MONTANA Naturalist

Spring/Summer 2005

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see Get Outside Guide, page 9

A publication of the MONTANA Natural History Center

Masters of disguise

Prairie opera

Summer program line-up

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

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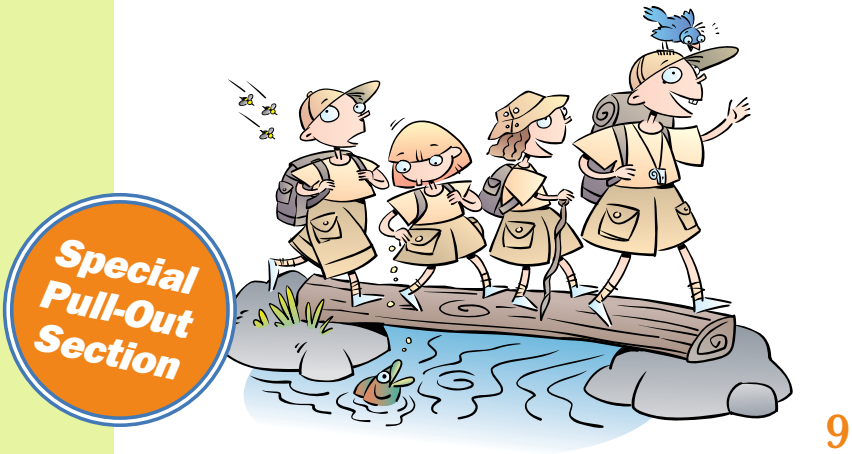
Cover photo – Two-tailed tiger swallowtail (*Papilio multicaudatus*) on balsamroot taken by Thea Linnea Pyle, a botanist, gardener and silkscreen artist in Gray's River, Washington. Common in spring and early summer in western and southern Montana, less so in northern and eastern parts of the state. The big green caterpillars with blue eye-spots can be found on chokecherry and green ash. Taken with a Nikkormat FTN 135-mm camera.



MONTANA
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tidings

MNHC Photo

Metamorphosis: a profound change in appearance, form or function; a transformation from one stage to the next. Biologists use the word to indicate change in the form and habits of an organism: caterpillars become butterflies, tadpoles become frogs. We at the Montana Natural History Center have been working on a metamorphosis as well, and the first stage our transformation now is complete. We have moved to our new, permanent location adjacent to McCormick Park near downtown Missoula, where we have renovated an empty warehouse into a tremendous new space for education.

Yet just as biological metamorphosis takes time and progresses through stages, so too will the metamorphosis of MNHC. More phases will unfold over the next year or two. And as we continue to grow we will contribute to and benefit from the greater changes that are occurring in the McCormick Park area.

Our changes, however, have not distracted us from our mission. We are more committed than ever to providing natural history education. Our new facility ultimately will give us a greater capacity to do so, through exhibit space, a hands-on discovery room, increased library and classroom space, and improved offices and gift shop. As you look through this issue you will see that we are offering more and more Saturday Discovery Days, Summer Science Day Camps, and increased volunteer and other opportunities to become involved with nature and with us.

Join us at the Montana Natural History Center in learning about our world, teaching others and creating change.

Caroline Kurtz

Caroline Kurtz
Editor

Elderhostel Programs with The Montana Natural History Center

Elderhostel

Week-long sessions include nature walks, presentations and trips to research institutes and field sites not typically open to the public.

June 19-24, 2005
Managing Birds and Their Habitats in the Last Best Place
Learn about the habitats and ecological relationships that support the rich diversity of bird life in scenic western Montana. Get a behind-the-scenes look at research projects and conservation efforts while enjoying local birding hot spots.

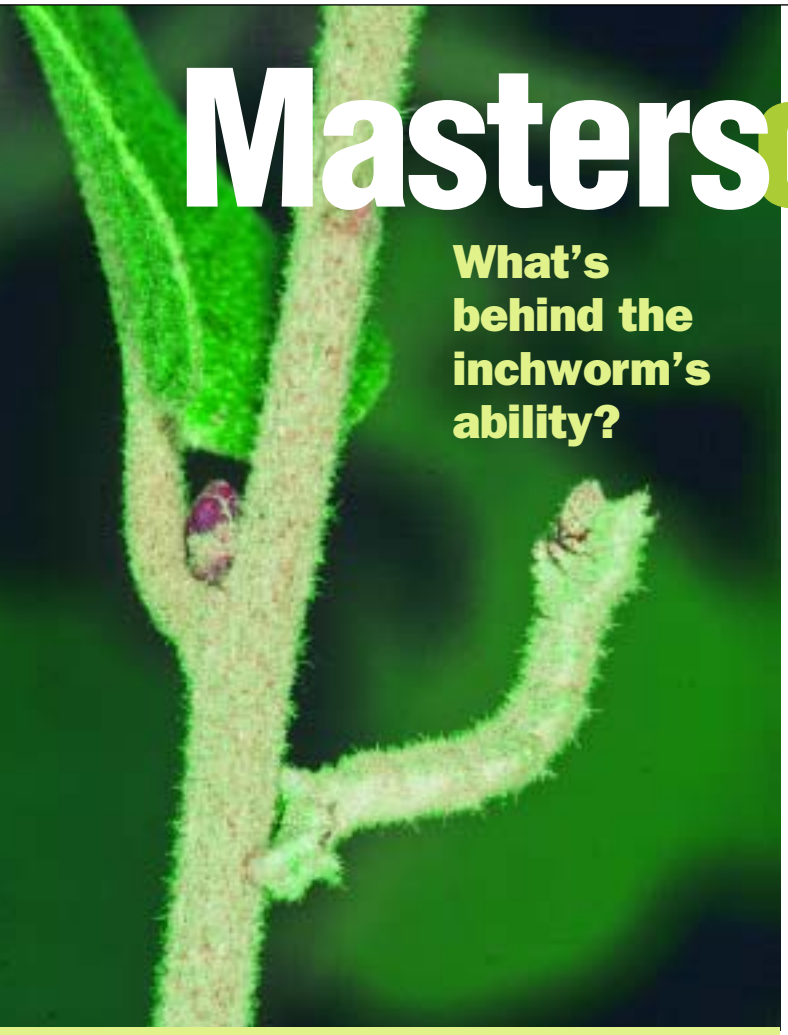
September 11-16, 2005
On the Trail with Lewis & Clark: A Montana Natural History Journey
Through a combination of classroom and outdoor activities, learn about the native plants and encounters with wildlife that the Corps of Discovery experienced 200 years ago.

For more information:
Montana Natural History Center
(406) 327-0405
www.MontanaNaturalist.org.

Special rate available for local participants

Masters of Disguise

What's behind the inchworm's ability?



The emerald moth *Nemoria arizonaria* is an example of a bivoltine life cycle, meaning there are two discrete generations in the course of a year. A first brood of adults appears in April or May and lays eggs on oak catkins, which are blossoming then. When the eggs hatch, the caterpillar babies mimic catkins, BELOW. These pupate and turn into moths several weeks later. The second batch of adults lays eggs in June or July in leafed-out oak trees. These caterpillars turn into twig mimics, ABOVE. They pupate and enter diapause, a dormant condition many insects undergo, which lasts until the following spring, when the cycle begins again.

By Caroline Kurtz
Photography by Erick Greene

Some geometrid caterpillars—those that lack feet along their mid-sections, causing them to move in a distinctive "inching" fashion—have an amazing capacity for mimicry.

As a graduate student doing field research in Arizona, Erick Greene, now an associate professor of biology at the University of Montana, experienced this first-hand. While poking around 20 feet up an oak tree, trying to discover what various songbirds were eating, he was startled when the some of the oak flowers he was holding in his palm began to walk away.

