

Coping with Winter's Cold

By Jim Fregonara

Leaves have fallen off the trees. The bare branches silhouette the gray sky. Snow blankets the ground and crunches underfoot. Days are short and the nights are cold. The woolens are brought out of the closet, hot cocoa is the beverage of choice, and the smell of wood burning in a fireplace permeates the darkness. These are the wonderful ways humans cope with winter.

But, with temperatures dropping into the single digits, a scarcity of natural food, and fresh drinking water locked in ice, how does wildlife survive? They survive this season by doing one of the six survival words that end in “-ate.” They can hibernate, insulate, congregate, generate, propagate or migrate.

Most people are familiar with hibernating mammals, such as chipmunks and woodchucks, and maybe even hibernating reptiles such as snakes and turtles. Deep sleep, along with low heartbeats, breathing and metabolic rates, enable true hibernators to sleep through the winter. Certain squirrel species can spend up to nine months hibernating in extremely cold climates. Amphibians, such as frogs, toads and reptiles such as aquatic turtles may bury themselves in the mud to escape the extreme cold temperatures while conserving energy. Different species of snakes, including venomous copperheads and timber rattlesnakes

along with non-venomous black rat snakes, can share the same hibernating dens called hibernacula.

Hibernation is a controlled form of hypothermia. This lowering of the body’s internal thermostat is controlled by hormones produced by the animal’s endocrine system. What hibernating mammals do every year would be fatal to humans. Hibernating animals can lower their temperature to near 32 degrees and can lower their heart rate to a few beats a minute.

Breathing rates also decrease greatly since the animal’s metabolic rate drops.

Bats entering caves may have a heart rate up to 1,000 beats per minute during flight before hibernation and will lower their heart rate to five beats per minute during hibernation. Their body temperature also decreases to become

only a few tenths of one degree above the temperature of the cave. Before bats can hibernate they have to double their body weight to provide the necessary stored energy, since they lose 25 percent to 50 percent of their body weight during hibernation. If they are disturbed and awakened during hibernation, they will leave the cave in search of food and use up precious stored body energy. They won’t find their main source of food, flying insects, in the winter. If they return to the cave and return to a deep sleep, they may not have



Little brown bats spend the winter hibernating in caves.

Craig Stiller



Like many birds, the red-bellied woodpecker fluffs out its feathers, trapping a layer of warmer air close to its body.

Photo by Ron Snow



Steve Shaluta

Layers of hair help keep deer warm in snow.

enough stored fuel to make it until spring when insects are out.

Birds such as black-capped chickadees have another trick up their feathers to survive the cold winter weather. They can go into a nightly mini-hibernation to conserve energy. This torpor lowers their metabolic rate and body temperature a few degrees. When the sun comes up, their body warms up and they can begin their daily quest to find more fuel to sustain them for another day.

Another way wildlife survives the blustery winter is to insulate. Many animals eat as much as they possibly can before the winter months to pack on the pounds or – depending on the size of the animal – pack on the ounces. This fat layer acts as a layer of insulation to help keep the animal warm. Animals active during the winter also may spend time in underground burrows or leaf-filled nests that have insulating properties. Ruffed grouse can actually burrow themselves in snow to conserve body heat. Snow can act as an insulator if the outside air temperature is extremely cold. Roosting birds can fluff out their feathers, trapping a layer of

warmer air close to their bodies to help them stay warm during the night.

Deer are insulated by several layers of fur. They have a softer fur close to the body along with longer, hollow guard hairs. The guard hairs are hollow, creating an insulating layer of air warmed by body heat.



Jeff Craig

Bird feeders are an important food source during winter.

Congregating wildlife use a communal approach to conserve precious body heat. By grouping close together, any escaping heat from one animal may be shared by another one. For example, a covey of quail can form a tight group to conserve body heat in the winter. Squirrels and mice cuddle up in a nest for a few days during cold spells to take advantage of shared body heat.

The few animals which remain active throughout the winter spend a considerable amount of time generating body heat to keep warm. This heat generation comes at a high cost, however. These animals spend the majority of every day trying to find fuel in the form of food to power their internal heat production. Birds especially use this survival technique, so it's important to keep your bird feeders clean and full.

