OCCURRENCE OF NEONATAL CERVIDS IN THE SPRING DIET OF BLACK BEAR IN SOUTH CENTRAL ONTARIO

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Abstract

Analysis of spring digestive tract contents was carried out on 296 hunter-killed black bear (Ursus americanus) in the Algonquin Region of South Central Ontario. The frequency of occurrence of moose (Alces alces) and white-tailed deer (Odocoileus virginianus) in the spring bear diet was examined considering proximity to prime moose and deer range.

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Several studies have documented neonatal cervid losses in North America. On the Kenai Peninsula, Alaska, Chatelain, (1950), found that moose (Alces alces) calf percentages in the population dropped from 40% in late May to 27% to 23% in late July and December respectively. Le Resche (1968), working near Palmer Alaska observed that moose calf/cow ratios decreased from 83 to 36/100 cows from May to October.

Gasaway et al (1977), in the Tanana Valley, Alaska, recorded a decrease in the moose calf/cow ratios from 44 to 14/100 cows from June to November. Kowal and Runge (1982) found that moose calf/cow ratios decreased by 60 and 76% respectively for two game management zones in the Cumberland Delta, Saskatchewan, during the period May to September. In Algonquin Park, Ontario, Addison (pers. comm.) determined an average spring moose twinning rate of 63% for the years 1981, 1982 and 1983, while Wilton (1983, unpub.) found occurrence of twins in early winter of 18% during the same three years. In north central Idaho, Schlegal (1976) established that total mortality of calf elk (Cervus elaphus) from calving through October was 67.9%.

Black bear (Ursus americanus) were found to constitute an important source of mortality for radio tagged neonatal moose in Alaska (Ballard et al 1979, Franzmann and Bailey 1977), and in one study (Franzmann, Schwartz and Peterson 1980) were shown to have killed 34% (16//47) of radio-tagged neonatal moose. Predation of 47% (25/53) of neonatal elk radio collared in Idaho (Schlegal 1976) was attributed to black bear. Smith (1983) reported that neonatal mule deer (Odocoileus hemionus) mortality in Utah due to black bear predation was 9.3% (5/54). Ozoga and Verme (1982) concluded that predation of as many as 12 neonatal white-tailed deer (Odocoileus virginianus) born within a 252 ha enclosure in Michigan in 1973 and 1980 could have been carried out by 3 black bear subsequently trapped within the enclosure.

Some black bear food habit studies (Chatelain 1950, Flowers pers. comm., Kowal and Runge 1982, Grenfell and Brody 1983, Hammond pers. comm., Lindzey pers. comm.) have identified neonatal cervids in black bear diets, while others (Tisch 1961, Kolenosky 1975, Hugie 1982, Crête 1983, pers. comm., Norton 1983, pers. comm., Snider 1983, pers. comm.), have failed to do so. The latter may be partially explained by the fact that black bear commonly skin (evert the hide of) their prey (Gilbert 1951, Franzmann pers. comm., Norton pers. comm.). Little hair, if any, may be ingested, leaving little for identification in digestive tract and/or scat analysis studies.

The objective of this study was to determine how frequently neonatal moose and white-tailed deer occurred in the spring diet of black bear in south central Ontario.

Study Area

The Algonquin Region is located in south central Ontario between Georgian Bay and the Ottawa River (45° 39'N, 78° 39'W) (Figure 1) and is approximately 39,485 km^2 in area. Hunting is prohibited in most of Algonquin Provincial Park (7314 km^2), which occupies the central part of the Region. A north-south height-of-land virtually bissecting Algonquin Park separates the region into two halves; the western half being comprised of primarily tolerant hardwood-hemlock forest, while the east half tends toward a poplar-pine climax with interspersed tolerant hardwoods (O.M.N.R. files). Black bear numbers are estimated at 0.38 per km^2 (Kolenosky, 1975), but are probably higher in Algonquin Park.

The Algonquin Region moose and white-tailed deer populations are generally distributed in the northern and southern portions of the region, respectively, with a central band of overlapping range (Figure 1). The moose population is generally centred in Algonquin Park and has an estimated density of at least 0.38 per km^2 (Wilton and Pashuk, 1982), across its range. The deer population which is now harvested on a selective basis, is increasing and is approaching 1.2 - 2 deer per km^2 (O.M.N.R. files). Moose calving in the Algonquin Region generally commences by May 10 and peaks by May 25 (Addison pers. comm.). Deer fawning begins in mid-May and probably peaks by June 10 (Lintack pers. comm., H. Smith pers. comm.).

