Fall 2004

MONTANA Naturalist

Fall Naturalist Scavenger Hunt

see Get Outside Guide, page 12

A publication of the MONTANA Natural History Center

Land(scape) of opportunity

Return of a native

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

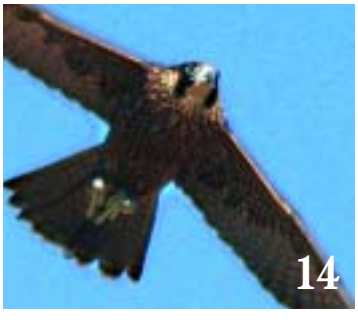
Fall 2004

MONTANA Naturalist

Feature

Departments

Special Pull-Out Section



Cover photo – Photo of aspen by Pam Voth, an independent photographer and sound recordist based in Missoula. You can reach her at pamvoth@hotmail.com.

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MNHC Photo

As fall again approaches during the ongoing drought that has parched much of the western United States, I cannot help but think about fire and its impact on Montana. Fire is one of nature's most spectacular and effective evolutionary forces and, as our feature story shows, the adaptations of plants and animals to fire are fascinating and diverse.

In the last few years I've had the opportunity to walk through many burns – from Yellowstone to Black Mountain. I never tire of spotting a flash of yellow and red or a blur of blue flitting among the trees in a recently burned area. Western tanagers and mountain bluebirds seem to know they look beautiful in that stark environment. The presence of these birds serves as a vibrant reminder that life returns to burned forests faster than you might expect.

As the participants in our school programs and public Saturday Discovery Days learned during our many fire ecology field trips, fire leaves a mosaic of effects in its wake. Scorched earth abuts virtually untouched forest. Trees that appear burnt will survive. A new regime of grasses and shrubs and flowering plants burst into growth, feeding on the sudden flush of nutrients released by flame.

Fire always has been and always will be an essential agent of change in the natural cycle of forests. The more we study the interconnectedness of life, the more we learn. With this in mind, we are creating a pilot program with partners from the University of Montana and Lolo National Forest, where high school students are contributing data on post-fire forest recovery and the use of burned areas by wildlife. We believe that education is the key to stewardship, which protects our living classrooms so that we can continue to learn and benefit from our natural surroundings.

We hope you'll enjoy the fire ecology and other articles in this issue of *Montana Naturalist.*

Brad Robinson
Executive Director

Celebration

Ecological impacts of forest fire

Courtesy of Richard Chapman

By Caroline Kurtz

A late June morning tramp through a section of the Black Mountain burn was, to paraphrase the words of one visitor, like seeing the face of the moon transformed into a garden.

Where the fire that swept across 7,300 acres in the Lolo National Forest near Missoula last August had burned most intensely, the scene was uniformly charcoal-colored. Not a blade of green remained. By May this year, visitors to the same site walked on a lush carpet of pine grass. One month later, participants on a Montana Natural History Center field trip counted at least 20 species of wildflowers and shrubs in profusion, heard or saw at least that many kinds of birds, and found plentiful evidence of the literally millions of insects that flock to the food bonanza burned wood and new growth provide.

When it comes to forests, are the wildfires that naturally occur, and have occurred throughout millennia, cause for a celebration or a wake? From an ecological point of view, there's no question, according to wildlife biologists and others.

"We've been programmed to see no value in a burned forest, other than the financial value we can squeeze out of the dead and dying trees," says Dick Hutto, a professor of ecology and ornithology at the University of Montana. "But from a biological perspective, there's plenty of value." In addition, he says, most of the ecological benefits from fire are lost when we salvage burned timber.

The wealth of new opportunities for food and housing that fires creates mean that for birds, at least – Hutto's area of expertise – many species are far more abundant in post-fire habitat than in any other type. Mountain bluebirds are two or three times more abundant in burned forests. Western tanagers, dark-eyed juncos, western wood peewees, chipping sparrows, mountain bluebirds, black-backed woodpeckers and Townsend's solitaires statistically are all more likely to be seen in burned areas than elsewhere.

"You'd be hard pressed to find any of those species to be more abundant in a salvage-logged area," says Hutto, than in an area that had been left alone after fire.

The U.S. Forest Service and other agencies are interested in knowing what happens to birds after fire moves through an area, using them as indicator species to assess the usefulness of habitat in order to salvage timber or manage forests in ways that minimize impacts on the wildlife that is relatively restricted to such conditions.

According to Hutto, birds make great indicators of habitat use because no other animal advertises its whereabouts like birds do for purposes of mating or territory defense.

"Just stand still and listen and they'll tell you who and where they are," he says.

One-stop shopping

Birds are drawn to post-fire forests because of the wealth of food and nesting opportunities they afford. Wood boring beetles detect smoke and fire from miles away and rush to burned forests in huge numbers to lay their eggs just under the bark of dead and dying trees. The beetle larvae remain in the wood for two years, growing into large, juicy grubs that provide powerful protein meals for hungry nestlings. The beetle buffet lasts up to four years post-fire and then declines.

But fire creates many other food opportunities as well. Some of the cones of lodgepole pine and larch, for example, need

Dave Menke, Courtesy of USFWS

The thin skin and sensitive roots of Douglas fir trees (above) make them more vulnerable to fire than ponderosa pine or western larch. Mountain bluebirds (male, right), western tanagers, dark-eyed juncos, western wood peewees, chipping sparrows, Townsend's solitaires and black-backed woodpeckers all are more likely to be seen in burned areas than in unburned habitat.

or Wake?

Courtesy of Pam Voth

Species seen or heard on the June Saturday Discovery Day walk through the Black Mountain burn site:

BIRDS

Black-backed woodpecker
Chipping sparrow
Cowbird
Dark-eyed junco
Downy woodpecker
Hairy woodpecker
Mountain bluebird
Northern three-toed woodpecker
Olive-sided flycatcher
Pileated woodpecker
Pine siskin
Raven
Rock wren
Ruby-crowned kinglet
Solitary vireo
Townsend's solitaire
Western bluebird
Western tanager
Western wood peewee
Yellow-rumped warbler

MNHC Photo

PLANTS

Arnica
Big-leaf geranium
Bluebells
Blue-eyed Mary
Fairy cup mushroom
Fireweed
Indian paintbrush
Liverwort
Miner's lettuce
Moss (var.)
Ninebark
Pea (var.)
Penstemon
Serviceberry
Slime mold (var.)
White hyacinth
Yarrow

Tracking Black Backs

From a wildlife or forest management perspective, it's important to understand what constitutes a viable population of organisms. If there are not enough individuals within an area to breed together, or if the area needed to support a breeding population is not sufficient, there eventually may be no population to manage.

