

Scavenging of an Elk, *Cervus elaphus*, Carcass by Multiple Cougars, *Puma concolor*, in Southeastern Alberta

MICHELLE M. BACON and MARK S. BOYCE

Department of Biological Sciences, University of Alberta, Edmonton, Alberta T6G 2E1 Canada; e-mail: mmbacon@ualberta.ca; boyce@ualberta.ca

Bacon, Michelle M., and Mark S. Boyce. 2010. Scavenging of an Elk, *Cervus elaphus*, carcass by multiple Cougars, *Puma concolor*, in southeastern Alberta. *Canadian Field-Naturalist* 124(3): 242–245.

We report the confirmed or suspected scavenging by six different Cougars, *Puma concolor*, on an Elk (*Cervus elaphus*) carcass, from January to April 2009, near Cypress Hills Interprovincial Park in southeastern Alberta, Canada. Visitations by Cougars were captured by a camera trap focused on the carcass; we were able to tentatively identify 6 individual Cougars by the presence of radio-collars, ear sizes and tail characteristics. Our photos are the first published event of >2 Cougars feeding on the same carcass.

Key Words: Cougar, *Puma concolor*, camera trap, scavenging, food sharing, Alberta.

Scavenging by cougars (*Puma concolor*) has rarely been reported, and most long-term studies suggest that they prefer to kill their own prey. For example, Ross and Jalkotzy (1996) found only four incidents of scavenging on Moose (*Alces alces*) carcasses during their 13-year study in southwestern Alberta; similarly, Logan and Sweanor (2001) reported only 16 cases of scavenging in their 10-year study in New Mexico. However, a few observations of Cougar scavenging have been reported, including an adult female scavenging on Elk (*Cervus elaphus*) carcasses during a 22-day period in northeast Oregon (Nowak et al. 2000). More recently, Bauer et al. (2005) reported 20 of 46 (43.5%) Mule deer (*Odocoileus hemionius*) carcasses they placed out as bait in California were scavenged by Cougars. Knopff et al. (2010) reported that the tendency for Cougars to scavenge in west-central Alberta is high, making them vulnerable to baited snares along traplines set for Wolves (*Canis lupus*) or Coyotes (*Canis latrans*); incidental snaring was responsible for 11% of Cougar mortalities during their four-year study.

Even with the advent of Global Positioning Systems (GPS) radiocollars and cluster techniques to locate kill sites (Anderson and Lindzey 2003; Knopff et al. 2009), Cougar scavenging events and rates are difficult to quantify. Previous studies (Bauer et al. 2005) have shown that Cougars will treat scavenged carcasses similar to their own kills, and will cache and cover them with vegetation and soil. A carcass might be scavenged by numerous species, including Coyotes, birds and small mammals, before researchers can visit it, making it a challenge to determine with confidence if the Cougar had killed the prey. Scavenging that is confused with kills could inadvertently inflate estimated kill rates (Bauer et al. 2005; Knopff et al. 2010). Most reports of Cougar scavenging have either noted scavenging by a single Cougar on a carcass, or they do not or can not distinguish between individual Cougars. Here, we

report scavenging of a single Elk carcass by multiple Cougars, captured on camera traps in southeastern Alberta.

On 6 January 2009, we were notified by a landowner of Cougar tracks and scat around the carcass of an adult bull Elk, approximately 350m south of Cypress Hills Interprovincial Park, a protected area straddling the Alberta-Saskatchewan border (49°40'N, 110°15'W). Here, Cougars naturally re-established a population during the mid 2000s (Bacon and Boyce 2009). We visited the frozen Elk carcass the following day, and confirmed that it did not exhibit the typical signs of a Cougar kill (e.g., consumed organs, caching the carcass and covering it with vegetation and hair piles). There were no fresh Cougar tracks upon initial investigation, and we concluded that scavenging was initiated by Coyotes and various birds. Elk hunting occurred in the area in late November 2008 (D. Mitzner, personal communication), and it was likely then that the Elk was wounded.

