Spring/Summer 2006

MONTANA Naturalist

Nature at night

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Roads and wildlife

A river for birding

Missing frogs

15th Anniversary!
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TO PROMOTE AND CULTIVATE THE APPRECIATION, UNDERSTANDING AND STEWARDSHIP OF NATURE THROUGH EDUCATION

MONTANA Naturalist

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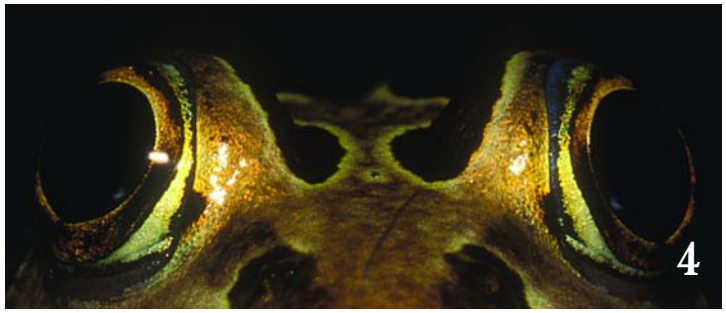
Special Pull-Out Section



Cover photo – Northern leopard frog *(Rana pipiens)*, taken by J. Kirwin Werner. Leopard frogs used to be common in western Montana, but are becoming increasingly rare.

15th Anniversary!
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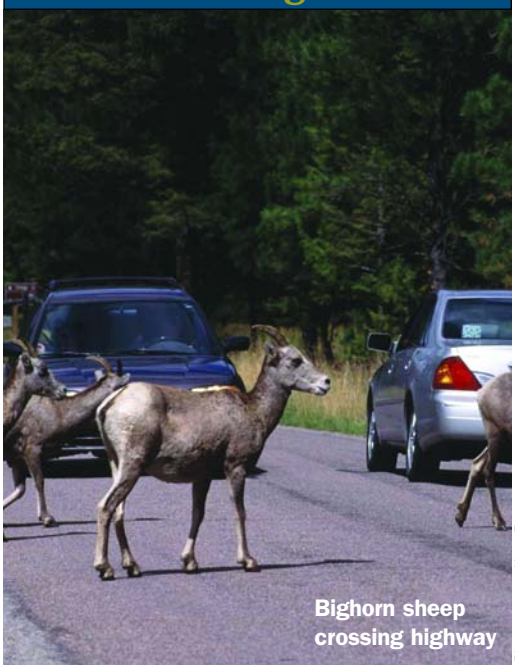

Bighorn sheep crossing highway

Photo courtesy Kerry Foresman

Lately I've noticed my neighborhood coming alive again as people emerge from their dens for evening strolls and garden preparations. Now is the time for noticing things: morning birdsong, painted turtles sunning, daffodils and iris poking green fingers up through dark earth. These next few months will bring more and more opportunity for wildlife watching.

Not all wildlife encounters are happy ones, though. Driving home in the dark and rain from a recent MNHC expedition to observe snow geese at Freezeout Lake, our stalwart driver had to slam on the brakes several times to avoid collisions with deer. As Elizabeth Williams writes in her feature story, the unfortunate truth is that every year millions of animals are killed on U.S. roads. The good news is that Montana is emerging as a leader in research and use of wildlife crossing structures that can lead to safer roads for people and animals. Those of you who joined Kerry Foresman on April 8 for the MNHC Saturday Discovery Day field trip along Highway 93 South got to discuss the issues and get a first hand look at some newly installed structures.

MNHC programs and exhibits help connect people with the nature of Montana. The Calendar and Imprints pages inside describe the variety of Summer Science Day Camps for children, community lectures, workshops, field trips and other events through which we can learn about our place. We hope to see you here this summer and we'd love to hear your opinions about our magazine. Please send letters to the editor to *MN*, Montana Natural History Center, 120 Hickory Street, Missoula, MT, 59801.
Or send email to caroline@MontanaNaturalist.org.

Now get outside!

Caroline Kurtz

Caroline Kurtz
Editor

Absent Amphibians

Where have all the northern leopard frogs gone?

By J. Kirwin Werner

Photo courtesy Kristi Dubois

The once familiar chortles, squeaks and grunts of northern leopard frogs now are heard only rarely in western Montana.

Part of a worldwide pattern of amphibian decline, this species has disappeared since the 1970s from more than 30 historical sites west of the Continental Divide. The last sighting of a leopard frog in the Mission Valley was in 1980.

Chytridiomycosis, a poorly understood fungal skin disease, is the suspected culprit in the leopard frog's disappearance. The evidence is suggestive, but still circumstantial. The fungus occurs on most continents and has been found in North American amphibians dating back to the early 1960s. It's recently been identified from living and dead leopard frogs found near Kalispell and Browning, and also in frogs from Washington, Oregon, Alberta and British Columbia, where there have been similar population declines.

Other fungal, bacterial or viral pathogens, as well as chemical contaminants, exotic predators or increased ultra-violet radiation exposure could be involved in the leopard frogs' disappearance. However, research emphasis remains on chytridiomycosis because of its known presence in leopard frogs, the timing of the fungus' appearance and the frogs' disappearance, and the fact that frogs have disappeared from pristine habitats where other causes seem less likely.

Our knowledge of the chytrid fungus is limited. Researchers suspect that microscopic spores in the water or mud of marshes, ponds and lakes—primary leopard frog habitat—are the infective agents. We don't know how the spores are disseminated, but theoretically a number of aquatic or semi-aquatic organisms, as well as humans, could be involved in transporting spores from one wetland to another. Because the fungus feeds on keratin, a common protein found in skin, it might be able to live for months on dead or decaying organisms

Photo courtesy Bryce Maxell

that leopard frogs come in contact with. Some frogs probably become infected through skin to skin contact during mating. Others might be infected during the winter as they lie burrowed in mud.

Research suggests the chytrid fungus may be deadly to leopard frogs because it disrupts oxygen and electrolyte movement across their thin, moist skin, leading to the failure of important organ systems. The fungus might also secrete a substance that is toxic to the frog.

The chytrid fungus infects amphibians other than leopard frogs —for instance, it's been found in Columbia spotted frogs and western toads from areas of western Montana within the leopard frogs' former range—but leopard frogs are particularly vulnerable. This may have something to do with the chemical attraction between the fungal spores and the skin of leopard frogs, meaning that some species may be more attractive to spores than others. It's also possible that leopard frogs are under more environmental stress than other species and their immune systems are less capable of fighting infections.

But puzzling questions remain. Why does chytridiomycosis seem to have appeared all of a sudden, and why has it hit some regions of the country harder than others? Are we looking at a new genetic strain or strains of the fungus that recently have evolved or been introduced? And why do some leopard frogs in central Montana appear healthy while their counterparts to the west are dying? At this time, far more questions than answers exist regarding the fungus and leopard frog die-offs.

Photo courtesy J. Kirwin Werner

Photo courtesy Kristi Dubois

Chytrid fungus could be passed between male and female leopard frogs during mating (far left). While they look similar to leopard frogs, Columbia spotted frogs (left) do not seem overly affected by the fungus. Small ponds or marshy areas (opposite page) are good places for leopard frogs to lay eggs in early spring. Tadpoles metamorphose into young frogs by early August.

I like to think that no one wishes to see a frog species disappear. After all, they are the delight of children, objects of stories, subjects of paintings—in a sense, our earth companions for thousands of years.

clipart.com

Can anything be done? If, in fact, chytridiomycosis is the culprit, it seems that over the long haul leopard frogs must develop immunity to the fungus or they will die out. Currently, re-introduction programs are underway in Alberta, British Columbia and in Montana to restore leopard frog populations to their former areas. These programs are just beginning and their success or failure is not known at this time. Several co-workers and I have been closely monitoring the only two known leopard frog populations in western Montana, one near Eureka and one near Kalispell. Both populations are small with little reproductive success over the past few years. We are considering how best to improve their habitat and whether remaining frogs might be protected from the disease. Exposing frogs to high temperatures for short periods, for example, can help eliminate the fungus.

What are the consequences if leopard frogs die out in western Montana? Would they ever return on their own? The loss of a species anywhere causes certain reverberations in the food chain, causing impacts on what it eats and what eats it. Most of these disruptions go unnoticed, but others are more obvious. Frogs eat thousands of insects over the summer, including mosquitoes that carry diseases such as the West Nile virus, thus potentially impacting human and equine health. Trout, bass, pike and walleye eat leopard frogs, thus potentially impacting those species and the quality of sport fishing in some places. It's unlikely that the leopard frog's absence would upset a functioning ecosystem in western Montana, but one never knows. An ecosystem's collapse begins with the loss of a few species, just as a dam's collapse begins with a small crack in the foundation.

Over evolutionary time, species die out due to diseases, predators and climactic shifts. Sometimes these species are replaced by other species, sometimes not. During the last glaciation, it is unlikely that leopard frogs were present in Montana. After the glaciation, frogs from southern populations probably found their way here by following river systems and wetland corridors. Some of these river systems and corridors are gone, but others remain. If existing populations in western Montana die out, it does not mean they are gone forever. The leopard frog could return with or without human intervention. I like to think that no one wishes to see a frog species disappear. After all, they are the delight of children, objects of stories, subjects of paintings—in a sense, our earth companions for thousands of years. If we are sincere in our desire to live harmoniously with the land, I'm betting the leopard frog will be here for many generations to come.

