INSIDE: DOING HOMEWORK WITH A BOW

Montana Outdoors

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BIGHORN SHEEP

What's halting their progress?

THE STATE IN SYMBOLS

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NATIONAL LANDS DEDICATED TO WILDLIFE

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Montana Outdoors

MARCH-APRIL 2011

FEATURES

DEPARTMENTS

WANDERERS Three moose head across Red Rock Lakes National Wildlife Refuge. See page 30 for more on national wildlife refuges in Montana. Photo by Eve Wills.

FRONT COVER A Missouri River Breaks bighorn stands his ground. See page 8 to learn how Montana's wild sheep are faring statewide. Photo by Tony Bynum.


LIVING UP TO ITS NAME

How controversial hunting regulations restored big bulls to the Elkhorn Mountains

More Elkhorns

I enjoyed your article "Living Up to Its Name" (November-December 2010), which discussed elk management in the Elkhorn Mountains (hunting district 380). The article highlights the success of the "spike only" management strategy and states that 75 percent of hunters surveyed after three years supported this type of management. Why is FWP not managing more hunting districts this way? I realize that most Montana hunters (myself included) would not support managing all hunting districts like this. But it seems to me that FWP could implement this management strategy in one hunting district per region, or even a portion of a large hunting district, to provide hunters throughout the state with more hunting opportunities similar to those in HD 380.

Todd Butts
Trego

It was heartening to read that FWP's spike season in the Elkhorns has resulted in bigger, older bulls. FWP should consider similar regulations for the elk archery season. There are more archery hunters each year, and they are using increasingly sophisticated weapons and tactics to kill rutting bulls. Even if a bull isn't killed, by responding to bowhunters' calls he is distracted from the work he should be doing (breeding cows). FWP should also make hunters choose to hunt in either the rifle season or the archery season. Weeding out casual archers and favoring more dedicated bowhunters would reduce the pressure on breeding bulls and result in fewer crippling losses.

Bob Love
Columbia Falls

Takes her home

Congratulations on a fabulous 2011 photo issue (January-February). As a third-generation Montanan and veteran subscriber, I nominate this issue as one of your best. I thumbed through it quickly, with a smile on my face the entire time. Now I'm going to brew some coffee, sit in front of the woodstove, and take my time to study each and every entry as well as the photographer profiles. Thank you photographers, and thank you *Montana Outdoors*. You take me home with every issue.

Barbara Earle Montgomery
St. Maries, ID

Feathered colt

We just received the annual photo issue. Amazing photography. I do have a question though. On page 34 you have a terrific photo of sandhill cranes. Isn't a young crane a colt and not a chick?

Sharon Lowe
New Park, PA

Ms. Lowe is correct.

Start them young

We enjoy each issue of *Montana Outdoors*. We began subscribing after moving from Libby to Wisconsin, to keep in touch with the beautiful state of Montana. Even our 16-month-old granddaughter, Elsa, is enjoying it.

Frank and Connie Schad
Kiel, WI

Tracking furbearers

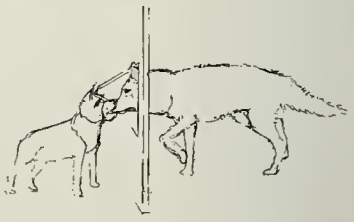
Regarding furbearer trapping in Montana: How are these species' populations determined? Are scientific methods used to monitor population trends, or are quotas based merely on seat-of-the-pants estimates?

Steve Barrett
Kalispell

Brian Giddings, FWP Furbearer Program coordinator, responds: *As is the case with most wildlife species, FWP does not estimate precise furbearer population numbers but rather tracks population trends. We monitor the population ups and downs of five furbearer species based on information derived from the animals harvested by trappers. This data includes harvest rates, the ratio of juveniles to adult females, age structure, male-to-female ratios, and median age. On four other furbearer species, we monitor harvest trends from harvest surveys sent to trappers and track how many days it takes trappers to catch animals. FWP collects and analyzes this information for each of Montana's seven trapping districts. We also conduct furbearer snow track surveys in western Montana, which gives us another index for monitoring populations.*

Running into Trouble

I thought your readers would be interested in this incident, which happened some time ago. I had just been released from the hospital after hip surgery and was using a walker to get around. I had a Boston bull terrier named Trouble who weighed about 20 pounds. One morning at 1:30 I heard the darndest screaming coming from the kitchen area of my house. It took me a while to get to the back door, and that's where I saw that Trouble had a coyote by the nose. The coyote had stuck its nose in the doggy door and Trouble had grabbed hold of it. She held on until I told her to let go. I'm sure that coyote is still running.



I told the story to a friend of mine who knew my dog well, and she drew this picture.

Allen Bradley
Dillon
Drawing by Golda Henzle

Correction

In our short article on Spotted Dog Wildlife Management Area in the November-December 2010 issue, we wrote that, among many other species, lynx and wolverines live on or use the area. Though it is possible the two species could show up on Spotted Dog WMA, which contains the types of habitats they are known to use, there are no records of lynx or wolverines appearing there.

Why we acquired more habitat and public access

One of FWP's proudest achievements over the past several years has been to acquire critical wildlife habitat and recreational land. With the help of private landowners, the Montana legislature, hunters and anglers, and state and federal programs, this department has purchased or bought conservation easements on a total of 170,000 acres since 2004.

Many new acquisitions are notable for their important fish and wildlife habitat. The new Fish Creek Wildlife Management Area and State Park, 40 miles west of Missoula, encompasses 40,000 acres of prime terrestrial wildlife habitat and 66 miles of riparian (streamside) habitat. Fish Creek and its tributaries support healthy bull trout and west-slope cutthroat trout populations. The creation of 24,000-acre Marshall Creek Wildlife Management Area (WMA), north of Seeley Lake, secures outstanding fish and wildlife habitat, especially for lynx and spawning bull trout. Conservation easements on the Moline and Riverdale Ranches, in Cascade and Chouteau Counties, respectively, protect wetlands. Portions of Marshall Creek WMA and the West Swan conservation easement may serve as wolf and grizzly bear connectivity corridors essential for maintaining genetic diversity, required by the federal government before delisting those species.

FWP acquisitions also provide new access for hunting, fishing, and other recreation. Some examples: 37-acre Stipeck Fishing Access Site (FAS) on the Yellowstone River near Glendive; 12-acre Pine Grove Pond FAS along the Whitefish River north of Kalispell; and the Moline Ranch easement, near the White Cliffs Area of the Missouri River, which opens up the only public hunting access to 14,200 acres of state school trust and Bureau of Land Management lands. The 6,200-acre Fish Creek State Park will provide camping, hiking, hunting, angling, and wildlife viewing opportunities.

FWP

Fish Creek Wildlife Management Area and State Park, now secured for wildlife and public use.

Our new acquisitions have strong public support. For instance, the Marshall Creek WMA acquisition was backed by Missoula county commissioners, the Seeley-Swan ATV Club, Pyramid Mountain Lumber, and local sportsmen and sportswomen.

FWP acquired these and many other sites because they are special parts of Montana that deserve protection. This agency is committed to providing more public recreational access—something Montanans tell us again and again is a major concern. These acquisitions are also a reinvestment into the natural resources that sustain a lucrative portion of the state's tourism industry. More than $1 billion in direct expenditures is spent on hunting, fishing, and wildlife watching in Montana each year.

Money to acquire these lands and conservation easements came from a combination of federal sources (such as the Forest Legacy Program and Pittman-Robertson Act), Habitat Montana (mainly revenue from nonresident big game license fees), general hunting and fishing license fees, and general funds approved by the 2007 Montana legislature for land acquisition.

Not everyone in Montana is happy about new FWP acquisitions. Some people think we should spend less on gaining new lands and more on managing those we already have. Others don't like the idea of the state owning any more property for public use.

We agree that controlling weeds and other maintenance on WMAs is important. That's why we keep our WMA maintenance budget in good shape. In answer to criticism about adding to the state land base, I think previous acquisitions speak for themselves. Consider the popular fishing access sites along the Yellowstone and Big Hole Rivers; Bannack State Park and the scenic parks ringing Flathead Lake; the Blackfoot-Clearwater, Robb-Ledford, and Freezout Lake Wildlife Management Areas; and more. Today all of us enjoy and value these and other special places that Montanans years ago had the conviction and foresight to secure. We're confident future generations will feel the same way about Montana's most recent wildlife and recreational acquisitions.

Joe Maurier
Montana FWP Director

While touring Yellowstone National Park last spring with his wife and father, **JIM HERRLY** spotted this large, white cranelike bird in a large pond. "I'd never seen anything like it," says Herrly, a part-time professional photographer in Belgrade. He spent the next hour photographing the elegant bird as it waded the shallows. "He was all by himself and most of the time was standing still, but occasionally he'd take a few steps," says Herrly. "It was snowing, and the wetness really highlighted the bird's feathers." Not until he returned home and checked his bird identification book did Herrly learn he'd seen a great egret. Common along the Gulf Coast and Mississippi River basin, this great blue heron relative is rarely seen in the Rocky Mountains. "We're used to grizzlies and elk out here," says Herrly, "but to see a big white bird with those beautiful long feathers, I just thought that was neater than heck." ■


MONTANA OUTDOOR

TALK OF THE TOWN

No animal possesses the language complexity of humans. But new research suggests that prairie dogs may come the closest of any other species.

A study recently published in *Animal Cognition* found that Gunnison's prairie dogs in the American Southwest produced different alarm calls when similar-sized humans approached wearing different-colored shirts. The finding is similar to others by Constantine Slobodchikoff, professor emeritus at Northern Arizona University, who led the study. The biologist found in previous projects that the prairie rodents differentiate among various predators, including humans, and can communicate the information to each other. By listening carefully to recordings of prairie dog alarm calls—which include barks, squeaks, and squeals—Slobodchikoff has discerned that each call has its own rhythms and frequency modulations.

The research scientist, who has studied prairie dogs for three decades, believes the rodents may have developed a complex language to survive in a world filled with rattlesnakes, coyotes, raptors, and other predators. He says that by varying the modulation and harmonics in a single call, one prairie dog can warn others in the colony of the type of predator, what color it is, and where it is.

> "Prairie dogs have the most complex natural language decoded so far."

Though no such studies have been done on the white-tailed and black-tailed prairie dogs in Montana, the species have other similar social behaviors to those of Gunnison's prairie dogs.

Slobodchikoff and his colleagues recorded calls made by prairie dogs in response to models of coyotes, badgers, and hawks they moved toward the colonies. They also noted the rodents' reaction to the faux predators. When the recordings were later replayed to prairie dogs in another colony, the animals reacted the same way. When they heard the "coyote call," prairie dogs stood up to see the approaching predator, while the "badger call" caused them to stay low to avoid detection.

The researchers have also learned that prairie dogs from different parts of the Southwest have language variations, similar to human dialects. Each prairie dog has its own vocal quality, just as human voices differ. But because all prairie dogs use the same "words" to describe the same predators, each alarm call can be understood by the rest of the colony and by prairie dogs in other colonies.

Slobodchikoff believes that prairie dogs possess a sophisticated vocabulary unmatched by any species other than humans. "They have the most complex natural language that has been decoded so far," he told a BBC reporter. "They have words for different predators, and they have descriptive words for describing the individual features of different predators, so it's a pretty complex language that has a lot of elements."

Help Montana's raptors and other nongame wildlife by donating to the Nongame Wildlife Program on your state income tax form this year. It's easy, and the money helps FWP monitor and conduct studies on bald eagles, loons, frogs, and other wildlife. "Our goal is to reverse population declines for species of concern," says Lauri Hanauska-Brown, program coordinator. "As for common species, we want to keep them common so they don't become a concern."

PRAIRIE DOG PHOTO: TIM CHRISTIE; RAPTOR ILLUSTRATION: PUBLIC DOMAIN; LOADER: ISTOCKPHOTO; BOATING PHOTO: U.S. COAST GUARD/*MONTANAOUTDOORS*; TALL TREES: LUKE DURAN/*MONTANA OUTDOORS*

FWP helps build local economies

Most people know FWP conserves fish, wildlife, and state parks while managing hunting, fishing, and other recreation. But few realize the department also boosts local economies with millions of dollars in direct cash payments each year.

"It's not widely known, but our budget gives an economic boost to communities across Montana," says Ron Aasheim, chief of the FWP Communication and Education Bureau.

