



UNAWARE Images of wolverines taken by trail cameras for a new multi-state study.

COUNTING GHOSTS

In the deep of winter, far into the backcountry, wildlife biologists search for the West's most elusive carnivore. **BY HAL HERRING. PHOTOS BY TONY BYNUM**

*U.S. Forest Service Bunkhouse
Augusta, Montana
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Dawn is a long time coming, but the moon is huge and yellow, its light reflecting off the snow, and we barely need our headlamps. It's -17 Fahrenheit here in town, the snow around our boots as light as down. Nothing is done barehanded, not for long anyway.

Montana Fish, Wildlife & Parks field workers Wendy Cole and Daniel Madel hustle packs and toolboxes into the bed of the pickup, check the hitch on the snowmobile trailer, then load snowshoes and ski poles along with a deer ham and a couple of

skinned beaver carcasses, the meat frozen hard as lead. In the windless crystalline air, the nostril-scorching stench of the liquid wolverine bait—an elixir of skunk glands, fermented beef blood, and a hint of potent urine stored in canisters in the truck bed—rises and falls as we work, then settles over us like a shroud. Madel, a stocky young man who just turned 30, shakes his head, grinning, “After every one of these trips, my fiancée makes me change clothes before I come into our house.”

Cole pulls a strap tight on one of the packs, lost in thoughts of the day to come. Grinning, she asks Madel, “Do you think the people staying in the bunkhouse will care if we put all the beavers in there to thaw out?”

I'm on my first of two days accompanying

the pair on a first-of-its-kind wolverine monitoring project. Over the next three months, these and other intrepid winter athletes will be setting up and checking 51 sites across western and central Montana. Two are west of my hometown of Augusta, near Crown Mountain at the far eastern edge of the Scapegoat Wilderness.

Cole is a tall, ultra-fit veteran wildlife technician originally from the mountains of Vermont, a skier and winter mountain traveler of the first order. Madel grew up in nearby Choteau, a hunter and a terror on the high-school wrestling mat. His father is Mike Madel, an FWP bear management specialist in this region, which is chock-full of grizzlies. Daniel has been following large carnivores through wild country since he could walk, and is steeped in the work and the tradition.

As Madel guns the truck through a berm of wind-drifted snow, Cole tells me they are

working 10 sites this winter, scattered from here to St. Regis to the upper Yaak to the Cabinet Mountains. We drive west into the oceanic immensity of the prairie, a white arctic landscape stretching to our destination in the mountains, which stand jagged and moonlit to the color of tawny gold. As we get closer, we can see that the frigid stillness down here is giving way to something else way up high. From the heights of Crown Mountain a few plumes of snow are rising straight up, gathered and whirled by some wind cold beyond imagining. “There it is,” Cole says from the back seat, wedged among down jackets, snowshoe bindings, bulky gloves, and snowmobile suits. She points to the ridge where the snow devils are rising. “That’s exactly my idea of wolverine habitat.” And that’s exactly where we’re headed.

Fearless ferocity

Most people reading this will know the basics of the wolverine, even if few of us—including backcountry-savvy winter travelers and hunters—have seen one in the flesh. Its scientific name is *Gulo gulo* (Latin for “glutton,” tribute to the animal’s supposedly insatiable appetite). It’s the largest member of the weasel family, with an adult weight of 25 to 40 pounds. Wolverines are found in very small numbers throughout the world’s northernmost regions, residing on a human-dominated planet only in unpeopled boreal forests, taiga, and tundra.

In the Lower 48, the roughly 300 wolverines—a rough estimate because the elusive, remote animals are so hard to



claws, and fluid and aggressive athleticism coupled with a fearless ferocity that allows it to run a grizzly bear or wolf off a carcass and claim it for its own. The solitary males scent-mark and defend a territory of 300 square miles or more, where two or three females may live, each of which may raise two or three kits every other year in dens sheltered by snowpack or other dense cover. Unlike grizzly bears or other large carnivores, the wolverine was likely never a plains or lowland animal, even before European settlement. They’ve always preferred to live in the highest, roughest country.

Spurred to action

In 2013, the U.S. Fish & Wildlife Service (USFWS) proposed listing the wolverine as a federally threatened species, mainly because of the possibility that warming climate would someday reduce mountain snowpack, until recently considered necessary for winter denning (see “Wolverines, snow, and the ESA,” page 18). This spurred the four states in the Lower 48 that have wolverine populations, along with tribal and university partners, to begin conservation work. “Our Western States Wolverine Conservation Program focuses on the same features that an ESA [Endangered Species Act] program would emphasize: monitor,

“There it is. That’s exactly my idea of wolverine habitat.”

