The Distribution of Franklin's Ground Squirrel in Wisconsin and Illinois

Timothy L. Lewis and Orrin J. Rongstad

Abstract. Eastern populations of Franklin's ground squirrel (Spermophilus franklinii) have declined in the past two decades. We studied the current range of this squirrel in Wisconsin and Illinois to determine whether a reduction in range accompanied the population decline. We contacted 236 biologists in Wisconsin and Illinois by mail and telephone to determine the extent of recent sightings. We found a range extension in northwestern Wisconsin but a range reduction in southwestern Wisconsin and northwestern Illinois. Several possible explanations for the range reduction are discussed.

A growing body of evidence indicates that in recent years the number of Franklin's ground squirrels has declined at the eastern extent of its range (Van Petten and Schramm 1972; Panzer 1986; Johnson 1988). We studied the distribution of this squirrel in Wisconsin and Illinois to determine its current range.

In Indiana Franklin's ground squirrel was listed as a "species of special concern" (Panzer 1986). Recent trapping work in Indiana indicated a substantial reduction in the ground squirrel's distribution (Johnson 1988). At least two reintroductions of Franklin's ground squirrel in Illinois have succeeded in countering this decline (Van Petten and Schramm 1972; Panzer 1986). In Wisconsin the squirrel is currently managed by the Bureau of Endangered Resources.

Franklin's ground squirrel is reclusive, hibernating from late September until April each year (Sowls 1948; Panzer 1986), and is strictly diurnal. Thus it may spend 90% of its life below ground (Sowls 1948). Its habitat is native prairie, brushy borderlands, fence rows bordering cropland and railroad tracks, or marshland edges (Cory 1912; Sowls 1948; Jackson 1961).

This squirrel's natural range was almost exclusively in the tall- and mid-grass prairie region (Hall 1981; Hall and Kelson 1956). The general range of the squirrel has not changed much in recent times, although De Vos (1964) reported a slight range extension along the Indiana-Michigan border, and Anderson (1947) reported a range extension in Manitoba. De Vos (1964) attributed the extension along the Indiana-Michigan border to human-influenced disturbances. Smith (1957) attributed the Manitoba extension to climatic changes.

The Franklin's ground squirrel has probably always been an uncommon species in Wisconsin and Illinois. The squirrel is more abundant farther west in Minnesota, the Dakotas, and north into the plains of Canada. Wildlife biologists in the eastern range of the squirrel feel that the abundance of the ground squirrel has declined during the past twenty years. This survey was conducted to deter-

Timothy L. Lewis is Assistant Professor of Biology at Wittenberg University, Springfield, Ohio. He was formerly with the Department of Wildlife Ecology at the University of Wisconsin-Madison.

Orrin J. Rongstad is with the Department of Wildlife Ecology at UW-Madison.
mine whether there have been any changes in the ranges found in Wisconsin and Illinois.

**Methods**

We identified wildlife biologists and state park naturalists as the people most likely to be familiar with the Franklin's ground squirrel. In October 1986 we surveyed each biologist by mail and by follow-up telephone interview about recent and past ground squirrel sightings. In the past, sightings were often recorded because of the squirrel's destructive role as a nest predator (Sowls 1948; Sargeant et al. 1987). Each biologist was asked to report any Franklin ground squirrel sightings made in the past ten years.

In Wisconsin we contacted all 68 Department of Natural Resources wildlife biologists and managers, as well as 4 U.S. Fish and Wildlife biologists at Horicon National Wildlife Refuge. In Illinois we contacted 22 of 25 wildlife managers and all 6 natural heritage biologists. In addition, we wrote to each state park supervisor or naturalist at Wisconsin's 61 state parks and recreation areas, the Illinois Department of Conservation's 71 state parks and recreation areas, and 4 forest preserve districts. A sample of nonrespondents was made to determine nonresponse bias.

Information on Franklin's ground squirrel was also solicited from the general public through wildlife managers, radio programs, and personal contacts in areas where Franklin's ground squirrels were previously found. Most such sightings reported by the public were other small mammals; however, several sightings were later confirmed by personal observation. Each potential sighting location in Wisconsin was visited and live trapping attempted at five locations.

