

Wild about WINTER



Winter is a big deal for our wildlife. Snow covers the plants and soil, and it decreases mobility for many species. The days are shorter, leaving less solar energy for plant life. Temperatures are lower, decreasing available thermal energy (heat) for all lifeforms. Since growth and activity are at lower rates, less nutritional energy (food) is produced and available to both plants and animals. These deficiencies have caused winter to be an evolutionary challenge: to survive, successful organisms have had to balance the impacts of the cold season on their energy supplies, even if much less energy is around to sustain them. Even so, some wildlife has adapted and evolved in unique ways to survive seasonal changes, while still calling Canada home.

PLANTS

In areas of Canada covered in snow, the upper layer of soil is frozen and there is little rain. Thus, plants lack the required water and nutrients for growth. Also, below-freezing temperatures prevent sap circulation between roots and leaves, while shorter days and lower levels of sunlight reduce the plants' capacity to produce their own sugars needed for growth through photosynthesis. Because of this, deciduous trees and shrubs, and one type of coniferous tree (the larches), lose their leaves and stay dormant throughout the winter. Coniferous trees and shrubs, and even some plants such as Christmas Fern and Common Wintergreen, like deciduous species, do not grow during the winter but have adapted in a different way. They keep their needles or leaves, which can withstand the cold. This reduces the energy costs of having to regrow leaves every spring. Some of the other plants' seeds can survive the winter even if the plant does not, while others' roots can stay alive because of the snow's insulation.

INVERTEBRATES

Invertebrates, like insects, mollusks, earthworms and others, are ectothermic (meaning that they cannot produce their own body heat and rely instead on heat from their environment). To withstand winter, they have developed either freeze avoidance or freeze tolerance. Both strategies involve dormancy — surviving without being active, and with much slower metabolic rates — since the animal cannot function during the winter because of cold, lack of food and dehydration. Animals with freeze tolerance can reduce the amount of water in their bodies and produce "antifreeze" substances. Some can even survive being partially frozen. Freeze avoidance can happen at different stages of an invertebrate's life (egg, larvae or adult), depending on the species. Some adult invertebrates cannot survive the winter, but their eggs or larvae are able to, allowing the species to continue from year to year. In other cases, the only surviving individual is an adult: the bumblebee queen, for example, is the only one that remains alive throughout the winter so that the colony can be built up again the next spring. Many invertebrates also change their behaviour during the winter in order to avoid freezing: they choose a dry spot where several individuals can huddle together for warmth, burrow underground or under the snow, stay in spots exposed to the sun or, for aquatic species, remain in open water.

FISH

In winter, freshwater fish, like the Northern Pike and the Brook Stickleback, remain in open water under ice and snow. As ectothermic animals, they take on the same temperature of the surrounding water and remain minimally active, moving their mouths and gills to stay oxygenated. Since the cold slows their metabolism and that food is scarce or non-existent, the fish become sluggish, conserving oxygen and energy. When possible, they tend to remain in warmer, quieter water throughout the cold season.

REPTILES AND AMPHIBIANS

Amphibians and reptiles are also ectothermic animals and respond to winter conditions with similar strategies to fish or invertebrates. They stay dormant through winter, mostly inactive, while using their energy stores. Aquatic amphibians, like the Northern Leopard Frog, spend the winter on the bottom of waterbodies that don't entirely freeze, while other species partially bury themselves in the mud, occasionally swimming around slowly to obtain oxygen from the water. Terrestrial amphibians go into dormancy on land. The American Toad and other good diggers bury themselves underground below the layer of frozen soil. Those that cannot dig very deep, like the Chorus Frog, find a hidden spot under fallen leaves or under bark on logs and trees, leaving them susceptible to frost. To cope, they have developed freeze tolerance, and as long as some vital organs remain free of ice crystals (thanks to high concentrations of sugars in their blood), they can thaw and survive even if their heart and lungs haven't worked for many months! They still need an insulating snow cover over their bodies, since if temperatures were to drop below a certain point, they would not survive. Unlike some amphibians, reptiles are not generally freeze tolerant, and must therefore find a way to prevent ice from forming in their tissues. As a solution, Common Garter Snakes and some other species of snakes have hibernacula deep in the soil or in rock crevices where they group up and huddle to conserve heat. Another adaptation by freshwater reptiles such as the Snapping Turtle, which do not need much oxygen to survive, involves burying themselves in the mud at the bottom of lakes and ponds where the water is free of ice.