Methods

The spring bear hunt in Ontario runs from April 15 to June 15. Prior to and during this time commercial bear outfitters establish "baits" at which their clients may wait to shoot bears which become accustomed to visiting these baits. In addition, but to a lesser extent, the use of hounds which will tree a bear for the hunter to shoot is a popular method of hunting. Thirty-five commercial bear outfitters across the Algonquin Region were solicited to assist in the collection of entrails from bears harvested by their clients. Also, posters requesting co-operation from hunters were placed in sporting goods stores throughout the Region. Normally, bear hunters will utilize entrails of domestic livestock from abattoirs in addition to honey cappings obtained from commercial apiaries as bait. The use of road-killed moose and deer as bait by commercial bear outfitters was prohibited in the study area during the 1983 spring bear hunt. All black bear digestive tracts were collected from the area outside Algonquin Provincial Park.

Bear entrails were collected by Ontario Ministry of Natural Resources personnel as soon after notification as feasible, labelled as to live weight and sex of animal, date and location of kill, and subsequently frozen until examination could be conducted. The complete contents from all digestive tracts were washed and screened using 2mm. seives. The washed samples were then dipped in 3% formalin solution and spread on screens to dry. Two hundred and ninety six samples (92.5% of total collection) were chosen and examined completely. All animal parts such as hooves, bone fragments and hair were stored for identification. Hair

identification was made by first examining hair colour and gross characteristics. Impressions of the hairs were made on acetate slides (Bowyer and Curry 1983), for microscopic examination. Final identification was made by comparing the hair scale patterns to reference slides and illustrations in Adorjan and Kolenosky (1969).

Results

Cervid (moose and white-tailed deer) hair was found in 29.7% of the digestive tracts examined and was grouped as follows: 13.1% "adult only", 5.1% "adult and neonate" and 11.5% "neonate only". (Table 1)

Evidence was found of feeding upon such species as domestic pig (Sus scrofa), beaver (Castor canadensis), snowshoe hare (Lepus americanus), various mustelids, red squirrel (Tamiasciurus hudsonicus), and black bear. While pig hair indicates bait and much of the bear hair probably represents grooming, small bear claws were found in one instance which may imply predation. In addition, neonate deer hooves were identified in 3 instances and a neonate moose hoof in one instance.

Occurrence of neonate (only) and adult (only) cervid hair from black bear digestive tracts is plotted temporaly (by week) in Figure 2. While sample sizes containing neonate moose hair are too small to establish any trend, occurrence of neonate deer hair appears to increase during the expected fawning period while adult hair occurrence remains relatively stable through the survey period.

The winter immediately prior to this study (1983) was the most moderate winter experienced in the study area during the preceding 31 year period. (O.M.N.R. files).

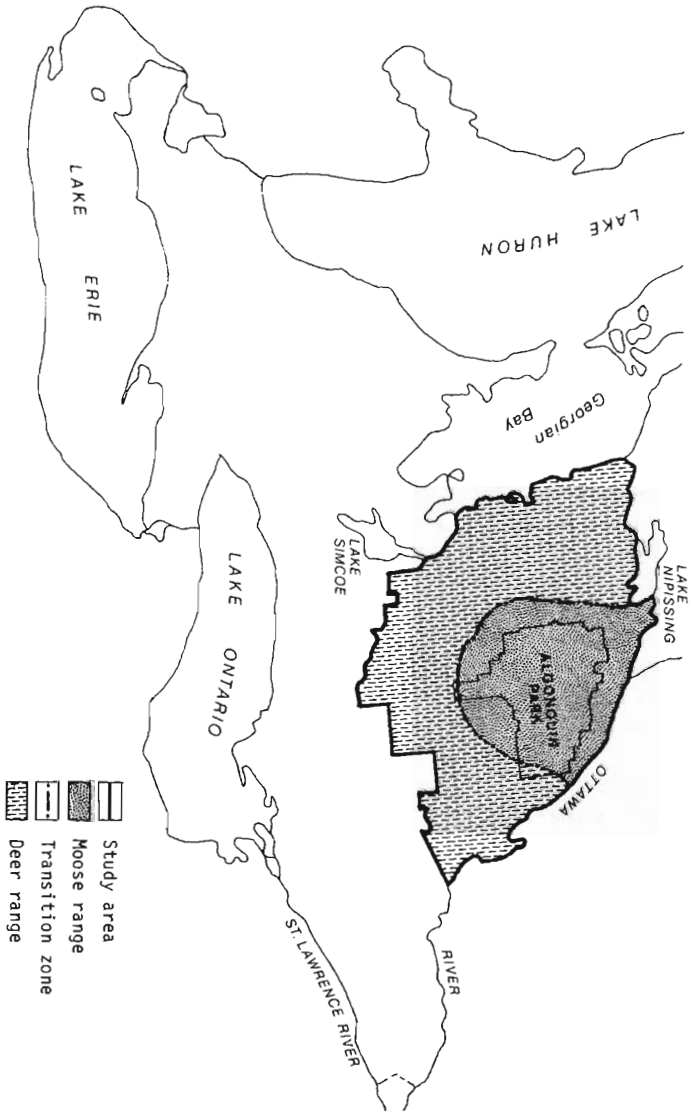

FIGURE 1. Study area showing moose range and white-tailed deer range.

