

MONTANA

Winter 2004-05

Naturalist



A publication of the
MONTANA
Natural History Center

**Yellowstone's
winter rhythms**

**Fishing fun
at 20 below**

**So Fun
Snow Fun**

see Get Outside Guide,
page 9

MONTANA Naturalist

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Cover photo – Bohemian waxwings feast on mountain ash berries. Photo by Scott Wheeler, www.wheelerimage.com.



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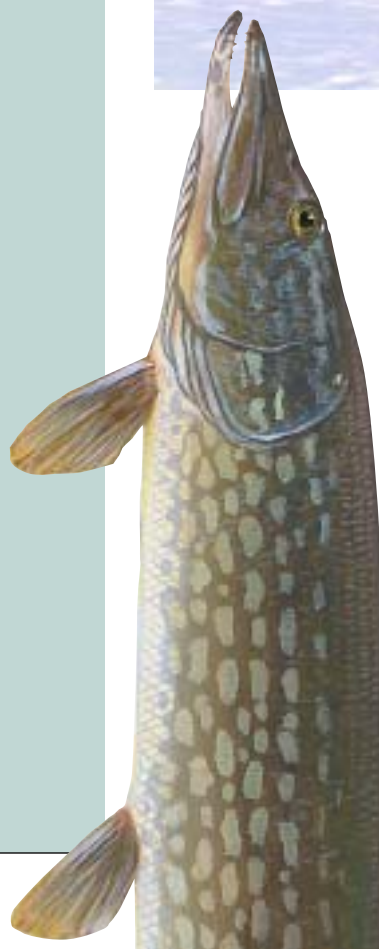
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tidings



MNHC Photo

Impending winter presses our resident animals into a frenzy of activity. Some eat voraciously to prepare for winter's hibernation. Some work at storing seeds to guard against the dearth of food to come. Some fly south in search of more hospitable places.

For human animals, holidays come and go. We settle into our winter routines. For many people this is the time to cocoon and await the arrival of spring. Others simply follow the birds south. For those who stay I encourage you to embrace winter. Snowshoe or ski in our forests and open spaces to escape the hubbub of the season. Take a walk along river banks and look for signs of life that continue. Winter is a time to get out and rejoice at the resiliency of nature.

Winter is a marvelous time for exploration. Fresh snow lays down blank slates for nature to write upon. Tracks left in the snow allow even the most casual observer to see what goes on when no one is looking. While many animals go dormant, others simply adapt to the change in the weather and get on with life.

The Montana Natural History Center does not go dormant during the winter. We are busy in the schools, with our community programming, unveiling a new website (www.MontanaNaturalist.org), planning our move to the new facility, wrapping up our 2004 fundraising and working on next year's educational projects. I invite everyone who receives this magazine to become a member of MNHC and get involved! Membership is a great source of support for us and helps with everything from heating the building to putting gas in the bus.

We hope you have enjoyed this first year of *Montana Naturalist*. From all of us at MNHC, best wishes for happy holidays and enjoy the season!

Brad Robinson
Executive Director

RIVERFEST 2004 WAS TRULY A COMMUNITY EFFORT.

Led by the Montana Natural History Center, the Missoula County Weed District and The University of Montana Wilderness Institute, RiverFest included over 30 organizations and a full day of speakers and programs celebrating the 40th anniversary of the Wilderness Act.

Thank you to these RiverFest 2004 sponsors!

A Squared Catering
Advanced Litho
Broadway Wine Company
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The Independent
Land & Water Consulting
Missoula Downtown Association
Hi-Noon Petroleum

Office City
PETSMAST
Rockin' Rudy's
Sierra Club
The Shirt Shop
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Thanks also to the RiverFest 2004 planning team:

Aldo Leopold Wilderness
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Arthur Carhart National Wilderness
Training Center
Audubon Society, Five Valleys Chapter
Missoula County Weed District
Montana Natural History Center
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riverfest
2004

The 40th Anniversary of the Wilderness Act



Restoring the

By Hank Fischer
Photos by Dan and Cindy Hartman

Wolves supply Yellowstone's missing beat

Wolves once roamed by the thousands over all of Montana, but by the 1920s government control programs had completely eradicated them. Wolves first reappeared in Montana in the mid 1980s when a few animals drifted into the northwest corner of the state from Canada. Northwestern Montana now has about 10 packs of wolves and an overall population of approximately a hundred animals. But Yellowstone has been the region's major focus for wolf reintroduction.

Our small group of wildlife watchers is on dawn patrol in Yellowstone National Park's Lamar Valley, searching for the Druid Peak wolf pack. We unsheathe our binoculars and start looking near the juncture of the Lamar River and Soda Butte Creek, the approximate center of their territory. Large snowflakes are falling, and the ribbon of gray and black cottonwoods that defines the Lamar River fades in and out of sight as snow squalls pass by.

Soon someone catches a glimpse of wolves in an aspen grove, but a small rise prevents a good view. We quickly scramble uphill in search of a better vantage point, post-holing through knee-deep snow until

we find a bluff overlooking the valley.

Once we get our powerful spotting scopes set up, it's like peering right into the wolves' dining room. A crimson splotch in the snow with a ragged antler thrusting skyward comes sharply into focus. The Druids have killed a bull elk and a spider web of tracks, like the spokes of a wheel, lead to the carcass. Eight wolves crouch around the elk, all feeding actively as ravens wheel about and a golden eagle perches on a nearby stump. Five of the wolves are black, three gray. One of the wolves is so light it is almost white. The blood on its face is visible from three-quarters of a mile away.

We watch the wolves feed for more than half an hour. One by one the pack





Rhythm



members tear off chunks of meat and bone and retreat to the base of a tree to chew on their dinner. One black pup remains at the carcass and for fifteen minutes makes it his mission to keep the ravens from feeding.

Finally all the wolves are at least 15 yards from the elk carcass and the ravens waddle in to consume their fill. I watch through the spotting scope as the eagle bounces off its stump and begins wading through the snow to the carcass, its huge brown and white wings partially unfolded. But the snow is soft and the ten-pound bird's legs sink deep with each step. I can't help but think the eagle might be in trouble if a wolf comes after it.

No sooner had the thought crossed my mind than one of the pack leaps up and bounds toward the eagle. The eagle takes a hop to get airborne but only settles deeper into the powder. The wolf charges forward in big bounds, gobbling up distance with its long legs. The eagle takes a second hop but still can't get airborne. Then, as the wolf hits deeper snow and slows down, the eagle takes one more hop and finally clears the ground in slow motion. The wolf snaps at the eagle's tail as the giant raptor flies away.

Gauging the impact

It's now been almost 10 years since the first wolves were restored to Yellowstone. The 31 brought from Canada in 1995 and 1996 have expanded into approximately 34 packs or groups and more than 300 individuals (not counting pups born in 2004). While much already has been learned about Yellowstone's wolves, the essential ecological question remains: Has this bitterly contested reintroduction fundamentally influenced the entire Yellowstone ecosystem, or have wolves slipped into the world's most famous park without significant impact?

