

MARCH HARE

FROM SPRING MATING RITUALS TO CLIMATE CHALLENGES, SNOWSHOE HARE OFFER AN INTRIGUING LENS ON THE WILD WORLD | BY ALEXEJ SIRÉN

Spring was finally returning to northern New England. The last lingering patches of snow clung to the cold spots under the softwood trees, newly arrived woodcock were “peenting” in the nearby old field, and a full moon illuminated the matted-down lawn where I sat. Out of the corner of my eye, I saw the silhouette of a snowshoe hare bounding along the edge of the lawn. Could this be the hare from last fall that I had observed near the same thicked and gnarled apple tree?

I slowly turned my head, keeping still until I found a comfortable position. The hare appeared to be eating freshly emerging clover and moved fairly quickly from patch to patch, making its way across the lawn, then disappearing among the shadows of the balsam fir trees. From the forest edge, I could hear leaves rustling. The sound was loud enough that I imagined another hare had accompanied the first.

My ears don't fail me. Two hares emerge from the forest edge, zig-zagging slowly back and forth across the moonlit lawn! Eventually they part ways, and one hops in my direction, heading toward my outstretched feet. I remain motionless and incredulous as it just barely touches its nose on the rubber soles, sniffing my boots. Seeming indifferent to this odd lawn ornament, it moves on as it did before, gracefully moving back to the forest edge. I hear the other hare join up again and what follows is a minute-long rustling of leaves. Eventually, one of the hares comes back onto the lawn and bounds effortlessly, but slowly, back to the original patch of clover. Was I witnessing the odd mating ritual of the snowshoe hare, or was this just two males fighting during breeding season?

SPRING FEVER

Snowshoe hare start breeding in March and April. Mating behavior is characterized by persistent chasing by males and mid-air urinations by both sexes. When the female finally becomes receptive and settles down, the male may investigate the female until copulation occurs. However, after breeding, females become more dominant and aggressive towards males. The telltale signs of this odd mating ritual can be seen if snow cover is present. Look for erratic trails and numerous urinations, especially along the margins of alder swamps and fir thickets. However, males are also aggressive towards each other during mating season, often chasing and jumping on each other and occasionally biting and scratching. Based on these descriptions, I cannot be sure that I was witnessing mating between a male and female or male-to-male aggression. I concluded it could have been either.

Snowshoe hare are what wildlife biologists call “r-selected species.” That means they breed a lot, have lots of leverets (baby hares), and live short lives. Indeed, snowshoe hares have 3-4 litters a year, producing 6-18 leverets in total! They are known for their fluctuating population cycles, influencing populations of predators such as Canada lynx, bobcat, coyote and great-horned owl. Hare survival is relatively low and variable compared to other animals. For example, during a population decline, only 3% of juvenile hares may survive to adulthood. However, in some years, when populations are increasing, over half of the juveniles make it to adulthood. Although adults have higher annual survival, typically less than half survive each year, with few living past four years old.





© OUTDOORSMAN / DREAMSTIME.COM

THE LYNX CONNECTION

Snowshoe hares are winter specialists, as their name implies. They have large snowshoe-like feet and relatively light body weight, which allows them to stay afloat in deep-snow conditions. Although they can live in forests dominated by hardwood trees, they prefer 10-50 year old softwood thickets. These forests provide thermal cover in winter and protection from predators. Hare populations are most abundant in spruce-fir forests that have been heavily managed. Most of these areas are found in low-elevation basins of northern New England. Research in Maine showed that the lynx population boom that started in the early 2000s was precipitated by the clear-cut logging that occurred during the 1970s and 1980s due to the spruce-budworm epidemic (the clear-cutting benefited hares, the favored prey of Canada lynx). Most researchers consider spruce-budworm outbreaks as the primary cause of historical lynx population booms in the region. These dynamics differ from western populations, where hare and lynx benefit from forest fires that create early regenerating softwood forest.



© ROGER IRWIN

Fluxuations in local numbers of Canada lynx are closely tied to the changing population levels of its favorite prey, the snowshoe hare.

The feeding habits of snowshoe hare play an important role in forest development.

When spring arrives early, snowshoe hares can be conspicuously white, leaving them vulnerable to predators. Their color change is aligned to day length, not temperature.

As hinted at earlier, snowshoe hares are important for a variety of wildlife species, including predators such as lynx, coyote, bobcat, red fox, marten, fisher and great-horned owl. They also influence forest development by eating the twigs and bark of young trees. When mature trees topple over from wind or ice storms, hares take advantage of the succulent twigs on the tops of trees. During winter, they prefer eating trees and shrubs that have high protein content, such as paper birch, spruce, willow, maples and aspen. During the summer, they eat a variety of succulent plants such as clover, ferns, and goldenrods. Interestingly, intensive browsing by hares results in trees releasing a chemical defense that is unpalatable to hares. Because hare influence a wide variety of animals and plants, they are known as keystone species, specifically of boreal forest ecosystems. The use of the word “keystone” refers to the central stone of an arch that keeps all of the other stones together. Without this central piece, the arch falls apart. Similarly, keystone species dramatically influence the viability of other species and, without them, the ecosystem is greatly altered.