J. Kirwin Werner teaches environmental sciences at Salish Kootenai College and is a professor emeritus at Northern Michigan University. He has worked for more than 30 years with amphibians and reptiles and their diseases, including in China and South America. He is co-author of the field guide Amphibians and Reptiles of Montana.

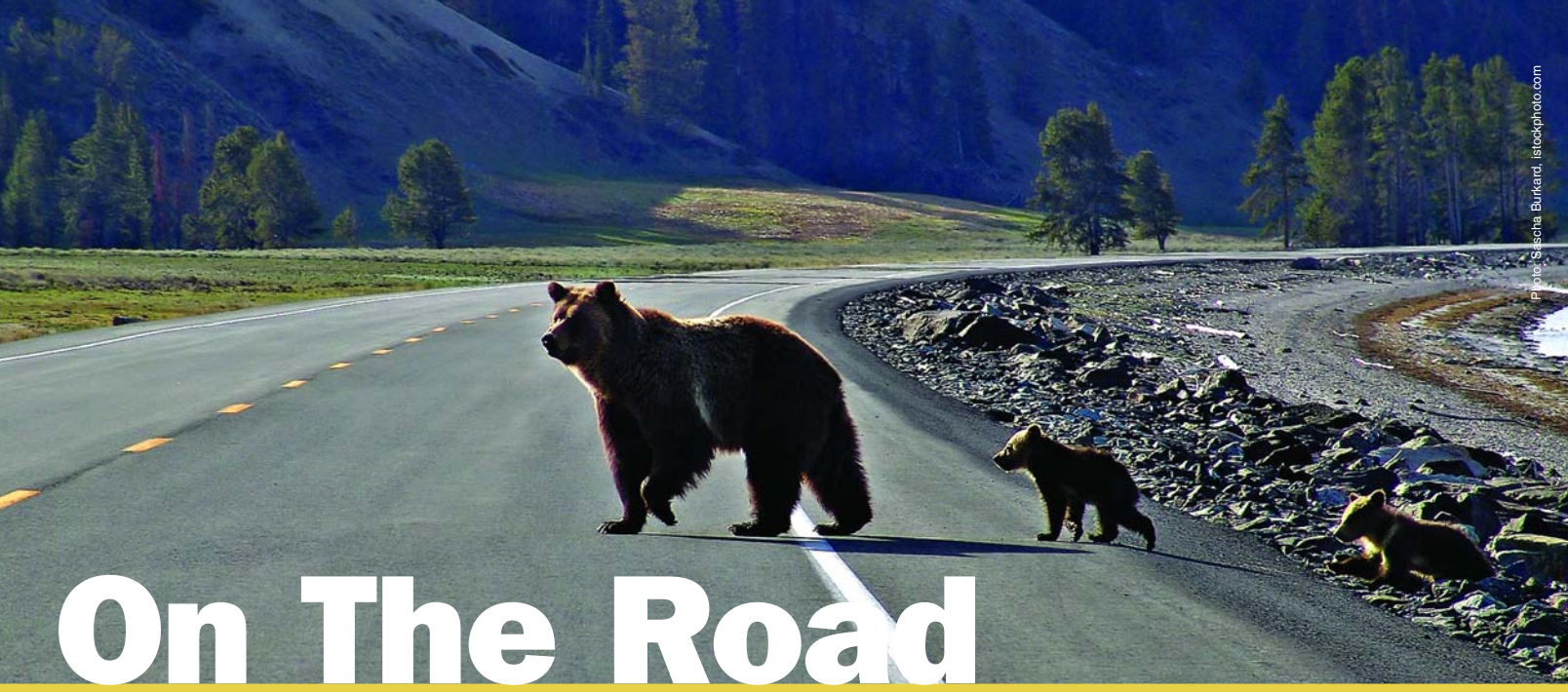

Photo: Sascha Burkard, istockphoto.com

On The Road

Creating safer highways for humans and wildlife

By Elizabeth Williams

Animal-vehicle collisions, with frequently dire results for both wildlife and people, can be reduced with the use of wildlife crossing structures. What's required is planning, money and time for the animals to adjust.

How often have you been driving along a Montana highway, enjoying the scenery, when a deer has stepped into the road just a few meters ahead? Or, while driving at night, a glowing pair of eyes suddenly has appeared in the headlights? Even if you manage to slow down in time to avoid a collision, the unfortunate truth is that every year millions of animals are killed on roads in the United States. And it's not just wildlife that suffers: the U.S. Department of Transportation estimates $200 million in damage, thousands of injuries and approximately 200 human deaths occur every year as a result of animal-vehicle collisions.

Roads also fragment the landscape, which can affect the long-term health and survival of wildlife populations. According to Josh Burnim, Lands Program Coordinator at the non-profit conservation group American Wildlands, the landscape in Montana used to be connected [in terms of wildlife habitat], but with development, it's being fragmented into isolated blocks.

"If you look at islands in the ocean," he says, "the smallest are those that have the least diversity of species, while those that are large or close to other islands have nearly the same diversity as on the mainland."

Roads, and particularly highways, can interfere with the home-range requirements of large carnivores, such as grizzly bears and wolverines, and with the seasonal migrations of grazers, such as elk. In isolating wildlife populations, roads and traffic restrict the size of the potential breeding pool and the gene flow among populations that is essential to the long-term survival of a species.

This is where the idea of wildlife "crossing structures" comes in. Ranging from vegetated overpasses to culverts and freestanding bridges (see sidebar), crossing structures are designed to allow animals to cross over, or under, roads safely. Although crossing structures are not a new concept—they have been used extensively since the 1980s in Canada's Banff National Park, for example—the idea has been slow to gain momentum in the United States. Crossing structures cost money to put in and there is not yet much data to show how well they work. But that situation is changing. In Montana, scientific research and a growing concern for the long-term health of wildlife are contributing to safer highways for wildlife and people.

Grassroots beginnings

The Bitterroot Valley in western Montana is a broad, fertile plain, rich in wetland and riparian habitats. It's also one of the fastest-growing areas of Montana. In 1999, the Montana Department of Transportation began holding public meetings on plans to widen Highway 93 to accommodate increasing traffic through the valley. Jackie Corday, Missoula's Open Space Program Manager who lived in the Bitterroot Valley at the time, remembers that several citizen focus groups formed to address various issues in each of the towns the highway passed through. "No one spoke up when they got to the wildlife focus group, so I volunteered to organize it," she says.

Corday's involvement was instrumental in getting a number of crossing structures, including large culverts and wildlife bridges, built along Highway 93 between Lolo and Hamilton. She organized field trips with biologists and engineers to determine the types of structures that would serve the most species based on "feasibility, topography, elevation, and an intuitive feel [for wildlife] from living in the Bitterroot and being in the outdoors all our lives."

At Bass Creek, a local "hot spot" for animal-vehicle collisions, animals moving down the drainage between the Bitterroot Mountains and points east, including the Bitterroot River, had to scramble up a steep wall of highway fill before crossing the busy road. Corday envisioned excavating a broad corridor under the existing roadway, essentially making the highway into a bridge over the animals' path.

Although such a project was beyond the Montana DOT's budget, Corday was determined. She wrote and submitted a proposal to her county commissioner, Barbara Evans, who was able to secure funding for the bridge during an annual trip to Washington D.C.

"The bridge was the big ticket item," Corday says, "but what's important is that we were able to get crossing structures in all sections" between Lolo and Hamilton, including dry culverts, wildlife bridges and tunnels built or modified specifically for wildlife. So far, tracks of moose, black bear and even mountain lion have been seen in the sand under the bridge at Bass Creek. And highway department researchers are optimistic about the long-term success of the structures. "I really don't have any doubt they'll be effective," says DOT biologist Pat Bastings.

During the planning process, Bitterroot residents also expressed concerns about small mammals safely getting across the new four-lane highway. The DOT intended to put shelving mounted above the floor of flood control culverts for small species to use, but no one knew if that would actually work so the department contacted Kerry Foresman, a professor of wildlife biology at the University of Montana.

Foresman, whose research specializes in tracking elusive small mammals by using remote cameras and video surveillance, happily took on the project. Wetlands, he says, are an incredibly rich environment for all kind of animals—jumping mice, voles, squirrels. But with the original culvert shelf design, "the only things using them were farm cats." For three years, Foresman and his students tested out various shelf designs and remotely monitored small mammal activity inside the culverts. Many hours of video and thousands of photographs later, they had the Critter Crossing.

The Critter Crossing, now under patent and manufactured by Roscoe Steel and Culvert, is a steel shelf that can be suspended inside any culvert at least 48 inches wide. The shelf material is small-gauge mesh that animals can move quickly across. A small, enclosed tunnel allows even the most timid of mammals, such as the meadow vole, to feel comfortable leaving protective grass cover. "For two years we didn't have a single vole," Foresman said. But after installing the tunnel, "it was like a vole highway back and forth."

