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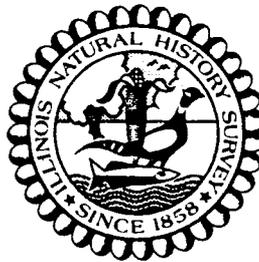
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ILLINOIS NATURAL HISTORY SURVEY

A LIMITED SURVEY FOR THE OCCURRENCE
OF THE GOLDEN MOUSE (*OCHROTOMYS NUTTALI*) AND THE MARSH RICE RAT
(*ORYZOMYS PALUSTRIS*) WITHIN THE TR 88A PROJECT AREA, BAY CREEK,
POPE COUNTY, ILLINOIS

FINAL REPORT



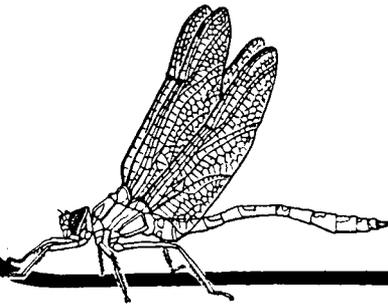
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Section of Faunistic Surveys and Insect Identification Technical Report

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by

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INTRODUCTION

Two state threatened species of mammals that occur in southern Illinois are the golden mouse (*Ochrotomys nuttali*) and the marsh rice rat (*Oryzomys palustris*). The objective of this limited survey was to determine if either species was present at the Illinois Department of Transportation's TR 88A study area at Bay Creek, south of Brownfield (T13S, R5E, Sec. 36), Pope County, Illinois, since this area provides potentially suitable habitat for both of these small mammals.

The golden mouse occurs in the southeastern United States with the northern edge of its range extending into southern Illinois (Linzey and Packard 1977). Specimens have been collected in Alexander, Jackson, Johnson, Pope and Union counties in Illinois (Necker and Hatfield 1941; Hoffmeister and Mohr 1957; Layne 1958; Andrews 1963; Klimstra 1969; Krull and Bryant 1972). This species also has been reported in Perry County, but no specific locality was given (Klimstra and Roseberry 1969). During 1985, live trapping in 15 counties in southern Illinois revealed the presence of *Ochrotomys nuttali* at sites in Alexander, Gallatin, Jackson, Johnson, Pope, Union and Williamson counties (Feldhamer 1985). In addition, the characteristic arboreal nests of golden mice have been found recently in Hardin and Pope counties (unpublished data, Illinois Department of Conservation). Localities from which this species has been reported are shown in Figure 1.

In Pope County golden mice have been captured on or near the Dixon Springs Experimental Station, in the vicinity of Lake Glendale and in the Bell Smith Springs area (Andrews 1963; unpublished data, Illinois Department of Conservation). These locations are within 25 km of the Bay Creek bridge project area, although in a more heavily forested part of the county. Golden mouse nests were found near Golconda and Temple Hill (unpublished data, Illinois Department of Conservation), each of which is approximately 5 to 7 km from the project area.

Golden mice occur in wooded or shrubby habitats such as moist thickets, canebrakes, bottomland hardwood forest and the edges of broomsedge fields and cypress swamps (Goodpaster and Hoffmeister 1954; Hoffmeister and Mohr 1957; Layne 1958; Andrews 1963; Blus 1966; Klimstra 1969; Barbour and Davis 1974; Schwartz and Schwartz 1981). They have been found in disturbed or early successional areas with there was a dense understory of shrubs and vines (Blus 1966; Linzey 1968). In Illinois, golden mice typically have been found in thickets of Japanese honeysuckle (*Lonicera japonica*) or green brier (*Smilax* sp.) entangled among trees and in canebrakes (*Arundinaria gigantea*) either along narrow upland waterways or in the floodplains of larger streams (Hoffmeister and Mohr 1957; Layne 1958; Andrews 1963; Blus 1966; Klimstra 1969; Klimstra and Roseberry 1969). They also are commonly associated with thickets of sumac (*Rhus* sp.) or poison ivy (*Toxicodendron radicans*) and with grape (*Vitis* sp.), Virginia creeper (*Parthenocissus quinquefolia*) or trumpet creeper (*Campsis radicans*) vines (Hoffmeister and Mohr 1957; Layne 1958; Blus 1966; Klimstra and Roseberry 1969).

