Winter 2007-08

MONTANA Naturalist

Too Many Elk?

Lens Craft

Long Winter's Nap

The Pleasures of Winter Botany

see Get Outside Guide, page 9

Montana Natural History Center
Your Base Camp for Discovery

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

MONTANA Naturalist

Features

Departments

Special Pull-Out Section

Cover photo – Snowy Ponderosa pine, taken by Michael J. Wolf on a crystal-clear, below-zero morning at Council Grove State Park last winter with a Nikon N80, 70-300 lens and Fuji Velvia film.

Photo by Michael J. Wolf

As Board President Hank Fischer wrote in our recent end-of-year appeal, 2007 surely has been a rollercoaster ride for MNHC. From the specter of foreclosure to the freedom of outright ownership of the wonderful old warehouse and brewery at 120 Hickory Street, we weathered a dire fiscal situation and are secure for the future – thanks to the Kendeda Fund and the generosity of our members and friends. You can learn the details of this in Imprints, but the bottom line is that we will be able to pay off our debt and direct one hundred percent of our efforts to developing more and better nature education programs for the whole community.

Beginning in January, we are offering two classes through the Davidson Honors College at The University of Montana. The Montana Naturalist and Community Watershed Education classes are designed to build naturalist skills and give participants unique opportunities to learn about Montana flora, fauna and the Clark Fork watershed.

Meanwhile, it's been great to see snow again in Missoula Valley; winter is so much more inviting when you can get out on skis or snowshoes. While you're out, look around to see what plants and animals do to cope with frigid temperatures and scarce food. It's a perfect time to see the unadorned framework of things, and perhaps to try your hand at capturing subtle winter designs with pen or camera. And if you suffer from a lack of sunlight, just remember the days start getting longer December 22.

Happy Holidays!

Caroline Kurtz

Caroline Kurtz
Editor

Letters

I offer some comments regarding an article ("A Conservationist's View"), appearing in the Fall 2007 issue of *Montana Naturalist*. While I agree our planet is warming, as a forester I challenge Dave Stallings' assumption that the current Northern Rockies infestation of mountain pine beetle, which is killing vast acreage of lodgepole pine, is directly related to [that warming]. Certainly, drought conditions will cause tree mortality, but seldom the death of a stand or a forest…. The primary causative condition is – old age! In the case of lodgepole pine, it is generally understood that once a stand reaches about 90 years…it becomes susceptible to mountain pine beetle. In the 1960s, northeastern Oregon experienced a huge mountain pine beetle epidemic, killing thousands of acres of lodgepole pine stands. These stands became victims because they had reached the age of susceptibility, not due to global warming…. In the 1970s, a similar infestation began in the southern portion of the Kootenai National Forest, spreading onto the Plains District of the Lolo National Forest. Even though serious harvesting efforts were initiated to curb the infestation…the beetles slowly moved south following the path defined by the 90-plus-year-old stands…. The death of vast acreage of once healthy forests in the West may, in a small way, be affected by the planet's warming, but the real cause is man's allowing the trees to reach an age where they become susceptible to insects and disease! I would like to see the issue of aging stands become incorporated into the discussion of why we are currently seeing heavy mortality in our resilient forests. Blaming it all on global warming is unfair and I believe unwarranted, given all the existing published research on mountain pine beetle.

Sincerely,
Charles W. Spoon
Northern Rockies Resource Consultant

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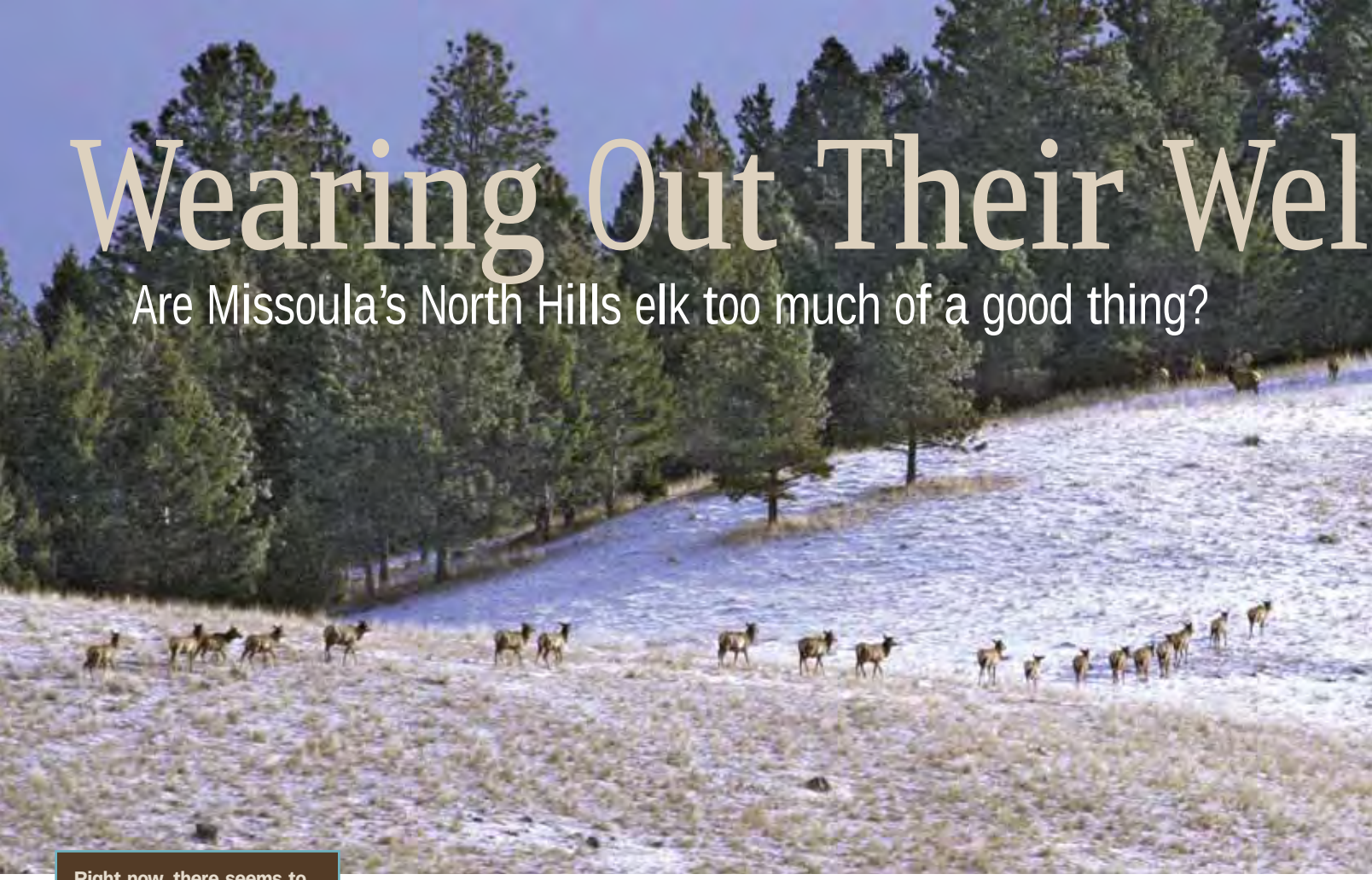
Wearing Out Their Wel

Are Missoula's North Hills elk too much of a good thing?



Right now, there seems to be no limit to the growth of the North Hills herd. The animals are coming through the winter in great condition, say researchers, with sufficient fat reserves to see them through the stressful calving season. Nor do they seem to be suffering from increased predation by natural enemies, and hunting by humans is very restricted.

