



Where Have All the Porcupines Gone?

In western Montana's mountains, once-numerous "quill pigs" have disappeared. Biologists have theories but, so far, no answers. **By Ellen Horowitz**

It's hard to drive anywhere in Montana and not see a land or water feature named after the porcupine. There's Big and Little Porcupine Creeks near Forsyth, Porcupine Saddle near Darby, Porcupine Basin by Lincoln, Porcupine Butte in the Crazy Mountains—the list goes on. In the *Montana Atlas & Gazetteer* I found geographic references to the prickly rodents in 21 of the state's 56 counties. And those counties are scattered across the state, indicating that when most places were named by European settlers in the late 1880s and early 1900s, porcupines were widespread.

That's still the case in much of Montana. When my husband and I head east of the Continental Divide to some of our favorite haunts, we often see porcupines or, more frequently, the gnawed branches of trees and brush indicating their presence. (The rodents are after the nutritious inner bark, known as cambium.) We know of a fellow who hunts upland birds near Malta and runs into porcupines so often that he invented a device for holding his dog's mouth open while he removes the quills. There's no shortage of porcupines in eastern and central Montana.

West of the Divide, it's another story.

The last time my husband and I observed porcupines in the mountains near our cabin

in the northern Whitefish Range was in the mid-1990s. Friends and acquaintances say the same thing, that porcupines seem to have disappeared from the high-elevation evergreen forests of western Montana.

Kerry Foresman, professor emeritus at the University of Montana and author of *Mammals of Montana*, told me he routinely saw porcupines while working in the mountains as a UM undergraduate in the 1960s. When he returned to the university as a professor in the 1980s, the quill-covered rodents were still a common sight. But by the end of that decade, he saw fewer and fewer. Colleagues across the western states and Canadian provinces witnessed the same decline.

"Where have the porcupines gone? That's the \$64,000 question," says John Vore, Montana Fish, Wildlife & Parks Game Management Bureau chief and previously the department's wildlife biologist in Kalispell. When he began working in the mountains of northwestern Montana in the early 1990s, Vore says he was surprised by the lack of porcupine tracks and freshly gnawed trees in what should have been prime habitat. Older biologists in the area told him that porcupines had been so widespread and numerous in the 1970s and '80s in the South Fork and North Fork of the Flathead that the rodents often

became pests around trailheads and camps. Porkies chewed on rubber brake lines, fan belts, and hoses of vehicles parked overnight, gnawed ax handles and canoe paddles for the salt residue left from sweaty hands, and consumed wood signs and even outhouses.

LUCKY CHARM

Humans did not always see porcupines as a nuisance. Native Americans have long regarded the animal with respect and even admiration. The large rodent was viewed as a minor animal spirit, usually representing self-defense and caution. Some tribes also associated porcupines with humility, modesty, and good luck. The animals supplied food when other game was scarce, and their stiff quills were softened, dyed, and woven into leather shirts, medicine bags, and moccasins.

Early settlers also held a magnanimous view toward porcupines. Trappers and woodsmen never killed them without cause, because the slow-moving, easy-to-approach rodents could be an emergency food source to someone lost in the wilderness. Settlers believed, as did Indians, that killing a porcupine was bad luck.

Attitudes began to change in the 1930s as porcupines consumed young trees planted by the fledgling U.S. Forest Service to replace

DISAPPEARING ACT Porcupine numbers in eastern Montana and western Montana valleys remain steady. So why have numbers declined at higher elevations in the state's western forests? No one knows for sure, but one factor could be the species' low reproductive rate.



those logged or lost to wildfire. Soon the rodents were depicted as a scourge of America's national forests. A 1936 Forest Service press release in the *Spokesman-Review* called porcupines a "new major menace to livestock and timber in Montana's national forests." So abundant were porcupines, the agency claimed, "that they are causing

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almost as much loss to timber as fires." In 1955, zoologist and ranger-naturalist R.R. Lechleitner wrote in *Mammals of Glacier National Park*, "Porcupines are quite abundant...and appear to be more numerous in the higher regions." He related a story of counting two dozen porcupines in a single evening while driving roughly 24 miles along the Going-to-the-Sun Road from the Loop to Sun Point.

By the 1950s, porcupine eradication pro-

grams were in full swing on national forests and private timber lands throughout the United States. Strychnine-laced salt blocks were used to control porcupine numbers in some national forests until 1972, when the use of toxicants on federal lands was banned.

