

Note

Reaching new heights: novel use of alpine talus by a Red Squirrel (*Tamiasciurus hudsonicus*)

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Abstract

Red Squirrel (*Tamiasciurus hudsonicus*) is common in the boreal forest, where it is chiefly arboreal and intricately tied to conifer trees for food and shelter. As such, these squirrels are found in close association with contiguous conifer forest. However, we observed a Red Squirrel in a talus patch in an alpine valley in southwestern Yukon, Canada. The valley was devoid of trees, with the nearest conifer ~3.6 km away and contiguous conifer forest ~4.8 km from our observation. How or why the Red Squirrel came to be in the alpine talus is unknown; however, it likely represented an unusual natal dispersal event. Our observation provides a novel record of this arboreal species in a talus patch located in an alpine valley that lacked trees.

Key words: Arboreal mammals; Kusawa Territorial Park; natal dispersal; talus

Red Squirrel (*Tamiasciurus hudsonicus*) is an arboreal mammal that is widely distributed across North America, where it is closely associated with boreal forests that consist of abundant conifer trees (Obbard 1987; Steele 1998; Steele and Koprowski 2001; Yahner 2003; Nagorsen 2005). Red Squirrels are highly dependent on conifer trees, particularly spruces (*Picea* spp.) and pines (*Pinus* spp.), for shelter and food (i.e., seed cones; Boonstra *et al.* 2001). As such, they are often common in conifer forests, and records of this species outside contiguous conifer forest are rare. Here, we report the occurrence of a Red Squirrel above the treeline in an alpine valley, far from the nearest conifers.

On 24 August 2023, while conducting surveys of Collared Pika (*Ochotona collaris*) in an alpine valley in Kusawa Territorial Park in southwestern Yukon, Canada (60.55513°N, 136.24769°W), we observed a Red Squirrel in talus (i.e., a boulder field) above the treeline. The animal was readily identified as a Red Squirrel based on its size, bicoloured coat, white eye ring, and long, bushy tail (Obbard 1987; Steele 1998; Steele and Koprowski 2001; Yahner 2003; Nagorsen 2005; Figure 1). Similar species, such as Collared

Pika, Least Chipmunk (*Neotamias minimus*), Arctic Ground Squirrel (*Urocyon parryi*), and Ermine (*Mustela erminea*), are somewhat common in our survey area, but these talus-dwelling species are readily distinguished from Red Squirrels based on diagnostic physical characteristics such as coat colouration and body size and shape (Obbard 1987; Steele 1998; Yahner 2003; Nagorsen 2005). The Red Squirrel did not vocalize during our observation (which is also a



FIGURE 1. A Red Squirrel (*Tamiasciurus hudsonicus*) observed in a talus patch in an alpine valley in southwestern Yukon, Canada, on 24 August 2023. Photo: T.S. Jung.

diagnostic trait; Obbard 1987; Steele 1998; Steele and Koprowski 2001; Yahner 2003; Nagorsen 2005), and it was seemingly leery of our presence, periodically disappearing into the talus, under the rocks, and re-appearing several seconds later 10–15 m away from us. Altogether, we spent about 10 min observing and photographing the Red Squirrel to confirm its identification (Figure 1).

Our observation occurred in a broad alpine valley that was devoid of trees or tall (>2.0 m) shrubs (Figure 2). Ground cover consisted of low (<0.5 m tall) shrubs, dry heath, wet hummocks, and talus (Figure 2). The valley was ~4.7 km long and the squirrel was observed roughly in the middle of the valley. We observed the Red Squirrel ~3.6 km from the nearest conifer and ~4.8 km from contiguous spruce forest (Figure 3).

Our observation occurred in August, when juvenile Red Squirrels were dispersing from their natal range and establishing their own territories (Larsen and Boutin 1994; Sun 1997). During our brief observation, there was no indication that the squirrel had permanently settled at this site (i.e., no food caching, midden material, or territorial vocalizations). Dispersing Red Squirrels are known to be transient through suboptimal habitat, such as forest gaps

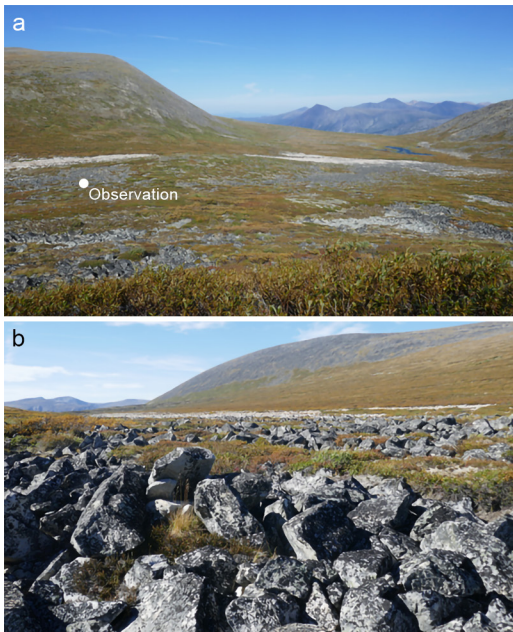


FIGURE 2. Landscape views of the location of an observation of a Red Squirrel (*Tamiasciurus hudsonicus*) in an alpine valley in southwestern Yukon, Canada. a. Looking east and showing the location of the observation. b. Looking west from the observation point. There are no trees in this broad valley. Photos: T.S. Jung.