During the past two years, FWP programs paid more than $32 million to farmers, ranchers, contractors, small businesses, and local governments across the state. Among the payments:

- **$9.66 million** to landowners, through the Block Management Program, for allowing public hunting access.
- **$8.54 million** to contractors and business owners for construction and materials at state parks, fishing access sites, fish hatcheries, and wildlife management areas.
- **$3.87 million** in grants to local governments and community groups to build and maintain trails, groom snowmobile routes, and construct ball fields and other facilities. Part of that money also went to local gas stations, small businesses, and hardware stores for building supplies and other materials.
- **$1.2 million** in property taxes and assessments to local governments and districts. Under state law, FWP pays the same amount of taxes on most lands it owns that private landowners would pay if the properties were in private hands. The taxes go to counties, cities, water and sewer districts, and ditch associations.

"Not a single penny of those payments comes from the state general fund," says Aasheim. "Almost all of it comes from resident and nonresident hunting and fishing license fees and federal funds and miscellaneous state revenue." Aasheim notes that the FWP budget adds new jobs and income to Montana's economy. "We're attracting federal funds and generating hunting and fishing license revenue that otherwise wouldn't find their way to Montana businesses and communities," he says.

Stick one on

Montana boaters need to replace their green validation decals with new orange ones. Old validation decals expired February 28, 2011. New ones are required March 1, 2011 and are valid through February 2014.

Montana requires two different decals to identify motorboats and personal watercraft, as well as sailboats 12 feet and longer. One is the white permanent ("PERM") decal, valid for as long as boaters own their watercraft and available by paying a one-time fee at the county treasurer's office. The other is the free validation decal.

The state requires periodic validation to track the number of registered watercraft in Montana, a prerequisite for receiving federal funds for boating education and enforcement.

New boat owners can get validation decals from the county treasurer when registering a new boat. Current boat owners can obtain theirs from any FWP office or on-line at fwp.mt.gov/recreation/permits/boats.html. Information from the Boat Registration and Payment Receipt is required to obtain validation decals.

Boat owners will end up with three decals for each craft. A single permanent decal goes on one side of the bow; two validation decals also go on the bow, one on each side. Old decals should be removed or covered with new ones.

The new orange validation decals are required starting March 1, 2011.

Small sailboats and manually propelled boats such as kayaks and canoes don't need permanent or validation decals because they are exempt from registration and taxes. Nonresidents' boats legally registered in another state or country may operate in Montana for up to 90 consecutive days without Montana registration.

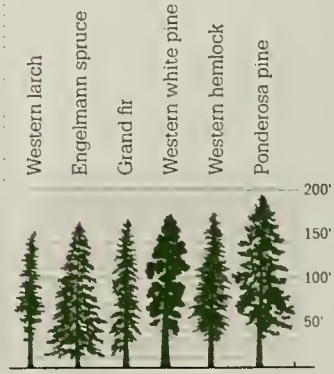
BIG TIMBER

The top of Montana's tallest tree, a 194-foot ponderosa pine growing near Seeley Lake, barely reaches the lowest branches of the cloud-scraping 369-foot U.S. record coast redwood that grows in northern California.

Still, Montana's biggest trees are impressive. According to Helen Smith, fire ecologist at the U.S. Forest Service Fire Science Laboratory in Missoula, six species exceed 150 feet tall (a 15-story building). In addition to the ponderosa pine, there's the state record western hemlock (175 feet), western white pine (175 feet), grand fir (168 feet), Engelmann spruce (164 feet), and western larch (153 feet).

Smith, who maintains the champion tree list for Montana, says several state giants may soon hold national records. A western larch (tamarack), white willow, and white spruce have been submitted for consideration to American Forests, a nonprofit organization that verifies national tree records.

For more information on state record trees, visit the *Montana Outdoors* website (fwp.mt.gov/mtoutdoors) and search for "Montana's Trophy Trees" (July-August 2003). Notify Smith of potential state or national trophies at hsmith04@fs.fed.us.



BILL BUCKLEY

THE BIGHORN'S ROCKY RECOVERY

After a catastrophic decline in the early 1900s, Montana's bighorn sheep population has grown into one of the nation's largest. But habitat loss, highway fatalities, and deadly disease could send numbers tumbling again.

BY TOM DICKSON

During several weeks in late 2009, Craig Jourdonnais shot dozens of bighorn sheep. It was something he wouldn't wish on anyone.

"That was gut-wrenching work," says the Fish, Wildlife & Parks Bitterroot Valley wildlife biologist. "Some nights I'd come home to my wife and say, 'I can't keep doing this.'"

Jourdonnais and other agency workers culled 80 dying Rocky Mountain bighorn sheep from the East Fork Bitterroot herd in the upper Bitterroot Valley. Biologists hoped to stop the spread of a pneumonia epidemic racing through the population by removing visibly sick animals—lethargic sheep with drooping heads and hacking coughs. Once bighorns contract pneumonia, they often perish within a few weeks. Veterinary scientists have yet to develop a vaccine to prevent the disease in wild sheep or medications that cure sick individuals. "It was a brash move, something this agency had never done," says Jourdonnais. "But there were no other options, and we had strong support from the local sportsmen's community to do this."

Deadly disease isn't the only threat to the majestic bighorn, valued for its thick, curled horns and symbolic of rugged mountain wilderness. Wild sheep have to survive in shrinking range that is being overtaken by noxious weeds, conifers, and new mountain resorts and subdivisions. And they must avoid speeding cars and trucks, which have killed hundreds of sheep drawn to highways by compounds used in deicing solutions.

It's a wonder Montana has any bighorn sheep left.

Yet the high-country ungulates survive and even thrive in many areas. Numbers have grown substantially since the 1940s, when most herds documented by early explorers had disappeared. Today Montana is home to roughly 5,250 bighorn sheep in 45 populations from the Idaho border east to the Missouri River Breaks. Over the past decade, Montana has become famous for producing big rams and now claims nearly half the Rocky Mountain bighorns entered in the Boone and Crockett Club records.

Unfortunately, these achievements may be short lived. If Montana's bighorns are to continue thriving, they will need to overcome obstacles even steeper than the mountainsides where they live.

A moth-eaten bighorn sheep mount stands in the Montana Bar in Miles City—a prairie town hundreds of miles from the mountains most people would consider wild sheep habitat. Before European settlement, bighorns were common here and in much of the state's eastern region. Members of the Lewis and Clark Expedition frequently saw bighorns along the Missouri and Yellowstone Rivers. Wildlife biologists estimate that at one time more than 100,000 wild sheep may have lived throughout the western mountains and eastern badlands of what is now Montana.

Like many big game species, wild sheep fared poorly after settlers arrived. Market hunters killed bighorns and sold them to meat vendors, while pioneers shot the animals for food. Cattle pushed wild sheep out of their winter range along mountain foothills. But it was the introduction of domestic sheep—and with them new diseases such as scabies (mange)—that nearly doomed what Theodore Roosevelt called "one of the noblest beasts." Disease killed wild sheep outright or made them too weak to escape predators or survive Montana's harsh winters. By the end of the 19th century, bighorn numbers statewide were tumbling like boulders down a mountain. The Montana legislature responded by setting hunting seasons and limits and even closing the season entirely starting in 1915. But it was too late.

In 1916 a hunter illegally killed the last of the Montana badlands wild sheep, once considered a separate species known as Audubon's bighorn, along the Missouri River Breaks northwest of Jordan. Over the next two decades, bighorns in the state's largest remaining herd along the Rocky Mountain Front repeatedly died off in large

CRAIG JOURDONNAIS/FWP

"It was a brash move, something this agency had never done, but there were no other options."

Tom Dickson is editor of Montana Outdoors.

numbers. By 1941 a report from the Department of Fish and Game, as it was known then, glumly noted that Montana's bighorn sheep population at the time had reached "a low ebb both in density and distribution." Biologists today believe numbers statewide dropped below 1,000.

That same year Montana began work to recover the state's dwindling bighorn population. With funding from the new federal Pittman-Robertson Act, which levied a tax on firearms and ammunition to raise money for wildlife management, Fish and Game began studying and monitoring wild sheep herds. Biologists also trapped bighorns from strongholds on and near what is today the Sun River Wildlife Management Area, carting the animals to historical habitats. Over the next decade, state wildlife workers reestablished new populations in the Gates of the Mountains, West Fork of the Gallatin, Missouri River Breaks, and other sites. By 1950, the statewide population had grown to 1,200 bighorn sheep in 16 populations. Three years later, Montana allowed limited ram hunting for the first time in 38 years.

Since trap-and-transplants began, wildlife biologists—and, starting in the 1980s, hired crews from New Zealand who fire nets over the animals from helicopters—have captured and released more than 2,000 sheep. FWP continues the practice as a way to control herds outgrowing their available habitat, establish new herds in suitable vacant habitat, and augment existing herds.

Bighorn sheep distribution in Montana

Before European settlement wild sheep ranged widely across Montana, from the Bitterroot Range east to the Missouri and Yellowstone River Breaks. By the 1940s disease and displacement by livestock had reduced the population to just a few strongholds. Since then, FWP has restored bighorns in many historical habitats. Today Montana is home to 45 herds, 40 with huntable populations.

SOURCE: FWP

JIM MCLUCAS PHOTO COLLECTION

TERRY LONNER/FWP

A NEW HOME
Starting in the 1940s, state wildlife workers began capturing bighorn sheep from strongholds along the upper Sun River and transporting the animals by truck to historical habitats. By 1950, when this photo was taken, the statewide population had grown to 1,200 wild sheep in 16 populations. Nowadays trapping is done by contracted New Zealand helicopter crews, who use netguns to capture the animals.

Facing page: FWP workers carry out the grim task of removing tissue from diseased wild sheep culled from the East Fork Bitterroot herd in late 2009.

Expanding bighorn populations beyond where they are today won't be easy. Among the obstacles is the steady loss of suitable range. Bighorns require a combination of four habitat elements: ample wild grasses and forbs, reliable water sources, wide visibility so they can see cougars and other predators, and steep, bare slopes nearby for escaping danger. Not just any mountain can support the minimum of 125 sheep that biologists say is required to maintain a healthy herd.

Threatening this limited bighorn habitat are noxious weeds, such as spotted knapweed, which crowd out bunchgrasses and other native forage. Another problem is conifers encroaching on open grasslands. Historically contained by frequent low-intensity wildfires sparked by lightning, trees have filled in parklands over the past century. For instance, wildfire suppression in the Kootenai Falls bighorn sheep range during the past century has allowed Douglas firs and ponderosa pines to shade out sun-dependent bunchgrasses and prevent wild sheep from seeing stealthy predators.

Some solutions to habitat loss can do more harm than good. Though prescribed burning keeps conifers from encroaching on open areas, the fires spur the growth of some noxious weed species. And an increasingly popular way to control weeds—using sheep and goats trained to eat the plants—increases

opportunities for the domestic animals to commingle with wild sheep.

Then there's the problem of human encroachment. New resorts and subdivisions displace wild sheep from historical range and fragment their habitat with access roads. As western Montana's highway traffic grows, so does the number of bighorns ending up as roadkill. In January 2010, despite large warning signs, a truck plowed into a herd on Montana Highway 1 near Anaconda, killing eight wild sheep. In northwestern Montana, more than 400 bighorns from the Thompson Falls herd have died from car and train collisions since 1985.

Another threat to bighorns is deadly disease. A 2010 study by the University of Washington proved that *Mannheimia haemolytica* can be transmitted from domestic sheep to bighorns even when a fence separates the animals. The bacteria, carried by but harmless to domestic sheep, is one of the pathogens that cause pneumonia in bighorns.

The findings validate what biologists have seen for decades as once-robust bighorn herds often succumb to disease after mingling with domestic flocks. Infected ewes that don't die outright produce diseased lambs that perish soon after weaning, causing diminished populations to stagnate for years. In 2009 nearly 90 percent of a 220-bighorn herd in the Elkhorns died from pneumonia. Tom Carlsen, FWP biologist in Townsend and author of the state's new bighorn conservation plan (see sidebar, page 15), says bacteria causing the disease likely came from a handful of sheep allowed to run loose on Bureau of Land Management (BLM) property and adjacent private land. "The sheep producer in the valley had a grazing allotment with the BLM and was doing a good job keeping his animals separate from the bighorns," Carlsen says. "But then someone moved in on a small patented mining claim and brought in a few sheep and goats that he let roam all over. Sure enough, the bighorns got sick, and within a year we'd lost almost the entire herd."

FATAL ATTRACTION A craving for chemical compounds in deicing solution draws bighorns to highways. Despite warning signs, sheep fatalities are common in some areas.

Facing page: Able to leap livestock fences, bighorns often contract disease by mingling with domestic sheep. Says one FWP biologist, "A ram during the rut is a highly effective vector for pneumonia."

Global competition and the growth of synthetic fabrics have depressed markets for Montana sheep, reducing numbers from a high of 5 million in 1910 to 300,000 today. But the number of hobby farms that bring tame sheep and goats dangerously close to bighorn range appears to be increasing as subdivisions and ranchettes pop up in mountain foothills. Jim Weatherly, president of the Montana Wild Sheep Foundation, has met with several hobby farmers to explain the risk their animals pose to bighorns. "Most of the time they don't know about the threat and are real concerned," he says.

