Spring/Summer 2009

# MONTANA Naturalist

## Finding Their Way Upstream

## A Voice for Nature

## Blackfeet Sky Stories

**Explore Your World**

See
Get Outside Guide
and Imprints

Montana Natural History Center
Your Base Camp for Discovery

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

Spring/Summer 2009

# MONTANA Naturalist

## Features



## Departments









**Cover photo** – Beargrass *(Xerophyllum tenax)* just beginning to bloom in Packer Meadow, Lolo Pass. Photo by Alan D. Cradick (www.alancradickphotography.com).

**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 Jessie Sherburne

**Scarlet gilia – a beautiful addition to a native plant garden.**

It's that schizophrenic time of year as we go to press – winter, spring, then winter again. But there are signs of a general progression toward warmth and growth – more daylight, early morning bird song, caterpillars along a trail, swelling buds. So much is starting to happen.

It's an especially exciting time for residents of the Clark Fork Watershed, as the process of removing the 100-year old Milltown Dam finally is complete. What is in store for the vertebrate, invertebrate and plant communities in and along the Clark Fork and Blackfoot rivers, and particularly in the smaller creeks upstream of their confluence? FWP fisheries biologist David Schmetterling shares some thoughts in this issue. And this being an International Year of Astronomy, this summer is the time to learn your way around the night sky with the help of local amateur astronomers. Blackfeet teacher Leo Bird offers some insights into traditional sky lore in Far Afield.

This spring and summer delve into fun, new opportunities for kids and families to explore nature together, through the debut of the Missoula Children & Nature Network's Passport Program (see Get Outside Guide for details), and sample the smorgasbord of camps, classes, Discovery Days and Evening Lectures that MNHC has to offer. Whether you take part in the June BioBlitz at the Lee Metcalf Wildlife Refuge or earn some blisters pulling noxious weeds on open space land or spend a week learning about Ladybugs and Slimy Slugs, I hope you will rejoice outside in the beauty and bounty of our green seasons.

Caroline Kurtz

**Caroline Kurtz**
*Editor*

## Missoula Restoration Volunteers

*For more information, contact Graham Roy at royboy1@bresnan.net unless otherwise indicated.*

April 18 **Restore Mt. Sentinel: M Trail.** Help restore fragile native prairie along the M trail. Pull knapweed, scatter seeds and cover up eroding trails. Meet at the M Trail, 10:00 a.m.

April 28 **Restore Fort Missoula Native Plant Garden.** Help restore the native plant garden and provide natural habitat for native wildlife by transplanting flowers, installing sign frames and more. Meet at the Native Plant Garden at Fort Missoula at 6:00 p.m.

May 19 **Restore Mt. Sentinel: Dyer's Woad.** Help restore fragile native prairie on Mt. Sentinel by pulling invasive Dyer's Woad. Meet at the M Trail, 6:30 p.m. Wear sturdy shoes and bring rain gear.

Utah State University Archive, Utah State University, Bugwood.org

Dyer's Woad

June 2 **Restore Mt. Sentinel: Dyer's Woad.** See above. Meet at the M Trail, 6:30 p.m. Wear sturdy shoes and bring rain gear.

June 6 **National Trails Day.** Help restore fragile native prairie on Mt. Sentinel by working to maintain existing trails and removing unofficial trails. Meet at the M Trail, time TBA. Wear sturdy shoes and bring rain gear.

June 16 **Restore Mt. Sentinel: Dyer's Woad.** See above. Meet at the M Trail, 6:30 p.m. Wear sturdy shoes and bring rain gear.

June 25 **Evening Mt. Jumbo Wildflower Walk.** Join Morgan Valliant, Missoula conservation land manager, as he explores what's growing up on Mt. Jumbo. Learn how to identify native plants and the invasive species that threaten them. Valliant will also cover local restoration efforts to mitigate invasive species in Missoula's open space. Be prepared for a light hike and hundreds of wildflowers. Meet at the parking lot at the Lincoln Hills Trailhead below Mt. Jumbo Saddle, 7:00-8:30 p.m. For information, call MNHC at 327-0405 or e-mail mvalliant@ci.missoula.mt.us.

July 8 **Map your Weeds: Learn Basic GPS.** Join Missoula County Weed District Senior GIS Specialist Jed Little to learn basic noxious weed mapping and GPS techniques. Be sure to have adequate shoes, clothing and water. Bring your own GPS unit or borrow one of ours for the night. Meet at the parking lot at the Lincoln Hills Trailhead below Mt. Jumbo Saddle, 6:00 p.m Please RSVP to Jed at 258-4220.

July 11 **Restore the Bitterroot River: All Day Float.** Spend the day floating the majestic Bitterroot River, pulling invasive plants along the banks. Prizes and a barbeque will follow at the end of the day. Transportation details need to be coordinated. Contact Melissa at 777-5842.

July 22 or 29 **Native Plant Seed Collection.** Join Bryce Christiaens of Native Ideals Wildflower Seed Company and learn how to collect seeds of many plant species effectively and ethically. Location and time TBA.

August 8 **Biocontrol Collection Day.** Help collect knapweed root weevils and earn the right to take some home. Location and time TBA. Contact Melissa at 777-5842.

September 26 **National Public Lands Day.** Help restore well-used trails around Missoula. Pull knapweed, scatter seeds and cover up eroding trails. Bring work gloves and water. Location and time TBA. Contact Jason Pignanelli at 552-6271.

## Keeping an eye on removal's effects

# Dam Good

By David Schmetterling

It was not that long ago that the removal of Milltown Dam was considered impracticable, not feasible, impossible. Yet last spring, as hundreds of enthusiastic citizens watched, the Blackfoot and Clark Fork rivers, once barricaded at their confluence by Milltown Dam, ran free from their headwaters to Thompson Falls for the first time in a century.

Shortly thereafter, local newspapers celebrated the first trout to ascend the rivers naturally since the breach, and people lauded the potential for the recovery of threatened native bull trout in rivers and streams around Missoula. For 100 years, the Blackfoot and Clark Fork rivers had been harnessed here for industrial purposes now outdated; the removal of Milltown Dam signals the beginning of a restoration process that will lead to public enjoyment of these rivers for centuries to come.

Historically, fish in the Clark Fork and Blackfoot rivers had used ecologically and geographically distinct – but connected – habitats, spanning hundreds of miles through the watershed, to live out the various stages of their lives. Until Milltown Dam was built, fish used headwater streams of the Blackfoot River or Rock Creek to spawn and for young fish to grow. Later in the year, fish could seek out the warmer, food-rich waters of the Clark Fork to mature and spend the winters. By using such distinct and varied habitats, fish were able to flourish and take advantage of all the resources our landscape offers.

**Montana Power Co. dam and Milltown Reservoir, date unknown. The confluence of the Blackfoot and Clark Fork rivers is clearly delineated.**

The construction of Milltown Dam in 1907 quickly and drastically changed the landscape for fish. Prior to 2008, the dam blocked upstream fish passage, limited downstream fish movements and created a reservoir that fostered a population of exotic northern pike. In the reservoir, the sediments that accumulated after a century of hard rock mining reduced fish and aquatic health through both chronic and acute exposures to toxic heavy metals, like copper. These changes conspired against fish – and no species was more affected than bull trout.

In 1998, fellow fisheries biologist David McEvoy and I decided to focus our attention squarely on the dam and its impacts to the rivers. Over the course of several years, we studied the movements and ecology of many fish, from bull trout to suckers to westslope cutthroat trout to northern pike. We soon found out that each year the dam was impeding upriver migrations of more than 200,000 individual fish, representing 11 fish species – almost every species in the river. The dam was

Vintage photo: Demmons Collection, Archives & Special Collections, The University of Montana-Missoula. Color dam photos by Sara Olin Malo, US Army Corps of Engineers

# Work

**ABOVE, FROM LEFT:** Crowds gather on an overlook to watch the dam breach on March 28, 2008; rivers flow through the space left by the powerhouse until a permanent channel is created where the spillway is located; view of the unimpeded river; a year later. **BELOW,** native bull trout (foreground) and cutthroat trout hopefully will have more reproductive success with access to spawning habitat. These fish photographed in the Middle Fork of the Flathead River.

Photo by Pat Clayton (www.fisheyeguyphotography.com)

The Clark Fork watershed extends from headwaters near Butte to Lake Pend Oreille in Idaho, where it mingles with the Columbia River on its way to the Pacific Ocean. Removal of Milltown Dam allows fish to migrate back to ancestral spawning creeks.


