"The strangest hibernator in Alberta lets itself freeze to death. Then it comes back to life, Lazarus-like."

If you live in Alberta and are not human, you have several ways in which to survive the winter.

You can join the humans and stay indoors. Try a far corner of the basement, coiled up in your web or relaxing in your mouse-nest. But don't let the larger residents—feline or bigger—find you.

You can tough it out in the snow. It helps to be mammalian, with fur and warm blood. Or avian, with feather insulation and heat-exchangers in your naked legs. Be aware that some January nights in this province are cold enough to freeze the bell off a moose. And the storms!

You can live in the water. Despite our –30° cold snaps, lakes do not freeze all the way to the bottom. This is good news if you're a fish or a freshwater clam. Sure, you have to slow down and conserve oxygen (because the supply is sealed off by ice and the underwater plants aren't getting as much oxygen as they did in the summer) but you can get by.

Not if you're a duck, though. Gotta have open water. Try the next option.

You can leave and go somewhere warm. Most feathered folks do, and lots of bats, too. Texas, Mexico, Belize, points south… if you're a fledgling warbler taking your first long trip over hostile territory in the autumn, you'll find that the flight goes mostly at night, past severe navigational hazards such as lit-up buildings. Daytime dangers include little boys with BB guns. Risky in the extreme, but the trip must pay off, or all those migrators wouldn't do it—a rule of natural history.

You can survive as an insect egg. OK for insects. (Pupation as a metamorphosing larva is probably more fun. You get to emerge in a completely different form.)

Or you can sleep the cold months away. Good choice; many creatures do it. No home heating bills, no frostbitten nose, no going to work and coming home in the dark. Bear in mind that selection of winter digs is important. When your heart rate is 1 per cent of normal, it's hard to pop up and flee if something bad comes knocking. Try a nice, deep burrow in the ground. Or wedge yourself into the mud below the frost line.

THE LAST OPTION is the choice of most amphibians—frogs, toads, salamanders—which absorb oxygen through their skins while dormant, even while underwater. But it is not the choice of the strangest hibernator in Alberta. This one lets itself freeze to death. Then it comes back to life, Lazarus-like.

Truly, the wood frog embraces death. When the cold weather hits and its brethren are heading for the bottom of the pond, *Rana sylvatica* leaves the water, crawls under the forest duff and nods off. The temperature drops below –2 degrees. The frog's tissues harden with the cold to the point where it goes clunk if you tap it (which is unkind, so don't). It does not breathe at all, has no heartbeat, no detectable brain waves, nothing. It might as well be dead.

Yet when spring comes and the snow melts away and the sun penetrates to the hoary back of this amazing beast, it thaws in half an hour, wakes up and hops away.

This form of hibernation works very well; so well that the wood frog can winter north of the Arctic Circle. But how does it do it?

Briefly, the animal floods its body with glucose—sugar—obtained by quickly breaking down massive amounts of glycogen stored in the liver. (We have glycogen in our livers, too.) In the final minutes before the heart stops, glucose is pumped throughout the frog, acting as antifreeze. It keeps the cells from freezing solid and dumping their fluids into the bloodstream, which would dehydrate the frog to the point of no return. Sharp, growing ice crystals that would otherwise wreck the frog's tissues are isolated, nicely padded out in what amounts to natural jam.

Why freeze when you can gel?

And why spend another minute without learning more about this? Try the web. Searching on *Rana sylvatica* turned up 8,130 sites. Searching on "hibernation" turned up 283,000. Perusing this stuff is good entertainment on a long winter's evening, when you're surrounded by a similarly large number of magical frogs lying under the snow throughout Alberta's woods.

Ben Gadd is a Jasper-based naturalist. He notes that the wood frog—for some unknown reason—has not experienced the severe population decline of other Alberta frog species.

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