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Distribution, Abundance, and Habitat of the Marsh Rice Rat (*Oryzomys palustris*) in Southern Illinois

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ABSTRACT

1. Live-trapping was conducted at sites in 17 southern Illinois counties during 1986 and 1987 to determine the distribution of the state-threatened marsh rice rat (*Oryzomys palustris*). 2. A total trapping effort of 3517 trap-nights resulted in 1111 captures of small mammals representing 13 species. 3. Rice rats were caught at 13 sites in ten counties, including four (Hamilton, Pope, Saline, and White) from which this species had not been previously reported. 4. Although at least 99 rice rats were captured, the number of individuals caught at most trapping sites was five or fewer. 5. Rice rats were found in permanent or ephemeral wetlands with emergent herbaceous vegetation. 6. Such habitats typically exist as small, isolated patches that cannot support large populations. 7. Further loss of habitat is the major threat to this species in Illinois and its continued status as a state-threatened species appears to be warranted.

INTRODUCTION

The marsh rice rat (*Oryzomys palustris*) is the only member of this predominantly Neotropical genus with an extensive range in the United States (Honacki *et al.* 1982). Its range extends from extreme southeastern Texas north to southeastern Kansas, through the southeastern states to Florida and north along the Atlantic seaboard to Pennsylvania and New Jersey (Wolfe 1982). A recent taxonomic revision of the species recognizes two subspecies: *O. p. palustris* in the continental United States and *O. p. natator* in peninsular Florida (Humphrey and Setzer 1989). Southern Illinois is at the northern limit of the range of *O. p. palustris*. The distribution, abundance, and life history of the rice rat in Illinois are not as well known as elsewhere (Wolfe 1982). Specimens have been recorded from only a few localities in the southernmost portion of the state.

As a result, the rice rat has been designated as a threatened species in Illinois (Illinois Administrative Code, Title 17, Chapter I, subchapter c, part 1010.30, 17 March 1989).

Rice rats once ranged at least as far north in Illinois as Peoria County (Fig. 1), where their remains have been identified from an archaeological site (Baker 1936). Remains of rice rats have also been discovered in Indian midden materials and paleontological deposits in Calhoun, Fulton, Greene, Madison, Pike, Randolph, St. Clair, Sangamon, and Scott counties (Fig. 1; Purdue and Styles 1986). During the Holocene, fluctuations in climate and the resulting changes in vegetation have caused shifts in the distributions of several mammalian species in Illinois. Southern species, such as the rice rat, extended their ranges northward during episodes of warmer climatic conditions, *i.e.* the Atlantic Episode (8500-5100 years BP) and the Scandic to Pacific Episodes (1700-400 years BP). The onset of cooler conditions again in the Neo-Boreal (400 years BP) apparently limited the range of the rice rat to the southernmost portion of Illinois (Purdue and Styles 1986).

The earliest modern records of rice rats in Illinois were from the towns of Olive Branch and Cache in Alexander County (Cory 1912; Necker and Hatfield 1941). McLaughlin and Robertson (1951) collected two specimens in southeastern Johnson County and concluded that rice rats were limited to swampy areas south of the Ozark Uplift, *i.e.* within the Coastal Plain Division of Schwegman (1973). More recently, rice rats have been reported from Franklin, Jackson, Massac, Pulaski, Union, and Williamson counties (Klimstra and Scott 1956; Klimstra 1969; Klimstra and Roseberry 1969; Rose and Seegert 1982; Urbanek and Klimstra 1986; Illinois Natural Heritage Database [INHD]). In addition, the remains of a rice rat were found in the stomach of a mink (*Mustela vison*) collected from an unspecified location in Washington County (Casson 1984). The recent range of the rice rat in Illinois, inferred from these limited records, extends through the Ozark, Lower Mississippi River Bottomlands, and Shawnee Hills divisions into the Mt. Vernon Hill Country Section of the Southern Till Plain Division (Schwegman 1973). Localities from which rice rats have been collected in Illinois exclusive of the present study are shown in Fig. 1.

The rice rat is semiaquatic, preferring wetland and riparian habitats. Rice rats are known to occur in salt and freshwater marshes, swamps and wet meadows, and along streams, ditches and lake shores (Barbour and Davis 1974; Hamilton and Whitaker 1979; Schwartz and Schwartz 1981; Wolfe 1982; Webster *et al.* 1985; Wolfe 1985; Jones and Birney 1988; Hoffmeister 1989). Such areas are often subject to human-induced alterations, primarily channelization or drainage. Rice rats occasionally are found on dry upland slopes (Schwartz and Schwartz 1981), but such individuals may be transients (Wolfe 1982). The major habitat requirement for this species appears to be a dense ground cover of grasses, sedges, or shrubs (Barbour and Davis 1974; Hamilton and Whitaker 1979; Schwartz and Schwartz 1981). The habitats where rice rats previously were captured in Illinois have been described as follows: a lowland brome-grass meadow; a wet forest-grass area; an agricultural drainageway containing native and non-native grasses; a cypress swamp; a marshy railroad right-of-way; a reed (*Phragmites australis*) marsh on surface-mined land; a low-lying successional field; and a farm pond dam (McLaughlin and Robertson 1951; Klimstra and Scott

1956; Klimstra 1969; Klimstra and Roseberry 1969; Urbanek and Klimstra 1986; INHD). More specific information on the characteristics of habitats that support rice rats in Illinois is lacking.