Map by Eileen Chontos. Montana image: Visible Earth (http://visibleearth.nasa.gov/)

having an effect on everything from 35-inch bull trout to three-and-a-half-inch longnose dace. Furthermore, once fish were impeded by the dam, they did not go elsewhere to spawn; they would stay at the dam trying to ascend it for days, even months, and many died trying. Although this sounds pretty depressing, we were encouraged; it represented a promising situation.

We were encouraged because we saw that fish were continuing to try to use the river system as though it were still connected, despite the long-term fragmentation that the dam had caused. Even though these individual fish that were now downstream of the dam would not return upstream to spawn, those fish had come from upriver areas earlier in their lives. The dam was a strong selective pressure against this migratory behavior, yet the disposition to migrate is still very strong in many species. With these results we concluded that by providing fish passage, we could see recovery – of depleted stocks of bull trout, but also of many other species, like suckers, and minnows and westslope cutthroat trout – from the fostering of their migratory natural histories. We had not yet lost all the pieces to the puzzle and this was a problem we could fix.

## They follow their noses upstream to find that place where they were hatched to spawn.

At Milltown Dam we had a great example of biology at work. Fish in our area "home," or return to the place where they hatched, to spawn and start another generation, just like salmon. The reasons are many, but the bottom line is survival – whatever it was about the place they hatched worked for them, and fish try, often dying in the process, to return to that same location to reproduce. This is a fascinating part of fish ecology – their ability to navigate hundreds of miles to a place they might not have been in several years, nearly their entire lifetime – and they do it with remarkable accuracy. Fish can use a variety of senses to do this, depending on scale.

For example, to navigate in the oceans, salmon and other fish rely on geomagnetism or sensing the earth's magnetic fields (like a compass); on a smaller scale they can recognize structure and particular areas of a stream. To return to their place of origin in the Clark Fork watershed, fish rely mainly on smell. Every stream and every location within a stream carries its own special scent – a combination of chemicals that fish can discern, despite the scent being diluted thousands of times. They follow their noses upstream to find that place where they were hatched to spawn.

Bull trout, once abundant in the area, now only are found in a fraction of their former range. Even where they are found, their abundance usually is low. Bull trout in the Clark Fork drainage of west central Montana literally are at the end of their range and figuratively at the end of their rope. Development, non-native species, climate change, habitat loss and degradation, and passage barriers threaten their persistence. Hopefully the removal of Milltown Dam will begin to reverse the decline of this Montana native.

Bull trout are not the only fish that will benefit from a free-running river; in fact they are almost numerically inconsequential. The overwhelming majority of the tens of

**We had not yet lost all the pieces to the puzzle and this was a problem we could fix.**

**ABOVE, FROM LEFT: David Schmetterling explains fish monitoring research that involved capturing rainbow trout in the Blackfoot, tagging them with a radio transmitter, releasing them in the Clark Fork below the former dam site, and monitoring their progress back upstream.**
**FWP research assistants Jim McFee and Ryen Anderson with tagged pikeminnow. Only juvenile rainbows were chosen for the study; any females that showed signs of containing eggs were released.**

Photos by Sara Olin Malo, US Army Corps of Engineers

thousands of fish annually impeded by the dam is native, non-game fish, including (roughly in order of abundance) largescale sucker, northern pikeminnow, longnose sucker, peamouth, longnose dace, red sided shiner, and sport fish such as rainbow trout, brown trout, westslope cutthroat trout and mountain whitefish.

Tens of thousands of largescale suckers congregated annually in the spring in the tailrace of Milltown Dam, thwarted in their upstream migrations. From our research I found that largescale sucker migrations are as lengthy as the storied bull trout migrations and, if allowed passage upstream, suckers use the entire watershed from the upper Blackfoot River to the upper Clark Fork River near Warm Springs. Their migrations take them hundreds of miles.

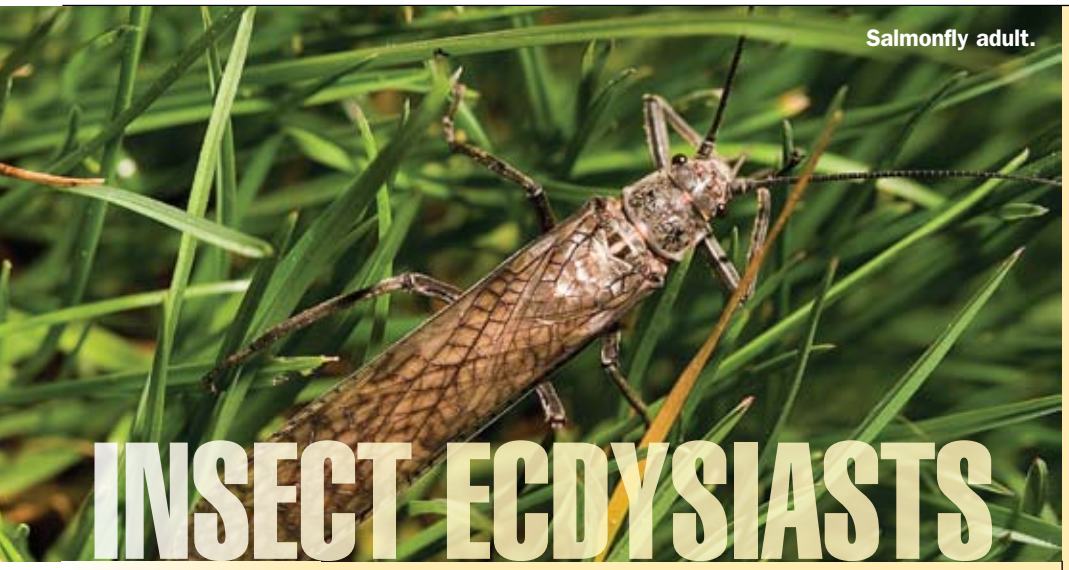
That is just where interesting things may begin to happen with this abundant, poorly understood fish. Many suckers die after spawning (mostly males), and given that tens of thousands annually congregated downstream of the dam I expect a tremendous amount of biomass will be transferred to upriver areas, which could replenish the system with a significant amount of nutrients (similar to how nutrients are derived from salmon carcasses in coastal streams). Providing upstream passage of largescale suckers may help promote full ecosystem recovery. Ultimately, accommodating fish like suckers may be the only way to ensure recovery of a fish like the bull trout.

Ultimately, accommodating fish like suckers may be the only way to ensure recovery of a fish like the bull trout.

**One of the most abundant fish in the Clark Fork, largescale suckers migrate hundreds of miles.**

Now begins the next chapter in this historic project as the focus shifts from cleaning up the site to returning it to its natural state as a river, rather than a reservoir. I expect changes from the dam removal will be far-reaching – from drastic local changes in species composition, fish densities and unimpeded fish passage, to more subtle, holistic changes to all the aquatic inhabitants of the Clark Fork. The changes will help populations be more resilient and better carry out their natural life histories.

*David Schmetterling is a fisheries biologist for Montana Fish, Wildlife and Parks in Missoula. For the last 14 years, his research has focused primarily on Milltown Dam, but has also included the study of the ecology of many native species, from bull trout to boreal toads and from suckers to sculpin.*



Salmonfly adult.

# INSECT ECDYSIASTS

## Salmonflies follow nature's imperative

By Ellen Knight

We are drawn to water, always. We love its richness and mystery. Walking along the riverside at any season we observe many things – the cottonwoods, grasses and shrubs that make up riparian vegetation, maybe a merganser paddling low in the water near the shore. An eagle poised on a high, bare branch or a heron standing statue-like. Maybe we see the shadow of fish beneath the water or a school of fry darting in and out among the pebbles in the shallows. There may be a hatch of insects out – the ephemeral forms crazily darting just above the water. And in some places, near the water's edge, you might find their strange, brownish, shell-like skins, particular in every detail, like the frozen shadow of the insect itself. These relics of the nymph, or aquatic pre-adult, phase are attached by the hundreds to exposed rocks, downed wood and branches near the water's edge.

Exuvia of *P. californica*.

Photo by Mark Vinson/Utah State University Bug Lab

If the shells are about an inch long, they may be the shed exoskeletons (exuvia) of *Pteronarcys californica*. *P. californica* is a stonefly, better known among anglers as a salmonfly, whose late June emergence as a winged adult calls to hungry trout like a groaning smorgasbord to a party of hungry Swedes. Salmonfly emergence over several days causes exuberant feeding by trout, and rallies even more exuberant anglers whose enticing imitations of the juvenile or adult forms are the flies of choice on these keenly-anticipated fishing days.

