

Note

Raven (*Corvus corax*) as a novel food item for lynx (*Lynx canadensis*)

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Abstract

Canada Lynx (*Lynx canadensis*) is a specialist predator of Snowshoe Hare (*Lepus americanus*), which dominates its diet. However, hare populations cycle over 9–11 years, and many lynx disperse or starve during cyclic lows of their prey. Here, I report observations of Canada Lynx scavenging and attempting to prey on Common Raven (*Corvus corax*). In addition, I provide a brief review of birds as a food item of lynx. These are the first observations of ravens as a food source for lynx and may be a response to lynx being malnourished. The value of these observations is that they highlight the adaptability of some lynx to opportunistically use novel prey species during the decline phase of cyclic Snowshoe Hare.

Key words: *Corvus corax*; diet; *Lynx canadensis*; predation; scavenging

Canada Lynx (*Lynx canadensis*) is a specialist predator of Snowshoe Hare (*Lepus americanus*), which dominates its diet, particularly in high-latitude boreal forests (O'Donoghue *et al.* 1997, 1998a,b; Mowat and Slough 1998, 2003; Roth *et al.* 2007; Ivan and Shenk 2016). However, hare populations cycle from periods of high to low density with a periodicity of 9–11 years (Elton and Nicholson 1942; Krebs *et al.* 2018; Oli *et al.* 2020), leaving few hare available as prey in years of low abundance. For lynx that are unable to secure enough hare to meet their energetic demands, it becomes critical that they find alternative food sources. Red Squirrel (*Tamiasciurus hudsonicus*) is their main alternate prey (Brand *et al.* 1976; O'Donoghue *et al.* 1997, 1998a,b). Other species appear to be rarely eaten by lynx, but occasional prey include ungulates, small rodents, grouse, and other birds (Saunders 1963; van Zyll de Jong 1966; Parker *et al.* 1983; Staples 1995; Squires and Ruggerio 2007; Hanson and Moen 2008; Ivan and Shenk 2016). Lynx may also switch to scavenging during periods of low hare abundance (Brand *et al.* 1976). Here, I report observations of Canada Lynx scavenging or attempting to prey on Common Raven (*Corvus corax*) during cyclic lows in hare abundance (Boonstra *et al.* 2018).

On 2 March 2010, wildlife officials were alerted to two Canada Lynx in a small patch of trees behind a

restaurant in the middle of the village of Haines Junction, Yukon, Canada (60.753°N, 137.513°W). The lynx were observed actively eating a raven and sitting by its carcass (Figure 1) for more than two days. The raven was believed to have been electrocuted on the powerline above where the carcass was found. Local wildlife officials noted that the lynx appeared malnourished and desperate, not wanting to leave the raven remains (L. Larocque and R. Osborne pers. comm. 3 March 2010), or their persistence may have been related to other potential attractants (e.g., food waste). Officials were able to capture the lynx with a snare pole and the lynx were subsequently translocated out of town to a shrubby meadow where hare tracks were relatively abundant.

In an earlier instance, on 25 September 2000, I observed a Canada Lynx cross the Alaska Highway about 2 km east of the Haines Junction. It was moving toward a public landfill, so I followed it. Once at the landfill, I used 8 × 30 binoculars to observe the individual crouching and watching a group of about 25 ravens feeding on refuse. It began stalking the nearest raven, which was about 30 m away. The lynx pounced at the raven when it was within 3–5 m, but missed, and the raven flew away. The lynx immediately ran toward another nearby raven that was still on the ground. When the lynx was about 10 m away,



FIGURE 1. Canada Lynx (*Lynx canadensis*) scavenging a Common Raven (*Corvus corax*) carcass in Haines Junction, Yukon, Canada. Photo: Lorne Larocque.

the raven flew up and the lynx jumped about 1.5 m into the air after it, swiping at the raven with its outstretched paw. Again, the lynx missed, and the raven flew away. The lynx then sat down and watched the remaining ravens that were foraging about 25 m away. After ~3 min, the lynx left the landfill and was not seen again.

Birds are not a major component of lynx diets. Although uncommon, grouse are the most frequently observed birds in lynx stomachs or scat, or found killed during snow-tracking (e.g., Staples 1995; O'Donoghue *et al.* 1998a; Squires and Ruggiero 2007). In total, 14 bird species have been recorded at least once in the diet of Canada Lynx (Table 1). No other bird species have been reported as a food item for Canada Lynx. However, several studies have indicated unidentified bird remains in lynx diets, and they may include other species, most notably passerines (e.g., Saunders 1963; Staples 1995). Many of the observations of birds in lynx diets are from the southern portion of their range (e.g., Newfoundland, Colorado, Minnesota; Table 1), where their dietary niche appears broader than in high-latitude boreal forests (O'Donoghue *et al.* 1998a,b; Roth *et al.* 2007; Squires and Ruggiero 2007; Ivan and Shenk 2016).

This is the first record of lynx foraging on ravens, one of the most common resident birds in the northern boreal forest. These observations are of value because they add to our knowledge of the foraging behaviour

and diet of Canada Lynx, especially when hares occur at low densities. Observations of lynx focussing on raven as a food item occurred when hare were at (or near) cyclic lows, with densities in southwestern Yukon of <0.2 hare/ha (peak density was 1–2 hares/ha; Boonstra *et al.* 2018; Oli *et al.* 2020). Lynx are not known to focus on ravens as prey; however, when hare densities are low and lynx likely malnourished, locally abundant species such as ravens may become attractive as prey to lynx. Moreover, with a mass of 1–2 kg, Common Ravens are heavier than other birds, making them a potentially substantial food item when hare are scarce.

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TABLE 1. Species of birds observed as food items used by Canada Lynx (*Lynx canadensis*).

Species	Location	Source*
Ruffed Grouse (<i>Bonasa umbellus</i>)	Alberta, Minnesota, Nova Scotia, Yukon	2–4, 6, 8
Spruce Grouse (<i>Falcapennis canadensis</i>)	Alaska, Minnesota, Montana, Newfound- land, Yukon	1, 5–8
Dusky Grouse (<i>Dendragapus obscurus</i>)	Colorado, Montana	7, 9
Willow Ptarmigan (<i>Lagopus lagopus</i>)	Newfoundland, Yukon	1, 6
White-tailed Ptarmigan (<i>Lagopus leucura</i>)	Colorado	9
Green-winged Teal (<i>Anas crecca</i>)	Newfoundland	1
Black Duck (<i>Anas rubripes</i>)	Newfoundland	1
Mallard (<i>Anas platyrhynchos</i>)	Alaska, Alberta	2, 5
Northern Flicker (<i>Colaptes auratus</i>)	Newfoundland	1
Three-toed Woodpecker (<i>Picoides dorsalis</i>)	Colorado, Alaska	5, 9
Fox Sparrow (<i>Passerella iliaca</i>)	Newfoundland	1
Canada Jay (<i>Perisoreus canadensis</i>)	Colorado, Nova Scotia	4, 9
Blue Jay (<i>Cyanocitta cristata</i>)	Minnesota	8
Common Raven (<i>Corvus corax</i>)	Yukon	This study

*Sources: 1 = Saunders 1963; 2 = van Zyll de Jong 1966; 3 = Brand *et al.* 1976; 4 = Parker *et al.* 1983; 5 = Staples 1995; 6 = O'Donoghue *et al.* 1998a,b; 7 = Squires and Ruggiero 2007; 8 = Hanson and Moen 2008; 9 = Ivan and Shenk 2016. Bird names follow the American Ornithological Society as the taxonomic authority (Chesser *et al.* 2021).

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