"Bears Don't Urinate, Defecate, Eat or Drink During The Denning Period"—or Do They?

"Bears don't urinate, defecate, eat or drink during the denning period." How many times have we as bear biologists repeated this phrase during public presentations? The literature on denning physiology tells us that fats supply the energy for metabolism during denning and when those reserves are depleted protein becomes the energy source, urination occurs, mass loss results and dehydration becomes life threatening (Maxwell et al. 1988). However, on Vancouver Island, BC, Canada I recorded several incidences that question our oft-repeated statement. First, using motion-sensitive cameras, I observed a black bear (*Ursus americanus*) leaving its den in the Jordan River watershed and licking the ground just outside the den entrance during the denning period. Unfortunately, the ground was not visible in the videos so I could not determine what the bear was accessing. Bears have been observed eating snow in the winter (Bridges et al. 2004), so this seemed plausible despite very little snow being present when the activity occurred.

I also observed denned black bears drinking water at a second den in a rootwad in the Campbell River watershed that was monitored with multiple motion-sensitive cameras in winter 2020–2021. At this site, I installed a camera in September 2020 and determined that the den was occupied when the camera was checked on 13 January 2021. Camera footage showed a female black bear and yearling cub had started denning 8 December 2020. I visited the den 3 times afterwards to service cameras for a film production. During these visits the bears were awake, but they did not outwardly react to our presence. The den was about 5 m from a very small creek (<1 m wide) with water that ran freely all winter. The den was at least a metre higher than the creek and there was no risk of inundation.

I collected several video recordings of the bears leaving their den, approaching the creek, and crouching as if urinating or defecating during the winter. Unfortunately, the bears were not always completely visible once they approached the creek. I then added a second camera on 11 February 2021 that focused on the creek.

Overall, I observed the adult female drinking less often than the cub, she only appeared to drink at the start of denning (8 December) and again in March (6, 20). However, the cub appeared to drink frequently after the onset of denning (9, 11, 12, 23, 31 December) and it appeared to have drunk water once in January and twice in February, but I could not definitely determine its activity. The second wildlife camera clearly showed the cub drinking at the creek in March when it drank on 6, 14, 20 (twice), 24 March before leaving the den with its mother 26 March 2021. A fecal plug, likely from the cub based on size, was present between the den and the creek upon our visit 10 February 2021, a second one from the adult female was found between the den and creek and appeared on videos to have been deposited 20 March 2021. The bears did not appear underweight and never left the den area or appeared to forage.

A female and cub in a den in a rootwad with the entrance partially obscured by vegetative bedding on Vancouver Island, BC, Canada. Photo credit: H. Davis

Videos of the cub emerging from the den showed staggered movements and loss of balance. It's possible that reduced blood flow to skeletal muscles reduces their physical ability (Rogers and Durst 1987) and may partially explain bear's lack of desire to flee their dens when disturbed.

In addition to drinking during the den period I recorded bears leaving the den and gathering bedding throughout the den period. Both study areas received the occasional snowfall but were mostly snow-free during the den period and den entrances were rarely, if ever, covered with snow, however, entrances were partially blocked by the large amount of vegetative bedding brought into the den. Past research has found that natural sealing of the den entrance with snow greatly reduces the energy requirements of denned bears (Maxwell et al. 1988) but bears on coastal Vancouver Island cannot rely on snow to seal the entrance of their dens. Piling bedding up to partially block the entrance may help but it doesn't close it completely and means that energetic losses may be greater than in areas with consistent snow cover. Similarly, the need for adequate insulation between the individual bear and the ground (Maxwell et al. 1988) may explain the behaviour of gathering large quantities of vegetation for bedding at the start of the den period as well as several times through the winter. Anecdotally, I also observed the adult female sleeping with her head tucked between her front legs, under her torso, which may be to reduce heat loss through the relatively un-insulated nose.

These results further highlight the utility of deploying motion-sensitive cameras at den sites, as found by Bridges et al. (2004). It supports that where bears have access to water or snow in winter they may use it, as has been found in captive bears (Jansen et al. 2021). It also challenges us to keep an open mind and highlights that there are still things to learn about bears!

Literature Cited

Bridges, A. S., J. A. Fox, C. Olfenbuttel, and M. R. Vaughan. 2004. American black bear denning behavior: observations and applications using remote photography. Wildlife Society Bulletin 32:188-193.

Jansen, H. T., B. Evans Hutzenbiler, H. R. Hapner, M. L. McPhee, A. M. Carnahan, J. L. Kelley, M. W. Saxton, and C. T. Robbins. 2021. Can offsetting the energetic cost of hibernation restore an active season phenotype in grizzly bears (*Ursus arctos horribilis*)? Journal of Experimental Biology 224: jeb242560.

Maxwell, R. K., J. Thorkelson, L. L. Rogers, and R. B. Brander. 1988. The field energetics of winter-dormant black bear (*Ursus americanus*) in northeastern Minnesota. Canadian Journal of Zoology 66:2095-2103.

Rogers, L. L., and S. C. Durst. 1987. Evidence that black bears reduce peripheral blood flow during hibernation. Journal of Mammalogy 68:876-878.

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A couple of bears move into a mating arena. These are usually particularly food-rich areas frequented by a number of bears year after year. Photo credit: Umberto Esposito and Bruno D'Amicis, Wildlife photographers, info@orsoeformica.it See article on page 21

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