# Seeing the Forests for their Hoofage and Stumpage Values

**Few animals symbolize BC wilderness like moose. While the majority** of BC's human population does not live within the range of moose, many residents of the province travel to see these magnificent creatures, to observe and photograph them, and in some cases to hunt them. Moose are of critical importance to many First Nations.

Moose populations in several parts of BC have been in decline since the mid 2000's (Figure 1), with some populations dropping by 50 to 70 per cent[1]. Most people studying moose suspect that the declines are attributable to a concert of factors.

Moose populations are regulated predominantly by predators, parasites and disease, climate, and habitat quality and quantity. Direct human causes such as hunting and vehicle/train collision mortality also have some impact.

Predators can and have been controlled, but current BC provincial policy limits predator control to special circumstances such as controlling specific individuals or packs of wolves where predation is likely preventing the recovery of wildlife populations such as mountain caribou[2]. Because predators such as wolves tend to target old, young, and sick, rather than healthy, prime breeding moose, moose reproduction and recruitment of calves is generally balanced with losses from predation[3]. In the words of Aldo Leopold, "You cannot love game and hate predators...the land is one organism."


Figure 2


Figure 3

Winter tick infestations have killed and continue to kill moose in areas of Interior BC. Tick infestations are particularly threatening to the young of the year[4]. Ticks can induce anemia and hair loss, which when combined with inclement weather can create severe health challenges for infected moose. There is concern that future climate warming trends may support high tick survival[5]. No other significant parasite or disease issue has been identified in BC moose[6].

Winter severity influences moose survival[7], but winters with deep snow and extreme cold have been few and far between where BC moose are concerned. What may be more important to moose is how warm BC winters have become and how such winters affect the ability of moose in winter coats to avoid heat stress. Also freeze/thaw cycles impact snow density and crusting thereby giving an unfair advantage to wolves hunting atop snow crusts that do not support the weight of moose.

Although it may be hard for us to control wolf numbers, tick outbreaks and climate, we can and do influence habitat quality and supply which are critical to maintaining populations of healthy moose across the landscape.

Winter ranges are of critical importance to the survival of moose. The best winter ranges tend to be found at lower elevations, often in valley bottoms, where snow depths tend to be shallow. Unfortunately, valley bottoms in BC have been and continue to be heavily developed with transportation corridors, agriculture, forestry, and many other forms of development, leaving moose with less critical winter habitat. These "epic losses in habitat" that Mike Morris, minister of public safety and solicitor general, refers to in his 2015 report *Getting the Balance Right*[8] may be leaving moose populations with much less winter range than is required for them to thrive, let alone increase in numbers. In our discussions of winter range requirements, we must be mindful because moose require high quality ranges in all seasons, not just in winter; protection of winter ranges only goes part of the way[9]. We have seen moose populations decline while efforts to protect ungulate winter ranges have been ongoing.

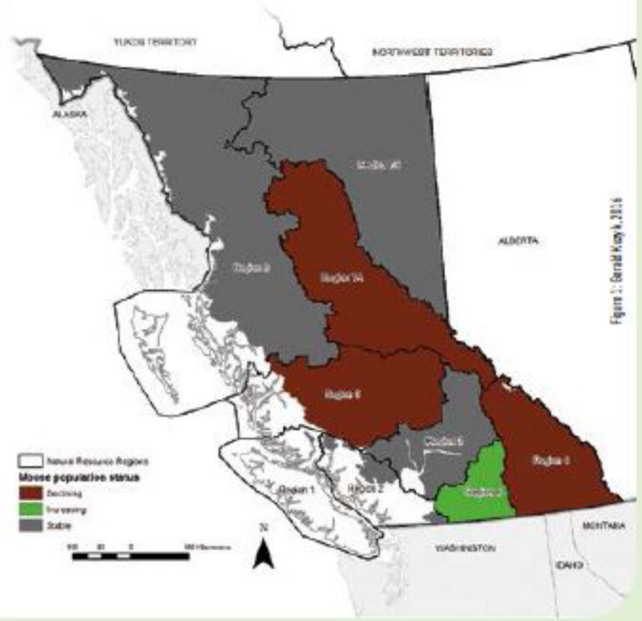
Generally there is a working assumption that clear-cut logging mimics the effects of forest fire and that forestry is good for moose. This may be true to some degree but not where large cutovers are numerous, nor where little mature forest structure remains post-logging. In addition to the browse created in early seral forests, moose require large amounts of mature forest for thermal and protective cover. Large clearcuts created from salvaged lodgepole pine (and now spruce) beetle-killed stands lacking thermal/protective cover are suboptimal for moose[10].

Depending on fire intensity, many post-burned habitats promote the growth of aspen, willow, birch, and other deciduous shrubs and trees that serve as year-round foods for moose. A post-burned habitat of dead standing trees carpeted with aspen suckers is not what most conifer plantations look like, or what foresters imagine will help a plantation reach free-to-grow status. Plantations, unlike burns, are managed to minimize hardwood production (e.g. herbicide treatments) and are also characterized by road networks that allow hunters and poachers to access moose habitats which were previously out-of-reach[10]. Put simply, patchworks of relatively young pine and spruce plantations that lack a hardwood component, that are all connected by roads, unlike burns, provide few habitat elements required by moose. Interestingly, recent research points to the importance of subalpine fir in the winter diets of moose in some areas of the Interior (~50 per cent of the diet), so that planting and retaining fir where feasible may benefit moose[11, 12].

In summary, there are many things that can affect moose over which we have little or no control. Fortunately for us, one thing we can and do control — habitat — is of critical importance to moose. Exploring the virtues of mixed wood management, using smaller cuts with fewer roads in a landscape where considerations for what is left behind is as important as what is taken is something we can and must do if moose are to be a serious provincial management objective. Perhaps seeing the commercial forest for its hoofage value as well its stumpage value is a vision that resource managers and society must begin to consider. ●

**Managing for Moose**

- Leave more mature conifer forest for connectivity and to increase the amount of mature forest edge. Mature forests provide more thermal and protective cover and shallower snow pack which reduces energy costs for moose travelling from one forest patch to another[13].
- Reduce the amount of roads on the landscape. Where possible, rehabilitate and/or deactivate in-block roads[9].
- Retain more hardwoods such as willow and birch as browse for moose. Manual brush cutting as opposed to herbicide use allows for short-term conifer release and long term browse production[14]. Immature subalpine fir appears to be an important food source for some Interior moose and should be more widely retained.
- For areas adjacent to or within critical habitat for woodland caribou, modify silvicultural practices in concert with local mountain caribou management strategies[9].

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