Many large-scale sheep producers use guard dogs and herders to keep their flocks separate from bighorn herds. But some wool growers lease grazing allotments on national forests and BLM land, where their domestic herds can mingle with bighorns. That troubles sportsmen like Jim Bailey of Belgrade, a retired University of Colorado wildlife biology professor and board member of the Gallatin Wildlife Association. "We think there should be more wild sheep in this region in places like the Snowcrest-Gravelly Range,"

Raising management money

With only about 5,250 bighorn sheep in Montana, FWP can allow hunters to harvest no more than a few hundred rams and ewes each fall. That limits hunting license revenue necessary for monitoring populations and transplanting bighorns to augment existing herds. To generate more wild sheep management money, the Montana legislature authorized auctioning one bighorn license each year and awarding another through the SuperTag lottery. Since 1984 the auction, conducted each spring by the national Wild Sheep Foundation, has generated $3.7 million (winning bids average $170,000). The money also helps purchase habitat and hunting lands, such as the Blue-Eyed Nellie Wildlife Management Area near Anaconda, recently expanded from 6 to 460 acres.

The bighorn sheep SuperTag lottery—chances for which cost $5 each—has brought in more than $500,000 for game law enforcement and hunter access since starting in 2006.

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he says. "But because a grazing company drives domestic sheep up there each spring, much of that area continues to be unsuitable for bighorns."

Adding to the problem is the bighorn's highly sociable nature. Sheep often stay close together and regularly touch muzzles, spreading bacteria. During the fall mating season, young male bighorns range for miles in search of breeding ewes—wild or tame. After mixing with domestics, a randy ram may head back to his herd like a bighorn Typhoid Mary. "A ram during the rut is a highly effective vector for pneumonia," says Carlsen. Unfortunately, the way FWP manages bighorn herds creates even more potential disease disseminators. By restricting sheep harvest, the department produces not only record-book rams but also herds with abundant male sheep of breeding age.

Another concern, says Bailey, is the loss of genetic diversity in dozens of small, isolated bighorn herds, many of them founded with just a few individual sheep. "Wildlife need a diverse gene pool to draw from for natural selection," he says. "Inbreeding within small herds reduces genetic variation, which in turn may increase the animals' susceptibility to diseases."

Keeping wild and domestic sheep apart is FWP's top priority for managing bighorns. To reduce the number of dispersing males, FWP keeps some bighorn herds at lower densities than the habitat would support. The department generally recommends against transplanting wild sheep any closer to domestic herds than 14 miles—the minimum distance that studies have shown is needed to prevent mingling. FWP wildlife managers have urged the BLM and U.S. Forest Service to stop issuing new grazing allotments where domestic sheep could mix with wild herds. And they've met with both hobby farmers and major sheep producers. Biologists explain the potential disease threats and discuss measures that reduce commingling, such as installing double fencing on small pens or swapping federal grazing leases for those not on wild sheep range.

"FWP has been real willing to work with us, and we want to encourage our members to cooperate with FWP," says John Helle, a third-generation sheep producer in Dillon and past president of the Montana Woolgrowers Association. "There are management practices that can reduce the threat of disease, like using guard dogs and herders to keep bighorns away from domestic sheep, so they both can use the same range." Another way woolgrowers can reduce disease risk, says Helle, is to develop grazing plans that provide "seasonal separation" so range can be shared by both domestic and wild sheep. One example is to graze domestics on bighorn winter range only in summer, when wild sheep are at higher elevations.

Bighorns in Montana
TIMELINE

Pre-European Settlement: Biologists estimate that up to 100,000 bighorns may have lived in Montana.

1805: Lewis and Clark see their first bighorns near the Missouri River.

1889: Montana establishes a bighorn sheep hunting season.

1907: Bighorn bag limit is reduced from eight sheep to one.

1910: Domestic sheep production peaks at five million animals.

1915: Bighorn sheep hunting is closed indefinitely statewide.

1922: Canada supplies Montana with 12 bighorns from Banff National Park.

1937: Pittman-Robertson Act passes, provides federal funds for state conservation work.

1941: Bighorn sheep population reaches "a low ebb both in density and distribution," states a Department of Fish and Game report. The agency begins a bighorn sheep research and management program.

1941–50: Wildlife biologists establish several new populations of bighorns through trap-and-transplant.

1940s: Domestic sheep production begins to decline because of foreign competition.

1950: Biologists estimate the state bighorn population at 1,200.

1953: Montana reopens bighorn hunting season for the first time in 38 years.

1984: Largest die-off on record, 400 sheep, along the Rocky Mountain Front. Another 250 die at the Beartooth WMA.

1990s: Major die-offs in the Highlands, Tendoys, Lost Creek, and other herds, totaling more than 1,400 sheep.

2010: FWP approves first statewide comprehensive bighorn sheep conservation plan. Major die-offs kill a total of 640 wild sheep in the East Fork Bitterroot, Bonner, Upper and Lower Rock Creek, and Anaconda herds.

Top: Captain William Clark's 1805 sketch of a bighorn sheep

MONTANA: home of the biggest bighorns

Before 1974 only ten bighorns with the combination of horn circumference and length totaling 200 points—a size hunters consider phenomenal—had ever been recorded. Most were from Alberta and British Columbia, and none were from Montana. That has changed.

Over the past four decades, sheep populations throughout the Rocky Mountains have grown, producing more big rams regionwide. And since 2006, Montana has produced more 200-plus-point rams than any other state or province. Montana also now claims nearly half the rams in the Boone and Crockett record book that meet the minimum score of 180.

Many of Montana's big sheep have been taken in the Missouri Breaks. Though by no means fertile, the badlands' soils are more productive than those in the flinty high country where most Rocky Mountain bighorns live. This produces more nutritious and abundant grasses and forbs that foster greater horn growth.

Another reason Montana has become Big Horn Country is that FWP issues relatively fewer hunting permits than other states do. This limits hunting opportunity but allows more rams time to grow bigger horns—and to pass their trophy-horn genes on to future generations of rams. Montana hunters appear satisfied with the trade-off. State regulations continue to receive strong public support.

By the end of 2010, pneumonia in five western Montana herds had killed 640 wild sheep—more than 10 percent of the state's entire population.

Though acknowledging that domestic herds transmit pneumonia-causing bacteria to bighorns, Helle isn't convinced tame sheep are entirely to blame for die-offs. "Some bighorns get pneumonia even with no apparent mingling with domestic sheep," he says. "And some herds have mixed with domestic sheep for years without problems. We wonder if there might be other issues such as stress or viruses that contribute to the problem."

Helle hopes FWP can find ways to make wild herds more resistant to disease. "We think there needs to be more work on making bighorn herds immune so that when there is contact—and that's inevitable no matter how hard we try to keep them apart—they are better able to survive." FWP officials say wildlife veterinary scientists throughout the West have long sought to learn why bighorns are more susceptible to disease and continue searching for ways to make herds less vulnerable.

Until then, keeping domestic sheep away from their wild cousins—and bighorns away from tame flocks—appears to be the best solution. If that fails and infection occurs, biologists are left with only two unsavory options: Let the disease run its course, or remove infected individuals to improve the odds that the rest may stay healthy.

Jourdonnais, the Bitterroot biologist, says the agonizing work of culling sick bighorns from the East Bitterroot herd appears to have worked—at least for now. Lamb survival last summer was much higher than among herds where biologists could not prevent pneumonia from spreading. Yet in the Upper and Lower Rock Creek herds, where in early 2010 biologists culled 47 infected sheep in an attempt to halt the spread, the disease was already too far advanced. Lamb survival last spring was near zero. By the end of 2010, pneumonia in five western Montana herds killed 640 wild sheep—more than 10 percent of the state's entire bighorn population. "The toughest thing about bighorn management," says Jourdonnais, "is that you work for years with hunters, private landowners, and other agencies to recover these herds and keep wild sheep alive and then, wham, disease gets in there and wrecks all that work practically overnight."

A new plan for wild sheep

In 2010 FWP issued Montana's first comprehensive strategy for conserving bighorn sheep. The 300-plus-page plan recounts the history of wild sheep, explains how biologists and hunters rebuilt populations, and identifies major threats to existing herds.

Funded in part by the Montana Wild Sheep Foundation (MWSF), the strategy outlines how FWP will conduct management activities such as monitoring herd health and evaluating the condition of bighorn sheep habitat. "It also gives new biologists protocols for trapping and transplanting bighorns and a process for identifying suitable transplanting sites," says Jim Weatherly, MWSF president.

Tom Carlsen, FWP biologist in Townsend and the plan's author, says the document shows the public how FWP has managed bighorns in the past and plans to manage them in the future. "People want to know how we conduct surveys and issue licenses, and we want to be accountable," he says.

Included in the plan are formulas for determining the percentage of rams and ewes that should be harvested in order to grow, maintain, or shrink populations as needed. And the document recommends observing herds more closely to detect sick animals and regularly capturing wild sheep to test blood and tissue for disease. "It's like with humans: The earlier you can detect a disease, the easier it may be to contain its spread," says Carlsen.

The plan calls for biologists to meet more frequently with sheep producers to agree on when domestic herds should be allowed on bighorn range and what to do when wild and tame sheep mix.

Some hunting groups criticized the plan for recommending that FWP not reestablish bighorns in habitat closer than 14 miles from domestic sheep and goat herds. They say the policy keeps vacant too much prime habitat that would otherwise support bighorns. Hunting groups such as the Safari Club and the Gallatin Wildlife Association also dislike a new policy in the plan stating that, unless the rancher agrees, FWP will not ask federal land managers to rescind grazing leases that put domestic sheep into bighorn range.

The "Montana Bighorn Sheep Conservation Strategy," which includes the management history and plans for each of the state's bighorn hunting districts, is available on-line at fwp.mt.gov.

Department officials point out that allotments affect only a few of the state's 45 bighorn herds. And they defend efforts to work with the sheep industry, which supports the plan. "We don't think bighorn sheep management can be effective over the long term without collaborating closely with domestic sheep producers," says Quentin Kujala, chief of the FWP Wildlife Management Section.

STANDING FOR MONTANA

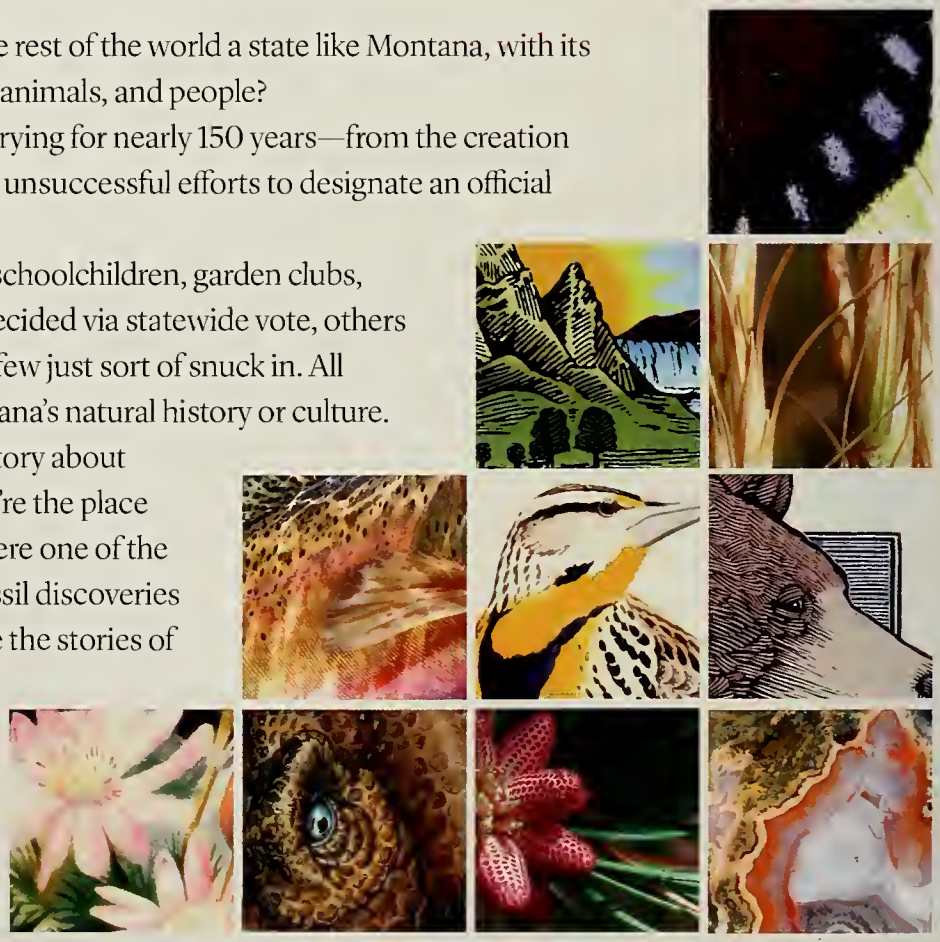
Strange stories of how the bitterroot, grizzly bear, mourning cloak butterfly, and Montana's other state symbols came into existence. BY SARA GROVES

How do you represent to the rest of the world a state like Montana, with its diverse landscape, plants, animals, and people?