Photo courtesy Kerry Foresman

Foresman now is turning his attention to monitoring larger mammals. This spring, he and a group of students will be installing video cameras at the entrances to several of the larger crossing structures to quantify their success at attracting use.

Guiding development

As highway 93 continues north from Missoula, it traverses the Flathead Reservation for more than 50 miles. In 2000, after years of negotiation, a Memorandum of Agreement was signed between the Confederated Salish and Kootenai Tribes, the Montana Department of Transportation and the Federal Highway Administration regarding the expansion of the highway through the reservation. The landmark agreement reflects the tribe's view of the "road as a visitor" that must respect the land surrounding it, and it includes, among other things, provisions for the construction of an unprecedented 42 crossing structures for wildlife.

"As far as I know, this is the most extensive effort of its kind in North America," says Amanda Hardy, a biologist with the Western Transportation Institute. Since 2002, her job has been to monitor wildlife activity around and on the highway before the structures go up. As part of her study, she compiled roadkill reports from various sections of the highway and established "pellet transects" to get an idea of deer abundance in the area. She also laid 100-meter-long, sand-filled "track beds" at random locations along the highway where the longest segments of wildlife fencing and crossing structures will be installed in order to estimate animal crossings in those areas. Every three days, she visited the track beds and studied the tracks left in the sand to determine "who is crossing and where."

Hardy's goal is to provide accurate baseline data on pre-construction wildlife movement and animal-vehicle collision rates that can be compared to post-construction crossings to determine how well animals respond to the new structures. Once the structures are in place, she plans to monitor the crossings and animal-vehicle collisions, but she doesn't expect dramatic results right

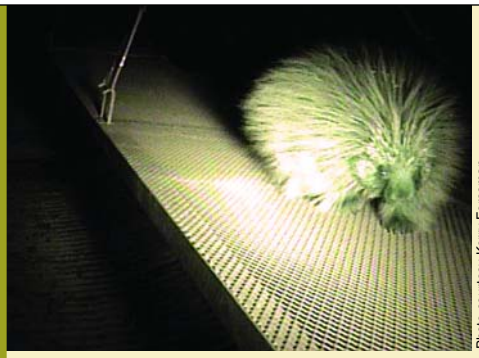

Photo courtesy Kerry Foresman

Critter Crossings – shelving used in existing flood control culverts to encourage small mammal use.

Dry Culverts – metal culverts large enough for groups of elk or deer to pass through.

Wildlife Bridges – in areas where drainages pass under roads, a broader path is created and stone or concrete "sidewalks" added for animals to move along.

Freestanding Bridge – created by excavating a section of highway fill under a roadway. Dawn's Crossing along Highway 93, named for the congressional staffer who helped get the funding allocated, so far is the only one of its kind in the state.

Wildlife Fencing – Eight- to ten-foot-high fencing paralleling highways to funnel animals to crossing structures.

Photo by Linda Haugen, www.forestryimages.org

Painted Turtles

Highway 93, as it passes through the Mission Valley in western Montana, is one of the deadliest stretches of road in the country for painted turtles, which frequently are hit and killed as they move between the many ponds in the valley. One study estimates that about 85 painted turtles are killed annually on each mile of the highway through the valley.

"When you put up these structures, you really change the animals' landscape and how they use it. It's not a natural thing for an animal to enter a dark tunnel…

away. "When you put up these structures, you really change the animals' landscape and how they use it. It's not a natural thing for an animal to enter a dark tunnel," she says. "It takes a while, but animals do appear to learn."

Technicians at the non-profit group American Wildlands use Geographic Information Systems (GIS) technology to map key wildlife corridors between large blocks of undeveloped land in Montana. The goal, as Lands Program Coordinator Josh Burnim explains, "is not to stop development, but to help guide it so that these corridors can be maintained."

One such corridor is at Bozeman Pass between the Bridger and Gallatin mountain ranges. Interstate 90 also happens to cross the pass. Not surprisingly, Burnim says, roadkill data collected by the Craighead Environmental Research Institute (CERI) showed lots of animals getting hit on the highway—mostly deer, but also black bear and mountain lion—right around the Montana Rail Link underpass on I-90. In September 2006, Montana DOT will install fencing to help guide animals under the highway instead, along a corridor adjacent to the train tracks. Researchers at CERI will use track beds and remote-sensing technologies to monitor animals' responses to the new, potentially safer landscape.

Photo courtesy Kerry Foresman

Deer passing through a dry culvert

Ultimately, in order for crossing structures to be effective, says Kerry Foresman, "we have to understand wildlife movement. Where are wolves denning? Where are bears crossing? Where are the migration pathways?"

Along the Thompson River, north of Highway 200, Foresman and a crew will be tracking radio-collared bighorn sheep and following game trails and snow tracks in order to better understand wildlife movement in that area. And in the Seeley-Swan Valley, studies of white-tailed deer movement have led to plans for the construction of a vegetated wildlife overpass on Highway 83 just north of Clearwater Junction. This and a similar overpass on Highway 93 in the Evaro Hill area between Missoula and Arlee will be the first of their kind in the state.

As Montana continues to grow and road use intensifies, crossing structures have the potential not only to reduce roadkill and save human lives, but to help restore connectivity for wildlife within the greater Northern Rockies ecosystem. Although scientific research is important, says Jackie Corday, "it's the people who drive these roads every day who have the anecdotal evidence about where animals get hit, and it's ordinary citizens who can get involved in helping create safer roads."

To find out what highway projects are being planned in your area, visit the Montana DOT website at http://www.mdt.mt.gov/ and click on Public Involvement.

Former MNHC intern, Elizabeth Williams is a writer and Environmental Studies student at the University of Montana in Missoula.

Photos courtesy Anthony P Clevenger, PhD., Western Transportation Institute, MSU - Bozeman

Canadian Experience

Banff and Yoho National Parks in Alberta, Canada, may be the only protected areas in the world that have a major highway bisecting them. In the 1980s, growing traffic volumes (up to 21,500 vehicles a day in the summer) prompted Parks Canada to expand the highway to four lanes. Twenty-two wildlife underpasses, two overpasses and some 28 miles of wildlife fencing were incorporated into the new highway in an attempt to reduce animal-vehicle collisions and facilitate wildlife movement.

Beginning in 1996, researchers conducted a five-year study of the effectiveness of crossing structures in the Bow River Valley in Banff National Park. Over the course of the study, more than 70,000 crossings by many different species were recorded along this stretch of the Trans-Canada highway.

From continued monitoring, it is clear that wildlife use of the passages increases over time. In areas where fencing was installed, animal-vehicle collisions have been reduced by 80%. Mortality rates for animals like cougars and bears that still climb the fence, however, remain relatively high. Human activity around crossing structures, proximity of structures to human development and quality of habitat adjacent to structures all have strong effects on animal use of crossing structures.

To learn more, visit www.cpawscalgary.org.

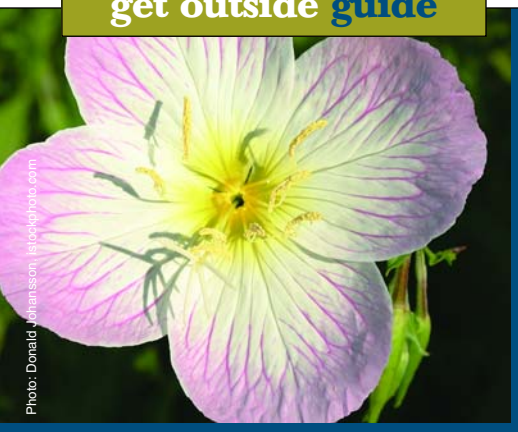
Photo: Donald Johanson, istockphoto.com


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Photo: Mike Brown, istockphoto.com


Photo: Cezar Serbanescu, istockphoto.com

"To go in the dark with a
light is to know the light,
To know the dark, go dark.
Go without sight and find
that the dark, too, blooms
and sings,
And is traveled by dark feet
and dark wings."

—Wendell Berry
To Know the Dark, from
Farming: A Handbook

Working the Night Shift

The long Montana summer evenings that slowly fade into a darkness no longer experienced many places in the United States offer special opportunities for nature watchers. Creatures that hide during the heat and light of the day begin to stir. Flowering plants that fold their blossoms in daylight, unfurl.

Nocturnal animals rely on highly developed senses of sight, smell, hearing, even touch to help them find food and avoid danger in the dark. What do you use to find your way at night?

Did you know? Plants like evening primrose and the ten-petaled blazingstar open their blossoms at night to attract night-flying pollinators. Plants can sense the presence or absence of daylight by using a light-sensitive pigment, called phytochrome, in their cells.

Did you know? During the time of dinosaurs, all mammals were nocturnal. It wasn't until the extinction of the great reptiles that small fur-covered creatures felt safe being out during the day.

Did you know? To help with night vision, some species have developed tubular eyes that allow them to gather as much available light as possible without taking up too much space in the animal's skull. Animals with this feature can't move their eyes around like we do; instead they are able to rotate their necks to a much greater degree than we can.

Did you know? Smells last longer in still night air than in daytime air. Many night animals use their noses to sniff out a meal, find a mate or protect themselves from predators. Likewise, sounds also travel farther in calm night air. Therefore, many nocturnal animals have large, moveable ears.

