Not all Tahoe bears will hibernate in winter

By Sarah Hockensmith and Will Richardson, Tahoe In Depth

Have you ever seen a bear print in the snow? How about a bear walking through your neighborhood during the winter season? At such times, many might ask themselves “shouldn’t this bear be asleep right now?” Others might be compelled to ponder “do bears really even hibernate in the Tahoe region?” The most curious among you may go on to ask “what exactly is hibernation, anyway?” These are great questions, and commonly asked, partly because hibernation is complicated.

Here in the Sierra Nevada, we experience the complete four-season cycle during the calendar year, including winter. Animals that breed in the Tahoe region have adapted three main strategies to cope with these seasonal changes. The first strategy is migration, where animals come to Tahoe during the summer months to take advantage of abundant resources, the mild climate, and long periods of daylight hours.

During the winter, these animals, which include deer, many birds and bats, and even insects, must retreat to lower latitudes and lower elevations.

Staying through the winter

A second strategy is where animals have evolved to stay put in Tahoe and stay active, somehow managing to balance their energy output, withstanding the freezing temperatures, and maintaining the ability to find enough food in a snow-covered landscape. This strategy is for the hardiest creatures, but it works for a surprisingly large diversity of animals.

The last strategy that animals have adopted to get through seasonal periods of difficulty, and the strategy that is

perhaps least intuitive, is the process in which an animal simply goes to sleep for a period of time to wait for better conditions. By reducing their metabolism and body temperature, animals are able to greatly reduce the “expense” side of their energy budget and make it through such periods. This tactic is commonly known as hibernation in the broad sense.

Among the scientists that study such things, the term “hibernation” has been applied somewhat strictly, reserved only for certain types of hibernation, and that has led to considerable confusion over the years. The experts hold competing ideas about hibernation strategies and patterns among bears and other animals, but some of the debate falls on very fine distinctions and technical definitions.

If food – including human garbage – is readily available, bears in the Tahoe area may forego hibernation. Photo/Will Richardson

Types of hibernation

There are many terms that refer to different, often very precise, types of hibernation. For example, brumation is a type of hibernation among reptiles, but different metabolic processes are involved. Unlike mammals, reptiles are cold-blooded and cannot control their body temperature; thus, brumation allows reptiles to handle temperature extremes.

Aestivation is a type of hibernation utilized in the summer to protect an animal (e.g. insects and amphibians) from long hot or dry periods. The term “torpor” often refers to a type of short-term hibernation where a reduction of body temperature and metabolic rate occurs during an inactive part of a daily cycle. We can often get frost in mid-summer, so consider the dramatic metabolic swing a tiny hummingbird must undergo not to burn through their meager reserves getting through such a night.

For the average person, it is unnecessary to get hung up on the finer distinctions of these technical definitions, and there is much debate among the experts anyhow, so we at the Tahoe Institute for Natural Science prefer to focus on the broader concepts and implications of seasonal dormancy.

For some animals, seasonal dormancy is a “facultative response” – only occurring if the conditions demand it for survival. Some of our short-distance migrants are similar in this regard. In other species, hibernation has been locked in as an obligate part of the annual cycle, regardless of weather and resource availability.

Programmed to sleep

A local example on the obligate side of the dormancy spectrum is the Belding’s ground squirrel (Spermophilus beldingi), which experience a long hibernation period for eight to nine months. Even if there are ample grasses and warm temperatures to find food in the late summer and early fall, these squirrels go to sleep as soon as they have enough body fat to survive the winter, often in late August.

Winter a hardship for most animals

This brings us back to the initial question, “Do bears hibernate in the Tahoe region?” Again, winter in the Tahoe region is a time of hardship for most animals, including bears. Food is scarce and hard to find, temperatures are

dipping below freezing for long periods of time, and snow is covering the ground, making travel and foraging energy intensive.

The American black bear (Ursus americanus), inhabits an enormous range across the North American continent and has evolved as a facultative hibernator. In Florida, you can find male black bears active year-round, but if you were to study populations in the coldest parts of Alaska, you would find that these bears are sleeping for up to sevent months out of each year.

Studies from the southern Sierra Nevada and elsewhere have demonstrated that onset of bear hibernation and denning behavior is driven by two factors. The first factor is whether the bear is pregnant. A pregnant female must den up for a period of time regardless of weather, and typically these family groups will remain in the den longer than individual bears given the same conditions.

The second factor determining when (or if) a bear decides to hibernate has to do with food availability. A large and readily accessible pine seed crop may keep bears active and feeding. Unfortunately, this applies to garbage as well as natural food sources, and if either are available throughout the winter, you are likely to find black bears awake and active.

Getting a wake-up call

Unlike deep hibernators, bears occasionally wake up and shift positions inside the den, helping to prevent sores and better conserve heat. During their dormancy they lower their body temperatures 8 to 12 degrees Fahrenheit, break down fat reserves for energy, and recycle wastes to eliminate the need for urination, defecation, or drinking water. Amazingly, they wake with almost no appreciable muscle atrophy and are capable of fine motor skills almost immediately.

Clearly, hibernation is a complicated subject. It has proven to be a successful strategy of saving energy during hard times and is utilized by many animals of the Sierra Nevada. “Do bears hibernate in the Tahoe region?” The answer is “yes and no, sort of. It depends.” When, if, and for how long an animal hibernates depends on whether that species is an obligate or facultative hibernator, may depend on the sex of that individual animal and how that relates to energy demands, and often depends on weather conditions and food availability from year to year.

Sarah Hockensmith is the outreach manager and Will Richardson is the co-founder and director of science and outreach for the Tahoe Institute of Natural Science. This article first appeared in ***Tahoe In Depth****.*