

NOTES OF A NATURALIST

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



The Moose Who Stay Behind

Centennial Valley is home to several ungulate species during the warmer parts of the year: moose, elk, mule and white-tailed deer, pronghorn, even domestic cows. But moose are the only ones who stick around in the winter. Moose thrive in subarctic, boreal, and high elevations habitats. Compared to their relatives, they are much better adapted to the snowy landscape.

Most deer have thick coats that keep them well insulated. A layer of dense underfur is protected by a top layer of hollow hairs, which provide even more insulation in the form of trapped air. For moose, the largest member of the deer family, this superb coat is supplemented by their size. Larger animals have a smaller surface area to mass ratio, which means less body heat is lost to the surrounding environment when compared to smaller animals.

As it turns out, a moose's somewhat awkward appearance is the result of characteristics that make them well suited for winter. Their long, seemingly double-jointed legs are able to swing above the snow rather than wade through it like their smaller cousins. Large feet with a high surface area also help them navigate through the snow. Their larger muzzles come in handy as well. Cold air takes longer to travel through their long nasal passages, allowing it to warm quite a bit before reaching their lungs.

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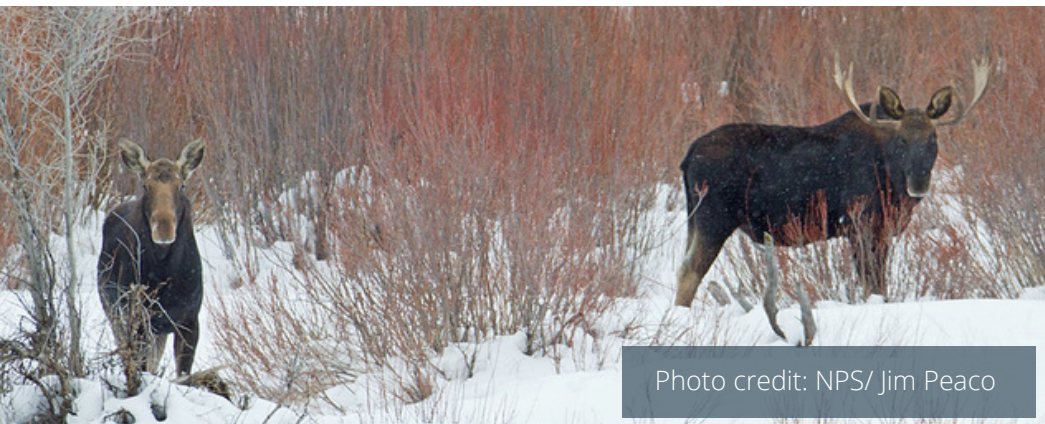


Photo credit: NPS/ Jim Peaco

Superhibernators

By now, bears have entered their dens, where they'll remain for the next six months. Bears may use natural cavities as dens or create their own in a process that can involve moving up to a ton of dirt over the span of a week. They may lose up to 30% of their body weight during hibernation, and they've been consuming up to 20,000 calories a day since August in preparation.

Though it was once debated whether or not bears were true hibernators, they are now widely regarded as super-hibernators. While most hibernators experience a dramatic decrease in body temperature, bears experience a drop of only 12°F. They are able to maintain relatively high core temperatures due to their larger surface area to mass ratio, and their thick insulating fur. Also unlike most other hibernating mammals, bears don't need to wake up intermittently. They have the amazing ability to recycle nitrogen waste into protein, an adaptation that prevents muscle atrophy. They are also able to maintain bone density during, as well as avoid arteriosclerosis despite their cholesterol levels doubling. These feats have intrigued researchers in various fields with their implications of what mammalian physiology is capable of.



Moose (cont.)

Their eating habits also contribute to their ability to survive Centennial Valley winters. Unlike many other ungulates, who graze on grasses and other herbaceous plants, moose are browsers, meaning they primarily eat leaves and twigs from trees or large shrubs. Their main food source is willow, which is often still accessible in the snow. Sometimes the moose population of Centennial Valley even increases in the winter, as those who spent the summer at higher elevations move down to take advantage of the abundant willows. Subalpine firs and Douglas-firs also become important food sources for moose in the winter. Moose don't have front teeth on their upper jaw, but their large incisors on their lower jaw allow them to scrape bark off of trees, which they rely on when other food sources are limited.

Even still, it can be challenging for them to keep up their energy intake. Their average daily food consumption decreases from around 50 pounds a day in the summer to 12 pounds a day in the winter. Another vital winter tactic for moose is to conserve energy. While other deer shed their antlers in late winter to early spring, bull moose typically shed their antlers at the beginning of winter. This helps them conserve precious energy by losing the extra baggage, which can weigh up to 40 pounds. Moose also conserve energy in the winter by limiting their movement.

Weather in Lakeview

"Although the valley is not suitable for farming, snow and weather conditions make it great for skiing and skating. The high elevation makes frost possible at any time of year and there have been snowstorms in the summer months of June, July and August. The record low temperature in the valley was -44F and the record high was 92F. Drifts of snow in the winter can be more than 10 feet deep! The record for snowfall was 224 inches in the winter of 1951—1952. The total precipitation (moisture from rain and snow) record was 27 inches in 1970."

-Amelia Warren, Lakeview Middle School

Frogs in a Deep-freeze

Few reptiles and amphibians call Centennial Valley home. As ectotherms, these critters can't create their own body heat, making winter particularly challenging. Some, like the Boreal Chorus Frog found in Centennial Valley, survive by literally freezing. They enter a dormant state and their breathing stops. The spaces between their cells contain ice nucleators, which promotes the formation of ice crystals. While this may seem



counter-intuitive, these ice nucleators can control the size of ice crystals and where they form, helping to keep them between the cells rather than within them. Meanwhile, high concentrations of sugars within their cells act as antifreeze. So their cells remain unfrozen, while the intercellular space freezes. They'll remain this way until they thaw out in the springtime.