Did you know? Soft fur and pads on the feet of many nocturnal predators, such as bobcats and lynx, enable them to walk quietly in search of food.

Did you know? We humans rely mostly on our hands to feel our way in the dark, but other animals use their faces. Whiskers are very sensitive touch organs that many nocturnal species use to navigate at night.

Diminishing Dark

Most living things—plant and animal—need cycles of daylight and darkness to function normally. As cities and towns grow, so does the amount of outdoor night lighting. We can see some things better this way, but what are we missing?


Photo courtesy NASA Visible Earth (http://visibleearth.nasa.gov/)

Nocturnal animals—insects, amphibians, birds and mammals—are adapted to low-light conditions. Too much light has the potential to interfere with their normal growth, ability to find food or a mate, even migration patterns.

The International Dark Sky Association's website contains information about different kinds of outdoor night lighting, light pollution and current research on lighting and wildlife. Go to www.darksky.org to learn more.

How many different kinds of artificial lights can you think of around your home or neighborhood? Where are they? What do they light?

get outside calendar

April 22 **Prairie Keepers Earth Day Weed Pull,** 10:00 a.m. See ad on page 15.

April 22 **Saturday Discovery Day**, ongoing noon-4:00 p.m. **Wading into Wetlands.** Celebrate Earth Day and learn more about our wetlands with MNHC staff and the Watershed Education Network. Free with MNHC admission (members free).

April 25 **Prairie Keepers Wildflower Gardening,** 6:00 p.m. See ad on page 15.

April 29 **Saturday Discovery Day,** 10:00 a.m.-3:00 p.m. **Eat Like a Bear.** Chuck Jonkel and the Great Bear Foundation staff describe bear biology, appetite and favorite foods. Help gather natural foods for the annual Bear Honoring. Start out at MNHC, then head into the field. Please bring gardening tools if you have them. $15/$10 MNHC members.

May 2 **Prairie Keepers Adopt-A-Native Plant,** 6:00 p.m. See ad on page 15.

May 5 **First Friday Botanical Art Show Opening,** 5:00-8:00 p.m. Come see what the students from our popular Botanical Illustration classes have been up to! Meet the artists and mingle during MNHC's 1st First Friday Opening.

May 5-31 **Botanical Art Exhibit.** An exhibit of work done by students in our popular Botanical Illustration classes. Their artwork will be on display all month.

May 6 **Saturday Discovery Day,** 1:00-3:00 p.m. **Osprey.** Stop by MNHC and visit with Donna Love, local author of ***Ospreys: Fishing Birds of the World.*** Donna will have fun osprey-related activities and stories to share. Free with MNHC admission (members free).

May 16 **Prairie Keepers Wildflower Gardening,** 6:00 p.m. See ad on page 15.

May 20 **Prairie Keepers Farmer's Market Native Plant Sale,** 9:00 a.m. See ad on page 15.

May 23 **Prairie Keepers Woad Warriors, Part 1,** 6:30 p.m. See ad on page 15.

June 6 **Prairie Keepers Woad Warriors, Part 2,** 6:30 p.m. See ad on page 15.

June 10 **Saturday Discovery Day,** 10 a.m.-3:00 p.m. **Mammal Sketching Workshop.** Local artist Rich Adams will lead this class for beginners and seasoned sketchers alike. Children 13 and older must be accompanied by an adult. Space is limited; registration required. A materials list will be available. $20/$15 MNHC members.

June 12-16 **Moose Tracks and Mice Trails** (Grades 1-3). See Imprints for details.

June 12-16 **Nature Detectives** (Grades 4-5). See Imprints for details.

June 17 **Saturday Discovery Day,** 9:00-11:30 a.m. **Black Mountain Fire: Three Years After.** Join experts from Lolo National Forest and the University of Montana Avian Science Center for another visit to the Black Mountain fire site. Registration req. $20/$15 MNHC members.

June 19-23 **Frogs, Fish and Fun** (Grades 1-3). See Imprints for details.

June 19-23 **Bird Brains** (Grades 4-5). See Imprints for details.

June 20 **Prairie Keepers Woad Warriors, Part 3,** 6:30 p.m. See ad on page 15.

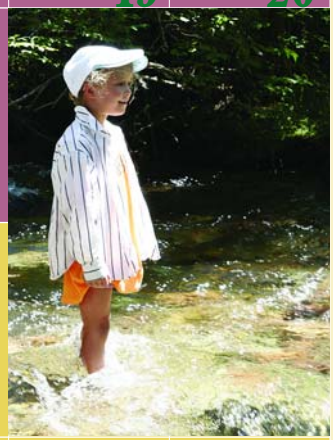
June 26-30 **Beetles and Butterflies** (Grades 4-5). See Imprints for details.

June 26-30 **Bats to Bears** (Grades 4-5). See Imprints for details.

July 5-7 ***Special 3-day camp!*** **Naturalist Explorers** (Grades 4-5). See Imprints for details.

April

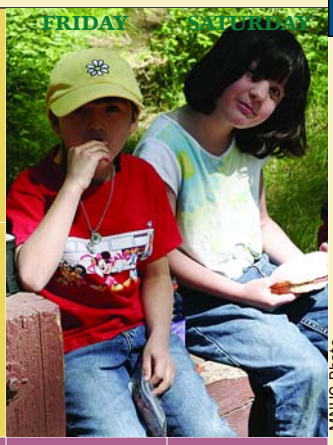
MNHC Hours: Tuesday-Friday, 10 a.m. - 5 p.m. and Saturday noon - 4 p.m.
Admission Fees: **$1**/adults, **.50**/children under 12, **free**/children under 3 and MNHC members.

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
16	17	18	19	20	21	**Prairie Keepers Earth Day Weed Pull** 10:00 a.m. **Saturday Discovery Day** ongoing noon-4:00 p.m. **Wading into Wetlands.** 22
23	24	**Prairie Keepers Wildflower Gardening** 6:00 p.m. 25	26	*Osprey nesting* 27	28	**Saturday Discovery Day** 10:00 a.m.-3:00 p.m. **Eat Like a Bear.** 29
30	1	**Prairie Keepers Adopt-A-Native Plant** 6:00 p.m. 2	3	4	**First Friday Botanical Art Show Opening,** 5:00-8:00 p.m. **Botanical Art Exhibit** *May 5 - 31* 5	**Saturday Discovery Day** Osprey 1:00 p.m.-3:00 p.m. 6
 MNHC Photo		9	10	*Meadowlarks trill* 11	12	13
		Prairie Keepers Wildflower Gardening 6:00 p.m. 16	17	18	19	**Prairie Keepers Farmer's Market Native Plant Sale,** 9:00 a.m. 20
Yellow swallowtails flutter 21	22	**Prairie Keepers Woad Warriors, Part 1,** 6:30 p.m. 23	24	25	 MNHC Photo	
28	29	30	31	1		
ALL SUMMER Leaders-in-Training Program for Teens (Ages 14-17). See Imprints for details. 4	5	**Prairie Keepers Woad Warriors, Part 2,** 6:30 p.m. 6	7	8	9	**Saturday Discovery Day,** 10 a.m.-3:00 p.m. **Mammal Sketching Workshop.** 10
11	**Summer Science Day Camps** *June 12-16* **Moose Tracks and Mice Trails** (Grades 1-3) **Nature Detectives** (Grades 4-5) 12	13	**Volunteer Recognition Picnic** 14	*Chorus frogs chorus* 15	16	**Saturday Discovery Day,** 9:00-11:30 a.m. **Black Mountain Fire: Three Years After.** 17

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

get outside calendar

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
18	19 **Summer Science Day Camps** *June 19-23* Frogs, Fish and Fun (Grades 1-3) Bird Brains (Grades 4-5)	20 **Prairie Keepers Woad Warriors, Part 3,** 6:30 p.m.	21	22		
25	26 **Summer Science Day Camps** *June 26-30* Beetles and Butterflies (Grades 4-5) Bats to Bears (Grades 4-5)	27	28	29		
July 2	3	4 MNHC closed for holiday	5 **Summer Science Day Camps** *July 5-7* *Special 3-day camp!* Naturalist Explorers (Grades 4-5)	6	7 *Mountain bluebirds re-nest*	8
9 *Bees buzz*	10 **Summer Science Day Camps** *July 10-14* Junior Nature Detectives (Grades 1-3) Drawing from Nature (Grades 4-5)	11 **Prairie Keepers Leafy Spurge Flea Beetle Collection Party,** 6:00 p.m.	12	13	14	15 MNHC's 15th Anniversary Celebration, noon-4:00 p.m.
16	17 **Summer Science Day Camps** *July 17-21* *Half Day Camp!* Step, Slither or Soar (Grades K-1) Nature Detectives (Grades 4-5)	18	19	20 *Red flowers attract rufous hummingbirds*	21	22
23	24 **Summer Science Day Camps** *July 24-28* Color Me Wild (Grades 1-3) Wade into Wetlands (Grades 4-5)	25 **Prairie Keepers Wildflower Gardening,** 7:00 p.m.	26	27	28	29 **Saturday Discovery Day,** ongoing noon-4:00 p.m. Big on Bugs.
30	31 **Summer Science Day Camps** *July 31-Aug. 4* *Half Day Camp!* My Big Backyard (Grades K-1) Bats to Bears (Grades 4-5).	**August** 1	2	3 *Fireweed peaks*	4	5 **Prairie Keepers and Saturday Discovery Day Bugloss Weed Pull & Float,** Time TBA.
6	7 **Summer Science Day Camps** *Aug. 7-Aug. 11* Little Stories, Big Discoveries (Grades 1-3) Adventures in Science (Grades 4-5)	8 **Prairie Keepers Knapweed Weevil Collection Party,** Time TBA.	9	10	11	12
13 *Trout surface to eat*	14 **Summer Science Day Camps** *Aug. 14-Aug. 18* Incredible Insects (Grades 1-3) Drawing from Nature (Grades 4-5)	**Summer Science Day Camp** *Aug. 21-Aug. 24* Wild About Wildfire (Grades 3-5)				



MNHC Photo

MNHC Photo

July 10-14 **Junior Nature Detectives** (Grades 1-3). See Imprints for details.

