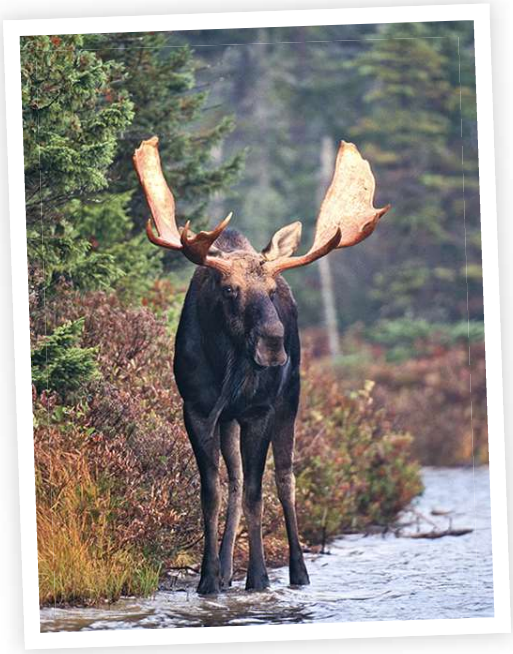
MINNESOTA'S MOOSE

MOOSE MISSION | MINNESOTA ZOO

HEALTHY HABITAT

Forest age plays a role in the quality of moose habitat in northern Minnesota. However, decades of fire suppression combined with a century of decreased logging have led to a slow aging of the forests in northern Minnesota. Although mature conifer forests provide important cover for moose, they aren't the best source of food. Moose depend on leafy deciduous plants found in younger northern forests for food. The location of quality food and cover within a moose's habitat can affect moose sensitivity to predators, disease, parasites and temperature. Healthy moose habitat provides a mix of leafy deciduous plants and mature conifers, but in some areas healthy habitat is getting harder to find.



FIRES AND OTHER DISASTERS

During annual surveys in northeastern Minnesota, moose are often found at higher density in habitats that have undergone large-scale natural disasters. Research has shown that these catastrophic events, such as the 1999 blowdown of trees in the Boundary Waters Canoe Area and Wilderness (BWCA) or the 93,000-acre Pagami Creek Fire in 2011, can benefit moose habitat. Moose move into areas that have undergone a major fire event 3–5 years later. It took about 8–10 years for moose to return to the blowdown area of the BWCA. These events clear the existing forest and create an environment for forest re-growth. Although these natural processes have negative impacts on tourism, local communities and the economy, research has shown that they benefit moose and are important for ecosystems health.

CLIMATE FACTOR

Moose act differently when average winter temperatures are above 24°F. Moose can overheat easily with a warm winter coat, so they rest more during warm stretches of winter temperatures. Similarly, moose behavior changes when average summer temperatures are above 68°F. Instead of spending the summer eating and gaining weight to survive the following winter, moose spend more time resting, less time eating, and search out areas that provide shade or cooler temperatures. Moose in poor health are more likely to die from disease, parasites and even predators. Over the past three decades, there has been an increase in winter warm stretches and in the number of summer days above 80°F in northern Minnesota. As moose face multiple health challenges at once, it's difficult to pick out the effects of a changing climate alone. Further research is underway to look at the physical effects of temperature on moose.

LOCATION, LOCATION, LOCATION

The health and management of Minnesota's moose population is complicated. Disease, parasites, humans, predators, habitat quality and changes in climate work together to influence Minnesota moose health, making the work of biologists and natural resource managers difficult. Furthermore, these factors vary across moose range. For example, wolves appear to eat fewer moose in Voyageurs National Park than elsewhere in Minnesota. While there is no one-size-fits-all solution to managing the challenges moose face in our state, scientists have learned much about trends across moose range:

Northwestern Minnesota
There are a small number of moose in northwestern Minnesota. This part of moose range has a high calf survival rate, low pregnancy rate and low adult survival rate. The moose population in northwestern Minnesota peaked with roughly 4,000 animals in the 1980s. After a steep decline in the 1990s, the population is now estimated to have less than 100 moose.

Voyageurs National Park
The moose population in Voyageurs National Park, in north-central Minnesota has remained stable over the last decade. Moose density is low within the park with only about 40-50 individuals. This area has a low pregnancy rate, high calf survival and high adult survival rate.

Northeastern Minnesota
Minnesota's primary moose habitat is in northeastern Minnesota. The population in this part of the state peaked in 2006 with over 8,000 moose. Following a rapid decline between 2007 and 2013, the population has been relatively stable with 3,200–5,600 moose for the past several years. This part of moose range has a normal-to-high pregnancy rate. However, the calf and adult survival rates are low.

PREDATORS

Although they account for 30% of all Minnesota moose deaths, predators do not appear to be driving moose decline. Wolves tend to focus their kills on sick, young or old moose. In one study, nearly half of the moose eaten by wolves had other health issues that made them easier prey. While wolves are the only predator of adult moose in Minnesota, moose calves are preyed upon by both wolves and black bears. Roughly half of all moose calves are eaten within the first 3–4 weeks of life. Only one-third survive until their first birthday.

MOOSE HEALTH

Research suggests that parasites and disease play a big role in Minnesota moose health. In fact, 65% of all moose deaths are due to health-related factors such as infections, birthing, parasites and disease. Some of the most impactful parasites for our state's moose are brainworm, liver flukes and winter ticks.

Brainworm
Brainworm is a parasite that infects the brain of a moose. Symptoms of brainworm in moose include weakness in the hind quarters, tilting of the head, inactivity, loss of fear and moving in circles, often resulting in death.

Liver Flukes
Liver flukes are flatworms found in the liver of moose. Once in the liver, these parasites can cause infection and liver damage. Generally, moose can survive a heavy liver fluke infestation. However, severe cases of liver flukes can cause poor health and weaken a moose against other health challenges.

Winter Ticks
Hot summers and mild winters fuel tick outbreaks. In autumn, ticks will attach themselves to moose to survive the winter. A single moose can be covered with thousands of feeding ticks. The blood loss can weaken a moose. Additionally, moose covered with ticks will accidentally rub off their fur to get rid of the ticks. Without a warm coat, these ghostly-looking moose can suffer from hypothermia and die in winter.