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The ingenuity of winter survival

As with birds and insects, evolution has provided mammals with a variety of means for coping with the cold and lack of food of winter. Some become completely dormant, others simply sleep for extended periods but awaken regularly, while yet a third group carries on with life pretty much the same way as during the rest of the year. The word “hibernation” used to be defined in terms of a drastically lowered body temperature or some other physiological characteristic. It’s probably more useful, however, to say that hibernation is simply a period of torpor (inactivity or sleep) that allows the animal- be it a mammal, an insect or an amphibian - to survive the famine of winter.

Beginning some time in the first half of October, groundhogs enter their five month hibernation period. The winter den is often located along a forest edge and extends below the frost line. The groundhog does not store food for winter consumption but relies on a substantial layer of fat to provide nourishment. The animal’s heart rate falls from 100 beats per minute to only 15; its body temperature plummets from 35C to 6C, and its breathing is reduced to one breath every six minutes! The jumping mouse is the only other mammal in the Kawarthas to enter a state of such deep hibernation.

A second group of mammals simply sleep for extended periods during the winter months. However, they maintain near normal body temperatures and awaken frequently. Chipmunks, for example, spend the winter in their network of underground chambers. They sleep for two or three days, awaken to visit a food chamber, go to another chamber to rid themselves of body waste, and then return to their sleeping quarters. In years when there is a large quantity of wild food available - and the underground larders are full - chipmunks tend to be most active and will even make occasional trips outside onto the snow.

Raccoons and skunks do not store food but rely mostly on body fat to come through the winter. In preparation, both species feed heavily in the fall. This increased activity may explain why skunk spraying seems to occur so often at this time of year. When temperatures drop below freezing, raccoons and skunks both sleep for long periods. They will, however, become active again during mild spells. For their winter quarters, raccoons will choose abandoned burrows, hollow logs, culverts and even buildings. Skunks usually prefer a chamber in the ground such as an old groundhog hole. They will also take refuge under man-made structures. Skunks are generally more active than raccoons in winter.

Most bears in the Kawarthas den up by late October unless large quantities of food are still available. All summer and fall, they have been preparing for winter by building up body fat from a diet of berries, insects and small mammals. They usually dig out their den on the side of a hill or under an uprooted tree. Sometimes, however, the den consists of nothing more than the shelter of a brushpile or a rock crevice. The bear’s winter fur has double the insulative capacity.

Bears, too, enter a state of torpor, from which they can easily be awakened. A sleeping bear’s body temperature decreases only a few degrees, although its heart rate slows down substantially. In addition, bears don’t have to drink or urinate while in torpor; they essentially shut off their kidneys. If we were to do this, metabolic waste, mostly urea, would accumulate in our blood and poison us. Amazingly, hibernating bears are able to biochemically recycle urea

from their urine back into protein. In this way, even though they are not exercising, no loss of muscle tissue is experienced. Another amazing adaptation is that hibernating bears do not appear to suffer from any signs of osteoporosis (loss of bone mass), even after months of total inactivity. For humans, physical inactivity is one of the main causes of osteoporosis. Clearly, research into how bears thrive as winter couch potatoes has implications for improving human health and fitness!

Squirrels are representative of mammals which pretty much remain active all winter long, except on the coldest days. Their behaviours are particularly interesting to observe. You will often see gray squirrels - most of which happen to be black in Peterborough - burying acorns and other seeds in the ground in the fall. They carefully cover their cache with soil and leaves. Later, they will dig through the snow to recover the food. Relocation, however, is strictly a matter of smell and maybe a measure of luck. Stored food usually ends up being shared unintentionally by all the squirrels in the neighbourhood. When other food sources have been exhausted, watch for gray squirrels feeding on keys, high up in Manitoba and Norway maples. It is also possible to see them entering and exiting their well-insulated tree nests (dreys), which provide critical shelter on cold winter days and nights.

Red squirrels, which are most common in mixed and coniferous woodlands, are busy right now gathering cones for winter consumption. They harvest this winter food supply by nipping off cone-bearing twigs from high up in spruce, hemlocks and other conifers. After several minutes of pruning, the squirrel scurries down to the ground and promptly removes the cones and terminal buds from the twigs. The buds are usually eaten right away but the cones are cached in hollow logs, under fallen trees and in underground cavities. Later in the winter, squirrels make tunnels in the snow in order to access the caches and to move safely to eating sites such as tree trunks. Only the seeds within the cones are actually consumed. A pile of cone scales and shafts, often referred to as a midden, accumulates at the eating site.

Unlike most mammals, red squirrels are actually brighter now than during the spring and summer months. Not only has their black side stripe disappeared, but the fur on the back has become a rich rust colour. This heavier winter coat also affords much great insulation.

Another mammal that is easy to observe this month is the beaver. To beat the coming freeze-up, fall beavers will often work during daylight hours, cutting down trees for winter food. Beavers do not eat the wood of the tree but rather the young bark. This often means having to cut down large trees in order to reach the young bark of the upper branches. The branches are stored under the water near the lodge. In this way, beavers can access their winter food without having to venture onto the land.

What to watch for this week:

Small numbers of loons, grebes and migrating diving ducks are still lingering on local bodies of water including Little Lake and the Lakefield sewage lagoon (ducks). They will continue to do so until freeze-up.

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