Predation on Two Mule Deer, *Odocoileus hemionus*, by a Canada Lynx, *Lynx canadensis*, in the Southern Canadian Rocky Mountains

DÖRTE POSZIG[1], CLAYTON D. APPS[2], and ALAN DIBB[3]

[1] Alhardstr. 15, 28757 Bremen, Germany
[2] Aspen Wildlife Research Inc., 2708 Cochrane Road N.W., Calgary, Alberta T2M 4H9 Canada (corresponding author)
[3] Parks Canada, P. O. Box 220, Radium Hot Springs, British Columbia V0A 1M0 Canada

Poszig, Dörte, Clayton D. Apps, and Alan Dibb. 2004. Predation on Two Mule Deer, *Odocoileus hemionus*, by a Canada Lynx, *Lynx canadensis*, in the southern Canadian Rocky Mountains. Canadian Field-Naturalist 118(2): 191-194.

A male Canada Lynx (*Lynx canadensis*) killed two Mule Deer (*Odocoileus hemionus*) in the southern Canadian Rocky Mountains in January 1999 and made use of the kills for 28 days. Canada Lynx predation on ungulates has been reported but is rare, and accounts have been brief. We detail the lynx behaviour associated with the kills and their consumption. An infrared monitor and attached camera were used to register daily activity at the kill site. We speculate on the factors that may have influenced this opportunistic predation event.

Key Words: Canada Lynx, *Lynx canadensis*, infrared monitor, Mule Deer, *Odocoileus hemionus*, predation, British Columbia.

The Canada Lynx (*Lynx canadensis*), hereafter referred to as lynx, preys mainly on Snowshoe Hares (*Lepus americanus*) and other small mammals, but rare accounts of ungulate predation have been noted (e.g., Saunders 1963; van Zyll de Jong 1966; Parker et al. 1983; Stephenson et al. 1991). However, these accounts do not describe lynx behaviour associated with the kills or their consumption. We give a detailed description of two Mule Deer (*Odocoileus hemionus*) kills made by a lynx and its subsequent use of them for 28 days. The observations were made in the course of an in-depth field study of lynx ecology in the southern Canadian Rocky Mountains of southeastern British Columbia and southwestern Alberta.

While snow-tracking on 18 January 1999, we found two Mule Deer that had been killed by a radio-collared adult male Canada Lynx in Kootenay National Park, British Columbia (51º N, 116º W). One was a doe aged by cementum annuli to be 3.5 years, and we estimated the other deer to be a fawn (teeth not completely erupted). The kills were separated by a distance of 10 m and were located at 1580 m elevation on a 15º slope of northwest aspect in a closed-canopy forest of Lodgepole Pine (*Pinus contorta*), Engelmann Spruce (*Picea engelmannii*), and Subalpine Fir (*Abies lasiocarpa*). The understory was sparse, although the immediate area around the kill site had some woody debris to a depth of about 1 m and some conifer thickets. The snow depth at the site was 90 cm and lynx penetration was 9-14 cm.

The fawn apparently was killed on 14-15 January, judging from daily radio-telemetry fixes of the lynx and accumulated snow cover. The shoulders, rib cage, part of the neck, upper front legs and organs had been consumed. The front and rear had been severed and lay twisted and partially cached in a hollow in the snow. The doe was killed on 18 January between about 1300 and 1500 h. On initial inspection, no snow had accumulated on the carcass, and the blood had not yet coagulated or frozen. The deer was found lying on its side with legs extended, and no part had yet been consumed.

Teeth of both deer were in good condition, and no deformities of their legs or hooves were apparent. The doe appeared to be in good physical condition. Both deer had major wounds on the dorsal side of their necks, and the spacing of obvious tooth-punctures matched that of a lynx (Figure 1). The cause of death of the fawn could not be determined because it had been consumed to a great extent and was not intact. On the doe, several puncture wounds were located in two small areas on the dorsal to slightly lateral area of the neck, 10-15 cm behind the ears. Claw marks on the deer's back and shoulders suggested that the lynx had leapt onto the deer and had been "riding" while biting it.

