

# Exploring the Future of Canada's Moose

A LOOK AT CHALLENGES AND THREATS AFFECTING THE SPECIES

By Vince Crichton, Ken Child and Bruce Ranta



Credit: Vince Crichton

The origin of Canada's moose population can be traced to their ancestors currently inhabiting eastern Asia. These migrants arrived in North America approximately 70,000 to 10,000 years ago (Hibbard et al. 1965). Their movement was facilitated by a natural corridor, the Bering Strait land bridge, which at that time connected Asia and North America. Moose, despite their relatively late appearance in the New World, likely preceded the arrival of humans (Reeves and McCabe 2007).

Moose dispersed southward along an ice free corridor created in the McKenzie River basin by division of the continental ice cap into two ice sheets — the Cordilleran to the west and the larger Laurentide

to the east. Progressive melting about 14,000 years ago enabled moose to move south between the ice sheets, taking up residence in new emerging habitats as the ice retreated (Peterson 1955).

Today, moose occupy all Canadian provinces and territories with the exception of Prince Edward Island. Although an icon of Canada's boreal zone, they are increasing in the prairies of southern Saskatchewan, Alberta and Southwest Manitoba. Expansion into these regions appears to have coincided with the demise of small, privately owned farms being replaced by large, corporate farms, which likely reduced an undocumented moose harvest. In Nunavut and Labrador, moose are slowly expanding northward.

Moose wander through Manitoba's Riding Mountain National Park in search of water. Parts of Manitoba, Saskatchewan, Ontario and British Columbia have seen dramatic declines in moose populations over the last decade.

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While some moose populations are stable, even if they are below historical levels, many others are in decline. For example, populations in west central and southeastern Manitoba, eastern Saskatchewan and parts of Ontario and British Columbia have seen a dramatic decline ranging from 50 to 80 percent since around 2000 ([B.C. Ministry Forest Lands and Natural Resources 2013](#)). In addition, researchers have documented precipitous declines where moose are accessible by road and are concerned about the effect expanding roads will have in more remote areas.

Other factors are also playing a part in their decline. While researchers estimated Canada's moose population at around 750,000 about a decade ago ([Timmermann 2003](#)), the overall population is now less, due to the cumulative impact of hunting, climate change, predation, disease, maturing habitat and increased penetration of roads into moose habitat. In response, wildlife professionals are working toward identifying current threats and implementing measures to protect the region's moose populations.

### What's Troubling Canada's Moose?

Moose are an integral part of Canada's biodiversity, with additional significance to the culture and economy. Historically, they provided food, clothing and a variety of tools for early peoples and settlers. In more recent times, they have generated millions of dollars annually via hunting, viewing and photography by both residents and tourists.

Unfortunately, Canada's moose face a number of threats today including disease, hunting, habitat degradation and increased access. Below, we examine some of these threats:

**Predation.** Wolves, black bears and grizzlies are the primary predators of moose ([Ballard and Van Ballenberghe 2007](#)). The impact of predation on regulating moose populations is debatable; however, as moose numbers decline, the effect is accentuated. In the mid-80s, researchers conducted a study where they removed 12 black bears from one area in Saskatchewan and 26 from another and found that the cow/calf ratios of moose in those areas were significantly greater than in areas in which no bears were removed ([Stewart et al. 1985](#)).

**Incidental mortality.** Moose deaths from vehicles; fighting injuries; calf abandonment; drowning; entrapment in holes, crevices or deep snow; birthing issues and injuries from slips and falls were once considered

to be of little consequence, but research suggests they claim thousands of animals each year in North America ([Child et al. 1991](#), [Child 2007](#)). Although quantifiable data on the extent of these losses is lacking in most cases, researchers infer that the effects may be long lasting. In British Columbia, researchers estimate 10 to 30 percent of the annual allowable moose harvest is collectively lost to vehicle or train collisions.

