Annotated Checklist Of The Mammals Of The Tallgrass Prairie Preserve, Osage County, Oklahoma

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We conducted an inventory of the Tallgrass Prairie Preserve in Osage County, Oklahoma, to determine the species of mammal that occur there. Small mammals were live-trapped in Sherman traps in six different habitat types from June 1991 to May 1992. Sightings by reliable sources of large mammals were recorded through 2000. A literature search was used to determine historical accounts of mammals and accounts of mammals that could eventually be found in the preserve. This annotated checklist describes the distribution of 43 extant species of mammals (38 native, 4 domestic, and 1 introduced) known to occur in the Tallgrass Prairie Preserve. It also includes 8 species that probably occurred in the preserve historically, but were extirpated and 17 species that are known to occur near the boundaries of the preserve, and ultimately could be found there.

INTRODUCTION

The tallgrass prairie is now the rarest of North America's major biomes (*1*). Fifty-seven million ha of tallgrass prairie originally extended north and south from southern Manitoba to mid-Texas (*2*). Only about 10% of this area remains today (*1*). The increase in fire prevention practices and cultivation of the land have been major factors contributing to its decline (*3*). The largest extant area of tallgrass prairie in North America lies in the Flint Hills of Oklahoma and Kansas (*4*). This area has remained uncultivated because of the rocky terrain, which makes it difficult to plow, and because it is prime grazing land for cattle.

In 1989, The Nature Conservancy (TNC) purchased the historic 11,800 ha Barnard Ranch that lies in the Flint Hills (generally referred to as the Osage Hills in Oklahoma) in Osage County, Oklahoma, and established the Tallgrass Prairie Preserve (TGPP) (*4*). Additional purchases of land have increased the preserve to 15,200 ha. The goal of TNC is to recreate a functioning tallgrass prairie ecosystem by using bison and fire (*4*).

The TGPP contains gently rolling hills dissected by spring-fed streams that merge to form Wild Hog Creek and Sand Creek through the central and eastern portions of the preserve and Dry Creek and Hickory Creek on the west side. Over 100 human-made stock ponds are located in the preserve. Hillsides are often eroded, exposing limestone outcrops. Dark-colored soils cover a bedrock of shale and limestone. Eighty percent of the preserve is tallgrass prairie (*4*) dominated by big bluestem (*Andropogon gerardii*), Indiangrass (*Sorghastrum nutans*), little bluestem (*Schizachyrium scoparium*), and switchgrass (*Panicum virgatum*). The remaining area of the preserve is made up of upland woods and gallery forests along streams (*4*). Post oak (*Quercus stellata*) and black-jack oak (*Q. marilandic*a) are the dominant trees in the upland woods, and the gallery forests consist primarily of oaks (*Quercus* spp.), hickories (*Carya* spp.), and black walnut (*Juglans nigra*). Mean temperature and total precipitation were 15.8^{O}C and 106 cm, respectively, for the study period (Oklahoma Climatological Survey, Norman, Oklahoma).

Our purpose was to provide a species list of mammals that is as complete as possible through the end of 2000. This list will serve as baseline information for future studies to determine the impact of fire and grazing on mammals at the TGPP.

METHODS

Data collected as part of Payne's masters thesis research on small mammals species diversity at the TGPP (*5,6*) was used to compile the small mammals species list. Six habitat types were used to characterize habitat occurrences of mammals in the preserve. The estimated percent of the habitat types in the preserve at the time of the study were: 92.3% prairie grasses, 4.0% upland woods, 2.5% wooded streamsides, 0.6% grassy streamsides, 0.4% disturbed areas, and 0.2% rock outcrops. Payne and Caire (*6*) described the method used to estimate the overall extent of each habitat type. Trapping of small mammals was conducted at least two nights per month from June 1991 through May 1992. Sherman traps (23.5 x 7.7 x 9.0 cm) were set in trap-lines (about 4 m apart, 2 per station) of varying lengths, depending on the amount of vegetation. Information from trapping in September 1998 was used to include two additional species of small mammals. Mist-nets were set over creeks and stock ponds to capture bats.

Sightings of large mammals by reliable sources were recorded through 2000. We used literature searches to determine which mammals probably occurred historically in the TGPP, and those known to occur close to the boundaries of the preserve and possibly be found there.

The taxa and their vernacular names follow Jones and co-workers (*7*). A brief description of the occurrence of each species in the TGPP is provided. Additional information relative to the ecology and distribution of most of the species listed in the discussion can be found in Caire and co-workers (*8*) and Bee and co-workers (*9*). Figure 1 shows the creeks and other areas of the TGPP mentioned in the species accounts.

