

Notes

Tree-climbing by Arctic Ground Squirrels, *Spermophilus parryii*, in the Southwestern Yukon Territory

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Arctic Ground Squirrels (*Spermophilus parryii*) are commonly considered obligate ground-dwelling. However, seventy-eight Arctic Ground Squirrels were seen climbing or sitting in spruce trees and on deadfall and stumps 164 times in the southwestern Yukon from 1991–1994. Trees, deadfall, and stumps, seemed to serve primarily as temporary refuges and/or predator surveillance sites, although some were occasionally used as nest sites. Arctic Ground Squirrels are not as obligate ground-dwelling as previously thought.

Key Words: Arctic Ground Squirrel, *Spermophilus parryii*, climbing, nesting, boreal forest, Yukon.

The Arctic Ground Squirrel (*Spermophilus parryii*) lives in a variety of habitats in North America ranging from Arctic and alpine tundra to boreal forest (Banfield 1974). This species has, however, only been previously studied in tundra habitats where it is considered to be obligate ground-dwelling (Carl 1971; Green 1977; Woods 1980; McLean 1981; Lacey 1991). In the boreal forest, Arctic Ground Squirrels must not only contend with relatively high levels of predation (Hubbs and Boonstra, unpublished), but compensate for an obscured view of approaching predators. Here, we report on climbing of trees, deadfall, and stumps by Arctic Ground Squirrels within the Boreal Forest of the southwestern Yukon Territory (61°N, 138°W).

Squirrels were observed from mid-April, when they emerged from hibernation, to late August, when they entered hibernation, on five 10 ha grids between 1991–1994 and on two additional 10 ha grids between 1992–1994. All grids were dominated by White Spruce (*Picea glauca*) with an understory of Bog Birch (*Betula glandulosa*), Grey Willow (*Salix glauca*), and grasses (*Festuca altacia* and *Calamagrostis lapponica*). Observations of squirrels climbing or sitting in live or dead trees, or on deadfall and stumps greater than 1 m high were made during live-trapping and telemetry sessions.

Seventy-eight of a possible 400 Arctic Ground Squirrels captured on the grids from 1991–1994 (19.5%) were observed in trees or on deadfall and stumps 164 times. These included 49 females (25

adults, 24 young-of-the-year), 16 males (7 adults, 9 young-of-the-year) and 13 young-of-the-year of unknown sex. Squirrels were seen on average, 2.5 times $\pm$ 0.3 SE (median 1; maximum 13) per individual, at aboveground heights of 1.8 m $\pm$ 0.2 SE (range 0.5 m – 6.0 m). Squirrels were most frequently seen on deadfall (112 sightings), followed by trees (48 sightings with 21 in live trees and 27 in dead trees), and stumps (4).

The majority of climbing events (156 or 95% of the total sightings) were observed when squirrels were approached by an observer, usually when squirrels were away from their burrows or when their burrow entrances were not readily accessible upon release from traps. Alarm calling frequently occurred once squirrels were in trees or atop deadfall and stumps. This suggests that squirrels used these structures as temporary refuges against potential predators, as has been reported for Woodchucks (*Marmota monax* — Bowdish 1922; Cleveland 1922; Swihart 1982) and small mammals (Jedrzejewski et al. 1992), or as surveillance sites from which to monitor predator movements with the least visual obscurity. Columbian Ground Squirrels (*S. columbianus*) and Beldings Ground Squirrels (*S. beldingi*) have also been reported to use aboveground structures (rocks, burrow mounds, and fence posts) for vigilance (Tyser 1980; Sherman 1985; MacHutchon and Harestad 1990).

The remaining 5% of climbing events involved six female squirrels (five adults, one young-of-the-year)

which appeared to be nesting within 1.5–2.0 m high woodpecker or Red Squirrel (*Tamiasciurus hudsonicus*) holes in dead spruce trees. Nesting was suggested by a squirrel's repeated presence in trees prior to morning emergence as determined from radio-telemetry and by the lactating status of four of the five adults. This behaviour was observed on only one grid with very high numbers (55–216 squirrels versus 7–119 on the other grids from 1991–1994; Hubbs and Boonstra, unpublished; A. Byrom, unpublished; T. Karels, unpublished) where burrow sites likely were limiting.