Jennifer Woolf, a Ph.D. student in wildlife biology at the University of Montana, spent the summer surveying black-backed woodpeckers in Montana, Oregon and Alberta. Black-backs are considered a sensitive species by the U.S. Forest Service and a species of special concern in Montana. As such, she says, land management agencies direct resources to manage this species, but this is difficult without knowing at what scale their populations function. And because black-backs depend on

Courtesy Dick Hutto

recently burned forests for nesting and feeding sites, she would also like to determine at what scale burned patches are available for birds to disperse.

"Black-backs are naturally rare and wide-ranging," she says, "but we don't know how wide ranging."

Woolf and colleagues from Oregon and Alberta collected blood samples from 10 nesting sites in each region. They will use DNA tests to determine how closely related the birds are and help define their population boundaries.

Woolf says that DNA screens will reveal whether the birds are from the same population or from recently isolated populations.

"We might not expect to see much genetic difference among birds in Montana, but will they also be similar to birds in Oregon and Northern Alberta? We'll know more in a few more summers."

MNHC Photo

Much of the forest covered by the Black Mountain burn on Blue Mountain had been marked for timber harvest before the fire and so was slated for salvage. Forest Service biologist and educator Sue Reel (above) was able to convince the Lolo National Forest supervisor to preserve it as an educational and research site.

MNHC Photo

A burned tree shows signs of heavy woodpeacker activity. Unlike bark beetles, wood boring beetles are only attracted to dead and dying timber. They have little affect on a live, healthy forest.

flame to melt their resinous coats and allow seeds to disperse and germinate. Pine siskins, red crossbills and Clark's nutcrackers feast on the seeds and aid in seed dispersal. The birds also are drawn to the downy seeds of fireweed, dandelion and other flowers. The smorgasbord of wildflowers that spring up with the increase in sunlight and nutrients in a burned forest invite hummingbirds. In late summer, the more open, grassy conditions attract grasshoppers, which in turn draw bluebirds, robins and other "pouncers" that fly from perches to the ground and leap on insect prey. Olive-sided flycatchers and western wood peewees also are more numerous in burned forests, perhaps because they can maneuver better or locate flying prey better among bare trees with little or no shrubby understory.

Bluebirds, Townsend solitaires and juncos make use of new nesting sites created by fire, such as the holes left after tree roots and stumps have burned out. Somewhat curiously, western wood peewees, which typically occupy cottonwood riparian areas along streams, are drawn to burned forests and build their cup nests in the forks of charred twigs, seemingly without the least cover. As it turns out, birds that nest in severely burned areas enjoy a couple of years of increased nest success, meaning more eggs hatch and nestlings fledge because, for a short time, they have few or no major nest predators, such as tree squirrels, chipmunks or garter snakes.

Fire specialists

And then there are the woodpeckers – pileated, northern three-toed, hairy, downy and black backed. During our Saturday morning saunter, conversation and questions were repeatedly interrupted by the staccato drumming of all these types of woodpecker searching for insects inside charred wood. Drumming also is used for advertising and territory marking. Careful listeners might be able to distinguish hairy and downy woodpeckers, which have an even drumming rate, from the three-toed and black-backed birds that tend slightly to increase or decrease their speed at the end.

We came upon a black-backed nest in a small-diameter tree canted alongside our trail. The bird's soot-colored back feathers were a perfect match for the blackened tree trunks. The two to four young in this nest were near fledging, and we could hear them chirring away inside

Courtesy of Pam Voth

for their next meal. The parent bird, with a mouthful of beetle larvae, sat in a tree about 20 yards away and chirped back, waiting to come to the nest until we had moved a safe distance away.

Studies of birds like woodpeckers that nest in tree cavities show that burned forests are important nesting habitat, but that, even more importantly, birds prefer to use trees that were already old and diseased pre-fire. This means, Hutto says, that if so many birds make use of burned forests, we need to know what were the conditions that existed pre-fire that produced the essential ingredients afterwards? Such questions again have implications for pre- and post-fire forest management.

"If you draw a boundary around the whole of a fire area," says Hutto, "it doesn't all look the same. You'll see a patchwork of green and brown and black areas."

Pileated woodpeckers like the green trees at the edge of a burn. Western tanagers prefer moderately-burned places, rather than the green or totally toasted areas. Black-backed woodpeckers and others seek out high-intensity burns.

"It just goes to show that the appropriate prescription for forest fire is complex," says Hutto. Fire-dependent wildlife needs the variety that a naturally occurring fire produces.

"We need it all," he says.

MNHC Photo

Fire generally leaves a patchwork of green, brown and black areas in its wake. Above, aftermath of the 2003 Moose Creek fire on the western edge of Glacier National Park. At right, burned out tree roots leave a network of holes that provide new nesting sites for some birds. They also can be traps for anyone who isn't careful walking through a post-fire forest, as UM professor Dick Hutto illustrates.

Mysterious Morels

One of the most eagerly anticipated effects of a forest fire is the crop of highly desirable black morels (genus Morchella) a burn produces. Even the most sane and sober person can become a morel-hunting lunatic the spring following a fire.

But leaving aside morel economics (black morels can fetch upwards of $100 per pound dried) and cuisine (the sautéed morel has a flavor that, apparently, should not be missed), what do we know about the ecology of these elusive and mysterious mushrooms?

"Relatively little," according to mycologist Larry Evans.

Like all fungi, morels play roles as decomposers of organic matter and nutrient recyclers. Like many types of mushrooms, morels also are mycorrhizal symbionts, meaning that through their underground filaments they connect with plant roots and help the plants obtain the nutrients they need.

"All plants require mycorrhizae to survive and thrive," Evans says. For instance, "Douglas fir is reputed to associate with some 1,600 species of fungi throughout its range."

