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Recently Discovered Populations of Eastern Woodrats (*Neotoma floridana*) in Southern Illinois

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ABSTRACT

Until recently it was believed that the population of eastern woodrats (*Neotoma floridana*) in Pine Hills, Union County, Illinois, represented the only extant population remaining in the state. Trapping at sites formerly occupied by woodrats and in areas with suitable habitat resulted in the documentation of additional populations at Fountain Bluff, Little Grand Canyon, and Horseshoe Bluff, Jackson County. Woodrats currently are more numerous and have a wider distribution in southern Illinois than previously believed.

INTRODUCTION

Eastern woodrats (*Neotoma floridana*) historically ranged through the eastern United States from New York state across the southeast and central states as far west as Colorado (Hall 1981). Populations have been declining recently throughout the species' range. In the northeastern United States, woodrat populations are believed to be adversely affected by reduced habitat availability and a nematode parasite, *Baylisascaris procyonis*, found in raccoons (*Procyon lotor*) (Woodrat Recovery Workshop 1993). Woodrats are an intermediate host for *B. procyonis* and may ingest the nematode eggs while collecting animal feces (Birch et al. 1994). Infection leads to lethargy, loss of muscle control, and eventual death (Kazacos et al. 1981, Kazacos and Boyce 1989).

The Illinois woodrat (*N. f. illinoensis*), found in southern Illinois, Missouri, Arkansas, Alabama, Mississippi, and western Kentucky and Tennessee, currently is listed as endangered in Illinois (Herkert 1992). Based on the presence of old nest sites and woodrat molars, woodrats inhabited numerous sites throughout the Shawnee National Forest in the past (Nawrot 1974, Nawrot and Klimstra 1976). Only three populations remained in Illinois by the 1960's: Pine Hills, in Union County, and two sites in Jackson County; Fountain Bluff and Horseshoe Bluff (Crim 1961). By 1974, the Horseshoe Bluff population was extirpated and only three individuals could be found at Fountain Bluff

(Nawrot and Klimstra 1976). Since the late 1970's it was believed that the only extant population of woodrats remaining in the state was located at Pine Hills, in southwestern Illinois (Todd Fink, Illinois Department of Conservation Natural Heritage Biologist, personal communication). Woodrat population density continued to decline at Pine Hills; Nawrot (1974) suggested a "liberal" estimate of 50-75 individuals remained. The Illinois Department of Conservation conducted periodic surveys for signs of activity at nest sites at Pine Hills (Todd Fink, unpublished data) since 1973. West (1986) estimated that 15-30 woodrats inhabited Pine Hills based on the number of presumed active nests. A 3-year live-trapping investigation of the Pine Hills woodrat population was initiated in July 1993. Associated with this effort was exploratory live-trapping at several previously inhabited sites, and areas with appropriate bluff habitat. Since January 1994, we have documented the occurrence of woodrats at three additional sites in Illinois: Fountain Bluff, Little Grand Canyon, and Horseshoe Bluff, Jackson County.

STUDY AREAS

Pine Hills

Pine Hills is composed of north-south oriented limestone bluffs that extend 8.8 km and average 24.4 m above the flood plain (Baskett 1925, Weller and Ekblaw 1940). Woodrats have been trapped along the south- and west-facing bluffs located in sections 9, 16, 21, and 28, T. 11 S, R. 3 W.

Fountain Bluff

Fountain Bluff is located 8 km northwest of Pine Hills. The lower strata of this isolated ridge are composed of limestone, although thick layers of sandstone form the upper strata. The bluffs reach 61 m above the Mississippi River (Poor 1925). Woodrats have been located in section 36, T. 9 S, R. 4 W, and section 31, T. 9 S, R. 3 W.

Horseshoe Bluff

Woodrats have been captured at Horseshoe Bluff, a stretch of west-facing sandstone bluffs and fallen boulders located in sections 11 and 14, T. 10 S, R. 3 W. Horseshoe Bluff is located about 11 km north of the trapping site at Pine Hills.

