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A Second Population of Rock Voles, *Microtus chrotorrhinus,* in Minnesota with Comments on Habitat

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The rock vole, *Microtus chrotorrhinus,* has been reported in Minnesota from a single specimen taken near Burntside Lake, St. Louis County in 1921 (Swanson 1945; Handley 1954) and from 26 specimens taken at one locality along the Gunflint Trail in central Cook County (Timm 1974; Timm et al. 1977). In recent years, subsequent collecting in the Burntside Lake area by several different individuals has failed to reveal additional rock voles.

Four rock voles were captured along the south shore of Saganaga Lake in northern Minnesota during a study of the impact of the Roy Lake wildfire on small mammal populations (Buech et al., unpublished data). This find is significant because it is the western-most population currently known for the species, it identifies a second viable population of rock voles in Minnesota, and it provides additional insight into the habitat requirements of this rare vole.

The rock voles were captured near Red Rock Bay of Saganaga Lake, 74 km north and 6 km west of Schroeder (SW 1/4 of the NE 1/4 and SE 1/4 of the NW 1/4 section 27, T. 66 N, R. 5 W, elevation 440–460 m) in the northwestern tip of Cook County, Minnesota. This site is located 21 km north and 47 km west of the Gunflint Trail population and some 27 km north and 80 km east of Burntside Lake. The four rock voles were captured within 30–180 m of each other on 2 and 3 September 1976 in a spruce-fir-aspen community in which portions of the overstory appeared to have been removed by wind.

Three of the rock voles captured were males, one a female. The largest, an adult male (weight 42.0 g; testes 7 × 4 mm), was undergoing extensive autumnal molt. One subadult male (testes = 4 × 2 mm), undergoing molt into the adult pelage, was partially consumed by a shrew. A second subadult male (weight 22.4 g, testes = 3 × 2 mm) was not molting. The female (weight 28.4 g) was molting into the adult pelage and exhibited no evidence of previous reproductive activity (no embryos or placental scars present in the uterus and all ovarian follicles minute). One species of chigger, *Neotrombicula microti*, was found parasitizing all four rock voles. The rock voles have been deposited in the mammal collection of the James Ford Bell Museum of Natural History, University of Minnesota, Minneapolis, Minnesota. For more details concerning the mammalian fauna of this region see Timm (1975).

Estimates of habitat attributes were available at three of the four capture sites. A sparse overstory of trees, a dense tall shrub stratum, and a sparse low shrub-herbaceous stratum were characteristic of the three sites. Two of the sites were located below a boulder escarpment between upland forest dominated by shrubs and lowland forest dominated by black spruce (*Picea mariana*). The overstory at these two sites had 5 and 9 m^2 basal area (BA)/ha, respectively, in black spruce about 14 cm diameter breast height (DBH), and 3 m^2 BA/ha each in white birch (*Betula papyrifera*) or quaking aspen (*Populus tremuloides)*

both about 25 cm DBH. The third site was located on a slope below an upland shrub community and differed in that there were no rocks present. Here the overstory contained only 3 m^2 BA/ha in white birch and quaking aspen combined. The tall shrub layer on all three sites included round-leaved dogwood (*Cornus rugosa*), beaked hazel (*Corylus cornuta*), red maple (*Acer rubrum*), balsam fir (*Abies balsamea*), and white birch. Other species noted in the low shrub-herbaceous layer included prickly rose (*Rosa acicularis*), currant (*Ribes*), raspberry (*Rubus*), bush honeysuckle (*Diervilla lonicera*), blueberry (*Vaccinium angustifolium*), twin-flower (*Linnaea borealis*), bunchberry (*Cornus canadensis*), Clinton's lily (*Clintonia borealis*), large-leaved northern aster (*Aster macrophyllus*), wild sarsparilla (*Aralia nudicaulis*), and sphagnum moss (*Sphagnum*). Organic litter and deadwood were abundant on the three sites.

The habitat composition and structure of these capture sites were similar to those described by Timm et al. (1977) for rock voles in central Cook County. The composition of the tree overstory in both areas was similar, but density was greater at the Gunflint Trail site. Rock voles there, however, were restricted to a narrow transition zone dominated by shrubs, between the boulder stream and the forest. Shrubs were likewise dominant at Saganaga Lake, although there the shrubs were a result of a sparse overstory. Both the Gunflint Trail and Saganaga Lake areas had a generally sparse herbaceous layer composed of many of the same species; however, the Saganaga Lake site was not located near an open boulder field. Although two of the capture sites were near a boulder escarpment, one site had no rocks in the vicinity.

Rock voles have been reported from moist rocky habitats in Canadian and Hudsonian life zones (Timm et al. 1977) and rarely in small openings in moist forests (Goodwin 1929). Most previous accounts of rock vole habitat stressed the importance of rocks, boulders, or talus as an important component (Gunderson and Beer 1953; Burt 1957; Linzey and Linzey 1971; Martin 1971; Doutt et al. 1973; Timm et al. 1977). In contrast, Kirkland (1977) found 50 of 73 rock voles in clearcuts less than 8 years old in West Virginia. Moreover, the voles were twice as abundant in red spruce (*Picea rubens*) and red spruce–deciduous clearcuts (less than 3 years old) than in adjacent uncut stands. This led Kirkland (1977) to suggest that rock voles exploited disturbed sites and benefited from forest openings created by clear-cutting practices.

The vegetation composition and density where rock voles have been collected along the Gunflint Trail, at Saganaga Lake, and those described in the literature are similar. Rocks or rocky escarpments may not be the most crucial component of rock vole habitat. The vegetation characteristics of younger communities, including a relatively open overstory, a high density of shrubs, and thick moist litter, may be equally if not more important. This habitat type is often associated with proximity to boulder fields or talus slopes, but it may also be created by logging (see Goodwin 1929; Kirkland 1977) or by wind falls. If thick moist litter is truly a dominant requirement, fire may rarely if ever create favorable habitat for rock voles because it usually destroys the litter layer. The fact that most forest stands in this region are of fire origin could in part explain the apparent scarcity of rock voles.

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