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Diurnal Activity of Moose.

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Introduction

The daily habits of the american moose (*Alces alces*) have been little investigated, for, despite its size, it is a difficult animal to observe. In summertime, in the mountains of British Columbia, it moves to high elevation in the subalpine zone. In the lowlands it frequents the forests and brush regions around lakes offering ample aquatic vegetation. Continuous observation of a single animal for the length of a day is impossible under these conditions.

In winter the conditions for observations in mountainous country are much better. On open, snowcovered slopes the black moose are easily seen and can be observed from distances up to three miles (4.8 km.). Since moose move but little during the day if undisturbed, continuous observation is often possible.

The observations on which this report is based were made in the period between December 22, 1958 and January 3 1959. Reference is also made to a period between December 21 1957 and January 2 1958. The moose were observed in Wells Gray Provincial Park in east-central British Columbia.

The study area was located at the eastern margin of the Clearwater Valley. To the east it was bounded by rising mountains, on whose open slopes moose were observed. To the south it was bordered by the Myrtle River and to the west by Frenchman Creek. The microtopography consisted of small hills and ridges. Several small creeks wound through the area.

The climax forest which once covered this region fell victim to forest fires, and remains only on the higher elevations of the mountains to the east. The greater part of the area is covered by willow-aspen community of which the dominants are *Salix sp.* and *Populus tremuloides. Populus balsamifera, Betula papyrifera* and *Betula glandulosa* were also found scattered over the hills. *Alnus tenuifolia* was found mostly in the creek bottoms. Occasional small clumps of conifers stood on the hillsides, and in areas where the forest fires had been less severe, these were the dominants. They were represented by *Pinus contorta*, *Pseudotsuga menziesii, Abies lasiocarpa* and *Picea engelmanuii*. In some localities *Tsuga heterophylla* and *Thuja plicata*, the climax species, were becoming re-established.

During the time spent on the study area, the ground was covered by a blanket of snow about 1 m. thick.

I would like to thank and acknowledge Mr. M. STEINLE'S (Munich, Germany) help in the observations on the study area. Further thanks goes to Mr. RITCEY, biologist of Wells Gray Park, for his aid in this project.

Methods

Moose were observed by means of 7 X 35 binoculars and a 15 X spotting scope. Most observations were made from an observation-point on a hill side overlooking a large area of rolling terrain. Some observations were made from the roof of a cabin, or while moving in various parts of the study area.

Every moose seen was given a number and classified as to sex and age (adult or young). Calves were given the number of the cow, but received a letter in addition; for example, a cow with two calves 5, 5a, 5b. Individuals in a group received the same number plus a side number; for example, 7-1, 7-2, 7-3. The times at which moose were seen, and their activities, were recorded. These moose were observed till they moved out of sight, darkness fell, or the observation point was left. Times of arising and lying down were also recorded. Special attention was paid to manner of feeding, behaviour of individual when in group or single, and bedding.

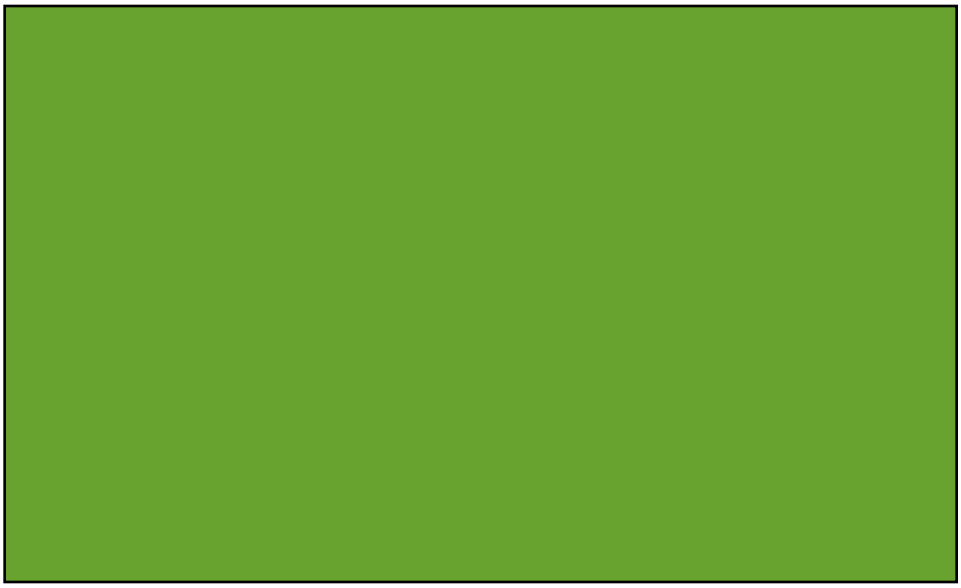
Sample Size

15 18 24 22 32 40 51 52 57 67 67 66 68 61 54 42 31

Figure 1. Feeding rhythms of moose in wintertime starting at about 1 hour after daylight till the end of the daylight.* The sample size increases towards midday, since more hours were spent in the field during that time.

Results

186 moose were seen while in Wells Gray Park. 97 of these were observed for a total of 379 hours. Some of these moose were watched daily. Since individual moose are difficult to identify, no special records were kept concerning activity of known individuals. The



observations started from about 3/4 to 1 hour after daylight, which came between 7 and 7:30 a.m. Pacific Standard Time, and ended at the end of daylight at 4:30 p.m.

The observation periods were tabulated and values of percentage of moose feeding and resting derived for any half hour of the daylight period (*fig. 1*). Some qualitative aspects of moose behaviour will be mentioned later.