RESULTS and DISCUSSION

During Payne's study (*5,6*), 110 sites were live-trapped for small mammals. We captured 941 individuals, representing 15 species of mammals in 11,000 trap nights. Of the small mammals trapped in that study, 14 species occurred in prairie grasses, 10 in disturbed areas, 7 in grassy streamsides, 6 in wooded streamsides, 6 in rock outcrops, and 6 in upland woods. Twelve large mammal species were noted in prairie grasses, 15 in disturbed areas, 8 in grassy streamsides, 16 in wooded streamsides, seven in rock outcrops, 12 in upland woods, and 2 in aquatic habitats. In 1998, an additional 153 small mammals were collected in various habitats.

This annotated checklist contains 68 species of mammals. Forty-three species (38 native, 4 domestic, and 1 introduced) are known to occur at the TGPP. Eight species (indicated by + preceding the species name) probably occurred in the preserve historically, but were extirpated; 17 species are known to occur close (approx. 200 km) to the boundaries of the TGPP, and could ultimately be found there (indicated by * preceding the species name).

ORDER DIDELPHIMORPHIA-Opossums

Family Didelphidae (Opossums)

Didelphis virginiana (Virginia opossum) is the only species of marsupial occurring in the TGPP. It typically occupies wooded areas along streams and creeks, but also occurs in grassy habitats and disturbed areas around buildings.

ORDER INSECTIVORA-Insectivores

Family Soricidae (Shrews)

Blarina hylophaga (Elliot's short-tailed shrew) has been collected in three habitat types in the preserve; one in prairie grasses, one in upland woods, and nine in grassy streamsides. They probably occur in other habitats in the TGPP, too.

Cryptotis parva (least shrew) has been collected twice in the preserve. One was captured by hand in prairie grasses, and one was caught by a preserve employee's dog in a disturbed habitat. Although no least shrews were captured in traps in the TGPP, they are probably common.

Family Talpidae (Moles)

Scalopus aquaticus (eastern mole) prefers moist, sandy and loamy soils, avoiding areas where soil is shallow or rocky (*8*). Eastern mole tunnels on the preserve have been located in many wooded streamside habitats where sandy soils are deep.