"I nearly fell off the ladder," he recalls. "They had the same fuzzy golden coloration as the catkins, the identical bumpy appearance even down to having what looked like pollen-producing stamens."

A bigger surprise came a few months later, after the oak catkins had disappeared. Up a tree once again, Greene found inchworms that looked, not like flowers, but exactly like little oak twigs. What he was seeing were caterpillars of the genus *Nemoria*, specifically *N. arizonaria*.

"It turned out these two caterpillars were the same species, but from a different generation," he says.

Nemoria is a large genus, with between 150 and 200 species. Several species make their way this far north, but most are found in central and northern South America. The adults are commonly called emerald moths, for their bright green color.

Greene was not the first person to notice these fascinating oak-tree caterpillars. Noel McFarland, an independent researcher, had observed and described the species in 1988. He also had raised them, discovering that both phenotypes—an organism's physical appearance—were the same species. Today, how one animal can end up looking like two completely different organisms has become a large part of Greene's research program.

You are what you eat

"The neat thing about this discovery is the implication that when the caterpillars are born they have the genetic blueprints to turn into two different forms, either catkin or twig. Somehow they get information from their environment that turns particular genes on or off during development in such a way as to send the organism down one developmental path or another, Greene explains.

"This raises some very interesting evolutionary questions and suggests that every individual baby caterpillar has the ability to turn into either thing, and that the environment provides the trigger."

There are several different environmental cues that could be triggering the changes – length of day, temperature, humidity, diet. With *N. arizonaria*, says Greene, it truly is a case of "you are what you eat" and that diet is the all-important cue.

Greene caught female emerald moths and let them lay their eggs in the lab. He then separated the siblings into dozens of chambers and raised them under various conditions.

"It turned out that if the caterpillars ate pollen, one hundred percent turned into the catkin form. If they ate leaves, one hundred percent turned into twigs. Nothing else mattered," Greene says.

Furthermore, the developmental decision is made during a very short period when the caterpillars are about two weeks old, long before they are large enough to become a songbird's meal.

"During this window of about 48 or 72 hours, they are sensing what they are eating and different genes are turning on or off, setting them on an irrevocable developmental trajectory," he says.

It's good to be flexible

Nemoria arizonaria is a stunning example of phenotypic plasticity, otherwise known as developmental flexibility, currently a hot topic in evolutionary biology. Until recently, Greene says, developmental pathways in organisms – how an eye becomes an eye or appendages become a certain size and shape, for instance – were considered direct routes from A to B to C. Newer thinking considers the development of some systems to be subject to forks in the road, so that the end product might be one of several possibilities, depending on the fork taken.

"The idea that plasticity is a developmental mistake is not true for a lot of systems. Instead, organisms have incredibly sophisticated genetic architecture that can react to environmental stresses and help the organism turn into the most advantageous form," Greene says.

N. arizonaria lives exclusively on oak. Other *Nemoria* species are dietary specialists on very different plants, such as scrub rosemary, gooseberry or persimmon, among others. These species have highly discrete caterpillar forms, depending on what they are eating. As Greene says, it makes sense for a specialist to look like what it's surrounded by in order to disguise itself from predators.

"If you feed dietary specialists a mixed diet you will not see intermediate forms," he adds. "Caterpillars fed catkins mixed with leaves will look like catkins until a critical ratio is reached and then the babies will switch to the twig form."

Greene wondered whether this would be true for other species in the genus. Currently, he is studying a number of closely related *Nemoria* species, some of which are specialists and others of which are generalists that eat all sorts of plants. With collaborators at Harvard University, he is putting together a molecular family tree to discover the evolutionary relationships within the genus.

"I'm very curious to know whether generalists gave rise to specialists or vice versa," he says. "Do generalists have the same or a different blueprint for flexibility?"

He and students are studying local Montana geometrids, catching females and raising sibling caterpillars on different foods. Early results suggest that caterpillars of *N. darwiniata*, for instance, that eat the flowers of ceanothus, an important post-fire woody plant, turn ivory white, just like the blossoms. The same species fed on hawthorn turn reddish brown.

"There appears to be some plasticity in generalists," he says, "but not to the extent of the specialists. It's more of a continuum of twiggy forms rather than radically different ones."

Greene says research into the issue of developmental flexibility interests him because it represents the intersection of so many areas of biology—ecology, evolution, genetics, behavior and development.

"I got into this research as a result of observing the natural history of these creatures, from trying to understand the ecology of the animal, because that represents the conditions under which the organism has to live and operate. From simple observations of an organism's natural history—its life cycle, where it lives, what it eats and what eats it—other aspects of its biology can be discerned, from its molecular make-up to larger patterns of population, he says.

"Most basic questions in biology stem from observations of natural history. Good natural historians have come up with the most exciting observations and questions."

For many caterpillars, how they are classified has been worked out on the adult butterfly or moth, based on wing venation or genital structure. Says Erick Greene: "It's amazing how many caterpillars of common species have never been seen. We don't know anything about that phase. We don't know about the basic natural history of a lot of organisms." Different forms of the local caterpillar *Nemoria darwiniata*. CLOCKWISE FROM LEFT: **On wild rose, on sumac, on hawthorn and on ceanothus.**

A Level Playing Field

Combating Montana's weed problems with biocontrols

By Caroline Kurtz

After biocontrol

Norman E. Rees, USDA ARS, www.forestryimages.org

Knapweed. Spurge. Toadflax. Salt cedar. Nasty names around here.

These plants, and many, many others, are exotic species, introduced intentionally or by accident in the United States over the past couple of hundred years, and which have become particularly troublesome in Montana.

Without the natural checks and balances that exist in the invaders' native ecosystems these noxious weeds have become ecological and economic nightmares. Without the constraints of predators, pathogens or co-evolved plants, non-native plants take hold and squeeze out natives, creating great tracts of land that essentially are monocultures, reducing biodiversity and turning productive habitat into a wasteland for wildlife and livestock.

Acre after acre of grey-brown knapweed stems or the sickly yellow flowers of leafy spurge can be a depressing sight, but there are a number of tools landowners and weed management specialists have to control Montana's weed problems. Herbicides, hand pulling, mowing or grazing, and revegetation with native species are some of the most commonly used counter-weed measures. Biocontrol, or the deliberate use of natural enemies – be they parasites, disease organisms or predators—to stress weed plants and reduce densities to acceptable levels is another approach that has been gaining popularity over the past couple of decades. However, the practice still is being debated by the research community and the general public.

On one hand, insects that feed exclusively on target species could be a cheap, effective and sustainable way to keep weed populations from getting out of control. On the other, combating one non-native species with another could lead to disastrous unintended ecological consequences.

"In my experience, people either tend to think biocontrol is environmentally safer and more effective than herbicides, or they think it's ultradangerous," says Marilyn Marler, director of the Integrated Plant Management Program at the University of Montana.

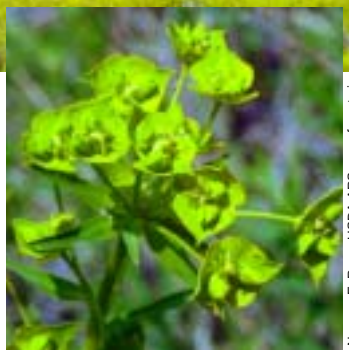
While herbicides are poisonous, both to plants and sometimes animals, they typically break down and disappear in a matter of weeks.

Leafy spurge before biocontrol

Norman E. Rees, USDA ARS, www.forestryimages.org

Flea beetle *(Aphthona)*

USDA APHIS PPQ Archives, USDA APHIS, www.forestryimages.org



Norman E. Rees, USDA ARS, www.forestryimages.org

The introduction of noxious weeds, like leafy spurge (ABOVE), will continue to be a problem given global trade and travel. Biocontrol was first used in Montana in the 1940s against St. Johnswort on the National Bison Range. It was not seriously considered again until the 1970s, when ranchers began lobbying for more options to control weeds. Today there are about 100 biocontrol species in use or under study for use against at least a dozen noxious weed species in the state. For more information about biocontrol in Montana, go to www.weedmt.org.