Salmonflies approach their momentous day of flight after three or four years, during which, teenager-like, they eat their way through their long nymphal phase. On the stream bottom, they do the work of the world by helping move the energy of the sun, stored as organic detritus, algae, fungus or other invertebrates, up the food web. This transformation of energy into resources that can be used by other beings in the food web (e.g., trout) is critical to a healthy stream.

But on the day of metamorphosis, the new salmonfly adults have something other than eating on their agenda. Like adults of any species, they are bent on reproduction. So, still in their nymphal guise, they make the hazardous climb or swim to the edge of the river. There they clamber over land for the first time where, on some rock or dry leaf, they begin to emerge. They quickly split their tight-fitting skins down the back, and gingerly pull every body part out, leaving the exuvia as evidence of their previous life. Emerging is dicey work for all those insect body parts – head, thorax, abdomen, two antennae and all six legs. Their new wings unfold, dry, and are laid along their abdomen. Their dramatic new life as adults has begun.

The next thing these sex-driven salmonfly adults do is begin calling for a mate. From their perch on a stone or leaf, the males begin their Valentine song by thumping their abdomen on the substrate, relaying a very particular drumming pattern to any female close by. If she fancies him, she drums back a similar but distinct pattern

Drumming in salmonflies is another one of those biological wonders, and other stonefly species use drumming as well as *P. californica*. If you are listening in, you'll find that each has its own drumming pattern. There are even dialects within species, and some, for instance, have drumming patterns east of the Continental Divide that are slightly different from their brothers and sisters west of the Divide. Like an accent of sorts!

Once mated, eggs develop in the female using the stored energy from the algae, dead leaves, dead insects and so on that she ate in her earlier nymphal phase. When ready to lay her eggs, the female will climb a tree and glide off on the wind, heading for the river on her plane-like wings (which are not so good for heavy-duty flying). She dips her abdomen into the water repeatedly until all the eggs are released into some, hopefully, good habitat so that they can mature and eventually hatch into new nymphs, starting the cycle over again.

Keep your eyes open along Montana's bigger streams in June, and if you happen to be there on emergence day, take a few minutes to watch the miracle of transformation in one particular insect as it honors the imperative cycles of nature.

Photo by Arlen Thomason

*Ellen Knight gets a kick out of teaching about life in ponds and streams, and other topics, for the Montana Natural History Center. She is a founding member of MNHC and loves this beautiful earth. She is grateful for expert help with this article from Winsor Lowe, an assistant professor in the Division of Biological Sciences at the University of Montana.*

Edward L. Manigault, Clemson University Donated Collection, Bugwood.org

# What Is It?

By Charles Miller

While jogging along the Riverfront Trail recently, I noticed a huge insect near a puddle of water. It was a giant water bug, one of North America's largest true bugs. Other common bugs in this order are the boxelder bug, stink bug and leaf-footed bug, but they are much smaller. This bug measured about two inches long!

Giant water bugs *(Lethocerus americanus)* live in ponds, lakes and streams, but they also have strong wings and can fly from pond to pond looking for better habitat or mates. Giant water bugs are brown with flat, oval bodies, similar to a cockroach. Their back two pairs of legs are flattened and fringed with hairs, which enable them to swim well. These bugs are hunters. Their mouthparts are elongated into a beak-like structure, and their front legs have claws that can grasp and hold prey, such as aquatic insects, fish, frogs, even baby birds! With these weapons, a water bug engages in ambush, using its clawed front legs to capture prey and their beak to inject a toxin that kills the prey and liquefies its insides so the bug can slurp it up.

At a water bug's back end are two retractable tube-like appendages, which can act as snorkels when the bug is swimming. Otherwise, water bugs breathe through small openings, called spiracles, in their abdomens. Water bugs also can store air bubbles under their wings in contact with spiracles, allowing them to breathe while submerged.

During mating a female giant water bug will lay as many as 150 eggs on the back of the male, who protects them from being eaten by other aquatic insects and exposes them to air to prevent the growth of mold. After the eggs hatch, the glue attaching them to the male's back deteriorates and the egg cases fall off.

In many parts of Asia, giant water bugs are considered a delicacy and are served both raw and cooked!

## 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 winter issue of *Montana Naturalist*.

This spring and summer, while you are on vacation, at camp, 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 Labor Day (September 7). All entries will be displayed during September at the Montana Natural History Center. 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.

## How Do They Do It?

Insects have multi-staged life cycles, with either three or four stages in their metamorphosis from egg to adult. All insects are eggs at first. Eggs hatch into immature insects, either a larva or a nymph. Aquatic insects, such as stoneflies and mayflies, which undergo incomplete (or three stage) metamorphosis, produce nymphs that already look much like the adult, with three body parts, six legs and wing pads that must grow into full-fledged wings before they emerge as adults.

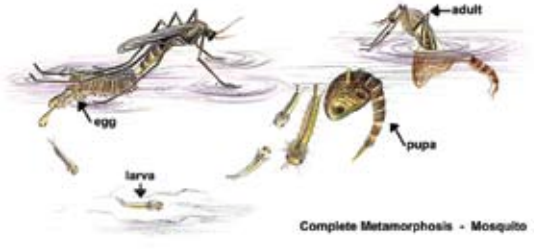



Illustration by Gina Mikel, www.scientificillustrator.com

Insects such as mosquitoes, crane flies and caddis flies, which undergo compete (or four stage) metamorphosis, have life cycles that include a caterpillar-like larva that hatches from the egg. This worm-like creature grows in the water, but in order to make the dramatic change to adult form, has a third immature stage called a pupa. Think of it as an aquatic chrysalis, in which the encapsulated juvenile can completely change to its final adult form in relative safety. —*E.K.*

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

# get outside calendar

April 8 **Evening Lecture Series. Blackfeet Plant Knowledge,** 7:00 p.m. Rosalyn LaPier talks about specific plants harvested by the Blackfeet people. She also focuses on the importance of women and children in tribal society.

April 11 **Saturday Discovery Day. Women's Naturalist Retreat,** 8:30 a.m.-5:00 p.m. Join local artist and botanical illustrator Claire Emery and MNHC naturalist Jessie Sherburne for a nourishing day of sketching, wildlife watching and relaxation at a cozy cabin in the Blackfoot Valley. Cost TBA. Call 327-0405 to register.

April 18 **Saturday Kids Activity. Garbage Art!,** 2:00 p.m. We'll learn fun and creative uses for everyday garbage, and have plenty of clean garbage on hand to make some awesome art projects. Kids are welcome to bring a few pieces of clean garbage from home to use as well.

April 22 **Evening Lecture Series. Wildlife of Israel,** 7:00 p.m. Avi Lourie, biologist and director of the wild animal protection division of Israel National Parks, will share his experiences with the wildlife of this region.

April 25 **Saturday Kids Activity. Outrageous Owls,** 2:00 p.m.

April 25 **Saturday Discovery Day. Evening Stargazing for Beginners,** 9:00-10:30 p.m. Members of the Western Montana Astronomical Association will give an introduction to amateur astronomy. Binoculars and telescopes provided, but participants are welcome to bring their own. **ALTERNATE DATE IF CLOUDY, APRIL 27.** $8/$5 MNHC members. To register, call 327-0405.

April 28 **Nature Discovery Traveling Trunk Show,** 4:00-6:00 p.m. Ever wonder what materials, activities and equipment are inside our educational resource trunks? All will be on display for teachers, day care providers, summer camp leaders, students teachers and others to look through. MNHC staff on hand to answer questions. Refreshments and door prizes, too, including a free trunk rental!

May 6 **Evening Lecture Series. A Sedimental Journey: Ice Age Flood Stories from Flathead Lake,** 7:00 p.m. Presented by Mark Hendrix, UM professor of geoscience.

May 9 **Saturday Discovery Day. Native Plant Garden Design,** 2:00-4:00 p.m. Cost TBA. Turn your yard into a wildlife friendly native plant oasis. Class focuses on plant selection and garden design. Bring any plans you may have, a sketch of your yard or an aerial photograph for discussion and planning.

May 9 **Saturday Kids Activity. Incredible Insects.** 2:00 p.m.

May 22 **Evening Lecture Series. John James Audubon,** 7:00 p.m. Renowned storyteller and author Brian "Fox" Ellis brings history, ecology, art and literature to life in this celebration of the lifework of one of America's greatest artists and naturalists.

May 23 **Birding with Audubon,** time TBA. Join Fox Ellis on a birdwatching adventure as he interprets local bird species as artist John James Audubon would have viewed them. Cost TBA. Call 327-0405 for information.

May 23 **Storytelling Workshop. Breathing Life into Dry Bones,** time TBA. Learn how to use storytelling to teach science concepts. Cost TBA. Space is limited; call 327-0405 to register.