Montanans have been trying for nearly 150 years—from the creation of our state seal in 1865 to recent but unsuccessful efforts to designate an official Montana state pancake.

Symbols have been promoted by schoolchildren, garden clubs, legislators, and others. Some were decided via statewide vote, others were picked by the legislature, and a few just sort of snuck in. All represent an important part of Montana's natural history or culture.

Each symbol tells an interesting story about Montana to the rest of the world. We're the place to see grizzly bears, and the state where one of the world's most significant dinosaur fossil discoveries was made. Even more interesting are the stories of how Montanans selected these particular symbols over other popular candidates. ▸▸



CREDITS ON FOLLOWING PAGES

Sara Groves, Helena, is a writer and the marketing and communications coordinator for the Montana State Library.

STATE SEAL

In 1865 territorial delegates appointed a committee to select an official seal to represent Montana to the world. Committee chairman Frank M. Thompson wrote that "the territorial seal shall . . . represent a plow, a miner's pick, and shovel; upon the right, a representative of the great falls of the Missouri; upon the left, mountain scenery. Underneath, as a motto, the words *Oro el Plata*. The Seal shall be two inches in diameter and surrounded by these words: 'The Seal of the Territory of Montana.'" (Fortunately, someone caught the Spanish language goof and changed the motto from "Gold the Silver" to "Gold and Silver," or *Oro y Plata*.) That same year Governor Sidney Edgerton signed a bill approving the territorial seal.

Thompson sent a crude sketch to an engraver, who produced the seal with a bison on the banks of the Missouri River, as per the wishes of the territorial delegates. The seal was to be shared by the governor and the territorial secretary. However, in 1876 enterprising Secretary James Callaway decided to augment his salary by charging to affix the seal to documents. He took physical possession of the seal, forcing Governor Benjamin Franklin Potts to commission a new one, which ended up without a bison, to use on newly issued territorial bonds and other documents.

Over the next year, both men used their respective seals on territorial papers. In 1877 the legislature decided that Callaway's seal was the official version. Six years later, delegates decided to have that seal destroyed and commission a new one, which was entrusted to the territorial secretary.

In 1887 an engraver replacing the worn-out 1883 seal changed the mountains, removed the clouds, added trees, and put the sun in the sunset position. Two years later, when Montana entered statehood, the seal was again changed, to replace the word "Territory" with "State." The new engraver, a Helena jeweler, took his own liberties with the state seal. He moved the trees, altered the Great Falls and the Missouri River, and redesigned the mountains. Montana's official state seal remains much the same today.

Montana has also designated a state song, state lullaby, and state quarter. Learn more about state symbols in *Symbols of Montana*, by Rex C. Myers and Norma B. Ashby, and by visiting montanakids.com. *(Click on "Facts and Figures.")*

STATE FISH: BLACKSPOTTED CUTTHROAT TROUT

(Oncorhynchus clarki lewisi)

The idea for a state fish may have first been proposed in this magazine. George Holton, a senior fisheries manager, suggested in a 1974 *Montana Outdoors* article that the state designate an official fish species because "fishing is a major recreational pursuit for state residents and an important attraction for the state's tourism industry." Holton then wrote, "At the risk of biasing the outcome, I propose as candidates the paddlefish, the Dolly Varden [bull trout], and the Arctic Grayling."

The grayling was the top choice of C. J. D. Brown, a distinguished professor, fisheries researcher, and author of *Fishes of Montana*. In a letter to Senator Margaret Warden, who would later introduce legislation for designating a state fish, Brown warned, "I think it would be a serious mistake to designate other trouts not native to Montana. Utah is the laughing stock of ichthyologists and fish biologists and sportsmen for designating the rainbow trout the state fish, which is native only to the Pacific coast states and is a true exotic to Utah."

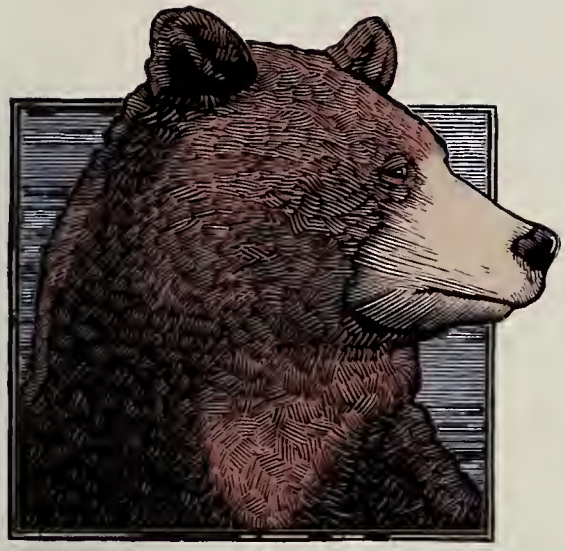
A prominent supporter of the blackspotted (westslope) cutthroat trout was television personality Norma Ashby and her husband, Shirley, of Great Falls, both avid fly anglers. In 1976, Ashby launched on her TV show, "Today in Montana," a campaign for Montanans to vote for a state fish.

Described by Captain William Clark in 1805, the blackspotted cutthroat trout was also the choice of the Lewis and Clark Trail Heritage Foundation.

The cutthroat campaign got its most eloquent endorsement by Art Whitney, chief of the state's Fisheries Division, who wrote, in testimony later delivered before the 1977 legislature: "Probably more than any other species, the cutthroat trout symbolizes the quality we are striving for . . . in Montana. Just as this fish requires a quality habitat if he is to survive, Montanans as a people are striving for a quality of life already lost in many parts of this nation. Naming the blackspotted cutthroat trout as Montana's state fish will be just another indication that the people in this state will settle for nothing but the very best in protecting the Montana way of life we are all dedicated to preserving."

The legislature agreed, after which Governor Thomas Judge signed into law the bill that made the blackspotted cutthroat trout Montana's official state fish .

WESTSLOPE CUTTHROAT: PAT CLAYTON; GRIZZLY ILLUSTRATION: PETER CROSSGROVE; BLUEGILL: MIKE STOCKER; MARTIN: [illegible]



STATE ANIMAL: GRIZZLY BEAR

(Ursus arctos horribilis)

Secretary of State Jim Waltermire launched the State Animal Project in 1982 as a way to "impress upon Montana students the importance of an individual's vote and to familiarize them with the legislative process."

Students statewide were encouraged to learn about Montana's wildlife, nominate candidate species, and even form "political" committees to support and campaign for a particular animal. Students voted in a primary election and narrowed their choices to the grizzly bear and the elk. The general election was scheduled for a month later.

Students across Montana heard an earful from the two campaigns on why they should vote one way or the other. Adults also weighed in. Some believed that if the elk became the state animal it would lose its big game status, thus eliminating Montana's multi-million-dollar elk hunting industry. Others opposed the grizzly because it was a predator and had only a few years earlier been given federal protection under the Endangered Species Act, which ended grizzly hunting and closed some trails and roads.

The grizzly won, capturing 34,346 votes to the elk's 18,354 in the students' election. Senator Larry Tveit sponsored a grizzly designation bill in the Senate, and Representative Clyde Smith was the House sponsor. More than 1,000 children attended the grizzly bear designation hearings, and the bill passed by wide margins in both houses. Governor Ted Schwinden, decked out in a grizzly cap, signed the bill into law in 1983.

STATE GRASS: BLUEBUNCH WHEATGRASS

(Agropyron spicatum)

At a PTA seminar on the environment in 1972, Havre resident Toni Hagener heard Joseph C. Zacek, a range conservationist with the Soil Conservation Service, mention that Montana had no state grass, even though 75 percent of the landmass was composed of rangeland.

Hagener wrote to Zacek that a local community development group she chaired might be interested in promoting an official state grass. She asked which native grass would best qualify: Western wheatgrass? Blue gamma? Another species?

Zacek replied that blue gamma was not highly regarded by ranchers. "We have a saying about this grass: 'A cow has to have a mouth a yard wide and travel 20 miles an hour to get a belly-full,'" he wrote. His top choice was rough fescue, which he claimed was the "one species that is definitely Montanan because it occurs in only limited amounts in other states." His second choice was bluebunch wheatgrass, found throughout the state.

That's the species Hagener's group decided to lobby for, and in 1973 the legislature made bluebunch wheatgrass Montana's official state grass.

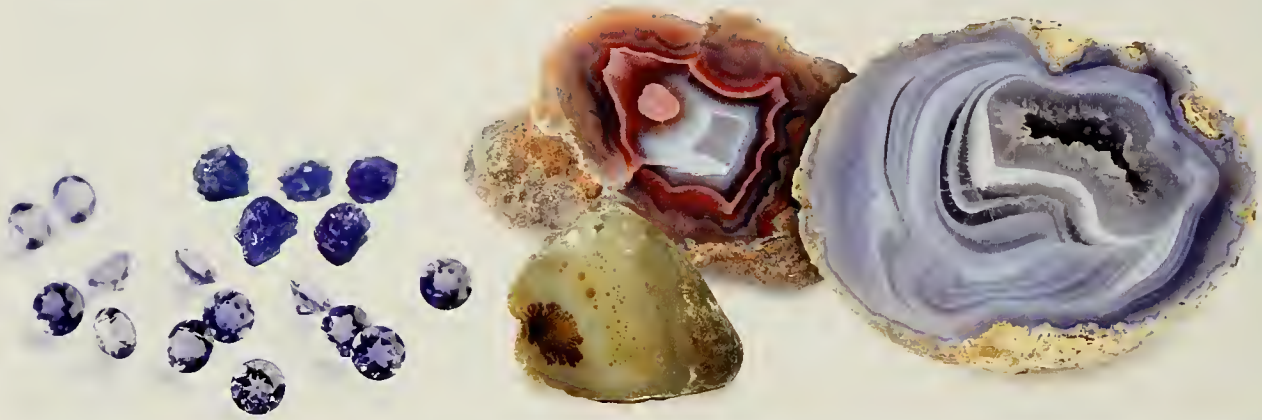
STATE GEMSTONES: SAPPHIRE AND AGATE

In 1895 prospector Jake Hoover discovered gold in the Little Belt Mountains. He and two partners invested $40,000 to begin an extensive mining operation. After a year of mining, Hoover managed to extract only $700 worth of gold, but he also found some pale blue pebbles in Yogo Creek. He sent a cigar box full of the stones to Tiffany & Co. in New York to see if they were worth anything.

George F. Kunz, at the time considered America's foremost gem expert, called Hoover's rocks "the finest precious gemstones ever found in the United States." Tiffany & Co. sent the prospector a check for $3,750, the first of many he would receive for his discovery.

Hoover's mines, which the U.S. Geological Survey later described as "America's most important gem locality," eventually produced an estimated $40 million worth of sapphires. Montana's yogo sapphires are even found in the Royal Crown Jewel Collection in London.

The Montana Council of Rock and Mineral Clubs asked the legislature to declare both the sapphire and the Montana agate (the latter found in abundance along the Yellowstone River) as Montana's official state gemstones. The legislative body complied in 1969.



STATE TREE: PONDEROSA PINE

(Pinus ponderosa)

The ponderosa pine is a common western conifer that grows on dry slopes and mountain foothills, often surrounded by juniper, sage, and prairie grasses. Its range extends from central British Columbia south to central Mexico and east to South Dakota's Black Hills. Ponderosa pine forests, found throughout Montana, are highly valued for their commercial timber.

The tree is likely named for its "ponderous" size, reaching 230 feet in some regions (though topping out at 194 feet in Montana), or its heavy wood.

Ponderosa pine forests are used by a wide range of wildlife, including birds such as western tanagers and great horned owls, and mammals such as grizzly bears and mule deer. This tree also helped build the West, supplying timber for mine braces, railroad ties, and residential homes.

In 1908 Montana schoolchildren selected the ponderosa pine over the Douglas fir, American larch, and cottonwood as Montana's state tree. But not until 1949, after a yearlong campaign by the Montana Federation of Garden Clubs on behalf of the ponderosa, did the legislature finally make the designation official.

