Clinging to Existence

TONY BYNUM

CLIFFHANGER Under a mountain goat's hoof is a flexible, rough-textured pad that helps the animal cling to near-vertical cliffs. Yet these and other remarkable adaptations may not help some goat populations survive changes to their environment.

Mountain goats have managed to survive for thousands of years in some of the state's most brutal, unforgiving environments.

So why are some populations now declining?

BY CHRISSY KOETH

Snow-white and sure-footed, the mountain goat is a powerful icon of northern alpine wilderness, an animal that has adapted to some of the harshest conditions on earth. Imagine living where pointed crags rise above the clouds, temperatures fall below -40 degrees, and, during winter, the scant vegetation is buried deep beneath mountains of snow. Avalanches are commonplace. Near-hurricane winds lash the steep, granite terrain. One slip can end life in a 1,000-foot freefall. Despite these hardships, mountain goats have survived in their high-elevation habitats for thousands of years.

Yet as tough as they are, these remarkable animals are disappearing in parts of their historic range. In the mid-1970s, for example, the central Sapphire Mountain's goat population was around 75; now the number is closer to 10. Since 1994, Montana Fish, Wildlife & Parks has closed nearly 20 percent of mountain goat hunting districts due to low numbers.

Some biologists speculate that expanded snowmobile use at higher altitudes could factor in the decline. Global warming could also contribute by altering the goat's alpine habitat. But no one knows for sure what the causes might be. "We're left scratching our heads," says Mike Thompson, FWP wildlife manager for southwestern Montana.

As if the goat decline in many traditional strongholds isn't puzzling enough, other populations are going great guns. In the Crazy Mountains, for example, transplanted goats have thrived, and the area now provides more hunting permits than anywhere else in Montana.

Biologists realize they need to get a better handle on what's happening to mountain goats and why. If the animals are in trouble, the stress of increasing climate change could, figuratively, push many populations over the edge. That would be a great loss for Montana, which holds one of the healthiest goat populations in the lower 48, and for the people who thrill at seeing the animals scramble across cliff faces. Further goat declines would also reduce opportunities for highly coveted goat hunting permits. "It's going to be difficult," says Tom Lemke, FWP wildlife biologist in Livingston, "but we realize we have a responsibility, even at these low population densities, to find out what's going on."

ONE OF A KIND

The mountain goat is the only animal of its kind in the world; its closest relative is the smaller and less physically impressive chamois of Europe. Mountain goats are native to high-altitude peaks of the Northern Rockies and the Cascade Range in Alaska, Canada, Washington, Montana, and Idaho, along with small introduced populations in parts of Nevada, Colorado, Oregon, and Utah.

Chrissy Koeth is a freelance writer in California.

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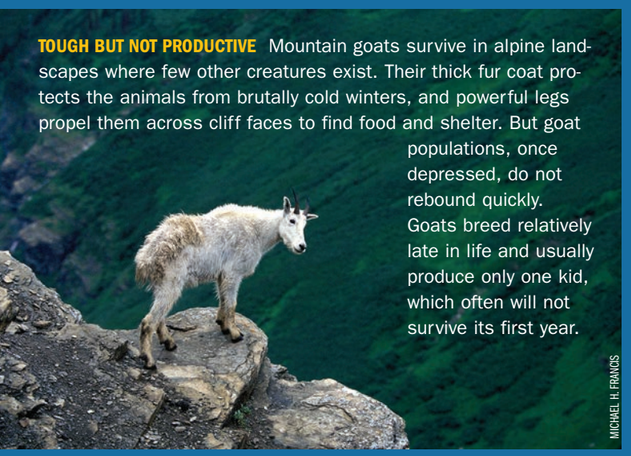
Mountain goats survive in extreme alpine environments due to a unique combination of biological equipment. Keeping out the cold is a double coat of white fur, with a fine, dense undercoat covered by a thick layer of hollow, 7-inch-long guard hairs. The animals can cling to near-vertical rock cliffs with a flexible, rough-textured pad under each hoof that grips slippery surfaces. The cloven hooves also spread wide to provide extra stability. A mountain goat's powerful shoulder muscles help it climb nearly straight up and stabilize its weight while moving downhill. Though unrelated to domestic goats, mountain goat males are called billies and the females nannies. Both sexes have a white beard of chin hairs and blackish horns that curve slightly backward. Males can weigh up to 300 pounds but average around 150; females are slightly smaller.