Courtesy of Larry Evans

Picking morels, which essentially are the "fruit" of the organism, should not harm the body of the fungus, which lives underground, as long as only mature mushrooms are harvested. This allows the reproductive spores a chance to be released. Evans suggests cutting morel stems with a knife to avoid disturbing underground hyphae, and using a bucket with holes or a mesh bag to put the spongy-looking treasures in to allow spores to escape. Another concern in some areas is soil compaction by pickers, which might be detrimental to the morels' underground growth.

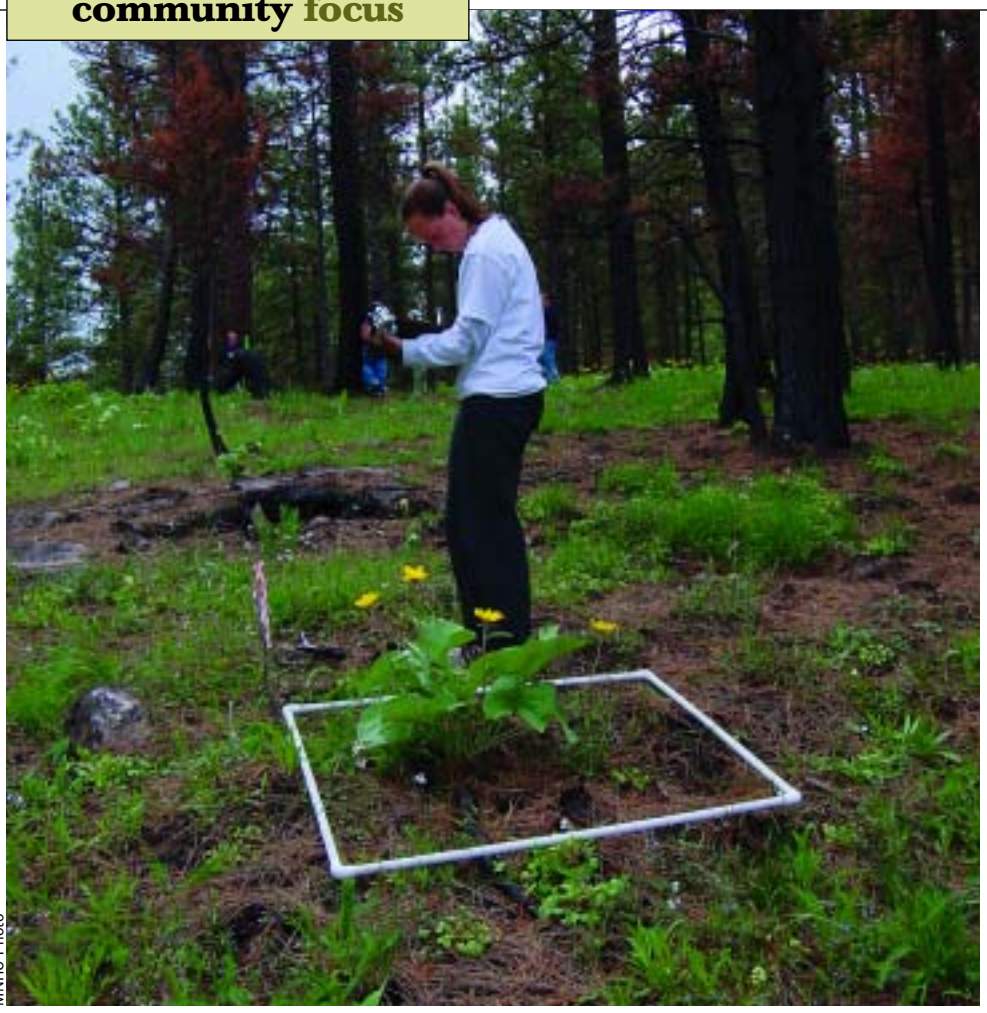
Evans says he doesn't know of any vertebrate other than *Homo sapiens* that regularly eat morels, "although there is anecdotal evidence of deer and elk nibbling them." But, he adds, the animals actually like oyster mushrooms much better.

However, "lots of bugs, from thrips to millipedes, and then snails and slugs, devour morels with gusto," Evans says. So you should be sure to clean your morels carefully to avoid getting some unexpected protein with your meal.

Exactly why black morels fruit only after forest fires is not known. Most likely it has to do with the availability of nutrients and perhaps the lack of phenols, which burn off in forest fires. There are other types of morels that can regularly be found in the spring in riparian areas, but they fail to elicit the same frenzied response. Evans suggests why.

"I'd be happy to sell you a few pounds of each," he says, "and allow you to explore the culinary subtleties."

For further information on morels and other Montana mushrooms, including an essay on ethical harvesting, visit Evans' website at www.fungaljungal.org.



MNHC Photo

Real World Research

How fire shapes forests in the Northern Rockies

By Caroline Kurtz

The juniors and seniors in Dave Oberbillig's two ecology classes at Big Sky High School in Missoula are a smart and motivated bunch. Nevertheless, getting them loaded and transported to a field site, making sure they have the necessary equipment and know how to use it, and having them record observations on three topics at nine sites split between three locations is a challenge when you only have a 90-minute class.

But with the help of researchers at the University of Montana's Avian Science Center and educators at the Montana Natural History Center and Lolo National Forest, the students are learning how to get it done. Their data eventually will help answer questions about how local forests and wildlife recover from fire.

The Seattle-based Bullitt Foundation has provided $15,000 to create a pilot project that links scientists and environmental educators with students and the general public to increase understanding of fire's role in the natural cycle of change in forests. Students learn how to orient themselves and map a site. They lay out meter-square plots to count the number and types of grasses, forbs and shrubs growing. They count the number of beetle-infested trees in an area and try to identify the type of beetle present. And they listen for and identify as many different types of birds as possible in a specific amount of time. Such data gathering requires advance classroom preparation on bird, bug and plant identification; how to use binoculars, compasses and GPS units; and how to set up transects for measurement.

"This project ties right in with what we've been doing in class," says Oberbillig. "It's great to get kids out there in the real world collecting data."

Another advantage to linking with scientists, he adds, is being able to bring people into the classroom, like researchers Dick Hutto and Kristina Smucker and wildlife educator Sue Reel, who have even more knowledge to share with students.

"We've been doing something similar to this for several years, going out in the fall to observe and record," says Oberbillig. This project takes his curriculum further by adding a spring field trip, and ensuring that students use consistent methods to take data that compares burned and unburned areas and areas of different fire intensity. The students' data will be added to a website at the Avian Science Center, where it will be available to anyone who is interested (http://biology.dbs.umt.edu/avian/links/links_gen.htm).