Insect populations potentially are viable for decades. So far, biocontrol seems to have produced no seriously negative effects in Montana, although there are concerns. One involves a *Rhinocyllus* beetle, which was introduced decades ago to control invasive thistles in Arizona and New Mexico. The screening process to ensure target specificity was not so stringent then and the beetle spread to non-target plants, attacking a rare native thistle. *Rhinocyllus* now is in Montana, but it is unclear whether it will become a problem here with our different climate conditions and array of native plants. More indirect and potentially far reaching effects have been documented from the use of *Urophora flies* that lay eggs in knapweed seedheads (see sidebar below).

According to experts, the best use of biocontrols is in concert with other methods, like herbicides, mowing or pulling and revegetation. "It's not a magic bullet that can solve the problem alone," says Jerry Marks of the Missoula County Weed District.

Neither is biocontrol helpful in small patches, adds UM's Marler. "By the time you're looking at using biocontrol, the weed issue has gotten to a point where you know you're going to be living with it at some level forever. We use biocontrol to give other species a chance against the invader, to level the playing field," she says.

According to Marks, biocontrol has led to a new focus on ecology in weed management and the importance of timing on how effective insects are against weeds.

"In my opinion," he says, "you need to start with the desired vegetation in a place—what you want to see growing—and then work backwards through the life cycles of the plant and insects involved to find an effective treatment strategy."

Knapweed now is the most widespread problem weed in the state. The life cycle for an individual plant is about five years, while natives like bluebunch wheatgrass average about 20 years. Knapweed is an opportunist, establishing and growing quickly to take advantage of open niches in the community. To this end, it puts most of its reproductive energy into massive amounts of seeds. Herbicide use and mowing before seeds are ready are the most effective means of killing or limiting knapweed, but without constant management it soon returns. Therefore biocontrol becomes important for the longer term, and insects that target seed production would seem most promising, although there is no evidence to support this yet. Insects that attack roots or foliage have quantifiably reduced knapweed infestations in some areas. However, there also is laboratory evidence that such predation can instead stimulate knapweed growth and increase its competitive ability.

We use biocontrol to give other species a chance

The most effective biocontrol agent so far has been against leafy spurge, which is able to colonize a wide range of Montana plant communities, from willow stands along rivers to dry grasslands. Spurge takes a long time to establish its enormous root system, so herbicides can do well against young plants. But once spurge has taken hold poison cannot reach all the roots, and new plants spring up. A tiny flea beetle of the genus *Aphthona* does much greater damage to roots and root hairs, at least in the top foot. About a dozen *Aphthona* species are being used in different parts of the state as their effectiveness varies due to different climate conditions. The beetles' impact can be seen in roughly circular patches of stunted plants that don't flower. Eventually, as the food source declines, so do the insects, opening a window for spurge to come back and the cycle to start again.

Quantitatively monitoring the effects of biocontrol agents is essential to understanding its best use as a management strategy. The U.S. Forest Service's Cooperative Forestry and Forest Health Protection northern region unit has been monitoring releases of biological control agents across Montana since 1997, says entomologist Nancy Sturdevant. "We make very few releases of our own, but work with range managers and county weed agents who make releases as part of an integrated weed management program. The weed issue in Montana is too large and diverse for any one agency or private landowner. Managing weeds must be a cooperative effort across the state," she says.

Monitoring the impacts of biocontrols is very labor intensive and time consuming. "It's a matter of resources," says Marilyn Marler. "It's a perfect opportunity to develop a citizen science program that gets Montanans involved in tracking plant responses to biocontrols on public lands."

The top federal agency for overseeing biocontrol efforts is the U.S. Department of Agriculture's Agricultural Research Service. The major steps necessary before an insect biocontrol agent can be introduced are:

A survey of what insects attack the weed in its native region.

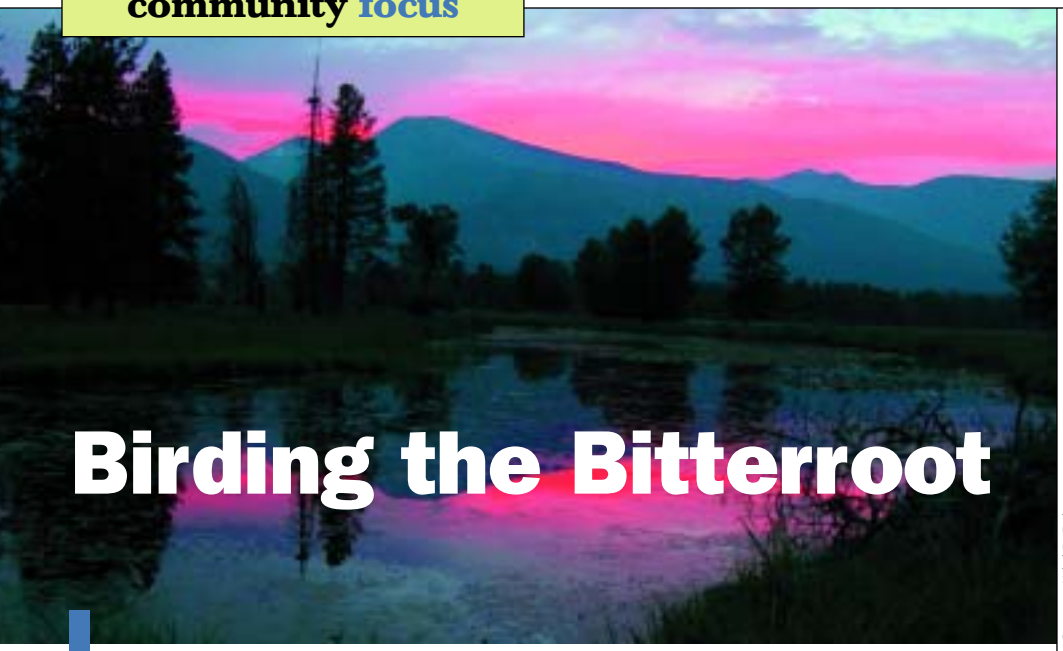
Raising insects on other plants (e.g., crops, natives) to see if they can complete their life cycle on any. Insects are screened only to the genus of weed species, or closely related genuses, meaning that the insect is known only to eat plants of that genus or closely related ones. This can be a problem if a noxious weed has a close native relative.

Insects that meet specificity requirements can be petitioned for approval by the U.S.D.A. Animal Plant Inspection Service. The equivalent department in states that are considering its use must also approve.

Once approved, insects are studied to determine whether they can actually live, reproduce and build up significant populations in the desired geographic location.

University of Idaho Archives, University of Idaho, www.forestryimages.org

A few years ago, Dean Pearson, a U.S. Forest Service wildlife biologist at the Rocky Mountain Research Station, identified the connection between European gall flies, imported in the 1970s to use against knapweed, and an explosion in deer mice populations. Gall flies have become widely established in the state and the maggots overwinter feeding inside knapweed seed heads. These larvae make a nutritious winter food source for mice, enabling their numbers to remain high instead of crashing in the winter. Bigger, denser populations of deer mice have led to the increased presence of hantavirus in those populations around knapweed. It also seems deer mice eat the seeds and reduce the spread of the native plants that the gall flies were introduced to help come back.



Courtesy Kristi DuBois

Birding the Bitterroot

If you create it, they will come.

That's the firm belief, anyway, of the citizens behind the creation of the newly designated Bitterroot Birding and Nature Trail that spans the Bitterroot watershed from Lost Trail to Lolo Pass.