By Caroline Kurtz

Like family that lingers a little too long around the holidays, Missoula's North Hills elk herd is wearing out its welcome with some property owners. Too many elk are staying too long at the table, and there is concern that in a few years they might never leave. It's a thorny wildlife management issue.

According to researchers, 25 years ago fewer than 50 elk would come out of the Rattlesnake Wilderness Area around Thanksgiving and spend a few months foraging at lower elevations on National Wildlife Federation and private ranch land east of Grant Creek. In the spring they'd migrate back to their calving grounds and summer range. Over the past couple of decades, though, people who live in the hills just north of Missoula have been seeing elk come down earlier and earlier and leave later and later. And now there are not just a few dozen, but more than 300. And they don't stay east of the creek anymore, but have found their way to the west side and the good grass of the ranches and subdivisions there.

The heavy snows of 1996-97 really pushed this trend, according to Grant Creek homeowner association president Bert Lindler.

"The elk found their way to I-90 and the Goodan-Keil subdivision, where they could starve less quickly," he says. "They survived and have been growing ever since."

According to Lindler, the ranches between Grant and Butler creeks have been bearing the brunt of an increasingly large herd eating up rangeland needed for cattle, trampling fences and generally stressing the ranchers' patience and resources.

"Everyone wants to see elk around, just not at these levels," he says. "We want to find a way for a healthy herd to live with people, but not among them."

To this end, Lindler was instrumental in forming the North Hills Elk Working Group in 2005, which brings together various groups with an interest in elk-people harmony, including ranchers, homeowners, hunters, biologists, state wildlife managers and conservationists.

"We've got great cooperation among all the players," says Shawn Cleveland, a wildlife biology graduate student at the University of Montana. "We'd like to be on the leading edge of this urban wildlife issue, and be able to offer some concrete information and advice to other communities."

Photo by Paul Queneau, Rocky Mountain Elk Foundation

Keep them moving

Unlike herds in Estes Park, Colorado and around Banff and Jasper National Parks in Canada, Cleveland says the North Hills herd is not yet at the point of no return, where elk lose their migratory habits and become resident. Resident elk can overburden the ecosystem of their winter range and lead to dangerous animal-human interactions, especially during the calving and rutting seasons.

"We might be O.K. with resident deer," says Lindler, "but elk are far bigger and more dangerous."

Typically, elk begin to move back to their summer range in early spring. They calve during June, and cow-calf pairs spend the summer mostly by themselves. Starting around August, they begin to congregate with other moms, babies and young adults. At the same time mature bulls begin to spar and define harems for the rut, or mating season, which happens in September. Cows and youngsters move to winter range in late fall and spend the winter in a concentrated group, with bulls coming and going on the periphery.

In the case of the North Hills herd, the timing of this cycle has been moved up. Elk now arrive pretty much *en masse* on protected or private land in September, leaving good foraging ground in the Rattlesnake Wilderness a couple of months before snow normally would force them out. Last year, some elk reportedly stayed on winter range until late June.

"Fortunately, so far it doesn't appear that any calves have been born on the winter range," says Cleveland, which is good news since elk that calve on winter range tend to become non-migratory.

Where this has happened in Estes Park, outside Denver, the elk have wiped out aspen trees along creeks, producing a cascade of negative effects on wildlife that depend on the riparian ecosystem, from beaver to birds to fish. Elk-human encounters reached the point in Banff where a couple hundred elk had to be relocated onto First Nations territory, at great expense and difficulty.

> "We'd like to be on the leading edge of this urban wildlife issue, and be able to offer some concrete information and advice to other communities."

Moving elk outside of Montana is not an option, according to Cleveland, since there are few areas that would accept more elk and because chronic wasting disease has brought about a moratorium on elk relocation. Sterilization, which has had some success in controlling deer populations, is expensive and labor intensive as it has to be repeated every year, and has brought up ethical concerns.

What's to be done?

State Fish, Wildlife and Parks biologists estimate the herd has been growing by 11 percent a year since 2000, at which rate it is expected to double in less than seven years. In addition to good grazing and less snow to deal with, the elk have little to fear from predators, including hunters. Even after 80 hunters received permits for an early-season hunt in the Rattlesnake Wilderness, established last year specifically to control the herd's growth, only nine animals were taken – five bulls, three cows and a calf. Wildlife managers says that reducing the number of bulls by a few will have little or no impact on overall population growth; what's needed is around 40 or 50 cows a year to be harvested for a while.

Photo by Bert Lindler

Traditional barbed-wire fences can be tough on elk, which can get hung up in the wire and die, and elk can be tough on fences, tearing out top wires when they cross. Volunteers (above) have been removing unneeded barbed wire fences in the North Hills and working with ranchers to make fences easier for elk to cross, benefitting the elk and also property owners, who hopefully will have fewer repairs in the spring .

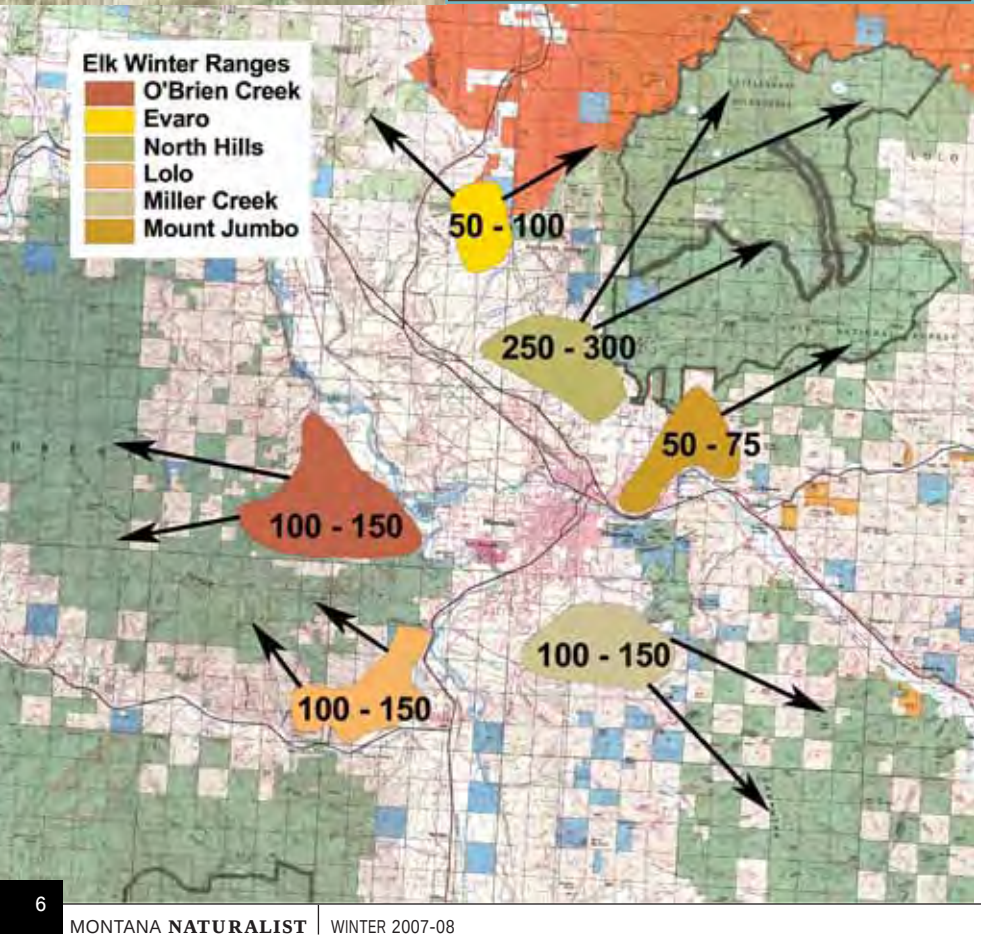
Photo by Kristi DuBois

Photo by Shawn Cleveland

Above: Intrepid Rattlesnake hunter takes a two-wheeled approach.