May 30 **Saturday Discovery Day. Springtime Mushroom Hunt with Larry Evans,** 1:00-5:00 p.m. $25/$20 MNHC members. Call 327-0405 to register.

## April

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

*Beginning January 1, 2009*
**Admission Fees: $2**/adults, **$1**/children 4-12, **free**/children 3 and under and MNHC members.

**COMMUNITY EVENTS**

Saturday Kids Activities
Join us for fun children's programs at MNHC. Children must be accompanied by an adult. Programs run about an hour. Great for kids ages 5 and older. Cost is $2/child; MNHC members free.

Evening Lectures
$4 Suggested donation; MNHC members free.

Saturday Discovery Days
Cost varies. See listings in Calendar.

Summer Science Discovery Camps
See complete listings in Imprints.

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 |
| | | | 8 **Evening Lecture Series. Blackfeet Plant Knowledge,** 7:00 p.m. |  MNHC Photo | | 11 **Saturday Discovery Day. Women's Naturalist Retreat,** 8:30 a.m.-5:00 p.m. |
| | | | 15 | | | 18 **Saturday Kids Activity. Garbage Art!,** 2:00 p.m. **Restore Mt. Sentinel: M Trail.** 10:00 a.m. |
| 19 | 20 *Common mergansers incubate eggs in tree hollows* | 21 | 22 **Evening Lecture Series. Wildlife of Israel,** 7:00 p.m. | 23 | 24 | 25 **Saturday Kids Activity. Outrageous Owls,** 2:00 p.m. **Saturday Discovery Day. Evening Stargazing for Beginners,** 9:00-10:30 p.m. |
| 26 | 27 | 28 **Nature Discovery Traveling Trunk Show,** 4:00-6:00 p.m. **Restore the Fort Missoula Native Plant Garden.** Fort Missoula, 6:00 p.m. | 29 | 30 | **May** 1 | 2 |
| 3 |  | 5 | 6 **Evening Lecture Series. A Sedimental Journey: Ice Age Flood Stories from Flathead Lake,** 7:00 p.m. | 7 *Willow leaves begin to unfurl* | 8 | 9 **Saturday Discovery Day. Native Plant Garden Design,** 2:00-4:00 p.m. **Saturday Kids Activity. Incredible Insects.** 2:00 p.m. |
| 10 | | 12 | 13 MNHC Photos | 14 | 15 | 16 |
| 17 | 18 | 19 **Restore Mt. Sentinel: Dyer's Woad.** M Trail, 6:30 p.m. |  | | 22 **Evening Lecture Series. John James Audubon,** 7:00 p.m. | 23 **Birding with Audubon,** time TBA. **Storytelling Workshop. Breathing Life into Dry Bones,** time TBA. |
| 24 | 25 | 26 | | | 29 | 30 **Saturday Discovery Day. Springtime Mushroom Hunt with Larry Evans,** 1:00-5:00 p.m. |
| 31 | **June** 1 | 2 **Restore Mt. Sentinel: Dyer's Woad.** M Trail, 6:30 p.m. | 3 | 4 | 5 | 6 **National Trails Day.** M Trail, time TBA. |



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

# get outside calendar

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|---|---|---|---|---|---|---|
| 7 | **Summer Science Discovery Camps** *See imprints for details, page 16.* 9 | 10 | 11 | | **Weekend Discovery Days.** Wild Yellowstone with the Experts. *June 12 - 14* 12 | 13 |
| 14 | *June 15 - 19* **Herp Hunters** (Grades 1-3) **Moose Tracks and Mice Trails** (Grades 1-3) **Nature of Flight** (Grades 3-5) **Survivor!** (Grades 5-8) 15 | **Restore Mt. Sentinel: Dyer's Woad.** M Trail, 6:30 p.m. 16 | 17 | 18 | 19 | *Watch for salmonfly hatch* 20 |
| 21 | *June 22 - 26* **Lady Bugs and Slimy Slugs** (Grades K-1) **Feathered Friends** (Grades 1-3) **Pond Life** (Grades 1-3) **Wade into Wetlands** (Grades 3-5) 22 | 23 | 24 | **Evening Mt. Jumbo Wildflower Walk.** Meet at the parking lot at the Lincoln Hills Trailhead below Mt. Jumbo Saddle, 7:00-8:30 p.m. 25 |  MNHC Photo | |
| 28 | *June 29 - July 3* **Nature Art** (Grades 1-3) **Kid vs. Wild** (Grades 3-5) **FireWorks** (Grades 5-8) 29 | 30 | **July** 1 | 2 | | |
| 5 | *July 6 - 10* **Water Skippers** (Grades K-1) **Folklore and Fables** (Grades 1-3) **Predators and Prey** (Grades 1-3) **Birds of Prey** (Grades 3-5) 6 | 7 | **Map your Weeds: Learn Basic GPS.** Meet at the parking lot at the Lincoln Hills Trailhead below Mt. Jumbo Saddle, 6:00 p.m 8 | 9 | 10 | **Restore the Bitterroot River:** All Day Float. 11 |
| 12 | *July 13 - 17* **Wildlife Wizardry** (Grades 1-3) **Junior Nature Detectives** (Grades 1-3) **Space Camp** (Grades 3-5) **Inventor's Workshop** (Grades 5-8) 13 | **Glacier Lake Missoula Elderhostel,** *see page 18* *July 13 - 17* 14 | 15 | 16 | 17 | 18 |
| 19 | *July 20 -24* **My Big Backyard** (Grades K-1) **Garden Safari** (Grades 1-3) **Beetles and Butterflies** (Grades 3-5) 20 | **Glacier Lake Missoula Elderhostel,** *see page 18* *July 27 - Aug. 2* 21 | **Native Plant Seed Collection.** Location and time TBA. Or 29th 22 | 23 | 24 | 25 |
| 26 | *July 27 - 31* **Mammals of Montana** (Grades 1-3) **Fishing for Fun** (Grades 1-3) **Nature Detectives** (Grades 3-5) **Map Your World** (Grades 5-8) 27 | 28 | 29 | 30 | 31 | **August** 1 |
| *Start of huckleberry-picking time* 2 | *August 3 - 7* **Color Me Wild** (Grades K-1) **Naturally Spooky** (Grades 1-3) **Super Tracker** (Grades 3-5) 3 |  MNHC Photo 4 | | | 7 | **Biocontrol Collection Day.** Location and time TBA. 8 |
| 9 | *August 10 - 14* **Bugs to Slugs** (Grades 1-3) **Wild Woodlands** (Grades 1-3) **Art and Nature Adventures** (Grades 3-5) **Naturalist Adventures** (Grades 5-8) 10 | 11 | | | **Weekend Discovery Days.** Women's Intro to Backpacking. *August 14 -16* 14 | 15 |

June 12-14 **Weekend Discovery Days. Wild Yellowstone with the Experts.** Space is limited; registration required. Cost TBA. Call 327-0405 for more information.

June 15 -19 **Herp Hunters** (Grades 1-3).

June 15-19 **Moose Tracks and Mice Trails** (Grades 1-3).

June 15-19 **Nature of Flight** (Grades 3-5).

June 15-19 **Survivor!** (Grades 5-8).

June 22-26 ***Half-Day Camp!* Lady Bugs and Slimy Slugs** (Grades K-1).

June 22-26 **Feathered Friends** (Grades 1-3).

June 22-26 **Pond Life** (Grades 1-3).

June 22-26 **Wade into Wetlands** (Grades 3-5).

June 29-July 3 **Nature Art** (Grades 1-3).

June 29-July 3 **Kid vs. Wild** (Grades 3-5).

June 29-July 3 **FireWorks** (Grades 5-8).

July 6-10 ***Half-Day Camp!* Water Skippers** (Grades K-1).

July 6-10 **Folklore and Fables** (Grades 1-3).

July 6-10 **Predators and Prey** (Grades 1-3).

July 6-10 **Birds of Prey** (Grades 3-5).

July 13-17 **Wildlife Wizardry** (Grades 1-3).

July 13-17 **Junior Nature Detectives** (Grades 1-3).

July 13-17 **Space Camp** (Grades 3-5).

July 13-17 **Inventor's Workshop** (Grades 5-8).

July 20-24 ***Half-Day Camp!* My Big Backyard** (Grades K-1).

July 20-24 **Garden Safari** (Grades 1-3).

July 20-24 **Beetles and Butterflies** (Grades 3-5).

July 27-31 **Mammals of Montana** (Grades 1-3).

July 27-31 **Fishing for Fun** (Grades 1-3).

July 27-31 **Nature Detectives** (Grades 3-5).

July 27-31 **Map Your World** (Grades 5-8).