Rather than a continuous physical trail, a collection of prime viewing spots are linked by suggested routes to travel by road. Outdoor activities are featured at every site, from floating the Bitterroot River to hiking a canyon trail or wandering a gentle path into sagebrush country. According to Project Director Deborah Richie Oberbillig, the idea is to give western Montanans and visitors a better idea of the bounty of outdoor recreation and wildlife viewing opportunities available in this part of the state—and help communities reap positive economic and conservation benefits as a result.

The Trail is officially sanctioned by the Montana Tourism and Recreation Initiative, and represents the efforts of multiple partners. The National Forest Foundation has been instrumental in funding Phase I planning in 2004 and the 2005 completion.

Twenty-five other states either have or are in the process of developing similar nature and birding trails, Oberbillig says. The Bitterroot Trail is intended to be a pilot project in what the organizers hope will become a statewide network of birding venues.

More than 50 possible sites, most on public lands but some on private property as well, were nominated by people who live in and know the area. A steering committee winnowed the choices to 25 locales that feature a range of habitats and a diverse natural history.

"From the Sapphire Mountains to the east, to the Bitterroot River flowing through the valley to the jagged Bitterroot Range to the west, every habitat is home to different kinds of birds and animals, either year-round or seasonally," Oberbillig says.

Elk graze in summer in the high peaks and winter in the foothills. Moose feed among willows. Birds of prey grace the river's edge— bald eagles, osprey, great horned owls and hawks.

"Basically," she says, "the trail will consist of itineraries that organize the way visitors and residents can experience the nature of the Bitterroot. The sites will be arranged as suggested loops in the southern, middle and northern parts of the area. These itineraries will encourage visitors to 'stay and bird,' similar to the marketing idea of 'stay and ski'."

According to Oberbillig, successful ventures in other states demonstrate that birding trails bolster economies, bring people closer to nature, link nature with the cultural history of a place and create support for conserving habitat.

"Landowners, businesspeople and other residents from Sula to Lolo have been very supportive of the birding trail idea," she says. "We're also grateful for the financial help from sponsors, especially Travel Montana and Montana Fish, Wildlife and Parks, along with countless hours of work contributed by individuals at the Montana Natural History Center, Lolo National Forest, the University of Montana Avian Science Center and Bitterroot Audubon.

Oberbillig says the birding trail map and guide will be completed and released to coincide with the June 17-19 Bitterroot Birding and Nature Festival—the official kickoff for the Trail. The brochure format differs from other birding trails in its emphasis on links between wildlife and habitat, and between nature and culture—from Native American history to discoveries of the Lewis and Clark Expedition.

"I'm very fired up about the possibility of giving people the chance for memorable wildlife experiences," she says. "I've had those moments and seen it happen to others. For some people it's their first chance to see a bald eagle; for others, it's seeing something they've never noticed before, right in their own backyard. It's wonderful."

For information about the Bitterroot Birding and Nature Festival, contact Bob Danley, Outdoor Recreation Planner, Lee Metcalf National Wildlife Refuge, (406) 777-5552, ext. 203. To learn more about the Bitterroot Birding and Nature Trail, visit the website at www.montanabirdingtrail.org or call the Montana Natural History Center, 327-0405.

Courtesy Lee Metcalf NWR

The Bitterroot Birding and Nature Trail is the first of its kind in Montana but organizers say interest is growing around the state. Residents of Libby, St. Ignatius and Choteau have voiced a desire to create trails that showcase what their regions have to offer in the way of nature and wildlife.

In northeastern Montana, wildlife biologists and representatives from the state's tourism bureau have been promoting a birding trail, featuring species that make use of the area's pothole prairie habitat. In west-central Montana, the Seeley Lake Birding Route provides a guide to several bird-watching spots in the Blackfoot/ Clearwater valleys (www.fs.fed.us/r1/lolo/ resources-natural/ wildlife/birding/seeley/ index.html.)

Go Take a Hike

Ideas to help your family have fun on the trail

By Alan Kesselheim

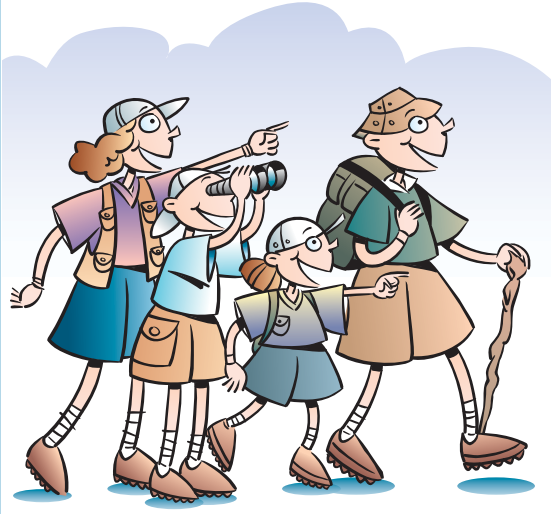
Adventure has always been a priority for my wife and me. So when we decided to have children, we promised each other to do all we could to make the great outdoors part of the family equation. To our delight, not only have our three children, now aged 9 through 13, embraced our passion for exploring, but seeing nature from their perspective has deepened our appreciation of it. Here are some trail-tested strategies we've adopted to keep hiking a favorite pastime in our family.

Pick the Right Place

If you want to introduce your kids to the wonder of the woods, the most important step is finding an appropriate location – one that won't intimidate the young and inexperienced but also won't bore the veterans.

Start Small

You don't have to head to the Grand Canyon to have a memorable hike. There are often dozens of exciting, lesser-known hikes within an hour of home.



Have kids research interesting destinations. The more involved they are in the decision making, the more stake they have in seeing the hike succeed.

Look for places with built-in diversions, such as boulders to scramble over or streams to play in.

Choose areas that offer a variety of options, from short, easy walks to more strenuous hikes so you can do what works best for the day and the group's energy level.

Contact local chambers of commerce, convention and visitors' centers, or regional tourism offices for maps and brochures of trails and parks.

Get in touch with the administrative offices of federal or state land managers. The U.S. Forest Service (www.fs.fed.us), the Bureau of Land Management (www.blm.gov) and the National Park Service (www.nps.gov) all offer a wealth of maps, access tips and resources.

Visit your local recreation-oriented stores or nature centers. They usually carry maps and guidebooks and often employ people who are knowledgeable about outdoor options.

Tip for Success

Make it a group event. Whenever possible, we invite another family, relatives or school friends along on our hikes. We've discovered we all get along better, with less bickering, when others are around.

Prepare at the Trailhead

After all the planning, it's tempting to hop right out of the car and head down the path. But a few minutes spent stretching, establishing ground rules and setting the tone for the day will pay off.

If you have a map or if there's one at the trailhead, look it over with everyone to discuss the length of the hike and points of interest along the way. Also, go over the basics of hiking:

Stay on the trail. There's no such thing as a shortcut, especially in unfamiliar territory.

Pack it in, pack it out. Don't litter!

Be courteous to other hikers and allow plenty of room for people to pass you.

Identify natural hazards, such as ticks, poison ivy and rough terrain and alert fellow hikers if any of these come your way.

Drink small amounts of water frequently.

Pay attention to discomfort. It's better to stop and adjust clothing or look at and put moleskin on a sore spot than to endure and pay the price later.

Find a comfortable pace, even if it seems slow. If you're breathing too hard to talk as you walk, you're going too fast.

Take only pictures.

Most parks and trails prohibit taking any token of nature home in your backpack, so do the next best thing and photograph it.

