PRAIRIE VOLE AND OTHER SMALL MAMMALS FROM THE TEXAS PANHANDLE

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ABSTRACT—We collected owl pellets from 4 counties to examine the distribution of prairie voles (*Microtus ochrogaster*) and other small mammals in the Texas Panhandle. We identified 797 individuals of 15 genera and species of small mammals from 207 owl pellets. Overall, the 5 most abundant small mammals, *Peromyscus* (331 individuals), *Reithrodontomys* (182 individuals), *Cryptotis parva* (74 individuals), *Sigmodon hispidus*, and *M. ochrogaster* (60 individuals), comprised 89% of all individuals identified. This study extends the known range of *M. ochrogaster* 24 km south and 13 km east of the previous record in Carson County, Texas, and provides new county records of *M. ochrogaster* in Armstrong and Ochiltree counties. Additionally, we identified *C. parva* in samples from Ochiltree and Carson counties and *Notiosorex crawfordi* in samples from Armstrong County, both of which represent new county records. Our results, along with other recent work on *M. ochrogaster*, suggest that this species is more widespread in the northern and central Texas Panhandle than previously reported. More work is necessary to determine the southern limit of this species in the Texas Panhandle.

RESUMEN—Nosotros colectamos pelotillas de buho de cuatro diferentes condados para examinar la distribucion de ratones de las praderas (*Microtus ochrogaster*) y otros pequeños mamiferos en el panhandle de Texas. Nosotros identificamos 797 individuos de 15 especies diferentes de pequeños mamiferos apartir de 207 pelotillas de buho. En general, los cinco pequeños mamiferos mas abundantes fueron *Peromyscus* (331 individuos), *Reithrodontomys* (182 individuos), *Cryptotis parva* (74 individuos), *Sigmodon hispidus* y *M. ochrogaster* (60 individuos), comprendiendo un 89% de todos los individuos identificados. Este estudio extiende el rango conocido de *M. ochrogaster* en 24 km al sur y 13 km al este respecto de lo anteriormente registrado en el condado de Carson, Texas, y provee nuevos registros para la especie *M. ochrogaster* en los condados de Armstrong and Ochiltree. Adicionalmente, nosotros identificamos *C. parva* en muestras de los condados de Ochiltree and Carson y *Notiosorex crawfordi* apartir de muestras del condado de Armstrong, todo lo cual representa nuevos registros para estos condados. Nuestros resultados, junto con otro trabajo reciente en *M. ochrogaster* sugieren que estas especies se estan diseminando en el area norte y central del panhandle de Texas. Trabajo adicional es necesario para determinar el limite sur de esta especie en el panhandle.

The prairie vole (*Microtus ochrogaster*) is widely distributed in grasslands across the northern and central United States from just east of the Rocky Mountains to Ohio and West Virginia (Stalling, 1990). The species is known to occur in the panhandle of Oklahoma (Reed and Choate, 1988), southwestern Oklahoma (Choate, 1989; Stangl et al., 1992), and, until recently, from 2 counties in the extreme northern Texas Panhandle (Manning and Jones, 1988; Choate and Killebrew, 1991). McCaffrey et al. (2003) recently documented the species in Carson County, 80 km south of its previously known range, and in Dallam and Sherman counties in the extreme northern Texas Panhandle. We investigated the distribution of *M. ochrogaster* and other species of small mammals in the northern Texas Panhandle by examining remains of small mammals in owl pellets.

We collected owl pellets from Ochiltree, Hemphill, Carson, and Armstrong counties to investigate occurrence of *M. ochrogaster*, as well as other species of small mammals in these relatively unstudied counties (Fig. 1). Sixty-one (37 complete and 24 incomplete) pellets were collected from a barn 23 km south and 8 km west of Perryton, Ochiltree County (36°11′25.5″N, 100°53′16.7″W). Thirty-one (17 complete and 14 incomplete) pellets were collected from a grain elevator in Claude, Armstrong County (35°06′43.3″N, 101°21′30.9″W). Seventy-two (all complete) pellets were collected from a barn 8 km

