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Distribution and Habitat of the Red Squirrel, *Tamiasciurus hudsonicus*, in the North Central States¹

G. ROBERT LYNCH and G. EDGAR FOLK, JR.

Abstract. A survey of the distribution and habitat of the red squirrel (*Tamiasciurus hudsonicus*) was conducted in northern Iowa, southern Minnesota, and Wisconsin. The results indicate that the present range of the red squirrel in Iowa covers the north central counties of the state, and is considerably smaller than that given in earlier surveys. The Iowa red squirrel lives in immature hardwood forests near rivers and lakes. If mature trees are present, they are used for nesting and caching food. The preferred foods of the Iowa red squirrel are the black walnut (*Juglans nigra*) and the butternut (*Juglans cinerea*). In Wisconsin and southern Minnesota the red squirrel usually inhabits coniferous forests.

The following account will update information on the distribution and ecology of the red squirrel, *Tamiasciurus hudsonicus* Erxleben, in Iowa and other north central states. This preliminary study was an outgrowth of current research at the University of Iowa on the effect of photoperiod on activity rhythms of the red squirrel.

Scott concluded in 1937 that the range of the red squirrel at that time probably extended over the southern half of Iowa. In 1953, Glen Sanderson (personal communication), then with the Iowa Conservation Commission, conducted a survey which concluded that the red squirrel was "common" throughout the north central counties of Iowa on the Minnesota border and extended into Cerro Gordo, Chickasaw, Bremer, and Black Hawk Counties. Polter (1953, 1958) presents additional data which tends to support Sanderson's survey, except for one locality record in Madison County. The most recent ecological account is that of Stoner (1918), but the information is very general and of little use in locating the animal.

The distribution of the red squirrel was determined by visiting national wildlife refuges, state and county parks in Iowa, Wisconsin, and southern Minnesota. Since the red squirrel is primarily active an hour after sunrise (Layne, 1954), direct observation was not always possible because of the distance between parks. In such cases, three criteria were used to establish its presence. The most characteristic of these is the occurrence of a midden. This is an accumulation of discarded nuts, cone bracts, or seed pods strewn around a localized feeding area which is usually one tree. Other positive evidence included clearly defined runways between several trees in the territory, and the presence of a summer nest usually formed of twigs and shredded bark, and sometimes including grass and leaves.

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In addition to making personal observations, we sent descriptions (ozalid copies of plates) of the red and fox squirrels (*Sciurus niger*), and requests for information to 64 conservation officers in Iowa. Plates of both squirrels were included since in certain areas of Iowa the fox squirrel is commonly called the "red squirrel." A lack of reply was assumed to indicate an absence of red squirrels in the area. Local residents often referred to *Tamiasciurus* as the jack squirrel, pine squirrel, and in one instance the chipmunk. The data obtained from these sources are summarized in Figure 1.

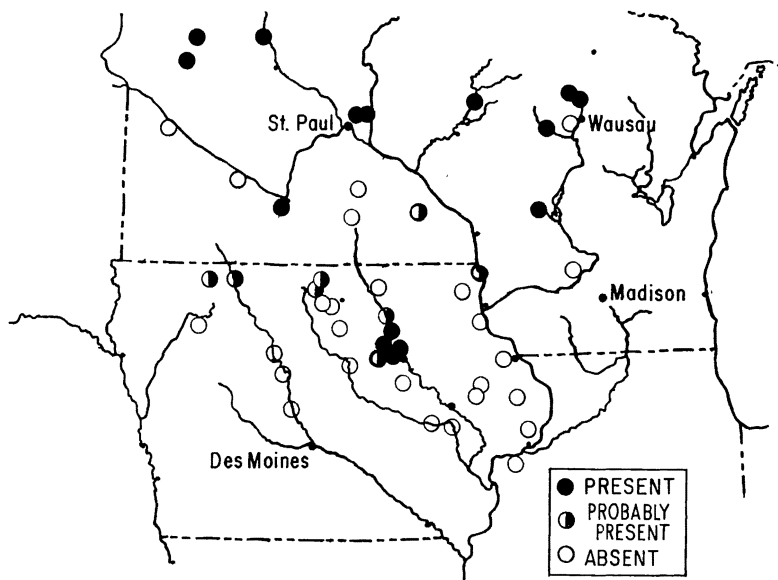


Figure 1. Distribution of the red squirrel in the north central states. Open and closed circles indicate areas which were visited. Half circles indicate information which was acquired from conservation officers or the recent acquisition of museum specimens (since 1953).