July 10-14 **Drawing from Nature** (Grades 4-5). See Imprints for details.

July 11 **Prairie Keepers Leafy Spurge Flea Beetle Collection Party,** 6:00 p.m. See ad on page 15.

July 15 **MNHC's 15th Anniversary Celebration,** noon-4:00 p.m. Help celebrate our 15th anniversary! We'll have music, food and you can visit with Donna Love, local author of ***Loons: Diving Birds of the North.*** Donna will have fun, loon-related activities and stories to share from 1-3 pm. Free.

July 17-21 ***Half Day Camp!*** **Step, Slither or Soar** (Grades K-1). See Imprints for details.

July 17-21 **Nature Detectives** (Grades 4-5). See Imprints for details.

July 24-28 **Color Me Wild** (Grades 1-3). See Imprints for details.

July 24-28 **Wade into Wetlands** (Grades 4-5). See Imprints for details.

July 25 **Prairie Keepers Wildflower Gardening,** 7:00 p.m. See ad on page 15.

July 29 **Saturday Discovery Day,** ongoing noon -4:00 p.m. **Big on Bugs.** Drop by MNHC for interactive invertebrate fun. Meet live insects and learn about where they live and what they do. Free with MNHC admission (members free).

July 31-August 4 ***Half Day Camp!*** **My Big Backyard** (Grades K-1). See Imprints for Details.

July 31-August 4 **Bats to Bears** (Grades 4-5). See Imprints for details.

August 5 **Prairie Keepers Floating Bugloss Weed Pull,** Time TBA. See ad on page 15.

August 5 **Saturday Discovery Day,** Time TBA. **Bugloss Weed Pull & Float.** Join us for this all-day event on the Bitterroot River, beginning at Angler's Roost and ending at Kiwanis Park in Hamilton. We will be pulling Viper's bugloss *(Echium vulgare)*. Trout Unlimited and Montana Flywaters will provide boats and guides. Barbeque to follow. Call MNHC for details.

August 7-11 **Little Stories, Big Discoveries** (Grades 1-3). See Imprints for details.

August 7-11 **Adventures in Science** (Grades 4-5). See Imprints for details.

August 8 **Prairie Keepers Knapweed Weevil Collection Party,** Time TBA. See ad on page 15.

August 14-18 **Incredible Insects** (Grades 1-3). See Imprints for details.

August 14-18 **Drawing from Nature** (Grades 4-5). See Imprints for details.

August 21-24 **Wild About Wildfire** (Grades 3-5). See Imprints for details.

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

- **Volunteer Naturalist Training**
- **Summer Science Day Camps**
- **Saturday Discovery Days**
- **Prairie Keepers**
- **Volunteer Opportunity**

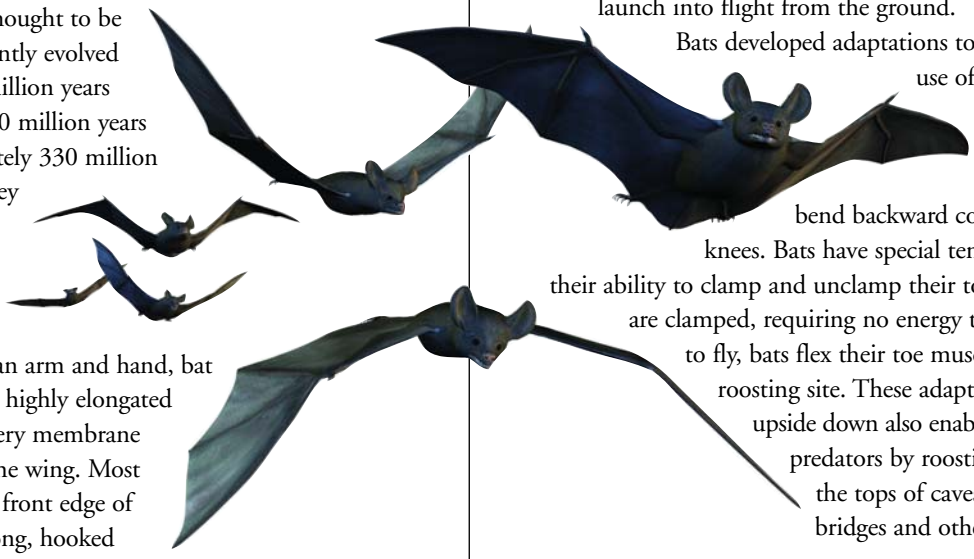
Visit MontanaNaturalist.org for directions. To register or for more information, call MNHC at 327-0405.

On Night Patrol

Have you ever stood outside on a warm summer evening and noticed dark shapes darting overhead, catching insects on the wing with aerobatics that put action movies or video games to shame? These flying creatures aren't birds, they're bats, and they are mammals just like you and me.

Fifteen species of bats regularly make Montana their home, occupying different habitats throughout the state. Some Montana bats, like the long-legged myotis *(Myotis volans)* live in mountainous conifer forests, while others, such as the Eastern red bat *(Lasiurus borealis)*, prefer farmland and open range. The most common Montana bat, the little brown bat *(Myotis lucifugous)*, lives just about anywhere. One thing all Montana species have in common, however, is their food source. They all hunt insects—beetles, moths, spiders, flies, aphids, bees, wasps, ants, dragonflies, caddisflies and mosquitoes—and they all do their hunting at night.

As a group, bats have some important adaptations that aid them in their nightly hunts. Most obvious is their ability to fly. Bats are thought to be the group that has most recently evolved the power of flight (30-50 million years ago, compared to around 150 million years ago for birds and approximately 330 million years ago for insects), and they are the only mammals to achieve true powered flight.



A bat's wings are unique. Although similar to the bone structure of a human arm and hand, bat fingers (called phalanges) are highly elongated to support the flexible, leathery membrane that makes up the blade of the wing. Most bats also have thumbs at the front edge of their wings, usually with strong, hooked claws that they use for climbing, handling food or fighting. Between their hind legs, bats have developed an uropatagium, a wide flap of skin similar to the patagial membranes of flying squirrels. A bat can stretch this skin tight between its legs and use it to provide even more surface area for gliding and flight.

Bats can communicate using sounds within the range of human hearing, but they have a more specialized sound system for hunting. This system, called echolocation, is like the sonar used by a submarine to map objects in its path. While hunting, a bat will emit a series of ultrasonic sounds (above the upper limit of human hearing) and listen with its large ears as the sound waves bounce off nearby obstacles and prey. A bat's brain can process these reflected sound waves to create a map of what is out there in the dark, much like the picture our brain makes from the information received by our eyes. By using sound to "see" after dark, bats can function even in complete darkness. All these adaptations make Montana's bats perfectly suited to their task of patrolling our night skies.

By Eric Dallalio, Mike McDonald and Leigh Ann Reynolds
Wildlife Biology Writing Class, University of Montana

Photo: Joe Stone, istockphoto.com

Q: Why do bats hang upside down?

A: Bats began as gliders and later evolved into true fliers. Their original "take-off sites" were underneath branches, so all they needed to do was let go in order to be airborne. Only a few bats today can launch into flight from the ground.

Bats developed adaptations to allow them to make use of aerial launch pads. Their hind limbs are rotated 180 degrees, making their knees bend backward compared to human knees. Bats have special tendons to control their ability to clamp and unclamp their toes. At rest their toes are clamped, requiring no energy to hold on. In order to fly, bats flex their toe muscles to let go of their roosting site. These adaptations for hanging upside down also enable bats to avoid many predators by roosting out of reach at the tops of caves, trees or under bridges and other high locations.

Illustraation: Linda Bucklin, istockphoto.com

Illustration courtesy Rich Adams

Bat Watching

The best places to watch bats in Montana are near bridges, water and the mouths of caves, natural or man-made. Bridges and caves provide excellent roosting sites for bats. Lakes, ponds and wetlands are rich in insects, the primary food source for Montana bats. Water also is important because bats need to drink a lot of it. With a lot of body surface area compared to weight, bats are efficient fliers but dehydrate quickly.

