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Notes of a Naturalist

A newsletter bringing you the species, landscape, history, and happenings of the Taft-Nicholson Center

Photo Credit: Shane Mills

Built for Snow

Let's face it - some animals just aren't cut out for winter. Some journey to warmer locations, whether that be nearby lower elevations or much further lower latitudes. Others lie low for a few months, awaiting the arrival of spring. Even most of those that stay active on the landscape merely tolerate winter. Only some can be said to truly thrive in winter. These are known as chionophiles, a term that translates to "snow lover". These are animals with unique adaptations specifically suited for frigid temperatures and deep snow. They are generally arctic or boreal species. In the United States, Alaska is, unsurprisingly, home to most chionophile species, but they can also be found in the higher latitudes and high mountainous regions of the lower 48. One great example of a chionophile is also one of the Greater Yellowstone's most elusive and mysterious creatures: the wolverine.

Photo Credit: USFWS

Wolverines are the largest terrestrial members of the weasel family, about as big as medium-sized dogs. Their natural range includes the arctic, boreal and subalpine habitats of Northern Europe, Russia, and North America. They are well adapted for the infamously harsh winters of these regions. Their thick fur, which was once so highly coveted it lead to their extirpation in parts of their range, can easily sluff away frost. Pregnant females usually build dens by digging tunnels in the snow, where their young will be born between the months of February through April. This means that, even in their first days of life, wolverines depend on snow. They walk around on snowshoe-like feet with a high surface area and claws that can grip ice, giving them a significant advantage over prey in the snow. When they can't find sufficient prey, they rely on their powerful jaws to gnaw through frozen carcasses.

Photo Credit: NPS

Wolverines are wide-roaming scavengers, traveling up to 15 miles a day in search of food. Their home ranges can reach up to 500 square miles. Males have a greater tendency to wander. In one extreme example, a radio-collared male was found to have wandered from Wyoming to Colorado, then to North Dakota, covering over 800 miles. Their roaming nature have helped them repopulate areas where wolverines had previously been extirpated.

While wolverines were likely never very common, their historic range spanned the northern continental U.S., and throughout the Rocky Mountains and the Sierra Nevada. That all changed after European colonization. Populations in the lower 48 states were likely killed off by the early 1900s. The current populations in the United States are the result of individuals from farther north in Canada moving back into these regions. There may be less than 300 wolverines in the contiguous United States, mostly found in Washington, Wyoming, Idaho, and Montana. It's tricky to study their populations, so it's uncertain how many live in the Centennial Mountains. Researchers in Yellowstone have documented less than ten individuals in the entire park. Because of their specific habitat requirements, wolverines already have low population densities. But human-caused disturbances and climate change are making these resources even harder to come by.

Disappearing Winter

One of the greatest threats facing wolverines, lynx, and other chionophiles is climate change. Snow conditions are becoming less reliable in key portions of their ranges. When snowpack disappears, these animals lose the advantage of their specialized snow adaptations. That leads to greater competition with other predators in the season where they would otherwise have an edge. For wolverine and lynx populations in the continental U.S., prime habitat is already hard to come by. A trend of warmer, drier winters will further reduce the available habitat for these snow-reliant creatures.

This is exacerbated by other forms of habitat fragmentation. Land development, resource extraction, roads, and outdoor recreation can all be barriers for these wide-roaming animals. A study spanning six winters in four different regions of the Greater Yellowstone, including the Centennial Mountains, found that wolverines avoided popular backcountry skiing and snowmobiling sites even when these areas overlapped with high-quality denning habitat. With snowpack projected to decrease in many areas, wolverines may find it harder to avoid these popular recreation areas and be pushed into the fringes of their habitat. Because of their dependency on habitat connectivity and snowpack, wolverines and lynx are case studies for the future of conservation in a changing world.

Another example of a chionophile in the Greater Yellowstone Ecosystem is the similarly elusive Canada Lynx. Unlike bobcats, their closely related cousins who thrive throughout most of the continental U.S. and into northern Mexico, Canada lynx are found mostly in the more northern latitudes of North America. In Montana, they often inhabit lodgepole pine or subalpine fir forests above 7,000 feet. Compared to most other wild cats, lynx have disproportionately long legs and big feet. Despite their much smaller body size, a lynx's tracks can be the same size as a mountain lion's. These features may make them look awkward and lanky, but they are key adaptations for traveling through deep snow and give them a competitive edge over most other carnivores in the winter. The undersides of their large paws are also covered in thick, insulating fur to protect the pads of their feet.

Lynx have a close relationship with snowshoe hares, their preferred prey - wherever snowshoe hares are found, lynx often are too. As their name suggests, snowshoe hares are also incredibly well-adapted for winter, changing their fur color from brown to white with the seasons. Lynx do this as well, to a lesser degree, their thick fur becoming more silvery in the wintertime. Whenever snowshoe hare populations dip, lynx populations do as well, though these population dynamics are less pronounced in the lower reaches of these their ranges. But at these lower latitudes, prime habitat is also harder to come by. So these southern lynx generally have larger home ranges.

Photo Credit: Shane Mills