We placed a Reconyx RC55 RapidFire camera (Reconyx, Inc., Holman, WI, USA) in a tree approximately 1 m above the ground and 3 m from the carcass. A second camera trap (Stealth Cam, LLC, Grand Prairie, Texas, USA) was set up on a game trail leading away from the carcass by the landowner for the month of January. The Reconyx camera took 3845 photos between 7-13 January 2009 before the memory card filled. We checked the camera on 30 January 2009 and reprogrammed it to take fewer pictures per motion event; however, largely due to the frequent activities of Black-billed Magpies (*Pica hudsonia*), the memory card filled within four days. We checked and reset the camera on 12 March 2009; the camera took 3734 photos before filling up the memory card on 3 April 2009. We removed the camera on 17 April 2009 once the carcass was mostly consumed. In total, the Reconyx camera trap was operational for 34 days of 101 days

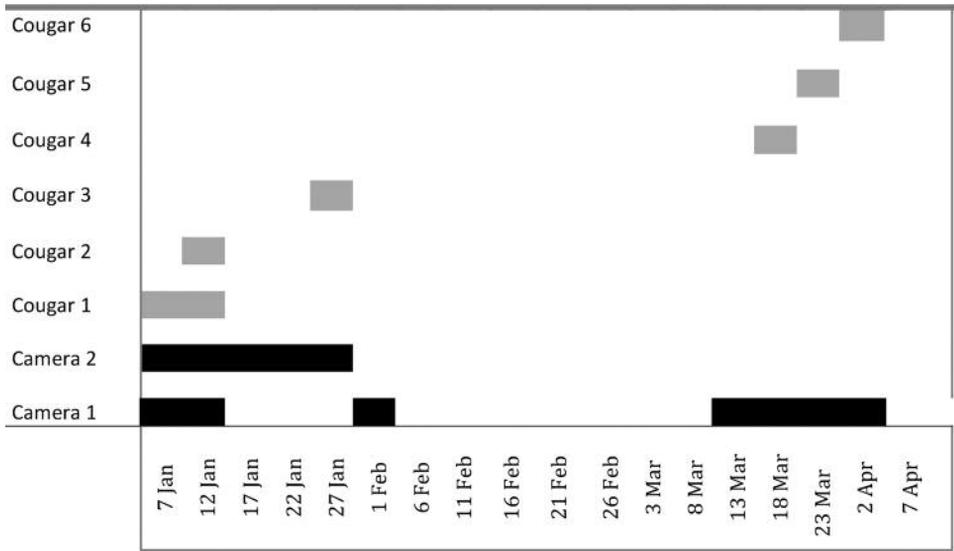


FIGURE 1. Timeline showing days that Reconyx and Stealthcam cameras were active, and days individual Cougars were recorded.

it was deployed (34 %) between 7 January 2009 and 17 April 2009 (Figure 1).

Cougars in our study area had frequently lost the tips of the ears or the black tips of their tails, likely from frostbite. These traits, along with body size and morphology, and the presence or absence of a radio-collar, allowed us to tentatively identify six individual Cougars that visited the Elk carcass during the 3.5 months that the camera traps were deployed. Photographic evidence showed that three of these Cougars fed on the carcass, while another three visited the carcass and may have fed on it, but we could not confirm this with our photos.

Cougar 1 was our most frequent visitor to the carcass and spent the most time scavenging on the carcass (Figure 2). She had very short ears, a full tail, and no radiocollar, and her body size and configuration indicated she was a female. Cougar 1 was first captured on the camera on 8 January 2009 and spent much of the following 6 days eating, grooming and sleeping next to the carcass. She scavenged on the carcass at all times of day, and several series of photos showed her covering the carcass with soil and vegetation. She was last photographed on 13 January 2009.

Cougar 2 appeared while Cougar 1 was still feeding on the carcass (Figure 2), although Cougar 2 was never photographed at the carcass at the same time as Cougar 1. Cougar 2 was smaller than Cougar 1 and had no radio-collar, but had very large ears and a full tail. Based on body size, Cougar 2 was probably a juvenile. Cougar 2 was never observed consuming meat from the carcass; each of the four times it appeared between

11-13 January 2009, it sniffed the Elk, walked around the carcass and then left. This Cougar might not have eaten anything from the Elk possibly because Cougar 1, an adult, was still using the carcass and likely marking it with urine or scat. Cougar 2 also was captured on the camera trap on the trail leading away from the carcass on 14 January 2009, the day after the camera at the carcass ran out of memory.

Cougar 3 was photographed by the camera trap on the trail on 26 January 2009, during a period when the camera trap on the carcass was not working (Figure 2). This Cougar had full ears, a short tail and possibly a radio-collar. After examining GPS data from our radio-collared females (M. Bacon and M. Boyce, unpublished data), we confirmed that an individual had been in that area but not long enough to conclude with certainty that she had been scavenging on the carcass.

Cougar 4 was a radio-collared adult female that was easily identified from her half-length tail. She arrived at the carcass on 19 March 2009 and scavenged for 30 min before leaving. She returned 11 days later but did not feed on the carcass (Figure 2).