Left: GPS radio collar records this cow elk's location over time. Collars release and fall off after a while.

Below: Missoula, the hub of five valleys, also is the hub of six elk herds. Winter ranges for these herds ring town in the Miller and O'Brien Creek drainages, in the North Hills, on Mount Jumbo, and in the hills near Evaro and Lolo. Between 50 and 150 animals comprise each herd, except for the North Hills bunch, which exceeds 300 animals.



"But, between private property, National Wildlife Federation land and the Rattlesnake Recreation Area, which either allow no hunting or have very restricted access, these elk simply cannot be hunted effectively," says Cleveland. It's not safe to shoot in some areas because of homes, ranchers are understandably cautious about whom they choose to let hunt on their land, the National Wildlife Federation property so far does not allow public access and the Rattlesnake Wilderness permits no vehicles beyond a certain point. Dragging a 300 or 400 pound animal many miles to the trailhead is less than inviting for most people.

"You can definitely get elk up in the Rattlesnake," says Cleveland, "but it's not for the faint of heart." With better promotion, though, he wonders whether such a challenging hunt may gain popularity in time.

Cleveland, Assistant Professor Mark Hebblewhite and FWP biologists Bob Henderson and Mike Thompson are spearheading the latest effort to understand more about where and when these elk move and how the animals respond to the presence of people, hunters in particular.

Last year Cleveland was able to outfit 15 elk with radio collars, eight with GPS units that allow researchers to get a reading on the animals' precise locations as frequently as every half hour. The seven other animals can be monitored by researchers going out and getting a signal from their VHF radio collars. Cleveland hopes to put VHF collars on 20 more elk, giving him location data on more than 10 percent of the herd, enough to extrapolate to the rest of the population.

"As we get further along in the research, we'll be able to make better recommendations for hunting," he says. "Right now there's pretty low pressure on these elk. We'd also like to do some field tests on how the elk respond to the presence of people in general. How close can you get? How much are they becoming habituated to people? If we can be proactive, maybe we can find ways that elk and people can be good neighbors."

For a free brochure on "Living with Wildlife: Missoula's Elk Herds," contact the Montana Natural History Center, 327-0405. To learn more, go to:

www.fwp.mt.gov
www.mhfj.org/MissoulaElkHerds
www.rmef.org
www.fs.fed.us/r1/lolo


Photo by Eugene Beckes


Photo by Anthony Cesare

Nature Photography

For the love of it

The photography that has appeared in *Montana Naturalist* over the past few years has come from a variety of individuals – amateurs, professionals, artists, scientists, naturalists – with a variety of perspectives. In every case, the photographer has been willing to share his or her images with us for free, to serve the greater good of inspiring us with the beauty and diversity of our natural history. We recently sent out a short questionnaire to a number of contributors with the hope that their answers might inspire readers to relate to nature in a new or different way. Eugene Beckes (St. Ignatius), Anthony Cesare (Missoula), Michael Wolf (Missoula) and Daniel J. Cox (Bozeman) are featured.

Q: What draws you to photograph nature?

Cox: The love of the outdoors and a curiosity about animals' lives.

Cesare: The wonder that is nature.

Beckes: Love.

Wolf: Love of the natural world, combined with a desire to share my view of it.

Above left: American dipper, or ouzel, at Lucifer Creek, by Eugene Beckes.

Above right: Garden drama – spider, bee and foxglove, by Anthony Cesare.

Q: Do you consider yourself primarily a photographer, scientist, naturalist, artist, something else, or a combination?

Cox: A photojournalist specializing in the natural world.

Cesare: A photo*diarist*.

Beckes: Primarily a photographer, although also an illustrator.

Wolf: I don't think you can be an effective nature photographer without a good dose of the other three. The better you understand your subject, the better your images will be. I also think you must have a bit of the artist in you to communicate effectively with a visual medium.

Q: What currently is your favorite subject in nature? Why?

Cox: Currently I'm working in the high arctic doing volunteer work for Polar Bears International. Polar bears have become a global icon for climate change. People love [these animals] and it's an incredible opportunity to help spread the message that if we all don't make serious changes, all animals of the planet are at risk, not just polar bears. This includes humans.

Cesare: During the autumn, the trees, leaves and skies are especially attractive to me, primarily because of the way light sparks the colors. As winter comes, the snow, hoar frost, fog and ice draw my attention, as does the skeletal and more abstract aspects of trees and other vegetation.

Beckes: Birds, it's really challenging to get a good shot. For me, spending time with them, getting to watch their behavior is a huge payoff.

Wolf: High mountain scenes in great light get my heart pumping. Unfortunately, I have to make a living so [my time is] limited for alpine access. In between, I do a lot of macro and small pieces of nature types of images. I don't rule anything out. Nature photographers must be opportunists; you never know what might present itself if you are open to it.

Q: How much time do you spend in the out of doors in general? What do you like to do besides take photographs?

Cox: I regularly spend as many as 10 months a year on the road, producing my work. When I'm not shooting I enjoy spending time with my wife in sunny locations, kicking back on a beach, snorkeling or diving.

Cesare: In spring, summer and fall I am outdoors tending the garden and yard on a daily basis for many hours.

Beckes: I spend a lot of time out there. I've been a backpacker, climber, hiker, canoeist and skier for decades. All my favorite recreation revolves around nature in one way or another.

Wolf: Ideally, I try to get out for at least an afternoon every weekend. I have a small child right now, which limits my range and how long I can stop for a photo op. He just doesn't have the patience to wait around for Dad very long. Besides photography, I enjoy hiking, camping, wood working, cooking, gardening, boating and target shooting.

Q: How long have you been taking photographs of nature? For what purpose?

Cox: I've been working full-time as a professional for 25 years. I do it because I love my work and I hope someday to make a difference in society's attitude toward nature. It's certainly not for the money.

Cesare: It must be at least 30 years. Even during my years in New York City, I was surprised to find nature not only in Central Park's 843 acres, but also in many unexpected or, better, unnoticed places around Manhattan. In the courtyard trees outside my third floor apartment windows, the bird life included cardinals, eastern bluejays, robins, goldfinches, mourning doves, house finches, sparrows, chickadees and even peregrine falcons.

Beckes: Professionally, just four years. But I've always loved photography and fooled around with it. The digital revolution made it affordable for me to do it for a living. The price of film and processing would have killed me.

Wolf: More than 20 years. I tend to be a collector: my first photographic interest was collecting images of wildflowers and I'm still doing it. I like to share my vision of the world with others. Everyone sees the same thing differently.

Q: What do you expect or hope that others "get" from your photos of nature?

Cox: I hope people will become more appreciative of what mother earth has blessed us with. I often meet folks who had no idea how affected they could be by wildlife. An example is the polar bears of Churchill, Manitoba, where I'm writing from. Just today I had people I'm guiding tell me that seeing the polar bear congregation had changed them for life. I'm not sure how exactly, but this is the kind of reaction people have to amazing animal encounters. There's something primeval about our need to be around animals, in my opinion.

Cesare: An awareness, a memory, a sense of time, a mood.

Beckes: Really, I just hope to pass on the love and excitement it gives me. But as excited as I can get over capturing an image I'm really happy with, it never compares to being out there, experiencing the reality.

Wolf: I want them to gain more awareness of what is out there, perhaps a desire to go there or to look more closely at their world. I hope some will realize the importance of preserving pieces of the natural world and that preservation includes not just a species, but the whole ecosystem in which the species lives. Details matter, all the pieces matter.

Q: If you could tell people one thing about what you do as a photographer of nature, what would you say?

