

Article

Brooks Range brown bears spend most of the year in their dens

[Gates Of The Arctic National Park & Preserve](#)

Brown bears have a remarkable way to adapt to life in the Arctic. Like many Arctic animals, they hibernate in the winter months when food is scarce. But bears push the physical limits with some of the longest denning times in the world.



Gates of the Arctic National Park and Preserve lies entirely above the Arctic Circle and spans the central portion of the Brooks Range mountains of northern Alaska.

NPS/Kyle Joly

Wild animals have a range of adaptations to help them survive the extreme seasons of the Arctic. Some animals migrate long distances to tropical destinations to escape the cold, while other animals stay and rely on physical or behavioral adaptations to survive the snowy winter. Brown bears, also known as grizzlies, are among those that stay but they spend their winters in earthen dens they dig. All winter long, they live underground with lowered body temperature, slowed breathing, and reduced activity (technically, this is *torpor*, but it is often called *hibernation*). They do this to minimize the amount of energy they use in response to limited food availability during winter.

Gates of the Arctic National Park and Preserve lies entirely above the Arctic Circle and spans the central portion of the Brooks Range mountains of northern Alaska. As National Park Service biologists, we wanted to learn more about brown bear denning in this region and used GPS collars to figure out just how long bears spent in their dens. We discovered that, on average, brown bears in this area spent 206 days in their dens. They enter their dens, on average, around September 30th and exit around April 25th. One bear pushed the physiological limit (241 days) that they can remain in torpor by spending a remarkable 233 days (64% of the year) in its den! These are some of the longest denning durations ever reported in the world and reflect the difficult living conditions for bears in the Brooks Range.



The view from a bear den. On average, bears in the Brooks Range spend about 206 days a year in their dens.

NPS/Mat Sorum

We also learned that food availability was an important in determining when bears entered their dens in the fall. Chum salmon can be available late into the fall, even after snow blankets the mountains and foothills, covering other important foods, like berries. We

determined that bears that had greater access to salmon in the fall denned much later than bears that relied more heavily on berries or other foods. This means that bears will stay out of the den and remain active in the fall if they can continue to consume high-quality food, like salmon. The timing of den exit in the spring was less variable. Half the bears exited within the same week-long span from April 23-28 and that timing was related to when snow melted in the spring.

Sows (female bears) with cubs or ones that are pregnant have greater energy demands while in the den. Despite their increased energy demands, we confirmed that these bears denned longer than any other group of bears (211 days on average). Boars (male bears) denned for the shortest amount of time on average (203 days). After exiting their dens, bears stayed close (within about half a mile) to their dens for another 6 days, on average, but sows with cubs stayed for 12 days. All of this highlights how Brooks Range bears face difficult conditions in winter but have found remarkable ways to adapt to their Arctic environment.



A female bear and her two cubs emerge from their den. Female bears with cubs have higher energy demands when in the den, but lingered longer than males--211 days in the den compared to an average of 203 days/year for males.

NPS/Matt Cameron

Denning chronology in an Arctic brown bear population

Abstract

Denning is a critical behavioral adaptation for brown bears (*Ursus arctos*) to cope with winter, a period of extended resource scarcity. Bears reduce their body temperature, heart rate, and metabolism during this time to minimize energy expenditures. The Arctic has among the most pronounced and longest period of resource scarcity. Thus, we predicted bears in the region would respond by having among the longest recorded denning periods. We used GPS data from brown bears to determine the den entry, den exit, and denning duration for a population living primarily above the Arctic Circle. On average, brown bears in the region denned for 206 days, the longest duration reported using GPS data of which we are aware. The longest denning duration for any individual bear was a remarkable 233 days (64% of the year), which is near the theoretical maximum of 241 days. We found that food availability in fall delayed den entrance, with bears that appeared to consume more salmon entering their dens later. Bears showed greater synchrony in den exiting than den entrance, and female bears with cubs exited their dens more than a week after other bears. Later snow melt out in spring was also associated with later den exits. Climate change has the potential to affect the denning ecology of Arctic brown bears by altering the availability of food, ambient temperature, and precipitation, all of which can alter the costs and benefits of hibernation for brown bears.

Deacy, W., [M. S. Sorum](#), [M. D. Cameron](#), [G. V. Hilderbrand](#), D. D. Gustine, and [K. Joly](#). 2025. [Denning chronology in an Arctic brown bear population](#). Wildlife Biology e01420.