Golden mice are largely arboreal; their nests are usually aboveground, most often supported by grape, honeysuckle or green brier vines or by cane (Blus

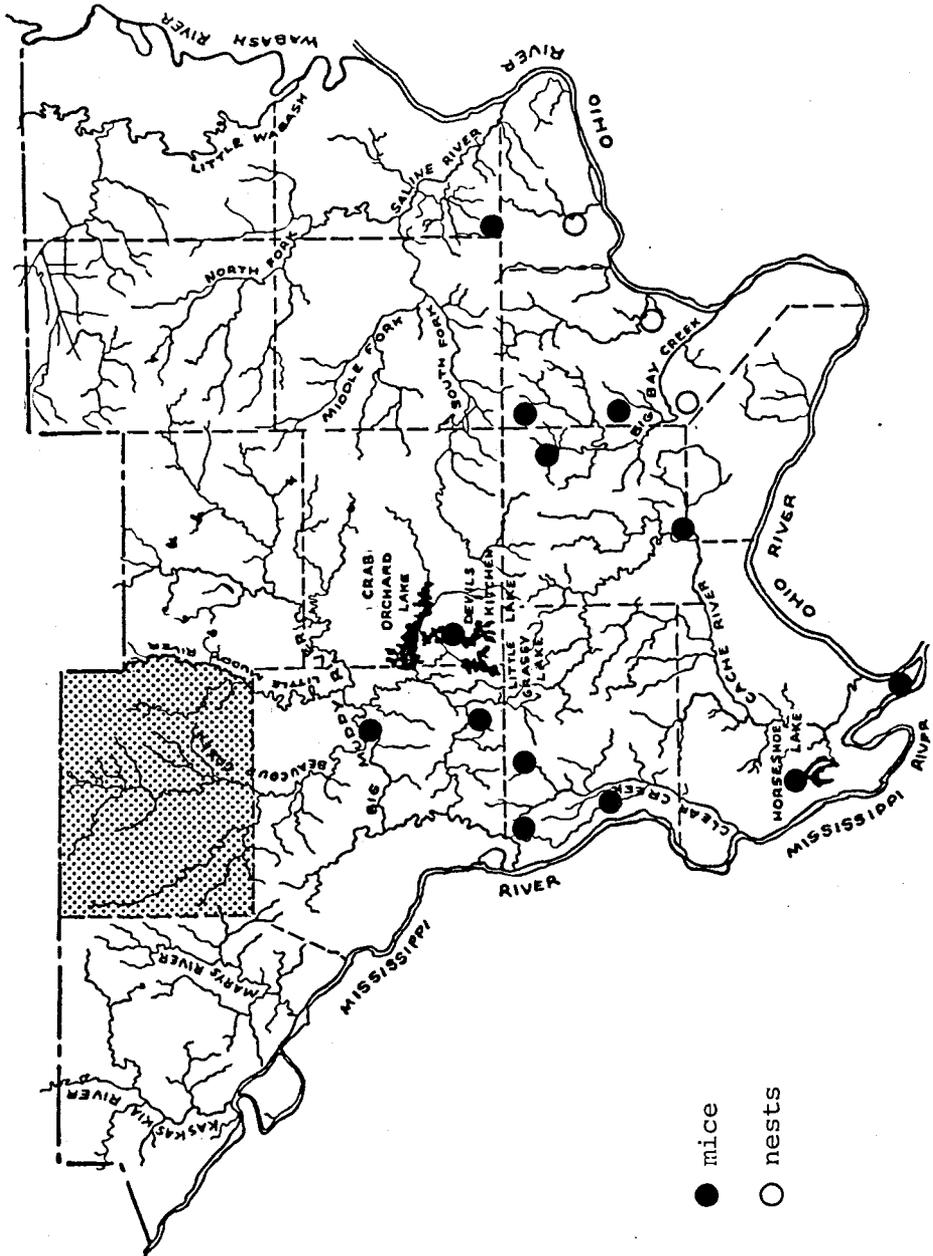


Figure 1. Localities at which golden mice have been recorded and sites at which golden mouse nests have been found in southern Illinois. A specific locality was not given for Perry County (shaded) (Sources: Necker and Hatfield 1941; Layne 1958; Andrews 1963; Klimstra 1969; Klimstra and Roseberry 1969; Krull and Bryant 1972; Feldhamer 1985; unpublished data, Illinois Department of Conservation).