Other than sites for nesting, refuge, or surveillance, squirrels may climb trees to obtain food, as observed for Woodchucks (D. M. Jedlicka, unpublished). Arctic Ground Squirrels will climb shrubs to feed on the buds, leaves, and flowers as will Columbian Ground Squirrels (Manville 1959) and Richardson Ground Squirrels (*S. richardsonii*: G. Michener, personal communication). Arctic Ground Squirrels have been observed climbing trees for food, but only when artificially supplemented foods have been provided (K. Stuart-Smith, personal communication). Squirrels will feed on spruce buds and arboreal lichens, but only when other food sources are scarce (Lincoln 1972; Batzli and Sobaski 1980). It therefore seems unlikely that the primary reason for Arctic Ground Squirrels climbing trees in the Boreal Forest of the southwestern Yukon was to obtain food.

Our findings indicate that Arctic Ground Squirrels in the Boreal Forest will climb trees, deadfall, and stumps, and thus are not obligate ground-dwelling as previously suggested. The primary reason for climbing appears to be to gain access to temporary refuges and/or surveillance sites. This conclusion is based strictly on observational data, rather than experimental analysis. To more accurately determine if this is the prime reason(s) for climbing, predators should be simulated and the frequency of tree-climbing determined in simulated and unsimulated areas. To test the utility of these structures further, they could be added to unforested areas and their usage monitored (MacHutchon and Harestad 1990).

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Literature Cited

- Banfield, A. W. F.** 1974. The Mammals of Canada. University of Toronto Press, Toronto. 438 pages.
- Batzli, G. O., and S. T. Sobaski.** 1980. Distribution, abundance, and foraging patterns of ground squirrels near Atkasook, Alaska. *Arctic and Alpine Research* 12: 501–510.
- Bowditch, B. S.** 1922. Tree-climbing woodchucks. *Journal of Mammalogy* 3: 259.
- Carl, E. A.** 1971. Population control in Arctic Ground Squirrels. *Ecology* 52: 395–413.
- Cleveland, P.** 1922. Woodchucks climb trees. *Journal of Mammalogy* 3: 260–261.
- Green, J. E.** 1971. Population regulation and annual cycles in the Arctic Ground Squirrel. M. Sc. thesis, University of British Columbia, Vancouver, British Columbia.
- Jedrzejewski, W., B. Jedrzejewska, and E. McNeish.** 1992. Hunting success of the weasel *Mustela nivalis* and escape tactics of forest rodents in Bialowieza National Park. *Acta Theriologica* 37: 319–328.
- Lacey, E. A.** 1991. Reproductive and dispersal strategies of male Arctic Ground Squirrels (*Spermophilus parryii plesius*). Ph.D. thesis, University of Michigan, Ann Arbor, Michigan.
- Lincoln, B. J.** 1972. Behavior study of the Arctic Ground Squirrel. I.R.R.P. Science Results 3: 245–253.
- MacHutchon, A. G., and A. S. Harestad.** 1990. Vigilance behaviour and use of rocks by Columbian ground squirrels. *Canadian Journal of Zoology* 68: 1428–1432.
- Manville, R. H.** 1959. The Columbian ground squirrel in northwestern Montana. *Journal of Mammalogy* 40: 26–45.
- McLean, I. G.** 1981. Social ecology of the Arctic Ground Squirrel *Spermophilus parryii*. Ph.D. thesis, University of Alberta, Edmonton, Alberta.
- Sherman, P. W.** 1985. Alarm calls of Belding's ground squirrels to aerial predators: nepotism or self-preservation? *Behavioural Ecology and Sociobiology* 17: 313–323.
- Swihart, R. K.** 1982. Scansorial behavior in woodchucks, *Marmota monax*. *Canadian Field-Naturalist* 96: 215–216.
- Tyser, R. W.** 1980. Use of substrate for surveillance behaviors in a community of talus slope mammals. *American Midland Naturalist* 104: 33–38.
- Woods, S. E., Jr.** 1980. The squirrels of Canada. National Museums of Canada, Ottawa. 199 pages.

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