In Montana, mountain goats live at such high altitudes that predators are rare. Golden eagles will try to knock young goats, called kids, off cliffs. And occasionally, mountain lions venture into the rocky crags to pursue goats. Far more dangerous is the harsh environment itself. Avalanches have buried entire herds. Missteps can send goats crashing to their death. Goats unable to consume enough food to build fat reserves can perish from starvation or exposure in winter.

The same isolated, rugged environment that makes goat survival difficult also impedes biologists trying to count the animals. Goats hide in the creases and cliffs of mountains and are hard to count. The only reliable survey method—by air—is pricey, costing $500 an hour for a helicopter. "Goats are extremely expensive to survey because they live in some giant country and there's no access," says Jerry Brown, an FWP wildlife biologist in Libby who has conducted helicopter surveys of the Cabinet Mountains for 33 years. Not only is the terrain difficult to reach, but goats don't gather in large herds like deer or elk. During aerial surveys over established routes, biologists count as many goats as they can see. "If it's warm, goats go into alder fields or under trees and are about impossible to find," says Brown.

The counts don't indicate exact populations; they act as indices. By comparing numbers with previous years, biologists can spot population trends and determine if herds are increasing, decreasing, or staying level.

Ideally, biologists would survey small goat populations every other year and large ones annually. Yet in many areas, it may be a decade or more between surveys. Though mountain goats are popular with wildlife watchers and big game hunters, they receive far less attention from FWP compared to elk and deer. Because the state has relatively few



TOUGH BUT NOT PRODUCTIVE Mountain goats survive in alpine landscapes where few other creatures exist. Their thick fur coat protects the animals from brutally cold winters, and powerful legs propel them across cliff faces to find food and shelter. But goat populations, once depressed, do not rebound quickly. Goats breed relatively late in life and usually produce only one kid, which often will not survive its first year.

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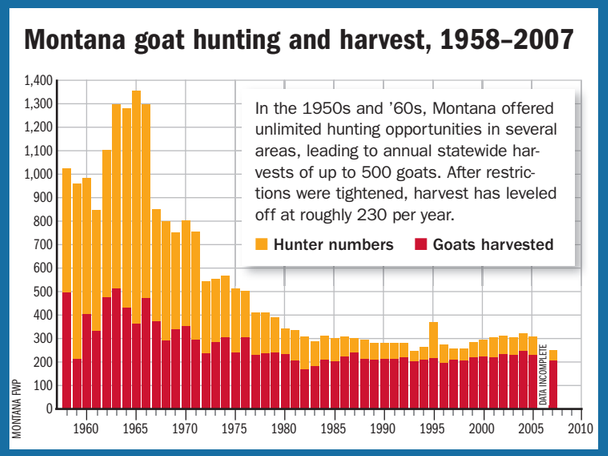

JESSIE WARNUCO

goats, it can provide only a few hundred permits each year. This generates little revenue for goat management, particularly goat population surveys. That leads to uncertainty over population trends, forcing the department to close hunting seasons to be on the safe side.

Despite incomplete monitoring data, biologists believe goats are in trouble in many areas. In the Pintler Range, for example, the number of observed goats dropped from 66 in 1990 to 40 in 2006. In the Flint Range, the number went from 40 in 1990 to 25 in 2007. Goat numbers in the upper Bob Marshall Wilderness declined by 85 percent from 1982 to 2002. Since 1994, FWP has closed 10 of the state's 53 mountain goat hunting districts because of what appear to be significant population declines. "Once we close a hunting district, it's rare for it to open up again," says Thompson.

The mountain goat's low productivity makes population recovery especially challenging. Unlike elk and deer, which begin breeding as yearlings, goats don't mate until age two or three, and then usually produce only one kid per year. The alpine environment where goats live is so harsh, says Lemke, that "many kids don't even survive their first year."

HUNCHES, BUT JUST THAT

Scientists in Montana and other parts of the mountain goat's range suspect that changes in habitat are likely contributing to population declines. "Because goat winter habitat is limited," concluded a 1989 study by the U.S. Forest Service of declining populations in Alaska, "even small areas of habitat alteration that impinges on these areas can have a disproportionately large effect on the goat populations concentrated there."

> "There's nothing like talking to guys who just drew a goat license. They are so jazzed you wouldn't believe it."