"As we add data over time, a better picture of post-fire forests should emerge," says Hutto, a professor of ecology and ornithology at UM. Many species are dependent on fire in one way or another, but there are many more interactions that are not known or understood. Since fire is a natural and essential agent of change in Rocky Mountain forests, such research will better inform decisions about how to manage forest land and the forest-urban area interface. The ultimate goals of the Wildland Fire Education Program are to increase the basic ecological literacy of high-school students and the public in general, and to create a program model that can be applied broadly through the region and beyond.

"Teachers anywhere can use this information to work on research problems in their classrooms and as examples of the scientific method in action," says Oberbillig. "The key is to keep the data collection simple enough that students can do it in the time allotted and that observations can be consistent over time."

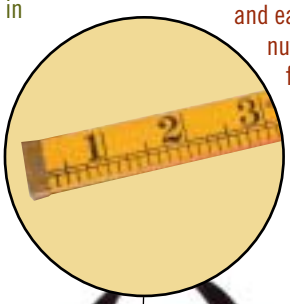
The more teachers and classes involved from other locations, the more conclusions can be drawn, Hutto says. For information about participating in the Wildland Fire Education Program, contact Anita Maxwell, program director, MNHC.

A Big Sky student takes pictures of each study site for future reference.

A Naturalist's Backpack for Fall

Think safety! Band-aids, of course. Sunscreen, lip balm. Also an anti-itch cream for encounters with biting bugs and an antihistamine to keep allergic reactions from driving you indoors. Don't forget to replenish supplies in your kit before you hit the trail.

Rulers are helpful when you want to note the size or scale of an interesting discovery in your journal or with a camera.

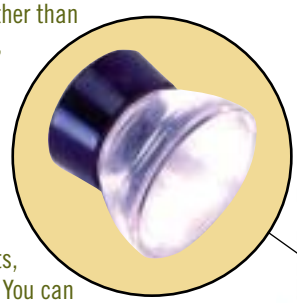


Whether you're out for an hour or a day, staying hydrated is important. Keep your energy up with appropriate and easily portable snacks — nuts, dried fruit, energy bars, for example.

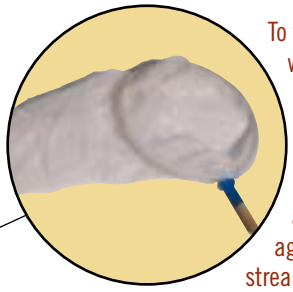
Layers! Regardless of conditions, layers help make your outdoor time comfortable and enjoyable. Wool and fleece are great for retaining body heat when wet, but fleece dries more quickly. Pair a fleece jacket with a windbreaker. Stashing rain pants and a jacket into your pack is always a good idea. Also, sturdy, comfortable, quality boots that are well broken in are essential. An extra pair of socks for longer adventures can give your feet a breather.

And finally, don't forget a brimmed hat. If the day is cool and cloudy, or you've worked up quite a sweat, a fleece or wool cap will keep the chill off.

If you're someone who likes to look down rather than up, these small, inexpensive magnifiers, called loupes, can help you identify and appreciate the details of insects, plants or rocks. You can order one for $3.95 from www.acornnaturalists.com.



To find out what's hiding in plain sight, hold a net against a stream's current and gently kick up the bottom to catch aquatic insects and larvae, or sweep a net through grass (without hitting the ground!). Stream nets have a finer mesh than aerial nets. You can find both online at www.acornnaturalists.com.



Get into the habit of recording observations and impressions during walks. Let each of your senses speak. Surprise yourself with your drawing skills when you give yourself time to look at something closely.

Binoculars are not essential, but they can be useful and fun for close-ups of birds or for scanning far-off slopes for bears or other animals. Higher-quality lenses mean brighter and sharper images, so buy the best you can afford. More expensive binoculars tend to be more durable as well. Seven or eight-power binoculars are lightweight, produce bright images and give a wider field of view than higher-power ones.

There are scores of guides available now, covering topics from mammals to winter shrubs. Some use categories (birds, trees, grasses); some use habitat types (forests, deserts); some use regions (Rocky Mountains, Glacier National Park). Pick one that works best for you depending on your interests. Consider how portable it is and whether it provides useful and easy-to-read keys or maps.

Safety Note:
If you are planning a trip into the back country, you'll want a topographic map of the area and compass to keep you on track. Other items, such as matches in a waterproof container and a pocket knife, could come in handy. Remember: Before you head out, let someone know where you're headed and when you expect to be home, especially if you'll be gone overnight.

Thanks to contributor, Cassie Carter, Executive Director of the Montana Outdoor Science School in Bozeman, MT. To learn more about MOSS, visit them on-line at www.outdoorscience.org.

get outside calendar

August 14 **Saturday Discovery Day** Colors on the Wing, 10:30 a.m. to 2:30 p.m. Will Kerling introduces the wonders of butterflies. A slide show of Kerling's outstanding photography will be followed by a trip to Mt. Jumbo saddle in search of butterflies.

August 24 Seed Collecting Workshop, 7 p.m. Learn to collect seeds from wildflowers and native bunchgrasses to be used in restoration projects. A great activity for families! Meet at the Waterwise Garden.

August 28 Walk by the Light of the Moon Series: Perseid Moon, 8 p.m. Lake Como. For more information, contact the Bitterroot National Forest at www.fs.fed.us/r1/bitteroot/recreation.

September 7 Plant Rescue, 6 p.m. Help rescue native plants from a local subdivision. The wildflowers and grasses will be used in local restoration projects and gardens. Meet at the Comfort Inn parking lot, near intersection of Hwy 93 and I-90.

September 8-11 **The 2004 Traditional Trades Week at Travelers' Rest State Park** Learn traditional trades and crafts of the early 19th century! Daily workshops offered in quillwork, naturalist journaling and traditional beading. Saturday, September 11, will be a demonstration day, featuring brain tanning, natural pine glue sticks, a gallery of workshop students' work and Ya-Ya dolls. Demonstration day is free and open to the public. Instructors from MNHC will present early American preservation techniques used by scientists and naturalists. 11 a.m. to 4 p.m. For more information, visit www.travelersrest.org

September 11 **Astronomy Series,** 9:00 p.m. Public Viewing. The Western Montana Astronomical Association will present a public viewing program for Missoula City Parks and Recreation. This program will be at the Fort Missoula complex on South Avenue West across from Big Sky High School. Astronomers will focus their telescopes on various celestial objects, and take requests.