**Disease.** Moose are susceptible to a variety of diseases and parasites ([Lankester and Samuel 2007](#)). While viral and bacterial diseases may affect few individuals, two parasites are recognized to impact moose populations — the meningeal or brain worm (*Parelaphostrongylus tenuis*) and winter tick (*Dermacentor albipictus*). The former occurs in Manitoba and eastward; whereas the winter tick, an external parasite, is common in most areas with the exception of Newfoundland and rarely occurs in the Yukon. Winter tick-transmitted diseases have periodically been documented in the provinces of Alberta, Saskatchewan and Manitoba and have resulted in significant mortality. These events are weather related — early springs help females survive after dropping from moose while a warmer, snow-free autumn helps more larvae find moose ([Samuel 2004](#)). In the spring of 2002, west-central Manitoba lost about 40 percent of its moose population to winter tick infections followed by a late, cold and wet spring.

**Hunting.** All Canadian jurisdictions with moose populations advertise and regulate moose hunting. Licenses are allocated either via a lottery system or over-the-counter sales. In 2000, 344,871 licensed hunters harvested 70,744 moose across Canada, whereas a decade earlier 383,760 hunters harvested about 78,653 moose ([Timmermann 2003](#)). The total estimated population of moose in 1991 was 662,200, whereas in 2001 it was estimated to be 784,000. Estimates put today's Canadian population as significantly less with the exception of Newfoundland, Nova Scotia's Cape Breton Highlands, eastern Quebec and New Brunswick. In addition, the numbers of licensed hunters and the associated harvest has likely also declined as moose licenses, often along with tags, are usually reduced when population numbers fall. The one notable exception to this is Quebec, which has approximately 175,000 licensed hunters.

In addition to regulated hunting, most jurisdictions have unregulated, rights-based hunting by different indigenous peoples, though the magnitude of this harvest





is unknown. Similarly, the impact of illegal poaching is also largely unknown and likely varies by region.

**Habitat uncertainties.** Activities such as forest fire suppression, reduced logging and forestry practices tend to impact the quality and quantity of moose habitat. In Ontario, fire suppression has had a dramatic impact on total acres burned and the supply of nutritious foods, which follow such fires. Researchers found that about 1.54 percent of Ontario used to burn annually, but with fire suppression, only about .17 percent burns. This magnitude of change is likely similar in other jurisdictions (Ward and Tithecott 1993).

Until recently, logging likely compensated for the shortfall of early succession — the favored habitat of moose following fires — but logging has declined drastically across Canada's boreal forests.

**Inadequate funding.** Resource agencies over the last few decades have experienced funding constraints, staff reductions and increased workloads, as politics can often trump resource conservation. In Manitoba, for example, all funding for aerial monitoring was cut from 2000 to 2005 and all questionnaire surveys of the province's licensed hunters to determine harvest levels was curtailed in 2014, making science-based management impossible.

**Easier access.** The effects of greater access and new technology are cumulative and increase the risk of moose death. Hunters have access to cars, 4X4 trucks, all-terrain vehicles, snow machines, airplanes, high-powered firearms with enhanced optics, satellite maps, GPS locators, radio and cell phone communica-

tion, trail cameras and drones. Road networks often created for resource extraction offer increased access and fragment habitat (Rempel et al. 1997).

Although the significance of these mortality factors may be obscure, experts contend that enough is known to reverse the downward trends.

## Protecting An Icon

In order to protect and manage moose populations, wildlife professionals and government agencies must develop workable, proactive conservation strategies with enforceable legislation to sustain populations in the face of anthropogenic and natural pressures. Now is the time for management agencies and politicians to collaborate with conservation organizations and the public in order to develop and implement strategies that will secure the future of this boreal forest icon.

Where populations are declining but have not reached levels necessitating restrictive conservation measures, remedial actions must be developed and implemented. In provinces such as Newfoundland and Labrador where moose populations exceed biological or social carrying capacity, government officials have implemented measures to reduce moose populations to acceptable levels. In fact, earlier this year, the province released a five-year moose management plan with a vision of improving the sustainability of the moose population that reflects social and ecological factors while seeking to maximize the social, cultural and economic benefits of a viable moose resource. While the previous focus was to provide a sustainable yield of moose for hunters, the new plan addresses concerns that threats such as moose vehicle collisions, nuisance moose management issues and the environmental effects of a hyper-abundant moose population were not properly addressed.