TRAILCAM PHOTOS FROM MONTANA FWP.



FROZEN FINGERS From top to bottom: FWP wildlife technicians Wendy Cole and Daniel Madel dig out a snowmobile trailer; heading west to Crown Mountain from Augusta; chaining up; drilling holes into a beaver carcass so it can be wired to a tree.





INTO THE FOREST Top: Madel and Cole snowshoe into the Lewis and Clark National Forest to check on hair traps used to gather wolverine DNA. In many areas of the new study, researchers use snowmobiles to reach backcountry areas, but the vehicles aren't practical in some places. Below: Cole checks a trail camera for images of wolverines. Bottom: Madel prepares a beaver carcass to lure a wolverine into a tree where its fur can be captured.



and other carnivore biologists identified, based on existing knowledge, the best habitat across the four states that held or was likely to hold significant numbers of wolverines.

The next step came in the fall of 2016, when field crews across the four states set up hair traps, bait, and trail cameras in the likely habitat to start monitoring wolverine range. “We’ll use this initial snapshot of population distribution to determine whether certain habitat features are good or bad for wolverines,” Inman says. “It will also tell us if there are areas where introductions might work, and which areas are genetically connected.”

Another project goal is to figure out how the habitats are connected. “We have these isolated high-elevation habitats, some of them in island mountain ranges, separated by sagebrush and rangelands,” Inman says. “Because wolverines live in such low densities, the offspring have to leave their birthplaces for new territories, and they have to cross these low grounds to do that.” The danger is that new development like roads and housing would block the animals’

connect, and restore,” says Bob Inman, FWP Carnivore-Furbearer Program coordinator. The work by Cole and Madel is part of the monitoring component and is the first time the states have tried to document wolverine distribution and genetic profile across the Lower 48. Inman says the program aims at estimating occupancy, not actual population numbers, which would be prohibitively expensive. “By mapping where wolverines occur, then monitoring those sites over time, we can see if the range is contracting or expanding,” he says.

Isolated populations of super-carnivores that are naturally uncommon, live only in high mountains, and have few young need proactive conservation work. Inman says that after biologists determine where in the four states wolverines live, they’ll focus on determining what those populations need to survive and expand.

Funding for the work comes from the four states’ conservation agencies (FWP alone has invested \$100,000) along with the U.S. Fish & Wildlife Service, U.S. Forest Service, National Fish and Wildlife Foundation, and Confederated Salish and Kootenai Tribes. “It’s a collaborative effort, and we are all responsible for it,” says Inman, who wrote his PhD dissertation on wolverines, directed wolverine conservation for the Wildlife Conservation Society, and published several scientific papers on the animal’s biology, movement, and monitoring. “The primary responsibility to carry out the field work rests within each state’s wildlife agency, and then all the partners will coordinate and share what we learn.”

Before monitoring could begin, Inman

movement. “That would leave the populations so separated that you’d eventually lose the genetic diversity that any species needs for long-term survival,” Inman says. “So we need to figure out where those connectivity areas are and then make sure connectivity is conserved, by working with

and swap sweat-soaked inner layers for dry ones. I don’t mention to the others that the lid on my thermos has come loose in my pack and the quart of hot tea and honey I was looking forward to is sloshing about, soaking my extra gloves, fire kit, and small stash of food.

“Restoring populations there would go a long way toward ensuring the long-term survival of the species.”

The site consists of a bait station on a 10-inch-diameter Doug fir. A month earlier, Cole had fixed a deer hindquarter to the trunk with baling wire about 12 feet up. Above the hindquarter, another loop of wire holds a

round yellow sponge saturated with the gland-blood-urine elixir so the wind could announce the bait site far and wide. At intervals around the tree trunk, stiff copper-bristled gun-cleaning brushes have been drilled into the bark. The bristles catch the hair—which provides DNA samples—of any creatures that climb to investigate the bait. About 20 feet away, a motion-activated trail camera is chained and locked 12 feet up another young fir. Today we are checking for hair and rebaiting the station.

Madel climbs the fir that holds the bait station. Cole pulls one of the frozen beavers from a pack, uncoiling lengths of baling wire that will fix it to the tree, and checks the batteries on the trail cameras. “It’s always kind of a challenge when you first get here, because you’ve been powering your way uphill hauling the packs, and now, as you start to really chill down, you have to do all this fine motor-skill work,” she says, not looking up. “These beavers are the best bait, because it’s greasy, smelly meat wolverines supposedly

state and federal land management agencies and using conservation easements.”