Another way for a species to survive the winter is to propagate. If an animal can't survive the harshness of winter, it passes on its survival chances to its offspring. This winter survival technique is used by many species of insects. Adult insects breed before winter, lay their eggs, and then succumb to the first hard frost. With the arrival of warmer temperatures in the spring, the eggs or larvae hatch and grow to adulthood, surviving on emerging sources of food. Unfortunately for the insects, this "method of survival" also benefits woodpeckers and nuthatches that spend a considerable amount of their waking winter days searching underneath bark on trees for over-wintering insect eggs or larvae.

Probably the best known winter survival technique is migration. For thousands of years, many animals have performed the twice a year migration in order for

their species to survive. Examples of migrating animals include some species of butterflies and bats, whales and birds. For them, the benefits of migrating outweigh the costs for making these dangerous trips -- benefits such as better food supplies, longer daylight hours and warmer temperatures. More than 85 species of birds which breed in West Virginia fly south for the winter.

Though we think of birds migrating to warmer climates in winter, a few species of the other group of warm-blooded animals – mammals – also migrate. Pacific gray whales and humpback whales leave the icy waters of the Arctic to swim thousands of miles to the Baja Coast of Mexico or to Hawaii. The hours of Arctic daylight in winter suppresses growth of algae eaten by krill, a shrimp-like crustacean preferred by the whales. The subsequent lack of krill drives the whales to sunnier, warmer climates.

In the high elevation of the Rocky Mountains in the western United States, some members of the deer family practice a vertical migration. They spend the summers in the higher elevations of the mountains and then migrate thousands of feet down out of the snow-covered peaks to the valleys for the winter. This migration again relates more to finding a suitable food supply than escaping colder temperatures.

Even the small, fragile West Virginia state butterfly, the monarch, migrates thousands of miles to Mexico to wait out the winter. Millions of monarchs from the midwestern and eastern United States spend the



Lacy L. Hyché, Auburn University, Bugwood.org

Praying mantis (left) survives cold weather by laying the next generation of mantids in a protective egg case (above).

Photo by Jessica Lawrence, NC State Entomology Department, Bugwood.org



Ron Snow

The monarch butterfly leaves winter behind and gathers with tens of thousands of monarchs in the mountains of Mexico.

winter months in a 70-square-mile patch of land in the Sierra Madre Mountains in Mexico. How can a fragile butterfly make the perilous journey to a place it has never been before? Instincts, replayed over thousands of previous generations, guide these butterflies to their ancestral wintering grounds.

Birds also travel thousands of miles before they reach their wintering grounds. The champion migrating bird in terms of distance is the arctic tern which travels thousands of miles every year from the northern hemisphere to the southern hemisphere. It is estimated that this bird travels enough miles throughout its lifetime to reach the moon! Some of the birds we see at our feeders in the winter have actually migrated from colder, more northern regions, such as Canada, choosing West Virginia as their “warmer” winter destination.

Migrating birds face many perils on their annual treks. An obvious difficulty can be its winter destination. Are the wintering grounds still there, or has the area been converted to agriculture? What physical obstacles will they encounter on the way south?

For example, during peak fall migration time usually in early October, foggy moonless nights coupled with certain wind conditions, can make for hazardous flying

conditions. Birds may fly lower than normal and if there are lights illuminating the dark, foggy sky, the birds can become confused by the artificial light. They then circle the lighted area in a state of confusion and eventually collide with buildings, wires, poles or any other structure. This has been documented in West Virginia at higher elevations: near Monterville in Randolph County; Snowshoe Resort in Pocahontas County, and Tucker County High School. Hundreds of birds of many species have been killed this way. DNR wildlife biologists have found that the birds died from massive trauma received from colliding with manmade structures.

Other manmade structures that have created havoc in the migratory pathways are newly constructed cell or microwave towers, the guy wires holding them up and wind turbines. As we look for balance between human demands and nature’s needs, the paths of migration and location of these obstacles will need to be closely studied.

In spite of all the challenges of migration, many species will continue to use this “-ate” method of surviving winter’s cold. Fortunately for us humans, we can simply grab a sweater and put another log on the fire.

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