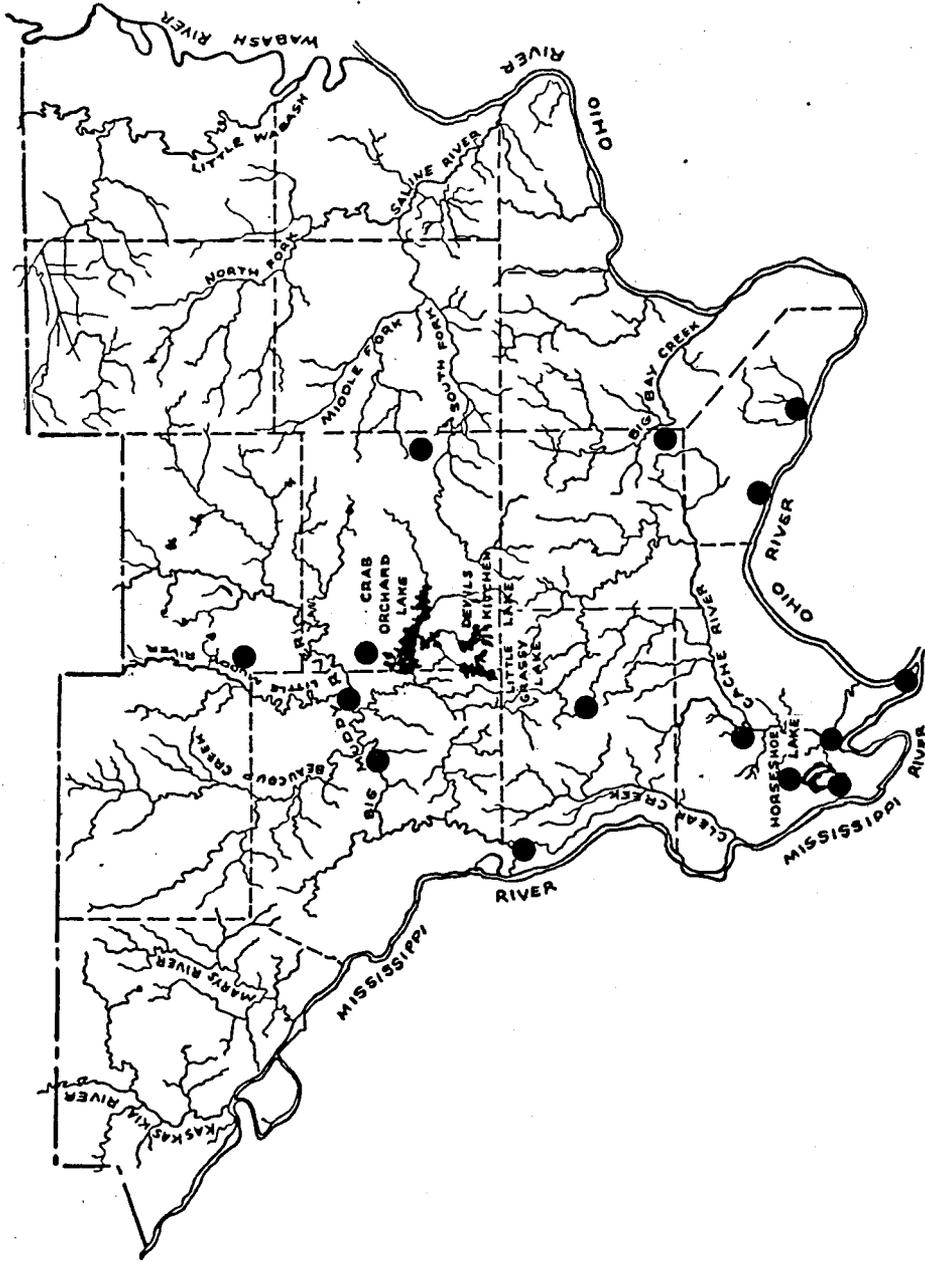


Figure 2. Localities from which marsh rice rats have been collected in southern Illinois (Sources: Necker and Hatfield 1941; McLaughlin and Robertson 1951; Klimstra and Scott 1956; Klimstra 1969; Klimstra and Roseberry 1969; Rose and Seegert 1982; unpublished data, Illinois Department of Conservation).