BIRDS

Birds are endothermic (they produce their own body heat). They must maintain their body functions and activities by finding food and proper habitat. While most species migrate to have access to food sources, a great number of birds have evolved to remain in Canada throughout the year. Many flock together, sometimes with other species, and huddle together to help retain heat. Like the Blue Jay and Northern Cardinal, most remain active by feeding on invertebrate eggs and larvae, nuts, berries and seeds in vegetation. Many have strong beaks, like the Evening Grosbeak, which helps to crack seeds and nuts. Some species, like the Pileated Woodpecker, feed on dormant insects and their eggs under the bark of trees. Common Ravens eat carrion left by predators. The Canada Jay keeps food in caches to survive the winter. Birds of prey that winter in Canada, like the Snowy Owl, are equipped to hunt in winter conditions and some can hear small mammals under the snow. Most birds that winter here find shelter from winds and predators in coniferous trees and dense shrubs. Some, like the Ruffed Grouse, also use deep snow for shelter. As grouse are unable to fly for long distances, they grow fleshy bristles on their feet that act as snowshoes and help them to stay mobile. The Ptarmigan also turns completely white during the winter. A few species of aquatic birds, like the Mallard and Canada Goose, can remain in southern Canada during the winter as long as they find open water habitat, including in urban areas.

MAMMALS

Mammals, like birds, are endothermic. But unlike birds, some mammals have the capacity to hibernate. When in hibernation, animals have low body temperatures, and have slow breathing, heart and metabolic rates. They typically hide in a shelter away from predators. Some mammals alternate between hibernation and wakefulness, like ground squirrels, chipmunks and Black Bears. Only a few species can hibernate efficiently, as it requires survival on limited resources of fat and water in their tissues for an uncertain length of time, but the Woodchuck and some bats (like the Little Brown Bat) have been able to adapt to winter by doing so. Most Canadian terrestrial mammals have evolved to remain active in our northern winters. Some species grow thicker winter fur in the fall, which, for some, is completely white. This helps the Snowshoe Hare, for example, to stay warm and hide from predators. To help with mobility, they, like the Woodland Caribou and Canada Lynx, have rather large feet compared to their body size. Their feet function a bit like snowshoes, so they do not sink as deeply into the snow. To survive, mammals must find food and shelter during the winter. Most active mammal species need to change their diet seasonally as some food is unavailable year-round. For example, the Red Fox eats mainly small mammals in the winter, since there are no fresh berries or large insects. The Moose, unable to rely on aquatic plants and other leafy material during the cold season, eats twigs and buds. Some species change their methods of feeding seasonally. To ensure they continue to have access to food, the Grey Squirrel, Beaver and others store it for later. The Wolverine gets to use its powerful neck and jaw muscles to crunch down frozen bones found on scavenging trips. Just as finding food in the winter is more difficult than in the summer, so too is finding shelter. Species like the White-footed Mouse and the Meadow Vole stay active throughout the winter but dig holes and burrow in the snow and ground where they huddle together for warmth. They can even stay and forage in the warmer layer of air trapped between the snow and the ground. Mammals will use coniferous vegetation, dens, holes in the trees, and more to hide from the bitter winds.

- A Snowy Owl
- B Moose
- C Snowshoe Hare
- D Red Fox
- E Grey Squirrel
- F Ruffed Grouse
- G Pileated Woodpecker
- H Blue Jay
- I Northern Cardinal
- J Evening Grosbeak
- K Raven
- L Chorus Frog
- M Meadow Vole
- N Northern Pike
- O Brook Stickleback
- P Snapping Turtle
- Q Leopard Frog
- R Beaver
- S Common Garter Snake
- T Chipmunk
- U Black Bear
- V Little Brown Bat
- W Bumblebee Queen

To find out more about how our wildlife survives the winter, please visit HinterlandWho'sWho.ca!

HINTERLAND WHO'S WHO

CANADIAN WILDLIFE FEDERATION
350 Michael Cowpland Drive, Kanata, ON K2M 2W1
1.800.563.9453 | CanadianWildlifeFederation.ca

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Illustration: Astrid Collon
Text: Annie Langlois
Copy Editing: April Overall
Creative Design: Sandra Williams