GEMSTONES: ISTOCKPHOTO; PONDEROSA PINE: CRAIG & LIZ LARCOM; MAIASAURA: DAVIDE BONADONNA

STATE FOSSIL: MAIASAURA

(Maiasaura peeblesorum)

One of the most significant paleontological discoveries of the latter 20th century came in 1978, when fossils of a nesting colony of duck-billed dinosaurs were found west of Choteau. The following year, paleontologist Jack Horner and research partner Bob Makela determined that the species, which they named Maiasaura ("good mother lizard"), raised its young in colonies, as many birds do, rather than abandon the nest after laying eggs, like reptiles.

So scientifically important was the finding that in the mid-1980s the Montana Council of Rock and Mineral Clubs decided to lobby for the Maiasaura as the state's official fossil.

Representative Orval Ellison introduced the fossil designation legislation, telling Ben Veach, chairman of the council, "You get me the kids and I'll get your bill passed." Veach enlisted the help of Helen Peterson's sixth-grade class at Livingston Middle School. Peterson and 130 schoolchildren wrote letters to Governor Ted Schwinden, legislators, and other schools in Montana. They wrote songs and stories and made and distributed brochures and T-shirts. They also baked 2,000 Maiasaura-shaped cookies for the legislators, and toured the State Capitol and governor's office.

The House unanimously passed the bill in February 1985. The Senate passed it after debating whether the Tyrannosaurus rex would be more appropriate.

A few weeks later, the governor visited Livingston to sign the state fossil bill. Rarely before had a law been signed outside of the State Capitol, but as Veach put it, "I'm sure the capitol is well-built; it withstood the Helena earthquake of 1959. But 130 sixth-graders twice in one year? Well, why risk it?"

STATE FLOWER: BITTERROOT

(Lewisia rediviva)

The bitterroot's scientific name comes from Meriwether Lewis, who first officially described the plant in 1805. (*Rediviva*, Latin for "revived," refers to the plant's bright flowers, which blossom each summer.) But long before that, the bitterroot was well known to American Indians of the region, who for centuries boiled and ate the plant's nutritious root.

Despite its heritage and lovely pink petals, the bitterroot was no shoo-in for Montana's state flower. Many people denounced the oddly shaped forb. The *Helena Independent* editorialized in 1894 that the bitterroot "has one quality which should be fatal to it as a state emblem. It has no stem . . . and the leaves and flower grow out of the top of a thick, fleshy, spindle-shaped root." That made the flower difficult to pick, the editors argued, and lacking a stem it couldn't be made into a bouquet or worn as a boutonnière.

But 3,621 Montanans disagreed, and that year they made the bitterroot the clear winner in a statewide contest. (The evening primrose and the wild rose took distant second and third places with 787 and 668 votes, respectively.) The 1895 legislature acknowledged the public's decision and made the bitterroot the official state flower of Montana.

STATE BIRD: WESTERN MEADOWLARK

(Sturnella neglecta)

Another state symbol inspired by its connection to Meriwether Lewis is the western meadowlark. The melodic prairie bird was first recorded for science by the explorer on June 22, 1805, when the Corps of Discovery portaged around the Great Falls of the Missouri River. In his journal that night, Lewis wrote, "there is a kind of larke here that much resembles the bird called the oldfield lark with a yellow brest and a black spot on the croop . . . the beak is somewhat longer and more curved and the note [song] differs considerably; however in size, action, and colours there is no perceptable difference; or at least none that strikes my eye." In 1930 Montana's schoolchildren voted for the western meadowlark as the bird that best represented their state. The following year, the state legislature made it official.

In 1998 several lawmakers proposed to replace the meadowlark with the magpie. They argued, unsuccessfully, that unlike the songbird, which flies south each fall for warmer climes, the magpie stays in Montana year-round and is more deserving of the state bird honor.

BITTERROOT AND MEADOWLARK ILLUSTRATION: ARTHUR SINGER AND ALAN SINGER; MOURNING CLOAK BUTTERFLY: ALETA ANN RODRIGUEZ

STATE BUTTERFLY: MOURNING CLOAK

(Nymphalis antiopa)

Who would have thought that naming a state butterfly would spark a Grizzlies versus Bobcats controversy? But it did—at least for one state representative. In 2001 all 100 members of the Montana House except Representative Brad Newman voted to make the mourning cloak the state butterfly.

The mourning cloak is a handsome insect. Its wings of dark brown (the color of mourning cloaks once worn to funerals) are edged in bright blue and yellow. Newman took issue with the blue and yellow, which he believed too closely resembled the school colors of Montana State University.

The Butte Democrat claimed that his loyalty to The University of Montana, along with the Bobcats' losing streak at the time, kept him from voting for the mourning cloak. "I think that as a matter of legislative policy, we ought to stick with a winner," Newman said after his vote. "I'm holding out for a maroon butterfly."

He couldn't convince enough of his fellow lawmakers, however, and in 2001 the legislature made the mourning cloak Montana's state butterfly.

THE LAND THAT

WHAT ARE WEST COAST RAINFOREST CREATURES DOING IN NORTHWESTERN MONTANA?

TIME FORGOT

STORY BY BEN LONG

PHOTOS BY DAVID HERASIMTSCHUK

BIG AMPHIBIAN Only recently discovered in Montana, the Idaho giant salamander (shown here in its larval stage) lives in the Northern Rocky Mountain Refugium, a bastion of biologically diverse coastal creatures in the Bitterroot Mountains.

The phenomenon struck me while I was watching the 2010 Olympics on TV. The scenery around Vancouver, British Columbia, looked a lot like my family's favorite camping spot at Bull Lake, south of Troy, Montana. I could identify redcedar and hemlock cloaking the slopes where skiers were racing for gold medals. Even the pitch of the mountains looked familiar.

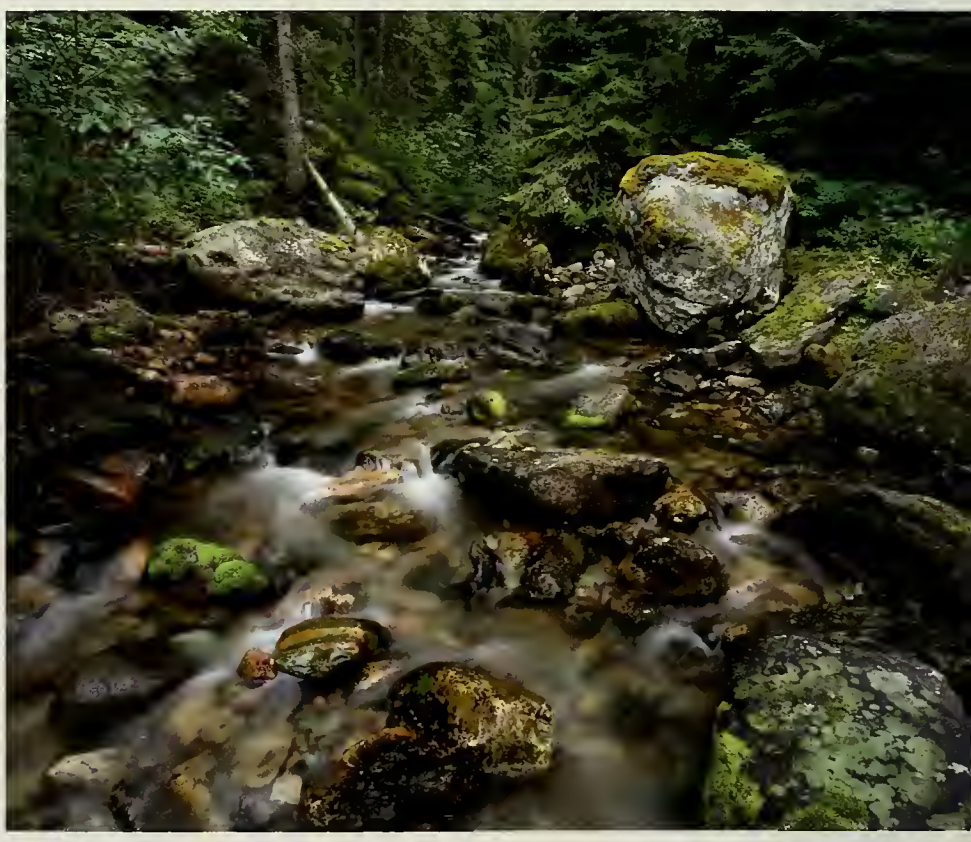
It turns out scientists have noticed the same thing. They've recognized that parts of western Montana and northern Idaho look like a big chunk of rainforest plucked from the Pacific Coast and plopped down 350 miles inland. And it's not just casual appearances. Scientists have identified scores of similar species living in both places, from mighty trees to lowly mayflies. For instance, the viciously thorny devil's club plant shows up in both Olympic National Park west of Seattle and Glacier National Park east of Kalispell.

How did these rainforest plants and animals survive the glaciers and glacial lakes that not so long ago covered most of northwestern Montana? Even more puzzling: How did a place that looks like Washington's Olympic Peninsula get here in the first place?

Making the Inland Rainforest

The earth's crust is assembled of plates that fit together like puzzle pieces. But they don't snap together neatly. Instead, slowly moving tectonic plates collide and buckle over and under each other, occasionally pushing skyward to form mountains. Sometime between 90 and 65 million years ago, the Farallon Plate slid under the North American Plate, piling layers of the earth's crust upon one another to form the Rocky Mountains. At the time, northern Idaho and northwestern Montana were the continent's western coast. What are today Oregon and Washington were continental islands floating on their own tectonic plates in the Pacific Ocean.

Over the next ten million years, the continental islands drifted east and stacked up against Idaho to form Oregon and Washington and the new Pacific Coast. For several million years, moist air masses moving east from the Pacific Ocean dropped rain across the region all the way to the Rockies, creating a giant rainforest stretching for hundreds of miles. This vast mesic ecosystem was awash in warm coastal rain and lush with life. Dinosaurs had long been extinct, but salamanders slithered in the misty



MONTANA'S "OLYMPIC PENINSULA" Small high-gradient mountain streams in northwestern Montana look remarkably similar to those along the Pacific Coast, 350 miles to the west.

Northwestern Montana Inland Rainforest Timeline

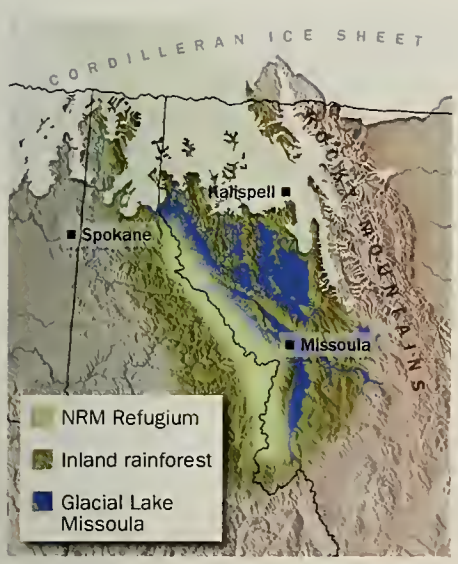
200 MILLION YEARS AGO

200 million years ago
North America is part of the supercontinent Pangea. Today's western Montana and northern Idaho are the west coast of the continent, with ocean waves lapping up against the Idaho Panhandle. Most of Montana is under a shallow inland sea. What is today Washington and Oregon are continental islands in the Pacific.

90 to 65 million years ago
Large tectonic plates collide, push up, and form the Rocky Mountains.

65 to 55 million years ago
The continental islands drift east and stack up against the Idaho coastline like ice floes, building today's Oregon and Washington and creating the new west coast. Moisture-bearing clouds coming in off the Pacific drop rain from the coastal shore all the way to the Rockies. This creates a giant rainforest stretching hundreds of miles.

17 to 15 million years ago
Immense lava flows from Oregon spread east, covering large tracts of what had been rainforest in central Idaho.



LUKE DURAN/MONTANA OUTDOORS

NATURE'S ARK Thousands of years ago, Glacial Lake Missoula and glaciers creeping south from Canada covered much of the inland rainforest in today's northwestern Montana. Several large areas that were too high, too low, or too far south to be covered by ice acted as refugia—places containing isolated populations of once-widespread species.

streambeds, and creeks were full of snails, slugs, aquatic insects, and water plants. Today we consider these to be coastal rainforest species, yet they existed well into the continent's interior.

Just as geological events created the giant rainforest, so did they destroy large parts of it. Roughly 17 to 15 million years ago, immense lava flows from Oregon spread east, covering large tracts of eastern and central Idaho rainforest with molten rock. Then, roughly five million years ago, the Cascade Range of today's Oregon and Washington was born. The mountains forced air masses coming in off Puget Sound to rise, causing the moisture to cool, condense, and fall as rain. This produced a "rain shadow"—a dry region on the lee side of mountains—east of the Cascades. Much of the wet forestland there eventually turned into the dry scrubland and prairie of today's eastern Washington and Oregon.