August 3-7 ***Half-Day Camp!* Color Me Wild** (Grades K-1).

August 3-7 **Naturally Spooky** (Grades 1-3).

August 3-7 **Super Tracker** (Grades 3-5).

August 10-14 **Bugs to Slugs** (Grades 1-3).

August 10-14 **Wild Woodlands** (Grades 1-3).

August 10-14 **Art and Nature Adventures** (Grades 3-5).

August 10-14 **Naturalist Adventures** (Grades 5-8).

August 14-16 **Weekend Discovery Days. Women's Intro to Backpacking.** Space is limited; registration required. Cost and location TBA. Call 327-0405 for more information.

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.***

# Get Into Nature

## With Children & Nature Passport Program Events

The aim of the "Got Nature?" Passport Program is to get kids and families outside. Organized by members of the Missoula Children & Nature Network, accessible and inclusive programs are offered once a month throughout the year to teach a variety of outdoor skills, offer opportunities to learn about the natural environment and teach stewardship. The Passport Program introduces fun activities that families and kids can do on their own as well, using local parks and nature areas. Pick up a "Got Nature?" journal and Nature Tracker stamp card at any Passport event or at Currents Aquatic Center. Kids get their cards stamped when they participate at different Passport Programs, and when their Nature Tracker card is full, they receive one free admission to Currents. Passport Programs are free and designed for children aged four and older. To learn more about the Missoula Children & Nature Network, go online to www.missoulachildrenandnature.org.

## Get Blitzed

**Come be a part of the BioBlitz at the Lee Metcalfe National Wildlife Refuge! The BioBlitz is a 24-hour survey of the flora and fauna of one area, led by scientists but involving members of the public of all ages and skills. This year's BioBlitz will take place from noon to noon, starting Friday, June 26 to Saturday, June 27. Contact the Lee Metcalfe National Wildlife Refuge for more details.**

## Schedule of Upcoming Passport Programs

**April 18 Follow That Track!** Saturday, 10:00-4:00 p.m. Learn how to identify animals by the tracks they leave when they walk, and make your own animal tracks for fun! Hosted by the Great Bear Foundation. Drop in anytime at the Great Bear Foundation home base, 802 E. Front St., Missoula.

**May 30 What Bird is That?** Saturday, 8:30-10:00 a.m. Sue Reel, Lolo National Forest wildlife interpreter, and Dick Hutto, ornithologist and UM professor of biology, will share their secrets on how to identify birds along the Clark Fork River. Meet at Jacob's Island (south side of UM footbridge). Binoculars provided. For more information, call Sue at 329-3831.

**June 20 All About Bugs!** Saturday, 1:00-3:00 p.m. Montana Natural History Center staff will lead you on a buggy adventure. Learn how to make a simple insect sweep net, then head out into the park to see what we can find. We'll practice some insect identification and demonstrate simple tools you can make to explore insects in your own yard! Meet at MNHC, 120 Hickory Street. If possible, please bring a coat hanger, an old pillow case and a stick or broom handle to make a net. We will have some materials on hand as well.

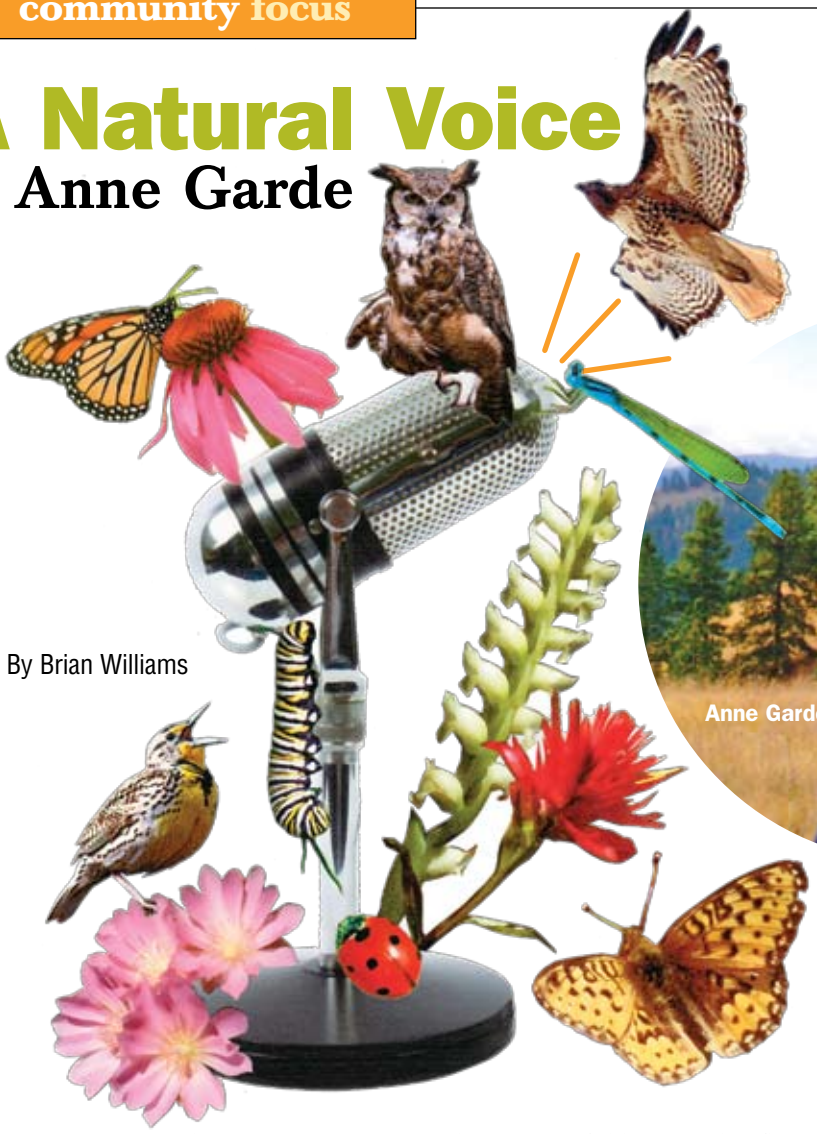
**July 11 Native American Games Day.** Saturday, 1:00-3:00 p.m. Children and their grownups will have the opportunity to participate in several fun, active, outdoor Native American games, hosted by Travelers' Rest Preservation and Heritage Association. The event will be held at McCormick Park, 600 Cregg Lane, Missoula.

**August Star Party!** Local astronomy clubs will put on a star party for the community. A fun and exciting way for kids and families to learn some of the summer constellations and how to "star hop" to find other stars, planets and night sky wonders. See Children & Nature Network website for more details.

Illustration by Elleen Chontos using istockphoto.com images: Jamie Farrant, Mustafa Hacalaki

# A Natural Voice
## Anne Garde

By Brian Williams




I first met Anne Garde on a Montana Native Plant Society field trip to Shoofly Meadows in the Rattlesnake Mountains. It was late July, and we were hunting the tiny, carnivorous sundew plants, *Drosera rotundifolia*, that grow exclusively in fens.

I, like many other Montana Public Radio listeners, knew Anne by voice, from The Pea Green Boat children's radio show. Since I had often heard her telling kids about the chickadees and hawks and flowers she'd seen in her rambles around Missoula, I knew she enjoyed the natural world. But I got a taste of how deep her knowledge and appreciation ran as we squished through the soggy beds of sphagnum moss and Anne reeled off the Latin names of lovely plants for me: *Spiranthes romanzoffiana* (hooded ladies-tresses), an orchid with a spike of creamy-white flowers; *Pedicularis groenlandica* (elephant's head), a purple bloom with the big ears and long trunk of an elephant; *Eriophorum chamissonis* (cotton-grass), whole swaths tipped with golf-ball sized fluffs of white, rocking in the wind. I realized then that the boundless enthusiasm for the natural world Anne exudes on her radio show is matched by her enthusiasm as a naturalist in real life.

Though Anne is reluctant to admit it, she possess the characteristics that I most admire in naturalists: specific knowledge of our plant and animal neighbors, an intimate connection to place and a talent for opening the door to the natural world for others. Through almost 40 years of exploring the hills and mountains around Missoula, she knows when to look for bitterroots pushing up leaves, and when camas will be blooming in high meadows.

"I love that I know each of the mountains – Sentinel, Dean Stone, Blue Mountain, Black Mountain, Waterworks Hill, the Rattlesnakes. It's all around me and I know it and I love that," she told me recently.

Like many naturalists, Anne didn't receive formal training in natural history. She grew up in Brooklyn, playing "Cowboy" and "Davy Crockett" and reading books about nature, like Thorton Burgess's *The Wishing Stone Stories*. She came to Missoula to pursue graduate studies in English and fell in love with the place.