September 17 **Natural History Educator Award Presentation and Special Performance by Confluence**, 7:00 p.m., Governor's Room in the Florence Building Join MNHC as we honor two outstanding natural history educators. The awards ceremony will be followed by a performance by Confluence, a joining of music and words by classical guitarist Stuart Weber and writer Alan Kesselheim. See story on page 17 for further details. Tickets for

continued. on page 11

August

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
8	9	10	11	12	13	14 **Saturday Discovery Day** Colors on the Wing, 10:30 a.m - 2:30 p.m.
15	16	17 *Katydids sing on warm afternoons*	18	 Glen Smart, Courtesy USFWS		21
22	23	24 Seed Collecting Workshop, 7 p.m.	25			28 Walk by the Light of the Moon Series: Perseid Moon, 8:00 p.m., Lake Como.

September

29	30	31 *Asters and goldenrod color meadows*	1	2 *Monarch butterflies head south*	3	4
5	6	7 Plant Rescue, 6 p.m.	8 **The 2004 Traditional Trades Week at Travelers' Rest State Park** *Sept. 8-11*	9	10	11 **Astronomy Series:** Public Viewing, 9:00 p.m. Fort Missoula complex on South Avenue West across from Big Sky High School.
12	13	14	15	16	17 **Confluence and Natural History Educator Award Presentation,** 7:00 p.m., Governor's Room in the Florence Building.	18 **RiverFest 2004!** Caras Park, Missoula. Astronomy Humor 8:30 p.m.
19 *Snakes begin to den up*	 Gary M. Stolz, Courtesy USFWS	22	23	24	25 Art of Field Sketching, 9:00 a.m. to 5 p.m.	
26	29	30	1	2		

October

					Montana Festival of the Book	
3	4	5 *Ruffed grouse drum to defend territory*	6	7	8	9 **Saturday Discovery Day,** 9 a.m. to noon. Return to Black Mountain Burn Site.

Saturday Discovery Days
Come explore the natural world with the Montana Natural History Center. Discovery Day programs are held on the second Saturday of the month and are for anyone and everyone. Local experts share knowledge and lead trips to fascinating field sites. Call MNHC for times and registration information.

Events take place at the Montana Natural History Center at Fort Missoula unless otherwise noted.

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
10	11	12	*Ladybugs hibernate under logs and leaves* 13	14	15	**Astronomy Series:** 7:30 p.m. Buying and Using Binoculars and Telescopes 16
17	18	19	20	**Montana Educators Association, Helena** *Oct. 21-22* 21	22	*Larch turn golden* 23
Balloon spiders disperse 24	25	26	27			
31	**November** 1	2	3			
7	8	9	10	11	12	**Saturday Discovery Day,** 9:30 a.m. - 11:30 a.m. Humans, Bears and Befuddlement: Be a Forensic Detective 13
14	*Milkweed pods release their last seeds* 15	 Courtesy USFWS		18	19	**Astronomy Series:** 7:00 pm. Radio Astronomy 20
21	22			25	26	27
28	29	30	**December** 1	2	3	4
5	6	7	8	9	10	**Second Annual Wild Gift Bazaar,** 120 Hickory Street, Missoula 11

get outside calendar

Confluence may be purchased by calling 327-0405, or at the door.

September 18 **RiverFest 2004!**
Caras Park, Missoula
RiverFest 2004 honors the 40th Anniversary of the Wilderness Act with a celebration of water, wildflowers and wilderness. This event is free and for all ages. See page 17 for more details. A benefit concert for MNHC and Raptors of the Rockies will follow. Cash 4 Junkers will perform.

September 18 **Astronomy Series,** 8:30 p.m. Astronomy Humor (The Universe and Stuff In It), presented by Johnny Larson and Bill Lawrenson. "Stuff Experts" Johnny and Bill will answer questions about all the stuff over head and discuss myths about bad astronomy, the Moon, the naming of stars and other untrue "facts" of astronomy.

September 25 Art of Field Sketching, 9 a.m to 5 p.m. Local illustrator and educator Claire Emery will show you how to create a native journal. Class includes indoor and outdoor time and instruction in basic drawing, page design and more. Ages 12 to adult. Cost is $50 per person, lunch included. Call MNHC to register by September 24.

October 1-2 **Montana Festival of the Book**

October 9 **Saturday Discovery Day,** 9:30 a.m. to 11:30 a.m. Return to Black Mountain Burn Site. Join local experts for a look at fire's effects on the landscape and wildlife.

October 16 **Astronomy Series,** 7:30 p.m. Buying and Using Binoculars and Telescopes, presented by Lynn Springer and Leonard Lahaye. Lynn and Leonard are experienced astronomers; Lynn also works in the optical field. Both are members of the Mission Valley Astronomy Club and the Western Montana Astronomical Association.

October 21-22 **Montana Educators Association,** Helena

November 13 **Saturday Discovery Day,** 9:30 a.m. to 11:30 a.m. Humans, Bears and Befuddlement: Be a Forensic Detective with Garry Kerr.

November 20 **Astronomy Series,** 7:00 pm Radio Astronomy, presented by Jerry Rude. Jerry is an experienced astronomer and skillful at finding objects in the sky using a star-hopping method. He is a member of the Western Montana Astronomical Association and the Mission Valley Astronomy Club.

