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DISTRIBUTION AND VERTEBRATE ASSOCIATES
OF THE BLACK-TAILED PRAIRIE DOG IN
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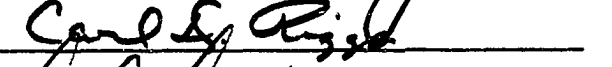
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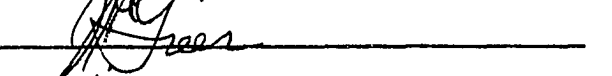
A DISSERTATION
SUBMITTED TO THE GRADUATE FACULTY
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degree of
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BY
JACK D. TYLER
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1968

DISTRIBUTION AND VERTEBRATE ASSOCIATES OF THE
BLACK-TAILED PRAIRIE DOG IN OKLAHOMA

APPROVED BY



DISSERTATION COMMITTEE

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DISTRIBUTION AND VERTEBRATE ASSOCIATES OF THE
BLACK-TAILED PRAIRIE DOG IN OKLAHOMA

CHAPTER I

INTRODUCTION

According to Hollister (1916) there are five species of prairie dogs in North America, but only the black-tailed species (Cynomys ludovicianus) occurs in Oklahoma. These stocky, short-tailed rodents are three to four times larger than most ground squirrels and have coarse, tawny hair. They are diurnal grassland animals that live in colonies or "dogtowns" characterized by large earthen burrow mounds surrounded by short grasses and forbs.

After white men settled the Great Plains, heavy grazing by cattle favored the spread of short grasses and extended the habitat of the prairie dog. Because it survived on poor ranges, the prairie dog was blamed for the depletion and condemned to be destroyed. "Extermination was so effective that today a thriving dog town is a curiosity. This fact is deplored by those who appreciate the historical, scientific, recreational, and educational values of a bustling dog town

with its traditional badgers, burrowing owls, and rattlesnakes." (Koford, 1958).

Merriam (1902) discussed the history, economics, and general ecology of the prairie dog. Kelso (1939) investigated food habits of 249 prairie dogs, mostly from Montana. King (1955) made a definitive study of the behavior, social structure, and population dynamics of C. ludovicianus in South Dakota. Smith (1967) studied prairie dog ecology in Kansas; his work contains a very good historical resume of the prairie dog on the Great Plains. Koford (1958) studied prairie dogs from North Dakota to Oklahoma, and touched on virtually every aspect of their natural history, especially population dynamics, associated animals, and economics. Recently, a distributional study of the prairie dog in Texas was conducted by Cottam and Caroline (1965).

History of the Prairie Dog in Oklahoma

The Plains Indians utilized prairie dogs for food, as did many early trappers and pioneers, some of whom made records in diaries and letters concerning the antics, numbers, associates, etc. of these interesting rodents. Washington Irving (new ed., 1956) saw a prairie dog town on October 30, 1832, near the present city of Norman. Strong (1960) reported that in 1878, a virtually continuous dogtown stretched from Kingfisher Creek to Fort Reno (now El Reno), a distance of twenty-two miles. Blair (1939) reported that

prairie dogs inhabited all of Oklahoma west of the Osage Savanna biotic district, which extends westward to central Oklahoma, and that they possibly also existed in that district at one time. Osborn and Allan (1949) studied the vegetative succession of an abandoned dogtown in the Wichita Mountains Wildlife Refuge, and Anthony and Foreman (1951) studied reproductive potential of 180 prairie dogs captured in the refuge.

To my knowledge, the oldest authenticated dogtown still active in Oklahoma is on the James Patterson farm, in Blaine County. It occupies about 140 acres, and is reported by Mr. Patterson, who was born on the farm, to have been active prior to 1889.

Reliable observers have reported that as recently as 1960 or 1961, active prairie dog towns covered 10,000 acres on a single ranch in Texas County. Because of continued widespread poisoning by government and private concerns, hardly that many acres remained in Oklahoma in 1967.

Objectives

The objectives of this study were: 1) to assess current numbers, habitat, and distributional limits of the Black-tailed Prairie Dog in Oklahoma; 2) to make concurrent observations on various aspects of prairie dog ecology; and 3) to study the interrelationships of the several vertebrate animals associated with prairie dogs in different ways.