1966). Some nests also are constructed in shrubs or the forks of trees (Hoffmeister and Mohr 1957; Blus 1966; Linzey 1968; Schwartz and Schwartz 1981). Nests in Illinois were located up to 6.4 m aboveground with an average height of 2.2 m (Blus 1966).

The marsh rice rat has a range that extends from southeastern Texas north to southern Kansas, through the southeastern states to Florida and northward along the Atlantic seaboard to Pennsylvania and New Jersey (Wolfe 1982). Along its northern limit the species' range extends into southern Illinois. The earliest records of *Oryzomys palustris* in Illinois were from Alexander County (Cory 1912; Necker and Hatfield 1941); McLaughlin and Robertson (1951) concluded that rice rats were limited to areas south of the Shawnee Hills Division (natural divisions of Illinois, Schwegman 1973). Additional records for rice rats have shown that their range in Illinois extends through the Shawnee Hills Division and into the Mt. Vernon Hill Country Section of the Southern Till Plain Division (Klimstra and Scott 1956). Rice rats have been found in Franklin, Jackson, Johnson, Massac, Union and Williamson counties as well as Alexander County (McLaughlin and Robertson 1951; Klimstra and Scott 1956; Klimstra 1969; Klimstra and Roseberry 1969; Rose and Seegert 1982; unpublished data, Illinois Department of Conservation). Recently, a rice rat was found in the stomach of a mink collected in Washington County, substantially north of other records for rice rats (Casson 1984). Thus the range of the rice rat extends northward along the Mississippi River and through the Shawnee Hills along the Big Muddy and Cache River drainages. Figure 2 shows the localities from which specimens of *Oryzomys palustris* have been collected in Illinois.

Habitat along the Ohio River from Golconda to the Saline River valley has been considered possibly unsuitable for this species; trapping in the Saline River valley yielded no rice rats (Klimstra and Scott 1956). Although there are no published records of rice rats for Pope County, specimens from Johnson County were collected along Bay Creek, 0.4 km east of Grantsburg (McLaughlin and Robertson 1951). That location is approximately 17 km northwest of the Bay Creek bridge project area.

Rice rats are semiaquatic, preferring wetlands and riparian habitats (Barbour and Davis 1974; Schwartz and Schwartz 1981; Wolfe 1982). They occur in coastal marshes, swamps, freshwater marshes and wet meadows and also along streams and ditches (Hoffmeister and Mohr 1957; Barbour and Davis 1974; Schwartz and Schwartz 1981; Wolfe 1982). Rice rats sometimes are found on dry upland slopes with tall grass, weeds or brush (Schwartz and Schwartz 1981), although these individuals may be transients (Wolfe 1982). The major habitat requirement for this species appears to be a dense ground cover of grasses, sedges and/or shrubs (Barbour and Davis 1974; Schwartz and Schwartz 1981). In Illinois, rice rats have been caught in a lowland bromegrass meadow adjacent to a highway, in a wet woods-grass area, along a drainageway passing through cropland and lined with native and exotic grasses (Klimstra and Roseberry 1969), in cypress swamps bordering a creek (McLaughlin and Robertson 1951), along a marshy railroad right-of-way (Klimstra 1969) and on a farm pond dam (Klimstra and Scott 1956). In Kentucky, rice rats have been found along roadside ditches or streams where there was sufficient vegetative cover (Barbour and Davis 1974). They were found nesting in fencerows adjacent to sloughs and in soybean stubble near a lake in Tennessee (Goodpaster and Hoffmeister 1952).

DESCRIPTION OF STUDY AREA

This survey sampled the small mammal fauna over an area of approximately 6 acres along the east and west sides of a 200 m segment of Bay Creek, 0.4 km south of Brownfield (T13S, R5E, Sec. 36), Pope County, Illinois.

Forested palustrine wetland occurred along both sides of the creek and extended in a narrow strip west of the county road on the east side of Bay Creek (Figure 3). Dominant canopy species included silver maple (*Acer saccharinum*), cottonwood (*Populus deltoides*), sycamore (*Platanus occidentalis*), American elm (*Ulmus americana*) and green ash (*Fraxinus pennsylvanica*). This submature to mature second-growth floodplain forest showed evidence of disturbance due to selective cutting, utility line right-of-way maintenance and siltation. Bay Creek had overflowed its banks prior to the survey, resulting in extensive flooding of the lowland forest.