Evidence of predation of the fawn was obscured by recent snow, but old blood stains 2 m from the carcass suggested that it had been killed and not scavenged. When removing the mandible of the fawn, we found pieces of undigested Subalpine Fir in its mouth, suggesting that the animal had been browsing shortly before it died.

Tracks in the snow provided a clear record of how the lynx encountered and stalked the doe. The lynx approached this deer from a slightly higher elevation than where both kills were found, partially circling the site for about 100 m. It briefly stopped at the edge of a small opening about 50 m from the kill site, and then again 25 m uphill on a knoll. Moving downhill in a normal gait, the lynx used several fallen logs for cover, but was clearly stalking for the last 10 m. It then made three bounds before its attack, as the doe stood next to a thicket of mixed-age trees. The deer appeared to succumb ≤4 m from the attack site. The lynx then dragged the carcass about 7 m to its final location.

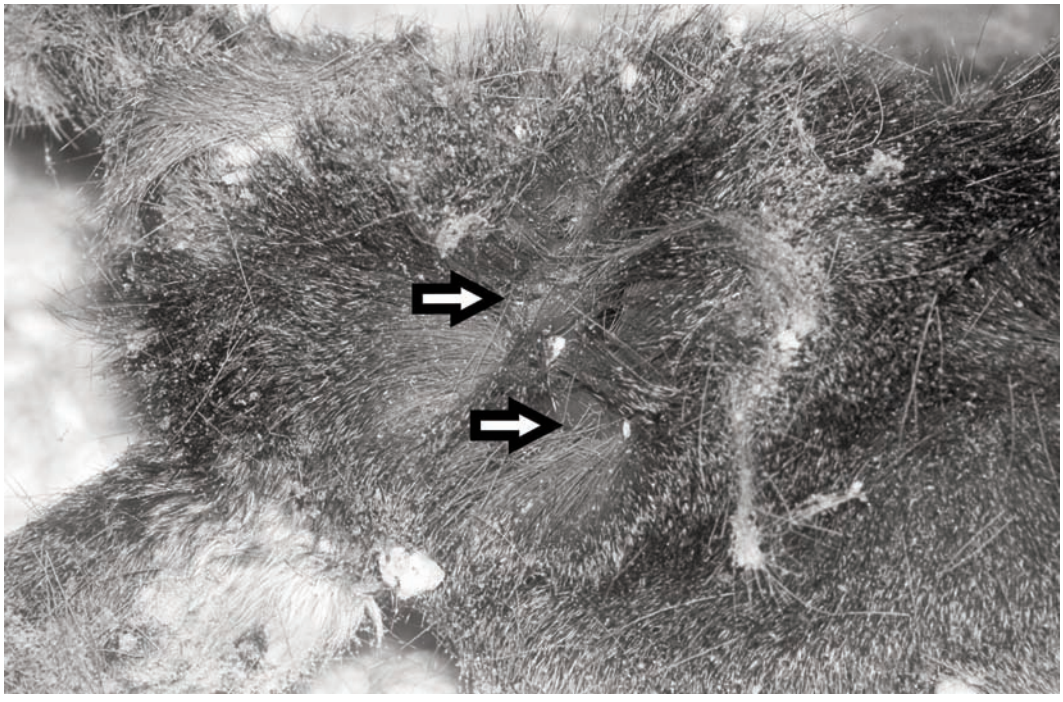

FIGURE 1. Neck wound (arrows indicate puncture locations) resulting in the death of an adult female Mule Deer by a Canada Lynx in the southern Canadian Rocky Mountains, January 1999.