Many leading scientists believe that the major impacts on our natural world originate at the top of food chains rather than at the bottom. World-recognized ecologist Dr. John Terborgh calls large predators "the big things that run the world." He believes that large carnivores have a disproportionate impact on the structure and function of natural systems, and that the impacts caused by these species ripple through an entire ecosystem. To the extent that Yellowstone serves as a testing

ground for Terborgh's hypothesis, the early conclusions are unequivocal: Yellowstone's wolves are having an extensive influence on the ecosystem, affecting everything from grizzly bears to beetles.

The most obvious impact of wolves – though not necessarily the most important – is that they kill other animals. In Yellowstone, 98% of the wolf's diet is elk. The wolves' kills attract scavengers, including grizzly bears, ravens, magpies, coyotes and eagles. They also attract insects – nearly 450 beetle species are known to use carcasses in Yellowstone. One researcher asks the question, "How much biodiversity would vanish if Yellowstone Park lost its great herds of megafauna? The herds themselves are composed primarily of fewer than five species. However, I can name 57 beetle species that might be greatly affected by such a loss."

The indirect impacts of wolf predation are everywhere. A raven takes a piece of meat and caches it in a tree. There it's found

by a pine marten or a bluebird or a Stellar's jay. Yellowstone wolf researcher Dr. Douglas Smith calls it "the trickle-down effect of wolves." While we typically only look at wolf impacts on grazing mammals or scavengers, their effects on other creatures are remarkable. A 50-percent reduction in coyotes (which has been noted since wolf reintroduction) could lead to a significant increase in small mammals, such as ground squirrels or pocket gophers. That in turn could lead to an increase in hawks, owls and eagles.

The biggest impact of wolves? "Without wolves," says Smith, "we have a food chain that's heavy on elk. With wolves, we see faster cycling of nutrients because the elk don't live as long. Instead of a pulse of carrion in the spring as a consequence of winter kill, there is a steady trickle of nutrition all year long that really enriches the entire ecosystem."

Harvard evolutionary biologist Stephen Jay Gould has suggested that natural history is largely a tale of how species adapt to avoid being eaten. Anyone who watches the wolves in Yellowstone can't help but reflect on the incredible complexities created by predation. It's an inexhaustible game of "what ifs" and "maybes." What if wolves reduced elk to the point where willows and aspens grew vigorously along the Lamar River? Perhaps there would be more beaver and songbirds. What if wolves completely



WOLF WATCHING ETIQUETTE

1. Do not pursue wolves on foot (in search of that perfect photo!). You will disturb the wolves and ruin the viewing for everyone else.
2. Don't maneuver your car in such a way that it prevents wolves from crossing the highway.
3. Honor area closures.
4. Howling at wolves is illegal in Yellowstone Park and distracting to other visitors.
5. Use pull-outs so you don't block traffic.
6. Turn off lights and car engines, and close doors quietly when you get out of your car.
7. Talk quietly when you are out of your car; loud noises will alarm wolves even at a distance.



Courtesy Hank Fischer

WHERE TO LOOK FOR WOLVES IN YELLOWSTONE PARK

Druid Peak Pack. This has been the park's most visible wolf pack, seen by more than 100,000 visitors. Their range extends approximately from Slough Creek to the Soda Butte cone. They are most commonly seen about a mile east of the Yellowstone Institute (also known as the Buffalo Ranch). The hill at Slough Creek is also a popular spot.

Swan Lake Pack. This pack is sometimes seen in the Swan Lake Flats area, just a few miles from Mammoth. A great birdwatching spot if the wolves aren't around!

Agate Pack. This relatively new pack has been spotted with increasing frequency. They are most often seen in the Antelope Creek drainage, which is on the east side of the road heading up to Mount Washburn. This used to be *the* spot in Yellowstone to see grizzlies, and it's still good.

Leopold Pack. This longtime Yellowstone pack roams the Blacktail Plateau about midway between Mammoth and Tower. The best strategy is to climb one of the hills overlooking the plateau (the area near the Children's Fire Exhibit is good) and use your binoculars or spotting scope.

Geode Creek Pack. This pack roams the rugged hillsides in the Hellroaring Creek area between Mammoth and Tower off the north side of the road across the Yellowstone River. It is best observed from the big overlook just before the Hellroaring trailhead.

eliminated coyotes? Perhaps raptor numbers would explode. What if wolves started preying aggressively on bison?

This endless evolutionary drama between wolves and their prey has been rehearsed on the slopes of Yellowstone for thousands of years. In this play the prey grows ever more difficult to find and catch while the predator becomes ever more skillful at searching and capturing. It's a rhythm from a song as old as time, temporarily interrupted in Yellowstone, but now restored. 🗡️

Hank Fischer was closely involved with Yellowstone wolf restoration and wrote a book about it entitled Wolf Wars (Falcon Press, 1995). He currently works for the National Wildlife Federation and, with his wife, Carol, operates a business (www.fischeroutdoor.com) leading wildlife viewing trips to Yellowstone, Glacier National Park, Africa and other locations. They'll be leading a winter wolf trip to Yellowstone this February. Hank is also on MNHC's Board of Directors.

Where the wild things are

By Caroline Patterson



I'm standing in the Lamar River Canyon with Nancy Procter of the Yellowstone Association Institute. We are watching magpies and a bald eagle pluck meat from an elk killed by a mountain lion. Two coyotes prowl nearby, waiting their turn.

This, Procter points out, is a distillation of the harsh realities of winter in Yellowstone National Park. Ringed by the Madison, Gallatin and Absaroka mountains on the Montana-Wyoming border and known for containing most of the world's hot springs and geysers – nearly 10,000 – the park is also home to almost 400 species of animal. Winter is hard for those that do not sleep or hibernate as bears and ground squirrels do. But one death sustains many lives: Elk become prey for predators like wolves and mountain lions and opportunistic feeders like coyotes, eagles, magpies and ravens.

“Winter drives the ecosystem,” says biologist Jim Halfpenny. “It is the period of greatest stringency that determines the survivorship in the ecosystem.”

Deep snow, limited food and some of the coldest temperatures in the nation determine who lives and who doesn't among animals ranging from 1,800-pound bison to teacup-sized voles. Thousands of elk and bison and hundreds of bighorn sheep, coyotes, deer, grey wolves, trumpeter swans, eagles and ducks shift for their wintertime living inside the 2.2 million-acre park. But it is the unquantifiable I remember. The lone male buffalo wreathed in mist by Yellowstone Lake. The herd of elk curled up, calm, as Old Faithful Geyser vents its regular explosion of steam. A coyote poised on a hillside in the Lamar Valley, ears cocked, pounces on a vole under the snow.

Wildlife, Yellowstone-style

Wildlife is more visible in winter, says Tom Olliff, the park's natural resources chief, because they hang out near roads and thermally-warmed ground features.

“In the park's interior, where you can only travel by snow coach



Courtesy Pam Voth



Courtesy Pete Bengueyfield

Bison forage near Yellowstone geysers. A coyote finds its prey, even under snow. Trumpeter swans, with young in summer, linger year round.

or snowmobile, you can see elk, bison, trumpeter swans,” Olliff says. “In the Lamar Valley, bighorn sheep, wolves and coyotes.”