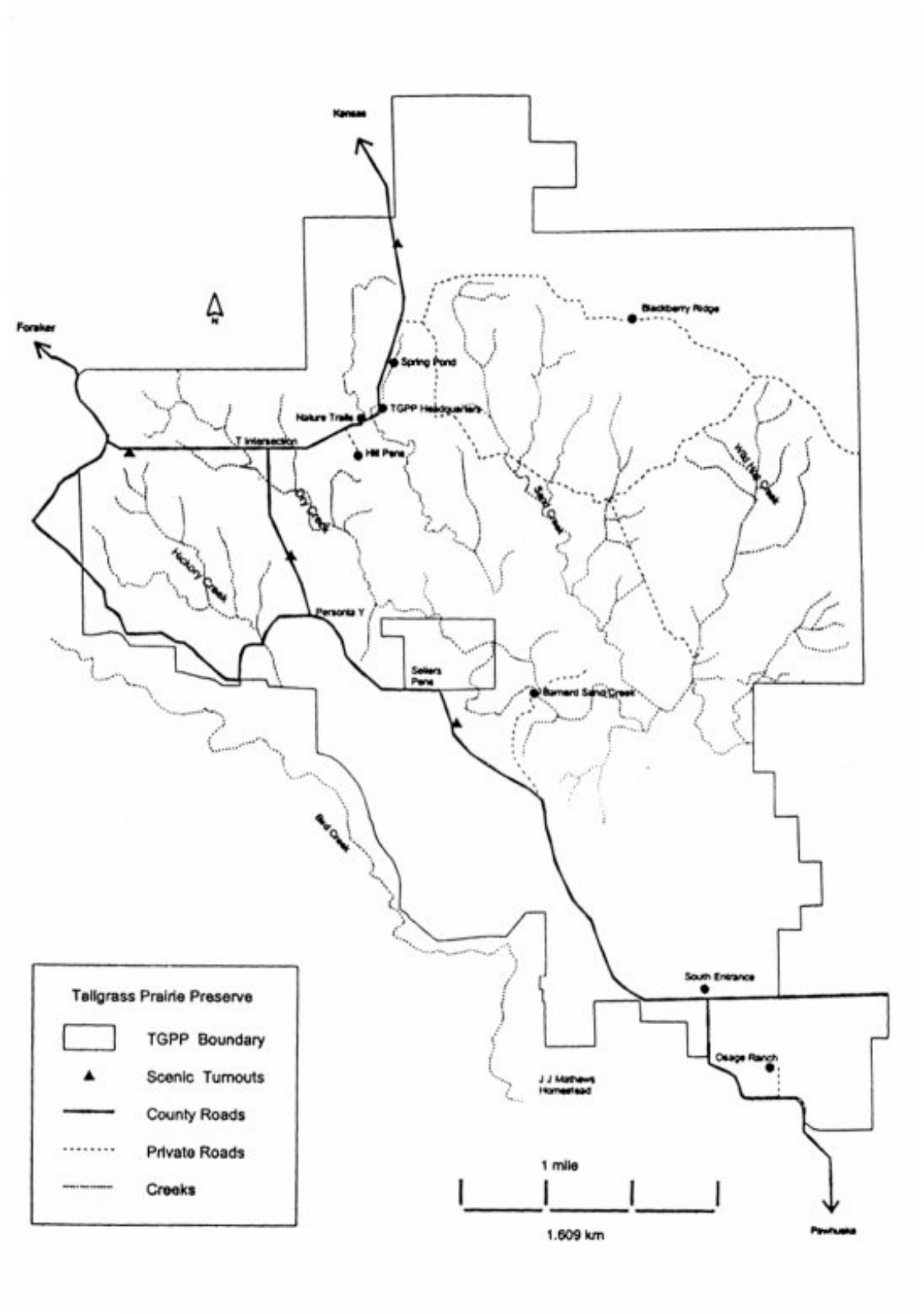

Figure 1. TheTallgrass Prairie Preserve: creeks, roads, and other areas mentioned in the species accounts.

ORDER CHIROPTERA-Bats
Family Vespertilionidae (Vespertilionid Bats)

Lasiurus borealis (eastern red bat) can be seen flying above trees bordering streams and drinking from streams and stock ponds soon after sunset in the TGPP. Ten post-lactating female red bats were mist-netted at Sand Creek and Wild Hog Creek.

**Lasiurus cinereus* (hoary bat) occurs over the entire state, but has not been recorded in the TGPP. The nearest records to the TGPP are 80 km southeast at Tulsa, Tulsa County; 103 km southwest at Stillwater, Payne County (*10*); and in Crawford County, Kansas (*9*). Most likely habitats within the preserve for hoary bats would include wooded streamsides, upland woods, and stock ponds.

**Lasionycteris noctivagans* (silver-haired bat) are solitary bats rarely found in Oklahoma (*8*). A specimen taken 103 km southwest of the TGPP in Stillwater, is the nearest record to the preserve (*11*). Riparian forests and upland woods would be likely habitat for this bat in the preserve because it roosts in trees.

**Pipistrellus subflavus* (eastern pipistrelle) has not been documented as occurring in Osage County., but has been verified 55 km southwest of the TGPP in Kay County; 77 km southeast in Tulsa County (*8*); and approximately 52 km NW in Cowley County, Kansas (*9*). Eastern pipistrelles roost in rocky areas, caves, and trees. Habitat for this bat could be limited in the preserve because only 20% of the area is wooded (*4*), adequate rock outcrops are limited, and no caves are known to occur in the TGPP.

**Eptesicus fuscus* (big brown bat) is common in eastern Oklahoma (*8*) and have been recorded in Osage County, but not in the TGPP. Eight specimens were captured 26 km south of the TGPP (*8*). Although this bat hibernates in caves, it lives in hollow trees during the summer season and often uses buildings for nursery colonies (*8*).

Nycticeius humeralis (evening bat) is a common migratory bat in the forested areas of eastern Oklahoma (*8*). Maternity roosts are often established in hollow trees and buildings (*8*). Evening bats have been mist-netted in the preserve in wooded streamside areas at Sand and Wild Hog creeks. Of the 17 specimens collected, 14 were post-lactating females. Two sub-adults (one male and one female) were taken in July, which suggests that parturition occurs in June and that at least one maternity roost exists in the TGPP.

Family Molossidae (Molossid Bats)

**Tadarida brasiliensis* (Brazilian free-tailed bat) has been recorded from most parts of Oklahoma and Kansas (*8,9*). Large maternity colonies exist in gypsum caves in the western parts of the two states, but records east of the caves are of individual migrants (*8*). The closest records to the preserve are three specimens from Stillwater, Payne County, 103 km southwest (*8*) and in Sumner County, Kansas (*9*). Migrant Brazilian free-tailed bats might be found around buildings in the TGPP.