CHAPTER II

METHODS

Location of Dogtowns

Prairie dog towns were located in several ways. An article was published in most state daily newspapers on February 4, 1966, requesting specific dogtown locations from the public; in June of 1966, I sent a letter to each agricultural agent in the 49 westernmost counties of Oklahoma requesting a county map and information about prairie dog towns. The most successful method of finding active colonies, however, was by contacting government predator and rodent control agents. Several dogtowns were brought to my attention by local residents.

Field Investigation

When the dogtowns in a particular county had been located, each was visited by automobile with the aid of a county map. Material concerning prairie dogs in each county, such as county maps, field data sheets, and correspondence from county agents, was filed separately.

A pair of ten-power binoculars was used for observation and identification and a field data sheet was completed for each prairie dog colony investigated. It included location of the dogtown by section, township and range; dominant vegetation; weather conditions at the time of investigation; an estimate of population size from actual counts; notes on prairie dog activity; an estimate of the acreage of the colony, and other pertinent information. The acreage estimate was made by driving through and around the colony; barbed wire fences along the edges of dogtowns were used whenever possible to check accuracy of the estimate, since a section is usually fenced into quarters, eighths, sixteenths, etc. Observations of the species, numbers, and activities of animals other than prairie dogs in or near the dogtowns were also recorded and later transferred to a permanent notebook. Personal communication with the landowner or nearby residents often revealed additional information, such as age of the town, whether or not it had been poisoned, hunting pressure, and potential predators seen in the vicinity.

Field work was conducted from June, 1966, to June, 1967, and I travelled approximately 28,000 miles through 38 counties in western Oklahoma.

CHAPTER III

RESULTS

Distribution and Numbers of Prairie Dogs in Oklahoma

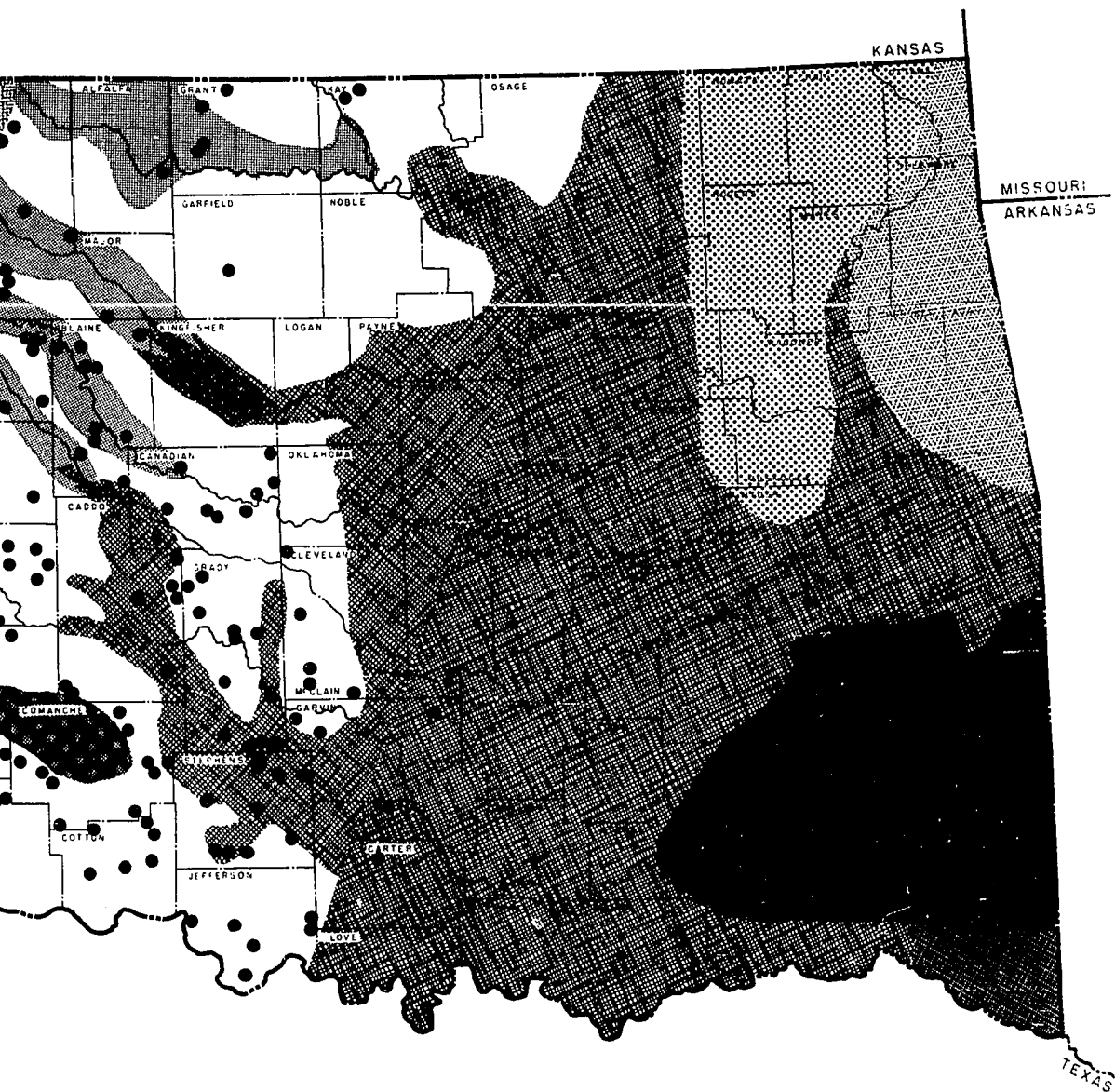
A total of 280 active prairie dog colonies occupying an estimated 9,522 acres was located in 34 Oklahoma counties. The cumulative number of prairie dogs estimated from actual counts at each dogtown was 34,511 (Table 1). Locations of all known prairie dog towns in Oklahoma are given in Appendix I and pictured in Figure 1.