NO SMOKING GUN

Though federal poisoning killed many porcupines, Vore doesn't believe it explains why the animals are so scarce today. He points out

PETTING NOT ADVISED

Porcupines are the only North American animal that grows quills. The shafts are soft but not hollow, containing an airy, foam-like core made of keratin that adds quill strength.

Roughly 30,000 of the 2- to 4-inch-long quills cover the porcupine's backside. The dark end of each sharp, cream-colored quill is covered in barbs, making removal from an overaggressive dog's mouth extremely difficult. If not removed, quills work themselves deeper into tissue and then cause infection and intense pain. Young coyotes and wolves that attack porcupines often starve to death or die of dehydration because of barbs embedded in their mouth or tongue.

Contrary to popular belief, porcupines can't throw or shoot their quills. The flick of a porcupine's muscular tail is so swift that it's imperceptible to the human eye and creates the impression that the quills were actually flung at the dog or other intruder.

A porcupine's quills and guard hairs are piloerectible, meaning they can be raised and lowered. When at rest, the quills lie flat and point toward the back. When roused, they spring up and point in random directions to create the porcupine's formidable defense.

Quills also contain fluorescent pigments that make them look brighter and act as a warning sign to nocturnal predators.

Quillwork is considered a unique Native American art form. Native people collected and dyed quills for ornamentation. They gathered them by throwing a blanket over the animal's back, pulling it off to harvest the freshly embedded quills while allowing the porcupine to continue on its way, unharmed.



The porcupine's 360 degrees of defense



MISGUIDED MANAGEMENT For decades porcupines were mistakenly thought to harm forests. U.S. Forest Service workers shot porcupines as pests and, until 1972, even spread strychnine on trees in some national forests to poison the rodents.

that porcupines were common into the 1980s, years after the most intensive eradication programs ended. What's more, adds Glacier National Park wildlife biologist John Waller, no poisoning took place in the park, yet porcupines are now rare there, too. "It's a notable occurrence when you see one," Waller says.

Could fishers and mountain lions, which purposely hunt porcupines, be to blame? Probably not, says Vore. Even though Montana's mountain lion population has increased since the 1980s, the predators don't prey on enough porcupines to account for the massive declines. Fisher numbers also have grown, and these large members of the weasel family are able to kill any porcupine they find by biting the rodent's snout, flipping it over, and attacking its vulnerable belly. Yet fisher populations have low densities, so "even when numbers are up, there are never a lot of fishers around," Vore says.

Another possibility is climate change. "Fire frequency and severity and mountain pine beetle epidemics have impacted thousands upon thousands of acres of habitat and the trees that porcupines need," says Chris Hammond, FWP nongame wildlife biologist in Kalispell.

One factor no one can rule out is the possibility of an unknown epidemic afflicting

A SLOW LIFE AMONG TREES

The North American porcupine (*Erethizon dorsatum*—Greek and Latin for "excitable back") is found throughout Canada and the western United States.

These usually nocturnal animals are strictly herbivores, feeding on leaves and stems of a wide range of woody and herbaceous plants. During winter their diet consists primarily of tree bark and conifer needles.

Porcupines spend much of their time in trees, eating, resting on branches, and sleeping in hollow trunks. Excellent climbers, porcupines have long curved claws for grasping tree bark, and their pebble-textured footpads provide traction. A porcupine uses its powerful tail when climbing by pressing it against the trunk as an additional point of support. The tail's rough underside further reduces the chance of backsliding.

Kerry Foresman, author of *Mammals of Montana*, says that while porcupines can kill an individual tree by eating too much of its bark, the animals have never been numerous enough to damage entire forest stands. "A lot of that was exaggeration," he says of reports in the mid-20th century claiming that porcupines were devastating forests. "Porcupines are few and far between even when you have a healthy population," he says.

A porcupine has a small home range, just 10 to 100 acres in summer and as little as 1 acre in winter.

Mating season occurs in fall. Porcupines mate just as other mammals do, though, not surprisingly, much more carefully. When the female is ready, she lifts her tail and allows the male to mount. During the process, he lets his forelegs go limp at his side or places his paws on her quill-less undertail.

Unlike most rodents, porcupines have extremely low reproductive rates, giving birth to just one baby each year. Following a seven-month gestation—about the same length as a deer's—the porcupette is born. The youngster nurses for four months before being weaned.