The primary objective of this study was to investigate the current distribution of the rice rat, but information on the abundance and habitat of this species was also obtained. Such information is essential for evaluating the status of the rice rat as a threatened species in the state and as a basis for conducting environmental assessments and developing recommendations for the management of rice rat populations.

METHODS

During June, October, and November 1986 and March through September 1987, live-trapping was conducted in 17 southern Illinois counties (Fig. 2). Most trapping sites were chosen during a study of the distribution of the rice rat funded by the Illinois Endangered Species Protection Board. After U.S. Geological Survey 7.5' topographic quadrangles and wetland maps generated by the Illinois Geographic Information System had been checked, sites were located by driving through a county looking for types of habitat known to be used by rice rats, such as thickly vegetated stream banks, ditches, or marshes. Other potentially suitable sites were trapped at the request of the Bureau of Location and Environment, Illinois Department of Transportation.

At least one site was located in each of the southernmost Illinois counties (Gallatin, Hamilton, Hardin, Perry, Pope, Randolph, Saline, and White) from which rice rats had not been reported previously. In addition, suitable habitat in Alexander, Franklin, Jackson, Johnson, Massac, Pulaski, Union, Washington, and Williamson counties was sampled to determine the current occurrence and abundance of the rice rat. Trapping sites in these latter counties were not locations from which rice rats had previously been recorded, because these sites were usually impossible to identify from available information.

Each study site was characterized in terms of its physiographic features, community type, and common plant species. At each site, trap lines were established with trap stations located at 10-m intervals. One Sherman live trap (8 x 9 x 23 cm) was placed on the ground at each station. Since the size of the areas of suitable habitat differed, the number of trap lines and stations varied among sites. Traps were baited with a mixture of rolled oats or wheat and peanut butter. During cold weather a small amount of cotton or polyester fiber was placed in each trap to provide warmth. Live-trapping was conducted for two consecutive nights in each county (although some individual trap lines were used for only one night). Traps were set during late afternoon or evening and checked early the following morning; they remained closed (unset) during the day.

The following information was recorded for each animal captured: trap station, species, sex, reproductive condition, and weight (to the nearest gram). The position of the testes (either descended into the scrotum or abdominal) was used as a general indicator of male reproductive condition. Females were examined for such signs of reproductive activity as a perforate vagina, pregnancy (determined by palpation of the abdomen), or lactation (determined by inspection of the teats).

In order to recognize individuals that were recaptured on the second morning of a trapping session, animals caught on the first morning were marked. A small patch of fur was clipped on the back of each rice rat; members of other species were toe-clipped (only one toe removed). After animals had been examined and marked, they were released at the trap station.

RESULTS

Trapping Results

A total trapping effort of 3517 trap-nights (one trap-night = one trap set for one night) resulted in 1111 captures of small mammals, an overall trapping success of 31.6%. Trapping success ranged from 69.1% in roadside ditches near Horseshoe Lake, Alexander County, to 3.3% along the backwaters of Big Creek, Hardin County. At least 941 individuals of thirteen species, two insectivores and eleven rodents, were caught. In addition to the rice rat, other species caught were the southern short-tailed shrew (*Blarina carolinensis*), least shrew (*Cryptotis parva*), eastern chipmunk (*Tamias striatus*), golden mouse (*Ochrotomys nuttalli*), white-footed mouse (*Peromyscus leucopus*), deer mouse (*P. maniculatus*), prairie vole (*Microtus ochrogaster*), pine vole (*M. pinetorum*), southern bog lemming (*Synaptomys cooperi*), house mouse (*Mus musculus*), Norway rat (*Rattus norvegicus*), and meadow jumping mouse (*Zapus hudsonius*). The white-footed mouse was the most commonly encountered species (587 individuals).

Rice rats were captured at 13 trapping sites in ten counties (Table 1, Fig. 2). They were found for the first time in Hamilton, Pope, Saline, and White counties and were also trapped at new localities in six counties for which previous records exist (Alexander, Franklin, Jackson, Johnson, Massac, and Williamson). Rice rats were not caught in Pulaski, Union, or Washington counties even though the species had been reported there previously. Despite the trapping efforts reported here, no rice rats have been captured in Gallatin, Hardin, Perry, or Randolph counties.

The 132 captures of rice rats represented 99 to 103 individuals (Table 2). The number of individuals is inexact because of uncertainty about the number of recaptures at the Saline County site. During the second night of trapping, the water level rose unexpectedly, inundating some traps and making it difficult to determine if wet animals had been marked. Breeding populations, as indicated by the presence of reproductively active females, occurred at seven trapping sites in seven counties (Table 2).