"When I stepped off the plane, I knew this was where I wanted be," Anne recalled. On hiking trips and backpacking expeditions, she carried the Craighheads' field guide to plants and began to learn the flowers. But it was when she met local botanist Peter Lesica and joined the Clark Fork Chapter of the Montana Native Plant Society that her interest in flowers went to the next level. Botanizing with Peter and learning the latin and common names of the local flowers was like "returning to the first days when I came out here – a whole new world opened up."

These days, Anne takes her love of natural history a step further, sharing it with children on The Pea Green Boat. Anne's been hosting the hour-long program (it airs at 4:00 p.m. on weekdays) for six years now. It's not solely a program about nature, but in Anne's hands (and voice) the love and appreciation of nature is a strong, repeating theme. The Pea Green Boat introduces children to guests like Kate Davis, who brings injured raptors to the studio, and Byron "Bug Man" Weber. Anne shares the magic of growing a giant pumpkin or watching a robin nest in a hanging porch plant. She encourages children to find a spot and sit outside each day. She delivers a simple, but profound message that kids and adults alike can appreciate: "If you go outside, something interesting is going to happen." In these days, as more and more people are realizing the physical, mental and emotional benefits of time spent out-of-doors, that message seems especially important and compelling.

So now it's Anne's turn to be the mentor that Peter Lesica was for her, and literally open the door for children in Montana to a whole new world. And on that July afternoon, in the soggy Shoofly Meadows, I saw Anne's excitement when we found our tiny carnivorous plants shaped like miniature red suns, and knew that her young listeners couldn't ask for a better mentor.

Photo courtesy Anne Garde

Illustration by Eileen Chontos using istockphoto.com image: Valerie Loiseleux; Bugwood.org images: Terry Spivey, USDA Forest Service; Russ Ottens, University of Georgia; David Cappaert, Michigan State University; Johnny N. Dell; Susan Ellis; and YNP images.

# Blackfeet Skies

By Caroline Kurtz

Leo Bird teaches chemistry and astronomy at Browning High School on the Blackfeet Reservation. The skies are his passion, he says, and he loves teaching astronomy because it integrates so many disciplines – history, physics, geology, geography, art and math.

"Today we think of astronomy as a hard science, carried out with gigantic telescopes on far away mountain peaks. But it really began with people watching the sun," says Bird, quoting another Native American teacher, Greg Cajete of the Santa Clara Pueblo, author of "Native Science: The Natural Laws of Interdependence."

The people watched the sun for many reasons, Bird continues, "to tell which way was north, by observing the direction that shadows point at midday. Or to mark the beginning of a new season, by observing when the sun sets at its northernmost or southernmost point of the year. It's something anyone can do."

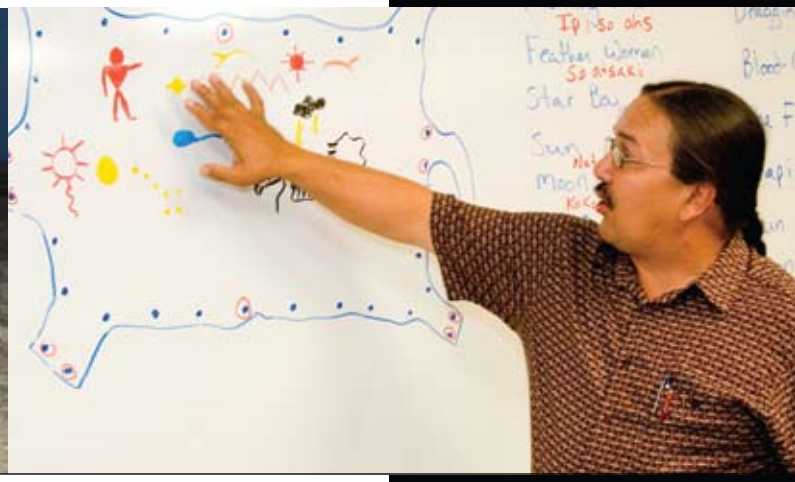
Long before European settlers arrived, native people had learned to organize their life and activities around the cyclic motions of celestial bodies, Bird says. Spomi-tapi-ksi, or Sky Being, stories "guided native people through life and defined the seasons. They tell us about our relationship to nature and teach us respect for life."

Bird outlines his approach to teaching astronomy in a Digital Teacher Workshop for Teachers of Native American Students, produced by the U.S. Department of Education (www.t2web.us). In addition to helping students visualize scientific concepts, he seeks to re-connect students with their natural heritage of the night sky.

**A key component of Bird's astronomy class is the Night Lab, in which he takes students outside to observe the sky with telescopes and the naked eye. With this experience, students learn to tell sky stories themselves, and re-create them in a visual medium by making their own pictographs. These pictographs tie sky stories to natural phenomena, as in the legend of weather and the seasons.**

Photos by Patrick O'Brien Photography

**Natosi – Creator Sun**
Made the earth and everything on it; boundless power; provider of light and warmth; the source of all life.



# Star Myths

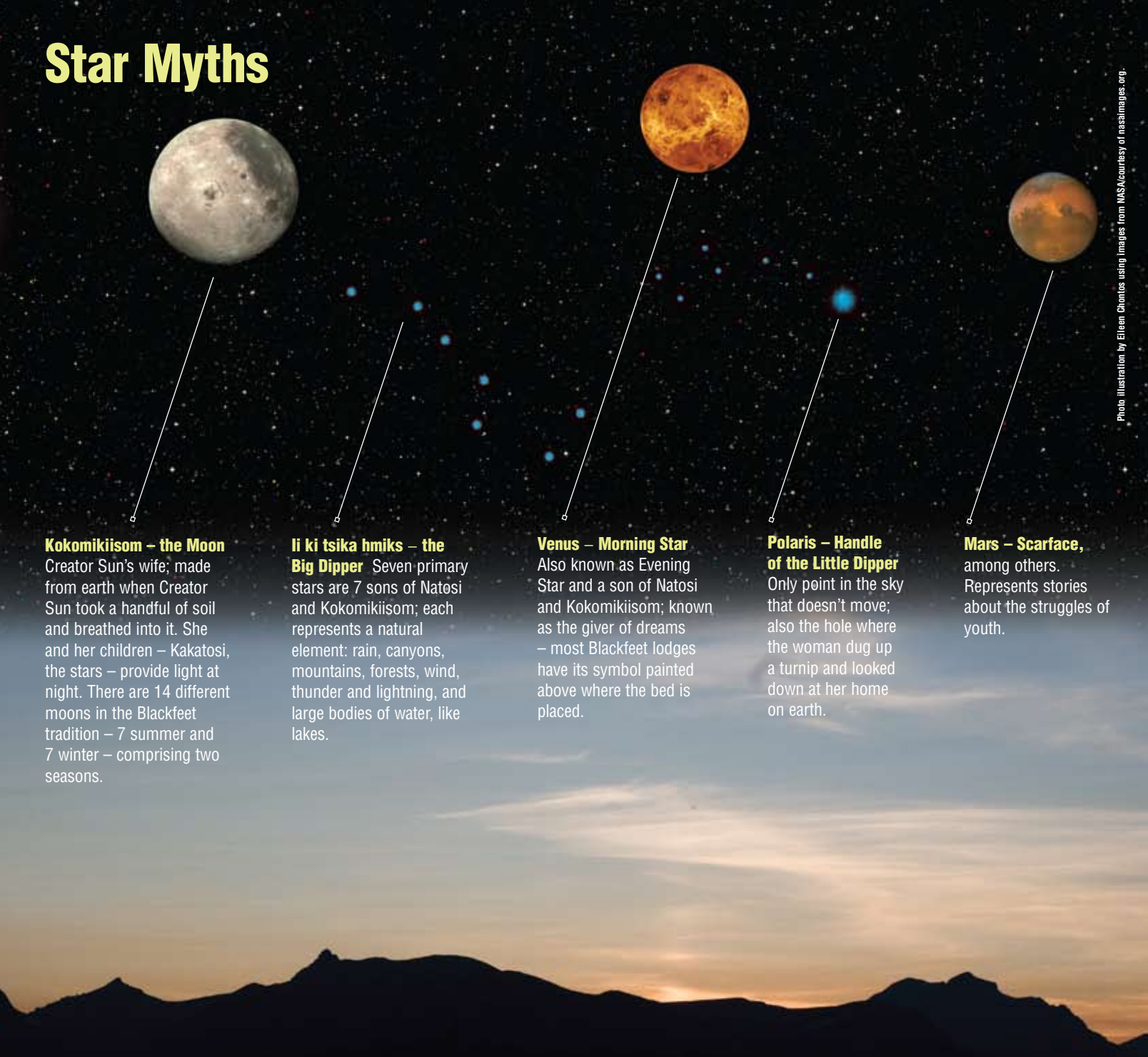


Photo illustration by Eileen Chontos using images from NASA/courtesy of nasaimages.org.