© ROGER IRWIN

DANGEROUS MISMATCH

So what’s the status of hares in New Hampshire? They are less common in the southern part of the state. Any rabbit-like animal you see in the Portsmouth or Nashua area is likely to be an eastern cottontail, not a snowshoe hare. In southwestern New Hampshire, hare are found in isolated pockets in the best habitat. As you travel northward into the White Mountains and beyond, the likelihood of seeing snowshoe hare increases dramatically. Their distribution

LEARN MORE ABOUT HARES

To learn more about hares in New Hampshire, see a report written by Karen Bordeau, N.H. Fish and Game small game biologist, at www.wildnh.com/hunting/documents/nh-snowshoe-hare-assessment-2015.pdf. It contains valuable information on hare biology, ecology and includes a section for managing forest to promote hare populations.



© ROGER IRWIN

|||| HIGH-ELEVATION REFUGE ||||

Researchers from the Northeast Climate Science Center at the University of Massachusetts have teamed up with the N.H. Fish and Game Department, the U.S. Forest Service, and the U.S. Fish and Wildlife Service to study snowshoe hare in the White Mountain National Forest and northeastern Vermont. High-elevation habitat is predicted to be “climate refugia” for many species that like deep-snow conditions and spruce-fir habitats. Climate refugia refers to ecosystems that will have similar climate and habitat in the future, despite predicted changes in climate.

Few studies have been done of high-elevation populations of snowshoe hares because of the remote nature of these areas. According to N.H. Fish and Game biologist Jillian Kilborn, lynx historically were common in the White Mountains during the mid-1900s; today, the state-threatened American marten is often found in these habitats. To further understand the potential distribution of these listed species, as well as the many other carnivores that depend on snowshoe hare, the research seeks to compare the density and survival of low-elevation snowshoe hare to that of snowshoe hare found in the more remote higher-elevation populations of the White Mountains. Researchers are using a combination of pellet (hare scat) transects and remote game cameras, in addition to radio-collaring hares during the spring and summer of 2016 to estimate movement patterns and survival.

Could it be possible that high-elevation hare populations have high survival due to the large swaths of spruce-fir and snow conditions conducive to hare needs? This habitat is predicted to become increasingly important for hare and other boreal forest species as the climate changes. The researchers’ work is not easy. Each spring and fall, they must bushwhack to remote sites in the White Mountain National Forest that range from 1,000 to 4,800 feet in elevation and count pellets in one-meter radius circular plots

(45-50 per site). Many of these sites also have remote cameras nearby to document carnivores and hares.

Researchers will become even busier this year, as they begin live-trapping at a subset of the sites to estimate hare numbers and radio-collar individuals. These radio-collared hares will be followed to record home range size and mortalities. Hares will be monitored at approximately ten locations, with an equal ratio of high-and low-elevation sites. The results of this study will be helpful to determine if high-elevation habitat contains abundant enough hares to support lynx, and if it will continue to provide the habitats so critical to snowshoe hare survival. Stay tuned!



Cooperators participating in North Country research on high-elevation species in 2015 included (left to right) Leighlan Prout (US Forest Service), Will Staats (NH Fish and Game), Jillian Kilborn (NHFG), Lesley Rowse (USFS), Meredith Lewis (University of Massachusetts), Timothy Duclos (Northeast Climate Science Center at UMass), Ashley Newell (NHFG), and the author, Alexej Siren of the Northeast Climate Science Center at UMass.

is directly related to snow! Yet climate change is predicted to decrease the amount of snow and shorten the length of the snow season. While this may be beneficial to cottontails, which are poorly equipped for snow conditions, the opposite is true for snowshoe hare – something that has captured the concern of biologists and researchers alike.

Another problem is that, unlike cottontails, snowshoe hares change color from brown to white in the beginning of winter and back again to brown in the spring, a transformation triggered by changing day length. Recent research has shown that hares are experiencing more mismatch scenarios in which the snow melts early or comes late, and the hares are unable to blend into their surroundings. Interestingly, hares do not seem to recognize when they are mismatched to the background conditions, and higher predation results when they do not have a camouflage advantage. They are also more vulnerable as climate change seems to increase the duration and frequency of snow conditions that allow for many predators to move around freely on top of the snow crust.

Viewing hares is a fun pastime in New England. If you know of a place with lots of softwood thickets and small openings (lawns, etc.), watch closely at dusk and dawn, especially in the spring when newly emerging plants are poking through. Also, the continued participation by hunters to report hare sightings or the numbers harvested during the small game hunting season is helpful for management. Please continue reporting, and best of luck finding hares. Watch out if it's March, though!



Alexej Sirén is working on his doctorate through the Northeast Climate Science Center at the University of Massachusetts, studying the influence of climate change on montane boreal forest species in New England. He is collaborating with several state and federal agencies, including the N.H. Fish and Game Department, and has over a decade of research experience in the region. He considers himself lucky to be working in his backyard with incredible support from agency biologists.

New Hampshire Wildlife Journal is your best source for fishing, hunting, wildlife and conservation information in the state.

DID YOU ENJOY READING THIS ARTICLE?

Every issue of N.H. Wildlife Journal includes stunning wildlife photography, in-depth features and "how-to" articles – plus Naturalist's Notebook, Warden's Watch and no advertising.



So what are you
waiting for?
Subscribe today!

www.wildnh.com/pubs/wj-magazine.html