Cox: Never lose your curiosity and always keep an eye on cutting edge technology. To make a living in this business, you have to want more out of it than just money. Open eyes and a desire for exciting travel are helpful.

Cesare: Observe, observe, observe. Be aware that photography is all about how light hits an object. I'm not a technical photographer, and by some standards I wouldn't be considered a serious nature photographer. Still, my list of flora and fauna images is ever increasing. Many of these have been taken around my yard and neighborhood. You need to have the camera at the ready to be able to catch a serendipitous encounter with birds or other animals, to record a sudden sensational sky, or photograph that flower found at its peak of beauty.

Beckes: The "follow your bliss" approach works well. If you're involved in it because you love it, the rest will be discovered. Patience and respect for your subject are critical.

Wolf: Photograph from your heart. If you aren't having fun and feeling the passion, you need to try a different subject.

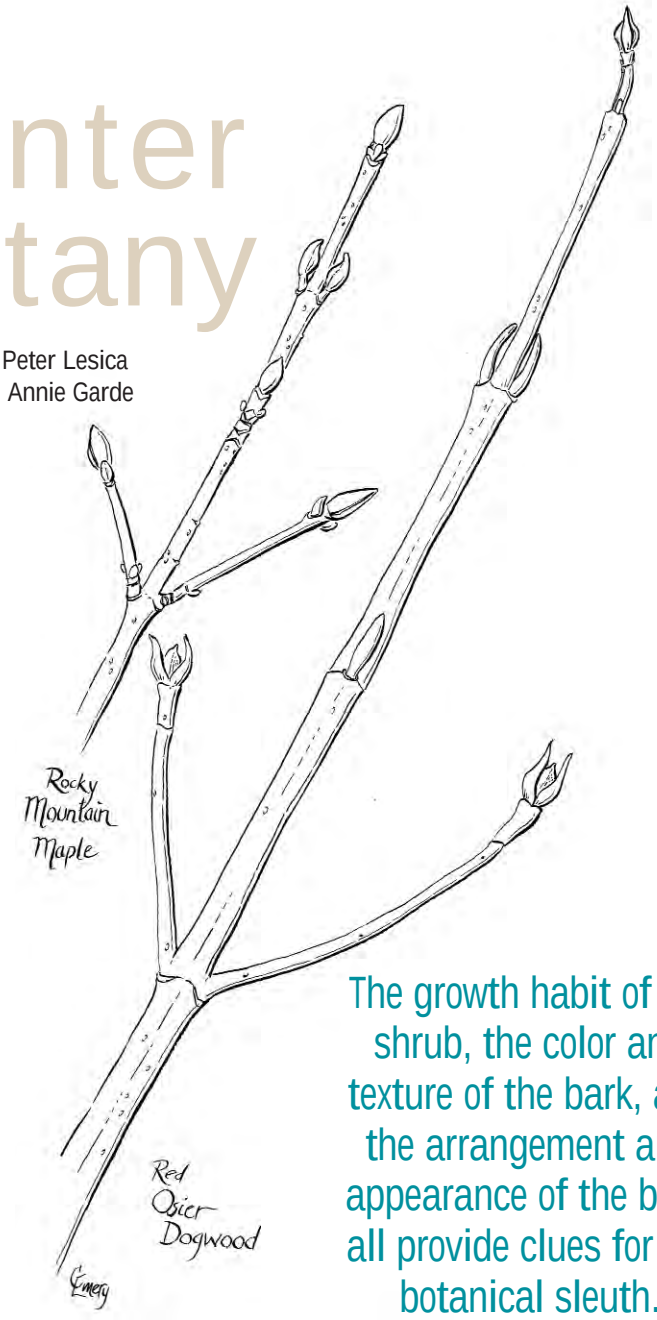
Photo by Daniel J. Cox, www.naturalexposures.com

Photo by Michael J. Wolf

Top: Great gray owl, by Daniel J. Cox (www.naturalexposures.com)
Above: Six by six elk at the National Bison Range, by Michael J. Wolf.

Winter Botany

By Peter Lesica
and Annie Garde



The growth habit of the shrub, the color and texture of the bark, and the arrangement and appearance of the buds all provide clues for the botanical sleuth.

Winter might seem like a pretty dull time for a field botanist. No flowers, no leaves, no green except for the conifers. Ho hum. The serviceberries, chokecherries and mock orange that are so familiar by their flowers and fruits in the summer, just look like a tangle of generic bushes in winter. In the early fall, you may still find some fruits clinging to the branches or some old leaves on the ground, but as winter wears on, we're left with only the twigs.

But a twig offers sufficient information for identification; you just have to look closely. The growth habit of the shrub, the color and texture of the bark, and the arrangement and appearance of the buds all provide clues for the botanical sleuth.

The first thing to notice is whether a shrub has spines or thorns. It's also important to observe whether the branches and buds are opposite or alternate. These characteristics help place the shrub in a family.

Perhaps the most informative characters are the buds. A bud is actually a very short branch. In most species, the lowest leaves of the shortened branch are modified to form tough scales. These scales wrap around and help protect the delicate tissue that will become next summer's leaves.

Naked buds are more common in warm climates. In western Montana, only buckthorn, dogwood and poison ivy lack scales. Generally there are two or more scales covering each bud, and these may be arranged like numerous overlapping shingles or paired and meeting edge to edge. Willows are unique in that they have only a single bud scale.

I used to notice buds for the first time each year in about February, during, say, a chinook, and I'd worry that they'd been fooled by old man winter. But I was wrong. They'd been there all along. Buds are formed in the summer and become dormant in the fall in response to lower temperatures. And buds are winterized; the tissues are filled with sugars that act as antifreeze, and the scales prevent drying out. As the days become longer and warmer, the leaves inside the bud expand and the scales fall away.

So how can these features tell us what's what? A common shrub with smooth, bright red twigs and opposite buds and branches could be red osier dogwood or Rocky Mountain maple. The difference is that the maple has paired bud scales, while the dogwood had naked buds enclosed by little baby leaves. Among the shrubs with spines or prickles, roses, raspberries and gooseberries are common. Roses have small shiny buds and the base of some of the thorns resembles a white shield. Gooseberries always have stout thorns just below the buds, while raspberries do not.

So, see? When the snow is lousy or nonexistent, you can still have fun. Grab your winter shrub field guide, an exacto knife and 10-power hand lens and head for the hills, as long as they have bushes on them. I can now recognize seven species of common shrubs on Mount Sentinel in the winter. And if you see me up there squatting in the bushes, don't get the wrong idea. I'm simply examining these woody plants in their winter attire.

Illustration by Claire Emery, www.emeryart.com. Claire currently is working with Peter to illustrate a comprehensive resource for anyone interested in the plants of Montana – Flora of Montana, *due out in 2010.*

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

get outside calendar

January 2 **Visiting Naturalist in the Schools Volunteer Training,** 4:00-5:00 p.m. Interested in becoming a volunteer naturalist in classrooms? Join us to learn about "Animals in Winter." Call 327-0405 for details.

January 12 **Saturday Kids Activity.** Hibernation Celebration, 2:00 p.m.

January 19 **Saturday Discovery Day.** Wildlife Tracking Workshop, time TBA. Join Elliot Parsons of the Missoula Wildlife Tracking Club to learn how to identify and interpret animal tracks in the field. Dress for outdoors. Call 327-0405 to register; $15/$10 MNHC members.

January 21 **Montana Naturalist Class,** 5:00-8:00 p.m. Develop naturalist skills, explore local natural areas, learn about Montana's plants and animals. Mondays through May 5, with two Saturday field trips in April. OPI credit available. $295; space is limited. Call 327-0405 to register.