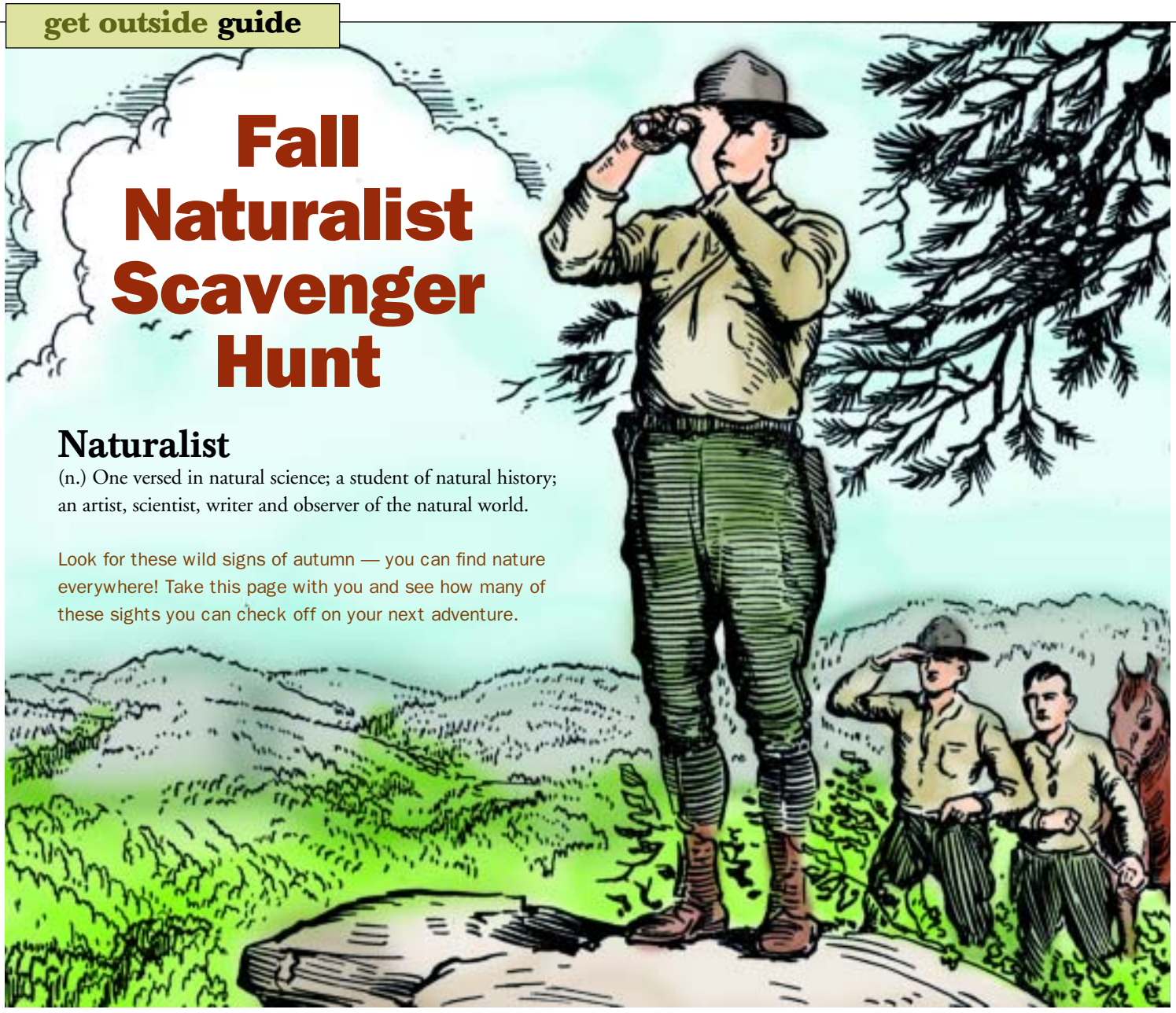
December 11 **Second Annual Wild Gift Bazaar,** 120 Hickory Street, Missoula

Look for these symbols of our Summer Science Day Camps, Elderhostel programs and Saturday Discovery Days in future issues of *Montana Naturalist* and our website at www.TheNatureCenter.org.

Summer Science Day Camps
Elderhostel
Saturday Discovery Days

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

Fall Naturalist Scavenger Hunt



Naturalist

(n.) One versed in natural science; a student of natural history; an artist, scientist, writer and observer of the natural world.

Look for these wild signs of autumn — you can find nature everywhere! Take this page with you and see how many of these sights you can check off on your next adventure.

- A raptor with angled wings
- A bird that's a "hoot"
- A rodent who visited your birdfeeder this summer
- Seeds or seed "containers" that show signs that an animal has nibbled on them
- A shrub with red leaves
- A weed that has invaded your lawn
- A place where a bug will spend the winter
- A raptor with a wingspan larger than yours
- A weed with deep roots
- A bird with your favorite color
- A seed head that has more than 10 seeds
- A bird's call
- A place where an animal can get out of the rain
- A tree with yellow leaves
- A sign that a mammal went through here
- A juicy meal for a bird
- A bird who stays in Montana all year
- A bird that is about to migrate south
- An insect preparing for winter
- A seed that has hooks to stick to fur

Join Us!

Become a member, become an art collector, support the MNHC.

Your membership in the Montana Natural History Center helps support our natural history education programs and exhibits.

Membership Benefits:

- Three issues of *Montana Naturalist*
- Invitations to special programs
- Membership card & decal
- Access to the Ralph L. Allen Resource Library

Family level and above receive free passes to visit nature centers throughout the country and a 10% discount on all MNHC merchandise and programs.

Membership Levels:

Jr. Naturalist - $5
Living Lightly - $15 or 25 volunteer hours
Individual - $30
Family - $50
Associate - $100
Leader - $250
Sustainer - $500

You can join online at www.TheNatureCenter.org or give us a call at (406) 327-0405.
Or you can visit us at our Fort Missoula home, Building T-2, Fort Missoula Road.

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.

To order, stop by the Montana Natural History Center at Fort Missoula, call (406) 327-0405, or e-mail us at info@TheNatureCenter.org

Courtesy Deb Dawson

Courtesy Deb Dawson

Above, Sibly, a captive-bred peregrine trained by Kate Davis. Wild peregrins may not be used for falconry in Montana.
Opposite page, 28-day-old chick will leave the nest in another 2 weeks.