Although at least 99 rice rats were trapped during this study, nearly half (45-49 individuals) were captured at the Saline County site and more than 70% (72-76 individuals) were caught at just four sites in Alexander, Jackson, Pope, and Saline counties. Five or fewer rice rats were caught at each of the nine remaining sites (Table 2). Although the numbers of rice rats captured at these nine sites were low, the relative abundances (number of individuals captured per 100 trap-nights) for this species varied considerably (Table 2). For example, at a strip-mine pond in Williamson County only one individual was caught in 120 trap-nights for a relative abundance of 0.83. In contrast, at a roadside ditch in Hamilton

County five rice rats were caught in only 22 trap-nights, a relative abundance of 22.73.

Additional trapping information for each site where rice rats were captured is given in the Appendix.

Habitat Features

According to the categories defined by the National Wetland Inventory Program (U.S. Fish and Wildlife Service), habitat at sites where rice rats were captured during this study would be classified as palustrine emergent wetlands (PEM), palustrine scrub-shrub wetlands (PSS), palustrine aquatic beds (PAB), or riverine aquatic beds (RAB) (Table 1; Cowardin *et al.* 1979). The two types of site at which rice rats were most frequently captured during this study were ditches along county or state highways and the shorelines of lakes or ponds (Table 1). Rice rats were trapped in palustrine emergent wetlands in roadside ditches at five sites in four counties (Alexander, Franklin, Hamilton, and White; Fig. 3). They were found within emergent vegetation along the shores of Mermet Lake (Massac County), Norris City Reservoir (White County; Fig. 4), a pond created by subsidence as a result of underground mining (Saline County), and a tailing pond on surface-mined land (Williamson County).

Most sites where rice rats were caught during this study had two common features: standing water and emergent herbaceous vegetation (Fig. 3, 4). Rice rats were caught in two locations, however, that did not fully match this description. The first was the roadside ditch along county highway 7 in Hamilton County. Although standing water was absent at the time of trapping, the presence of saturated soil indicated that the ditch had been inundated earlier in the spring. The second exception was the capture of a single rice rat in a trapline at the edge of a forested palustrine wetland at Bay Creek in Pope County. This individual, however, was caught only 65 m from a scrub-shrub wetland on the opposite side of the creek that contained standing water and emergent herbaceous vegetation. Six other rice rats trapped at this site were within the scrub-shrub wetland.

The vegetation at all sites where rice rats were captured was characteristic of wetlands (Reed 1988) with representatives present from at least one, and often three or four, of the following groups: sedges (*Carex* spp.), bulrushes (*Scirpus* spp.), rushes (*Juncus* spp.), spike rushes (*Eleocharis* spp.), and cat-tails (*Typha* spp.). Rice cutgrass (*Leersia oryzoides*) occurred at three trapping sites and common reed (*Phragmites australis*) at two sites. Other grasses and a variety of terrestrial and aquatic broad-leaved plants also occurred at sites where rice rats were caught, but no single species or taxon seemed to be an indicator of habitat suitability. Wetland plants (obligate and facultative wetland species; Reed 1988) at each trapping site where rice rats were caught are listed in the Appendix.

DISCUSSION

Distribution

New records for Hamilton, Pope, Saline, and White counties obtained during this study reveal that the rice rat occurs substantially farther northeast in Illinois than indicated by previous records. Rice rats may have expanded their range within the state, perhaps using waterways and wet areas within highway and railroad rights-of-way as dispersal corridors. Even more likely, however, rice rats may have been present in these four southeastern Illinois counties but were unreported due to limited sampling. In fact, few museum specimens of such common species as *Peromyscus leucopus, Microtus ochrogaster,* and *Mus musculus* have been collected in Hamilton and White counties (Hoffmeister 1989).

The significance of the single rice rat specimen from the stomach contents of a mink taken at an unspecified location in Washington County (Casson 1984) is not evident. Furthermore, there are no records of rice rats from adjacent counties. It seems unlikely, therefore, that rice rats are widely distributed in Washington County. Although some potentially suitable habitat for rice rats occurs in Perry, Randolph, and Washington counties, the results of this study suggest that the primary range of this species extends only as far north as Franklin and Jackson counties in southwestern Illinois.

Rice rats were not caught in Pulaski or Union counties during this study and existing records do not suggest that the rice rat is common in either county. The only specimen known from Pulaski County was found dead in a field in January 1987 (INHD), and no rice rats have been reported from Union County since 1958 (Klimstra and Roseberry 1969). Although rice rats were captured in all adjacent counties during this study, if they were also present in Pulaski and Union counties, they would probably be uncommon due to the limited amount of suitable habitat.

