.327.0421

Basic Membership Benefits

Annual subscription to ***Montana Naturalist***
Free visitor center admission
Discounts on all programs
Invitations to special programs
Access to the Ralph L. Allen Environmental Education Library

Business Membership Benefits

Advertising discounts in ***Montana Naturalist***
A supporters link on our website
Free meeting space (subject to availability)
Invitations to special programs
Recognition in our visitor center and in ***Montana Naturalist***

If you have enjoyed the articles and photos in *Montana Naturalist*, won't you please help us continue to celebrate Montana's natural history by becoming a voluntary subscriber? Your donation will go directly to support the costs of producing this magazine.

Please send donations to:
Montana Naturalist,
c/o Montana Natural History Center
120 Hickory St.
Missoula, MT 59801.

Thank you!