Cougar 5 was first photographed on 23 March 2009. This Cougar had a significantly larger body and head than any other cougar that we photographed on this camera, and it was clearly an adult male. He ate sparingly from the carcass and was not photographed again (Figure 2).

Cougar 6 was a radio-collared female with full ears and a full tail (Figure 2). She was a young female and we would later find other incidents of scavenging on



FIGURE 2 a-f. Six individual Cougars can be identified visiting and/or scavenging on the elk carcass between January 7-April 17 2009.

Elk and Moose by her as well. She was first photographed at the carcass on 2 April 2009 and ate throughout that day and the next, despite the fact that little meat remained on the carcass. She left the carcass frequently and covered it when she left between scavenging events. The camera's memory card filled on 3 April 2009, but GPS data from her radiocollar showed that she remained at the carcass until the morning of 8 April 2009 (M. Bacon and M. Boyce, unpublished data). She

returned to the carcass repeatedly during 21-28 April 2009.

Our use of motion-activated camera traps confirmed scavenging activity as well as the use of a single carcass by multiple Cougars during a relatively short time frame. We think it unlikely that this was a unique event; Cougars may be chasing other intra- and interspecific competitors off fresh and scavenged kills frequently, which could inflate estimated predation rates. Cougars

of varied age-classes and both sexes scavenged the carcass. All six Cougars that visited and/or scavenged on the Elk carcass appeared to be in healthy condition, and we know the three with radiocollars were all capable of killing their own prey because we had located kill sites using GPS cluster techniques (Bacon and Boyce 2009). Our photographs add to the other recent observations (e.g., Nowak et al. 2000; Bauer et al. 2005; Knopff et al. 2010) that scavenging may be a more important foraging strategy in Cougars than previously recognized.

Acknowledgments

We are grateful to D. Mitzner for identifying Cougar tracks and allowing us access to his land. We thank all field technicians for assistance in data collection. Funding was provided by Alberta Tourism, Parks and Recreation, Saskatchewan Environment, Alberta Conservation Association, Alberta Sport Recreation Parks and Wildlife Foundation, Medicine Hat Fish and Game Association, Canadian Wildlife Federation, TD Friends of Environment, Heritage Association of Cypress Hills, Safari Club International-Northern Alberta Chapter and The Lions Club. We thank Cypress Hills Inter-provincial Park for in-kind and logistical support during field work.

Literature Cited

- Anderson Jr., C. R., and F. G. Lindzey.** 2003. Estimating cougar predation rates from GPS location clusters. *Journal of Wildlife Management* 67: 307-316.
- Bacon, M. M., and M. S. Boyce.** 2009. The prairie cougar: Examining the effects of a re-established predator population. *Nature Alberta* 38: 20-23.
- Bauer, J. W., K. A. Logan, L. L. Sweanor, and W. M. Boyce.** 2005. Scavenging behaviour in Puma. *Southwestern Naturalist* 50: 466-471.
- Knopff, K. H., A. A. Knopff, and M. S. Boyce.** 2010. Scavenging makes cougars susceptible to snaring at wolf bait stations. *Journal of Wildlife Management* 74: 644-653.
- Knopff, K. H., A. A. Knopff, M. B. Warren, and M. S. Boyce.** 2009. Evaluating global positioning system telemetry techniques for estimating cougar predation parameters. *Journal of Wildlife Management* 73: 586-597.
- Logan, K. A., and L. L. Sweanor.** 2010. Behaviour and social organization of a solitary carnivore. Pages 105-117 *in* Cougar ecology and conservation. *Edited by* M. Hornocker and S. Negri, University of Chicago Press, Chicago, USA.
- Logan, K. A., and L. L. Sweanor.** 2001. Desert Puma: evolutionary ecology and conservation of an enduring carnivore. Island Press, Washington DC, USA.
- Nowak, M. C., T. E. Taylor, and G. W. Witmer.** 2000. Prolonged scavenging by a female mountain lion in north-eastern Oregon. *Northwestern Naturalist* 81: 63-65.
- Quigley, H., and M. Hornocker.** 2010. Cougar population dynamics. Pages 59-75 *in* Cougar ecology and conservation. *Edited by* M. Hornocker and S. Negri, University of Chicago Press, Chicago, USA.
- Ross, I. P., and M. G. Jalkotzy.** 1996. Cougar predation on moose in southwestern Alberta. *Alces* 32: 1-8.

Received 5 September 2010

Accepted 19 November 2010