Don't worry about getting there. Enjoy where you are!

get outside calendar

April 16 **Volunteer Naturalist Training,** 10:00 a.m. **Studying Riparian Ecosystems.** Interested in helping with our Visiting Naturalist in the Schools program? Join us for a Spring Field Trip Training workshop to learn skills to help lead our May school field trips. Anyone interested in spring phenomena and ecology also is welcome to attend. Registration required, 327-0405.

April 16 **Astronomy Series,** 7:30 p.m. **The Science of the Space Shuttle.** A lecture by John Mandler, presented by the Western Montana Astronomical Association. Learn what it really takes to pull off a space shuttle flight. Sky-viewing to follow, weather permitting. $2 donation requested.

April 23 **Saturday Discovery Day,** 10:00 a.m. **Earth Day Weed Pull with Prairie Keepers.** See Imprints for details.

April 26 **Prairie Keepers Native Plant Rescue,** 6:00 p.m. See ad on page 13 for details.

May 10 **Prairie Keepers Fort Missoula Native Prairie,** 6:00 p.m. See ad on page 13 for details.

May 14 **A Soup and Stars Saturday Discovery Day,** 6:00 p.m. **The Moon: Dead or Alive?** See Imprints for details.

May 14 **Prairie Keepers Native Plant Sale** at the Missoula Farmer's Market, 9:00 a.m. See ad on page 13 for details.

May 24 **Prairie Keepers Woad Warriors, Part 1,** 6:30 p.m. See ad on page 13 for details.

May 30-Labor Day **Ongoing Interpretive Programs at Travelers' Rest State Park,** Daily at 11:00 a.m., 1:00 p.m. and 3:00 p.m. Discover the rich cultural heritage and natural history of Travelers' Rest State Park by attending one of their interactive interpretive programs. Learn to load and shoot a flint lock rifle, listen to Nez Perce stories, find out how fire shaped the landscape around Travelers' Rest, and how archeologists and historians were able to pinpoint the now famous site. Free for Montana residents. For more information, 273-4253.

June 4 **Le Junque Rummage Sale,** 8:00 a.m.-3:00 p.m. This high-end rummage and bake sale benefits MNHC's programs. Donations welcome. Everyone who donates is invited to a preview sale on June 3rd from 5:00-8:00 p.m. For more information, contact Betsy Maier, 327-0405.

June 4 **Astronomy Series,** 8:00 p.m. **Telescopes 101.** Presented by Lynn Springer and the Western Montana Astronomical Association. From buying a new or used telescope to finding objects in the sky, this workshop has it all. If your telescope isn't working, bring it along for a diagnosis. You'll even learn how to build your own! Sky-viewing to follow, weather permitting. $2 donation requested.

June 7 **Prairie Keepers Woad Warriors, Part 2,** 6:30 p.m. See ad on page 13 for details.

June 11 **Saturday Discovery Day,** 8:30 a.m. **Return to Blue Mountain.** See Imprints.

June 13-17 **Nature Detectives** (Ages 8-11). See Imprints for details.

June 17-19 **Bitterroot Birding and Nature Festival,** Lee Metcalf National Wildlife Refuge. (406) 777-5552, ext. 203

June 19-24 **Residential Program Elderhostel. Managing Birds and Habitat in the Last Best Place.** See ad on page 3 for details.

June 20-24 **Beetles and Butterflies** (Ages 8-11). See Imprints for details.

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
April 17	18	19	20	21	22	23 **Saturday Discovery Day** 10:00 a.m. **Earth Day Weed Pull with Prairie Keepers.** Meet at the M trailhead.
24	25	26 **Prairie Keepers** **Native Plant Rescue** 6:00 p.m. Location TBA.	27	 MNHC Photo		30
May 1	2	3	4			7 **Saturday Discovery Day** 6:00 p.m. **The Moon: Dead or Alive?**
8 *Western tanagers arrive*	9	10 **Prairie Keepers** **Fort Missoula Native Prairie** 6:00 p.m. Meet at the Nature Adventure Garden at Fort Missoula.	11	12	13	14 **Prairie Keepers** **Native Plant Sale** 9:00 a.m., Missoula Farmer's Market
 MNHC Photo		17	18	19	20	21
		24 **Prairie Keepers** **Woad Warriors, Part 1** 6:30 p.m. Meet at the M trailhead.	25	26	27 *Canada goose goslings hatch*	28
29	30 **Ongoing Interpretive Programs at Travelers' Rest State Park** *May 30 - Labor Day* Daily at 11:00 a.m., 1:00 p.m. and 3:00 p.m. Travelers' Rest State Park	31	**June** 1	2	3	4 **Le Junque Rummage Sale** 8:00 a.m.-3:00 p.m. 120 Hickory St. **Astronomy Series** 8:00 p.m. **Telescopes 101.**
5	6	7 **Prairie Keepers** **Woad Warriors, Part 2** 6:30 p.m. Meet at the M trailhead.	8	9 *Coyote pups emerge from dens*	10	11 **Saturday Discovery Day** 8:30 a.m. **Return to Blue Mountain**
12	13 **Summer Science Day Camp** *June 13-17* **Nature Detectives** (Ages 8-11)	14	15	16	17 **Bitterroot Birding and Nature Festival** *June 17-19* Lee Metcalf National Wildlife Refuge	18

SATURDAY: **Volunteer Naturalist Training** 10:00 a.m. **Studying Riparian Ecosystems**; **Astronomy Series** 7:30 p.m. 120 Hickory St. 16

All programs and events held at MNHC's new home – 120 Hickory St. – unless otherwise noted.

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Residential Program Elderhostel *June 19-24* Managing Birds and Habitat in the Last Best Place. 19	**Summer Science Day Camp** *June 20-24* Beetles and Butterflies (Ages 8-11) 20	**Prairie Keepers** Clark Fork Native Prairie 9:00 a.m. Meet at the Waterwise Garden on 4th St., behind the Missoulian building. 21	22	23	24	**Saturday Discovery Day** 10:00 a.m. Native Plant Garden Tour with Prairie Keepers Begin at Water Wise Garden, behind the Missoulian. 25
26	**Summer Science Day Camps** *June 27-July 1* Frogs, Fish and Fun (Ages 5-7) Bird Brains (Ages 8-11) 27	28	29	**Discover Travelers' Rest Days** *June 30-July 3* The Travelers' Rest Chapter Brigade re-enacts Lewis and Clark's celebratory return to Travelers' Rest on June 30, 1806. 30	**July** 1	2
Cottonwood fluff fills the air 3	4	**Prairie Keepers** Prairie Seed Collecting Workshop 7:00 p.m. Meet at the Fort Missoula Native Prairie. 5	6	 MNHC Photo	**Saturday Discovery Day** 10:00 a.m. Butterfly Safari with Will Kerling. 9
10	**Summer Science Day Camp** *July 11-15* Moose Tracks and Mice Trails (Ages 5-7) 11	12	13			16
17	**Summer Science Day Camp** *July 18-22* Teen Summer Science Camp (Ages 12-15) 18	**Prairie Keepers** Wildflower Gardening 7:00 p.m. Meet at the Fort Missoula Native Prairie. 19	20	21	22	**Saturday Discovery Day** 8:00 a.m. Into the Woods. 23
24	**Summer Science Day Camps** *July 25-29* Little Stories, Big Discoveries Half-Day Camp (Ages 4-5) Wade into Wetlands (Ages 8-11) 25	26	27	*Dippers, robins, bluebirds and house wrens re-nesting* 28	29	30
31	**Summer Science Day Camps** *August 1-5* Junior Nature Detectives (Ages 5-7) Adventures in Science (Girls, ages 11-14) 1	**August** **Prairie Keepers** Wildflower Gardening 6:00 p.m. Meet at the Nature Adventure Garden at Fort Missoula. 2	3	4	5	*Fireweed in peak bloom* 6
7	**Summer Science Day Camps** *August 8-12* My Big Backyard Half-Day Camp (Ages 4-5) Drawing from Nature (Ages 8-11) 8	9	 MNHC Photo			**Saturday Discovery Day** 10:00 a.m. Big on Bugs. 13
14	**Summer Science Day Camps** *August 15-19* Nature Art (Ages 5-7) Bats to Bears (Ages 8-11) 15	16				20

get outside calendar

June 21 **Prairie Keepers** Clark Fork Native Prairie, 6:30 p.m. See ad on page 13 for details.