On the west side of Bay Creek, the floodplain forest was 15 to 40 m wide and was bordered on its western edge by a county road. The understory was relatively open and in some areas the ground was largely devoid of herbaceous cover. Numerous poison ivy, wild grape, green brier, trumpet creeper and Japanese honeysuckle vines were present. On the east side of the creek, the forested strip was 10 to 30 m wide and the understory was very open; few vines were present and there was little herbaceous cover, except where the woods bordered an old field.

The old field was located between the strips of lowland forest along the east bank of Bay Creek and the county road (Figure 3). This area was dominated by forbs such as goldenrod (*Solidago altissima*), aster (*Aster sp.*) and ragweed (*Ambrosia trifida*). Many green ash saplings, 3 to 4 m high, also occurred in the field.

An abandoned railroad right-of-way, characterized as forbland-shrubland, was present northeast of Bay Creek (Figure 3). Along this right-of-way were thorny shrubs, such as multiflora rose (*Rosa sp.*) and blackberry (*Rubus sp.*), and vines, including Japanese honeysuckle, crossvine (*Bignonia capreolata*) and trumpet creeper. This area was adjacent to the old field in the north and upland forest in the south.

A scrub-shrub wetland was located west of the county road along the west side of Bay Creek (Figure 3). This type of habitat also extended in a narrow strip southwest through cultivated fields. The area was dominated by buttonbush (*Cephalanthus occidentalis*) and immature black willow (*Salix nigra*). Immature green ash, silver maple, river birch (*Betula nigra*), pin oak (*Quercus palustris*) and slippery elm (*Ulmus rubra*) also were present. There was a dense herbaceous cover of sedges (*Carex hyalinolepsis*).

- 1 residential
- 2 cropland
- 3 old field
- 4 forbland-shrubland
- 5 scrub-shrub wetland
- 6 excavated palustrine wetland
- 7 lower perennial riverine wetland
- 8 forested palustrine wetland
- 9 upland forest

