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on the
REBOUND

by Jillian Kilborn

It was the winter of 2000/2001, and it seemed like the snow would never stop falling. Coos County was blanketed with fresh fluffy snow on an almost daily basis, and it was April before snowbanks melted below head height. During that winter, I was first introduced to the species that would become the focus of much of my career, the American marten.

I was fresh out of college, wildlife management degree in hand, and had just been hired to fill a temporary vacancy created by a biologist returning to the University of New Hampshire for master’s research. The landscape was white, but I was green in so many ways! I could identify trees by their leaves and buds, but couldn’t tell you how to manage our forests for wildlife. I could identify wildlife tracks in a book, but couldn’t tell you what a track looked like in the snow. Slowly, this began to change over that long winter, as I was mentored by regional Wildlife Biologist Will Staats. We spent the majority of our time on snowshoes and snowmachines, walking deer yards, conducting track transects, examining moose wintering habitat, and looking for bears in their winter dens.

In all of our travels that winter, Will beamed with a special excitement each time we stopped to examine a unique track in the snow. His well-trained eye could spot American marten tracks with amazing accuracy. I used my GPS to mark the location, because at that time, marten tracks were not common. In fact, American marten had been considered threatened since the passage of the State Threatened and Endangered Species Act in 1979.

Marten were once found throughout nearly all of New Hampshire, but by 1979, it was likely they remained only in a few isolated pockets north of the White Mountain National Forest. Will had begun to document the expansion of marten in New Hampshire in the 1990s, possibly the result of reintroduction attempts in the 1950s and 1970s, but a systematic approach to documenting marten distribution in New Hampshire had not yet been undertaken. After that winter, I joined Fish and Game’s Nongame and Endangered Wildlife Program to help monitor many of the listed and nongame species found in northern New Hampshire. During this time, I was able to explore my interest in marten, and so began my story of documenting their recovery in New Hampshire.

While concerns remain, American marten are making a comeback in New Hampshire.
Elusive Target

With a handful of GPS locations and a few of Will’s hand-drawn X’s on a map, I worked with John Kanter, then the Nongame Program Coordinator, to propose a research project that would document marten distribution across New Hampshire. This would be the first step in understanding the status of one of the most elusive mammals in the state. I had the opportunity to travel to UMass Amherst to attain my master’s degree implementing the marten research, a project funded in part by conservation dollars from the Moose Plate Program.

Over the next two summers, I systematically sampled for this mid-sized member of the weasel family in habitats from the White Mountains to the Canadian border. Using live traps, I sampled some 177 locations. Two live traps set at each location for 10-12 nights yielded nearly 4,100 trap nights of effort resulting in 34 captures in 32 different locations. This painted a picture of the areas where marten could be found. I used these captures, along with data collected from our knowledgeable trappers and the tracker community, to display the distribution of marten. The occurrence data were then coupled with variables such as habitat, snow distribution, and depth and fisher abundance to create a map showing the actual versus predicted statewide marten distribution. Based on what we had learned at that time, it appeared we had a long way to go before marten could be considered recovered.

In 2010, using mitigation funds from a high-elevation industrial wind development project, we were able to expand our knowledge about the intriguing marten and their evolving story in New Hampshire. Working with the University of New Hampshire, we set out to study the importance of our high-elevation habitats and to discover the potential impacts of the fragmentation created by the wind development. We also wanted to finally identify a survey method that we could use to track marten densities over time, one that would give us a better understanding of their abundance in relation to their distribution.

That study confirmed that high-elevation (above 2,500 feet) was a critical habitat component for marten. Especially in the winter, these areas provide complex structure close to the forest floor. The structure not only supports higher densities of prey, such as red squirrels and small mammals, but also provides important access to them during the cold snowy months when prey is active in the subnivean (beneath the snow) world. In addition, high-elevation habitats have some of the deepest, fluffiest snow during those winter months, minimizing the access of competing carnivores, such as fisher and coyotes, which are not as well adapted for hunting in those conditions.

We also discovered that fragmentation had impacts that we didn’t foresee. Forest carnivores (coyote, fox, and fisher), typically unable to use high-elevation habitats in the winter, were able to access these areas using compacted road and snowmobile trails that accompanied the wind development. These well-packed routes became superhighways for competing species to get into the mountainous terrain that the marten once had all to themselves. Throughout the study, we were able to attribute much of the marten mortality to these competing species.

Before 2000, marten were rare in New Hampshire Systematic research through 2005 yielded a better picture of marten distribution and the high-elevation habitat they need (shown in black). By 2015, marten had expanded into many of these identified areas. The species remains challenged by a changing climate.

Conservation license plate ("Moose Plate") dollars have been a critical part of the funding for Fish and Game’s ongoing research into the abundance and distribution of marten in New Hampshire.
Future Outlook

By 2015, New Hampshire marten had expanded into many of the areas predicted to be able to support marten back in 2005. During the winter months, marten tracks were some of the most commonly seen at high elevations and in northern habitats in Coos County. It was time to consider removing marten from the Threatened and Endangered Species list in New Hampshire. After the completion of the updated Wildlife Action Plan in 2015, the Nongame and Endangered Wildlife Program set out to review the list. An analysis of 16 years of data revealed that because of its widespread distribution and growing abundance, we could justify delisting marten.

While this secretive mammal was removed from the Threatened and Endangered Species list in 2016, we still had some significant concerns that would call for further monitoring. Marten are sensitive to changes at the landscape level, as well as at smaller scales. Here in New Hampshire, martens are on the southern edge of their range, making them an

New Hampshire’s northern forests are threatened by changes in the climate and other pressures that have reduced the amount of the spruce-fir habitat that martens need.
excellent species to monitor over time, especially as we experience the effects of climate change. We are already seeing dramatic shifts in our winter weather, to the detriment of marten. Shorter winters with decreased snowfall affect martens. So do warmer temperatures, resulting in snow with higher moisture content, which in turn creates dense, supportive snow that gives a variety of competitors access to high-elevation habitats.

Similarly, we are seeing a transition of our northern forests away from a boreal or softwood (spruce and fir) composition. Marten utilize softwood and mixed-wood habitats during the fall, winter, and spring, before the hardwood trees have leaves. Year-round access to the forest canopy provides important escape cover from predators, as well as hunting opportunities for martens. Extensive timber harvesting in parts of northern New Hampshire has also led to large areas of forest that lack the structure and complexity that martens prefer near the forest floor.

As a result of these concerns, Fish and Game once again is collecting data to ensure that our management decisions are sound. Marten will remain on the list of species of special concern while we attempt to better understand their recovery and address some of the threats.

During the winter of 2016/2017, the Department began collaborating with UMass Amherst to measure marten density at a landscape scale and establish a method to track marten population changes over time. To do so, we are replicating the monitoring techniques identified during the wind development study to conduct a “mark recapture” study using trail cameras focused on the unique throat patches of individual marten. These “camera traps” are designed to take photos of marten throat patches as the animals eat from a can of sardines placed at a specific distance and position in front of the camera. Each marten is identified by the size and shape of its throat patch.

Cameras are then deployed in a grid design so that individual martens can be “captured” at multiple different camera traps. The capture data are then used to estimate density and evaluate the influence of different factors, such as forest type and snow depth, on marten populations. This type of work is on the leading edge of marten conservation and is being duplicated by other states.

So, here I am, 17 years later, still trudging through the snow learning more about one of my favorite mammals, the American marten. While they are doing quite well in much of the state, marten still face challenges. Stay tuned… we will let you know what we find in the ongoing story of marten in New Hampshire.

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