My experience holds true. I see elk, bottoms up in the sage, as I pass through the century-old Roosevelt Arch at the park's north entrance. A bull elk and his harem loiter on the terraced Mammoth Hot Springs, where Fort Yellowstone was established in 1886, 14 years after the park, to curb rampant poaching. By the end of my trip, I lose count. Elk, which number up to 22,000 in winter are, according to Halfpenny, “the major driving factor for everything in the ecosystem.”

On my snow coach trip from Mammoth south to Old Faithful, I see bison at Norris Geyser Basin, the north end of a 600,000-year-old volcanic caldera. Braced against the cold, rugged and ancient, the bison use their heads to clear snow from the ground to graze. At the thermally-warmed Gibbon River I see swans, long necks bending to silver water.



NPS Photo

Yellowstone's Serengetti

In the open, wind-blown Lamar Valley – the Serengetti of Yellowstone – I see elk, bison, bighorn sheep, coyotes. Then, on a ledge above Soda Butte Creek, I stand, glued to a spotting scope, as wolf biologist Rick McIntyre holds up a

tracking device. February is mating season and he is tracking two wolves from warring packs among the 30 some that have formed in Yellowstone since reintroduction in 1985.

“People are fascinated by wolves because they see in wolves behaviors similar to dogs,” says naturalist Hank Fischer.

I'm no exception. When I see the four wolves, moving like shadows among the trees lining a creek bottom, I'm thrilled. Then they begin to howl – first one, then another and another, their voices rising in thrilling cacophony as we stand above them, stunned silent. This, I think, is what I have come for; this sound of otherness. This chance to see, as retired park ranger Norm Bishop says, “an ecosystem work as it did in the

Pleistocene epoch.” I have come to witness, in the words of Henry David Thoreau, this “absolute wildness.”

Caroline Patterson has contributed to Home & Away, Sunset and other magazines. She lives in Missoula with her family and commutes to Helena, where she is an editor for Farcountry Press.



NPS Photo

Travel Planner

The park website provides excellent information on road conditions, snow coach reservations, and snowmobile and ski rentals, www.nps.gov/yell; (307) 344-7381. Two park lodges are open from mid-December to mid-March: Mammoth Hot Springs Hotel and Old Faithful Snow Lodge, www.travelyellowstone.com; (307) 344-7311.

Wildlife viewing through the Yellowstone Association ranges from introductory wildlife tours to classes on topics including wildlife photography and wolf behavior, www.YellowstoneAssociation.org; (307) 344-2293. Other guided wildlife trips are offered by A Naturalist's World (www.tracknature.com), The Environmental Adventure Company (www.environmentaladventure.com), Fischer Outdoor Discoveries (www.fischeroutdoor.com) and the Teton Science School (www.tetonscience.org).



Courtesy Pete Bengueyfield

Hot Water

Thermal springs make winter more hospitable

Perhaps the most treasured of Montana's natural features, especially in wintertime, are the region's variety of hot springs and thermal pools.

Native Americans congregated at hot springs to soak in the therapeutic waters, and many springs were considered sacred and healing places. Lewis and Clark gladly stopped at Lolo Hot Springs in 1805, and Captain Clark explored Jackson Hot Springs in the Big Hole valley in 1806. Present-day residents and visitors continue to enjoy these special places.

Humans are not the only creatures that benefit from hot springs. A variety of algae and bacteria, each attuned to a specific temperature, colonize runoff channels and pool edges. The result can be a rainbow of microscopic organisms, “a slow motion kaleidoscope of color that responds to the subtle changes in water flow and temperature,” writes Forest Service hydrologist Pete Bengueyfield in his book “Incredible Vision: The Wildlands of Greater Yellowstone” (Riverbend Publishing, 2003).

Many animals that remain active during the winter, notably deer, elk, and bighorn sheep take advantage of the warmer microclimate surrounding hot springs, although sometimes strange things happen. Last winter in Yellowstone, for example, a geyser vented a large amount of carbon dioxide, which was trapped near the ground by an inversion layer, killing five bison nearby.

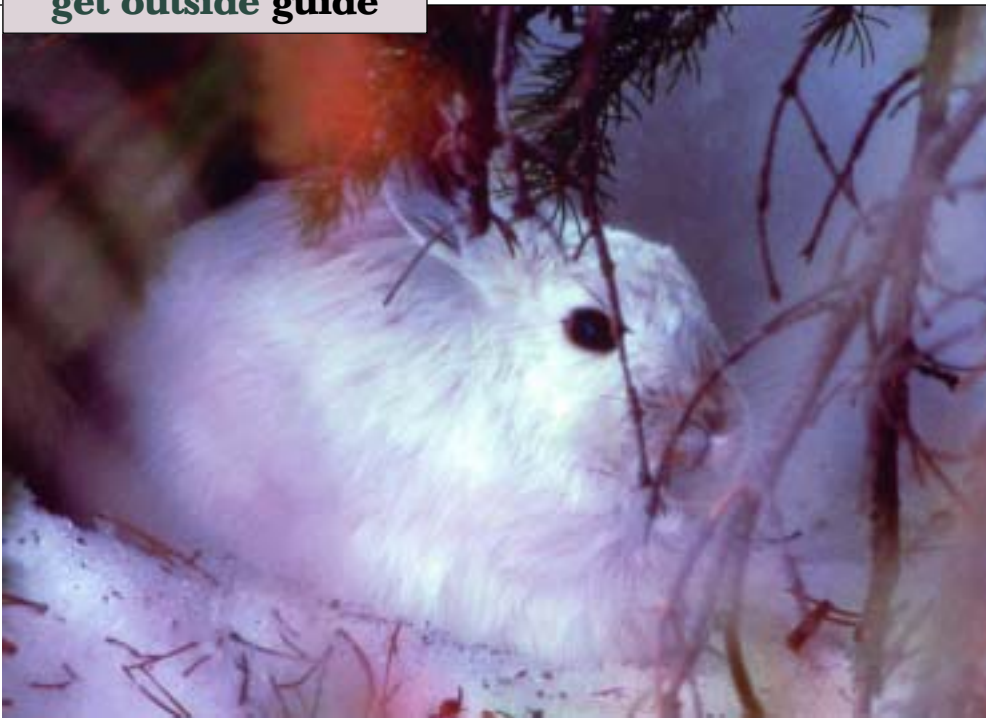
Montana and Wyoming are home to the largest concentration of hot springs in the world. The majority of these lie within the boundaries of Yellowstone, but a number are found elsewhere throughout the states.

The heat source for hot springs is the radioactive decay of rock at Earth's core. This heat rises upward, cooling from 7,000° F to around 2,000° F within 50 miles of the surface. Rainwater and snowmelt percolate downward through cracks and fissures in Earth's crust, where it is warmed by the rising heat from the core. Most hot springs in Montana are found at the edges of mountains, where their formation created deep cracks for water to flow. Eventually the heated water finds other conduits and is pushed back to the surface by convection and water pressure, bubbling out as a hot spring. The entire cycle can take hundreds or even thousands of years.