Rice rats have never been captured in Gallatin and Hardin counties, although they were caught in adjacent counties during the present study. Their apparent absence from Gallatin and Hardin is probably attributable to the scarcity of suitable habitat. A comparison of conditions during 1986 with those shown on older U. S. Geological Survey quadrangles (New Haven SW, 1964 and Wabash Island, 1981) revealed that large expanses of wetland in Gallatin County have been drained for agricultural use.

Previous records indicated that the range of the rice rat in Illinois extended northward along the Mississippi River and through the Shawnee Hills along the Big Muddy and Cache River drainages. Habitat in the Saline River drainage and along the Ohio River north of Golconda had been considered unsuitable for this species (Klimstra and Scott 1956) until a rice rat was caught in the Saline River valley in 1975 (Urbanek and Klimstra 1986). During the present study, rice rats were captured not only in the Saline River valley but for the first time in the Little Wabash River drainage within Schwegman's (1973) Wabash Border Division of Illinois.

Habitat, Abundance, and Status

Although standing water and emergent herbaceous vegetation were characteristic of sites where rice rats were found in this study, these conditions did not ensure rice rat captures. No rice rats were caught at palustrine emergent or scrub-shrub wetland with standing water in eight counties (Gallatin, Hardin, Jackson, Perry, Pulaski, Union, Washington, and Williamson counties; Table 3). Because the rice rat is uncommon in Illinois and southern Illinois' wetlands are widely scattered, it is not surprising that areas of apparently suitable habitat have not been colonized. Some sites where rice rats were not captured during this study lacked standing water at the time of trapping (Hardin, Randolph, and White counties; Table 3). Other sites were forested palustrine wetlands (PFO) where herbaceous vegetation occurred atop stream banks but not in the water (Alexander, Johnson, and Union counties; Table 3). The results of this study strongly suggest that optimal habitat for rice rats in southern Illinois has standing water with emergent herbaceous wetland vegetation, but the possibility that rice rats occur in other types of habitat cannot be ruled out.

Mermet Lake in Massac County, Norris City Reservoir in White County, Worthen Bayou in Jackson County, and the Saline County wetland are permanent bodies of water where rice rats were captured. Other sites where rice rats occurred during this study, however, contained standing water, but only seasonally or semipermanently (*e.g.*, roadside ditches in Alexander, Hamilton, and White counties). Although rice rats occupied such ephemeral wetland areas, they may not use them year-round (Hofmann and Morris, unpublished data). During drier seasons (or drought years) they would be likely to move to other suitable habitat, perhaps to more permanent sources of water. In the Everglades, for example, rice rats occupy hammocks surrounded by water during the wet season but leave the hammocks during the the dry season, presumably moving to mesic sites (Smith and Vrieze 1979). By the same reasoning, study sites that had no standing water at the time of trapping might be occupied by rice rats at other times.

The results of this study indicate that rice rats are not limited to natural, undisturbed wetlands. For example, rice rats were often found in wetland habitat in roadside ditches. Such ditches receive and may retain water from direct precipitation, surface runoff, and agricultural drainage. Standing water may, therefore, be present at least seasonally, resulting in the establishment of wetland vegetation. Other habitats created or altered by humans where rice rats were found during this study included a channelized drainage ditch (Worthen Bayou, Jackson County) and a tailing pond on surface-mined land (Williamson County)

The sizes of the wetland sites that were inhabited by rice rats during this study were estimated using field notes, U. S. Geological Survey 7.5' quadrangles, National Wetland Inventory maps, and Agricultural Stabilization and Conservation Service (U. S. Department of Agriculture) aerial photographs. The largest areas were the palustrine emergent wetlands in Saline County (approximately 5.5 hectares) and along the shoreline of Mermet Lake (approximately 4.5 hectares). Eight of the 13 sites, however, were estimated to have been one hectare or less in size. The smallest areas found to be inhabited

by rice rats, two roadside ditches in Hamilton County, were approximately 0.1 and 0.03 hectare. Thus, the size of a wetland does not limit the occurrence of this species.

Although the amount of habitat considered to be suitable for rice rats at each site could be estimated, the area that was effectively sampled by trap lines could not be determined. As a result, population densities were not calculated. The relative abundance of rice rats at each site, however, was calculated (Table 2); these values should correlate with density and be useful for comparisons among sites (Emmel 1976). Relative abundances suggest that high densities of rice rats occurred at several sites, but large numbers of individuals (>10) were captured only in Alexander and Saline counties. At the other sites, the absolute number of individuals captured was small, a reflection of either low densities (e.g., a Williamson County pond where only one rice rat was caught in 120 trap-nights) or limited size of suitable habitat (e.g., Hamilton County).

Although rice rats were captured in ten Illinois counties, the major difficulty encountered during this study was locating potentially suitable rice rat habitat. Many wetlands in southern Illinois no longer exist due to surface mining, residential and commercial development, highway construction and, most often, drainage for agriculture. The remaining wetland areas often are small, disjunct, and ephemeral and are unable to support large numbers of rice rats. Small populations are especially vulnerable to extirpation due to environmental changes, disease, or predation. Furthermore, if a local population were extirpated, recolonization of the area could be slow or nonexistent because the large expanse of unsuitable habitat would act as a barrier to other populations.