ORDER XENARTHA-Xenarthans
Family Dasypodidae (Armadillos)

Dasypus novemcinctus (nine-banded armadillo) prefers wooded areas, but have been sighted in all habitats in the TGPP. Armadillos are commonly seen near the nature trail, around buildings, and along creeks in the preserve. Skulls and other skeletal parts have been collected near Spring Pond, Sand Creek, and at the TGPP headquarters. In the late 1900s, the armadillo began extending its range northward in the United States (*12*). In the mid 1920s, Strecker (*12*) stated that armadillos were still confined to Texas and western Louisiana, but by the mid 1930s, they were noted by Blair (*13,14*) as far north as Creek and Rogers counties in Oklahoma. In 1974, occasional records were noted by Humphrey (*15*) in Kansas.

ORDER LAGOMORPHA-Lagomorphs
Family Leporidae (Hares and Rabbits)

**Sylvilagus aquaticus* (swamp rabbit) has been documented from Mohawk Park in Tulsa County and 32 km southwest of the TGPP in Washington County, but not in Osage County (*8*). Swamp rabbits are common in the eastern half of Oklahoma (*14*). They prefer low, wet areas near bodies of water. Grassy streamsides and areas around stock ponds in the TGPP provide potential habitat for swamp rabbits.

Sylvilagus floridanus (eastern cottontail) was observed in rock outcrops, wooded streamsides, upland woods, but most commonly in disturbed habitats around corrals, preserve buildings, and oil production sites.

Lepus californicus (black-tailed jackrabbit) has been observed in the TGPP in tall grasses and disturbed areas. Two jackrabbits were seen running along a road and into open prairie grasses west of Wild Hog Creek at the same location a jackrabbit had been seen on two other occasions. A jackrabbit was also seen crossing the county road at the Osage Ranch drive and another one was found dead in the road east of Pearsonia Y.

ORDER RODENTIA-Rodents
Family Sciuridae (Squirrels)

**Tamias striatus* (eastern chipmunk) occurs throughout the eastern part of the state and has been documented 80 km southeast of the preserve in Tulsa County (*8*) and in Montgomery County, Kansas (*9*). Eastern chipmunks inhabit deciduous wooded areas and bluffs along creeks and streams (*16*). They might occur along riparian forests within the preserve. However, it seems that with all the activity that has taken place in the TGPP since TNC took control of the area, if chipmunks are there, they would have been sighted.

Marmota monax (woodchuck) has been sighted occasionally along the nature trail in the preserve, and probably occur in other areas in the preserve. Numerous sightings have been made at Pawhuska Lake, Bluestem Lake, and around buildings in Pawhuska, 15 km south of the TGPP (Harvey Payne, Bob Hamilton, and Sandy Stevens, TNC employees, personal communication). Several specimens have been collected approximately 39 km east of the preserve near Bartlesville in Washington County (*8*) and in Cowley County, Kansas (*9*).

Spermophilus tridecemlineatus (thirteen-lined ground squirrel) is known from Osage County by only a few specimens. One specimen was taken 77 km southeast of the TGPP near Sand Springs and another from 8 km northwest (*8*). Recently two male specimens (road kills) were collected by Sandy Stevens near the Persona Y. This species is occasionally seen along the road from the Sellers Pens to the Pearsonia Y and has been seen 10 km northwest of the preserve near Foraker (Sandy Stevens, personal communication). It prefers open areas with short grasses or grazed grasslands.

+*Cynomys ludovicianus* (black-tailed prairie dog) has been documented 58 km west of the TGPP in Kay County (*8*) and in Sumner County, Kansas (*9*). A small prairie dog town was reported by Walter Gerard (former Barnard Ranch cowboy) to have existed for one year in the mid 1970s northeast of the Pearsonia Y, on what is now preserve land. It is not known why the colony disappeared. Shallow soils might limit the presence of fossorial mammals in the preserve, and the tall vegetation could also keep prairie dogs from colonizing the area. The Arkansas River could be a natural barrier preventing prairie dogs from establishing in this area. The records listed above for Sumner and Kay counties are west of the Arkansas River.

**Sciurus carolinensis* (eastern gray squirrel) is known to occur in Chautauqua County, Kansas, and Cherokee, Noble, Pawnee, Tulsa and Washington counties in Oklahoma, but has not been recorded in Osage County (*8*). However, Mathews (*17*) mentions gray squirrels in the 1930s in the tree tops in the bottoms along Bird Creek bordering the south side of the preserve. Gray squirrels probably occurred in the preserve originally, but could have been removed by hunting and trapping. Gray squirrels inhabit oak-hickory forests and lowland woods and are more arboreal than are *S. niger.* Possible habitat for gray squirrels within the preserve would be forests along Wild Hog, Sand, and Dry creeks.

Sciurus niger (eastern fox squirrel) prefers upland oak-hickory forests. On the preserve, they are seen along wooded streamsides and in wooded areas around the TGPP headquarters.