TABLE 1

SUMMARY OF CERVID HAIR IDENTIFICATION FROM BLACK BEAR DIGESTIVE TRACT EXAMINATIONS

	Frequency	% of total
Adult Cervid Only		
Adult Moose	13	4.4
Adult Deer	25	8.4
Adult Moose & Adult Deer	1	0.3
Sub Total	39	13.1
Adult & Neonate Cervid		
Adult & Neonate Moose	2	0.7
Adult & Neonate Deer	10	3.4
Adult Moose & Neonate Deer	1	0.3
Adult Moose, Neonate & Adult Deer	2	0.7
Sub Total	15	5.1
Neonate Cervid Only		
Neonate Moose	5	1.7
Neonate Deer	28	9.5
Neonate Moose & Neonate Deer	1	0.3
Sub Total	34	11.5
Total Neonate Occurrence	49	16.6
Total Cervid Occurrence	88	29.7
No Cervid Occurrence	208	70.3
Total No. Digestive Tracts	296	100.00

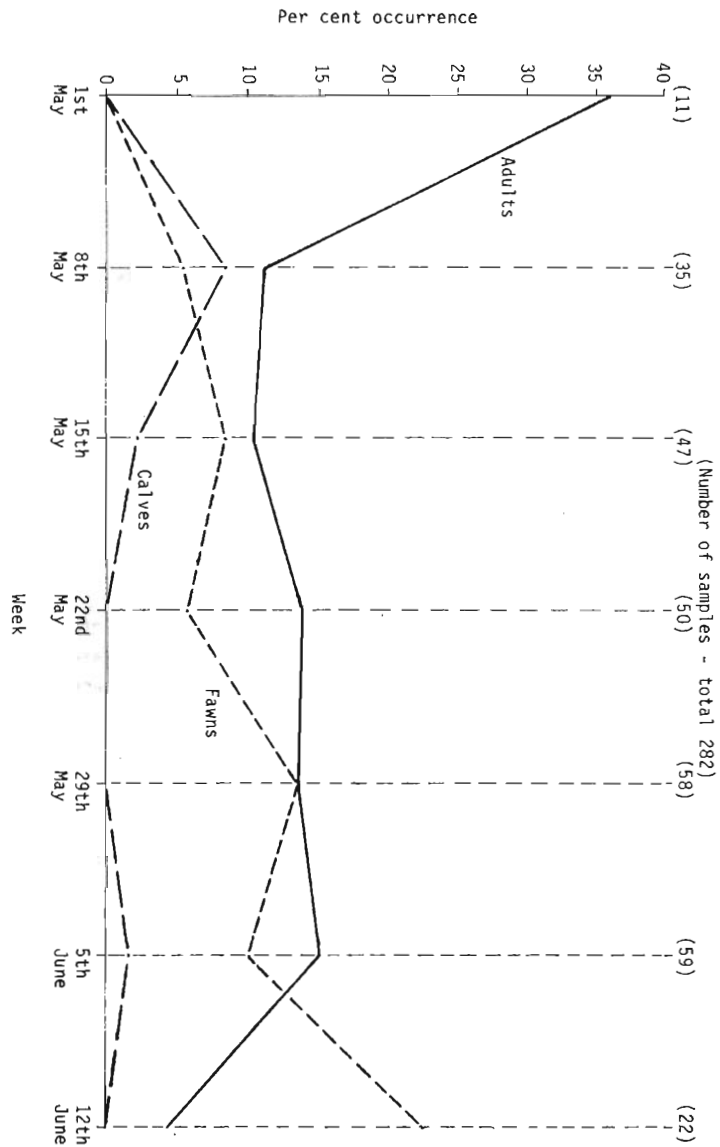

FIGURE 2. Per cent occurrence of neonate and adult cervids in black bear digestive tracts by weekly intervals.

Discussion

While deer and moose ranges are approximately equal in the study area (Figure 1) it should be noted that approximately half the moose range lies in Algonquin Park and is unhuntable. This partly accounts for the greater occurrence of deer hair than moose hair in our sample.

The winter of 1983 was the mildest during the past 31 years suggesting not only that fewer adult cervid carcasses would be available for scavenging in the spring, but also that low numbers of neonate losses would result from maternal winter stress.

The literature indicates that black bear predation on cervids occurs primarily on neonates. We suggest, therefore, that the occurrence of adult (only) cervid hair in black bear digestive tracts may represent scavenging.

While the occurrence of adult and neonate cervid hair together may represent either scavenging or predation, we considered it to represent scavenging in order to ensure a conservative approach. Therefore, if black bear predation is occurring in the spring upon neonate cervids in the study area, we would consider it to be represented by the 11.5% occurrence of "neonate only" cervid hair in the sample (Table 1).

Indications are that neonate cervids constitute an important part of the black bear spring diet in south central Ontario. Moreover, our results are probably conservative considering that bears often skin their prey.

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