

# Why We Hunt Moose

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*By Kristine Rines, NHFG Moose Project Leader*

When this state was first colonized by Europeans, moose were described as being more numerous than deer. Moose were so numerous they were used as a primary source of food and clothing. At that time, there were no laws governing wildlife use, and between subsistence hunting and market hunting, moose quickly became scarce so that by the mid-1800's only a dozen animals could be found, and only in the far north. With the advent of the NH Fish and Game Department, moose were able to make a comeback. By 1980, they were once again found statewide and in 1988 when the first modern day season was instituted, the estimated population was 1,600. The population grew quickly, and by the mid-1990s, the population was estimated to be at approximately 7,000. At this level, most people were unhappy with the high number of moose/vehicle collisions and requested the Department reduce the moose population. This was done and subsequently, when the population reduction had been achieved, the Department reduced permit issuance. But even with the reduction of moose permits, the moose population continued to decline. Today (2018) the statewide moose population is estimated to be 3,300.

## A Changing Climate

Unfortunately for moose, over the past 40 years our winters have shortened due to climate change. New Hampshire's winter is currently three weeks shorter than it was in the 70s. As our climate continues to change and warm, our environment will become home to many more parasites and diseases from which our long cold winters have protected us in the past. Moose evolved in the far north and are not equipped to deal with these southern ectoparasites and diseases. In addition, their large muscle mass, thick skin and coat, and small volume to weight ratio, makes it difficult for moose to disperse heat and predisposes them to heat stress in warmer environments. As a result, moose have never existed in warmer climates. New Hampshire and Massachusetts have long represented the southern edge of moose range in eastern North America and the two states are the transition zone between environments that will and will not support moose. Because we are on the southern edge of moose range, it takes very little change to tip the scale one way or the other for moose.

Climate science indicates that our winters could be 50% shorter by the end of this century, eventually becoming similar to that of North Carolina. This is not a climate or environment that could support or sustain moose or a host of other cold-adapted species that we enjoy and value here in New Hampshire. With shorter, milder winters and expanding numbers of parasites and wildlife diseases, it's very likely that moose will eventually disappear from the New Hampshire landscape. We don't know how long this could take. Moose may be able to persist in very low levels in small pockets if winter persists. But, the cold snowy winters we have always experienced are not expected to exist here in the future.

What we do know is that currently moose in New Hampshire are dealing with higher levels of two parasites that are causing statewide populations to decline. Winter tick and brainworm are both parasites that are directly and indirectly benefitting from shorter winters. Winter tick is influenced by both shorter winters and moose density. These ticks become a problem for moose when late arriving snowfall affords ticks a greater opportunity to attach to a host in the fall. In areas that have delayed snowfall and delayed freezing weather, more ticks survive and successfully hitch a ride on moose. Moose density is also an important variable in the success of ticks. The ticks thrive in areas of high moose density; as moose density declines so do tick numbers. In our state, we see far fewer problems with ticks at moose densities below 0.25 moose/mi<sup>2</sup> with our current winter length. It is important to remember that ticks will not cause moose to disappear but can drive them to very low levels, since tick problems are expected to abate at low moose densities.

## Parasites

Brainworm is another parasite that kills moose. In the same way that tick numbers proliferate in the presence of high moose densities, brainworm proliferates in the presence of comparatively high deer densities. While brainworm is fatal to moose, it has no measurable impact on deer. At deer densities in excess of 10 – 13/mi<sup>2</sup>, moose densities tend to decline to very low levels. Our deer densities have increased in recent times, presumably in response to milder winters. Deer densities in the southern half of the state are now above the levels found to cause moose to decline. Brainworm mortalities have been seen statewide in moose.

Given current climate and parasite trends New Hampshire's future capacity to sustain moose is doubtful. If we stopped hunting moose they would not "bounce back." Hunting at current conservative rates is not causing moose populations to decline. Currently (2018), hunting is taking 1% of the standing moose population of approximately 3,300 animals. Vehicle kills account for 3%. In our ongoing study of moose in northern New Hampshire, we lost approximately 35% of the study population to ticks in 2016. As our winters shorten, years that result in high tick-induced calf mortality and reduced cow productivity are occurring more frequently. In areas of the state where ticks are not an issue, the moose population is declining slowly, probably due to brainworm. Given weather variability, we are not seeing a steady population decline, and in some years we see growth. However, looking at long term trends, the moose population is slowly declining.

## Conservation

At what point should we stop hunting? The answer is more of a social decision than a science based one to the extent that current moose harvest is having little if any impact on population growth. While we still have a robust moose population (densities range from 0.10 to 1.94 moose/mi<sup>2</sup>) social considerations and public opinion play a major role in deciding at what point to stop harvesting a species that is being adversely impacted by a moderating climate and whose

future is questionable given predicted changes in our climate and environments over the next century.

As part of the development of the 2016-2025 New Hampshire Game Management Plan, in 2015 we asked the public at what point in each region permit issuance should be suspended. The following graphs show the estimated regional moose density (white line), the moose population objectives from the current and previous management plans (red line) and the resultant regional “permit cut-off thresholds” from the 2016-2015 plan (green line).

As we learn more about how moose might respond to changes in our environment, these thresholds may be revisited. Until then, the green lines represent the moose population density at which regional permit issuance will be suspended. Permits may be re-issued if the population experiences at least two years of growth that results in a population at least 13% greater than the suspension threshold.

Currently moose permit issuance has been suspended in the South West Region. There is not a cut-off threshold in the South East Region since the public has previously asked that moose numbers be held at the lowest possible levels due to concerns over moose/vehicle collisions resulting from high road densities and traffic flow volumes in the region. The remaining regions remain above the cut-off thresholds. As long as the public agrees and the science indicates negligible population impacts and until regional cut-off thresholds are reached there will continue to be regional moose hunting in the state, commensurate with regional population trends and status. As the cut-off thresholds are reached, moose permits will stop being issued, but it is very important to remember that this will not allow moose to rebound. Only a change back to a colder climate and longer winters will do that.

# Moose Data