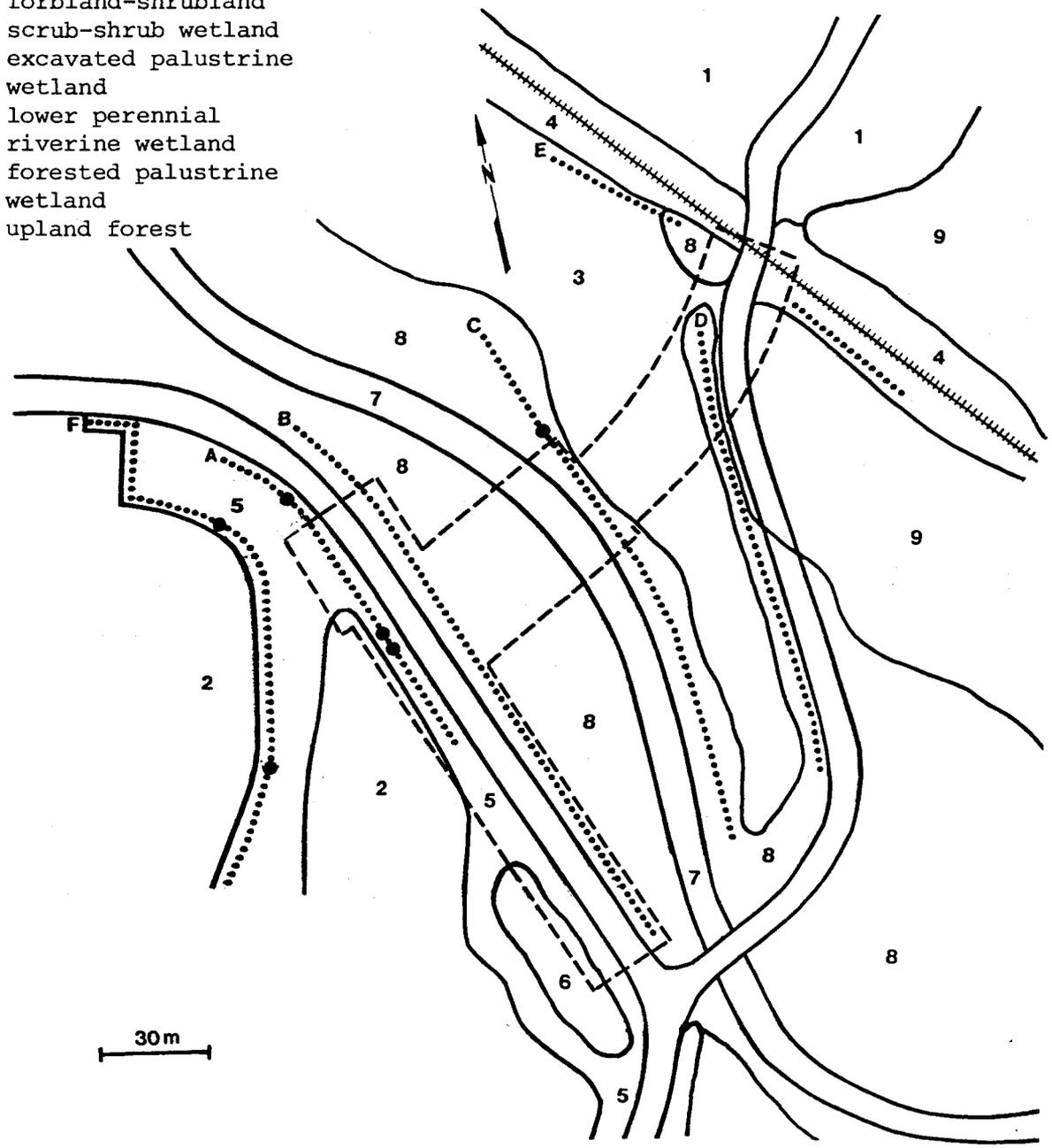


Figure 3. Location of trap lines and rice rat captures at the TR 88A project area, Bay Creek, Pope County, Illinois. Trap lines (dotted) are identified by letter; locations of rice rat captures are indicated by large dots.

METHODS

Live trapping was conducted for two nights to determine if either golden mice or rice rats occurred at the TR 88A study area. A series of trap lines (transects) was established within the scrub-shrub wetland, forested palustrine wetland and forb-shrub habitats (Figure 3). Trap stations were established at 10-m intervals along each line with one Sherman live trap (8 x 9 x 23 cm) placed in a suitable location near each station. Because golden mice are largely arboreal, some of the traps in wooded habitat were positioned aboveground on vines or in trees. Traps were baited with a mixture of rolled oats and peanut butter. They were set during the early evening (1900-2000 h) and checked the following morning (beginning at 0730-0800 h); traps were closed (unset) during the day.

Trap line A contained 11 traps and was located in the scrub-shrub wetland west of the county road along the west side of Bay Creek (Figure 3). Most of the traps were placed on the ground in dense herbaceous or shrub cover along the west side of a roadside ditch.

Trap line B consisted of 19 traps located in the forested palustrine wetland (floodplain) west of Bay Creek (Figure 3). Because the ground near the creek was largely devoid of herbaceous cover, the trap line was established near the western edge of the forested area within 12 m of the county road. Traps in this line were placed on the ground, in vines and in trees.

Trap line C, containing 16 traps, was established on the east side of Bay Creek along the edge of the forested palustrine wetland where it adjoined the old field (Figure 3). Most of the traps in this line were placed on the ground in dense herbaceous cover or near brush piles.

Trap line D was located in the forested palustrine wetland along a fencerow between the county road on the east side of Bay Creek and the old field (Figure 3). The 14 traps in this line were placed on the ground, in vines and in trees.

Trap line E was established near the abandoned railroad right-of-way (Figure 3). Five traps were located on the ground along the edge of upland forest southeast of the proposed alignment for the bridge approach and five were set along the edge of the old field among dense vines and multiflora rose northwest of the alignment.

An additional trap line (F) was established for the second night of the survey. Twenty traps were placed near the northern and western edges of the scrub-shrub wetland where it bordered a cultivated field (Figure 3).

The following information was recorded for each individual captured: trap station (stations in each transect were numbered consecutively from north to south), trap location (surface or aboveground), species, sex, reproductive condition and weight (to the nearest gram). For males the position of the testes was determined as a general indicator of reproductive condition; testes were diagnosed as either descended into the scrotum or within the abdominal cavity. Reproductive activity in females was denoted by an open

vulva, pregnancy (determined by palpation of the abdomen) and/or lactation (determined by teat examination). Animals caught on the first morning were toe clipped (one toe removed) to distinguish individuals recaptured on the second morning from those trapped for the first time. Thus the total number of individuals captured during the survey could be determined accurately. After examination the animals were released at the site of capture.