January 23 **Community Watershed Education Class,** 4:10-7:00 p.m. Learn about the natural and cultural history of the Clark Fork Watershed, explore local water issues, gain tools for monitoring water quality and stream health, help out at the annual Clark Fork Watershed Festival. Wednesdays through May 7. Free; space is limited. Call 327-0405 to register.

January 26 **Saturday Kids Activity.** Winter Ice Painting, 2:00 p.m.

January 30 **Evening Lecture Series.** Montana's Bats, Kristi Dubois, 7:00 p.m.

February 2 **Saturday Kids Activity.** Family Day: Bird Brains, 2:00 p.m. Featuring Glacier National Park ranger/funnyman Pat Hagan.

February 4 **Visiting Naturalist in the Schools Volunteer Training,** 4:00-5:00 p.m. Interested in becoming a volunteer naturalist in classrooms? Join us to learn about "Animal and Plant Adaptations." Call 327-0405 for details.

February 15-18 **11th Annual Great Backyard Bird Count,** sponsored by the Cornell Ornithology Lab and the Audubon Society. See Get Outside Guide for details.

February 16 **Saturday Kids Activity.** Winter Wildlife Detectives, 2:00 p.m.

February 23 **Saturday Discovery Day.** Intro to Photography for Kids, time TBA. Call 327-0405 for details.

March 1 **Saturday Kids Activity.** Rock and Gem Discovery, 2:00 p.m.

March 3 **Visiting Naturalist in the Schools Volunteer Training,** 4:00-5:00 p.m. Interested in becoming a volunteer naturalist in classrooms? Join us to learn about "Geology." Call 327-0405 for details.

March 12 **Evening Lecture Series.** The Careful Art of Tracking Porcupines, Katie Malley, 7:00 p.m.

March 15 **Saturday Discovery Day.** Field Sketching with Claire Emery, time TBA. Call 327-0405 for details.

March 15 **Saturday Kids Activity.** Skulls, Teeth and Bones, 2:00 p.m.

March 24-28 **Spring Break Day Camp.** Call 327-0405 for details.

April 12 **Saturday Kids Activity.** Tall Tales about Trees, 2:00 p.m.

April 26 **Saturday Kids Activity.** Beaver Boogie, 2:00 p.m.

April 30 **Evening Lecture Series.** Fishers, Mike Schwartz, 7:00 p.m.

January

MNHC Hours: Tuesday-Friday, noon - 5 p.m. and Saturday noon - 4 p.m.
Admission Fees: $2/adults, **$1**/children 4-12, **free**/children 3 and under and MNHC members.

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1	**Visiting Naturalist in the Schools Volunteer Training,** 4:00-5:00 p.m. 2	3	4	5
6	7	*Raven pairs play on sunny days* 8				**Saturday Kids Activity.** Hibernation Celebration, 2:00 p.m. 12
13	14	15				**Saturday Discovery Day.** Wildlife Tracking Workshop, time TBA. 19
20	**Montana Naturalist Class,** 5:00-8:00 p.m. *Through May 5* 21	22	**Community Watershed Education Class,** 4:10-7:00 p.m. *Through May 7* 23	24	25	**Saturday Kids Activity.** Winter Ice Painting, 2:00 p.m. 26
27	28	29	**Evening Lecture Series.** Montana's Bats, Kristi Dubois, 7:00 p.m. 30	31		

Photo by J Schmidt, Yellowstone National Park

February

					1	**Saturday Kids Activity.** Family Day: Bird Brains, 2:00 p.m. 2
Bear cubs born 3	**Visiting Naturalist in the Schools Volunteer Training,** 4:00-5:00 p.m. 4	5	6	7	8	9
		12	13	*Great horned owls begin courtship* 14	**11th Annual Great Backyard Bird Count,** sponsored by the Cornell Ornithology Lab and the Audubon Society. *Feb. 15 -18* 15	**Saturday Kids Activity.** Winter Wildlife Detectives, 2:00 p.m. 16
		19	20	21	22	**Saturday Discovery Day.** Intro to Photography for Kids, time TBA. 23
24	*First bluebirds, robins, red-wing blackbirds return* 25	26	27	28	29	**Saturday Kids Activity.** Rock and Gem Discovery, 2:00 p.m. 1

Photo by Terry Spivey, USDA Forest Service, Bugwood.org

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

get outside calendar

March

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
2	**Visiting Naturalist in the Schools Volunteer Training,** 4:00-5:00 p.m. 3	4	5	6	*Canada geese reclaim nesting territories* 7	8
9	10	11	**Evening Lecture Series.** The Careful Art of Tracking Porcupines, Katie Malley, 7:00 p.m. 12		**Saturday Discovery Day.** Field Sketching with Claire Emery, time TBA. **Saturday Kids Activity.** Skulls, Teeth and Bones, 2:00 p.m. 15	
16	17	18	19			22
Aspen and cottonwood buds burgeon	**Spring Break Day Camp.** *March 24-28* 24	25	26	27	28	29

Photo courtesy Yellowstone National Park

April

		1	2	3	4	5
		8	9	10	11	**Saturday Kids Activity.** Tall Tales about Trees, 2:00 p.m. 12
13	14	15	16	17	18	19
			Columbian ground squirrels wake up 23			**Saturday Kids Activity.** Tall Tales about Trees, 2:00 p.m. 26
27	28	29	**Evening Lecture Series.** Fishers, Mike Schwartz, 7:00 p.m. 30			

Photo by Paul Wray, Iowa State University, Bugwood.org

Photo by Monique Vorstenbosch, istockphoto.com

MNHC Photo

Pines in Peril

This past fall, Stephen Arno led a group to Morrell Peak in the Swan Valley to look at whitebark pines and discuss their ecology. The event was one of MNHC's Saturday Discovery Day field trips, open to the public. The following week, Diana Tombeck, a professor of biology at the University of Colorado / Denver gave a free public talk about Whitebark Pine: Keystone Species Under Threat. Both Arno and Tomback provided assistance with the new Whitebark Pine exhibit at MNHC.

Funding for the display was provided by the Whitebark Pine Ecosystem Foundation and the USDA Forest Service Forest Health Protection Program and the Rocky Mountain Research Station (Fire, Fuel and Smoke Program).

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

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

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

Photo by Ben Blankenburg, istockphoto.com

Let's Go Snowshoeing

If you can walk, you can snowshoe. That's what they say, anyway. Actually, snowshoeing is easy and requires little experience or expensive equipment.

Snowshoes evolved from their original designs that were widely used by trappers, explorers and indigenous people to get around when snow was deep. The idea was to spread your weight out over a broad platform, which would keep you from sinking up to your knees or higher with each step.

Early snowshoes were three to five feet long and about a foot and a half wide, though. They were made from saplings, with fixed leather bindings and sinew or rawhide lacing as the decking. They were pretty heavy and clumsy to maneuver in forested areas or on inclines and uneven ground. Today's snowshoes are made from lightweight aluminum with plastic or rubber decking and bindings that hinge under the balls of your feet. Modern snowshoes are only two or three feet long and less than a foot wide, making them much easier to move around on.

Snowshoeing combines well with a number of outdoor activities: a casual hike in the woods, an overnight backpack excursion or a rigorous alpine climb. Most public land is accessible for snowshoeing, and trail maps are available from the governing agencies. Whether you're looking for family fun or a quality workout, snowshoeing can provide either!