Peregrines Return

Recovery of endangered falcon an unqualified success

By Kate Davis

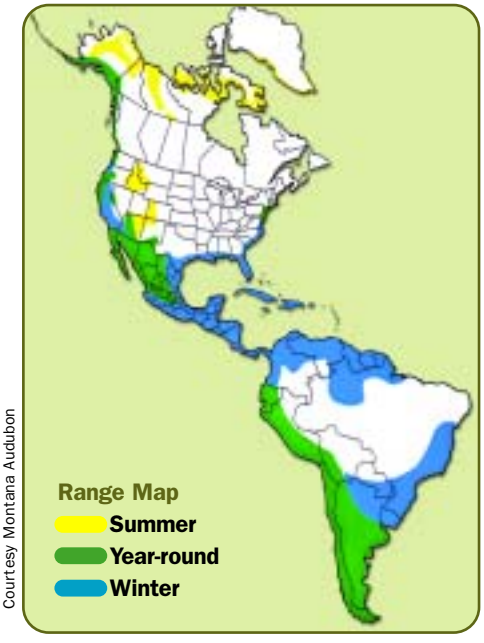
Peregrine falcons deserve to be one of the most celebrated animals on the planet. They are undeniably the fastest, clocking speeds of more than 200 miles an hour in vertical "stoops" or dives in pursuit of prey. Along with osprey, peregrines are cosmopolitan birds, a species with worldwide distribution. And, they are the first bird to be removed from the United States Department of the Interior's Endangered Species List – one of the greatest recovery stories ever.

The reason peregrines made it on the list in the first place was a result of human activities. The use of pesticides such as DDT after World War II caused reproductive failure and was a death knell for many kinds of predatory birds at the top of the food chain. By the 1970s, not a single peregrine nest could be found in Montana and

they were extinct east of the Great Plains. But the story of peregrine recovery is also due to human intervention, specifically by thousands of participants in the U.S. and Canada who ensured a happy ending for this intriguing falcon.

In 1965 the alarm was sounded that peregrine numbers in the U.S and Britain had declined drastically. Biologists and falconers decided that quick action was necessary and the Peregrine Fund was formed for the purpose of trying to restore this bird to pre-DDT numbers. In Montana, as across the country, captive-bred peregrines were released to the wild from "hacking" stations. The Rocky Mountain peregrine subspecies is called *Falco peregrinus anatum*, and this was the only race of bird to be raised for reintroduction in the western U.S. and Canada. (The eastern U.S. birds were bred from 5 subspecies in a mixture available from the budding breeding program encouraged by the urgency for species survival.)

The intention was to take young chicks at the age of 37 or 38 days from breeders and place the birds in plywood containers on natural cliffs or on specially constructed towers with a full view of their future surrounding hunting grounds. Hack site attendants fed the chicks whole quail dropped into a feeding tube so the birds wouldn't associate with humans. At 45 days of age, the now flighted falcons were released by opening up the front of the hack box. The youngsters usually remained near their artificial nest for four or five weeks after fledging and continued to be fed by their attendants until the birds became skilled at hunting on their own.



Courtesy Montana Audubon

Peregrines become old enough to breed between two and four years of age, and a significant number of hacked birds returned to their former sites or found new ones. More than 6,000 peregrines were released in North America over 30 years, mostly out of hack boxes. Now in the Midwestern U.S., 70 percent of nests are urban, located on buildings, bridges and smokestacks away from the deadliest of their predators – great horned owls. Fifteen pairs may be seen snatching pigeons above the streets of New York City. The world has changed and these new peregrines have learned to adapt.

Closer to home, 28 hack sites were used in Montana, the first at Red Rocks National Wildlife Refuge in 1981. By 1998, the last year of this program, 617 birds had been released statewide. Curiously, no historic peregrine nests had been recorded in the Bitterroot Valley despite the optimal hunting and breeding conditions. Here were steep canyon cliffs near water with a wide valley for foraging – a seemingly-perfect habitat. The first Bitterroot hack site was at Painted Rocks Reservoir in 1991 and birds soon occupied there, followed by Canyon Creek and Blodgett Canyon. Now the Bitterroot Valley is home to a record number of breeding pairs, with 9 active eyries, or nests, in 2004.

The nature of peregrine falcons, as with most raptors, is to return to their natal origins to breed, so we are ensured a healthy population of peregrines in the Bitterroot and along many waterways in Montana for the future. The crowning achievement of these recovery efforts was the peregrine's de-listing, or removal, from the Endangered Species List on August 20, 1999.

We can thank members of the Peregrine Fund for their insight, private sources for funding, and agency support from the U. S. Fish and Wildlife Service, U.S. Forest Service, the Bureau of Land Management and many others. Plus, kudos also should go to Jay Sumner and Ralph Rogers of the Montana Peregrine Institute for their ongoing monitoring of the status of this species. We had 40 active Montana eyries in 2003, and this year Jay and Ralph found 10 new nests in the state, all on the Clark Fork and Flathead Rivers.


Courtesy Kate Davis

Young falcons fledge around the 10th of July, and this is the best time for watching as they learn flight skills and noisily harass their parents. Observations are best from below and at some distance from the nest – never from above the eyrie, especially if young are still in the nest. Last year, two young falcons fledged to the wonder and delight of observers sitting in lawn chairs and on tailgates across the river at a state park. A warning though: Falcon watching can be addictive. If you are lucky, you will see a wild peregrine and immediately know why this bird deserved its triumph after a brush with extinction. They are simply the pinnacle of perfection.

Kate Davis is executive director of Raptors of the Rockies, a non-profit organization dedicated to educating people about wild raptors, caring for permanently disabled raptors and protecting raptor habitat. For more information, visit www.raptorsoftherockies.org. Her book Raptors of the Rockies *is available at MNHC's giftshop.*

***Falco peregrinus*. The word *peregrinus* means "wanderer," referring to this bird's long-distance migrations. Our local subspecies migrates into South America in the winter. Peregrines primarily feed on other birds. They prefer open country, cliffs and, recently, even large cities, where they nest on window ledges and prey on pigeons. Peregrines are one of the most widely distributed birds in the world.**

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News from the Montana Natural History Center

MNHC Photo

Exploring Nature on Saturdays

Have you ever wondered how to take better wildlife pictures or how to hike and camp safely in bear country, why birds of prey are important or where butterflies go in the winter? People who have participated in recent MNHC Saturday Discovery Day programs have had the chance to find out.

Held on the second Saturday of every month, these events are opportunities for families to do things together, and for people to get outside and experience nature in a way that is more memorable than listening to a lecture, says Community Programs Coordinator Gabrielle Sivitz. They also are a way for people to meet and learn from local experts in all sorts of fields.

"There's a wealth of enthusiasm about and expertise on Montana natural history in our community," says Sivitz. "Saturday Discovery Days offer a chance for everyone to benefit from this."

