

# BOREAL BITS

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*And 'neath the hemlock, whose thick branches bent  
Beneath its bright cold burden, and kept dry  
A circle, on the earth, of withered leaves,  
The partridge found a shelter*

*A Winter Piece, William Cullen Bryant, 1821*

## WINTER SURVIVAL Part 1

How do they do it? How can nature's own survive the brutality that we call winter? As beautiful as it is, it is equally as deadly. While the snow insulates, it blocks easy access to food supplies and any effort to gain food uses precious energy. Any walk in the forest at this time of year causes one to wonder where the wildlife is.

There are proven adaptations to winter, each carrying its own dangers. The Canada goose, the white tail deer and the groundhog are representative of the three differing adaptations to the problems of winter. The goose migrates, the white tail deer toughs it out, while the groundhog avoids it by entering a state of torpor better known to us as hibernation. There is no doubt that the Canada goose increases its chances of meeting with an accident, or a shotgun, as it works its way south to warmer, more hospitable climes. For many migrators, starvation is an ever-present threat. Migration places a high demand on energy and if for some reason energy reserves (fat) are expended and new sources are not available (e.g. an ice storm coating food supplies, storms blowing flocks

of migrators off course), the bird is in real danger of perishing. On top of all this there is the threat of parasites and disease from too many birds congregating in one area.



(P Burke)

Our local Christmas Bird Count gives a reasonably accurate indication of those birds that choose to tough it out. Like the deer and other tough-it-outers, winter survival is usually guaranteed if energy is kept on the positive side of the balance. This is accomplished in two ways. The deer cannot rely solely on the chance that it will find sufficient food supplies to see it through ‘the hunger moon’ as Native Americans termed the latter months of winter. Deer enter into a hunger-mode, whereby the energy requirements for existence are lowered considerably. This is triggered by a drop in energy ingested through browsing. It’s a good set up; at the time when energy resources are at a minimum, the deer require a minimum of food. However, those kind-hearted citizens who insist on providing food for deer in early winter are not usually doing the deer a favour because they prevent the deer’s entry in the ‘winter mode’. Unless these people continue feeding the herd, their charges will die of starvation while unfed deer will survive. Deer also carry a fair amount of fat with them to augment energy they obtain through foraging. At the end of a tough winter—cold and deep snow—many deer come into spring emaciated. It’s a dangerous game they play, and often the playing field is very close to the edge of survival. The number of deer we have in and around town is a result of gentle winters over the past few years.



One amazing fact is that rarely do well-fed deer and other life forms that tough it out over winter die of the cold. If their metabolic furnaces have enough heat, and injury is not a factor, these animals can survive the cold.

Our mammalian hibernators are legendary and successful primarily due to a substance known as brown fat. The black bear that pestered us throughout the fall with its insatiable appetite was desperately preparing itself for the winter. When finally the bear dens (either in a natural or bear-excavated cavity, or simply by cuddling beside a downed tree), the huge omnivore enters a state of

torpor and exists for months off the avails of the previous summer and fall, much of which is stored as brown fat. Researchers have found that cells containing ordinary fat provide energy to power various life processes. But brown fat cells release the energy directly as heat in a process biologists have dubbed non-shivering thermogenesis. With this to fuel the furnace, and a good, heavily insulated coat to boot, the bear is quite comfortable. The only bears that don't make it through hibernation are those that go into their winter state ill-prepared—possessing insufficient fat resources.

In hibernators referred to as 'true hibernators' the winter sleep is close to death. Respiration and heart beat drops very low and body temperature plummets. The groundhog is a classic example of this. Like the bear it carries its food supply under its skin and while both species survive without eating or drinking, the bear's body temperature drops only a few degrees—it takes them little time to awaken from their sleep. Unlike the active red squirrel, the chipmunk sleeps throughout the winter, arousing occasionally to have a snack from the pantry, visit the toilet chamber, and then go back to sleep. On a warm winter day, you may also see a chipmunk out for a bit of a stroll. Our discussion of winter survival just skims the surface of the pool of knowledge exploring how our boreal residents handle the season.

Next week we will discuss life under the snow.