Although most of the geothermal features found in Montana are near mountains, the western half of the state doesn't hold a complete monopoly. In eastern Montana, far from any mountain ranges, hot springs occur around hot water wells. These wells usually were intended to be for oil or drinking water, but instead punctured an underground aquifer of geothermally heated water with no natural outlet to the surface. Examples are the 185° F Angela Well north of Miles City and the Sleeping Buffalo Resort near Malta.

For an entertaining history and guide, read Jeff Birkby's “Touring Montana and Wyoming Hot Springs,” (Falcon/Globe Pequot Press, 1999).

—Caroline Kurtz



NPS Photo

So Fun Snow Fun

Winter in the northern hemisphere officially begins on the winter solstice and ends at the spring equinox, but winter-like weather often appears sooner and lasts longer. This period when we find most of our landscape blanketed by snow and ice can seem never-ending. But instead of viewing winter weather as frightful, strive to see the season in a different way. With a little preparation you can get outside and enjoy exploring nature during its “quiet time.” Through outdoor explorations of the nivean (snow world) environment, you can gain a greater understanding of the physical and biological processes associated with winter and snow.

Let’s find out

Animals survive freezing temperatures in many ways. Some migrate to warmer climates, some stay and remain active. But some mammals (like mice and bats), insects, reptiles, amphibians and even fish pass the winter in a deathlike state called hibernation, during which they dramatically reduce their body temperature, heart rate and breathing rate. Other animals, such as bears and raccoons, actually sleep through all or part of the winter without their life processes slowing down much. Both true hibernators and winter sleepers rely on stored fat deposits for nourishment while they are dormant.

In order to survive the winter, hibernators and winter sleepers must choose a safe spot that will provide protection from the cold. Animals can freeze to death if the temperature of the sleeping site drops too low for too long a time.

Imagine you are a small animal looking for a cozy place to curl up for the winter. Mix up some gelatin and fill a film canister with it. Put the lid on tight. This little flask of liquid is your imaginary animal. Find a likely snoozing place somewhere in your backyard or elsewhere outside (but burrowing



Be Prepared

Just like plants and animals, humans also need strategies to help ward off winter’s chill. To make sure you have fun outside in winter, be prepared. Obtain the weather forecast and know what to expect. Stay active and watch for signs of hypothermia or frostbite.

Hypothermia is when your body’s core temperature drops and it becomes increasingly difficult to warm yourself up. Signs include shivering, tiredness, lethargy and finally collapse. Wind and wetness are the biggest contributors to hypothermia. Dress appropriately in layers (no cotton!) and learn how to make a snow shelter for protection.

into the ground and building with non-living materials is not allowed) and place your gelatin animal there.* You could use one unprotected animal and one under a small box or knit hat as controls for your experiment. The test is over when the semi-protected animal (the one under the box or hat) is frozen. At that time, if the animal in your sleeping spot is still liquid, it survived the winter. If the gelatin has set and won’t pour, your animal didn’t make it.


(*An unprotected “animal” will freeze in about 3 to 6 minutes when the outside temperature is between -4 and 14 degrees F; in 6 to 12 minutes when the temperature is between 14 and 23 degrees F; in 12 to 18 minutes when the temperature is 23 to 32 degrees; and in 18 to 25 minutes when it’s 32 to 41 degrees. Unflavored gelatin sets faster than flavored.)

Things to think about:

What areas seem to offer the best protection from the cold?

How did burying or using natural materials such as leaves or soil to cover the gelatin animals affect their freezing times?

Why would a gelatin animal always eventually freeze in sub-freezing temperatures, while a rabbit might not?

If you were stranded outside in a winter storm without a fire, how could you keep from freezing? 

Animal Anti-Freeze (Developed by Outdoor Biology Instructional Strategies, Lawrence Hall of Science, University of California, Berkeley, CA, 94720.)

December 3 Featherin' Our Nest: Birdhouse Artist Reception, 5:00-6:30 p.m., 127 N. Higgins Ave. Area artists created 30 birdhouses to be auctioned off at our annual "Down by the River" fundraiser. Come view their designs and make your bid at a free artists' reception from 5:00 to 6:30 p.m.

December 3 Down by the River Dinner and Auction, 7:00-9:30 p.m. Enjoy gourmet food and wine as a prelude to loosening your purse strings for the original birdhouses and select trips, dinners and experiences that will be auctioned during the evening. Auction tickets are available for purchase at the door or by calling 327-0405.

December 11 Wild Gift Bazaar, 10:00 a.m.-6:00 p.m., 127 N. Higgins Ave. Finish your holiday shopping with a fine selection of locally made hand-crafted, nature-oriented gifts, including jewelry, clothing and decorative items. Children's activities will be provided on-site so that parents can shop with ease.

January 5 Volunteer Naturalist Training, 9:30-10:30 a.m. **Winter Food Webs**. Interested in helping with our Visiting Naturalist in the Schools program? Join us for training to take part in January's monthly classroom visits that reach almost 500 Missoula area students.

January 8 Saturday Discovery Day, time TBA. **Winter Ecology on Snowshoes**. Join us for a trek to explore winter's wonderland. Snowshoeing novices welcome. Location TBA. Registration required. Call MNHC for snowshoe rental information. Led by MNHC Naturalists Lisa Moore and Charles Miller.

January 22 Volunteer Naturalist Training, 9:00 a.m.-3:30 p.m. **Winter Ecology**. Learn about winter ecology in the northern Rockies and get trained in the tools and techniques for teaching in the field. We will spend the day learning about the science of snow and how our plant and animal communities adapt to winter. This workshop serves as a Volunteer Naturalist training day for our February winter ecology field trips, but anyone with a curiosity about our wintry environment is welcome. Registration required.

January 26 Community Watershed Education class. Wednesdays through May 4th, 4:10-7:00 p.m. at UM, location TBA. Register with MNHC. Open to UM students for credit. Free to community members. Explore current issues in the Clark Fork Watershed by going into the field and learning from local experts. Issues include water monitoring techniques, current environmental concerns and educational practices. The class culminates by sharing your knowledge with local sixth-grade students during the 11th Annual Clark Fork Watershed Festival.




SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
December			1	2	Featherin' Our Nest: Birdhouse Artist Reception , 5:00-6:30 p.m. Down by the River Dinner and Auction , 7:00-9:30 p.m. 127 N. Higgins Ave.	4
		7	8	9	10	Wild Gift Bazaar 10:00 a.m.-6:00 p.m. 127 N. Higgins Ave.
		<i>Deer, elk and bighorns forage along river bottoms</i>			17	
		14	15	16	<i>Winter migrants appear</i>	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1
January			 Volunteer Naturalist Training 9:30-10:30 a.m. Winter Food Webs			 Saturday Discovery Day Time and location TBA. Winter Ecology on Snowshoes.
2	3	4	5	6	7	8
		<i>Mice, weasel tracks tangle in snow</i>				15
9	10	11	12			 Volunteer Naturalist Training 9:00 a.m. - 3:30 p.m. Winter Ecology
16	17	18	19			22
			Community Watershed Education class. Wednesdays through May 4th, 4:10-7:00 p.m. at UM, location TBA.	Becoming a Naturalist class Thursdays through May 4th, 4:10-7:00 p.m. at UM, location TBA.		<i>Grizzly cubs born</i>
23	24	25	26	27	28	29

NPS Photo

NPS Photo



Volunteer Naturalist Training
Volunteers, look for our monthly trainings to take part in classroom visits that reach almost 500 Missoula area students.

