The Outside Story

Creating Caches: Winter Preparation

By Loren Merrill

On a recent walk in the Maine woods, I heard a red-breasted nuthatch calling softly to itself. It was 6 feet above me in a large white pine, climbing down the tree headfirst. Looking through my binoculars, I saw that the nuthatch was carrying a red spruce seed, which it slotted under a piece of knobby bark before flying off into a tangle of branches and cones on a nearby spruce. The bird soon reappeared on the pine, 15 feet higher this time, and stashed another seed under the bark on a large horizontal branch. It was still late summer then, but the nuthatch was already planning for winter.

Winter presents several food-related challenges for vertebrate animals in cold climates: there is little in the way of fresh vegetation or nectar to eat; most invertebrates migrate, hibernate, or die; and any fruits, berries, and nuts produced in the fall gradually vanish into the stomachs of hungry competitors. Some animals migrate to avoid winter conditions, while others stay in the Northeast, either entering some form of hibernation or suspended animation, or remaining active throughout the winter months. For those that stay active, finding enough food to meet their elevated energetic requirements becomes a daily challenge.

Red-breasted nuthatches, like the one hiding seeds under the white pine's bark, typically stay in cold climates. They employ a clever trick to ensure they have enough food to last the winter: they create secret food caches across the landscape for later consumption. A number of species engage in this food-caching strategy to survive the winter, including American red and eastern gray squirrels, deer and white-footed mice, meadow and southern red-backed voles, red-breasted and white-breasted nuthatches, tufted titmice, black-capped and boreal chickadees, northern shrikes, and all our corvids (jays, crows, and ravens) to varying degrees.

Gray and red squirrels exemplify the two primary caching types: gray squirrels are scatter hoarders, meaning they cache seeds and nuts individually or in small groups, and red squirrels are larder hoarders, meaning they create large caches of seeds, nuts, or cones in one or a few places.

Animals that store food throughout their territory or home range typically have a highly developed hippocampus, the region of the brain responsible for spatial memory. The hippocampus can undergo seasonal changes, increasing in size during periods when the animal relies heavily on recalling where it has placed its snacks, and decreasing for the months when it feeds on fresh food. This plasticity is handy because the brain consumes a lot of calories, and downsizing a portion of the brain that isn't needed for months of the year can save a lot of energy. The memories of squirrels and birds are not infallible, however, and many seeds are forgotten. These seeds may then germinate and become part of the next generation of trees. Cachers are thought to play important roles in natural forest regeneration, acting as seed dispersers, and even giving the seeds an early boost by burying them in the ground.

In addition to spatial memory, squirrels rely heavily on smell to help relocate their food caches, or to find (and raid) the caches of others. In fact, one of the major problems cachers face is contending with cache thieves. Some individuals make a living as thieves and invest a good portion of their time spying on others. What's an honest, hard-working squirrel supposed to do when thieving spies are everywhere? Researchers have discovered that caching squirrels engage in some deception of their own: if they think they are being watched, they will pretend to bury something in the ground. The would-be thief then wastes time searching for a non-existent food item, while the honest cacher can go hide its food somewhere else.

An important aspect of caching is that the food item being stored needs to have a good shelf life. Nuts and seeds, which are well-suited for long-term storage, make up the bulk of cached food. Birds visiting backyard feeders often split their time between eating the sunflower seeds and hiding them around the yard. The next time you see a black-capped chickadee at your feeder, watch it closely to see whether the bird cracks open the seed and eats it, or tucks it away under some bark for safekeeping. If it's the latter, that's caching in action.

Loren Merrill is a writer and photographer with a PhD in ecology. Illustration by Adelaide Murphy Tyrol. The Outside Story *is assigned and edited by* Northern Woodlands *magazine and sponsored by the Wellborn Ecology Fund of New Hampshire Charitable Foundation: nhcf.org.*

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PO Box 270, Lyme, New Hampshire 03768
mail@northernwoodlands.org / 603-795-0660
www. northernwoodlands.org