

Note

Predation of a Western Water Shrew (*Sorex navigator*) by a Belted Kingfisher (*Megaceryle alcyon*)

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Belted Kingfishers (*Megaceryle alcyon*) are highly piscivorous and rarely take prey other than fish. Here, I report an observation of a male Belted Kingfisher preying on a Western Water Shrew (*Sorex navigator*) in a small boreal stream in southwestern Yukon. This observation provides further evidence that Belted Kingfishers will occasionally prey on riparian small mammals when the opportunity arises and points to piscivorous birds as apparently novel predators of shrews.

Key Words: Belted Kingfisher; *Megaceryle alcyon*; predation; *Sorex navigator*; Western Water Shrew; Yukon

Predation of *Sorex* shrews is rarely observed, and most species appear to have few predators, despite their diminutive size. Although mammalian carnivores appear to find shrews unpalatable, likely because of their pungent, musky odour, Red Foxes (*Vulpes vulpes*), Ermine (*Mustela erminea*), and other species do occasionally prey on shrews as indicated by diet analyses (Nagorsen 1996). In contrast, shrew skulls are often found in the pellets of various birds of prey, particularly owls, which appear to prey on them regularly (Nagorsen 1996).

Belted Kingfishers (*Megaceryle alcyon*) are highly piscivorous, and observations of non-fish prey are rare (Kelly *et al.* 2009). However, they are known to consume crustaceans and frogs occasionally. With respect to small mammals, Cairns (1998) reported an Eastern Water Shrew (*Sorex albibarbis*) consumed by a Belted Kingfisher, and Jung (2013) reported another kingfisher attempting to prey on a diurnally active Spotted Bat (*Euderma maculatum*). No other instances of small mammals as prey of kingfishers have been reported in the literature. Here, I record an observation of a Belted Kingfisher preying on a shrew.

At approximately 0830 Pacific Daylight Time on 12 July 2015, a male Belted Kingfisher was observed and photographed in a dead tree with a small mammal in its beak (Figure 1). The tree was adjacent to McIntyre Creek, a small tributary of the Yukon River, located immediately northwest of Whitehorse, Yukon, Canada (60.7°N, 135.1°W).

The size and morphology of the small mammal, particularly the shape of the snout, indicated that it was a shrew. I identified the species based on the estimated tail length. ImageJ software was used to measure the culmen length of the kingfisher and the tail length of the shrew in the digital photograph (Figure 1). Kelly *et al.* (2009) provide a range of culmen lengths of 48–

63 mm ($n = 130$) for Belted Kingfishers, so I applied a midpoint value of 55 mm for the culmen length of the photographed Belted Kingfisher. I then used the estimated culmen length as a scale to estimate the tail length of the shrew as 92 mm.

Nagorsen (1996) reported varying shrew tail lengths: 29–49 mm ($n = 137$) for Common Shrews (*S. cinereus*), 22–34 mm ($n = 50$) for American Pygmy Shrews (*S. hoyi*), 35–68 mm ($n = 436$) for Montane Shrews (*S. monticolus*), and 62–88 mm ($n = 177$) for Western Water Shrews — the only shrew species known from southcentral Yukon (Slough and Jung 2007). Thus, the only shrew in the region with a tail length ≥ 68 mm is the Western Water Shrew, which is present in McIntyre Creek, based on a targeted live-trapping study of them (M. Leung, unpublished data, 2007).

The shrew had a bloody abdomen, presumably from the kingfisher “piercing” or “pounding” it to stun and subdue it—the common method kingfishers use to kill fish prey (White 1953)—suggesting that the kingfisher had killed the shrew, rather than finding it already dead. It is not known whether the kingfisher consumed the shrew.

Nagorsen (1996) reported the total length of Western Water Shrews as 133–179 mm ($n = 179$); if the mean tail length (75 mm) is subtracted, their body length is about 58–104 mm. The length of fish consumed by kingfishers is ≤ 127 mm (Salyer and Lagler 1946); hence, water shrews are likely approaching the upper limit of the size of prey that a kingfisher can consume.

The main scientific value of this observation is that it further demonstrates that Belted Kingfishers will occasionally prey on small mammals, despite their highly piscivorous diet, corroborating Cairns (1998) and Jung (2013). Bantock (2008) reported a Common Kingfisher (*Alcedo atthis*) in England killing a Eurasian Pygmy Shrew (*S. minutus*) and attempting to consume it. If



FIGURE 1. A male Belted Kingfisher (*Megaceryle alcyon*) with a Western Water Shrew (*Sorex navigator*) that it had likely captured and killed. Photograph taken on 12 July 2015 near Whitehorse, Yukon, Canada. Photo: Ed Lepp.

Belted Kingfishers can swallow prey as large as water shrews then they likely gain a substantial amount of energy for the effort and should do so as opportunity allows. Such opportunism is similar to reports of shrews (*Sorex* spp.) being occasionally consumed by fish that normally eat much smaller prey (i.e., Arctic Grayling [*Thymallus arcticus*; Moore and Kenagy 2004; Jung *et al.* 2011] and Rainbow Trout [*Oncorhynchus mykiss*; Lisi *et al.* 2014]). In addition, predators of water shrews are not well reported (Beneski and Stinson 1987; Nagorsen 1996; Powell *et al.* 2007), and this observation confirms the Belted Kingfisher as a predator of water shrews. Finally, this observation adds to others (e.g., Cochran and Cochran 1999; Moore and Kegany 2004; Jung *et al.* 2011; Lisi *et al.* 2014; Jung 2016) who report small mammals being susceptible to predation by apparently novel predators while in the water.

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