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	
<h1>February</h1>							
30	31	1	2	3	4	5	
<i>Lynx pursue snowshoe hares</i>						 Saturday Discovery Day 10:00 a.m.-noon. Beetles: Good, Bad and Ugly	
6	7	8	9	10	11	12	
		FireWorks Trunk Workshop Learn about wildland fire using FireWorks, an educational trunk for grades 1-10. To learn more, go to firelab.org and click on FireWorks. To register, contact Jane Kapler Smith (329-4805, jsmith09@fs.fed.us).					<i>Great horned owls hoot</i>
		15	16	17	18	19	
						 Saturday Discovery Day 1:00-5:00 p.m. Creating a Wildlife Sketchbook.	
		22	23	24	25	26	

March

		 Volunteer Naturalist Training 7:00-8:00 p.m. How Many Elk?	1	2	3	4	5
27	28						
							 Saturday Discovery Day Our Naturalist Heritage.
6	7	8	9				12
			<i>Flies, spiders active on warm days</i>				
13	14	15	16				19
						 Saturday Discovery Day Time TBA. Waterfowl at Lee Metcalf National Wildlife Refuge.	
20	21	22	23	24	25	26	

April

		<i>Aspen catkins swell and open</i>					
27	28	29	30	31	1	2	
					 Watch for early-bird Summer Camp registration – Coming soon!		

January 27 Becoming a Naturalist class
Thursdays through May 4th, 4:10–7:00 p.m. at UM, location TBA. Our landscape is a manuscript written in trees, flowers and tracks. Learn how to read its story with a course on the basic skills and tools of a naturalist. Class includes field components with local experts. Cost: \$295. Register with MNHC.

February 12 Saturday Discovery Day, 10:00 a.m.-noon. **Beetles: Good, Bad and Ugly**. Explore the fascinating lives of beetles in our region and their adaptations to all sorts of conditions. We will discuss which species homeowners should be aware of and which they can relax about. Led by UM Ph.D. students Kjerstin Skov and Kathy Bleiker. Location TBA.

February 15-17 FireWorks Trunk Workshop
Learn about wildland fire using FireWorks, an educational trunk for grades 1-10. Participants will learn about fire ecology through hands-on activities. Classroom teachers and non-formal educators are welcome. To learn more, go to firelab.org and click on FireWorks. To register, contact Jane Kapler Smith (329-4805, jsmith09@fs.fed.us).




February 26 Saturday Discovery Day, 1:00-5:00 p.m. **Creating a Wildlife Sketchbook**. Drawing on the inspiration and techniques of Scottish wildlife artist Keith Brockie, we will create our own wildlife sketchbooks. Working with UM's extensive animal collection, we will use many techniques to portray the form, gesture and detail of local fauna. No drawing experience required. Materials list available upon registration. Led by natural science illustrator, Claire Emery.

March 1 Volunteer Naturalist Training, Time TBA. **How Many Elk?** Interested in helping with our Visiting Naturalist in the Schools program? Join us for training to take part in March's monthly classroom visits that reach almost 500 Missoula area students.

March 12 Saturday Discovery Day. Time TBA. **Our Naturalist Heritage**. Our country has a great naturalist tradition, including Henry David Thoreau, Rachel Carson and John Muir. Depending on weather we will investigate their legacy through indoor or outdoor exploration. Led by educator Steve Archibald.

March 26 Saturday Discovery Day. 10:30 a.m.-2:30 p.m. **Waterfowl at Lee Metcalf National Wildlife Refuge**. Late March is waterfowl migration season and Lee Metcalf National Wildlife Refuge is the perfect place to see them. Outdoor Recreation Planner Bob Danley will take us behind the scenes at the Refuge to explore the lives of these avian travelers. Beginning birders welcome. Registration required.

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

-  **Volunteer Naturalist Training**
-  **Summer Science Day Camps**
-  **Elderhostel**
-  **Saturday Discovery Days**



Follow that Footprint

Snow or mud can be a great way to capture the footprints of passing animals. Go on a walk around your neighborhood or around a park or in the woods. See how many tracks and traces of animals you can find and try to identify who made them by noticing their location, size, shape and pattern. There are several good field guides available to help you.

You can try to capture animal tracks yourself by putting some seeds or peanut butter (or experiment with other types of food) somewhere the snow or ground is smooth and unmarked. Near water often is a good place for animal traffic. Check out the spot over several days to see if any or how many different kinds of tracks appear.

Life Beneath Snow

The next time you gaze out at an expanse of snow, consider what may be happening beneath the featureless surface. In the gap between snow and ground – a space called the subnivean zone – lies an active, unseen world. The space is formed when warmer, unfrozen ground melts the snow above it. Water vapor condenses and freezes on the undersurface of the snow, forming a solid ceiling. The air in this space remains just above freezing, even when outside temperatures dip below zero.

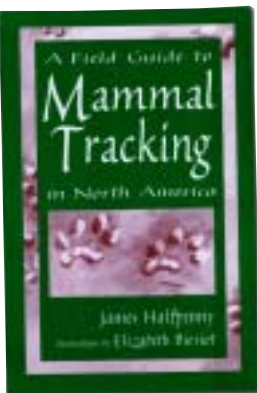
Small mammals, such as mice, pocket gophers and voles, remain active throughout the winter in the subnivean zone, feeding on grasses, seeds and tender sprouts. Some of these rodents are highly territorial in the spring and summer, but tolerate the company of others like them during the cold season. They may even form communal nests, benefiting from the warmth of their combined body heat.



Although invisible from the surface, subnivean rodents are still subject to predation from above and below. Weasels and martens hunt beneath the snow. Other predators, such as coyotes, foxes and owls, use their keen hearing to detect activity under the snow, then pounce through the surface to capture unsuspecting prey.

Winter Reading for the Whole Family

Life in the Cold: An Introduction to Winter Ecology 3rd Edition by Peter J. March with illustrations by Libby Walker. University of New England Press, 1996. Basic information on snowpack, animal and plant survival mechanisms, plant and animal interactions and human reactions to cold by the founder of the winter ecology program at the Center for Northern Studies.



Winter World: The Ingenuity of Animal Survival by Bernd Heinrick. HarperCollins, 2003. An exploration of winter from a master of science writing.

A Field Guide to Mammal Tracking by James Halfpenny with illustrations by Elizabeth Biesiot. Johnson Books 1986. The standard for identification and interpretation of animal tracks by the founder of the University of Colorado's Institute of Arctic and Alpine Research.