After retaining their moisture over the low-elevation aridscape, the air masses rose again when they reached Idaho and Montana, dropping rain. This produced enough precipitation to continue supporting thirsty plant species like hemlock and water-loving animals such as salamanders.

That was the pattern for several million years, with one rainforest thriving along the Pacific and another—separated by hundreds of miles of lava fields, grassland, canyons, scrublands, and dry pine—persisting along the western face of the Rockies. Then, about two million years ago, the climate changed again.

The Ice Ages Cometh

This was the Pleistocene Epoch, a two-million-year period of great ice ages that chilled the entire planet. Though average temperatures were only a few degrees lower than today, snow piled up so high that great slabs of ice covered Canada and the Rockies. These glaciers shaped modern Montana, pushing the Missouri River south toward the Gulf of Mexico, gouging out the footprint of Flathead Lake, and whittling down the peaks of the Rockies.

Covering much of Montana's inland rainforest were glaciers up to 1 mile thick and, during the most recent ice age, 200-mile-long Glacial Lake Missoula. But some valleys, where lower elevations created warmer temperatures, escaped glaciation. And southern reaches of the rainforest were at latitudes too warm to sustain thick ice.

These rainforest remnants are known as refugia—places containing isolated or relict populations of once-widespread animal or plant species. One of the largest, the Northern Rocky Mountain Refugium, extends from where I-90 crosses into Idaho southwest for roughly 150 miles along both sides of the Montana-Idaho border to the southern end of the Bitterroot Valley. There, rainforest species covered by glaciers elsewhere in northwestern Montana were able to survive the Pleistocene. Scientists have documented roughly 150 species of complex plants and vertebrate animals (and many more if insects are included) living in the Northern Rocky Mountain Refugium that have "sister taxa," or related forms, on the Pacific Coast. Among these are the 2-inch-long Coeur d'Alene salamander, the Rocky Mountain tailed frog, the newly discovered

> Many species dispersed from this and other refugia—which acted as natural Noah's arks.

90 MILLION YEARS AGO — 65 MILLION YEARS AGO — 17 MILLION YEARS

5 million years ago
The Cascade Range is formed. This creates a rain shadow over eastern Oregon and Washington, producing an aridscape that further cuts off the inland rainforest from the coast. The clouds retain moisture as they move east across lower elevations, then drop rain when they hit the Rockies. This sustains what becomes an isolated rainforest ecosystem in northern Idaho, northwestern Montana, and south-central British Columbia.

2 million to 10,000 years ago
Glaciers and Glacial Lake Missoula cover much of Montana's inland rainforest with ice and water up to 1 mile deep. Some low-elevation valleys (which are warmer), mountain peaks, and areas south of the glaciers escape inundation. These are known as refugia. One of the largest, the Northern Rocky Mountain Refugium, stretches 150 miles along the Bitterroot Mountains and contains coastal plant and animal species established millions of years earlier that continue to survive.

10,000 years ago to today
After the glaciers retreat, some species from the refugia "arks" recolonize parts of the previously ice-covered rainforest, which continues to receive moisture from the Pacific. Other species survive only in the refugia, which one scientist calls "multi-taxa hotspots of genetic diversity." Biologists hope that studying the refugia and publicizing the findings will help preserve the areas and associated dispersal corridors.

Holding that frog or snail will be like staring into the depths of time.

Lolo mayfly (*Caurinella idahoenis*), and dozens of other aquatic invertebrates, slugs, snails, and delicate wetland flowers.

When the last of the glaciers retreated and floodwaters subsided roughly 10,000 years ago, many plant and animal species dispersed from this and other refugia—which acted as natural Noah's arks. Over millenia, the flora and fauna followed avenues of suitable habitat known as "dispersal corridors" and recolonized parts of northwestern Montana's inland rainforest where they had once thrived. But many species are endemic, meaning that only the Northern Rocky Mountain Refugium and other inland rainforest refugia retained the ecological conditions they needed to survive.

The Bering Land Bridge

Colder temperatures also triggered a sweeping change that created the suite of wildlife species we enjoy today. During the ice ages, moisture remained locked up in the polar ice caps rather than evaporating into the atmosphere and falling as rain into the oceans. That caused sea levels across the globe to drop. One result was the Bering Land Bridge between Siberia and Alaska, across which bison, grizzlies, wolves, moose, elk, and other mobile species migrated from northern Asia into North America. When temperatures eventually warmed, Pacific fishes such as cutthroat trout and bull trout migrated from the ocean, swimming up river water melting from glaciers, and eventually populated inland streams.

We think of these species as Montana natives. Yet compared to northwestern Montana's Idaho giant salamander, tailed frog, and other refugia species, familiar mammals such as elk and mule deer are newcomers. Montana's original natives, like those of the Northern Rocky Mountain Refugium, have dwelt here for millions of years. They and other rainforest creatures quietly carried on with their lives as ice ages came and went and even entire mountain ranges were thrust up from the ocean floor.

All this was a revelation to me. I have lived my entire life within the boundaries of the inland rainforest, an ecosystem that runs from the mountainous country of the Clearwater and St. Joe River drainages of northern Idaho, east to western Montana's Lolo, Bitterroot, and Kootenai National Forests, and north about as far as Revelstoke, British Columbia. The lush forests and steep mountains are imprinted on my psyche as "home." So are its wildlife. Yet until recently I was perfectly ignorant of the area's ancient history.

Now I know that the reason Vancouver's ski slopes resemble Montana's scenic Bull Lake area is because both are part of what was once a contiguous mesic forest that extended from the Pacific to today's Glacier National Park. And that it was the emergence of the Cascade Range, which five million years ago created a rain shadow between here and there, that isolated our part of the rainforest.

Now when my son and I pluck a snail off a rock at Ross Creek or ponder a tailed frog from the Yaak, I can tell him that the crea-

ANCIENT CREATURES Coastal mesic forest species like this snail and tailed frog have lived in northwestern Montana for millions of years. Compared to these creatures, iconic Montana wildlife such as elk and mule deer arrived here only yesterday.

Ben Long is a writer in Kalispell. David Herasimtschuk is a conservation photographer in Fort Collins, Colorado.

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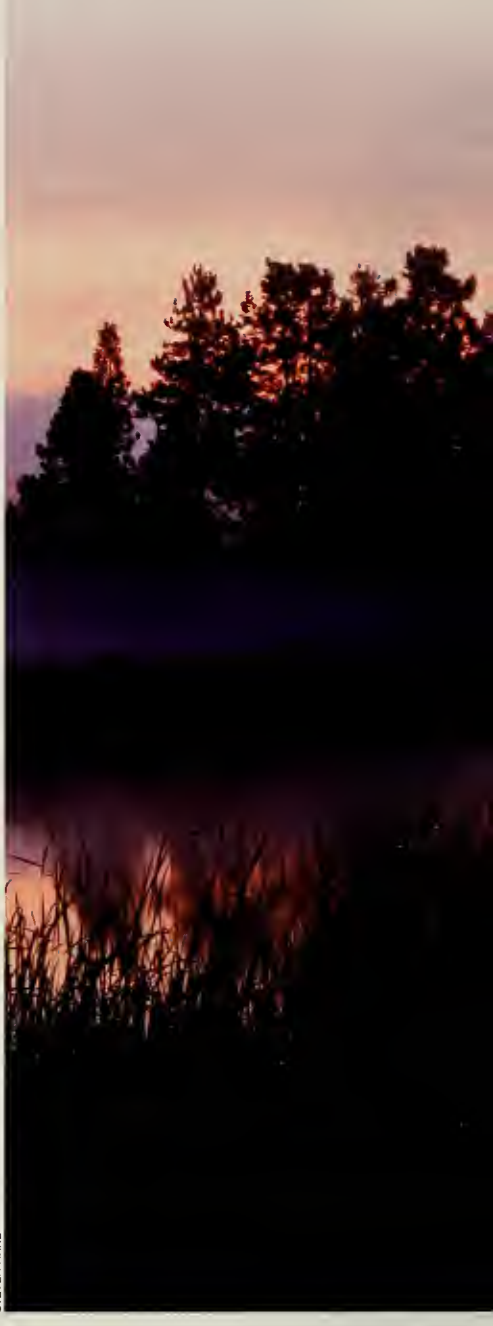
ture's history goes back in Montana so long it makes the oldest human history seem like a click of the secondhand on Earth's wristwatch. I'll explain how the little mollusk or amphibian has a biological twin living hundreds of miles away on the West Coast, and how its pedigree stretches back to a time before the Cascade Range even existed. I'll show him how refugia are remarkable areas of biological richness, places where we can flip a rock or peer into a mountain pool and see creatures found nowhere else in Montana.

Holding that frog or snail will be like staring into the depths of time, just as by looking at a distant planet he and I will stare into the depths of space.

And I will wonder what new discoveries await his generation and what secrets remain to be unlocked here and in other wild, pristine parts of Montana.

Where Wildlife Reigns Supreme



STEVEN AKRE

Enjoy the natural splendor of Montana's 21 national wildlife refuges. BY LEE LAMB

It was a clear and cold March morning when I stood in the Lee Metcalf National Wildlife Refuge (NWR) parking lot shivering beside the other students in my University of Montana ornithology class. We were waiting to head out on our first birding field trip. This was in 1994, and at the time I had no idea of the ornithological spectacle about to unfold.

Skirting the east banks of the Bitterroot River 25 miles south of Missoula, Lee Metcalf NWR encompasses 2,800 acres of woodlands, ponds, wetlands, and upland meadows. Established in 1963 and named to honor the U.S. senator, Stevensville native, and lifelong conservationist, the refuge is now one of the few remaining large tracts of undeveloped land in Montana's rapidly growing Ravalli County. Tucked between the Bitterroot and Sapphire Mountains, the refuge is home to eagles, herons, mergansers, warblers, pheasants, deer, coyotes, muskrats, and more. It offers visitors spectacular scenery, an excellent environmental education program, and opportunities for fishing, hunting, birding, and hiking (on 2.5 miles of trails).

Lee Metcalf is one of 553 national wildlife refuges nationwide encompassing more than 150 million acres and managed by the U.S. Fish and Wildlife Service (USFWS). The National Wildlife Refuge System was established by Congress in 1903, when President Theodore Roosevelt made tiny Pelican Island in Florida the first permanent sanctuary for birds. The refuge system now encompasses a network of lands and waters managed to conserve fish, wildlife, and their habitats. Congress appropriates funds for staff, operations, and maintenance, and the USFWS uses hunters' license dollars to buy and expand the refuges. Ninety-eight percent of funds from the Federal Migratory Bird Hunting and Conservation Stamp—the

Dawn at Lee Metcalf NWR, one of the few remaining large undeveloped tracts in the rapidly growing Bitterroot Valley. Right: American kestrel.

federal duck stamp waterfowl hunters must buy each fall—goes to leasing or purchasing wetland habitat included in the NWR System. It's a sound investment. Each year refuges nationwide draw nearly 40 million visitors who pump more than $1.5 billion into regional and local economies.

"Many refuges in the Lower 48 were established primarily for waterfowl, and waterfowl production remains a high priority for us," says Dean Rundle, regional supervisor for refuges in Montana, Wyoming, and Utah. "But others are for big game and also for things like bats and small fish and endangered butterflies. I think it's wonderful that so much of America's wildlife heritage is protected and conserved within the refuge system."

After two hours of peering through binoculars and adding 25 new birds to my life list that chilly spring day, I was convinced I'd hit the avian jackpot. But I've since learned that all of the 21 national wildlife refuges in Montana are great spots to see birds—and hike, hunt, fish, take photographs, and learn about nature and conservation. Some highlights:

Wildlife Without the Crowds

For a taste of Yellowstone National Park—without the three million tourists who visit each year—drive another 35 miles west to

STEVEN AKRE

Bulrushes ring a large wetland at Red Rock Lakes NWR in the Centennial Valley. "The big difference [between us and Yellowstone National Park] is that people who come out here have lots of country pretty much all to themselves," says the refuge manager.

Red Rock Lakes NWR. The little-known refuge spans the Centennial Valley at 6,600 feet and climbs to 10,000-plus feet up the Centennial Mountains on its southern border. The nearly 50,000-acre refuge contains an impressive mix of vegetative and aquatic communities, including lakes, rivers, marshes, meadows, sagebrush steppes, woodlands, and even alpine areas. Perhaps nowhere else on earth can a visitor spot a pronghorn, a sage-grouse, a trumpeter swan, and possibly even a wolverine track in the same day.

"With all the different habitats here, you just never know what you might run into," says Bill West, refuge manager. "One site here, Willow Fen, is as good a place as anywhere in Montana to see a moose, and Lower Red Rock Lake is a great location to spot waterfowl, shorebirds, and antelope. We have arctic grayling and nesting bald eagles, and you might even see a wolf."