**Kokomikiisom – the Moon** Creator Sun's wife; made from earth when Creator Sun took a handful of soil and breathed into it. She and her children – Kakatosi, the stars – provide light at night. There are 14 different moons in the Blackfeet tradition – 7 summer and 7 winter – comprising two seasons.

**Ii ki tsika hmiks – the Big Dipper** Seven primary stars are 7 sons of Natosi and Kokomikiisom; each represents a natural element: rain, canyons, mountains, forests, wind, thunder and lightning, and large bodies of water, like lakes.

**Venus – Morning Star** Also known as Evening Star and a son of Natosi and Kokomikiisom; known as the giver of dreams – most Blackfeet lodges have its symbol painted above where the bed is placed.

**Polaris – Handle of the Little Dipper** Only point in the sky that doesn't move; also the hole where the woman dug up a turnip and looked down at her home on earth.

**Mars – Scarface,** among others. Represents stories about the struggles of youth.

## Story of Raven and Thunder

One day, Ksiistsi-komm (Thunder) was jealous of a man's wife. So he knocked down the man's teepee and stole his wife. When the man recovered, he found out what Thunder had done. He was broken hearted. He wandered all over asking the animals to help him but all of them were afraid of Thunder. Finally he talked to Omahkaistow (Raven). Raven flew off and challenged Thunder for the man's wife. Thunder shot lightning bolts at Raven, trying to kill him. But Raven flapped his wings and brought the north wind and snow. Gradually, the snows slowed down Thunder so he could no longer send thunderbolts. Finally, Thunder gave up and returned the man's wife.

Raven insisted that Thunder divide the seasons in to two parts. Raven would get winter and Thunder would get summer. Raven also made Thunder give the man his thunder pipe for a peace treaty between them. From this day, the thunder pipe bundle is opened each spring during the first sound of thunder. The people ask for good crops and good luck and good health. Raven lived at the place called Crow's Nest Mountain, and Thunder lived at Ninastako, or Chief Mountain.

**2009 is an International Year of Astronomy.**

**Check out the Calendar for information about MNHC's upcoming astronomy events, or visit www.astronomy2009.us.**


MNHC Photo

# Gear Up for Summer Outside

## with MNHC Science Discovery Camps

There are discoveries galore waiting for kids outside this summer! Get into them with our summer camps for children entering kindergarten through 8th grade. Teens can gain experience and have their own adventure with our volunteer Leaders-in-Training program (see listing below).

Weeklong day camps engage children in the study of nature through field trips, arts and crafts and scientific exploration. Camps run Mondays through Fridays, 9 a.m.-4 p.m., with before and after-camp care from 8-9 a.m. and 4-5 p.m. Half-day camps run from 9 a.m.-1 p.m. Costs for camps are $175/MNHC members, $220 non-members. Half-day camps are $75 MNHC members, $120 non-members. Some financial assistance available. For more information or to register for a camp, call 327-0405 or visit our website at www.MontanaNaturalist.org.

### Grades K-1

**Lady Bugs and Slimy Slugs** *Half-Day Camp!* June 22-26
What makes an insect an insect, how do invertebrates change and grow, what is their place in the food web? We'll spend plenty of time in the field using nets and bug boxes to collect some creepy crawlies – and create an insectarium in our classroom to observe our discoveries!

**Water Skippers** *Half-Day Camp!* July 6-10
Explore the wonders of water habitats through stories, creative play and by visiting nearby riverside habitat. We'll learn about plants and animals that like watery homes. We'll even make a habitat in our classroom to observe some of our aquatic friends!

**My Big Backyard** *Half-Day Camp!* July 20-24
Spend the week looking for animal signs, searching for insects, watching for birds and peeking at plants. Using naturalist tools, we'll explore natural areas in and around Missoula, following our curiosity and adventurous spirit!

**Color Me Wild** *Half-Day Camp!* August 3-7
Nature is full of color! We'll explore nature's palette while trying out a variety of art media, from colored pencils to water colors, from clay to collage, as we create our own works of art. We'll host an art show for parents at the end of the week to show off our discoveries and our creations.

### Grades 1-3

**Herp Hunters** June 15-19
Join us for a week of discovery as we dive into an exploration of amphibians and reptiles! We'll learn about Montana's frogs, snakes and turtles, use nets to collect and observe aquatic creatures, explore food chain connections and discover other fun facts about aquatic habitats.

**Moose Tracks and Mice Trails** June 15-19
Learn how to read the signs that animals and insects leave behind! We'll learn to identify tracks, how to identify different animal homes, how to use clues left by animals to tell their stories, and create our own plaster animal track and tracking guides to keep.

**Feathered Friends** June 22-26
From ravens to raptors, hummingbirds to herons, we'll investigate the bird world to learn about their beaks and feet, feathers and wings, nests and eggs, songs and food through exploration, stories, art and by using binoculars to observe birds in the field.

**Pond Life** June 22-26
Explore life in ponds and wetlands from waddling waterfowl to tiny tadpoles. We'll spend the week investigating nearby ponds and wetlands, and learning about the importance of wetlands and the animals that use them. We'll even create an indoor pond as a laboratory for learning!

**Nature Art** June 29-July 3
Use crayons, paint, sculpture and elements from nature to create your own works of art! We'll learn about different habitats, from forests to grasslands, and try drawing, water coloring and printmaking as we create nature-inspired work. We'll host an art show at the end of the week to show off our creations.

**Folklore and Fables** July 6-10
Stories are springboards to discovery. We'll begin each day by reading stories that will guide our explorations of water, earth, air, night and animals. We'll learn about animal senses, nocturnal animals, the water cycle, plants, rocks and weather. And we'll explore different cultures through their stories and art.

**Predators and Prey** July 6-10
From birds to mammals predators make their living eating other creatures, and their prey have developed adaptations to stay alive! Explore this relationship, learn about the food web, study skulls, pick through owl pellets, practice the art of camouflage, and discover amazing adaptations predators and prey have to survive.

**Wildlife Wizardry** July 13-17
Animals can do some mysterious things, like change color with the seasons, move without feet and freeze nearly solid during the winter! We'll explore different global habitats from tundra to temperate rain forest and learn about animal adaptations through field trips, experiments, games, stories and art projects. Learn about metamorphosis, animal defense mechanisms, camouflage and mimicry!

**Junior Nature Detectives** July 13-17
Solve mysteries from clues left behind by Montana's wildlife. Student detectives will make their own nature detective kits, study animal skulls, learn to identify animal tracks and signs, and explore the neighborhood and local natural areas to learn more about wild animals in Montana.

**Garden Safari** July 20-24
From flowers to vegetables to the insects that crawl underneath them, gardens are full of discoveries. We'll learn how plants grow, get our hands dirty exploring soil, set up some experiments and learn about flowers, seeds and creatures that pollinate. We'll also visit gardens around town to see what animals make gardens their home.

**Mammals of Montana** July 27-31
Montana's magnificent mammals will amaze you as we explore different habitats from forests to prairies. Learn what makes a mammal a mammal as you examine study skins and skulls, read stories, play games, explore the habitats of your favorite critters and take a trip to the Bison Range to see some of Montana's largest mammals! We'll also learn about the endangered species of Montana.

**Fishing for Fun** July 27-31
Learn about stream ecology, what fish live in Montana and how to catch the big one! We'll visit local streams and ponds to explore the food web and aquatic habitats, learn how to fly fish, practice fishing skills and become fish experts. We'll use waders, nets and fishing poles to reel in adventure!

**Naturally Spooky!** August 3-7
From snakes to bats to stink bugs we'll explore the animals (and plants) in Montana that most people try to avoid. We'll learn about their natural habitats and what they really eat, and we'll hear stories and folklore as we learn why people are afraid of these animals and discover the truth that makes them – not so scary!

**Bugs to Slugs** August 10-14
Crawl behind an ant! Hop with a grasshopper! Slide with a slug! We'll spend the week looking for incredible invertebrates, using nets, hand lenses, and microscopes to discover who they are, where they live, what they do and how they add to the amazing diversity all around us.

**Wild Woodlands** August 10-14
We'll explore forests habitats around Missoula, from Pattee Canyon to Blue Mountain and beyond, searching for the treasures that make our forests so special. We'll learn about forest ecology, the importance of fire, read stories, learn about cultural connections to forests and discover the animals that live in our woodlands.