Allen and Mike's Really Cool Backcountry Ski Book: Traveling and Camping Skills for the Winter Environment by Allen O'Bannon with illustrations by Mike Clelland. Falcon Publishing, 1996. Black Diamond Catalogue calls this "...the winter back country bible..."

Snowflake Bentley by Jacqueline Briggs Martin with illustrations by Mary Azarian. Houghton Mifflin Company, 1998. Caldecott Award winning book about Wilson Bentley, who was transfixed by snow crystals as a boy and went on to photograph and describe these natural wonders.

Internet Sites

West Central MT Avalanche Center

<http://www.fs.fed.us/r1/lolo/avalanche/weekend.htm>

National Snow and Ice Data Center

<http://nsidc.org/>

Montana Natural Heritage Program

<http://nhp.nris.state.mt.us/>

NOAA Photo Library

<http://www.photolib.noaa.gov/historic/nws/index.html>

Junior Snow Ranger

<http://symbols.gov/jrsnowranger/index.html>

NASA Kids Learning Page

<http://kids.msfc.nasa.gov/>

Nearctica

<http://www.nearctica.com/geology/storms/snow.htm>

Snow Crystals

<http://www.its.caltech.edu/~atomic/snowcrystals/photos/photos.htm>

Snow Pit

http://www.blueiceonline.org/howsite/snowpit_about.html



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Courtesy Kate Davis

Natural History Educator Awards

Every year the staff and board of the Montana Natural History Center wish to recognize members of the community who in some way have added to the public's understanding and/or appreciation of the natural world. Natural History Educator awards are intended to be given to one individual and one organization, although sometimes distinctions blur.

"This year the awardees were an organization that is really an individual and an individual that is really a team," said MNHC Director Brad Robinson at the 2004 awards ceremony, held in September.

"Without the enthusiasm and dedication of teachers such as Jamie Nisbet and Patti Walker or of organizations such as Raptors of the Rockies, we would all be the poorer," he said.

Here's a little bit about our winners:

"Kate Davis is always on vacation"

That's the answer a group of schoolchildren once gave to Raptors of the Rockies Director Kate Davis when she asked when they thought she might ever have one.



Courtesy Kate Davis

"That was after I described my schedule of 24 hours a day, seven days a week, 365 days a year, caring for and feeding 20-odd birds of prey," she says wryly.

But in some ways the students were right: Kate Davis loves her work and probably would never do anything else.

Raptors of the Rockies, embodied in the person of Davis, has been opening the eyes of people

in western Montana to the beauty and natural history of raptors since 1988. According to its mission statement, Raptors of the Rockies was founded "to provide a lifetime of quality care to permanently disabled birds of prey; to educate through the use of live birds and wildlife art

programs; and to instill a sense of respect and wonder for raptors, and to promote wildlife conservation and habitat protection for wild bird populations."

But it is the passion that Davis herself exudes for the birds that has inspired audiences at schools, libraries, social clubs and public festivals – some 80,000 people at 900 events over the years. And that inspiration comes not only from her depth of knowledge about raptors and their habits, but also from her art.

"From ancient cave paintings to Roman coins to our own national emblem, depictions of hawks, falcons, eagles, ospreys and owls demonstrate thousands of years of human fascination with raptors," she writes.

Teaching the inner naturalist

"Children are naturalists by nature," says Jamie Nisbet, "they naturally look at the world and ask, 'I wonder why...?'"

Nisbet and fellow teacher Patti Walker try to encourage and direct that inclination in their 3rd grade classes at Hawthorne Elementary School in Missoula. Building on the curriculum offered


by MNHC's Visiting Naturalists in the Schools program, Nisbet and Walker spend time every week taking students outside to observe, ask questions and record their impressions of nearby nature in journals. Back inside, the students build vocabulary, learn about animal and plant adaptations and habitat, research topics and make presentations about what they've learned.



MNHC Photo

The two teachers say a naturalist approach ties in reading, writing, drawing, social studies and communication as well as science. "It takes advantage of the different ways kids learn," Nisbet says, "and gives them the lesson that learning takes place anywhere and everywhere, not just in school."

Although Nisbet and Walker have their own classrooms, they collaborate closely around monthly visits by MNHC's Visiting Naturalists in the Schools – sharing notes and following up on questions raised during those sessions. And they jointly participate in two day-long field trips included in the Visiting Naturalist program.

Visiting Naturalists in the Schools does a good job of supporting teachers, Walker says, "and reinforces the idea of being a life-long learner. As a society, we're often outside, running here and there, but we don't usually take the time to observe nature quietly and reflect on it." 



MNHC Photo

TOP LEFT: Red tail hawk, by Kate Davis.

FAR LEFT: Kate with Sibley, a Peregrine falcon.

TOP RIGHT: Patti Walker outside with students, and Jamie Nisbet, ABOVE.

Darkhouse Spear Fishing

Popular winter pastime at Medicine Lake

By Elizabeth Madden

You may not realize it, but one of the most consistently cold spots in Montana is not Glacier National Park or other mountainous spot, but the plains of the extreme northeast corner. This sparsely-populated corner of the state averages more than fifty days a year with temperatures below zero. Only the hardiest folk end up calling this area home.

So what do we in the ice box of Montana do for fun to get through the cold winter months? Well, quite a crowd sometimes convenes at the Medicine Lake National Wildlife Refuge, braving the elements in search of the wily northern pike. Here on the largest natural lake in eastern Montana anglers pursue the ancient art of darkhouse spear fishing.

Darkhouse spearing is a simple sport in theory: you suspend a decoy into clear water through a large hole in the ice, and when a fish comes up to inspect the decoy, you spear it! The ice house must be totally dark inside in order to see the fish from above.

Better than TV

As you bundle up and head out across the ice on Medicine Lake (which sometimes reaches three feet thick!), you see clusters of small, windowless shacks scattered about. Sometimes only a wisp of chimney smoke lets you know the house is occupied. You pull your shack along on a homemade sled until you find a promising spot.

But there's some work to be done before you start spearing, plus you need to warm up! So grab your auger and ice saw and cut out a two-foot square block of ice, which might take a few hours itself. Push your darkhouse over the hole, bank the sides of the shack with some snow to insulate and keep light out, and you're in business.

This two by two-foot hole is your window into the watery world of the northern pike. Stoke your heater and pull up a stool. Peer into the green depths. The water is about three feet deep here – perfect. You lower a six to eight-inch, brightly painted fish decoy until it dangles a foot or so below the bottom of the ice and you wait, ready with spear in hand. Minutes, and then hours, go by without any action. Some call it watching Norwegian television.


As you stare down into the aquatic environment,

it looks warm and inviting, especially compared to your frigid station. Schools of minnows swim by, and extraterrestrial-looking aquatic insects peddle and bob in the water column – fairy shrimp and waterboatmen.