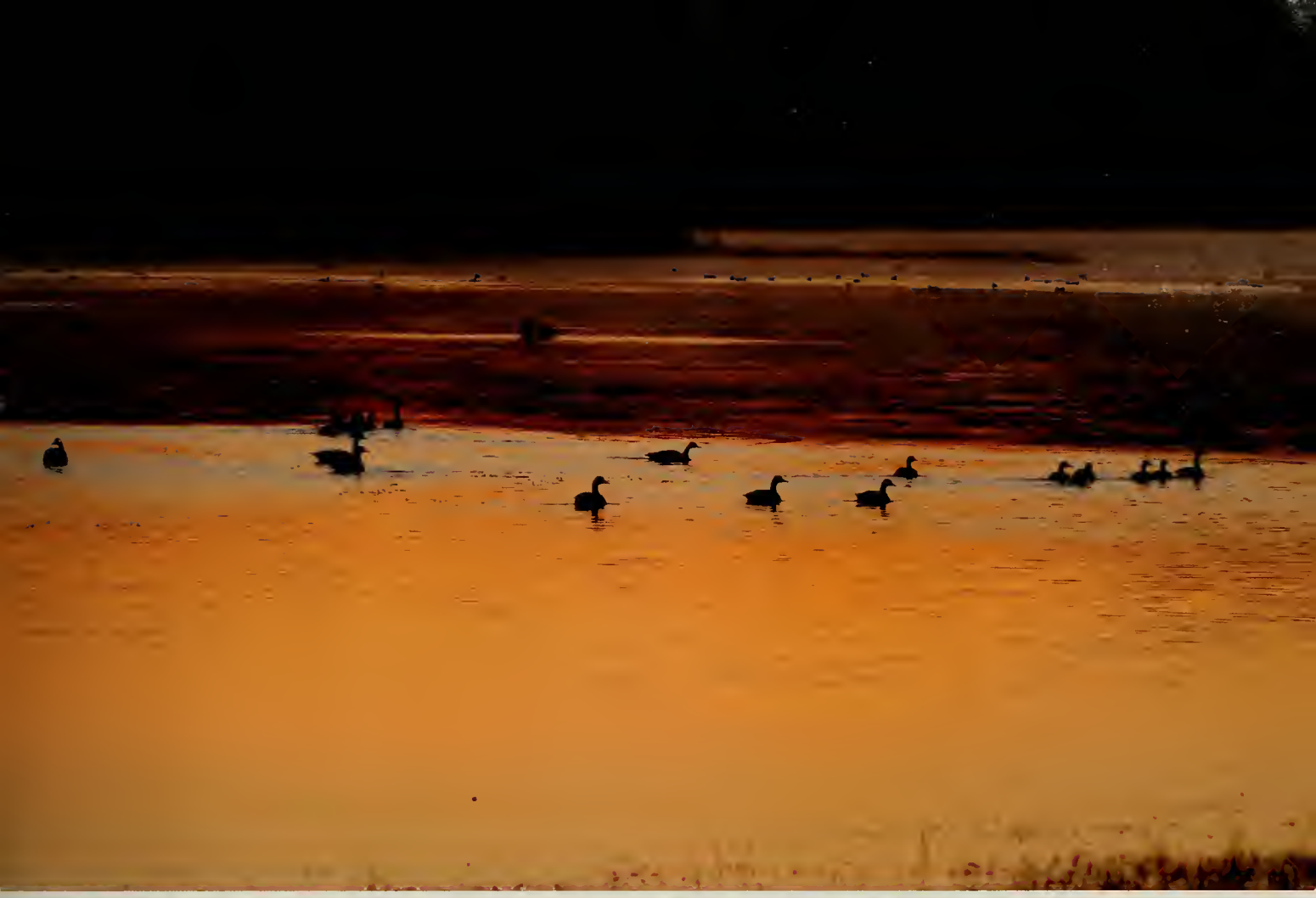
The refuge contains the largest wetland complex in the Greater Yellowstone Ecosystem. It serves as a crucial wintering area and year-round home to trumpeter swans that need wetland habitat undisturbed by human activity. Because much of the refuge is designated as a National Wilderness Area, it contains no developed wildlife viewing areas or designated hiking paths. Visitors explore the area by following game trails or striking out cross-country.

Some amenities exist. Gravel roads take visitors to both Upper Red Rock and Lower Red Rock Lakes, each with a developed campground (not found on most NWRs) and water access for boats (motors not allowed). Fishing, waterfowling, and big game hunting are allowed in designated areas.

West says visitors to the remote refuge are rare—especially when compared to the numbers crowding the national park just a few miles to the east. "We're pretty Yellowstone-ish in a lot of ways," he says. "We don't have geysers or bison, but we've got lots of other wildlife. The big difference is

Sales of federal duck stamps to hunters, other conservationists, and stamp collectors have raised over $700 million since 1934. The revenue has gone to acquire millions of acres of habitat for the National Wildlife Refuge System.

Writer Lee Lamb splits her time between Polson, Montana, and Coeur d'Alene, Idaho.



Ducks and other water birds rest at Red Rock Lakes, located about 35 miles west of Yellowstone National Park. Like many wildlife refuges, Red Rock Lakes is rich in wetlands. Unlike most others, it also contains prairie and mountain wildlife, including sage-grouse and cougars.

that people who come out here have lots of country pretty much all to themselves."

A Waterfowl Oasis

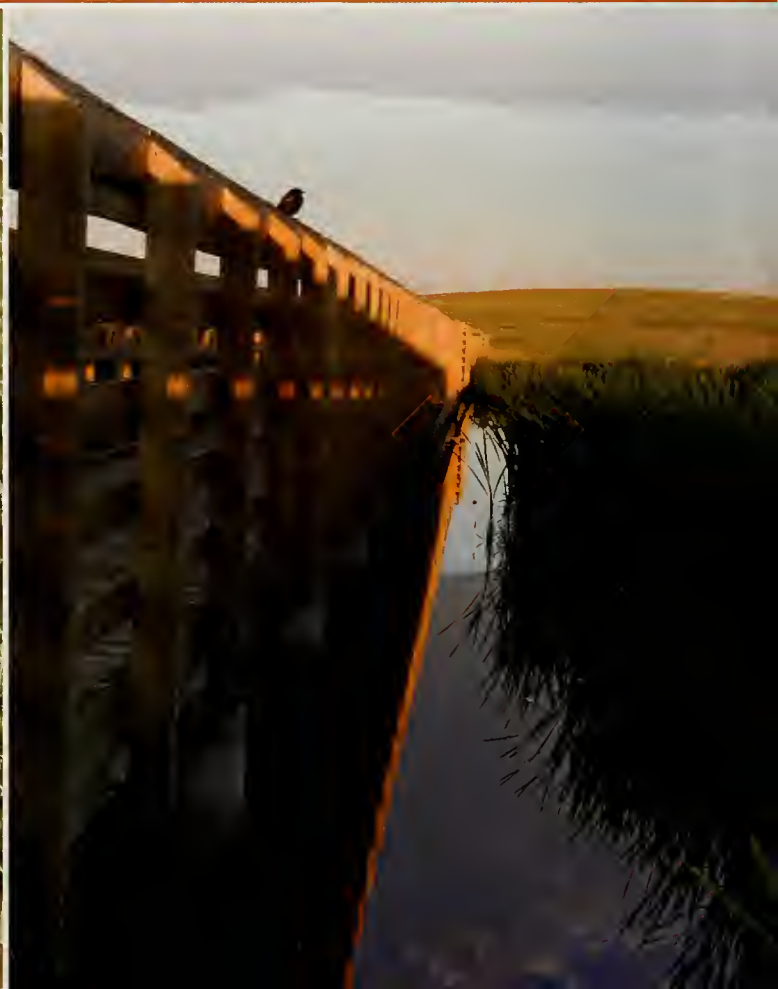
Thousands of years ago, glaciers carved out a shallow 5,000-acre depression known as Benton Lake. This and another 7,000-plus acres of native grassland and prairie habitat surrounding the wetland complex form Benton Lake NWR, located roughly 12 miles north of Great Falls.

Surrounded by arid farmland for miles in all directions, Benton Lake NWR is an oasis for waterfowl and shorebirds. The wetland complex was once susceptible to severe droughts and floods, which hampered wildlife use. Now an intricate diking system divides the main marsh into eight sections, providing diverse wetland habitats for bird species ranging from the white-fronted goose to the black-crowned night-heron. More than 200,000 ducks, geese, swans, and shorebirds use the refuge during spring and fall migrations. In spring and summer, Franklin's gulls and white-faced ibises gather in massive breeding colonies. Pronghorn, badgers, burrowing owls, and horned larks live in the nearby native shortgrass prairie. In April and May, the refuge allows visitors to reserve a viewing blind next to an open area called a lek, where male sharp-tailed grouse conduct their staccato-step mating dance at dawn.

fws.gov/bentonlake

Most visitors take the Prairie Marsh Wildlife Drive. Open year-round to vehicles (weather permitting) and bike and foot travel, the 9-mile gravel loop passes through wetland and upland habitats. Early morning and evening are the best times to spot wildlife. An interpretive map available at a kiosk near the drive entrance contains information on wetlands, wildlife, and the area's history and management. An observation blind sits on the north end of Marsh Unit 1

Perhaps nowhere else on earth can a visitor spot a pronghorn, a sage-grouse, a trumpeter swan, and possibly even a wolverine track in the same day.



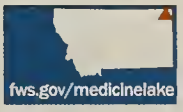
Clockwise from top left: The sun retreats over the Rocky Mountain Front, setting aglow Benton Lake NWR; view from the ten-story lookout tower at Medicine Lake NWR; red-winged blackbird on the Prairie Marsh Trail boardwalk at Benton Lake NWR; sharp-tailed grouse at Benton Lake NWR.

at the first parking area. Prairie Marsh Trail is a 1,000-foot boardwalk reaching out into the marsh that allows visitors a closer look at birds and scenery.

A Good Prescription for Birds

Medicine Lake NWR offers visitors a bird's-eye view of its lush surroundings. At the refuge headquarters (25 miles north of Culbertson in northeastern Montana), a ten-story-tall observation tower provides an expansive panorama of the refuge's western half—prairie pothole country of rolling plains dimpled with shallow wetlands.

Medicine Lake is a birding wonderland recognized by the American Bird Conservancy as one of the nation's top 100 globally important areas for avian wildlife. The refuge's 22 lakes and water impoundments, abundant wetlands, and expanses of mixed-grass prairie provide critical breeding habitat for 17 waterfowl species and several rare grassland birds, including Sprague's pipits and chestnut-collared longspurs. The 31,660-acre refuge also provides nesting habitat for migrating sandhill cranes, white-fronted geese, and tundra swans, and year-round range for sharp-tailed grouse and pheasants. Deer, coyotes, muskrats, and even the occasional moose, elk, and pronghorn live here too.



Visitors unwilling to trudge 135 steps up the tower can see the refuge by taking the 14-mile (one-way) graveled wildlife drive. It winds first along the north shore of shallow 8,218-acre Medicine Lake, then past smaller lakes and ponds. Signs explain the refuge's natural and cultural resources and how the lands and waters are managed for wildlife. Pelican Overlook provides a wheelchair-accessible viewing platform with binoculars that give visitors a closer view of American white pelicans on Big Island and Bridgerman Point. The colony of more than 10,000 pelicans is one of North America's largest.

The refuge encompasses the 11,360-acre Medicine Lake Wilderness Area, which includes a sandhills vegetative community composed of rolling dunes dotted with cacti, native grasses, and shrubs such as buffaloberry and chokecherry.

Because the refuge contains no designated hiking paths, visitors explore by following game trails and walking cross-country. Fishing as well as waterfowl, upland game bird, and big game hunting are allowed.

Prairie Wildlife and One Big Reservoir

Because most people think of elk as mountain creatures, many first-time visitors to the Charles M. Russell NWR are surprised to hear bulls bugling along the Missouri River Breaks at dusk. Before European settlement, elk abounded on Montana's prairies. Today they are returning to grasslands such as those at the "CMR," as it's called locally. The best spot to hear and see elk is the Slip-

Sunrise at the Charles M. Russell NWR. With its native shortgrass prairie, abundant pronghorn and elk, and nearby family ranches, the landscape has changed little since the famous Montana artist portrayed the region's open landscape and cowboy lifestyle.

pery Ann Elk Viewing Area, along a 19-mile self-guided vehicle tour on the refuge's western end. Hundreds of bulls, cows, and calves gather at this 1,500-acre no-hunting zone along the river bottom every September and October. Despite the region's remote location, more than 200 vehicles line the viewing area some evenings.