To find snowshoe and cross country ski trails in Montana, go to www.trails.com. *—Scott Eggeman*

Frog-sickles and Turtle Pops

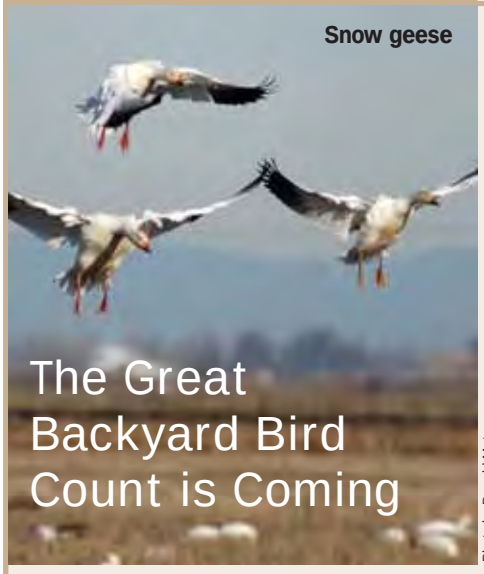
Some animals hibernate during the cold dark season by lowering their body temperatures to just above freezing and living off stored fat. But they can't survive below-freezing temperatures in their nest or den without waking up. Some animals can, though.

Frogs and turtles, for instance, can change their body chemistry to survive sub-zero conditions. They increase the amount of dissolved salts in their cells – which otherwise are mostly water – and manufacture special kinds of anti-freeze molecules in order to lower the cells' freezing-point. If they didn't, their cells would explode because water expands when it reaches 32 degrees Fahrenheit (0 degrees Celsius) and would rupture the cell walls.

In fall, many frogs and turtles bury themselves in mud at the bottom of ponds, which freezes around them. They wake up in the spring when temperatures warm enough to thaw the mud.

Illustration by Brian Blunt

Things to Do



Snow geese

Photo by Donald Metzner

The Great Backyard Bird Count is Coming

Winter is a great time to connect with nature. During Presidents' Day weekend, February 15-18, millions of novice and accomplished bird watchers can put their fascination with nature to work for science during the 11th annual Great Backyard Bird Count, led by Audubon and the Cornell Lab of Ornithology. Anyone can count birds from wherever they are and enter their tallies online at www.birdcount.org.

These reports create a real-time picture of where birds are across the continent and contribute valuable information for science and conservation.

"Volunteers are counting not only for fun but for the future," says Tom Bancroft, chief science officer for Audubon. "It's fun to see how many different kinds of birds can be seen and counted right in your backyard or neighborhood park. Each tally helps us learn more about how our North American birds are doing, and what that says about the health and future of our environment."

Here's how:

Step 1. Plan to count birds for at least 15 minutes during February 15-18. Count birds in as many places and on as many days as you like, just keep a separate list for every day and/or location;
Step 2. Count the greatest number of individuals of each species that you see together at any one time and write it down;
Step 3.Enter your results through the web page.

In 2007, Great Backyard Bird Count participants made history, breaking records for the number of birds reported, and the number of checklists. Participants sent in 81,203 checklists tallying 11,082,387 birds of 613 species.

"Literally, there has never been a more detailed snapshot of continental bird distribution," says John Fitzpatrick, director of the Cornell Lab of Ornithology. "Imagine scientists 250 years from now being able to compare these data with their own."

For more information on how to participate, go to www.birdcount.org.

Tough Trees at Timberline

Whitebark pines in peril

By Jane Kapler Smith

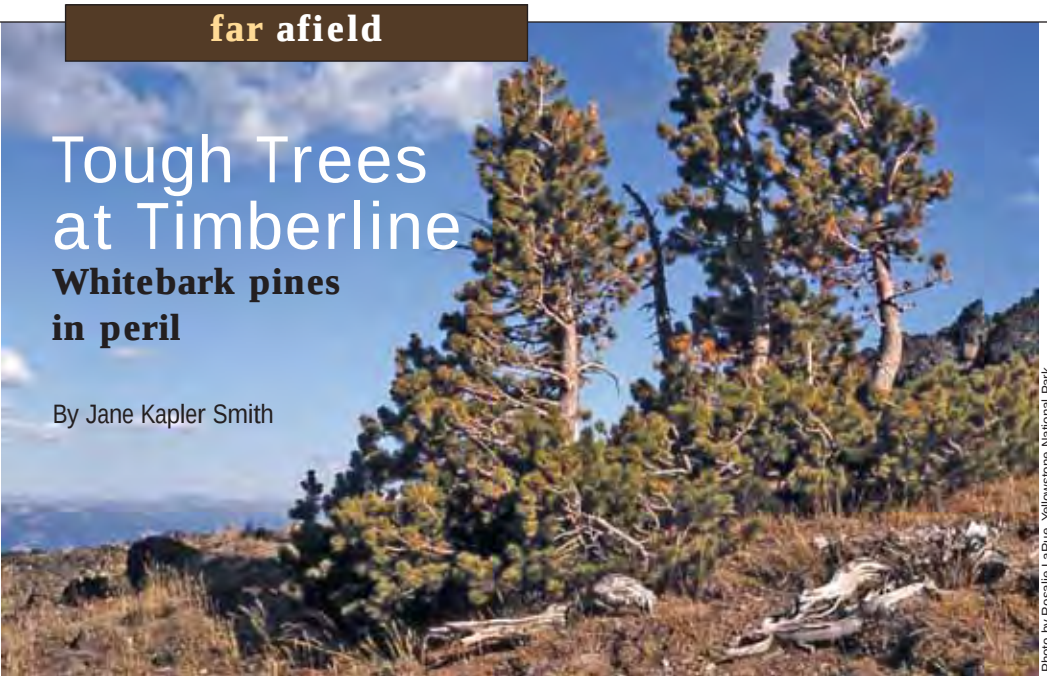


Photo by Rosalie LaRue, Yellowstone National Park

Whitebark pines grow in twisted beauty on the ridges and high mountainsides of the northern Rocky Mountains, North Cascades and the Sierra Nevada. Their home is beautiful, but rarely quiet. Wind whistles almost constantly through their upward-reaching branches. On an August afternoon, raucous bird calls cut across the wind. A flock of Clark's nutcrackers is harvesting calorie-rich seeds from the pine cones. The birds pry the cones open with their sharp bills, pick the seeds out, tuck them into a special pouch beneath their tongues, then fly off to a clearing where they will bury the seeds. A single nutcracker can bury up to 100,000 whitebark pine seeds a year. This is their future food supply, and they will feed nestlings from these caches next spring.

A pine squirrel is likely to add to the ruckus from the nutcrackers. The squirrel wants whitebark cones for her own winter food. She clips a few cones from the branches, lets them fall to the ground, then scrambles down the trunk. There she picks up a cone and carts it off to her midden – a pile of cones, seeds, and debris several yards across and often several feet deep, where the cones will stay cool and fresh for years. That is, unless a bear gets them first. Bears eat constantly through the summer to prepare for their deep winter sleep. They may climb whitebarks to harvest the sticky cones for themselves, but a squirrel midden provides much easier access to the pines' fat-laden seeds. If whitebark pines produce an especially large seed crop, the next spring often sees especially large numbers of bear cubs.

More than 100 kinds of living things – plants, animals, insects and birds – depend on the whitebark pine and its nutritious seeds. Even people benefit from the trees because they act as a snow fence, slowing spring runoff from the mountain slopes and contributing to a dependable water flow in the valleys below. Whitebark pine is often called a "keystone species," meaning that it holds this complex ecosystem together: remove the pine and the complex fabric of life of the high mountain slopes unravels.

Clark's nutcracker

Photo by Jim Peaco, Yellowstone National Park

Unfortunately, that is happening right now. Many whitebark pine forests contain more dead pines than living ones. More than half of the pines in northern Montana have died, and mortality is accelerating in Yellowstone and to the south. What's going on?