In conclusion, the continued listing of the rice rat as a threatened species in Illinois appears warranted. This species may be limited in its distribution by climatic factors to the southernmost portion of the state and it may never be considered common even there. Suitable habitat is limited and further habitat loss appears to be the major threat to the continued existence of rice rats in Illinois. Remaining wetlands, especially palustrine emergent and palustrine scrub-shrub wetlands, should be protected and serious consideration should be given to the restoration and creation of wetlands within the range of this species.

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APPENDIX

Alexander County

Trapping dates: 30-31 March 1987
Trap-nights: 188
Trapping success: 69.1%
Mammal species[a]: *Microtus ochrogaster* (11 individuals), *Ochrotomys nuttali* (1), *Peromyscus leucopus* (86)
Wetland plants[b]: *Arundinaria gigantea, Asclepias incarnata, Carex scoparia, C. squarrosa, C. vulpinoidea, Elymus virginicus, Fraxinus pennsylvanica, Liquidambar styraciflua, Lycopus americanus, Polygonum hydropiperoides, Quercus palustris, Scirpus atrovirens, Spermacoce glabra, Stachys tenuifolia*

Franklin County

Trapping dates: 12-13 May 1987
Trap-nights: 142
Trapping success: 32.4%
Mammal species: *Microtus pinetorum* (1), *Peromyscus leucopus* (21), *Tamias striatus* (4-5), *Zapus hudsonius* (2)
Wetland plants: *Alisma plantago-aquatica, Amsonia tabernaemontana, Carex annectens, C. hyalinolepis, C. squarrosa, Eleocharis tenuis, Galium obtusum, Iris brevicaulis, Juncus torreyi, Scirpus atrovirens, S. pendulus, Typha latifolia*

Hamilton County: county highway 7

Trapping dates: 3-4 June 1987
Trap-nights: 80
Trapping success: 65.0%
Mammal species: *Microtus ochrogaster* (2), *Mus musculus* (17), *Peromyscus leucopus* (12)
Wetland plants: *Carex annectens, C. frankii, C. lupuliformes, C.* c.f. *scoparia, C. typhina, Glyceria striata, Juncus acuminatus, J. effusus, Leersia oryzoides, Sagitarria* sp., *Scirpus validus, Typha latifolia*

Hamilton County: Illinois Route 14
Trapping dates: 3-4 June 1987
Trap-nights: 22
Trapping success: 72.7%
Mammal species: *Mus musculus* (9), *Peromyscus leucopus* (1), *P. maniculatus* (1)
Wetland plants: *Carex annectens, C. frankii, C. vulpinoidea, Glyceria striata, Juncus brachycarpus, J. marginatus, Scirpus atrovirens, S. pendulus, S. validus, Typha latifolia*

Jackson County
Trapping dates: 23-24 September 1987
Trap-nights: 72
Trapping success: 27.8%
Mammal species: *Mus musculus* (7), *Peromyscus leucopus* (2), *P. maniculatus* (1)
Wetland plants: *Ammania coccinea, Bidens* sp., *Cyperus erythrorhizos, Leersia oryzoides, Ludwigia decurrens, Polygonum lapathifolium, Rotala ramosior*

Johnson County: site 1
Trapping dates: 1-2 April 1987
Trap-nights: 86
Trapping success: 20.9%
Mammal species: *Microtus ochrogaster* (5), *Peromyscus leucopus* (9)
Wetland plants: *Arundinaria gigantea, Asclepias incarnata, Hibiscus moscheutos, Iris fulva, Ludwigia alternifolia, Lythrum alatum, Scirpus cyperinus*

Johnson County: site 2
Trapping dates: 2 April 1987
Trap-nights: 26
Trapping success: 15.4%
Mammal species: *Peromyscus leucopus* (2)
Wetland plants: *Hibiscus moscheutos, Impatiens capensis, Juncus* sp., *Salix nigra*

Massac County
Trapping dates: 1-2 April 1987
Trap-nights: 200
Trapping success: 28.5%
Mammal species: *Microtus ochrogaster* (1), *Mus musculus* (6), *Peromyscus leucopus* (39)
Wetland plants: *Nelumbo lutea, Polygonum lapathifolium, Senecio glabellus, Typha latifolia*

Pope County
Trapping dates: 2-3 June 1986
Trap-nights: 160
Trapping success: 25.6%
Mammal species: *Blarina carolinensis* (1), *Peromyscus leucopus* (28)
Wetland plants: *Acer saccharinum, Amorpha fruticosa, Betula nigra, Carex hyalinolepis, Celtis laevigata, Cephalanthus occidentalis, Chasmanthium latifolium, Fraxinus pennsylvanica, Ilex decidua, Ludwigia decurrens, Penthorum sedoides, Quercus palustris, Salix nigra*