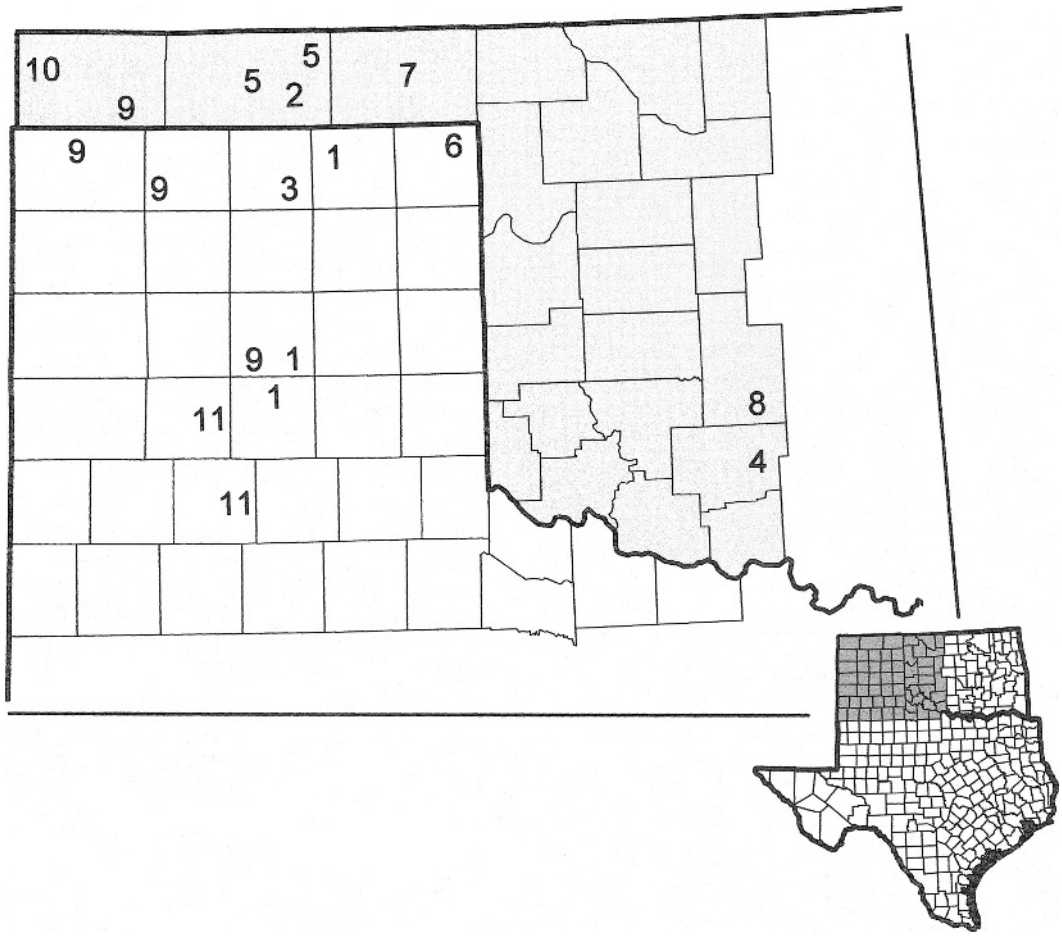

FIG. 1—Locations of recent records of the praire vole (*Microus ochrogaster*) in southwestern Oklahoma and the panhandles of Oklahoma and Texas from (1) our study, (2) Reed and Choate (1988), (3) Manning and Jones (1998), (4) Choate (1989), (5) Dalquest et al. (1990*a*), (6) Choate and Killebrew (1991), (7) Dalquest and Baskin (1991), (8) Smith (1992), and (9) McCaffrey et al. (2003). Remains of the praire vole have been found in archaeological sites dating from about 31,360 to 3,860 y before present in the Oklahoma Panhandle (10; Dalquest et al., (1990*b*) and in sites dating from about 1,700 to 890 y before present in the Texas Panhandle (11; Hughes, 1979).

north and 14 km west of Groom, Carson County (35°15′15.2″N, 101°16′08.5″W). Forty-three pellets (all complete) were collected from a barn on the Gene Howe Wildlife Management Area near Canadian, Hemphill County (35°55′20.1″N, 100°18′44.5″W). The species of owl that deposited the pellets in each location is not known with certainty. Great horned owls (*Bubo virginianus*) and barn owls (*Tyto alba*) are common in our study area, were observed near several of our study sites, and produce large pellets similar to the ones we collected. While the exact hunting locations of owls could not be determined it is likely that the small mammals in their pellets were captured within a short distance of the roosts. Barn owls forage ≤3.7 km from their roost sites (Smith et al., 1974). For great horned owls, home ranges of non-territorial ''floater'' owls are about 5 times larger than territorial owls and average 26.1 km^2 (Rohner, 1997).

Pellets were dissolved by soaking them in an 8% NaOH solution for 12–16 h. Small mammals were identified to genus and, where possible, to species by cranial and dental characteristics.

We recovered 797 individual mammals representing 15 species from 207 pellets. The 5 most

TABLE 1—Remains of small mammals found in owl pellets collected in 2003 from Ochiltree, Hemphill, Carson, and Armstrong counties in the Texas Panhandle. Asterisks indicate new county records, *n* is the number of individuals in the sample, and % is the percentage of the total number of individuals in each sample.