Whitebarks live in a tough environment. The constant wind dries out leaves and soil. A blizzard can occur in any month of the year. Many of these trees have their feet in snow until July, so they have only a couple of months to grow new foliage and seeds. But they've lived in places with harsh summers and long winters for thousands of years. That's not why they are in trouble. Three different problems are converging to imperil this keystone species.

Blister rust, a fungus imported to North America in the early 1900s, weakens whitebark pines, reducing cone production and eventually causing death. Since the cone-producing branches die first, nutcrackers, squirrels, and bears find fewer seeds each year.

Mountain pine beetles are not much bigger than a grain of rice, but when thousands of them lay eggs under a tree's bark, the tree can't survive. Beetle larvae feed on the tree's delicate inner bark, leaving a network of tunnels that interrupt the tree's supply of water and nutrients. Pines stressed by drought or blister rust, or overcrowded by spruces and firs, are especially vulnerable to beetle attack, and beetle epidemics may increase if global climate change lengthens summers in the high country.

Whitebark pines need fire. Fires may kill adult trees, but burned areas are needed for seedlings to thrive. Clark's nutcrackers prefer burns for seed caches, and the birds bury the seeds at a perfect depth – deep enough to escape predation by other animals, but not so deep that seedlings will run out of nutrients before reaching the surface where they can harvest the sun's energy. When fire is kept out of the high country, spruce and fir trees crowd and weaken the pines and reduce sites for seed caches.

Can whitebark pine forests be restored? Biologists harvest cones from rust-resistant trees, then grow and plant rust-resistant seedlings. Using fire, managers create openings where nutcrackers can cache seeds and seedlings can grow well. Foresters put beetle-repelling pheromone on trees to prevent bettle attack. Will these measures succeed? A whitebark pine may be 100 years old before it produces cones and may live more than 500 years. Restoration of this species will require similar persistence of biologists and conservationists. Hike to a high ridge in 50 years to see if progress is being made.

Jane Kapler Smith is an ecologist with the USDA Forest Service, Rocky Mountain Research Station Fire, Fuel and Smoke Program.

For more information:
www.whitebarkfound.org.

Whitebark Pine Communities: Ecology and Restoration, Diana Tomback, Stephen F. Arno and Robert E. Keane, eds. Island Press, 2001.

Northwest Trees, by Stephen F. Arno and Ramona P. Hammerly. Anniversary Edition, The Mountaineers Books, 2007.

to sleep or

Photo by Harlan Kredit, Yellowstone National Park

By Jim Hamilton

Montana animals cope with winter in different ways

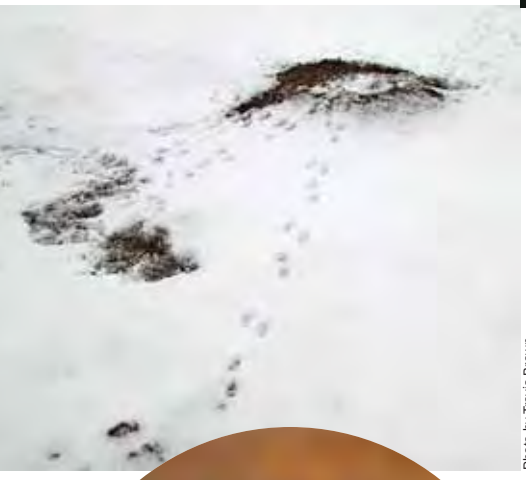


Photo by Travis Brown

Photo courtesy of Kerry Foresman

Hamilton observed that prairie dogs could lie low when the weather was bad, and emerge above ground when the sun was out to soak up the warmth. They didn't go foraging but continued to use their stored fat reserves until spring. Black-tailed prairie dogs are not as efficient at hibernating as the white-tailed variety, he says, and only truly hibernate when conditions are really bad.

When you think about hibernation, what comes to mind? Plump bears looking for a cave to den for the winter? Chipmunks holed up in logs or stone piles? Frogs or turtles buried in mud at the bottom of a pond? Maybe even that famous predictor of spring – Punxsutawney Phil – who purportedly crawls out of his groundhog burrow every year on February 2 in search of his shadow?

Animals have evolved various physiological mechanisms that allow them to cope with seasonally changing environments, specifically with extreme temperatures and lack of food. One way some species escape what's happening around them is to estivate. Estivation is a form of dormancy that desert animals use to cope with intense heat and dryness. They burrow underground, slow their heart rate and breathing, and rest until conditions improve.

But in Montana it's usually wintertime that requires some kind of response. Torpor is a way that many species deal with falling temperatures and diminished food supplies. Animals that exhibit torpor slow down their breathing and heart rate, and may lower their body temperatures a few degrees as well. Some animals – often birds or small mammals – use torpor on a daily basis to conserve energy in response to short-term lack of food; others are programmed to enter torpor in response to environmental cues, like day length. Animals that use torpor still must occasionally rouse themselves to get rid of waste (to pee or poop) and possibly feed more before going back to their previous state of mental and physical inactivity.

Depending on their depth of torpor, animals can be slow to react and are more vulnerable to predators during this time. Thermogenesis – the process of raising body temperature to become active again – can take anywhere from a few minutes to several hours, depending on the species. Many familiar mammals, from tiny deer mice to raccoons and skunks, will enter a torpid state in the winter. Although the mythology is that bears hibernate, they actually go into torpor after building up fat reserves by gorging during the late summer and fall. While a bear's metabolic rate does slow down, its body temperature drops only a few degrees. If disturbed, bears can wake up and react pretty quickly.

Hibernation is a third coping mechanism – essentially torpor, but more so. Hibernation allows an animal to lower its core body temperature to just above freezing, while heart rates, metabolic rates and other physiologic functions drop to minimal levels. Because species vary in their response to temperature changes, lack of food and in how easily and deeply they can enter hibernation, naturalists and comparative physiologists describe different types of hibernation.

Some hibernators adhere to a cyclical rhythm and hibernate regardless of outside temperatures and availability of food or water. Marmots and Columbian ground squirrels, for instance, fall into this category. These animals will enter hibernation starting in late July through early October, depending on the species. Their decision to enter a hibernating state is independent of the outside

not to sleep?

Photo courtesy Yellowstone National Park

Photo by John Good, Yellowstone National Park

Coyote, an animal that stays active during the winter and must work that much harder to find food. They are adept and finding small rodents, also awake and active in tunnels under snow, but also may dig out burrows of hibernating animals.

air temperature or food abundance. They store energy as fat and do not eat during the hibernation period, and emerge from their dens anywhere from February through April, again depending on the species.

Other hibernators do not adhere to any predetermined rhythm, but are forced to become hypothermic under certain conditions of food deprivation or reduced temperatures, whenever they arise. Badgers, bats, pocket mice and some prairie dogs are examples.

As a graduate student at the University of Montana many years ago, I studied black-tailed prairie dogs *(Cynomys ludovicianus)*. I found them to only become hypothermic, or to significantly lower their core body temperatures, in winter under certain low-temperature conditions. Most of the colony members I observed in the wild appeared quite fat throughout the winter, and inclement weather seemed a better predictor of their disappearance underground than going into hibernation. However I did find I could induce black-tailed prairie dogs to hibernate in late fall through mid-March by housing them in a cooler at six to eight degrees centigrade, just above freezing. In this state, the animals' body temperature did approach the ambient temperature; indeed, they became like little blocks of ice. As temperatures warmed, mimicking spring, it took them several hours to bring their body temperatures back up to normal levels. We couldn't duplicate this condition in the summer, because the animals weren't programmed to survive cold during that time.

So, why do animals hibernate? Hibernation provides an energy savings for certain animals in winter. The energy cost of waking up is by far the greatest of the hibernation cycle, so the longer an animal remains asleep, the greater the savings. Through this mechanism, a hibernating animal survives the cold without food in a deep sleep.