Illustration courtesy Elizabeth Dilbeck

Filmy Flowers

In a Marin County meadow, wild poppies and crimson pimpernel shrank from my gentle touch so that I could not trace their beauty and form. The lovely stork's bill and wild blue and white iris were a little more hearty.

The Joys of Touch and Sound

A conversation with Elizabeth Dilbeck

Elizabeth Dilbeck, 73, lost her vision when she was 15 years old. For more than 20 years, she has been making art using a variety of media and processes. Her artwork and poetry (The Joys of Touch and Sound) *express a deep connection to and understanding of nature that began in her home town of Mt. Holly Springs, Pennsylvania, grew upon marriage and a move to California, and flowered in the fertile soil of Missoula's arts community. She and her husband, Roger, now reside in Boise, Idaho.*

Q: Do you recall your earliest piece of artwork?
A: I've always been a crafts person, I like to use my hands to knit or crochet. I guess my earliest serious attempt at art was in abstract acrylics.

Q: Did you study art in school?
A: I don't feel I've had any real training, although I have worked with fine art students as instructors. Years ago my daughter took some art classes and, in a way, she was my first teacher.

Q: Do you spend a lot of time outdoors?
A: Oh yes. I did not grow up in a happy home, so I found a lot of comfort in the woods back in Pennsylvania. I found a gentleness and quietness there. When I lived in California, I used to take trips with guides into the desert and foothills and experience the flowers and other foliage. I'd bring home specimens and study them with my fingers until they fell apart.

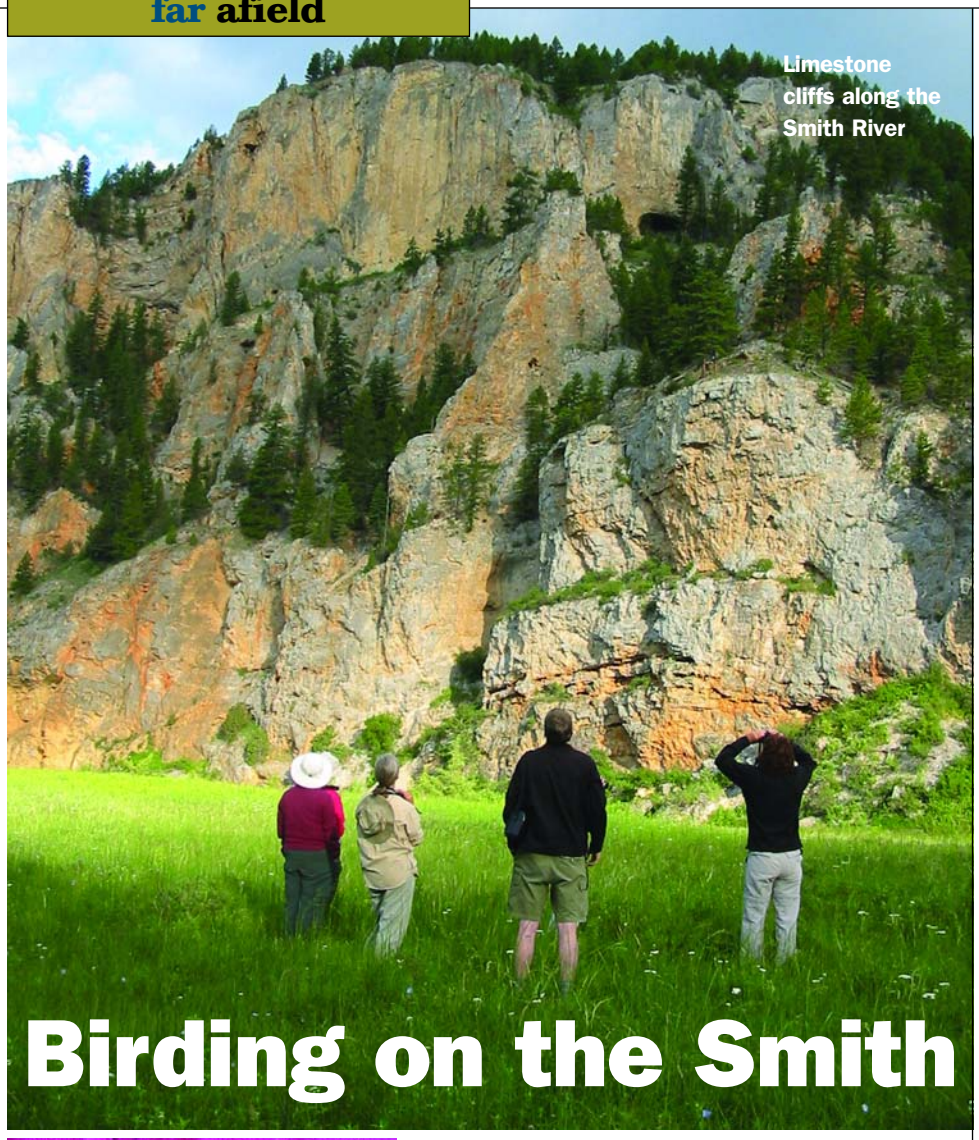
Q: What kinds of art do you like to make?
A: I like watercolors for their delicacy. I like to use materials I can blend. While I was recovering from cancer treatment some years ago, I began working in clay and made 100 clay orchids. Later I got into drawing with a pen on thin sheets of Styrofoam—I like it because I can feel the lines of my drawings—then rolling on paint and making rice paper prints. Recently I've gotten into box frames and putting in things that can be touched; I like the idea of touchable art.

Q: Where does your inspiration come from?
A: My themes are mostly about nature—the things I've experienced. I find inspiration in the lines of a leaf or the shape of an avocado pit. In California, the redwood trees have purple sap and there are pines that smell like vanilla. These are wonderful things. To me, life is an adventure or it's nothing. I find adventure in seeds and other ordinary things, like filmy poppies or the varied shapes of orchids. I think if I had retained my sight I would have gone into biology, the study of life.

Q: So nature is a metaphor in your work?
A: I like to think about different seed forms as having great potential. What will they become? How will they grow? That's a metaphor for ourselves. As people, we are unique; each of us is different and contains potential, like seeds. I want to show all the intricate interiors, all the details of what's inside.

Q: What are some of your favorite places or things to do outside?
A: In Missoula, I loved going to the iris, orchid or rose shows where I could touch the blooms. They were so evocative. Some seemed like miniature sculptures, like portrait busts, others seemed like wedding veils. In California, my favorite places were the public parks and gardens, like Balboa Park in San Diego. There's a century old rose tree there—I still remember its rich perfume.

Q: It's difficult for someone with vision to imagine how to understand the natural world without sight. How do you connect with nature?
A: Nature makes me happy. I've always been a curious person; I like to find out about things. Outside is where beauty is. I like to encourage others who have lost their sight to explore the outdoors. Basically I do what I do because it's a challenge and an adventure.



Limestone cliffs along the Smith River

Birding on the Smith

Yellow warbler

Story by Hank Fischer
Photos by Carol Fischer

Henry David Thoreau once wrote, "He who hears the rippling of rivers will never despair of anything."

Certainly the whispering waters of Montana's Smith River have that magical ability to soothe one's soul. The sixty mile float from Camp Baker to Eden Bridge may well be Montana's premier river trip. While the Smith is well-known for its fabulous trout fishing and incredible scenery, many people don't realize what a remarkable river it is for watching birds.

What makes it exceptional is its mixture of habitats. Tall cottonwoods and dense willow thickets thrive along the stream, and they support a diversity of songbirds, including flycatchers, goldfinches, bluebirds and warblers. The river itself provides sustenance for another host of birds, such as waterfowl, pelicans, herons, dippers and kingfishers. But what is truly unique about the Smith are the limestone cliffs that tower for hundreds of feet over the river. These cliffs not only provide homes for small birds like swallows and swifts, they also provide nesting and hunting grounds for birds of prey, including prairie falcons, peregrine falcons and golden eagles.

On a June, 2004 Smith River trip, our group of 12 people (most with average bird knowledge except for our ringer, University of Montana ornithology professor Dick Hutto) spotted 82 species of birds on a four-day trip. One of the best sightings occurred at the spectacular and appropriately named Sunset Cliffs, which rise straight up from the river for nearly a thousand feet in brilliant rose and tan glory. From our camp we watched a family of prairie falcons—two adults and two young—on a nest among the rock spires. They were visible throughout the evening and the next morning, the adult falcons frequently chasing white-throated swifts to feed to their young.

The white-throated swifts are a special Smith River avian delight. These cliff-nesting birds, which frequently are mistaken for swallows, perform a feat that few birds attempt: they mate in the air! On several occasions we observed swifts as they joined together in mid-flight, fluttering and gyrating toward the ground for hundreds of feet on their way to apparent oblivion, only to separate just before reaching the earth.

Many small songbirds travel thousands of miles to reach their summer home on the Smith River. These so-called neo-tropical migrants (including warblers, vireos, tanagers and flycatchers) spend approximately eight months of the year wintering in Central and South America and the remaining months in their breeding grounds in North America. Currently, the U.S. Fish and Wildlife Service classifies 11 of the 96 neo-tropical songbird species (12%) as endangered, threatened or being of management concern, and another 65 species (68%) as showing measurable population declines.

