



Snowshoe Hare

Varying hare – snowshoe rabbit. Both names describe physical properties of *Lepus americanus*, the big hare of Pennsylvania's north woods. "Varying" refers to its twice-a-year changes in pelt coloration; "hare" identifies it as a member of the genus *Lepus*, related to rabbits but different in several important ways; and "snowshoe" aptly describes the animal's huge, furry hind feet, which help it travel over deep snow.

Biology

Although closely related to the more abundant cottontail, the snowshoe is not a true rabbit. A hare's digestive tract differs structurally from that of a rabbit, and newborn hares are precocial (fairly well developed) in contrast to the hairless, blind cottontail young.

Snowshoes are about 19 inches in length and weigh 3 to 5 pounds, with males generally 10 percent heavier than females. Their body configuration is similar to the cottontail's, although the snowshoe has longer ears, larger feet and a rangier build. In summer, a snowshoe is dark – in winter, white.

In the dark phase, its fur is gray-brown, darker on the rump and down the middle of the back, the throat buffy and the tail dark brown above and white beneath. In autumn, the dark hairs gradually fall out and white hairs replace them. This molt is irregular and might occur in patchwork fashion, but it usually begins on the feet and ears and works upward and toward the rear until the entire pelt is white (except the ear tips, which stay black). A complete change takes about 10

weeks. In spring, another molt occurs. This time, brown hairs replace white, starting with the head and back and ending with the ears and feet by late spring.

Cold temperatures and ground color have nothing to do with the pelt's color change. It results totally from phototropism—in other words, it depends on light. As days get shorter in fall, for instance, a hare's eyes receive light for shorter and shorter periods; this stimulates the pituitary gland, located at the base of the brain. During molt, the pituitary shuts off pigment production in the new fur, which therefore grows in white. In spring, lengthening days trigger the reverse of this process.

Snowshoes have excellent hearing and big ears to catch sounds. Eyes are located on the sides of the skull, providing limited depth perception but covering a wide field of view. A hare may stand erect on its hind legs to see or hear better.

Should a predator threaten, a hare can burst out of a relaxed, sitting position into a dead run. It can race up to 30 mph over ground or snow, leap 10 feet in one bound, dodge with agility and swim if forced into water. A hare circles like a cottontail when chased — although making a larger circle — as it's reluctant to leave its home range. A Wisconsin biologist once tracked a hare in snow for more than an hour; despite continuous, noisy pursuit, the animal stayed within about 10 acres. Unlike cottontails, hares rarely hole up when running before hounds. A snowshoe's four toes are large and positioned wide apart. The bottoms of the toes and the soles of the big feet are covered with coarse hair that grows long in winter, making "snowshoes" that support the hare in deep snow and give it traction on icy crusts.

A hare's home range might be five to 30 acres, depending on density of food and cover. Some individuals probably spend months without moving 100 yards from one central location. Hares do not build nests or dens, although they might shelter from hard rain or snow in hollow logs or rock crevices. Primarily nocturnal, they feed at dusk, night or early morning.

During the day, a hare stays in a "form" — a small depression in the leaf litter or ground, either natural or made by the weight of the animal's body resting there. A form is often on a slight rise, providing drainage to keep the bed dry and allowing the occupant to see its surroundings. For protection from predators, a hare locates its form under overhanging branches, in a clump of shrubs or tall weeds, or at the base of a tree or stump. A hare might have several forms within its territory, but will use the same one most of the time. While resting, it sits with head, neck and body drawn together compactly and all four feet gathered beneath it. Ears may be kept erect or laid back on the neck and shoulders.

In summer, snowshoes eat green vegetation including leaves, clover, jewelweed, dandelions and tender buds and the growing twigs of low woody plants. After frosts kill herbaceous growth, hares may feed on the dried remains until these are used up or snow-covered. However, snowshoes depend mainly on woody plants for winter food, eating twigs and bark as high as they can reach by standing on their hind legs. Deep snow actually helps hares get food by making a platform that lets them reach higher food sources. They feed on aspens, willows, birch, alders, maples and blackberry canes. They eat bark, twigs and often the needles of conifers — firs, cedars, pines, spruces and hemlocks.

Except in breeding season, snowshoes aren't strongly territorial. Many might use the same general feeding area. Through habit and convenience, they use a network of trails and runways, which become conspicuous in the snow.

