ONTARIO PARKS

Algonquin Park Moose Hair-loss Survey Report 2008

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March 20, 2008

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1.0 Introduction

Moose are an iconic symbol of the North. In Algonquin Park they are a major attraction for tourists (Aniskowicz-folwer, 1998), are highly valued as a food source by aboriginal peoples and also provide recreational hunting opportunities. Moose are also an important part of the Algonquin Park ecosystem. For all the above stated reasons, a number of surveys and management actions are taken to monitor the health, size and status of the Algonquin Park moose population. These include, but are not limited to Moose Aquatic Feeding Area surveys, Moose Aerial Inventories (population surveys), moose research and monitoring, moose check stations and moose hair loss surveys. The following report outlines the results of the 2008 Moose Hair-loss Survey.

2.0 Background

Moose (*Alces alces*) are subject to a variety of parasites (Lankester and Samuel, 1998). Of these, some can be potentially fatal. Perhaps the most obvious of these is the winter tick (*Dermacentor albipictus*) which often infest Algonquin moose in large numbers and are conspicuous as the females swell in late winter.

Heavy infestations of winter ticks can result in dramatic hair loss in moose (McLaughlin and Addison, 1986), decreased physical fitness (Addison et al, 1994), and in some cases, mortality on an epidemic scale (CCWHC, 1999). As the ticks begin to feed in late March, they cause irritation and cause moose to lick and scratch themselves, losing hair in the process (Samuel, 1991). In years with severe infestations and low spring temperatures, moose can be susceptible to hypothermia, and death. This has been observed periodically in Algonquin Park, with the latest large die-off occurring in 1999 (CCWHC 1999).

In order to better understand the severity of hair loss in Algonquin Park's moose population a survey is conducted every year, weather and moose permitting (Wilton and Garner, 1993). Results can help guide harvest and management of moose in Algonquin Park and in neighbouring districts.

3.0 Methodology

The survey is conducted by helicopter with a crew of four; a pilot, navigator, and two observers. Survey time is generally three to four hours.

The survey is usually conducted between March 20th and March 25th. This is when winter ticks have been feeding long enough to cause hair loss, but there is still enough snow on the ground to make finding moose by air feasible.

A minimum of 50 moose are surveyed, and ranked into one of 5 categories of hair-loss, ranging from none to very severe (Garner and Wilton, 1994). Animals ranked 'none' exhibit no hair-loss, while animals in the 'worst' category exhibit over 80% hair loss.

Survey areas are not randomly sampled. The objective is to survey over 50 moose in a relatively short period of time. Thus areas with known or suspected high moose numbers are targeted. These usually include areas where winter forest management has been taking place, attracting moose to the additional browse made available by cutting.

A Hair-loss Severity Index (H.S.I.) is calculated by assigning a numerical value to each category of hair loss (1-5), and by multiplying the number of moose (frequency) in each category by that number. The sum of these numbers is then divided by the total number of moose (Wilton and Garner, 1994). For example, the HSI for 2004 was:

$$H.S.I. = \frac{(53x1) + (12x2) + (3x3)}{68}$$

H.S.I. = 1.26

H.S.I. in Algonquin Park has ranged from a high of 3.48 to a low of 1.18.

4.0 Results

The 2008 Algonquin Moose Hair-loss Survey was conducted on March 17, 2008 using an OMNR Bell Longranger helicopter under clear conditions. Weather conditions were clear, sunny, with a temperature of 0 Celsius. There was a light crust on approximately 65cm of snow.

The survey participants included:

Bill Spiers, OMNR pilot
Elizabeth Francis, Navigator, Algonquin Park Resource Technician
Clifford Bastien Jr., Chief, Mattawa/North Bay Algonquins
Lorne Laderoute, Algonquin Park Fish and Wildlife Technician, member Algonquins of Greater Golden Lake.