The third and final project goal is long term: Restore wolverines in places where they could and should be, but are not, either because they were killed off or for some other reason not yet understood. “For instance, we know they lived in Colorado and California until at least the early 1900s,” Inman says. “Restoring populations there would go a long way toward ensuring the long-term survival of the species.”

Though there have been no verified wolverine sightings around Montana’s Crown Mountain in recent decades, Inman selected the area as some of the best potential habitat in the state. I love that notion. This is my family’s hunting country in the fall and our hiking and wandering grounds in spring and summer. I can see Crown Mountain from my house on a clear day. That one of the wildest animals in the world might someday roam around up there makes the place seem even more wonderful.

Unbearable stench

When Cole, Madel, and I arrive, far up the Benchmark Road, it is cold, but not as cold as in town. We leave the snowmobiles behind and proceed on snowshoes, threading the jackstraw deadfall—timber toppled after a fire burned through several years back—up through a mountain-shaded no man’s land of thigh-deep powder, doghair Douglas fir, and lodgepole pine. Thankfully, we reach a ridgetop containing a wan bit of sunlight and more easily traverse areas where snow has been scoured away by wind. After an hour or so we get to the monitoring site, unshoulder packs, stomp snow to create a work space,

Winter 2016-2017 Wolverine Study



LOOKING FOR GULO GULO The colors show locations of a total of 180 8-mile-by-8-mile cells in Montana, Wyoming, Idaho, and Washington where officials are checking for wolverine presence. After biologists figure out where wolverines exist, they’ll focus on determining what those populations need to survive and expand.



AT THE HAIR TRAP SITE From top to bottom: Madel pour a putrid mix of skunk glands, blood, and urine onto a sponge to attract wolverines to a tree from far away; Cole uses a lighter to sterilize wire brushes drilled into the tree that can catch hairs of wolverines as they climb to feed on the frozen beaver bait; upon arriving at the bait station, Madel waves his arms to test the trail camera in a tree overhead.





CUMBERSOME WORK From top to bottom: Using screw-in metal hooks devised by bow hunters to ascend trees, Madel struggles to climb a Douglas fir to attach the beaver carcass bait while maneuvering around wire brushes; at a secondary sampling station, Madel inserts a lure designed to attract lynx; trail cameras identify which wildlife species fed on the bait and the type of hair that scientists will likely find in the wire bristles.



MONTANA FWP TRAIL CAM, CROWN MOUNTAIN, APRIL 2017

really like. Also, they sit flat against the tree, so a wolverine can't get the torque to rip it off." Madel reaches the deer hindquarter—used in November because no beavers were available then. The haunch has been shredded to nothing but a fright-wig of sinews and a yellow-white femur.

Budgets here are tight—nothing can be lost.

Cole scans through the images in the trail camera that she has retrieved. She's looking to see which animals visited the bait so she and Madel know whether any fur snagged in the wire brushes came from wolverines. All hair samples are sent to a laboratory for DNA analysis, from which biologists can identify the species, sex, and even an individual ani-

mal. Today, Cole announces that only gray jays have been working the meat. Bare-handed, she quickly replaces the tiny SIM card in the camera, carefully stashes the old one in a file folder, and starts replacing the batteries. She and I then tie a frozen beaver carcass to a rope that Madel hauls up and wires to the tree before dousing the sponge with fresh scent, the juice dribbling down the trunk of the tree, potent and feral. A pair of wire snips falls and disappears deep into the snow, and Cole quickly digs them out. Budgets here are tight—nothing can be lost.

Nothing is easy either, in this frozen wilderness where high technology is paired with raw meat, fermented blood, and copper bristles to try and find a creature so elusive and ferociously wild that it has become legend. This project is sweat and muscle, frozen

hands and balky snowmobiles, dead drill batteries, and avalanche hazards. Another threat is dehydration, because there's never time to melt snow to drink, and your water bottle froze 30 minutes after you left the truck. It is one tough species deeply engaged in studying another, looking for the best way to honor the whole tapestry of our lives here on this planet, in these last untrammelled spaces. I feel honored to be part of it, if only for this short visit.

Cole and Madel pack up and buckle on their snowshoes. They stand for a few seconds studying the bait station. "We had one of these beavers wired to a tree like this in the Bitterroots, with the wire around the spine. The wolverine ate the whole thing right in place, and then ripped off the backbone and left with it."

We marvel at the thought, which is another constant in this line of work. 🐾



HAIR MAIL Wire brushes containing hair samples are later mailed to a laboratory for analysis. Scientists can determine the species, sex, and even the identity of individual animals that left the hair behind, information wolverine managers will use to help conserve the species.