June 25 **Saturday Discovery Day,** 10:00 a.m. Native Plant Garden Tour with Prairie Keepers. See Imprints for details.

June 27-July 1 **Frogs, Fish and Fun** (Ages 5-7). See Imprints for details.

June 27-July 1 **Bird Brains** (Ages 8-11). See Imprints for details.

June 30-July 3 **Discover Travelers' Rest Days.** The Travelers' Rest Chapter Brigade re-enacts Lewis and Clark's celebratory return to Travelers' Rest on June 30, 1806. Watch and listen as re-enactors pitch a tent, hobble their horses and decide on the location of the now-famous latrine! This four-day event also includes interpretive programs, bird walks, pancake breakfasts, storytelling, an ice-cream social, children's programs, crafts and guest speakers. For information, visit www.travelersrest.org.

July 5 **Prairie Keepers** Prairie Seed Collecting Workshop, 7:00 p.m. See page 13 for details.

July 9 **Saturday Discovery Day,** 10:00 a.m. Butterfly Safari. See Imprints for details.

July 11-15 **Moose Tracks and Mice Trails** (Ages 5-7). See Imprints for details.

July 18-22 **Teen Summer Science Camp** (Ages 12-15). See Imprints for details.

July 19 **Prairie Keepers** Wildflower Gardening, 7:00 p.m. See ad on page 13 for details.

July 23 **Saturday Discovery Day,** 8:00 a.m. Into the Woods. See Imprints for details.

July 25-29 **Little Stories, Big Discoveries Half-Day Camp** (Ages 4-5). See Imprints for details.

July 25-29 **Wade into Wetlands** (Ages 8-11). See Imprints for details.

August 1-5 **Junior Nature Detectives** (Ages 5-7). See Imprints for details.

August 1-5 **Adventures in Science** (Girls, ages 11-14). See Imprints for details.

August 2 **Prairie Keepers** Wildlife Gardening, 6:00 p.m. See ad on page 13 for details.

August 8-12 **My Big Backyard Half-Day Camp** (Ages 4-5). See Imprints for details.

August 8-12 **Drawing from Nature** (Ages 8-11). See Imprints for details.

August 13 **Saturday Discovery Day,** 10:00 a.m. Big on Bugs. See Imprints for details.

August 15-19 **Nature Art** Ages 5-7). See Imprints for details.

August 15-19 **Bats to Bears** (Ages 8-11). See Imprints for details.

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

- Volunteer Naturalist Training
- Summer Science Day Camps
- Elderhostel
- Saturday Discovery Days
- Prairie Keepers
- Astronomy Series
- Volunteer Opportunity

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

Make It Fun

For some hikers, exploring nature is rewarding enough, but others need more than an interesting bird or picturesque stream to stay motivated. Here are some of our favorite trail games:

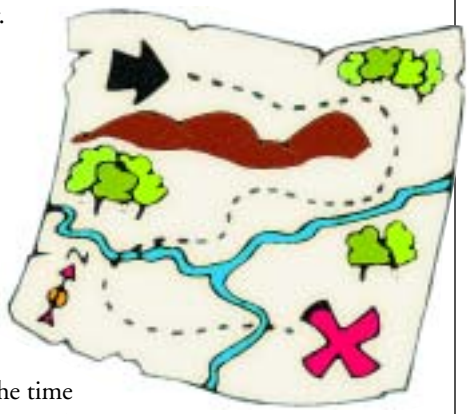
Follow the leader. Give each kid the opportunity to take the lead, including setting the pace and investigating things along the way.

Wildlife watch. Encourage everyone to notice plants and animals and keep a group checklist.

Treasure hike. Have kids take turns hiding an object along the trail for everyone else to look for.

Sing-alongs. Sing rounds, especially ones that call for fun choreography, such as "The Hokey Pokey."

Storytelling. Tell a progressive story that passes from hiker to hiker.



Finish the Journey

Back at the trailhead, take the time to unwind, stretch, cool down and get comfortable. Change clothes and footwear—my kids slip on their flip-flops—and have a refreshing snack. And don't forget to record the experience in some way. We keep journals devoted entirely to our outdoor adventures. After each outing, we make an entry by writing a description of our trip, pasting photos, maps and drawings to the pages. Periodically the kids pull out the journals and page through them to remember their accomplishments.

Tip for Success

Don't rush the hike. We strive to savor the moment and focus on what's around us rather than simply pass through on our way to a goal. My wife and I try to set an example by pointing out birds or flowers and stopping at interesting rock formations to encourage a leisurely style of hiking. Most importantly, we let the kids explore, even if it means not reaching the goal we had in mind.

Tips for Success

Stop along the way for short breaks, maybe every 20 minutes or so, or at a series of pre-determined landmarks—the first stream crossing, when we get to the lake, at the top of the hill. That way kids have doable goals to shoot for and less of a tendency to ask for stops.

Once when our kids were dragging and getting bored, we stumbled on an idea that made the hike more fun. We came to a little dry waterfall that we had to climb around and I said, "Uh-oh, looks like we have a problem!" Immediately the kids took on the challenge, tackled the obstacle in no time and dashed off to find the next "problem." Pretty soon there were problems everywhere – logs to balance across and other difficult routes to overcome. All the tiredness and boredom they had been feeling evaporated.

Family Packing Checklist

- Sneakers or boots that have been broken in but are sturdy enough to provide support.
- An extra pair of clean, dry socks.
- Layers of loose fitting, light-weight clothing (synthetics, such as fleece, dry much faster than cotton).
- A brimmed hat.
- At least one quart of water per person for a day hike.
- High-energy and packable (non-crushable) foods, such as trail mix, energy bars, jerky, apples, candy to ration out.
- Sunscreen and bug repellent.
- Binoculars for wildlife watching and a magnifying lens for close observation of flowers, rocks or bugs.
- Plastic bag for trash.
- Basic first-aid supplies for day hikes: a handful of band aids, moleskin to prevent blisters, antibacterial ointment.
- Map, compass and field guide(s).
- Toilet paper or tissues.

Adapted with the author's permission from Family Fun *magazine, October 2004. Alan Kesselheim is the author of eight books and hundreds of magazine articles on outdoor topics. He and his family live in Bozeman, where they enjoy paddling and hiking in Big Sky country. Kesselheim also performs with classical guitarist, Stuart Weber, in* Confluence: A Duet of Words and Music.

Prairie Keepers

Spring and Summer Schedule of Events

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

April 23 **Earth Day Weed Pull, 10 a.m.**
See page 16 for details.

April 26 **Native Plant Rescue, 6 p.m.**
Help rescue native plants from a construction site. The wildflowers and grasses will be used in local restoration projects and gardens. Location TBA. Contact MNHC, 327-0405 for information.

May 10 **Fort Missoula Native Prairie, 6 p.m.**
Learn about gardening with native plants by taking a guided tour of the Nature Adventure Garden and Fort Missoula Native Prairie, then help transplant some. Meet at the Nature Adventure Garden at Fort Missoula.

May 14 **Native Plant Sale at Missoula Farmer's Market, 9 a.m.**
The Clark Fork Chapter of the Montana Native Plant Society has its annual native plant sale fundraiser. Buy healthy native wildflowers, shrubs and grasses that have been grown by Society members from ethically collected seeds. North end of Higgins Ave.