So it was of special interest when Dick Hutto, a licensed bird bander, set up a mist net to capture songbirds in order to band them and get a better idea of migration patterns. His primary target was a lazuli bunting that he'd spotted on top of a nearby pine tree. This is a small bird with a brilliant blue head (named for the gemstone) and a spectacular orange breast. Dick set up an almost invisible net (about badminton size) near a small thicket and then brought out his secret weapon: an MP3 player with recorded bird calls. He dialed up the lazuli bunting call and as soon as its notes were heard the male bunting zoomed down like a prizefighter answering the bell for round one. It was easier than decoying a duck!

To the disappointment of our breathless birdwatchers, the diminutive bird flew right over the net. Undaunted, Dick called again

and the little flash of electric blue buzzed right into the trap. When released, the bunting flew back to the top of the conifer where we originally had spotted him.

So if you are floating the Smith River, try keeping track of the different kinds of birds you see or hear. Given the Smith's alluring qualities, it's not surprising that it's so popular. To protect and maintain its natural qualities, Montana's Department of Fish, Wildlife and Parks manages the stream under a permit system. Applications can be submitted for the upcoming float season until February 15. If you forget to apply for a permit, you can call the FWP office in Great Falls to check for cancellations.

Hank Fischer is co-author of Paddling Montana, *a book about floating Montana rivers. He currently works for the National Wildlife Federation and with his wife, Carol, operates a business leading wildlife viewing trips (www.fischeroutdoor.com) to Yellowstone, Alaska, Africa and other locations. They'll be leading a Smith River birding trip in 2007.*

Lazuli bunting

Ten Common Smith River Birds

Turkey vulture. This dark bird is nearly as large as an eagle. Look for its red head. When it flies it rocks and tilts on the air currents.

Spotted sandpiper. This is a robin-size bird, olive-brown on top with black spots on its white breast. Look for it teetering up and down along the side of the river.

Belted kingfisher. This blue-gray bird with a stout bill can be seen perching near the river or hovering in the air before diving on a minnow. Its call is a high, loud rattle.

White-throated swift. This black and white bird can be distinguished from a swallow by its narrow, stiff wings that appear to bend only at the shoulder. They congregate in large groups near cliff walls.

Common nighthawk. Distinguished by its long, pointed wings and notched tail. Usually flies at dusk; its wings have a white bar.

American dipper. This slate-gray bird with a stubby tail can be seen bouncing up and down next to the stream or swimming underwater in search of insects. Also known as a water ouzel.

Gray catbird. This robin-sized bird is all gray with a black cap. It gets its name from its mewing call. Usually seen on the ground in underbrush.

Common yellowthroat. This small warbler is olive green above and bright yellow below. The males have a black face mask. Often seen near the edges of thickets.

Lazuli bunting. This small member of the finch family has a turquoise blue head with a cinnamon breast and sides. Often seen near the edge of thickets or perched on the top of a pine tree.

Prairie falcon. Pointed wings and long tail, sandy brown in coloration. You can distinguish it from a peregrine falcon by its black armpits. Look for nests on the cliff walls or listen for its kree-kree-kree call.

Prairie Keepers

2006 Spring and Summer Schedule of Events

The bitterroot symbol denotes Prairie Keeper events on the calendar, pages 10 & 11.

April 11 **Prairie Keepers Gardening with Native Plants,** 7:00 p.m. Come learn about native plants that produce bird habitat. Also, what birdhouses are best for local birds and upcoming hands-on learning opportunities. Meet at MNHC.

April 22 **Prairie Keepers Earth Day Weed Pull,** 10:00 a.m. Celebrate by helping with urban prairie restoration. Meet at the M trailhead.

April 25 **Prairie Keepers Wildflower Gardening,** 6:00 p.m. Guided tour of the Nature Adventure Garden and Fort Missoula Native Prairie. Native plants for sale. Meet at the Nature Adventure Garden at Fort Missoula.

May 2 **Prairie Keepers Adopt-A-Native Plant,** 6:00 p.m. Rescue native plants from a local subdivision. Keep or donate to restoration projects. Location TBA, contact MNHC at 327-0405 for information.

May 16 **Prairie Keepers Wildflower Gardening,** 6:00 p.m. Tour of Fort Missoula Native Prairie and native plant sale. Meet at the Nature Adventure Garden.

May 20 **Prairie Keepers Farmer's Market Native Plant Sale,** 9:00 a.m. Purchase native wildflowers, shrubs and grasses that have been grown from ethically collected seeds by Native Plant Society members. North end of Higgins Ave at the Farmer's Market.

May 23 **Prairie Keepers Woad Warriors, Part 1,** 6:30 p.m. Help the Clark Fork Chapter of the Montana Native Plant Society pull this invader off the slopes of Mt. Sentinel. Meet at the M trailhead and be ready to walk a few miles.

June 6 **Prairie Keepers Woad Warriors, Part 2,** 6:30 p.m. We'll sweep the Sentinel prairie again for woad plants. Meet at the M trailhead.

June 20 **Prairie Keepers Woad Warriors, Part 3,** 6:30 p.m. Third time's the charm! We'll sweep Sentinel again. You'll be amazed at the wildflowers and wildlife viewing on this hillside. Meet at the M trailhead.

July 11 **Prairie Keepers Leafy Spurge Flea Beetle Collection Party,** 6:00 p.m. Collect spurge-eating beetles to distribute throughout the Missoula Valley. Meet in the parking lot of the UM Golf Course.

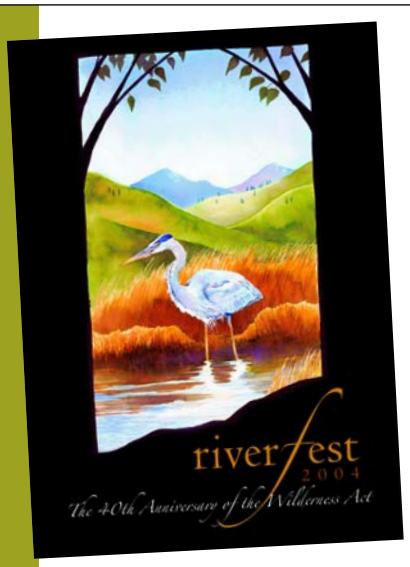
July 25 **Prairie Keepers Wildflower Gardening,** 7:00 p.m. Guided tour of the Nature Adventure Garden and Fort Missoula Native Prairie. Native plants for sale, too. Meet at the Nature Adventure Garden at Fort Missoula.

Aug. 5 **Prairie Keepers Floating Bugloss Weed Pull,** Time TBA. Float the Bitterroot River to pull this new riparian invader. Call MNHC at 327-0405 for details on meeting place, carpool, boats, etc. All day event.

Aug. 8 **Prairie Keepers Knapweed Weevil Collection Party,** Time TBA. Collect knapweed-eating weevils for redistribution around the Missoula area. Contact MNHC at 327-0405 for information about carpool location, etc.

imprints

News from the Montana Natural History Center



Call for Artists
RiverFest Poster Contest

The Montana Natural History Center is seeking artwork for a juried poster contest for the 8th annual RiverFest, to be held September 16, 2006. RiverFest is a community celebration of our local natural history, with family activities, programs and exhibits, sponsored by the Montana Natural History Center and the Missoula County Weed District. The winning submission will be showcased at RiverFest, used in RiverFest publicity and reproduced and distributed locally. To be considered, a piece must reflect the theme of rivers, wildlife and the Missoula area and include a great blue heron, the symbol of RiverFest. First prize is $100.

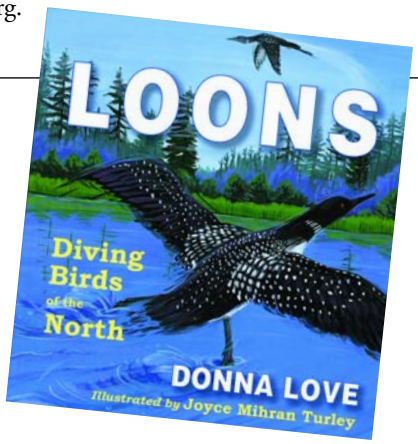
The contest is open to amateur or professional artists. All media that can be reproduced on a poster, except photography, is permitted. Submissions must be in the form of 35 mm slides, standard mounts, and include the artist's name and contact information on them, or on a CD with the artist's name and contact information on it. Entries cannot be returned. Please, no e-mailed submissions or original artwork.

Entry fee is $15 (non-refundable) per submission. Entries must be postmarked no later than June 1. Send all entries to Montana Natural History Center, Poster Contest, 120 Hickory Street, Missoula, MT, 59801. For more details about MNHC or RiverFest 2006, please visit: www.MontanaNaturalist.org. Questions about the contest? E-mail gsivitz@MontanaNaturalist.org.

Coming This Fall!
Inspirations from the Forest

Photo: Matthew Hull, istockphoto.com

MNHC will host its first traveling exhibit September 5-17 in conjunction with RiverFest 2006. "Inspirations from the Forest," produced by the Smithsonian Institution's Center for Folklife and Cultural Heritage in collaboration with the Forest Service and the National Endowment for the Arts, explores the ways our forests, mountains, grasslands and waterways serve as sources of artistic inspiration. Watch for special community events and school programs to be held in conjunction with this exhibit.