In addition, a visual search for the characteristic arboreal nests of golden mice was conducted along each transect within wooded habitat.

RESULTS AND COMMENTS

This survey was conducted during the nights of 2 and 3 June 1986 for a total of 160 trap nights. There were 41 captures of small mammals which represented a high trapping success of 25.6%. These captures involved 36 individuals of three species: the white-footed mouse (*Peromyscus leucopus*), marsh rice rat and southern short-tailed shrew (*Blarina carolinensis*). The trapping results are summarized in Table 1. In addition, two juvenile opossums (*Didelphis virginianus*) were captured, but were not included in the calculation of trapping success.

Table 1. Small mammal capture data for the TR 88A project area, Bay Creek, Pope County, Illinois.

Species	# captures	# individuals	# males	# females
<i>Peromyscus leucopus</i>	33	28	19	9
<i>Oryzomys palustris</i>	7	7	5	2
<i>Blarina carolinensis</i>	1	1	-	-

The white-footed mouse, a common inhabitant of wooded and shrubby habitats, was the species caught in greatest numbers. Twenty-eight individuals were caught in both surface and aboveground traps; the relative abundance [(number of individuals captured x 100)/number of trap nights] of *Peromyscus leucopus* was 17.5 for the project area as a whole. Members of this species were captured in every trap line; their relative abundance in the scrub-shrub wetland was 9.5, in the lowland forest along Bay creek 18.6 and in the lowland forest along the fencerow 28.6.

Seven *Oryzomys palustris* were captured during this survey, all in surface traps (Figure 3). The relative abundance of this species for the entire

project area was 6.0 (aboveground traps excluded from calculation). Six of the seven rice rats were caught in the scrub-shrub wetland (relative abundance = 15.0), while one was trapped in the lowland forest east of Bay Creek (relative abundance in lowland forest = 1.7).

Three rice rats were caught at two trap stations in line A located on either side of a drainage ditch; this drainage from the agricultural field crossed the wetland area perpendicular to the roadside ditch and entered a culvert under the county road. These traps were set 7 m left of center (west of the county road) in dense herbaceous cover of sedges. Buttonbush and immature willow also were present at these trap stations. Another rice rat was caught approximately 35 m north of the drainage in a clump of buttonbush. The trap was located west of the roadside ditch (4 m left of center) and was positioned along a log covered with poison ivy and other vines. Two rice rats were caught in trap line F along the western edge of the scrub-shrub wetland, also in dense herbaceous cover. The remaining individual was captured in trap line C in dense herbaceous cover of *Polygonum* at the edge of the lowland forest approximately 15 m from the eastern bank of Bay Creek.

The six rice rats captured in the scrub-shrub wetland included three adult males (74-84 g in weight), two of which were potentially in breeding condition and two adult females (approximately 70 g), one of which was pregnant. The sixth individual trapped in this habitat was a juvenile male (22 g). Thus, it is evident that the scrub-shrub wetland is occupied by a breeding population of *Oryzomys palustris*. The individual captured in the lowland forest was a subadult male (55 g) with descended testes. This animal may have been dispersing from the scrub-shrub wetland. Alternatively, its presence may indicate that a resident population of rice rats also inhabits the forested area east of Bay Creek. However, in the latter case, the number of residents must be relatively small since no other individuals were caught there.

No *Ochrotomys nuttali* were captured during this survey despite the high trapping success in wooded habitat. Although many white-footed mice were caught, this should not have excluded golden mice since unoccupied traps were always available. Golden mouse nests were not observed in shrubs, vines or trees along any of the trap lines in wooded habitat, even though these areas contained several species of vines with which golden mice typically are associated. However, the understory was relatively open, with few dense thickets of shrubs and vines, especially on the east side of Bay Creek. There was also a paucity of ground cover near both banks of the creek. Therefore, this area may be unoccupied by golden mice because it does not represent optimal habitat.

Construction activities in the TR 88A project area would not have an adverse impact on the golden mouse and would not disrupt optimal habitat for colonization by this species. However, disturbance of the scrub-shrub wetland along the western edge of the project area should be avoided since this area represents excellent marsh rice rat habitat and is occupied by a breeding population of this species. The lowland forest east of Bay Creek also provides suitable habitat for rice rats and may contain a resident population; therefore, disturbance of this habitat should be minimized.

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