Little Grand Canyon

The Little Grand Canyon area is composed of both limestone bluffs and sandstone canyons that have been eroded by streams. It is located about 1 km north of Horseshoe Bluff and about 8 km east of Fountain Bluff. Woodrats have been trapped in sections 2 and 11, T. 10 S, R. 3 W.

MATERIALS AND METHODS

Tomahawk wire mesh live-traps (16.5 x 16.5 x 48 cm) were set in appropriate habitats at all sites, primarily limestone or sandstone bluffs or outcrops with cracks, depressions, ledges, and overhanging areas. Traps were baited with cracked corn and sunflower seeds and placed as often as possible at sites with woodrat sign: stick nests, fecal droppings, feeding debris, and/or tracks. Polyester stuffing was provided for bedding. Each captured animal was tagged with two individually numbered Monel #3 ear tags. Mass (to the nearest gram), sex, and reproductive condition were recorded. Age class (juvenile,

subadult, adult) was determined on the basis of sexual maturity, body mass, and pelage color (Wiley 1980).

RESULTS

Pine Hills

Trapping at Pine Hills began in July 1993. A trapping schedule of 40 traps set for 3 nights every 3 to 4 weeks was followed. Although only part of the available habitat has been sampled, as of August 1994, 135 individuals (Table 1) have been captured 675 times in 1800 trap nights (36.0% trap success rate). The sex and age ratios of the trapped individuals change seasonally as most litters are produced in the spring and juveniles disperse in the fall. As traps have been placed at new locations within Pine Hills, new woodrats have been taken. This suggests a substantially greater population exists than previously anticipated.

Fountain Bluff

On 3-4 January 1994, 7 woodrats were captured in 24 trapnights. Large stick nests and latrine sites were present at the trapping location. From February through April 1994, exploratory trapping was conducted at additional locations throughout Fountain Bluff. In June 1994 a trapping schedule of 35 traps set for three nights every 3 to 4 weeks was established. As of July 1994, 19 individuals (Table 2) have been captured 29 times in 287 trap nights (10.1% trap success rate). In addition to the established trapping sites, we are continuing exploratory trapping.

Little Grand Canyon

On 10 July 1994, 3 woodrats were captured in 14 traps set at two sites. Stick nests, mast shells, and fresh scat were present at both sites.

Horseshoe Bluff

On 27 July 1994, 3 woodrats were captured in 12 traps set. Although no nests were observed, the bluff and forest habitat of Horseshoe Bluff was suitable to support woodrats. Mast shells, tracks, and leaves in rock depressions were the only signs that woodrats were present in the area.

DISCUSSION

Past assessment of the Pine Hills woodrat population determined the "activity" of nest sites by the presence of fresh vegetation cuttings in the nests, signs of recent building, and fecal droppings. In monthly trapping at Pine Hills from July 1993 through August 1994 very few active nests actually contained fresh cuttings. Many stick piles where woodrats were trapped appeared to be abandoned. Woodrat nests at Pine Hills do not always fit the usual description of a large mound of sticks (Hall 1955). Nests may be primarily composed of dead leaves and bark as well as sticks. Because numerous crevices and deep fissures are present in the bluffs of Union and Jackson Counties, it is possible that many more woodrat populations exist without externally visible signs such as stick nests. Therefore, in order to determine whether woodrats are present at a location that has no visible stick nests, it is necessary to conduct live-trapping. More extensive live-trapping will be conducted at the Little Grand Canyon and Horseshoe Bluff areas to

estimate the number of individuals present. The genetic diversity within and among the four populations currently is being investigated. The occurrence of more woodrat populations than previously known in southern Illinois offers expanded management opportunities for this endangered species.

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Table 1. Age and sex distribution of woodrats captured at Pine Hills, Union County, July, 1993 - August, 1994.

	Male	Female	Total
Juvenile	14	15	29
Subadult	13	25	38
Adult	27	41	68
Total	54	81	135

Table 2. Age and sex distribution of woodrats captured at Fountain Bluff, Jackson County, January, 1994 - July, 1994.

	Male	Female	Total
Juvenile	2	2	4
Subadult	1	4	5
Adult	4	6	10
Total	7	12	19