Tools for Teachers

Traveling educational trunks help teachers bring natural history to life in their classrooms. Each trunk is filled with interdisciplinary and scientifically accurate materials such as skins, skulls, age-appropriate lesson plans, posters, videos, audio cassettes, games and puppets.

Go "loon-y" with our newest addition, created by local author and loon expert Donna Love. Materials in the Loon Trunk can be adapted to teach K-8 students about the biology, behavior and folklore of these fantastic fishing and diving birds. You can preview the trunk and its uses during MNHC's 15th Anniversary Celebration July 15, when Donna Love will present Loons: Diving Birds of the North (see Calendar for details).

You can find a complete listing of MNHC educational trunks and instructions on how to reserve one on our website, www.MontanaNaturalist.org.

MNHC Photo

Don't Miss Out
on MNHC's Summer Science Day Camps

Reserve your child's place now in one or more of our 2006 Summer Science Day Camps for kids who will be entering Kindergarten through the fifth grade this year. We are also taking applications for our new Leaders-in-Training program for teens (see listing below).

Camps run Monday through Friday, 9 a.m. to 4 p.m., with before and after-camp care offered from 8-9 a.m. and 4-5 p.m. Half-Day Camps run from 9 a.m. to noon.

The cost for camps (including a camp T-shirt) is $145/members, $185/non-members. Half-Day Camps are $60/members, $100/non-members. The special three-day camp for upcoming 4th and 5th graders is $90/members, $115/non-members. *All MNHC memberships are annual.*

For more information or to register for a camp, call 327-0405 or stop by MNHC at 120 Hickory Street. Registration forms also are available on our website, www.MontanaNaturalist.org.

Grades K-1
(half-day camps for students entering kindergarten or first grade in fall 2006)

Step, Slither or Soar ***Half-Day Camp*** July 17-21
Ever tried to crawl like a beetle? Ever wish you could fly? We'll look closely at our animal friends to explore the different ways they move, and we'll even try different ways of moving ourselves.

My Big Backyard ***Half Day Camp*** July 31-August 4
Spend the week looking for animal signs, searching for insects, watching for birds and peeking at plants. Using tools of naturalists, we'll explore natural areas in and around Missoula, following our curiosity and adventurous spirit!

Grades 1-3
(full-day camps for students entering first, second or third grade in fall 2006)

Moose Tracks and Mice Trails June 12-16
Learn how to read signs that animals and insects leave behind. We'll identify tracks, learn about animal homes and figure out "who" was nibbling at that bush as we discover a world full of animal signs.

Frogs, Fish and Fun June 19-23
Dive into an amphibious adventure as we explore local rivers and streams. Learn about Montana's aquatic creatures and other fun facts about aquatic habitats.

Junior Nature Detectives July 10-14
What processes are at work here? Solve mysteries using clues left behind by Montana's wildlife. Student detectives will make their own nature detective kits and, with spy glass and bug net, we'll explore local habitats and use naturalists' tools to make exciting discoveries.

Color Me Wild July 24-28
Nature is full of color! We'll grab our crayons and hand lenses to investigate how nature uses color to get noticed or go unseen, and use the inspiration of the natural world to create our own works of art.

Little Stories, Big Discoveries August 7-11
Stories are springboards for discovery. Begin each day with a story, which will guide exploration and imagination as we step outside to discover what kinds of tales nature holds.

Incredible Insects August 14-18
Crawl, hop, soar! We'll spend the week looking for incredible insects, discovering who they are, where they live, what they do and how they add to the diversity around us.

Grades 4-5
(for students entering the fourth or fifth grade in fall 2006)

Nature Detectives June 12-16, July 17-21
Like a good mystery? We'll look for clues left behind by Montana's wildlife, make our own nature detective kits and explore local habitats to make exciting discoveries using the tools of the trade.

Bird Brains June 19-23
This week will "fly by" as we learn about our feathered friends. Learn to use binoculars and identify local birds. Study how birds are adapted for their habitat, how they build nests, and how and what different birds eat.

Beetles and Butterflies June 26-30
Insects make up the largest group of animals on the earth! Learn about the basic structure of creepy crawlies that inhabit our region, their amazing adaptations and what they need to survive.

Bats to Bears June 26-30, July 31-August 4
Learn what makes a mammal a mammal as you study local furry friends and survey nearby small mammal populations. Examine study skins and skulls, and explore the habitats of your favorite critters!

Special 3-day camp!

Naturalist Explorers July 5-7
Are you looking for an adventure? We'll hit the trail as modern-day explorers, making discoveries along the way. Learn how to use compass and maps, read field guides and carry naturalist tools to guide our journey.

Drawing from Nature July 10-14, August 14-18
Inspiration often comes from the natural world. What better way to celebrate our natural wonders than through art? Explore different styles, experiment with natural materials and observe nature in a new light.

Wade into Wetlands July 24-28
Why are wetlands so important? We'll use waders, nets and hand lenses to investigate the water cycle, explore local wetlands and discover what creatures make their homes here.

Adventures in Science August 7-11
Love adventure? Interested in studying science outside? Use curiosity and questions to launch investigations into natural processes at work in our region. From valleys to rivers to mountain tops we'll use the tools and theories of science to find out first-hand how adventurous science can be.

Wild About Wildfire! August 21-24
Open to upcoming 3rd graders as well. Study the nature of fire, learn about the plants and animals that benefit from fire, and visit the Smokejumper Visitor Center to learn more about fire in western Montana.

NEW! Teens

Leaders-in-Training Program All Summer
Teens aged 14-17 can volunteer for a Leader-in-Training position and gain experience in working with kids by assisting camp instructors with programs. Students must commit to two days of training at the start of the summer and must participate in at least one full week of camp as a junior instructor. Contact MNHC at 327-0405 for application instructions or for more information.

Sentinels on the Hill

The pockets of chokecherry look like farm laborers slogging away on the yellow hillside, their backs bent over the bunchgrasses, the wind having shaped their limbs and boughs. Signs of rustic beauty on the southern rise, they add dimension to the mounds of grass. I stick my hand into a cluster of gray branches, the mahogany buds poised to open, and run my fingers down their smooth arms.

I follow a footpath that climbs a rocky slope and then flattens along the ridge, rough fescue and mugwort all around. I have in mind to bed down in the bunchgrasses, among the yellow buttercups, and rest while watching the clouds move, the air like hot summer with a hint of the sea lingering there around me.

I lay my head on a large clump of bunchgrass and nestle in close. The blades smell dry and raw like the scent of straw or hay wound into bales. I take on whiskers of grass and chew. Close by, a lily pokes out from the earth, warm and green. My cheeks rub close to the grass, my ear to the buttercup, my hair tangled into the ground litter.

I wish I could dig into the dirt and cover my arms and legs with the damp, cool loam. I want to become part of the hillside, grow roots and leaves and seeds, maybe berries like the chokecherry in the fall. Instead, I settle for black clumps of earth under my nails. I decorate my braided hair with chokecherry sticks and mahogany twigs, tuck bunchgrass behind my ear.

A white-tailed deer comes grazing over the horizon. It stands like the mountain, keeping watch over the valley. It does not mind me as it bends its head to graze. For a moment I feel like I belong, both of us chewing. I watch it watch me. We watch each other. Then comes a sudden whipping of wind in the grass and a soft crackle like leaves blowing across the ground. A magpie chucks. Two flickers perch on clumps of chokecherry. The birds sway with the movement of branches. Everything on this hillside keeps watch.

Melissa Matthewson loves Missoula and likes to chase chickadees and track buttercups all around the wild spaces of the urban fringe. She now resides in Applegate, Oregon.

Spring wildflowers at their peak on Waterworks Hill just after an evening rainstorm, by Tim Wheeler (www.timwheelerphotography.com)**, and made possible by the many Missoulians who hike the hill to pull their share of weeds.**

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

☐ Basic Membership: $50 ☐ Senior/Student Membership: $35

☐ Business Membership: $100

☐ I would like to pledge $_____ monthly/annually (circle one).

Please charge my credit card. *All gifts are tax deductible to the full extent of the law.*

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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 nature your classroom 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

Biological Control of Knapweed

Do you have a noxious weed problem on your land?

Tired of these weeds reducing the value of your property and wreaking havoc on Montana's native plant ecosystems? Are you ready to fight back? **Good, so are we!** Our company, Weedbusters, supplies biological control agents for three major weeds of western Montana: Knapweed, Leafy Spurge and Dalmatian Toadflax. The insects we supply are the natural predators of these weeds in their native lands where they successfully keep the weeds in check. After careful screening to make sure they feed only on the targeted weed species, they are allowed into the United States for redistribution. Pictured above is one of the insects we offer, the Knapweed Root Boring Weevil. He loves to eat Knapweed and he's hungry!

For further information on noxious weeds and biological controls including insect availability and prices call:

WEEDBUSTERS

406-251-4261

Don't let the weeds win. Fight back with biological control.

15th Anniversary!

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