## Grades 3-5

**Nature of Flight** June 15-19
The week will "fly by" as we learn about winged animals. We'll explore the world of flight from insects to birds to mammals that fly. We'll learn about how wing shape and size affects bird flight, and we'll make our own paper airplanes and kites as we learn about the science of flight and the unique adaptations that make flying possible.

**Wade into Wetlands** June 22-26
Get your feet wet exploring local wetlands. We'll use waders, nets and hand lenses to observe the aquatic insects, reptiles, amphibians and fish we might find. We'll learn to identify a few wetland birds and find out why wetlands are important places for plants, animals and people!

**Kid v. Wild!** June 29-July 3
Do you think you have what it takes to make it in the wild? Spend the week learning some techniques for basic survival, including fire making and shelter building, orienteering, mapping, first aid, Leave No Trace, bear awareness, and even how to predict the weather! We'll also meet a search and rescue team and learn about river survival.

**Birds of Prey** July 6-10
Raptors are an amazing group of birds with adaptations specifically for capturing prey. We'll study eagles, hawks, falcons, owls and osprey to learn more about how they do what they do and where different raptors can be found. We'll also study pellets to see what they eat, and use binoculars to observe them in the field.

**Space Camp** July 13-17
Join us as we launch a journey into the galaxy and beyond! We'll learn about stars, constellations, planets, black holes, phases of the moon, properties of energy and light, build a comet, and learn about some amazing space missions that have taken place.

**Beetles and Butterflies** July 20-24
Insects make up the largest group of animals on the earth. Who dominates the sky? Who patrols the forest floor? Learn about the basic structure of creepy crawlies that inhabit our region, their amazing adaptations and what they need to survive by using insect nets, creating insectariums and observing insects in their natural habitat.

**Nature Detectives** July 27-31
Solve the mysteries of nature as we spend the week uncovering secrets about some wild animals. Learn animal tracking, how to identify a bird by its song, study skulls and use nets to catch insects. We'll even get to see some of the tools biologists use to study wildlife!

**Super Tracker** August 3-7
Learn how to identify animal tracks and signs, explore tools used by professionals for studying animals and learn basic skills for exploration in the outdoors. We'll practice our tracking skills in the field, create plaster tracks of our favorite Montana mammals, make our own tracking books and, through "Nature Clue," test our super tracker skills!

**Art and Nature Adventures** August 10-14
Inspiration often comes from the natural world. What better way to celebrate our natural wonders than through art. Explore plants and animals outside using different media, including sketching, painting, printmaking, sculpture and even some natural materials. We'll host an art opening at the end of the week to show off our creations!

## Grades 6-8

**Survivor!** June 15-19
Spend the week learning techniques for basic survival, including how to start a fire without matches, how to construct a shelter, how to filter water, make a fishing pole, predict weather, make your own string and how to perform basic first aid. We'll also make our own compass, learn about bear awareness, and we'll get a chance to meet a search and rescue team and hear tips for survival from the experts!

**FireWorks** June 29-July 3
Fire is a big part of living in western Montana. We'll spend the week learning about the causes of fire, how fire behaves, how plants and trees survive fire, how fire helps some living things survive and how people can make their homes safe from forest fires. We'll visit the Smoke Jumper Center, perform some exciting experiments at the Fire Lab's Burn Chamber and take a few field trips to some local burned areas to see the affects of fire first hand!

**Inventor's Workshop** July 13-17
Are you always coming up with new ideas for inventions? Come learn about the fields of Biomimicry and "green" design. We'll see some examples of great inventions, learn about current and historical inventors, practice observation skills using microscopes and field studies, create a solar- powered motor boat and use ideas from nature to come up with some fantastic inventions. This camp is developed in cooperation with The Biomimicry Institute.

**Map Your World** July 27-31
Learn basic map-reading skills, how to create your own maps, how to use compasses on an orienteering course and with a map to figure out where you are. We'll learn some introductory skills for using Global Positioning Systems (GPS) and try our hand at Geocaching! We'll also learn how scientists use maps to track animal migrations and how animals read the land as they travel.

**Naturalist Adventures** August 10-14
Are you interested in a little adventure this summer? We'll spend the week hiking some fantastic trails, learning how to use naturalist tools like field guides and compasses, hearing adventure stories about famous naturalists, and learning how to set up a tent and a safe backcountry camp. We'll also discover plants and animals common to our region as we get out and explore. We'll end the week with a kayaking trip on a nearby lake!

## Teens!

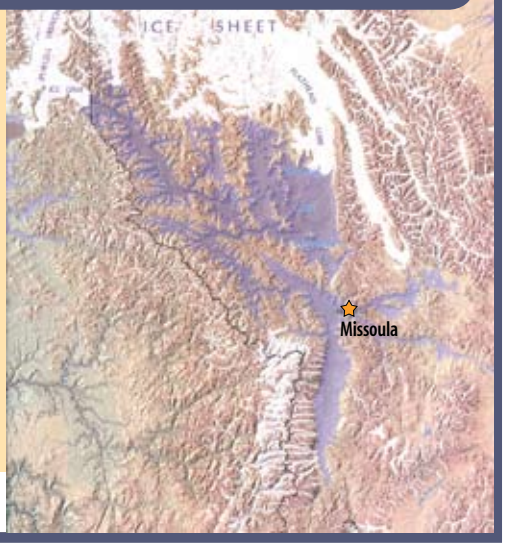
**Leaders-in-Training Program** ALL SUMMER
Teens aged 14-17 may volunteer for a Leader-in-Training position and gain experience in child care and summer camp instruction by assisting camp instructors with programs. Contact MNHC for application instructions and more information, 327-0405.

## ELDERHOSTEL TRIP: HIKING THROUGH THE ICE AGE FLOODS

**TWO TRIPS: 7/13/2009 - 7/19/2009**
or **7/27/2009 - 8/2/2009**
**www.elderhostel.org**
(program #17684)

Experience the power of the Ice Age Floods while hiking through the incredible scenery of western Montana and Idaho. Explore evidence of ancient Glacial Lake Missoula by rafting the lower Alberton Gorge, observe wildlife at the National Bison Range, experience spectacular views of the Mission Mountains and cycle the Hiawatha Trail in the company of experienced guides who interpret the region's natural history and geology. For more information about the trip, call MNHC at 327-0405. To register, contact Elderhostel at (800) 454-5768 or www.elderhostel.org (program #17684).

Elderhostel
Adventures in Lifelong Learning



**Cinnamon teal create a tapestry of reflections at Ninepipes National Wildlife Refuge.**
Photo by Eugene Beckes

**Montana Natural History Center**
Your Base Camp for Discovery

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

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*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!*

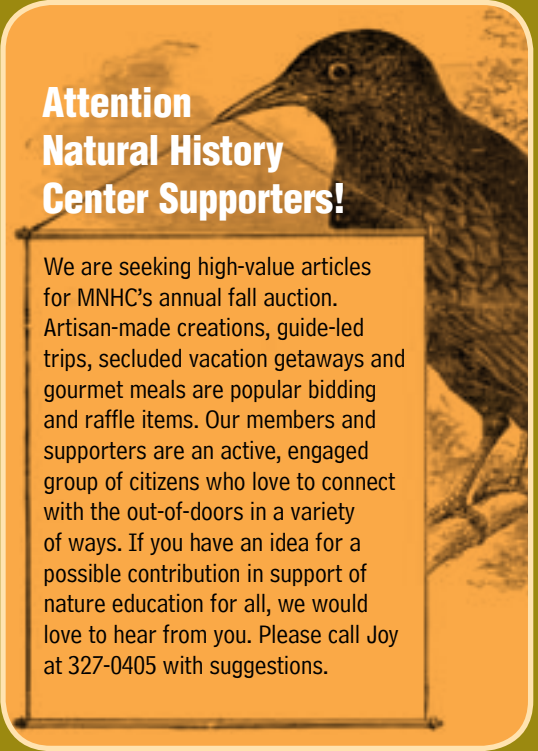
**Fill out and mail to Montana Natural History Center, 120 Hickory Street, Missoula, MT 59801 or Fax: 406.327.0421**

## 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***



## Attention Natural History Center Supporters!

We are seeking high-value articles for MNHC's annual fall auction. Artisan-made creations, guide-led trips, secluded vacation getaways and gourmet meals are popular bidding and raffle items. Our members and supporters are an active, engaged group of citizens who love to connect with the out-of-doors in a variety of ways. If you have an idea for a possible contribution in support of nature education for all, we would love to hear from you. Please call Joy at 327-0405 with suggestions.