As seen in Table 1, the three panhandle counties contained the greatest number of prairie dog colonies with 30, 29, and 24, respectively in Beaver, Cimarron, and Texas Counties. Alfalfa, Carter, Cleveland, and Garfield Counties each contained only a single dogtown.

Cimarron County surpassed all others in total acreage of prairie dog towns with 1,837, followed by Beaver County (1,522 acres) and Comanche County (1,497 acres). Although Texas County contained 24 dogtowns, they covered only 697 acres. This was probably because Texas County was the most densely populated and thoroughly cultivated of the

Table 1. Number of dogtowns, estimated acreage, and estimated numbers of prairie dogs in Oklahoma by county - August, 1967.

County	Number of Dogtowns	Total Estimated Acres of Dogtowns	Estimated Number of Prairie Dogs
Beaver	30	1,522	5,213
Cimarron	29	1,837	4,531
Texas	24	697	2,005
Comanche	16	1,497	4,816
Grady	12	163	748
Dewey	11	116	591
Harper	11	159	584
Beckham	10	451	1,465
Blaine	10	292	986
Ellis	10	164	658
Stephens	10	211	1,060
Canadian	9	76	871
Washita	9	77	591
Kiowa	8	161	807
Caddo	7	92	332
Cotton	6	95	364
Jackson	6	150	797
Jefferson	6	225	808
Major	6	183	817
Woods	6	326	1,507
Woodward	5	66	572
Harmon	5	129	440
Greer	5	87	225
Custer	4	121	440
Grant	4	21	279
McClain	4	161	501
Roger Mills	4	133	499
Tillman	4	169	690
Garvin	3	12	107
Kay	2	39	465
Alfalpa	1	8	65
Carter	1	30	70
Cleveland	1	8	98
Garfield	1	40	450
Total	280	9,522	34,511



Prairie Dog colonies in Oklahoma, August, 1967
 (modified from Blair and Hubbell, 1938).

panhandle counties. Each of the single dogtowns in Alfalfa and Cleveland Counties comprised but eight acres.

In southwestern Oklahoma, Comanche County had just 16 dogtowns but ranked second only to Beaver County in total number of prairie dogs: an estimated 5,213 animals inhabited Beaver County, and 4,816 were in Comanche County. Cimarron County was third with 4,531, and Texas County fourth with 2,005. In Alfalfa, Carter, and Cleveland Counties fewer than 100 prairie dogs were seen. The high population of the Garfield County dogtown (450 prairie dogs on 40 acres) was undoubtedly composed mostly of young animals, as the census was made in late spring. Also, the town was covered by an unusually lush growth of buffalograss (scientific names of plants used in the text are given in Appendix II).

Although Comanche County ranked fourth in number of dogtowns, it was third in acreage and second in total number of prairie dogs because the largest prairie dog colony in the state was located on the Fort Sill Military Reservation near Lawton. This dogtown was approximately 1,000 acres (1.56 square miles) in extent as determined from a topographic map, and by conservative estimate contained about 2,800 animals.