A total of 77 moose were observed, in the following categories:

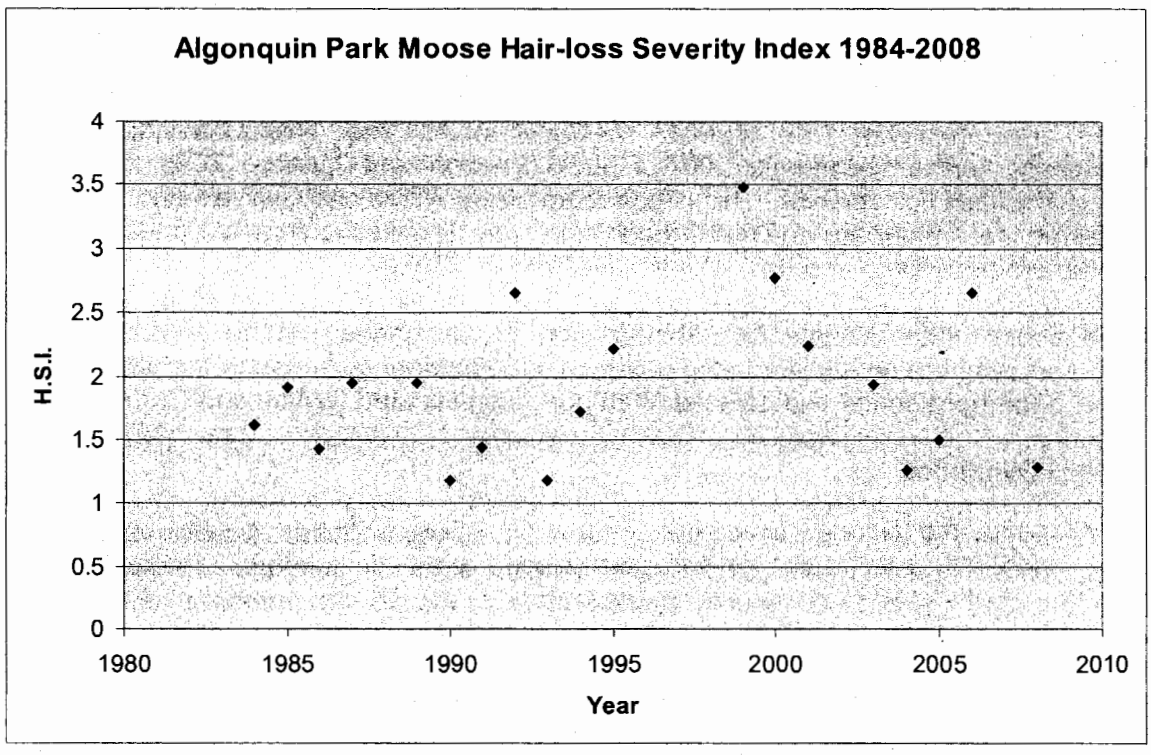
Table 1 2008 Hair-loss survey results

Hair-loss Category	**Bull**	**Cow**	**Calf**	**Unknown Adult**	**Total**
1- nil	22	28	5	2	57
2- light	7	10	1		18
3- moderate		2			2
4- severe					
5- very severe					
Total	29	40	6	2	77

$$\text{Hairloss Severity Index} = \frac{(57x1) + (18 \times 2) + (2 \times 3)}{77}$$

HSI = 99/77 = **1.2857**

Figure 1 Summary of H.S.I. in Algonquin Park 1984-2008



*note – hair-loss related mortality events were observed in 1988, 1992 and 1999

5.0 Discussion

A Hair-loss Severity Index of 1.29 is considered low for Algonquin Park moose. This is promising for the moose herd, as a high H.S.I. has been associated with moose die-off in Algonquin (most notably in 1999 when the H.S.I. was 3.48).