May 24 **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 7 **Woad Warriors Part 2, 6:30 p.m.**
We'll sweep the Sentinel prairie again for woad plants. Meet at the M trailhead and be ready to walk a few miles.

June 21 **Clark Fork Native Prairie, 6:30 p.m.**
Cheatgrass Pull. Learn to identify local grasses and help pull some nasty species out of this public prairie park. There will be snacks, raffle prizes and information about ongoing volunteer opportunities at this urban prairie. Meet at the Waterwise Garden on 4th St., behind the Missoulian building.

June 25 **Native Plant Garden Tour, 10 a.m.**
See page 16 for details

July 5 **Prairie Seed Collecting Workshop, 7 p.m.**
Learn to collect seeds from wildflowers and native bunchgrasses to use in local restoration projects. A great activity for families and kids. Meet at the Fort Missoula Native Prairie.

July 19 **Wildflower Gardening, 7 p.m.**
Learn about native wildflowers that thrive with minimal care. Samples available for purchase; transplant blanketflower, golden aster, penstemon, yarrow and others. Meet at the Fort Missoula Native Prairie.

August 2 **Wildlife Gardening, 6 p.m.**
Time to start thinking about attracting wildlife to your garden this fall and winter! Learn about easy-to-grow native plants that produce bird friendly berries, hiding spots and spring nesting opportunities. Meet at the Nature Adventure Garden at Fort Missoula.

Tune In to The Early Show

Songbirds of Montana's Prairie Grasslands

Baird's sparrow

Courtesy R. Royse

By John Carlson

Chestnut-collared longspur

Courtesy R. Royse

It's mid January as I write this and the grasslands of northeastern Montana are cloaked in a windblown covering of snow. The only songbirds here now are large nomadic flocks of Lapland longspurs, snow buntings and horned larks that are more concerned with survival than with singing. Only the horned larks will remain through the spring to breed here; the Lapland longspurs and snow buntings will follow the retreating snow to the tundra to breed.

But our wide open spaces will not remain silent for long. As the winter birds retreat north, they will be replaced by other grassland species returning home from the south, intent on forming territories and raising their young. Their appearance signals the end of the long winter and the beginning of one of the least-appreciated vocal performances in the world. The stage for this show is not the branches and limbs of trees and shrubs we associate with the singing perches of most songbirds, but the open airspace of the prairie grasslands. Here these birds use the wind as perches in "sky" trees. From their aerial vantage points they sing songs to establish ownership of the patch of grass beneath them.

Incredible aerial vocalists

Imagine it is 6:00 a.m. on a pleasant day in early June. We stand on a small rounded hill in northern Valley County near the Canadian border. The sun has just risen, the wind is lightly blowing and we can hear an avian opera in full force. Let's see who the main characters are, starting with a bird of the lower "branches" and working our way up the sky tree.

The first performer actually is perched on a low-growing snowberry bush. He (because all the roles in this show are played by males) is a small, light-brown sparrow with darker streaks on his back and breast and a buffy head and nape. He throws his head back and belts out a tinkling *"trick-e trick-e trik-eeeee chiky-le-roit"*. Our program for the morning performance—

The Sibley Field Guide to Birds of Western North America—lists this cast member as a Baird's sparrow.

As we continue our visual climb up our imaginary tree, the chestnut-collared longspur makes his entrance. These birds perform about 10 feet off the ground and sing a sweet descending warble—*"seet sidee tidee zink zeerdi"*—while fluttering through the air. This is the most colorful member of the cast, with a dark black belly that contrasts with an extensive rufus collar and a black stripe running across his creamy-colored face.

As we keep watching, the next player rises up on powerful wing strokes through the longspur's performance until he is about 20 feet in the air. At the top of his climb, he throws his wings back and keeps them there, then slowly parachutes to the ground while singing *"see, see, see me, see me, hear me, hear me, see"* the whole time. When he gets close to the ground he stops his fall and heads back into the sky to repeat the refrain. This is the McCown's longspur, a dapper gray bird with a black cap and breast set off by a cinnamon shoulder patch.

As we watch these displays, a faint, descending *"tzee, tzee, tzee, tzee tzee, tzee, tzee"* falls from the open air above us and we realize we've been hearing this ethereal song the whole time, only we've been too engrossed by the other performers to notice.

McCown's longspur

Courtesy R. Royse

Sprague's pipit

Courtesy R. Royse

It takes us a long time with heads craned back and eyes squinting to spot the small black speck about 300 feet above that is producing this song. It is the Sprague's pipit, perched on the topmost "branch" of our sky tree. If we could get a good look at it we would see a small, straw-brown bird with a necklace of darker streaks and a whitish face that gives the bird a somewhat surprised expression.

These are only a few cast members of this prairie broadcast. There are many others, each with its own unique role in this rapidly vanishing ecosystem. This spring, take a trip to a prairie grassland to tune in for yourself. You won't be disappointed.

John Carlson is a wildlife biologist with the Bureau of Land Management in Glasgow. He has been observing grassland birds in northeastern Montana since he was a boy and continues to be enthralled with their displays each spring. With fellow bird researchers, he is leading an effort to create a birding trail in northeastern Montana.

Northern Valley County provides an open grassland habitat for prairie songbirds.

Courtesy John Carlson

imprints

News from the Montana Natural History Center

MNHC Photo

Got Time?

People from all walks of life who love the natural world and want to share their time are vital to the Montana Natural History Center. MNHC relies upon such volunteers to achieve its mission of promoting and cultivating the appreciation, understanding and stewardship of nature through education. MNHC volunteers help out in many ways, including assisting with public programs, school programs, office duties, the library, the native plant garden and Elderhostel programs, to name a few.

There are no fixed qualifications for becoming a MNHC volunteer beyond having a curiosity about nature, enjoying working with kids and adults and an interest in helping a community non-profit organization. MNHC staff provide training for all participating volunteers, and MNHC volunteers enjoy companionship with a great group of people who share similar interests. As a volunteer you receive a monthly newsletter and are invited to special volunteer events. Volunteers also receive *Montana Naturalist*, discounts in our gift shop and on special programs, and access to the MNHC natural history library.

For more information about volunteer opportunities with MNHC, please visit our website at www.MontanaNaturalist.org or contact Community Programs Coordinator Gabrielle Sivitz at 327-0405.

Join Us!

For Saturday Discovery Days

April 23 Earth Day Weed Pull with Prairie Keepers, 10 a.m.
Celebrate spring and Earth Day by helping with urban prairie restoration! Pull knapweed, scatter wildflower seeds and cover eroding trails on Mt Sentinel. Meet at the M trailhead.

May 14 Soup and Stars. The Moon: Dead or Alive? 6 p.m.
Presented by Bill Elison. Join MNHC and the Western Montana Astronomical Association for a light dinner and then explore the Moon's craters, mountains, valleys and how they were created. Fun demonstrations and sky-viewing if weather permits. An opportunity to ask all your astronomy-related questions. $15/$10 MNHC members.

June 11 Return to Blue Mountain, 8:30 a.m.
A birding and post-fire ecology field trip with avian science professor Dick Hutto and wildlife educator Sue Reel. Wildflowers should be abundant in June so we will also identify plants and discuss how they are adapted to fire. $20/$15 MNHC members.

June 25 Native Plant Garden Tour with Prairie Keepers, 10 a.m. Visit several local native-plant gardens and talk with the gardeners who created them. This self-guided tour begins at the Waterwise Garden, behind the Missoulian building on 4th St. Free.

MNHC Photo

July 9 Butterfly Safari, 10 a.m.
Join local expert Will Kerling for an in-depth look at our region's Lepidoptera. Start at MNHC with a slide show on local species, their habits and how to find them, then head into the field. Dress for the outdoors and bring snacks and water. $20/$15 MNHC members.