**Glaucomys volans* (southern flying squirrel) inhabits Pawnee and Tulsa counties south of Osage County. A specimen taken 58 km southwest of the TGPP near Pawnee is the nearest record (*8*). Flying squirrels usually occupy mature deciduous forests and riparian woods. Riparian woods

in the TGPP could provide habitats for dispersal into Osage County for flying squirrels. Because they occur only 58 km from the TGPP, they could be present. Their nocturnal habits might preclude detection.

Family Geomyidae (Pocket Gophers)

**Geomys bursarius* (plains pocket gopher) has been recorded in Osage County, the nearest site to the preserve being 58 km southwest near Ponca City (*8*). Hoffman and co-workers (*18*) did not report this species in their US International Biology Program grassland biome study conducted 6 km west, 10 km north of the TGPP. Pocket gophers prefer deep sandy and loamy soils. The shallow soils and limestone bedrock might be a barrier to gophers on the preserve. Most likely habitat in the preserve for gophers would be sandy areas and possibly along roads.

Family Heteromyidae (Heteromyids)

Chaetodipus hispidus (hispid pocket mouse) occurs in a variety of habitats, but most frequently in grasslands. Two specimens were captured in the TGPP during Payne's study (*5*), one in a rock outcrop (6.8 km north of the south gate near the Barnard Sand Creek crossing) and one in a disturbed area along the county road near the nature trail. Another specimen was trapped in September 1998 in tall grass and briars along the road to the Hill Pens, and three more in tall grass near a fence row by the Sellers Pens.

Family Castoridae (Beavers)

Castor canadensis (American beaver) was observed along Wild Hog Creek, Sand Creek, and at many stock ponds. Signs included bank lodges, burrows in banks, tracks, dams, and freshly gnawed wood. Beavers were seen swimming in several stock ponds and in Sand Creek during the day, even though this species is usually nocturnal. Two skeletons were collected near Spring Pond after a year of low rainfall that reduced water levels in all the ponds.

Family Muridae (Mice, Rats, and Voles)

Reithrodontomys fulvescens (fulvous harvest mouse) was found in all habitat types except upland woods in the preserve. Ten fulvous harvest mice were collected from June through January. Remains of the dome-like nests of harvest mice can often be seen after a controlled burn in areas that contained thick vegetation prior to the burn.

Reithrodontomys humulis (eastern harvest mouse) was collected within the TGPP in prairie grasses. The first specimen was not collected until the end of December during Payne's study (*5*). Fourteen specimens were trapped, greatly increasing the number of *R. humulis* taken in Oklahoma (*8*) and extending the range northwest 91 km north from Tulsa County (*19*).

Reithrodontomys megalotis (western harvest mouse) was found only in prairie grasses within the preserve. The occurrence of western harvest mice within the TGPP represents the eastern most occurrence of the species in the state, a range extension of 282 km east of the previously known record at 3 km north of Shattuck, Ellis County (*8*).

Reithrodontomys montanus (plains harvest mouse) occurs within the preserve in prairie grasses and grassy streamside habitats. It was the most commonly trapped harvest mouse (32 specimens) in the TGPP. One specimen was captured in November, and the others were taken in January or later, suggesting either an increase in number or an increase in winter activity.

**Peromyscus attwateri* (Texas mouse) has been documented 2 km southwest of the preserve in Osage County (*8*), and in Cowley and Chautauqua county in Kansas(*9*). Texas mice prefer brushy hillsides and limestone outcrops. This habitat occurs within the preserve, but *P. attwateri* has not been found there. The disjunct occurrence of limestone outcrops separated by wide expanses of grasses might prevent dispersal of Texas mice into the TGPP.

Peromyscus gossypinus (cotton mouse) was captured in the TGPP in wooded streamsides and in upland woods. Nine cotton mice were trapped in lowland oak-hickory-elm forests along Sand Creek and one from an upland woods east of the creek. These specimens represent a range extension of 200 km northwest of the previously known occurrences in Oklahoma near Stigler, Haskell County (*20*). In September 1998, four additional specimens were trapped in woods across from the nature trail, and one specimen was captured in the barnyard at the headquarters.

Peromyscus leucopus (white-footed mouse) was captured in all habitat types in the preserve, and was the most commonly trapped mammal in upland woods and wooded streamsides. Although it is one of the most common mice in Oklahoma (*8*), only 126 specimens were captured. However, the white-footed mouse is most common in wooded areas (*8*). Because only 6.5% of the TGPP contained wooded area during the study (*5*), this makes the number of individuals appear small.