Saturday Discovery Day events begin at MNHC before venturing into the field. The programs are low cost, with a reduced rate for members. See the Calendar in the Get Outside Guide for details on upcoming programs.

Dark Skies Over Montana

At least during summer months, once twilight has faded, Montana night skies typically are dark and clear. Even during winter, if you can get above the clouds or live east of the mountains, Montana offers a spectacular view of the cosmos.

Members of the Western Montana Astronomical Association are eager to share their knowledge of stars, planets and other wonders of the night sky with the community – and not just their knowledge but their telescopes, too. Once a month on a Saturday evening from April through November, the association holds a meeting for current and prospective members, and then a public talk followed by telescopic viewing if the weather permits.

"It's another example of our collaboration with a local interest group whose dedicated members see the benefit of educational outreach," says MNHC Program Director Anita Maxwell.

Says Jerry Rude, one of the founding members of WMAA, "The night sky and things we can see when it's dark are part of our natural history, too. People have so many questions about what's out there."

Come learn your way around the night sky. Upcoming astronomy programs are listed in the Calendar.

MNHC Photo

Thanks to proceeds from the June "Le Junque" fundraiser, MNHC was able to purchase this school bus (which can seat 12 adults or 20 children), enabling us to offer transportation to field sites for Saturday Discovery Days and youth programs.

Give Early, Give Often

Remember MNHC in your workplace charitable giving plan. MNHC is a full member of Montana Shares, a federation of 40 Montana-based non-profit organizations working to promote our state's human, cultural and natural resources. Through our membership we participate in the combined charitable giving campaigns of federal, state, county and city employees, as well as many local businesses. Please consider participating during your employer's open enrollment period this fall. Your gifts help MNHC continue to offer unique programs about Montana's natural history.

Trunkfuls of Wonder and Experience

In a rural state like Montana, where more than half the population lives in communities of fewer than 5,000 people, educators often don't have access to the books, artifacts, audio/visual aids and equipment they need to teach about natural history. To help meet this need, the Montana Natural History Center currently distributes 17 nature discovery trunks on topics ranging from wolves to life in ponds. Three resource trunks containing lessons on Native Plants, Wetlands and Bull Trout are new this year.

"We started this program as a way to partner with other organizations to get materials and information into the hands of teachers who otherwise wouldn't have the time or money to create their own," says Anita Maxwell, MNHC program director.

"The trunks fit perfectly into the classroom," agrees Linda Pilsworth, a first grade teacher at Frenchtown Elementary School. For many years she has used the Songbird Blues discovery trunk, which focuses on the diversity of migratory songbirds and the many perils they face.

"I love the guide books," she says, "and everything – the research packets for kids to fill in, the felt story boards, the maps and films – is all laid out; I don't have to hunt around for anything."

Pilsworth typically rents the songbird trunk for three weeks but still finds she can't get to everything included. In recent years she has added curriculum units that make use of the Prairie Ecosystem and Pond Life discovery trunks.

Many organizations and individuals have been instrumental in developing the trunks, says Maxwell. For example, the U.S. Forest Service Fire Science Lab created the Fireworks trunk, the Clark Fork chapter of the Montana Native Plant Society prepared the new Native Plants trunk and the Western Montana Mycological Association put together the Fungal Jungal trunk. Most recently, Idaho Trout Unlimited produced a discovery trunk on bull trout, which they will make available for free through MNHC to both formal and informal educators.

Many of the trunks are geared to elementary school classes; some are aimed at middle and high school students. In addition to age-appropriate lesson plans, the trunks contain specimens, such as bear skins or wolf skulls, posters, videos, audiotapes, books, maps, games and puppets. And MNHC organizes teacher workshops and field seminars to help educators make more effective use of the trunks, Maxwell says.

Nature Discovery Trunks can be rented from MNHC at a modest cost, thanks to generous underwriting from Southgate Mall in Missoula, and some trunks are available for purchase. However, because of the large shipping charges (trunks are heavy!), educators far from Missoula may want to look for trunks closer to home. A complete Guide to Educational Trunks in the Northern Rockies, produced by the Montana Environmental Education Association and the Museum of the Rockies, is available on-line at www.TheNatureCenter.org. To add trunks or make corrections to the Guide, contact MNHC.

MNHC Photo

Trunks available from MNHC are: Air Care; Aquatic Invertebrates; Bull Trout; Clark Fork Watershed; Fireworks; Fungal Jungal; Geospatial; Glacial Lake Missoula; Living with Winter; Mount Jumbo; Native Plants; Pond Life; Prairie Ecosystems; Songbird Blues; Threatened and Endangered Species (three different trunks for elementary, middle and high schools, featuring different species in each); Wetlands; and Wolves and Humans.

RiverFest 2004

Mark your calendars for RiverFest 2004, a special celebration of water, wildflowers and the 40th anniversary of the Wilderness Act.

On Friday, September 17, MNHC honors an organization and an educator that have made significant contributions to the public's understanding and appreciation of nature with the 2nd annual Natural History Educator Awards. The award ceremony will be followed by a performance by **Confluence**, a joining of words and music by Alan Kesselheim and Stuart Weber. These Montana artists credit wild places and experiences in nature for much of their inspiration. Weber's classical guitar and Kesselheim's words weave together in a performance that evokes the fundamental natural themes that infuse their work. The awards ceremony and concert will be held in the Governor's Room in the Florence Building. Tickets are available in advance from MNHC by calling 327-0405, and at the door.

MNHC Photo

On Saturday, September 18, MNHC, the Missoula County Weed District and the University of Montana Wilderness Institute will host a free, day-long festival at Caras Pavilion. A walk for wilderness along the Clark Fork River will kick off the event, which also features speakers and performers, food vendors and display booths. Activities include natural history programs, a gardening-for-wildlife workshop, cross-cut saw demonstrations, fly-fishing lessons and more. The event is free and for all ages. Call MNHC at 327-0405 for more information, or visit our website at www.TheNatureCenter.org.

The evening concludes with bands and beer to benefit MNHC and Raptors of the Rockies. Cash 4 Junkers will perform.

A page from a naturalist's notebook by Claire Emery, an avid field journalist, educator and natural science illustrator in Missoula. Email cemery@montana.com for info on upcoming workshops or join her Saturday, September 25 for a day-long "Art of Field Sketching" class. See Calendar for details.

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