	Ochiltree	Hemphill	Carson	Armstrong
Species	*n* (%)	*n* (%)	*n* (%)	*n* (%)
Cryptotis parva	25 (12)*	7 (7)	30 (7)*	12 (9)*
Notiosorex crawfordi	0	0	0	2 (2)*
Scalopus aquaticus	0	3 (3)	0	0
Geomys bursarius	0	1 (1)	0	0
Perognathus	13 (6)	18 (18)	1 (0)	1 (1)
Chaetodipus hispidus	10 (5)	2 (2)	5 (1)	2 (2)
Dipodomys	0	20 (20)	0	0
Reithrodontomys	33 (16)	25 (25)	104 (26)	20 (16)
Peromyscus	79 (39)	6 (6)	216 (54)	30 (24)
Baiomys taylori	0	0	0	1 (1)
Onychomys leucogaster	0	8 (8)	2 (1)	6 (5)
Sigmodon hispidus	8 (4)	9 (9)	13 (3)	30 (24)
Neotoma	0	1 (1)	0	1 (1)
Mus musculus	0	0	6 (2)	5 (4)
Microtus ochrogaster	26 (13)*	0	21 (5)	13 (10)*
Sylvilagus	2 (1)	0	0	0
Unknown Mammal	5 (2)	0	3 (1)	3 (2)
Total	201 (98)	100 (100)	401 (100)	126 (101)

abundant mammals, *Peromyscus* (331 individuals), *Reithrodontomys* (182 individuals), *C. parva* (74 individuals), *Sigmodon hispidus*, and *M. ochrogaster* (60 individuals each), comprised 89% of all individuals identified.

We identified 201 individuals of 8 species from 61 pellets in Ochiltree County (Table 1). Of these, *C. parva* and *M. ochrogaster* have not been recorded previously in Ochiltree County. We also identified 100 individuals of 11 species from 43 pellets in Hemphill County, 401 individuals of 9 species from 72 pellets in Carson County, and 126 individuals of 12 species from 31 pellets in Armstrong County (Table 1). *Cryptotis parva* represents a new county record for Carson County, and *Notiosorex crawfordi*, *C. parva*, and *M. ochrogaster* represent new records for Armstrong County.

The remains of 60 prairie voles were identified in owl pellets collected from Carson, Armstrong and Ochiltree counties. Remains from Armstrong and Ochiltree counties represent new county records for the prairie vole, and Armstrong County represents a new southern limit for the species in the Texas Panhandle. Our results and the results from other recent studies suggest that the prairie vole is widespread in the northern and central Texas Panhandle (Fig. 1).

McCaffrey et al. (2003) suggested that prairie voles in this region represent a recent southwestern expansion of the species because previous sampling in the same areas failed to detect the species. However, presence of prairie voles can be difficult to detect in this region. Smith (1992) trapped periodically in Caddo County, Oklahoma, for nearly a year before the first prairie vole was captured. Dalquest et al. (1990*a*) were unable to collect prairie voles at any site in the panhandles of Texas and Oklahoma more than once and stated that the species could easily have escaped the notice of collectors. We propose that populations of prairie voles are ephemeral in southwestern Oklahoma and the panhandles of Oklahoma and Texas, increasing the chances that populations could be missed during surveys. Dalquest and Baskin (1991) suggested that scattered populations of prairie voles flourish for short periods, go extinct locally, and appear elsewhere.

Remains of prairie voles have been discovered in numerous archeological sites throughout the Texas Panhandle and in surrounding states. According to Dalquest et al. (1990*b*), the record of the prairie vole in northwestern Oklahoma and northeastern New Mexico extends back without apparent interruption for >30,000 y.

Remains of prairie voles have been discovered at archeological sites that date from 300 to 1,110 A.D. in Randall and Swisher counties in the central Texas Panhandle (Schultz and Rawn, 1978; Hughes, 1979). Given the difficulty of detecting the species and the archeological evidence of previous and relatively recent occupation of the area, we agree with Manning and Jones (1988), that prairie voles in the panhandles of Texas and Oklahoma are likely a relic of a more southwestwardly distribution of the species during the late Pleistocene and early Holocene.

Our findings represent new county records for the least shrew (*C. parva*) from Ochiltree and Carson counties and the desert shrew (*N. crawfordi*) from Armstrong County. It is likely that these species will be discovered in every county in the Texas Panhandle. Because of the difficulty associated with trapping these shrews using standard methods, examination of owl pellets is a relatively efficient way to determine their presence (Jones et al., 1988).

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