**Results**

We received 70 responses from 126 biologists (many responded jointly) of the 236 biologists originally surveyed. Follow-up telephone calls to 15 nonrespondents indicated nonresponse was due to lack of sightings to report.

**Wisconsin**

The Franklin's ground squirrel was reported in 14 of 72 counties in Wisconsin. There were 35 sightings reported for 28 locations (Fig. 1). Concentrations of squirrels

---

**Fig. 1.** The reported locations of Franklin's ground squirrel sightings by Illinois and Wisconsin biologists for 1985 and 1986. Note the lack of sightings in the unglaciated southwest portion of Wisconsin and northwest Illinois.
were found in Douglas, Burnett, and Rusk counties in northwest Wisconsin, and in Waukesha, Racine, and Kenosha counties in southeastern Wisconsin, as well as thinner groupings in between in an area ranging from Marathon County to Dodge County. In addition, one Franklin's ground squirrel was observed during trapping near Horicon National Wildlife Refuge, and two were collected in northwestern Douglas County.

Illinois

Franklin's ground squirrels were reported in 22 locations in 16 of 102 counties in Illinois (Fig. 1). Squirrels were reported in the northeast in Cook, DuPage, and Will counties. All other sightings were in a band of central counties from Henderson and Green counties to Ford, Vermilion, Coles, and Champaign counties. Squirrel range in Illinois showed no new extensions; no sightings were reported in northwestern Illinois, contiguous to an area of southwestern Wisconsin where there were no squirrels.

Discussion

Wisconsin

Cory (1912) listed the range of Franklin’s ground squirrel in Wisconsin as southern and western Wisconsin. His map (Fig. 2A) depicted the range from Burnett County southeast toWalworth County, west of Lake Michigan on the Illinois border. No specific sightings were listed.

Hall and Kelson (1956) drew the range line closer to Lake Michigan in the southeast, including Racine and Kenosha counties, south of Milwaukee (Fig. 2B). They listed only one specific sighting in Wisconsin, at Lake Delavan, and relied on sightings in Minnesota and Illinois to place the range line in Wisconsin.

Jackson (1961), dealing specifically with Wisconsin mammals, as had Cory (1912), listed 32 sightings and museum specimens dating from pre-1900 to 1960. Jackson’s range for the Franklin’s ground squirrel (Fig. 2C) is the most accurate to that date,
based upon museum specimens and sightings from authorities. He confirmed the range described by Hall and Kelson (1956) in Racine and Kenosha counties with actual records and moved the northwest range more southerly to Polk County, just south of Burnett County.

Hall (1981) revised the 1956 range map in Wisconsin (Hall and Kelson 1956) in light of Jackson’s 1961 work and one additional sighting in Hibbing, Minnesota, and one in Duluth. Using no records from Wisconsin, Hall estimated the range to extend north in northwest Wisconsin into Douglas County (Fig. 2D). We found five Franklin’s ground squirrels, including two livetrapped, for Douglas County, verifying Hall’s 1981 range estimate. All of the Wisconsin ranges listed are close to the tension zone described by Curtis (1959).

**Illinois**

Cory (1912) placed the range of the Franklin’s ground squirrel in Illinois as the entire northern two-thirds of the state except Lake County in the far northeast (Fig. 2A). His southern line ran from Madison to Clark counties.

Hall and Kelson (1956) established the range 80 km farther south based on one sighting in St. Clair County (Fig. 2B). They also included one sighting in Lake County in the northeast. Hall (1981) did not modify his earlier range map (Hall and Kelson 1956) after twenty-five years (Fig. 2D).

Hoffmeister and Mohr (1957) were more conservative with their range line (Fig. 2C). Their line of known locations was farther north from Adams County to Vermilion County, with a disjunct population in St. Clair County.

Our results tended to follow a line from Madison County to Clark County in the south, though sightings were reported from St. Clair County. There were no sightings in northwest Illinois contiguous with the area in southwestern Wisconsin that had no recent Franklin’s ground squirrel sightings.

