

Science

FINDINGS

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issue one hundred fourteen / July 2009

"Science affects the way we think together." *N. Parks*
Lewis Thomas

ON THE TRACK OF THE ELUSIVE WOLVERINE



John Reiter

Snow cover that lingers into May is a defining habitat feature for wolverines in the contiguous United States.

"Picture a weasel—and most of us can do that, for we have met that little demon of destruction, that small atom of insensate courage, that symbol of slaughter, sleeplessness, and tireless, incredible activity—picture that scrap of demoniac fury, multiply that mite some fifty times, and you have the likeness of a Wolverine."

—Ernest Thompson Seton

The wolverine has a near-mythical reputation. Stories abound of wolverines chasing down or leaping on the backs of animals as large as moose, harassing bears and wolves over prey, ravaging hunters' cabins, and even

attacking humans. However, most of these stories are either misunderstandings of wolverine behavior or tall tales. Although there have undoubtedly been altercations between wolverines and bears or wolves over potential food sources, wolverines do not try to compete directly with these much larger predators—in fact, wolverines are primarily scavengers. Their long canine teeth and claws, a sense of smell so acute they can sniff out animals buried under 6 feet of snow, and muscular jaws capable of breaking bone and tearing apart even frozen flesh—likely earned wolverines their scientific name: *Gulo gulo*, meaning "gluttonous glutton." Related to weasels and otters, wolverines resemble small bears with bushy tails, and the musky odor they exude has elicited such nicknames as "skunk-bear,"

IN SUMMARY

The wolverine is one of the rarest and least-known mammals in North America. A lack of understanding regarding its historical distribution in the contiguous United States and its broad-scale habitat needs has hampered conservation efforts. Using a suite of research methods, including the assemblage of historical data on wolverine occurrence, analyses of habitat factors, GIS mapping, radio-telemetry tracking, and genetic studies, researchers were able to address these information gaps.

Their findings show that historically, wolverines occurred primarily in high-elevation areas of the major western mountain ranges and in the Great Lakes region, where spring snow cover persisted throughout the animals' reproductive denning period. By the mid-1900s, the wolverine's range was dramatically diminished, owing probably to high levels of human-caused mortality and low or nonexistent immigration rates.

Today, wolverines survive in high-elevation pockets of northern Washington, northwestern Montana, south-central Idaho, and northwestern Wyoming. Throughout the year, wolverines stay within areas characterized by persistent spring snow cover, even when dispersing to new locales, and avoid areas with warmer temperatures to prevent thermal stress. This narrowly defined "bioclimatic envelope" suggests the wolverine's range will retreat northward in the face of climate change, but it also offers an empirical basis for initiating new conservation efforts.

Given that *Gulo gulo* evolved in the Arctic, the researchers speculated that wolverines may remain in high-elevation areas during the snow-free summer months to avoid overheating at lower elevations. To examine this hypothesis, the researchers overlaid the telemetry points on a map depicting the areas where maximum summer temperatures were typically less than 72 °F. "Although prey availability and other habitat factors may also play a role," Aubry notes, "our analyses indicate that even after the snowpack has melted, wolverines continue to use the same areas they used during the winter due to an upper limit of thermal tolerance." Thus, the researchers concluded that persistent spring snow cover provides a reliable and spatially explicit model of the wolverine's "bioclimatic envelope" throughout its circumboreal range.



LAND MANAGEMENT IMPLICATIONS



- The wolverine's specialized habitat requirements, combined with rising temperatures owing to global climate change, make it highly likely that wolverine populations in the contiguous United States will become even more fragmented than previously recognized.
- The reestablishment of wolverine populations in California, Colorado, and Utah is unlikely to occur without human intervention. Because human activities such as trapping and poison-baiting no longer pose significant threats, reintroduction may be an appropriate management strategy.
- The strong body of scientific evidence demonstrating that wolverines are closely associated with areas that contain persistent spring snow cover offers a sound empirical basis for managing the habitat conditions that are most important to wolverines.

IMPLICATIONS OF GLOBAL CLIMATE CHANGE

These studies have yielded important new insights into the nature of the wolverine's ecological niche in North America. Unfortunately, recent findings don't bode well for the species' future as the planet—and particularly the Arctic—continues to warm. "The wolverine may be second only to the polar bear in its sensitivity to global warming," Aubry contends. "If current warming trends continue, the spring snow cover layer will shift upwards in elevation and shrink in geographic extent, increasing the fragmentation and isolation of wolverine habitat," he explains. "We believe our research provides an empirical basis for identifying the most likely areas of wolverine persistence in the face of global climate change, and the most significant habitat corridors for maintaining connectivity among their populations," he adds.

The findings have already been used in a policy analysis related to the species. The U.S. Fish and Wildlife Service (FWS) relied extensively on the researchers' distributional analysis in its 2008 review for potential listing of *Gulo gulo* under the Endangered Species Act. However, the FWS ruled that listing was not warranted because the wolverine population in the contiguous United States is connected to populations occurring in Canada, and does not represent a significant portion of wolverine range in North America.

Although *Gulo gulo* faces an uncertain future, the species can only benefit from this growing knowledge of its ecology. "The wolverine is an iconic symbol of the American wilderness,



Wolverine tracks.

and if we can produce new scientific knowledge that contributes to understanding its habitat requirements in the lower 48, then we'll be helping to preserve a part of our heritage that has significant value to a great many people, whether or not they ever see a wolverine in the wild," Aubry declares.

"Man masters nature not by force but by understanding."

—Jacob Bronowski

FOR FURTHER READING:

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WRITER'S PROFILE

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