J.D. "Jim" Hamilton is an Illinois native who now makes his home in the Bitterroot Valley of western Montana. His interests include bird hunting with his two German shorthair pointers, playing percussion with local Celtic and community bands, and writing.

Photo by Harry Engels, Yellowstone National Park

Hibernation: It's not for everyone

Animals that use torpor can lower their body temperatures between 5 and 20 degrees Fahrenheit. Animals that hibernate, however, can drop their temperatures as much as 50 or 60 degrees, to just around freezing! If the ambient, or surrounding air, temperature goes below freezing, the hibernating animal's brain will send a signal for it to wake up and find more nest insulation, for example. If conditions get too cold for an animal in torpor, however, it has no way to recognize the fact and can freeze to death.

Hibernators generally are small mammals, like bats, various kinds of mice, ground squirrels, chipmunks and marmots. Hibernators do not lower their core temperatures all at once and for a whole season. They do it in a stepwise fashion, dropping 10 to 20 degrees for a few hours, then coming back to normal for a short time in order to flush out toxic waste products from cells and make sure all systems remain functional. Gradually the animal drops its temperature lower and lower for longer and longer stretches, until it reaches nearly zero for as long as a few weeks.

The amount of energy required for thermogenesis, the process by which an animal warms itself up, is substantial – and the reason why hibernators are small. A marmot that weighs ten pounds can pack on enough extra fat to be able to cycle in and out of hibernation as it needs to, unless it is too frequently disturbed. A several hundred pound bear, by contrast, couldn't possibly store enough extra energy to bring that sized body to life again and again during winter.

Hibernators, like this marmot, need to double their body mass during the spring, summer and early fall. The stored fat is of a type that has a lower melting point so that it can be mobilized easily in low temperatures.

Home Sweet Home

Major Gift Secures Place for MNHC

Illustration by Steven Dern, istockphoto.com

The Montana Natural History Center's home is secure and its future brighter thanks to an $800,000 grant from the Kendeda Fund, a private foundation which recognizes that respect and appreciation for nature are the basis for prosperous and sustainable communities.

The donation – the largest in the center's 16-year history – immediately and substantially reduces the debt outstanding for the 14,000-square-foot building at 120 Hickory Street, across from McCormick Park. Under terms of the grant, MNHC was required to raise an additional $100,000 from community contributions over three years. The fund would match this on a 2:1 basis. It only took two months to raise the required funds, enabling us to nearly eliminate our debt and begin an endowment for ongoing maintenance and operations. **In a further gesture of generosity, the Kendeda Fund extended its offer to match at 2:1 another $50,000 in community funds through the end of 2007, which would bring the total amount of Kendeda support to $900,000!**

"This is an enormous gift for a small, local nonprofit like ours, and it couldn't have come at a better time," said Hank Fischer, MNHC's board president. "More and more schools in western Montana want to participate in our Visiting Naturalist in the Schools program, and we had record applications this year for our summer camps. The greatest beneficiary of this gift will be the kids of western Montana."

Last year, MNHC's Visiting Naturalist in the Schools program reached more than 750 4th and 5th grade students in 31 classrooms. The program brings trained naturalists, many of whom are volunteers from the community, into schools, providing seven one-hour visits and two full-day field trips.

According to MNHC Executive Director Arnie Olsen, "It's hard to imagine a state where it's more important for kids to know and appreciate nature than Montana. We expect this program to grow, thanks to the Kendeda gift."

Other key MNHC programs include Summer Science Discovery Camps, which provide quality education and good outdoor fun for more than 275 Missoula-area children, and the Clark Fork Watershed Festival, which teaches some 600 area sixth-graders each year about watershed conservation.

According to Olsen, "This gift creates the best-case scenario we could have imagined: MNHC gets to stay in this ideal location near McCormick Park and we can focus our energies on pursuing our educational mission. It's an incredible boost for our organization."

Over the past two years the center has taken advantage of its central location and proximity to the bike trail to offer more programs for the general community, through Saturday Discovery Days, Explorers Club field trips, evening lectures, free Saturday children's activities and various exhibits in our visitor center. Thanks to the Kendeda Fund, opportunities for community members to connect with nature and learn more about the natural history of Montana will continue to grow.

To find out about upcoming events and programs, stop by the nature center at 120 Hickory Street, call 327-0405, or visit us online at www.MontanaNaturalist.org.

You can mail or call in a contribution to the Kendeda Fund matching gift opportunity before January 1, 2008. Email any questions to director@MontanaNaturalist.org.

Auction Thanks

We'd like to thank our many individual and business sponsors and donors for making this year's fundraising event our most successful yet. Total cash and pledges came to more than $85,000! Your support enables us to serve the community and bring quality nature education programs into schools in Missoula County.

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Photo courtesy Vicki Watson

The Envelope Please…

… and the 2007 MNHC Educator's Award goes to Vicki Watson, professor of environmental studies at the University of Montana.

A person whose hobbies include "hiking, biking, gardening, folk dancing and inspecting the bottoms of river rocks," Watson's work, including extensive research, teaching and community service, has focused on the conservation and restoration of watersheds. A UM faculty member since 1983, the Educator's Award honors Watson for her commitment to engaging students and others in environmental issues outside the classroom. Her efforts have resulted not only in enhanced learning opportunities for her students, but in increased volunteerism and public service throughout Montana. Her contributions have and continue to send ripples throughout the conservation community.

MNHC created the Educator's Award to honor each year an outstanding organization and/ or individual in the field of natural history education. Awardees are those who engage students of all ages with the natural world and inspire those in the field to even higher standards.

Spotlight: Interns

Why is the surface of a cat's tongue rough?

How many smell receptor cells does a rabbit have?

How big are an owl's eyes compared to its skull?

The answers to these and many other questions lie within the "Animals at Night" and "Skulls" exhibits at MNHC. Both these displays were researched and created by interns.

"Interns are essential in helping us meet our mission of natural history education," says Lisa Bickell, youth programs coordinator and intern supervisor. "Many come back to work for us. I interned here my senior year in college!"

MNHC provides internships as a way to help meet program obligations, but also to provide people new in the field of education an opportunity for professional development. Interns usually get college credit for what they do, but their work takes place outside the classroom. They leave with a strong addition to their resumes. In addition to the visitor center exhibits, interns have developed activities for the Visiting Naturalist in the Schools Program, Nature Discovery Trunks and Summer Science Discovery Camps.

Joanna Browning is a recent graduate from Western Washington University, where she concentrated on sociology and outdoor environmental education.

MNHC Photo

Former intern Courtney Oines proudly displays her work.

"I'm so excited to be back in my home state, teaching environmental education," she says. "Working here is giving me experience in a lot of different areas that I can use later on. EE is very much a passion of mine, and it's such a great feeling to be able to teach it to young students and to watch them get so engaged in the lessons and activities I created!"

"Having interns at MNHC brings fresh ideas, energy and inspiration to the staff," Bickell says. "For an organization with a small staff, we rely on interns to make our programs happen. They are very rewarding to work with and I think it's important for us to maintain the quality of the internships by providing a range of work-related experiences that prepare people for jobs in non-formal science education."

Photo by
Anthony Cesare

One must have a mind of winter
To regard the frost and the boughs
Of the pine-trees crusted with snow;

And have been cold a long time
To behold the junipers shagged with ice,
The spruces rough in the distant glitter

Of the January sun; and not to think
Of any misery in the sound of the wind,
In the sound of a few leaves,

Which is the sound of the land
Full of the same wind
That is blowing in the same bare place

For the listener, who listens in the snow,
And, nothing himself, beholds
Nothing that is not there and the nothing that is.

"The Snow Man," by Wallace Stevens

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

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