Six site visits conducted over the three weeks following the initial find indicated that the lynx first fed on the doe's neck, continued to feed on the shoulders and rib cage, and finally ate the rear and internal organs. Deer hair had been removed and was positioned around and on top of the kill. There were several well-used lynx beds that appeared to be strategically located upslope, <120 m from the kill site, with clear downhill views. The hindquarters of the fawn were moved to 4 different locations between our site visits, and each time were cached under snow and branches. It is possible that this was prompted by our inspections.

On 29 January we installed an infrared monitor (Trailmaster™ 1500, Goodson and Associates Inc., Kansas, with attached Olympus camera) at the doe's kill site to document the 24-hour activity of the lynx at the site. The monitor was programmed to register all beam interferences, while the remote camera was set to take a photo upon beam interference, with ≤1 photo/15 min and between 0900 h and 1630 h to avoid flash disturbance. Because the lynx no longer appeared to be feeding on the fawn, we expected that all subsequent feeding events would be registered.

Twenty photos of the lynx were obtained and showed that only this animal fed on the carcass (e.g., Figure 2). In addition, no other predator was detected at the site during inspections that occurred about every four days. lynx activity at the kill peaked around midnight and in the late morning (Figure 3).

The lynx abandoned the kill site after 28 days, at which time the head and lower side of the doe's carcass were frozen into the ground. Scratch marks suggested that the lynx had unsuccessfully tried to remove some snow to access parts of the deer. Upon incidental recapture 16 days later, the lynx weighed 15.9 kg, 18.6% more than at his previous and original capture in November 1996, while skeletal measurements had not changed (C. D. Apps, unpublished data).

Our account is consistent with the observations by Stephenson et al. (1991) of lynx ambushing ungulate prey at close range. They reported a lynx remaining on a Caribou (*Rangifer tarandus*) kill for 42 days. In our study, the Lynx apparently abandoned the site because it could not make use of the carcass remains, and it might have stayed longer had conditions permitted.

Previous reports of lynx predation on ungulates have been associated with the low phase of the approximate 10-year population cycle of Snowshoe Hares, the lynx's primary prey. The reliance of lynx on alternate prey is greatest at this time (Mowat et al. 2000). Although the deer kills we report occurred during an assumed Snowshoe Hare population peak, hare densities in the study area were comparable to boreal regions during the cyclic low (Apps 2000; C.D. Apps, unpublished data).

FIGURE 2. Remote camera photo of a Canada Lynx at the carcass of a Mule Deer it killed in the southern Canadian Rocky Mountains, January 1999.