5.1 The Weather/Tick/Hair-loss relationship

The low H.S.I. for 2008 is of particular interest with respect to the dynamics between spring weather and the winter tick. It has been observed that when winter ticks drop off moose in the spring and land on snow, they are susceptible to being predated by birds such as Gray Jays and Common Ravens (Addison et. al, 1989). Snow melt can also influence the survival of winter ticks (Drew and Samuel, 1986). If a winter tick falls on the ground, it is presumed they have higher survival rates (and thus more females lay eggs). Thus warm springs (with less snow) should generally be followed by higher rates of tick infestation, and hair-loss, in moose (CCWHC, 1999). This has been observed in Algonquin Park moose (Wilton and Garner, 1994), with a correlation between mean April temperature and tick-induced hair-loss.

In April of 2007 there was very little snow in Algonquin Park. In fact, the 2007 Moose Hair-loss survey for 2007 had to be cancelled because the lack of snow and warm temperatures made finding moose exceedingly difficult. The inability to see tracks in

snow, combined with moose seeking thermal shelter in conifer stands resulted in only 3 moose observed in over 90 minutes of survey time.

Following the aforementioned logic regarding the relationships between winter ticks, weather and hair-loss, the early snow melt in 2007 could have resulted in higher tick survival and thus higher H.S.I. in 2008. Yet this is not the case. This is likely due to a low average April temperature in 2007 of 3.08C (Environment Canada, 2008), which may have limited tick survival. This is corroborated by Wilton and Garner who suggested that "winter tick survival through April may be linked to a critical mean temperature between 3 and 4 C" (Wilton and Garner, 1994).

These results further validate the statement that "It is suspected that the link between mean April temperature, tick-induced hair-loss and apparent tick-related mortality in moose is for more subtle and complex than our data indicate." (Wilton and Garner 1994)

5.2 Herd Dynamics

The 77 moose that were surveyed during the H.S.I. survey included 29 bulls, 40 cows 6 calves and 2 unknown adults. Of particular concern is the low numbers of calves observed. Calf numbers are usually expressed as a ratio per the number of cows observed. The cow/calf ratio observed during the 2008 hairloss survey was 0.15 calves per cow, or 15 calves per 100 cows. This is considered a low recruitment rate among many moose managers, and is lower than observed in the 2003 and 2006 moose aerial inventories in Algonquin (0.20 and .025 respectively) (Francis and Steinberg, 2006).

6.0 Management Implications

The 2008 hair-loss survey suggests that there will be little hair-loss related mortality in moose this spring. However, the low calf numbers are of concern. It is important to note that the area surveyed for the hair-loss survey was in the un-harvested area of Algonquin Park. Thus low calf numbers or sex ratios should not be attributed to harvesting. However, if the low calf numbers on the un-harvested West side of Algonquin Park hold true for the harvested East side, it may warrant revisiting the number of calf tags issued for harvest.

While ongoing moose research conducted by OMNR and Trent University on moose population dynamics in Algonquin Park will yield valuable information on the recruitment and survival of moose, it is important that a full Moose Aerial Inventory be conducted in 2009. Without a full aerial inventory in Algonquin Park in 2009 it will be difficult to manage the moose harvest in a sustainable and responsible manner.

7.0 Acknowledgements

This survey was coordinated by Elizabeth Francis, who, as always, did an extremely professional and thorough job.

Bill Spiers has flown many surveys in Algonquin Park and is appreciated both for his superb piloting skills and for his keen eyes.

Chief Clifford Bastien Jr. of the Mattawa/North Bay Algonquins volunteered for this project and his assistance is greatly appreciated – both for his field skills and for helping us engage the Algonquin community in resource management in Algonquin Park.

Lorne Laderoute is an interior ranger, fish and wildlife technician, and member of the Algonquins of Greater Golden Lake. His professionalism and hard work ethic are highly valued.

Cathy Pordonick and Marie Shalla and Teri Frey play a vital role in all aerial work in Algonquin by coordinating Flight-watch. Their professionalism and willingness to work flexible hours makes this work possible and is much appreciated.

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