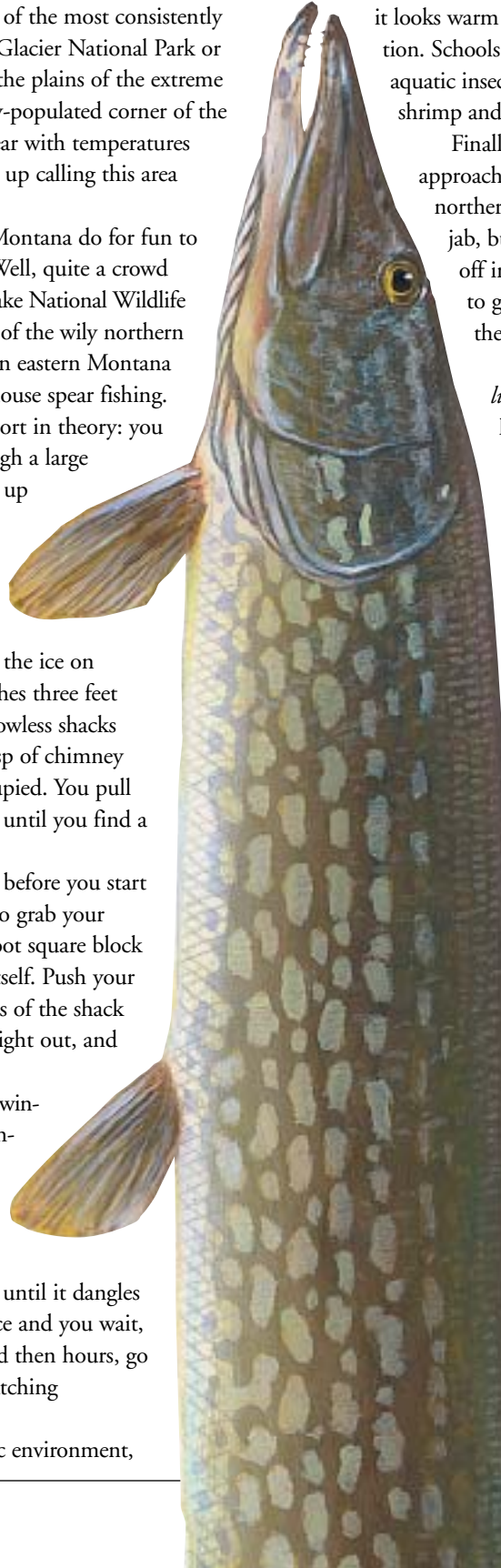
Finally, just when you are starting to drift off, a shadow approaches and there, nose to nose with your decoy, is a huge northern pike! You lower your spear to the water, ready to jab, but before you get a chance, the cautious fish moves off into the darkness. But just that glimpse was enough to get your adrenaline flowing. They really are down there, and they are hungry!

Northern pike go by the scientific name of *Esox lucius*, which comes partly from the Greek word *lukos*, meaning wolf, a reference to the predatory behavior of these fish. Pike are the largest and most voracious predator in our northern waters. Although pike are native to much of the United States and Canada, they are not indigenous to most Montana waters. Instead, they were introduced here as a sport fish. The adults feed mainly on other fish as well as frogs, crayfish, mice, muskrats and ducklings. It's this predatory nature that makes pike susceptible to human predators, as when a pike comes in to investigate a decoy carved in the likeness of its favorite menu item!

In a good winter, when the water is clear and the pike numbers and sizes are up, as many as 40 fish houses can be found on the Refuge – and that is quite a population explosion in a county like Sheridan, which averages 2.4 people per square mile. Five to eight-pound northern pikes are common, with the occasional 12 to 15 pounder speared. It's not unusual for an angler to spear a limit of 10 fish in a day.

So next time you see the Montana weather map and that extra-cold thermocline dipping down into the northeast corner near Medicine Lake National Wildlife Refuge, think of those intrepid fishermen and women bundling up and heading out to their darkhouses, to gaze through a frozen window into the world of the northern pike. 

Beth Madden is a wildlife biologist for the U.S. Fish and Wildlife Service at Medicine Lake Wildlife Refuge.



Timothy Knepp, courtesy USFWS

Creating a Resource for the Community

When Minie Smith moved to Missoula, she was drawn to volunteering at the Montana Natural History Center because of her background in land conservation and her love of the outdoors. Nevertheless, she rolled up her sleeves and tackled the unglamorous and decidedly indoor project of organizing the holdings of MNHC's Ralph Lee Allen Library. The library is a partnership between MNHC and the Montana Environmental Educators Association.

"Originally the library was mostly curriculum materials, things that weren't listed in the Library of Congress. Thanks to many donations over the years [most recently several hundred books, including some rare editions, from the estate of Winton Weydemeyer], we now have nearly 1,500 books, covering a broad range of nature topics," she says.

Smith says that sudden growth made it necessary to get more organized, using a catalog system the rest of the world can recognize. And it will make it much easier to add titles in the future.

"I'm very excited to be involved in building a resource for the community, acquiring more books and attracting more users," says Smith. "The new building will have a whole room dedicated to the library, with a table and seating and computer access. I'd like to remind people that books or donations of funds to purchase books make great gifts to MNHC. They'll go a long way toward making this library a great resource for everyone."



MNHC Photo

Community Watershed Education



MNHC Photo

According to Baba Dioum, director of agricultural policy for Senegal, "In the end we will conserve only what we love, and we will love only what we understand."

MNHC's Community Watershed Education course, offered through the University of Montana's Continuing Education program, teaches participants about issues in the Clark Fork watershed through lectures, field trips and hands-on activities, increasing understanding of one of the most important natural features of our area. In turn, participants share their new knowledge with local 6th grade students through class visits and MNHC's annual Watershed Festival, held in late April.

"The idea is that by connecting people to the place they live through education about our watershed, we foster an attitude of caring and stewardship for that place," says Brian Williams, UM environmental studies master's degree student who is teaching the Watershed Education course this year.

"Passing what we learn along to younger members of the community helps clarify our own understanding and, hopefully, will spark a spirit of involvement in the next generation," he says.

The Community Watershed Education course is open to anyone and free of charge if you aren't taking the course for UM credit. To register, contact Jazz Rowell, MNHC administrative assistant, at 327-0405.

Why Give?

There are as many reasons for making a philanthropic gift as there are donors. Years ago a man I loved and respected told me that the single best thing he could think of doing with his money was to join with others who believed as he did and try to make a difference in the world. The act of belonging to something bigger than himself gave him immense satisfaction and pleasure.

Most of us aren't able to make sizeable financial contributions like my friend could, but he taught me that everyone could give within their means and gain that feeling of making a difference. I have certainly found that to be true. My gifts to public

radio certainly don't pay for my favorite programs, but whenever I hear someone quote a story they heard on one of these programs I feel a little pride in having helped broadcast that story.

I hope the members and donors of MNHC feel the same way. In 2005 we will open a new public museum and discovery center in Missoula. We'll be right on the edge of McCormick Park. The Park itself was given to the people of Missoula nearly 70 years ago by the estate of Kate McCormick. This tradition of philanthropy is part of our history and culture. By giving to the causes you believe in you play an active and essential role in shaping our community for today and tomorrow.

—Betsy Maier

So You Want to Build a Nature Center....