Peromyscus maniculatus (deer mouse) was the most commonly trapped mammal on the preserve (203 specimens). Deer mice were found in all habitat types in the preserve, except wooded streamsides. It was the most abundant mammal trapped in rock outcrops and disturbed areas and was second only to *Sigmodon hispidus* in prairie grasses and grassy streamside habitats.

Sigmodon hispidus (hispid cotton rat) was the second most frequently trapped mammal in the TGPP. One hundred eighty-two specimens were trapped in six habitat types. It was captured more frequently in prairie grasses and grassy streamsides than any other mammal. Within the preserve, cotton rats were reproducing all year because immature individuals were captured throughout the year.

Neotoma floridana (eastern woodrat) was captured in all habitat types in the preserve except grassy streamsides, with about half of them (14 specimens) from rock outcrops. Rock outcrops allow woodrats to occupy areas away from upland woods and streamside forests.

**Rattus norvegicus* (Norway rat) has not been documented in Osage County, although it is common throughout the state and most of North America (*8*). The closest recorded location to the TGPP is 40 km east in Washington County (*8*). Norway rats were introduced to North America and are associated with humans and their buildings.

**Rattus rattus* (black rat) is not native to North America and usually live in association with human habitations. The record closest to the preserve is in Sedgewick County, Kansas (*9*). However, *R. rattus* and *R. norvegicus* probably occur in Pawhuska and in other towns and ranches near the preserve, and will most likely be found in the TGPP.

Mus musculus (house mouse) is an introduced species typically found in association with humans. Four house mice were captured in disturbed areas around houses and barns, and one specimen was captured in prairie grasses.

Microtus ochrogaster (prairie vole) was trapped in prairie grasses, wooded streamsides, grassy streamsides, and disturbed areas, but 92% of the voles were captured in prairie grasses. In Payne's study (*5*),the first vole was not captured until December after which they were relatively abundant (77 specimens). Juveniles, sub-adults, and adults were captured from December to May, and one nursing female was captured in mid-May.

Microtus pinetorum (woodland vole) can be found in upland woods, forest edges, and overgrown fields. The five specimens captured in the preserve were in the prairie grasses and upland woods ecotone.

Ondatra zibethicus (common muskrat) is known to occur in Osage County Two were collected north of Bartlesville, 31 km east of the preserve and one from 19 km west of the TGPP near Shidler (*7*). Muskrats occur in the TGPP at several stock ponds. One roadkill specimen was recently found near a pond west of the Hill Pens.

Family Zapodidae (Jumping Mice)

**Zapus hudsonius* (meadow jumping mouse) has been captured in Mohawk Park in a lowland thicket along Bird Creek in Tulsa County, 80 km southeast of the TGPP (*21*). The species occurs in the eastern third of Kansas, but is retreating northward and eastward (*9*). Jumping mice inhabit grassy meadows associated with forests and streams. Similar habitat occurs in the TGPP.

ORDER CARNIVORA-Carnivores

Family Canidae (Canids)

Canis latrans (coyote) has been observed in all habitat types. Tracks were found along creeks, streams, and roads, and coyotes have been seen and heard throughout the preserve. Coyotes are usually nocturnal or crepuscular, but can be seen during the day searching for rodents in recently burned areas, crossing roads and the prairie, and feed-

ing on carcasses of bison, cattle, deer, and other road kill.

+*Canis lupus* (gray wolf) probably occurred in the area of the TGP; it was known to inhabit forested regions and tallgrass prairie (*8*). The nearest record of *C. lupus* was 120 km east at Afton, Ottawa County (*8*). With the destruction of the bison herds in the 1870s, and the reduction in numbers of white-tailed deer from 1889 to 1917, the gray wolf lost its primary food sources. It then turned to cattle for food and was quickly exterminated (*22*).

+*Canis rufus* (red wolf), now extinct in Oklahoma, formerly ranged throughout the eastern two-thirds of the state. Prime red wolf habitat was woodlands and brush, which exist on the eastern side of the preserve. Two specimens were recorded from Red Fork, Tulsa County, 70 km southeast of the TGPP (*8*). Major factors that reduced populations of red wolves were trapping and shooting (*23*) and clearing of woodlands. Genetic swamping with coyote-dog hybrids further reduced their numbers (*24*).

Vulpes vulpes (red fox) has been documented in Cowley County, Kansas (*9*) and by predator control hunters *(25*) in Osage County. In December 1998, Sandy Stevens (personal communication) sighted a red fox crossing a ranch road in a disturbed area and heading into tall grass near Wild Hog Creek.

Urocyon cinereoargenteus (common gray fox) prefers wooded, brushy, and rocky habitats. Prior to a gray fox being seen on Blackberry Ridge in the preserve in October 1996, none had been verified in Osage County, but were known to occur in surrounding counties. The fox was sighted in tall grass on a rocky hillside near the edge of woods by Sandy Stevens, Gary Stevens, Jim Stevens, and Laura Ale (personal communication).