**Changes in distribution**

It appears from our distributional data that Franklin’s ground squirrels have a relatively stable range in Wisconsin and Illinois. However, we found no sightings in southwestern Wisconsin or northwestern Illinois, where a few squirrels had previously been reported (Jackson 1961).

Illinois naturalists familiar with Franklin’s ground squirrel think it has declined over the past thirty years, although precise data are lacking. Jim Grude of the McHenry County Conservation Department attempted to trap ground squirrels in the county but found none during the summers of 1986 or 1987 (pers. com.). Van Petten and Schramm (1972) wrote twenty years ago of the “increasing rarity” of Franklin’s ground squirrel in Illinois. Many of the responses to our survey also included comments suggesting the loss of squirrels, or at least the perception of loss from decreased frequencies of sightings. In order to counter the decline in Illinois, Van Petten and Schramm (1972) in Knox County and Panzer (1986) at the Markham Prairie have with some success attempted reintroduction into the former range.

There are several reasons that the Franklin’s ground squirrel may no longer be found in southwestern Wisconsin. The squirrels may never have been common in the unglaciated portions of Wisconsin and Illinois. This area is covered by a thin layer of unconsolidated material less than fifty feet thick, and often only inches thick. Erosion can be severe and could create a problem with burrow construction.

Land-use changes seem to be a primary candidate for causing a decline, as suspected in places in Minnesota as early as 1892 (Herrick). Sowls (1948) related a comment from C.C. Furniss that the squirrel “appears to be retreating before the advance of agriculture.” Van Petten and Schramm (1972) blamed cultivation, mowing, and grazing for the decline of Franklin’s ground squirrel. However, Cory (1912) felt the squirrel was not greatly affected by the cultivation of land.
The general loss of prairie habitat alone may not be entirely responsible for the decline. The Franklin’s ground squirrel is often locally abundant while nearby areas have none (Jackson 1961). Recent trappings in the plains of Canada by A. Sargeant revealed small concentrations of the squirrel isolated by large areas without them, despite apparently homogeneous habitats (pers. com.).

Isolation of these “islands” could easily lead to long-term numerical declines. Newmark (1987) found that over 40% of all species of lagomorph, carnivore, and artiodactyl (12 species) found in western national parks have become extinct. The loss of park species was attributed to the loss of mammals on adjacent lands, isolating the park populations. The populations within the park were smaller, less stable, and isolated from potential recolonizers. Habitat fragmentation in agricultural areas could similarly isolate ground squirrel populations.

Another factor contributing to a decline may be that the populations are cyclic. Erlien and Tester (1984) noted a ten-year cyclic population pattern in Franklin’s ground squirrel that they linked to predator shifts during cyclic lows in the snowshoe hare population. Sowls (1948) noted a six-year cycle at Delta, Manitoba, that he attributed to climate, infertility, and disease. Normal cyclic declines in fragmented populations could eliminate some populations even though habitat is suitable, and the isolation would prevent reoccupation, leading to a general decline. However, the apparent decline in Franklin’s ground squirrels at the eastern extent of the range has been noted for more than twenty years, and farther south than other cyclic populations. There seems to be no macroclimatic change that could exclude the squirrels from the area, as they are found farther south in Illinois, farther north into Canada, farther east into Indiana, and farther west into Illinois, Iowa, and the Dakotas.

Further work on site-specific changes in habitat should be done to examine changes over time in areas that may have lost or gained Franklin’s ground squirrels. Also necessary are studies of reproductive success and survivorship.

Acknowledgments

We would like to thank the many biologists in Illinois and Wisconsin for their cooperation with this research, and S. Craven, R. Guries, and an anonymous reviewer for comments. Support for this study was provided by the Max McGraw Wildlife Foundation, the University of Wisconsin-Madison College of Agricultural and Life Sciences, and the University of Wisconsin-Madison Graduate School.

Works Cited

Panzer, R. 1986. Franklin’s ground squirrel

Sargeant, A. B. Conversation with author, 10 September 1987.