The CMR extends from Fort Peck Dam 125 miles west up the Missouri River and includes Fort Peck Reservoir. The refuge is named for the famous western artist who portrayed the region's prairie landscapes and diverse wildlife in his paintings. The refuge's project leader, Barron Crawford, says the area has changed little since Russell's time. The CMR is surrounded by working family ranches, where cowboys on horseback still drive cattle on spring roundups. Conservation groups and private landowners protect and conserve prairie, sagebrush-grasslands, juniper coulees, badlands, and cottonwood-laced river bottoms. As they have for thousands of years, these habitats provide year-round and seasonal homes for pronghorn, mule deer, coyotes, mountain plovers, and long-billed curlews. Charlie Russell would feel right at home.

The refuge is packed with recreational opportunities. Hundreds of miles of gravel and dirt roads provide driving access. Hunting for big game, upland birds, and waterfowl is popular, as are walleye and smallmouth bass fishing on the sprawling reservoir. Camping is allowed throughout the refuge within 100 yards of the river and certain roads. Fort Peck Lake—which has more miles of shoreline than the entire California coast—is open for boating and, when the water freezes solid in winter, snowmobiling. At the Fort Peck Dam Interpretive Center and Museum in Fort Peck, visitors will find interpretive displays ex-

Sometimes no hunting

Though supported by hunter license dollars, some national wildlife refuges are closed to public hunting—a conservation measure hunters support. That's because wildlife need these sites to be refuges in the truest sense of the word, where they can rest unbothered by hunting and other activities. Closed to public hunting in Montana are Ninepipe and Pablo NWRs and the National Bison Range, though many nearby satellite refuges and waterfowl production areas are open, as is Ninepipe Wildlife Management Area (owned and managed by the state). Also, many refuges open to hunting have regulations more restrictive than those off the refuge. Call refuges beforehand to learn of special seasons and boundaries.

Download a state-by-state guide to hunting national wildlife refuges at fws.gov/refuges/hunting/pdf/huntingguide.pdf.

Male sage-grouse displaying on a lek at the Charles M. Russell CMR. *National Wildlife magazine* recently named the 125-mile-long eastern Montana refuge as one of the nation's top 10 wildlife viewing spots.

plaining the dam's colorful history and the biology of local wildlife.

Crawford says wildlife watchers have their best chance of spotting bighorn sheep by hiking on Mickey and Brandon Buttes. The place visitors are most likely to see sage-grouse dancing on mating leks (in April) or catch a glimpse of reintroduced black-footed ferrets hunting prairie dogs is at UL Bend NWR, 55 miles south of Malta and within the boundaries of the CMR.

World's Biggest

With these four refuges—Lee Metcalf, Red Rock Lakes, Medicine Lake, and the CMR—I've only scratched the surface of what's available in Montana. There is also the National Bison Range Complex near Missoula, which includes 2,062-acre Ninepipe and 2,542-acre Pablo NWRs. Near Malta, 15,551-acre Bowdoin NWR is home to 260 bird species, many visible from a 15-mile driving loop. The newest refuge in Montana is Lost Trail, near Kalispell.

Montana has seemingly endless federal lands containing species ranging from mountain goats to prairie dogs. What's so special about national wildlife refuges? "Two things stand out," says Rundle, the regional NWR supervisor. "One, this is the only federal lands system where wildlife conservation is the singular highest priority. And two, it's the largest publicly owned land system in the world dedicated to wildlife conservation."

Rundle adds that despite the system's reputation for great birding and other viewing, visitors should know that "national wildlife refuges are not zoos," where animals are on display and always easy to find. "But at the right season at the right times of day," he says, "a person looking for waterfowl, shorebirds, and other wildlife—especially wetland species—can be very well rewarded."

Learn more about national wildlife refuges in Montana at fws.gov/refuges/.

"And it's the largest publicly owned land system in the world dedicated to wildlife conservation."

Straight Aim Students

Archery gives kids self-confidence and recreation that can last a lifetime.

BY NICK GEVOCK

Shyann Kennedy draws her bow in the tiny lunch room at Melrose Elementary School. The sixth-grader steadies herself before releasing an arrow that smacks the middle of a target 10 yards away. She and eight schoolmates—the entire student body—spend an hour shooting round after round inside this small ranching town's sole school. It's the first time many of the kids have shot a bow, and they are excited.

Shyann says for years she has wanted to use her father's heavy-duty compound bow, which he uses to hunt deer and elk. "But it was too tough to pull," she says.

With the smaller, lightweight bows the school uses, Shyann is easily able to pull back the drawstring. And after a few days of practice, she was shooting tight groups of arrows into the target at the makeshift indoor archery range.

Students on this cold, sunny winter weekday are shooting under the direction of teacher Shelby Blixt. Blixt had never fired a bow before taking a training class put on by the National Archery in the Schools Program (NASP) last fall. The daylong course focuses on archery range safety and how to teach kids shooting skills.

NICK GEVOCK

HOLDING STEADY Compound bows may look intimidating, but youth models like this one are designed for beginners with light arm strength. "A 5-year-old or an 80-year-old could shoot these bows," says one instructor.

ISTOCKPHOTO

Blixt initially doubted whether her nine students could safely shoot arrows inside the school. "At first I thought, 'Are we really going to do this?'" she says. But the exercise worked out, as it has in roughly 50 other schools throughout Montana.

Several small schools in southwestern Montana formed a cooperative to participate in the NASP. The idea was developed six years ago by Ray Haffey, a psychologist with Dillon-based Great Divide Education Services and an avid bowhunter who enjoys working with young Montanans. Great Divide is a consortium that provides special education instruction, counseling, and other services to member schools. Haffey used it as a model for the regional archery co-op.

He secured commitments from seven rural schools to pitch in $300 apiece for

archery equipment. Financial help came from the Montana Chapter of the National Wild Turkey Federation and Montana Fish, Wildlife & Parks. The schools collectively ordered a NASP base package: 11 bows, a few dozen arrows, five targets, a backstop curtain, a repair kit, and a stand for holding bows.

Haffey says the innovative program is custom made for schools like those in Jackson, Grant, and Melrose with fewer than a dozen students. "The co-op approach gets archery into schools that couldn't justify going out and buying their own equipment," he says. Larger schools elsewhere in Montana purchase their own archery gear.

The NASP requires that all of Montana's 50 participating schools use standardized equipment and range protocols that promote safety. Schools have set up archery ranges in cafeterias, multipurpose rooms, and even a local barn. "All they need is a minimum of 30 feet between the shooters and the targets," Haffey says.

Equipment is half of the national archery program. The other element is a mandatory training course for teachers. Each school in the program must have a trained instructor who passes a test showing she or he understands archery fundamentals and how to maintain safe shooting conditions.

Blixt says she dreaded the idea of spending an entire day taking the archery instruction course. But her mood changed after spending a few hours shooting with half a dozen other teachers. "It was really fun once we started," she says. "We each shot at least 100 arrows that day."

Nick Gevock of Butte is a freelance writer and a reporter at The Montana Standard.

"Archery is a sport that any kid can do with some success."

Before the Melrose students are allowed to shoot, Blixt makes them recite the safety rules. Archers must stand back from their bows until the instructor blows a whistle that allows them to move to the shooting line and pick up their equipment. Another whistle command from the teacher gives the go-ahead to start shooting. Instructors teach an 11-step process on how to shoot correctly and accurately that includes proper stance, draw, anchor, aim, release, and follow-through.

Jory Thompson, Sheridan High School principal and an avid bowhunter, says on some afternoons more than 40 kids from fifth through eighth grades use his school's indoor range. Such enthusiasm for archery doesn't surprise Kurt Cunningham, an FWP education specialist. "You don't have to be the biggest and the tallest and the strongest kid out there," he says. "Archery gives kids who aren't great athletes or members of teams a chance to develop self-confidence and learn a lifetime sport."

Many young archers like to compete. Montana NASP holds regional competitions, with winners moving on to the state championship. Of a perfect score of 300, some kids have scored in the 270s and even higher. "It's amazing how quickly they pick it up," Thompson says. "Every year some kid will blow my mind."

Thompson has twice taken Sheridan archers to the NASP national shoot in Kentucky. Local businesses and residents chipped in to help cover the kids' travel expenses. In 2009 Michael Tilstra, a local middle school student, scored 287 points and came in 13th of 500 archers in his group.

Supporters say the archery program fosters the next generation of bowhunters. Thompson says many kids who learn to shoot a bow at Sheridan High School later take up archery hunting. To encourage the transition, the principal holds an annual hunting contest and gives small prizes such as hunting magazine subscriptions to the winners. Some awards go to the biggest deer, elk, or pronghorn. Others go to kids with the best hunting stories.

Cunningham says that no matter whether young archers become bowhunters, enter competitions, or just shoot for fun, they all benefit from spending time launching arrows into targets. "Archery is a sport that any kid can do with some success," he says. "There's something really satisfying about taking aim and hitting a target."

Learn more at archeryintheschools.org or fwp.mt.gov/education/teachers/nasp.html. For information about Montana State University Extension's 4-H archery programs, visit montana4h.org.

BOW-MOBILE A grant from the Montana Chapter of the National Wild Turkey Federation paid for a horse trailer that hauls archery gear to several small schools in southwestern Montana. Archery proponents say the sport is popular because it's accessible to kids of all sizes and strengths.

PHOTOS: ALAN GOLDING

CINDY GOEDDEL

Northern River Otter

Lontra (the Italian word for otter)
canadensis (referring to the origin of the first described species)

BY TOM DICKSON

After making camp along the Yellowstone River, I walked upstream 100 yards to fish while my wife, Lisa, settled on a boulder to read a magazine. After casting for an hour with little luck, I spotted a family of otters in the river and sat down to watch. They were hunting a riffle, porpoising along the shallow water in search of fish and crawfish. Then they swam downstream toward Lisa. She told me she watched the otters swim around a deep pool then was startled to see a massive trout rise to the surface, apparently fleeing the predators, before disappearing. Otters generally eat whitefish and suckers, which are slower and easier to catch, but they will take a trout if given the chance.

Later that evening I hooked what I suspected was a big brown, but the trout broke off before I could get a good look at it. I wonder if, like me, those otters ever dream of the big one that got away.

Tom Dickson is editor of Montana Outdoors.

IDENTIFICATION

There's no mistaking an otter for another species. The streamlined mammal has a long, cylindrical body, broad head, and thick neck. Adults weigh roughly 20 pounds and stretch 3 to 4 feet from nose to the tip of their thick, muscular tail. Otters have stubby legs, webbed feet, and small eyes and ears. Long, thick whiskers help them detect prey underwater, where these members of the weasel family spend most of their time. Otters have sharp canine teeth for capturing fish and large molars for crushing mussel shells.

FUR

The otter's thick, short, lustrous fur is dark brown except where it lightens on the throat and chest. The extremely dense underfur has "cuticular scales" that allow the hairs to interlock and trap air, creating insulation against cold water. Because their fur must stay clean to insulate well, otters constantly roll on sandy areas, grassy banks, and snowfields to remove dirt—behavior that is often mistaken for play.

BEHAVIOR

Otters do play—pups especially—sometimes chasing each other for hours.

They are fast, agile swimmers, able to dive 45 feet or more and stay underwater for up to four minutes. Otters travel on land by bounding along on their short, muscular legs. On snow, they alternately slide and run.

In summer, otters are most active at night. In winter, they become diurnal and are much easier to spot and photograph.

FOOD

Otters eat fish, crawfish, dragonfly and stonefly nymphs, and frogs. Strong enough to fend off coyotes and able to escape mountain lions by sliding into streams, they have no natural predators.

RANGE

Otters once ranged throughout North America as far south as Mexico. Unregulated trapping in the early 1900s greatly reduced populations, as did water pollution and the loss of streamside vegetation. By the mid-20th century, otters were extirpated (made locally extinct) in much of their original range. Since the 1970s the animals have been successfully reintroduced in many states. In Montana, otters live mainly in the state's western half and along the Yellowstone River drainage east to Miles City.

HABITAT

Look for otters along narrow streams containing log jams, beaver ponds, and backwater marshes bordered by willows and other shrubs. When smaller streams freeze in winter, otters move sometimes dozens of miles to larger, open rivers. Otters sleep in dens such as hollow logs, openings under streambanks, or burrows made by muskrats.

STATUS

Brian Giddings, coordinator of the FWP Furbearer Program, says Montana's river otter population is healthy enough for the state to allow regulated trapping. The limit is two otters per trapper per season. Roughly 70 to 100 otters are trapped each year, Giddings says.

PARTING SHOT

BAD FOR BOUTONNIÈRES See page 16 to learn why some people opposed making the bitterroot the state flower, and other odd origins of Montana's state symbols. Photo by Sheila A. Johnsen.

Montana Fish, Wildlife & Parks

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