Wolverines, snow, and the ESA

It's not like western states haven't wanted to learn more about their wolverines all along. The species has been increasing in number and range over the past century—showing up in recent years in California, Colorado, and even North Dakota, the latter for the first time in 100 years. Yet wolverines are still vulnerable due to their small population size in the Lower 48 and the isolated high-mountain habitats where they live. State biologists have long hoped to learn more about wolverines so they can conserve populations for the long term. "Unfortunately, we have limited financial resources, and because there were no indications that wolverines were in trouble, funding went to species with a clear, more immediate need," Bob Inman, FWP Carnivore-Furbearer Program coordinator, says.

State priorities began to change in 2013, when the USFWS proposed listing the wolverine as a threatened species. The proposal was based on a series of scientific papers that claimed the distribution of wolverines depends on deep snow for dens and can be

determined by where snow cover exists on May 15. The papers' authors concluded that warming global temperatures would, in coming decades, shrink snow cover in late spring, a period they maintained was essential for wolverine denning.

“The scientific process drove the decision, not politics.”

But in 2014, after an independent panel of scientists reviewed the previous studies, the Service concluded there was far more uncertainty regarding potential effects of climate change on wolverines than previously thought. Since then, new research has showed that the initial snow analysis was flawed. "Researchers have now found that wolverines in Canada and Sweden are doing fine in areas where snow is long gone by May 15," says Inman. "That's because snow-

pack is actually most critical in mid-February, when wolverines are born in dens. And there will likely be little to no change in snowpack at that time of year."

According to Inman, who worked on wolverine conservation for the Wildlife Conservation Society before taking his current position, a widespread myth has taken hold that the Service altered its decision due to political pressure from the western states. "That's simply not true. The decision to withdraw the ruling was a direct result of a deliberate and required peer-review process of the scientific findings and additional review by the independent panel. The scientific process drove the decision, not politics," he says.

Nevertheless, the U.S. Seventh District Court of Appeals sided with environmental groups that sued the USFWS in 2014 over its decision to withdraw the listing proposal. The court ruling put the species back on the "proposed for listing" list.

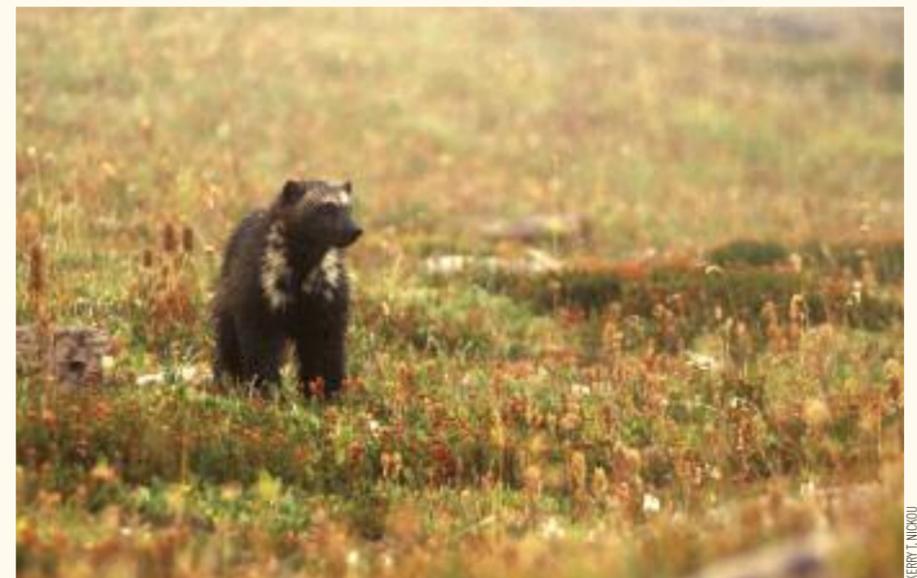
The Service has said it will closely review all existing and new scientific data and issue a new ruling later in 2017.

In the meantime, Montana, Wyoming, Idaho, and Washington are forging ahead with comprehensive management of their own—developed in cooperation with the USFWS,

National Park Service, U.S. Forest Service, and tribal and university partners—called the Western States Wolverine Conservation Project. "It's basically the same wolverine conservation

program we'd have come up with if we had drawn up a recovery plan for wolverines if they were listed," Inman says.

—Tom Dickson, Editor



KERRY T. NICKOU

MAY SNOW: UNNECESSARY Some environmental groups claim that the U.S. Fish & Wildlife Service withdrew its proposal to list the wolverine after receiving political pressure from western states. Not so, according to state and federal biologists. They say the science-driven decision has been validated by new research in Canada and Sweden showing that May 15 snow cover does not limit wolverine distribution.