Saline County
Trapping dates: 27-28 April 1987
Trap-nights: 200
Trapping success: 38.0%
Mammal species: *Microtus ochrogaster* (2), *Mus musculus* (10)
Wetland plants: *Carex vulpinoidea, Phragmites australis, Salix nigra, Typha angustifolia*

White County: Illinois Route 1
Trapping dates: 26-27 May 1987
Trap-nights: 25
Trapping success: 24.0%
Mammal species: *Peromyscus leucopus* (3)
Wetland plants: *Acer saccharinum, Betula nigra, Carex* c.f. *lupulina, Cephalanthus occidentalis, Eleocharis obtusa, Hibiscus moscheutos, Juncus acuminatus, J. effusus, Salix nigra, Scirpus atrovirens, Typha latifolia*

White County: Norris City Reservoir
Trapping dates: 27 May 1987
Trap-nights: 15
Trapping success: 60.0%
Mammal species: *Mus musculus* (4), *Rattus norvegicus* (1)
Wetland plants: *Carex vulpinoidea, Cephalanthus occidentalis, Glyceria striata, Ludwigia peploides, Salix nigra, Typha latifolia*

Williamson County
Trapping dates: 7-8 April 1987
Trap-nights: 120
Trapping success: 11.7%
Mammal species: *Microtus ochrogaster* (1), *Peromyscus leucopus* (1), *P. maniculatus* (5), *Synaptomys cooperi* (2)
Wetland plants: *Phragmites australis, Typha latifolia*

[a] exclusive of *Oryzomys palustris*
[b] obligate or facultative wetland species (Reed 1988)

Figure 1. Localities where rice rats have been reported in Illinois exclusive of this study and their former distribution in the state based on archeological finds (Baker 1936; Necker and Hatfield 1941; McLaughlin and Robertson 1951; Klimstra and Scott 1956; Klimstra 1969; Klimstra and Roseberry 1969; Rose and Seegert 1982; Casson 1984; Urbanek and Klimstra 1986; Purdue and Styles 1986; INHD).

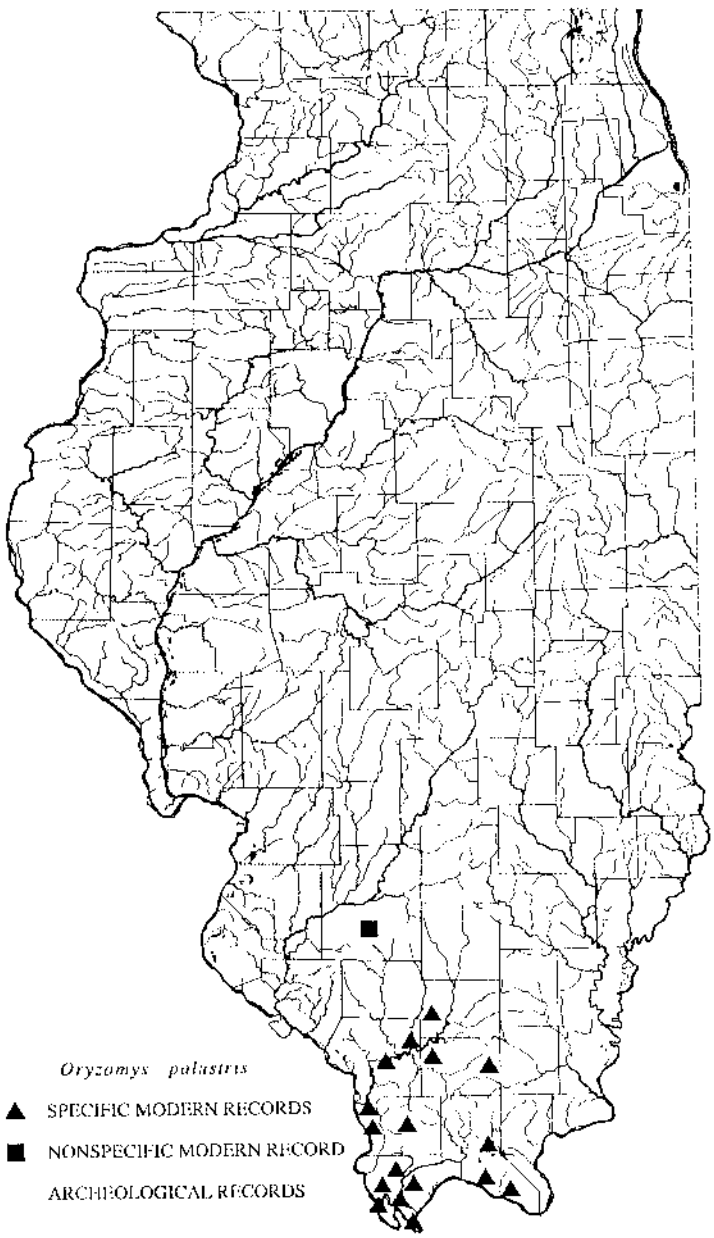

Figure 2. Locations of live-trapping sites in 17 southern Illinois counties, 1986 and 1987.