Our data support the unpublished work of Sanderson with respect to the distribution of the red squirrel; however, they do not seem to be as "common" today as the survey indicated in 1953. If we assume that the early work (Stone, 1918; Scott, 1937) is accurate, then the range of the red squirrel is decreasing in the state and presently extends through the central counties in the northern half of the state.

The populations studied were found in the river basins north of Waterloo, Iowa (two miles east of Finchford along the west fork of the Cedar River, four miles northeast of Janesville, one mile east of Plainsville along the Cedar River, and in Heery Woods State Park, Butler County). Their habitats were characterized by an abundance of young trees not more than 60 feet in height. Usually a dense under-

growth of scrub was present. Honey locust (*Gleditsia triacanthos*), hawthorn (*Crataegus spp.*), bur oak (*Quercus macrocarpa*), red or black oak (*Quercus sp.*), and black walnut (*Juglans nigra*) were the dominant species present. Scattered through this stand were several mature oaks, slippery elm (*Ulmus rubra*), and black walnut. Winter nests and food caches were found in hollow cavities in these mature trees. Summer nests were observed in adjacent trees although they were usually never completed and probably not used.

The preferred food of the red squirrel in the four study areas was the black walnut, but butternut (*Juglans cinerea*) was also commonly found in the midden. Gnawed pods of the honey locust were common in Heery Woods State Park, and there was some evidence that the squirrels had been eating the acorns of bur oak.

The habitat of the red squirrel in Iowa is different from the mature, open hardwood forests inhabited by the fox squirrel and gray squirrels (*Sciurus carolinensis*). Due to this difference, there is probably little competition between the red squirrel and the fox and gray squirrels. Although this habitat appears to be characteristic of the Iowa populations so far studied, it is not characteristic of the species as a whole. In southern Minnesota and Wisconsin, red squirrels were found most often associated with coniferous forests. At Lake Carlos State Park, Douglas County, Minnesota, they were observed in tamarack (*Larix laricina*) at the edge of a marsh; at Carlos Avery Wildlife Refuge, Anoka County, Minnesota, middens were found in a stand of white spruce (*Picea glauca*), although they have been reported in other habitats in the refuge. In Wisconsin, they were present in dense stands of eastern hemlock (*Tsuga canadensis*) along the Wisconsin River near Merrill. In Necedah Wildlife Refuge, Juneau County, Wisconsin, red squirrels inhabited dense stands of young jack pine (*Pinus banksiana*). Although red squirrels show a preference for coniferous forests in Minnesota and Wisconsin, they were absent from such stands at Pine Lake (Hardin County), Beed Lake (Franklin County), and Wapsipinicon (Jones County) State Parks in Iowa, all of which contain stands of pine. William Longley (personal communication) at the Avery Wildlife Refuge stated that the red squirrel was probably present in all counties of Minnesota, but was less common in the southern counties of the state. He observed that red squirrels in the south were inhabiting red cedar (*Juniperus virginiana*) stands, especially along the Minnesota River. Since such stands are also present in Iowa, we attempted to locate red squirrels in red cedar at Yellow River State Forest, Allamakee County, and west of Dubuque, but none were present.

In conclusion, the present distribution of the red squirrel in Iowa is less extensive than has been previously reported. Our study indicates that its present range covers the central counties in the northern

half of the state. In Iowa the red squirrel inhabits immature hardwood forests near rivers or lakes. In southern Minnesota and Wisconsin, it is found primarily in coniferous forests.

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