Moose management is continually faced with social, political and biological challenges (Crichton et al. 2007) and to achieve conservation success, the following additional approaches are worth considering:

**Biology and Social Structure.** Adult female and calf survival is the key to growth and sustainability of moose populations. Maintenance of social structure is also critical and involves ensuring the presence of an adequate number of prime breeding bulls. In small populations of a few hundred moose or less, both factors can be severely compromised and deaths from predation and disease can hinder recovery.

**Hunter Education.** In general, moose populations may be at risk without adequate controls

Author Bruce Ranta and a friend head back to their camp in eastern Manitoba with a harvested moose. As part of an effort to maintain sustainable levels of moose in the province, hunters are only allowed to harvest bulls.



Credit: Vince Crichton

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on harvest. For instance, when harvest exceeds recruitment or alters the sex and age structure, populations will decline and the gene pool will suffer. Hunter education should focus on fundamental moose biology, population demography (e.g. moose lack the reproductive potential of white-tailed deer thereby compromising their ability to recover from catastrophic events) and the effects of hunter harvest. Also, topics such as firearm safety, hunter ethics, field dressing and carcass care ensure hunting continues to be acceptable and viewed positively by society at large.

**Legislation and Role of Government.** When it comes to managing moose, government ministers can benefit from working directly with field biologists to ensure critical messages are not being filtered by managers who may have little or no background in wildlife biology. Proactive and contemporary management systems, including enforceable legislation, are required when populations swing out of balance. In 2011, Manitoba took such an approach to address declines by prohibiting all hunting in some areas. The province also established an ongoing wolf reduction program with the help of registered trappers. Although the results are not yet available — population monitoring was compromised in the 2014/15 winter due to a lack of sufficient snow cover — reports from the public and biologists suggest more moose are on the landscape.

Similarly, in 2014, government officials responsible for wildlife management in Nunavut and the Northwest Territories acknowledged that voluntary caribou hunting restraints were ineffective and subsequently enacted hunting restrictions.

But despite the recent attention focused on declining moose, Canada lacks effective management due to financial constraints. A survey carried out in 2013 revealed that Quebec was the only Canadian jurisdiction that had a current plan, while others have drafts or iterations that are dated, incomplete or in early stages of development.

**Collaborating with Indian Tribes.** Indigenous claims to resources and government obligations to accommodate those claims continue to keep moose management in the spotlight. Governments continue to struggle between balancing hunting and fishing access claims of some indigenous peoples in Manitoba, Saskatchewan and Alberta with obligations toward sustaining moose populations. It's critical to recognize the significance of this resource in relation to indigenous culture and, as part of that

effort, outreach programs could help ensure harvesting is reported and contemporary management programs are not compromised.

### Additional Recommended Actions

Provincial, territorial and federal governments must work collaboratively with indigenous peoples, wildlife professionals, scientific and hunting organizations and the public to develop visions and goals, which will ensure a binding, regulatory framework for moose management. Actions that could maintain sustainable moose populations include effective and enforceable harvest controls; expanded management tool box (e.g. bag limits, tag restrictions, conservation licences, season lengths, party hunting, hunting hours, vehicle and road restrictions, reduced deer numbers, proactive predator management); sufficient sustainable funding for monitoring and management-related research activities; long-term studies to assess the potential effects of climate change; public outreach programs (i.e. education); and improved implementation of management actions in a timely manner.

### The Future of Moose Conservation

There's a lot to be done. As wildlife professionals work toward protecting and conserving moose populations, governments must implement a number of measures such as incorporating contemporary hunting strategies into current management plans and adhering to their obligations to indigenous peoples as a means to secure the sustainability of populations for current and future generations and maintain ecosystem integrity.

Moose conservation can be complex — involving human dimensions of management, subsistence issues, management challenges, research gaps and changing perspectives (Crichton et al. 2007). The major challenges facing agencies are developing a mechanism that facilitates meaningful public input into management decisions and implementing plans that are current and concise and clearly enunciate objectives for achieving goals. The essential element for the future wellbeing of this resource is co-management partnerships that are respectful, transparent and which acknowledge the hurdles to overcome. Further, plans must be based on sound science, which includes data on population status, mortality factors, habitat limitations, practical options for achieving the enunciated goals, effective legislation, recognition and accommodation of diverse uses and values and a time frame for evaluating and updating plans. Only then can management and conservation of moose in Canada be successful. ■



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