○ TRAPPING SITES

• *Oryzomys palustris* CAPTURES

PREVIOUSLY REPORTED DISTRIBUTION

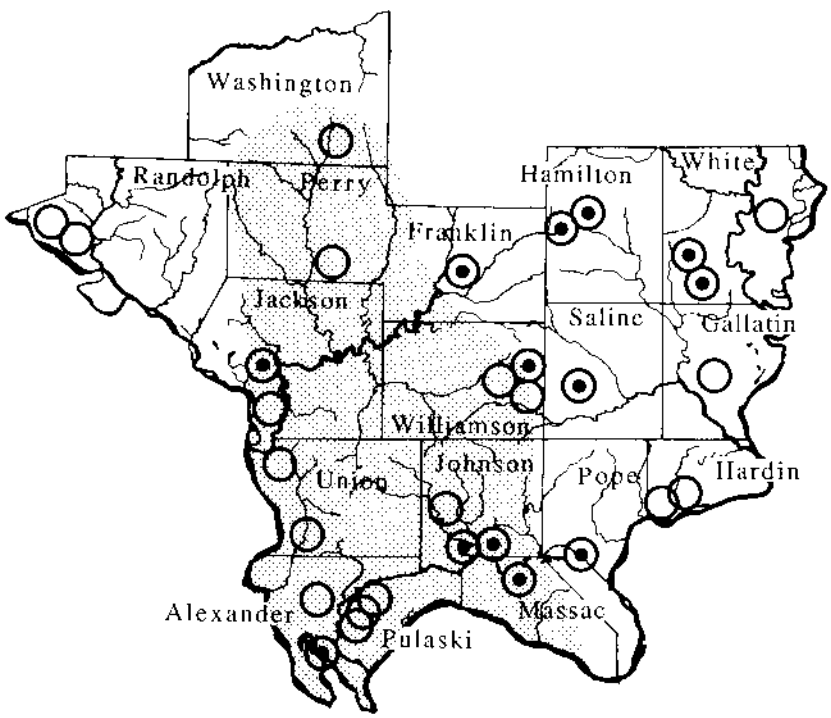

Figure 3. Ephemeral palustrine emergent wetland in a shallow roadside ditch in Franklin County, Illinois. Sedges, bulrushes, rushes, and spike rushes form a dense cover of herbaceous vegetation.

Figure 4. Confluence of Norris City Reservoir and a roadside drainage ditch, White County, Illinois. The water is partially covered with mats of creeping primrose-willow (*Ludwigia peploides*) and common cat-tail (*Typha latifolia*), rice cutgrass, and sedges grow along the water's edge.

Table 1. Locations and wetland classifications of trapping sites where *Oryzomys palustris* was captured in southern Illinois, 1986-1987.

COUNTY	TRAPPING SITE	LEGAL LOCATION	UTM COORDINATES	WETLAND TYPE[a]
Alexander	Roadside ditch, Promised Land Road 4.0 km NW Cache	T16S, R2W, Sec. 14, NE/4 and NW/4, SW/4	295450E 4110600N	PEM
Franklin	Roadside ditch, county highway 11 8.0 km SW Benton	T6S, R2E, Sec. 33, SE/4, SW/4 and T7S, R2E, Sec. 4, NE/4, NW/4	324100E 4202000N and 324100E 4201950N	PEM
Hamilton	Roadside ditch, county highway 7 2.5 km ENE Macedonia	T5S, R5E, Sec. 29, SE/4, NW/4 and NE/4, SW/4	325875E 4213540N	PEM
	Roadside ditch, Illinois Route 14 6.0 km W McLeansboro	T5S, R5E, Sec. 24, NE/4, NW/4	359360E 4215820N	PEM
Jackson	Worthen Bayou, west of Illinois Route 3 2.0 km SW Grimsby	T9S, R3W, Sec. 17, NE/4, SW/4	282900E 4179650N	PEM /RAB
Johnson	Marshy fields adjacent to Belknap Road			
	3.5 km NE Belknap	T13S, R3E, Sec. 32, SW/4, NW/4	330720E 4134680N	PEM
	4.0 km NE Belknap	T13S, R3E, Sec. 32, SW/4, NW/4	330980E 4134840N	PEM
Massac	Shore of Mermet Lake 2.5 km S Mermet	T14S, R3E, Sec. 35, NW/4 and SE/4, NE/4	336320E 4125340N and 336500E 4125200N	PEM
Pope	Bay Creek and associated wetlands 0.4 km S Brownfield	T13S, R5E, Sec. 36, NE/4, SE/4	357820E 4133940N	PSS/PFO
Saline	Pond and marsh adjacent to Illinois Route 13 5.0 km W Harrisburg	T9S, R5W, Sec. 13, SW/4, NE/4 and NW/4, SE/4	358800E 4177850N	PEM
White	Roadside ditch, Illinois Route 1 5.5 km NE Norris City	T6S, R8E, Sec. 12, SE/4, SW/4	387600E 4207750N	PEM
	Shore of Norris City Reservoir 1.0 km E Norris City	T6S, R8E, Sec. 22, SE/4, SW/4	384750E 4204600N	PEM/PAB
Williamson	Shore of strip-mine pond 3.5 km E Crab Orchard	T9S, R4E, Sec. 21, NE/4, NE/4	344700E 4177100N	PEM