Last year at the Down by the River Auction, MNHC took a giant step by announcing a dream to buy a building on the edge of Missoula's McCormick Park. Board Member Susan Estep and Executive Director Brad Robinson took to the auction podium and, with the help of a historic brick, told the audience of their vision to transform an old warehouse into a state of the art discovery and nature center. They described a signature building that could serve as a base camp that would encourage students of all ages to get outside and discover Montana's natural history. Twelve minutes later, they had pledges for nearly \$90,000 and MNHC was poised to have a permanent new home.

Wow! We left that evening elated and humbled as the challenge we had undertaken became clear. Architects, city inspectors, lawyers, environmental inspectors, surveyors, bankers, all began their surveys, inspections, planning and negotiations. Our plans to buy the building in December and move in by March were quickly pushed further into 2004. What we first hoped would be a \$50,000 remodel quickly became a \$500,000 job when we turned it over to architects.



Negotiations to complete the sale relied on surveyors completing their work (they are very busy people). But gradually throughout last winter the tasks were completed and on May 19, 2004 MNHC bought a building! Thanks are due to all those who helped by reducing their fees and working many hours: project manager Laurie Smith; attorney Julie Gardner; architects Kent Means and Lucas Dupuis of Macarthur, Means and Wells; Land and Water Consulting; Territorial Surveying and the City of Missoula.

Fundraising has continued at a strong pace and to date we have raised \$225,000 to make our new home happen. We have also worked with the architects to reduce the scope of the project to a more manageable \$260,000 to bring the building up to code for health and safety. We have divided the building into thirds and will develop the area closest to Hickory Street first. Mother Moose Enterprises will continue to rent the eastern end of the building and the middle section currently is available for rent as storage space.

We are committed to working with Missoula-area contractors and suppliers whenever possible, and we are planning to use sustainable building materials throughout the project. We hope the building itself will be part of our exhibits by featuring small-diameter-timber flooring (a sustainable material) in some areas. The heating and ventilation systems will conserve energy and provide the climate control required to bring in traveling exhibits from other museums.

Now that we've begun the remodel we expect to be in the building by early 2005. The leadership gift donors listed below put their faith in our mission and vision and we can't thank them enough. Look for their names on the donor wall at the new Montana Natural History Center, 120 Hickory Street. There is still more to do. A Community Campaign Committee is actively working to raise the money needed for Phase II of the building project. This committee is co-chaired by Susan Estep and Phil Gardner, M.D. Their task is to reach out to the Missoula community to find new supporters who share our passion for a natural history museum and discovery center in Missoula's downtown. You can help too! Put your name on the donor wall by making your tax deductible contribution today. Contact Betsy Maier at 327-0405 or maier@TheNatureCenter.org for more information. Join us in making Missoula's newest community project a success.



Building Campaign Donors

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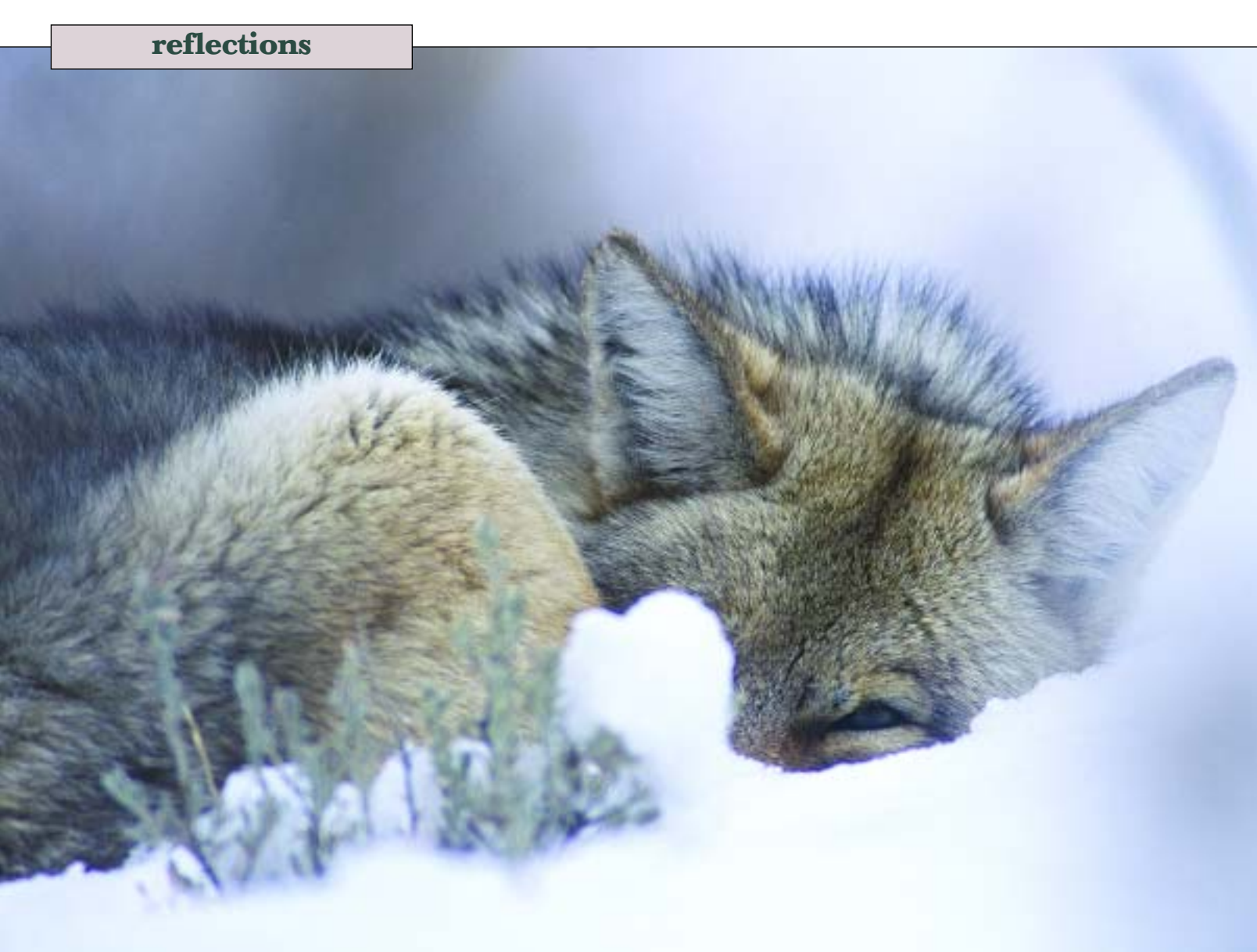
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Courtesy Pete Bengeyfield

“...perhaps because I know them less well, coyotes are still special. I like lying in bed as I did last night, with moonlight streaming in the window, listening to their song. Coyote. That name comes from the Aztecs’ word for them, *coyotl*, and should, to my way of thinking, always be pronounced ki-o-tee, not ki-oat, the way it sometimes is. Coy-o-tee, that word handed down from long ago, a clumsy approximation of their song, the song of wild things in the moonlight.”

from *A country year: living the questions*
—Sue Hubbell, Mariner books, 1986

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