Courtship begins in early March, when males (also called bucks) fight furiously for females (does), kicking each other with their powerful hind feet. The females become receptive later in the month. Both sexes are promiscuous.

One to six young (usually two or three) are born after a 36-day gestation period. The mother does not build a nest and gives birth while sitting in her form or wherever she happens to be. Young are delivered within a half-hour and start to nurse almost immediately. After the initial feeding, the mother nurses the young mainly at night and remains a short distance away during the day.

Young hares are called leverets. They weigh 2½ ounces at birth, their eyes are open and they're capable of walking and hopping soon after they are dry. Their fine brown fur blends with the surroundings. Young start eating green vegetation when a week to 10 days old and usually are weaned and on their own at six or seven weeks of age.

Hares have potential lifespans of eight or nine years, but only an estimated 30 percent live one year and perhaps 15 percent reach age 2. Snowshoes fall to hunters, disease, parasites and predators. Species that prey on snowshoes include foxes, coyotes, bobcats, weasels and some hawks and owls.

Population

As with many Pennsylvania small-game species, habitat change has caused varying hare populations to decline in recent years. After the nearly total logging of our state's forests in the late 1800s and early 1900s, brushy growth and saplings provided perfect hare habitat, and the population boomed. Today, maturing forests and a large number of deer — which compete for many of the same food sources — combine to restrict the snowshoe population.

Canada, part of the northern United States and Alaska are present strongholds of the varying hare. Its range extends into the northeastern U.S. in mountainous areas. In the Rockies, varying hares range south to central New Mexico. Hares are found in Pennsylvania in parts of the Allegheny Mountains, and on high plateaus in the northwest and the Pocono region. As Pennsylvania is the southernmost part of the species' eastern range, the varying hare is not abundant in our state; even if habitat were excellent, it's unlikely that snowshoes would become as abundant here as they are in New England and Canada.

Pennsylvania's hare population is valuable to maintaining genetic flow of snowshoe hares between West Virginia and New York through our higher elevation habitats in the Laurel Mountains. The maintenance of this link requires continuous management for suitable hare habitat.

In the far north, hare populations fluctuate dramatically. At times, snowshoes become very abundant, with as many as 500 to 1,000 individuals per square mile in primary range. Then the population goes down rapidly for three to five years, hits bottom and starts to climb gradually toward another peak. When hares are abundant for several years, predators increase. Should hares decline over a large area, goshawks and snowy owls range much farther south, while land predators starve or go hungry. It's unknown whether Pennsylvania's snowshoes go through population cycles similar to hare populations in Canada. Concerns about declining hare populations have resulted in shorter seasons and reduced bag limits in recent years.

Habitat

Snowshoes in Pennsylvania inhabit mixed deciduous forests with conifers and escape cover, such as rhododendron and mountain laurel. They favor younger brushy areas, those logged or burned seven to 10 years ago. Hares also live in swamps where cedar, spruce or tamarack grow. Dense stands of aspen or poplar, interspersed with pines, might support hares. In Pennsylvania, high country such as ridge tops, mountains, high swamps and plateaus harbor most hares.

As do cottontail rabbits, snowshoes move into forestland opened up by fires, high winds, ice storms and clear-cutting. While cottontails build up good populations in clear-cut areas in one or two years, snowshoes — with a lower reproductive rate and different food and cover requirements — need up to seven years to take hold.

Browse cutting can help snowshoes by bringing edible twigs within reach and encouraging the growth of shrubs, sprouts and seedlings. Planting conifers, particularly spruce, and cutting tall trees to keep them from shading out mountain laurel and shrubs will provide good cover.

Special Concerns

The timing of color change and the response of hares to climate change is a concern for Pennsylvania's hare populations. When a hare has a white coat and the habitat around it is brown, it is described as a hare in mismatch. In recent years, warmer weather has reduced the duration of snow cover thereby reducing the ability of a white hare to blend into its brown habitat. Mismatched hares are likely subject to increased predation rates.

The hemlock woolly adelgid is causing significant decline of Pennsylvania's hemlock groves. Hemlock groves are thought to be valuable hare habitat because they provide nutritional value and important thermal cover in winter. As hemlock groves decline, hare populations may be detrimentally impacted.