[a] based on National Wetland Inventory (U.S. Fish and Wildlife Service); PFO = palustrine forested wetland, PSS = palustrine scrub-shrub wetland, PEM = palustrine emergent wetland, PAB = palustrine aquatic bed, RAB = riverine aquatic bed (Cowardin *et al.* 1979)

Table 2. Numbers, reproductive condition, and relative abundances of *Oryzomys palustris* captured at trapping sites in southern Illinois, 1986-1987.

COUNTY	NO. CAPTURES	NO. INDIVIDUALS	NO. MALES		NO. FEMALES		RELATIVE ABUNDANCE [c]
			Repro. [a]	Non-repro.	Repro. [b]	Non-repro.	
Alexander	18	12	4	2	3	3	6.38
Franklin	6	3	1	1	1	-	2.11
Hamilton (Illinois Route 14)	5	5	1	3	-	1	22.73
Hamilton (Co. hwy. 7)	4	3	1	1	1	-	3.75
Jackson (Worthen Bayou)	9	8	-	5	1	2	11.11
Johnson (Site 1)	3	3	-	3	-	-	3.49
Johnson (Site 2)	2	2	-	1	-	1	7.69
Massac	7	4	-	2	-	2	2.00
Pope	7	7	3	2	1	1	6.25
Saline	62	45-49 [d]	12	12	7	14	$\geq$ 22.50
White (Illinois Route 1)	3	2	1	1	-	-	8.00
White (Norris City Res.)	4	4	1	1	2	-	26.67
Williamson	2	1	-	1	-	-	0.83
Totals	**132**	**99-103**	**24**	**35**	**16**	**24**	

[a] Scrotal testes
[b] Perforate vagina, pregnant, or lactating
[c] Relative abundance = (no. individuals/no. trap-nights) X 100
[d] Exact number unknown

Table 3. Locations, wetland classifications, and habitat characteristics of trapping sites in southern Illinois where *Oryzomys palustris* was not captured, 1986-1987.

COUNTY	LEGAL LOCATION	WETLAND TYPE[a]	HABITAT DESCRIPTION	HABITAT FEATURES Wetland Veg.[b]	Water[c]
Alexander	T15S, R2W, Sec. 13, NE/4	PFO	forested creek bank	Yes	Yes
Gallatin	T9S, R9E, Sec. 20, NW/4	PEM	marshy field	Yes	Yes
Hardin	T12S, R8E, Sec. 27, SW/4	PSS/PEM	shrubland and marsh	Yes	Yes
	T12S, R7E, Sec. 35, SE/4	PFO; PEM	forested creek bank; ditch	No; Yes	Yes; No
Jackson	T10S, R3W, Sec. 9, NW/4	PEM	roadside ditch	Yes	Yes
Johnson	T13S, R3E, Sec. 17, SW/4	PFO	forested creek bank	Yes	Yes
Perry	T6S, R2W, Sec. 17, NE/4	PEM	roadside ditch	Yes	Yes
Pulaski	T15S, R1W, Sec. 10, NE/4	PFO; PSS	forested creek bank; RR ditch	No; No	Yes; Yes
	T14S, R1W, Sec. 23, NE/4	PEM	marshy field	Yes	Yes
	T14S, R1W, Sec. 26, NE/4	PSS/PEM	roadside ditch	Yes	Yes
Randolph	T6S, R8W, Sec. 28, SW/4	PEM	marsh	Yes	No
	T6S, R9W, Sec. 1, NE/4	PEM/PSS	marsh	Yes	No
Union	T11S, R3W, Sec. 9, NE/4 and NW/4	PFO/PEM	edge of swamp	Yes	Yes
	T13S, R2W, Sec. 17, SW/4	PFO	forested ditch bank	Yes	Yes
Washington	T3S, R2W, Sec. 22, NE/4 and T3S, R2W, Sec. 23, NW/4	PEM	creek channel	Yes	Yes
White	T5S, R10E, Sec. 13, NW/4	PEM	marsh	Yes	No
Williamson	T9S, R4E, Sec. 22, NW/4	PEM	strip mine ponds	Yes	Yes
	T9S, R4E, Sec. 25, NW/4	PEM	strip mine ponds	Yes	Yes

[a] based on National Wetland Inventory (U.S. Fish and Wildlife Service); PFO = palustrine forested wetland, PSS = palustrine scrub-shrub wetland, PEM = palustrine emergent wetland (Cowardin *et al.* 1979)

[b] Presence of herbaceous obligate or facultative wetland species (Reed 1988)

[c] Presence of standing water at time of trapping