Family Ursidae (Bears)

+*Ursus americanus* (black bear) historically occurred throughout Oklahoma, but was eventually eliminated from areas inhabited by humans. In 1824, 460 black bear hides were shipped from what is now northeastern Oklahoma to New Orleans (*26*). The nearest known record to the preserve is in Labette County, Kansas (*9*). The State of Arkansas has recently reintroduced black bears into the Ozark Mountains, but their range will probably not extend into the TGPP.

+*Ursus arctos* (grizzly or brown bear) historically existed throughout much of Kansas and Oklahoma (*8,9*). Grizzly bears could have occurred in the TGPP.

Family Procyonidae (Procyonids)

**Bassariscus astutus* (ringtail) has not been recorded in Osage County. It was recorded from the early 1960s along the Arkansas River 35 km west of the TGPP near Ponca City, Kay County (*27*), and in Cowley County, Kansas, along the Arkansas River. Ringtails prefer rock outcrops and riparian forests (*28*), which are typical along Sand, Wild Hog, and Dry creeks.

Procyon lotor (common raccoon) was observed in wooded streamsides, upland woods, grassy streamsides, and disturbed habitats in the preserve. Numerous tracks and individuals have been sighted, including animals sleeping in hollow trees and in the hay barn at the TGPP headquarters. Although they are primarily nocturnal, raccoons are often seen during the day.

Family Mustelidae (Mustelids)

Mustela frenata (long-tailed weasel) is secretive, nocturnal, and rarely seen. Only five specimens have been recorded in Oklahoma. The nearest site is 90 km southwest of the preserve, 8 km northwest of Stillwater in Payne County (*8*). However, Bob Hamilton (personal communication) saw an weasel-like animal he interpreted as a long-tailed weasel crossing the road near the TGPP headquarters.

**Mustela nivalis* (least weasel) has been recorded only once in Oklahoma in Cherokee County, 142 km southeast of the TGPP (*29*). Prior to this record, least weasels were known to occur in northern Kansas and were believed to be increasing their range southward (*9*). The animals prefer marshy areas, but also inhabit grasslands and meadows. Suitable habitat occurs in the preserve, but least weasels are nocturnal and could easily be overlooked.

Mustela vison (American mink) is found throughout Oklahoma, and the nearest record to the preserve is 77 km southwest in Morrison, Noble County (*8*). However, Jeff Stewart, an intern at the preserve saw (personal communication) mink tracks in the

preserve in 1991. Being semi-aquatic, they reside along river banks, lake shores, and forests near water, and are mostly nocturnal.

Taxidea taxus (American badger) occurs in prairie grasses and disturbed areas within the preserve. A partial skull was found near the headquarters by Payne in 1991. Kenny Shieldknight, TGPP employee, (personal communication,) saw a badger numerous times on the edge of the main drive at the "T" intersection 2 km west of the headquarters, and Bob Hamilton (Personal communication, TNC employee) saw a female with one young at the same location. Two badgers were sighted in November 1999 by Bob Hamilton and Sandy Stevens (personal communication) outside their burrows after an area east of the south scenic overlook was burned. Both burrows were in the dams of stock ponds. Similar holes have been seen throughout the prairie.

+*Lontra canadensis* (northern river otter) at present (due to reintroductions), occurs primarily in the southeastern and east-central portions of the state (*8*). Locations of the nearest preserved specimens are Sequoyah County, Oklahoma (*8*) and Cherokee County, Kansas (*9*). They occurred along the Arkansas, Grand, and Verdigris rivers. Although fairly common at one time, river otter numbers are now low. River otters have been reintroduced into southeastern Oklahoma, and Sand Creek could provide habitat for them in the TGPP.

Family Mephitidae (Mephitids)

**Spilogale putorius* (eastern spotted skunk) occurs across all of Oklahoma, but the nearest state record to the TGPP is in Noble County, 86 km southwest. However, its presence has been verified in Cowley County, Kansas, approximately 3 km northwest of the preserve (*9*). From the 1930s to the 1950s, large populations of spotted skunks occurred in northeastern and central Oklahoma according to fur dealers (*8*). Numbers have declined since then because of agricultural practices (*30*). Spotted skunks occur in a variety of habitats, but prefer forest edges and upland prairie, especially if rock outcrops are present (*8*).

Mephitis mephitis (striped skunk) is common in a variety of habitats, and within the preserve, it has been seen along wooded streamsides, in upland woods, and around disturbed areas. Striped skunks are active primarily at night.