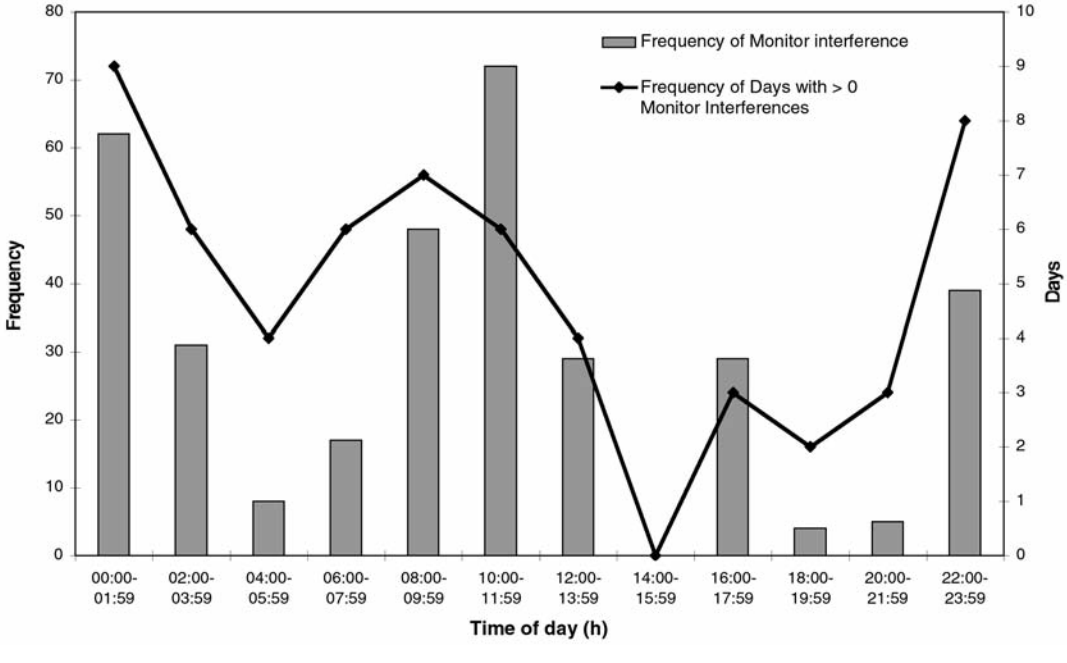

FIGURE 3. Lynx activity while feeding on a Mule Deer kill over 11 days in the southern Canadian Rocky Mountains, January 1999. Total frequency (1 min. intervals; $n = 344$) and number of days that the Canada Lynx triggered an infrared monitor (monitor interference) per 2-h period are shown.

We further note that the relatively high elevation and deep snow of the kill site made it an atypical location for Mule Deer during mid-winter. We speculate that the deer may have been avoiding other predators, most notably Gray Wolves (*Canis lupus*) that travel primarily through the valley bottom. Thus, we expect that this predation was opportunistic, perhaps influenced by relatively low densities of Snowshoe Hares, the age class and sex of the lynx (adult male), and the vulnerability of the deer.

Acknowledgments

The Southern Canadian Rockies Lynx Project was jointly funded by the Habitat Conservation Trust Fund through the British Columbia Ministry of Water, Land and Air Protection (formerly Environment, Lands and Parks), Parks Canada, and the Columbia Basin Fish and Wildlife Compensation Program. Additional financial contributions were provided by the Friends of Kootenay National Park, Husky Oil, World Wildlife Fund Canada, Fairmont Hotels and Resorts (formerly Canadian Pacific Hotels & Resorts), and the Bow Valley Naturalists. Contract supervision, input, and direction were provided by A. Dibb of Parks Canada, J. Krebs of the Columbia Basin Fish and Wildlife Compensation Program, and A. Fontana, R. Neil, G. Tipper, R. Forbes, and I. Teske of BC Environment.

Literature Cited

Apps, C. D. 2000. Space use, diet, demographics, and topographic associations of Lynx in the southern Canadian Rocky Mountains. Pages 351-371 *in* Ecology and conservation of Lynx in the United States. *Edited by* L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires. University Press of Colorado, Boulder, Colorado.

Mowat, G., K. G. Poole, and **M. O'Donoghue.** 2000. Ecology of Lynx in northern Canada and Alaska. Pages 365-306 *in* Ecology and conservation of Lynx in the United States. *Edited by* L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires. University Press of Colorado, Boulder, Colorado.

Parker, G. R., J. W. Maxwell, L. D. Morton, and **G. E. J. Smith.** 1983. The ecology of the Lynx (*Lynx canadensis*) on Cape Breton Island. Canadian Journal of Zoology 61: 770-786.

Saunders, J. K. Jr. 1963. Food habits of the Lynx in Newfoundland. Journal of Wildlife Management 27: 384-390.

Stephenson, R. O., D. V. Grangaard, and **J. Burch.** 1991. Lynx, *Felis lynx*, predation on Red Foxes, *Vulpes vulpes*, Caribou, *Rangifer tarandus*, and Dall Sheep, *Ovis dalli*, in Alaska. Canadian Field-Naturalist 105: 255-262.

van Zyll de Jong, C. G. 1966. Food habits of the Lynx in Alberta and the Mackenzie District, N.W.T. Canadian Field-Naturalist 80: 18-23.

Received 8 September 2002
Accepted 25 October 2004