One concern is the increasing number of high-powered snowmobiles venturing near mountain goat habitat. The disturbance, say biologists, could be stressing or dispersing the animals during a critical time. "Goats are right on the survival line in late winter and early spring," says Thompson. "That's also when snow is hardest and snowmobilers like to 'high-mark' [climb snow-covered mountainsides]." John Vore, FWP wildlife biologist in Hamilton, explains that at winter's end, goats have nearly depleted all their fat reserves and seek wind-blown areas where vegetation may be exposed. Vore suspects that the sound and sight of snowmobiles could drive goats into areas where food is even more scarce. "I can't say conclusively that snow machines are responsible for goat population declines, but I know that over the past 15 years, snowmobile use in the Sapphire Mountains has increased, while goat reproduction has decreased," he says.

Another possibility may be global warming. In summer, goats need succulent flowering plants to restore their strength from the previous winter and put on weight for the approaching one. Insufficient nutrition can also prevent females from bearing young. Particularly important are alpine snowfields. As they slowly melt through summer, the open areas provide moisture for St. John's wort, beargrass, Idaho fescue, and other forbs and grasses that goats eat. In recent years, Brown has seen fewer and smaller snowfields during his aerial surveys. "With the warmer weather, you also have more trees growing in alpine areas," he says, explaining that trees shade the ground and delay spring grass and forb growth.

BOOM IN THE CRAZIES

One problem with the snowmobile and global warming theories—besides the lack of solid evidence—is that, if true, the populations declines should occur throughout the goat's range. Yet in some areas, goat numbers are holding steady or actually increasing. Two of the largest populations west of the Continental Divide, in the Cabinets and Bitterroots, are at or above their long-term average. Numbers are also climbing in parts of Montana east of the divide, where FWP has established new populations with trap-and-transplant projects that began in the mid-20th century.

Because goats rarely cross valleys or other low areas—likely because it makes them vulnerable to predators—they historically didn't migrate to isolated mountain "islands," such as the Beartooths, Absarokas, Crazies, and Tobacco Roots. Though these areas contain the high alpine peaks that make ideal mountain goat habitat, no historical trace of the animals has been found. Starting in 1941, wildlife biologists began capturing goats in the Bitterroots and the Sun River area and carting them to new locations with suitable habitat. In the Crazy Mountains, 21 goats released in the 1940s have increased to an observable population of 297 goats in 2007. The area now provides the most mountain goat hunting opportunities in Montana. Goats transplanted into the Absaroka Range in the 1950s have also increased and now number 250 to 300. Some have migrated into Yellowstone National Park, starting a new population that has grown to roughly 150.

Lemke explains that the new environments provide large areas of high-quality habitat. "You have the great combination of forage, elevation, and escape cover," he says. "Goats immediately took advantage of the untapped habitat and exploded." So healthy are goats in the Crazies and Absarokas, he says, some nannies are having twins.

Not all transplants have thrived, especially those in smaller mountain parcels such as the Gates of the Mountains Wilderness and the Elkhorn Mountains. Whether in native or transplanted populations, goats appear to fare worse in small, isolated areas where they have fewer places to relocate if habitat conditions worsen. "The Sapphires, for instance, are a more marginal habitat," says Vore. "If there's going to be a habitat impact or change, we would expect it to occur first in areas like that, but we don't know for certain."

The mountain goat is Montana's least studied and understood big game animal. But new information is forthcoming. A three-year National Park Service research project that began this summer is mapping mountain goat distribution and estimating goat density and abundance in Glacier National Park. Dr. Don White, a University of Arkansas professor leading the study, is using both ground and aerial teams to search the mountainous park for goats. FWP biologists say the study will help them better understand the animal's behavior and could provide a model that statistically accounts for goats not seen during surveys.

For Lemke, the results can't come soon enough. New information might help biologists prevent goat population declines and assist in recovery. Until then, he hopes to continue transplanting goats from the Crazies to new habitats elsewhere in Montana.

He says he has met too many enthusiastic goat hunters to ever give up on goats. "There's nothing like talking to guys who just drew a goat license," Lemke says. "They are so jazzed you wouldn't believe it. They all know how unique a goat hunt is and how challenging it is to hunt up above 9,000 feet. It's a once-in-a-lifetime hunting opportunity, and I'd sure like to see us provide more of them."

SHEILA A. JOHNSON

GOAT SURVEY A new study at Glacier National Park will determine goat numbers and distribution at the park. The information could help biologists manage goat populations elsewhere in Montana.

GOATS ON THE GO Since the early 1940s, wildlife biologists have trapped and transplanted 443 mountain goats to 27 different sites. Originally, goats were moved by horseback from trap sites to a two-wheeled horse-drawn cart. Today, the animals are transported by helicopter. Below right: mountain goats transplanted from the Crazies in 2002 to the Scapegoat Wilderness north of Lincoln.

MONTANA FWP

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