Females are typically one and a half years old and males four years old before they can breed. In the wild, porcupines rarely reach ten years old.

Porcupines are best known for their quills, which cover their back and tail and provide the stocky animal with excellent self-defense (see "Petting Not Advised," page 12). Guard hairs, twice as long as the quills, make the animal look larger than its actual size of just 20 to 40 pounds.

Porcupines are one of the slowest animals in Montana, moving over the ground at a leisurely amble. And why not? When few other animals dare bother you, and all the food you need is within a few acres, what's the rush?

EAT YOUR GREENS In summer, porcupines forego tree bark for leaves, flowers, seeds, stems, and shoots.



CLOCKWISE FROM TOP LEFT: KEVIN DIERICH; NATIONAL MUSEUM OF FOREST SERVICE HISTORY, MISSOULA, MT; WWW.SAWANSTEPHEN.COM; MONA DOEBLER; SHUTTERSTOCK



HANDLE WITH CARE
University of Montana professor emeritus Kerry Foresman (far left) advises graduate student Katie Mally (near left and above) on a study of porcupine habitat in the Bitterroot Valley. Wearing welder gloves for safety, Foresman and Mally fit the rodents with radio transmitters, allowing them to track the animals (right) and learn that cottonwoods and hawthorn wetlands are preferred habitats.



porcupines. Says Vore, “There may be a porcupine or rodent-specific disease out there that we just don’t know about.”

STUDY BEGINS

Hoping to start finding some answers, in 2006 Foresman enlisted a graduate student, Katie Mally, to study the differences between high-elevation porcupines, which seemed increasingly rare, and low-elevation porcupines, still common in western Montana. Mally surveyed wildlife biologists, foresters, landowners, and others to learn of any sightings since 1996. Of the 183 instances where people reported seeing porcupines in the previous decade, not a single one was at an elevation above 4,000 feet.

Undaunted, Mally spent the next summer scouring western Montana mountains looking for porcupine sign. Her search came up empty. “If she had located some porcupines, she could have radio-collared them and found out what habitats they used, what they ate, reproductive success, causes of death, that sort of thing, in order to start get-

ting at what might be behind the declines,” says Foresman.

With no high-elevation porcupines to study, Mally instead began documenting porcupine habitat in the lower Bitterroot Valley. Funded by an FWP grant, she worked with staff of the Lee Metcalf National Wildlife Refuge, FWP biologists, and several landowners to trap porcupines and fit them with radio transmitters. After a year of study, Mally found that porcupines were most common in areas with low-elevation wetlands containing hawthorn and cottonwoods.

“That was important baseline information, but unfortunately we’re no closer to understanding what happened to the high-elevation porcupines,” says Foresman.

Foresman suspects that a wide range of factors are at play. “The biggest of all could be the fact that porcupines produce just one baby each year,” he says. “When a female rabbit dies, she probably has produced 10 or 12 babies. But when a female porcupine is killed—by disease, predators, or shooters—she might have only produced one or two

young in her lifetime,” he says. “It doesn’t take much to knock down such a slow-growing population and keep it from recovering.”

Foresman notes that porcupines are still commonly killed by tree nursery owners concerned about their stock and bird hunters hoping to prevent their dogs from getting quilled. Porcupines are classified as an unprotected nongame species that can be shot on sight. “What concerns me most are the porcupines shot just because they are there, for so-called ‘sport,’” Foresman says. That indiscriminate mortality, coupled with things scientists still don’t understand, like habitat change and disease, could be enough to keep porcupines from ever recovering enough to once again become a common species that people encounter while exploring western Montana’s forests. 🦘

Scientists continue to seek reports of porcupines at higher elevations. If you see one in the mountains, please report it to Kerry Foresman at foresman@mso.umt.edu or to Chris Hammond at chammond@mt.gov.



UM PORCUPINE RESEARCH PHOTOS COURTESY OF KERRY R. FORESMAN; RIGHT: NICK TREHEARNE

A NEED TO GNAW During winter, the animals use their chisel-sharp incisors to cut through a tree’s outer bark to reach the nutritious inner bark, or cambium. The porcupine gnaws by digging its upper incisors into the trunk or branch, then using its lower incisors to scrape, swiveling its lower jaw in a shallow arc with each scrape.