July 23 Into the Woods, 8 a.m.
Head into the mountains to explore the forest ecology of western Montana and read its landscape, including geology, wildlife and native plants. Along our hike, we'll read selections from nature writers. Bring a bag lunch and plenty of water. $20/$15 MNHC members.

August 13 Big on Bugs, 10 a.m.
Bring the family for a day of interactive invertebrate fun. Meet live insects and learn about where they live and what they do during this buggy celebration. Cost TBA.

Registration is required for Saturday Discovery Day programs, call 327-0405. See individual listings for cost information. All events meet at 120 Hickory St. unless otherwise indicated.

Get Ready, Get Set
for MNHC's 2005 Summer Science Day Camps

MNHC Photo

Parents! It's not too soon to be thinking about taking part in MNHC's 2005 Summer Science Day Camps for kids aged 4 to 15. Camps run Monday through Friday, 9 a.m. to 3 p.m., with before and after-camp care offered from 8-9 a.m. and 3-5 p.m. Half-Day Camps run from 9 a.m. to noon.

The cost for Camps (including a camp T-shirt) is $145/members, $195/non-members (includes a MNHC membership). The Half-Day Camps are $60/$110 (including membership); the Teen Camp and Girls Only Camps are $180/$230 (including membership).

Ages 4-5

Little Stories, Big Discoveries Half-Day Camp
July 25-29
Stories become springboards for discovery! Every day begins with a different story that will guide our explorations and our imaginations as we step outside to discover what kinds of tales nature can tell us.

My Big Backyard Half-Day Camp August 8-12
An adventure begins when you walk out your door! Spend the week looking for animal signs, searching for insects, watching for birds and peeking at plants. Using naturalists' tools, we'll explore natural areas in and around Missoula, following our curiosity and adventurous spirit.

Ages 5-7

Frogs, Fish, and Fun June 27– July 1
Sound a bit fishy? Join us for a week of amphibian adventure as we dive into a "wet and wild" exploration of rivers and streams. Learn about Montana's frogs and other aquatic creatures. Investigate food chains, collect aquatic insects and find out other fun facts about aquatic habitats.

Moose Tracks and Mice Trails July 11-15
Learn how to read the signs that animals, even insects, leave behind. Identify tracks, learn about animal homes, figure out "who" was nibbling at that bush. Become an expert at reading clues in the natural world and sharpen your observation skills as we discover a world full of animal signs.

Junior Nature Detectives August 1-5
What processes are at work in the natural world? Solve mysteries from clues left behind by Montana's wildlife. Study the geological forces that are shaping our landscapes. Student detectives will make their own "nature detective kit." With spy glass and bug net in hand, explore local habitats and use the tools of the trade to make exciting discoveries.

Nature Art August 15-19
With a paintbrush and pencil in hand, we'll let wonder inspire our masterpieces! Using a variety of styles and mediums we'll explore the colors and designs of nature and use the inspiration of our natural world to create our own works of art.

Ages 8-11

Nature Detectives June 13-17
What processes are at work in nature? Solve mysteries from clues left behind by Montana's wildlife. Study the geological forces that are shaping our landscapes. Student detectives will make their own "nature detective kit." With spy glass and bug net in hand, explore local habitats and use the tools of the trade to make exciting discoveries.

Beetles and Butterflies June 20-24
Insects make up the largest group of animals on Earth. They are almost everywhere you look. What bugs dominate the sky? Which patrol the forest floor? Learn about the basic body plan of creepy crawlies that inhabit our region, their amazing adaptations and what they need to survive.

Bird Brains June 27-July 1
The week will "fly by" as we learn about our feathered friends. Become a fledgling ornithologist by learning to identify local birds and exploring the perils of migration. Learn about birds from the inside out as we study bird anatomy, how and what different birds eat, and build bird feeders.

Wade into Wetlands July 25-29
Why are wetlands so important? We'll explore local wetlands and investigate the amazing cycle of water. Paddle upriver with us to collect aquatic insects, learn about the health of our wetlands and create a "pond aquarium."

Drawing from Nature August 8-12
Inspiration often comes from the natural world. What better way to celebrate our natural wonders than through art. Explore different styles, experiment with natural mediums and observe nature in a new light.

Bats to Bears August 15-19
Montana's magnificent mammals will amaze you as you discover their characteristics. Learn what makes a mammal a mammal as you study your local furry friends and survey nearby small mammal populations. Examine study skins and skulls, and explore the habitats of your favorite critters.

Girls Only Ages 11-14

Adventures in Science August 1-5
Love adventure? Interested in studying science outside? We'll use our curiosity and questions to launch investigations into the natural processes at work in our region. From valleys to rivers to mountain tops we'll use the tools and theories of science, and we'll see first-hand how adventurous science can become. This camp includes one overnight camping experience.

Ages 12-15

Teen Summer Science Camp July 18-22
Blend nature, science and adventure and you'll have a summer experience to remember. We'll study geology while hiking in the Bitterroots, take a closer look into stream science while floating and rafting local rivers, and climb into the forests to investigate wildlife and habitat. We'll meet with local researchers and learn about the variety of natural history research on going in our area. We'll have opportunities to participate in data collection ourselves! This camp includes one overnight camping experience.

A Few Definitions

By Charles Finn

The love of bird watching
is the love of things wild and free.
It is the round happy face of the
chickadee, the tall elegant steps of
the heron, the first darting curve of
a swallow parting the dawn.

For many of us bird watching is a flash of
movement in the trees, a finger extended and
pointed, then the swing and focus of binoculars.
It is a small gasp—recognition—or the
confused comparison of similar species.
It is good stories shared with good friends.

Bird watching—like anything, like everything—is a microcosm
of the whole. I learned this from the song sparrow's song,
from the winter wren pointing its tail, from the strong pump
of the osprey's wing, from the loons calling me out and into the night.

Bird watching is not a sport or a hobby or an occupation, it is a
participation in the living world. It is the egg, the found feather.
It is the owl, hooked beak dappled in blood, and the young downy
chick on the edge of its nest. It is flight and fancy and singing,
yes, all singing, in the arching light of the dawn.

Charles Finn in a freelance writer living in Stevensville. His essays have appeared in Big Sky Journal, Montana Magazine, High Country News, Open Spaces *and* Northern Lights. *He also writes the monthly wildlife column "Common Miracles" for the Missoula magazine,* Inside The Garden City.

Watercolor painting courtesy of Deborah O'Connor Clow (www.lovedogdesign.com).

Yes! I want to become a member and support the Montana Natural History Center. Basic membership dues are $50. Members receive *Montana Naturalist*, a membership card and decal, invitations to special programs, a discount on programs and MNHC merchandise, and a free pass to participating nature centers throughout the country.

☐ Basic Membership: $50

☐ I would like to pledge $ _____ monthly/annually. Please charge my credit card.

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

Name _____

Address _____

City _____ State _____ Zip _____

Phone _____

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

Account Number _____ Expiration 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 new 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**

Enhance your walls while enriching our programs.

Missoula artist Kendahl Jan Jubb completed a three-panel watercolor scene for the Montana Natural History Center entitled *Six Magpies*. The work highlights our amazing area wildlife.

We are offering these special prints suitable for framing in a signed and numbered limited edition of 250.
$75 members/$100 non-members.

Posters are also available,
$25 members/$30 non-members.
Or you can wear *Six Magpies* by purchasing one of our beautiful t-shirts,
$15 members/$17 non-members.

MONTANA Natural History Center
120 Hickory Street
Missoula, MT 59801

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Montana Shares

MNHC is proud to be a member of Montana Shares. Check with your employer to learn how you can participate!