Family Felidae (Cats)

Puma concolor (mountain lion) is the largest extant carnivore occurring in the preserve. The large home range of mountain lions probably enables individuals to move in and out of the TGPP. Kenny Shieldknight (personal communication) has seen a mountain lion on three occasions along Sand Creek. He also heard a mountain lion scream on Sand Creek just south of headquarters, and after searching the area found a dead white-tailed doe with large claw marks on her neck.

Lynx rufus (bobcat) was documented within the TGPP as occurring in prairie grasses, wooded streamsides, upland woods, grassy streamsides, and disturbed areas. Although bobcats are nocturnal and solitary, they occasionally can be seen during the day. A bobcat that lives south of the TGPP headquarters has been seen numerous times in the early morning.

ORDER ARTIODACTYLA-
Even-toed Ungulates
Family Cervidae (Cervids)

+*Cervus elaphus* (elk or wapiti) was historically more common in the tallgrass prairie from 1806 to 1832 than in mixed-grass or shortgrass prairies (*31*). After that time, elk suddenly disappeared from tallgrass and shortgrass prairies and were recorded only in mixed-grass prairies (*32*). Common in western Oklahoma (*8*) and western Kansas until 1875, elk were extirpated by 1890 in these areas (*32*). They were reintroduced in the early 1900s and are now found only in or near wildlife refuges (*8*). The nearest preserved specimen is from Cookson Hills Refuge, Cherokee County, Oklahoma, but this was a reintroduced animal (*8*). Elk inhabit riparian areas and forest edges; suitable habitat exists on the east side of the TGPP.

Odocoileus virginianus (white-tailed deer) is the only species of deer found in the TGPP and is common in all habitat types. Groups of up to seven individuals were seen in the early stages of the study, but recently larger groups of as many as 25 have been

seen foraging in recently burned areas. After 1889, hunting reduced the numbers of deer in Oklahoma to 500 animals (*33*). By the 1930s, white-tailed deer were completely gone from the area that is now the TGPP (*18*). Beginning in 1942, this species was transplanted throughout Oklahoma from herds in the Wichita Mountains, Fort Sill, and Lake Murray (*34*). Since that time, deer have become common across Oklahoma.

Family Antilocapridae (Pronghorn)

+*Antilocapra americana* (pronghorn) might have occurred in the tallgrass prairie, which is at the eastern-most extension of its range in Oklahoma. Pronghorn were known to occupy tallgrass prairie regions in small numbers between 1833 and 1849, but were not seen there after that time (*31*).

Family Bovidae (Bovids)

Bison (Bos) bison (American bison) historically occurred in the TGPP site, but in relatively low densities compared to numbers in shortgrass and mixed-grass prairies (*31*). By 1900, wild bison were extirpated in North America (*35*), with only a few individuals in zoos and refuges. The large herds that exist today on ranches and refuges are descendents of these bison. The closest recorded specimen to the TGPP is in Fairfax, Osage County, 35 km southwest. The remains of a bison were found in the Arkansas River 10 ft below water level (*8*). One lower molar identified as *B. bison* was collected within the TGPP at Sand Creek by Payne, and a second molar was collected from the creek bed along Hickory Creek by Kerry Sublett (personal communication). Further evidence of bison existing in the area of the preserve is provided by presence of buffalo wallows before bison were reintroduced into the TGPP. Three hundred animals were donated to the TGPP in 1993 by the Ken Adams Ranch to start a herd that will be allowed to grow to 3,500 animals (Bob Hamilton, personal communication,).

Domesticated Mammals

Canis familiaris (dog) occurs in the TGPP as pets to employees. No feral dogs have been seen in the preserve.

Felis catus (cat) occurs as pets to employees and as feral animals around buildings in the TGPP.

Equus caballus (horse) is used in the preserve during cattle round-ups. Preserve employees also have horses for private use.

Bos taurus (domestic cow) exists in areas of the TGPP that will eventually become part of the bison unit. Each year, additional areas are fenced with bison fence and opened to the bison, reducing the area grazed by cattle. In areas not yet open to bison, cattle are used as dominant grazers to simulate bison.

ACKNOWLEDGMENTS

We thank The Nature Conservancy and the Oklahoma Biological Survey for making the project available. We are grateful for the assistance and information provided by the employees of the Tallgrass Prairie Preserve and to others who supplied information. We also appreciate the many University of Central Oklahoma students who helped in collecting, and Dan Donaldson for his assistance with the map. This project was funded in part by a grant from The Nature Conservancy to survey the mammals of the Tallgrass Prairie Preserve and by a University of Central Oklahoma faculty research grant to William Caire.

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Received: February 27, 2001; Accepted April 27, 2001