Figure 3. Site of an observation of a Red Squirrel (*Tamiasciurus hudsonicus*) in an alpine valley in southwestern Yukon, Canada, showing the approximate location of the nearest, sparse White Spruce (*Picea glauca* (Moench) Voss) trees and the limit of contiguous White Spruce forest. Scale bar is approximate. Source: Kusawa Territorial Park, Yukon, Canada, 60.55513°N, 136.24769°W. Google Earth Pro 7.3.1.4507. Imagery date: 31 December 2020. Data provider: Maxiar Technologies 2018. Accessed: 11 October 2023.

(Bakker and Van Vuren 2004), and we may have encountered it in suboptimal habitat while it was in transit between forest patches. Natal dispersal by Red Squirrels varies with individuals and personalities (Cooper *et al.* 2017), and the fitness benefits of dispersal also vary among individuals (Martinig *et al.* 2020).

Although Red Squirrels may cross suboptimal forest clearings (Bakker and Van Vuren 2004), our observation is noteworthy with respect to the distance between contiguous conifer forest and the alpine talus patch (4.8 km). In a study of gap crossing in Alaska, a long-distance crossing was classified as >100 m, and crossings >400 m were rare (Bakker and Van Vuren 2004). In Yukon, the longest dispersal distance recorded for 176 Red Squirrels was 566 m (average = 102 m; Cooper *et al.* 2017). These distances are also consistent with the perceptual distances (i.e., the maximum distance an animal can perceive the presence of habitat patches; Zollner 2000) of other arboreal squirrels, which include 300 m for Eastern Gray Squirrel (*Sciurus carolinensis*) and 400 m for Fox Squirrel (*Sciurus niger*; Zollner 2000). As

such, the observation of a Red Squirrel nearly 5 km from a patch of forest is exceptional.

Collectively, we have observed and heard of reports from others of Red Squirrels in alpine tundra habitats, where sparse spruce trees occur above the continuous treeline. However, to the best of our knowledge, this is the first record of a Red Squirrel in alpine tundra far from any conifers. This is also the first record of a Red Squirrel in an alpine talus field, which it apparently used as shelter in lieu of conifers, similar to small, alpine mammals such as Colared Pika and Least Chipmunk. Our observation is of interest because it may indicate that Red Squirrels will explore or traverse novel habitats without conifer cover, and while doing so use available habitat features, such as talus, for shelter. However, a small percentage of dispersing Red Squirrels survive (Larsen and Boutin 1994) and the fate of the individual we observed is uncertain without nearby conifers for food and shelter.

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Literature Cited

- Bakker, V.J., and D.H. Van Vuren.** 2004. Gap-crossing decisions by the Red Squirrel, a forest-dependent small mammal. *Conservation Biology* 18: 689–697. <https://doi.org/10.1111/j.1523-1739.2004.00149.x>
- Boonstra, R., S. Boutin, A. Byrom, T. Karels, A. Hubbs, K. Stuart-Smith, M. Blower, and S. Antpoebler.** 2001. The role of Red Squirrels and Arctic Ground Squirrels. Pages 179–214 in *Ecosystem Dynamics of the Boreal Forest: the Kluane Project*. Edited by C.J. Krebs, S. Boutin, and R. Boonstra. Oxford University Press, New York, New York, USA.
- Cooper, E.B., R.W. Taylor, A.D. Kelley, A.R. Martinig, S. Boutin, M.M. Humphries, B. Dantzer, J.E. Lane, and A.G. McAdam.** 2017. Personality is correlated with natal dispersal in North American Red Squirrels (*Tamiasciurus hudsonicus*). *Behaviour* 154: 939–961. <https://doi.org/10.1163/1568539x-00003450>
- Larsen, K.W., and S. Boutin.** 1994. Movements, survival, and settlement of Red Squirrel (*Tamiasciurus hudsonicus*) offspring. *Ecology* 75: 214–223. <https://doi.org/10.2307/1939395>
- Martinig, A.R., A.G. McAdam, B. Dantzer, J.E. Lane, D.W. Coltman, and S. Boutin.** 2020. The new kid on the block: immigrant males win big whereas females pay fitness cost after dispersal. *Ecology Letters* 23: 430–438. <https://doi.org/10.1111/ele.13436>
- Nagorsen, D.W.** 2005. *Rodents and Lagomorphs of British Columbia*. Royal BC Museum, Victoria, British Columbia, Canada.
- Obbard, M.E.** 1987. Red Squirrel. Pages 264–281 in *Wild Furbearer Management and Conservation in North America*. Edited by M. Novak, J.A. Baker, M.E. Obbard, and B. Malloch. Ontario Ministry of Natural Resources, Toronto, Ontario, Canada.
- Steele, M.A.** 1998. *Tamiasciurus hudsonicus*. *Mammalian Species* 586: 1–9. <https://doi.org/10.2307/3504443>
- Steele, M.A., and J.L. Koprowski.** 2001. *North American Tree Squirrels*. Smithsonian Books, Washington, DC, USA.
- Sun, C.** 1997. Dispersal of young in Red Squirrels (*Tamiasciurus hudsonicus*). *American Midland Naturalist* 138: 252–259. <https://doi.org/10.2307/2426818>
- Yahner, R.H.** 2003. Pine Squirrels. Pages 268–275 in *Wild Mammals of North America: Biology, Management, and Conservation*. Second Edition. Edited by G.A. Feldhamer, B.C. Thompson, and J.A. Chapman. John Hopkins University Press, Baltimore, Maryland, USA.
- Zollner, P.A.** 2000. Comparing the landscape level perceptual abilities of forest sciurids in fragmented agricultural landscapes. *Landscape Ecology* 15: 523–533. <https://doi.org/10.1023/A:1008154532512>

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