Diurnal Activities of Moose

PETERSON (1955) and DEVOS (1958) both agree that moose are not frequently seen moving about during the middle of the day. They report the peaks of activity to center around early morning and evening. This seems to hold true for summer, but is not necessarily the case in winter.

*Mr. R. RITCEY obtained similar results in 1954. (By correspondence.)

Figure 2.a. This represents the activity of three cows with their calves. Notice that in the first two cases each cow and her calves rose simultaneously to feed. They also bedded down together. In the third case the calf continued feeding after the cow rested.
b. Here the reasonably coordinated activity of three bulls in a "club" is shown. -
c. This represents the observations of one day in the field.

The two peaks of activity occur, one in the beginning of the photoperiod, around 7:30 a.m., and the other at 2:00 p.m. Lows of activity were between 10:00 and 12:00 a.m. and 4:00 p.m. From 4:00 p.m. feeding activity rose strongly (*fig. 1*).

Some moose can be seen actively feeding during any part of the day. Cows and calves generally fed and rested together (*fig.2*). The same was shown by small gatherings of bulls, for these "clubs" acted more of less as a unit (*fig. 2*).

The resting periods were on the average considerably longer than the feeding periods. The average of 37 feeding periods is 1 hour 23 minutes. 26 complete resting periods gave an average of 2 hours 30 minutes. The fluctuations in length of resting and feeding periods are large. The shortest feeding period was 30 minutes, and the longest was 2 hours 38 minutes. The shortest resting period was 1 hour 37 minutes, the longest complete period 4 hours 39 minutes. One moose was observed which, when first seen at 11 o'clock, was resting, and continued to rest until 4:12 p.m. This is a period in excess of 5 hours 12 minutes.

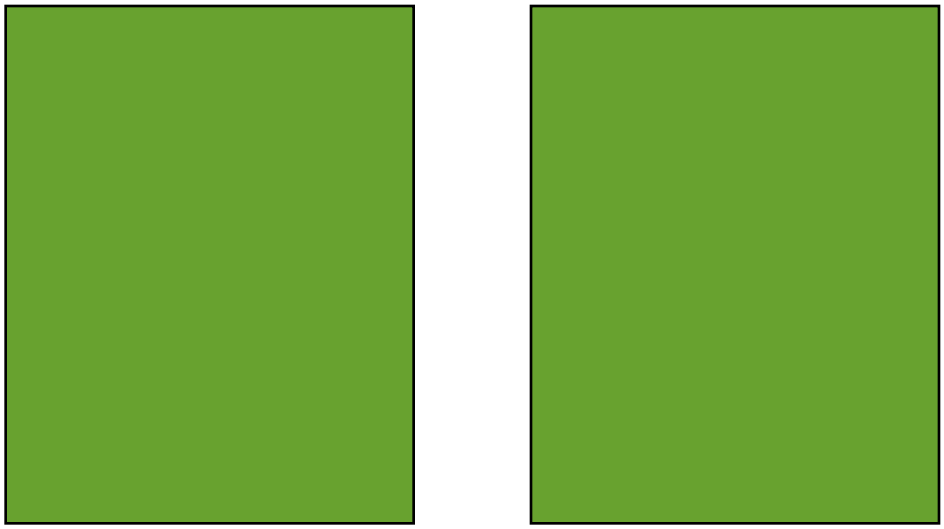


Figure 3. These two graphs represent the preference in length of feeding and resting time. Preferred feeding time was between 30 and 120 minutes. Preferred resting time was between 120 and 180 minutes.

PETERSON (1955) and DEVOS (1958) found the average feeding period on aquatic vegetation in summer to be 30 minutes to 1 hour. *Fig. 3* shows the preferred feeding period in winter to be between 1 1/2 to 2 hours in length. Moose feed on browse during this time.

When feeding, moose move about little, and usually they bed down within 100 m. of the previous bed. This tends to keep moose within a general area (also see HATTER, 1950).

Preferred bedding areas are ridges, knolls and open hill sides. Sometimes, however, moose lie down where they feed. All moose seen bedded down were facing either down or across the hill side. Only once was a moose observed facing up hill, but this was in a group of three and the others faced downhill.

Nearly all moose beds were in open, elevated locations, the major requirement for which seems to be good visibility in all directions.

Summary

Moose were observed in winter time in Wells Gary Park, British Columbia. Their feeding and resting periods were recorded, and their daily activity determined (*fig.2*). It was found that two activity peaks exist; one in the morning at 8:30 and the other at 4:00 p.m. The average resting period was 2 hours 30 minutes and the average feeding period was 1 hour 23 minutes. Peculiarities of bedding in moose were mentioned.

Zusammenfassung

Elchwild wurde zur Winterzeit im Wells Gray Park, Brittisch Columbien, Kanada, beobachtet. Die Länge der Asungs- und Ruheperioden wurde notiert und die tägliche Aktivität des Elchwildes erkundet. Es wurde festgestellt, dass zwei Aktivitätshöhen im Laufe des Wintertages existierten. Die erste fällt in die Morgenstunden um 8:30, die andere um 4 Uhr nachmittags. Die durchschnittliche Länge der Asungsperioden war 1 St. 28 Min. Die durchschnittliche Ruheperiode 2 Std. 30 Min. Die Eigenarten des Niederbettens und des Bettes beim Elchwild sind rewähnt.

Literature Cited

DEVOS, A., (1958): Summer observations on Moose Behaviour in Ontario, Journal of Mammalogy, Vol 39, No. 1, Feb. 1958. p. 128-139. - HATTER, Y., (1950); The Moose of Central British Columbia, Mss. thesis 356 pp. Washington State College, Pullman, Wash. - PETERSON, R.L., (1955): North American Moose, University of Toronto Press: 1955.