Vegetation in Dogtowns

Dominant grasses and weedy vegetation found in Oklahoma prairie dog towns are indicated in Tables 2 and 3, respectively.

Table 2. Dominant grasses in 238 Oklahoma prairie dog towns.

Species*	Percent of Dogtowns
Buffalograss.	80.23
Blue Grama.	7.36
Prairie Three-awn	6.20
Hairy Grama	3.10
Bermudagrass.	1.55
Little Bluestem	.78
Windmillgrass	.78
Total	100.00

*Appendix II lists scientific names of plants.

Table 3. Dominant weedy vegetation in 223 Oklahoma prairie dog towns.

Species	Percent of Dogtowns
Prickly-pear.	17.5
Prickly-pear & Prairie Three-awn Grass* . .	14.5
Wavy-leaved Thistle	13.9
Prairie Three-awn Grass	11.7
Prickly-pear & Wavy-leaved Thistle.	10.3
Prairie Three-awn Grass & Wavy-leaved Thistle.	9.4
Mesquite & Prickly-pear	8.1
Wavy-leaved Thistle & Prickly-pear.	5.9
Sandsage.	3.0
Soapweed.	3.0
Mesquite.	2.7
Total	100.0

*Here considered a weed, because, although abundant, it was not the dominant grass.

Habitat Types in Which Dogtowns Were Located

Table 4 shows the various types of habitat in which the 280 dogtowns were located.

Vertebrate Associates

A total of 83 species of birds was observed in and near prairie dog towns, but only 56 were considered important enough ecologically to be recorded in Table 5. They are listed in three categories of abundance: Common--those which were regularly associated with the dogtowns; Frequent--species which were observed quite often, but not regularly, in or near the colonies; and Occasional--birds which occurred infrequently in association with the towns. This scheme is followed in Tables 6, 7, and 8 with an additional category: Uncommon--those species seen in the dogtowns in only two or three instances.

Tables 6, 7, and 8 list the species of amphibians, reptiles, and mammals recorded from the prairie dog colonies.

Table 9 indicates by class the several species of animals which used vacant prairie dog burrows for various purposes.

Protected Dogtowns

Landowners were protecting 19 prairie dog towns in 14 counties as of August, 1967; these ranged in size from 1 to 90 acres and totalled 531 acres (Table 10). Of this

Table 4. Habitat distribution of 280 Oklahoma prairie dog towns.

Habitat Type	Percent of Dogtowns
Sandsage-Grassland.	35.36
Mixed-grass-Eroded plains	30.36
Short-grass-High plains	11.07
Tall-grass Prairie*	9.28
Mesquite-Grassland.	7.14
Shinnery Grassland**	6.79
Total	100.00

*Tall-grass prairie areas were heavily overgrazed to a mixed or shortgrass condition.

**A habitat type from Duck and Fletcher, ca. 1943.

Table 5. Status of 56 species of birds associated with prairie dog towns in Oklahoma (Common names from Check-list of North American birds by the American Ornithologists' Union, 1957).

Common	Frequent	Occasional
<u>Present All Year</u>	<u>Present All Year</u>	<u>Present All Year</u>
Marsh Hawk	Red-tailed Hawk	Turkey Vulture
Killdeer	Sparrow Hawk	Prairie Falcon
Mourning Dove	Golden Eagle	Lesser Prairie Chicken
Burrowing Owl	Mockingbird	Bobwhite
Horned Lark	Loggerhead Shrike	Scaled Quail
Common Crow		Rock Dove (Domestic
Eastern Meadow-	<u>Present in Summer</u>	Pigeon)
lark	Long-billed Curlew	Ladder-backed Wood-
Western Meadow-	Common Nighthawk	pecker
lark	Yellow-shafted	White-necked Raven
	Flicker	Starling
<u>Present in Summer</u>	Western Kingbird	House Sparrow
Swainson's Hawk	Brown-headed	Redwinged Blackbird
Scissor-tailed	Cowbird	Boat-tailed Grackle
Flycatcher	Lark Bunting	<u>Present in Summer</u>
Barn Swallow		Mississippi Kite
Lark Sparrow	<u>Present in Winter</u>	Mountain Plover
	Rough-legged Hawk	Eastern Kingbird
	Red-shafted Flicker	Cliff Swallow
	Lapland Longspur	Bullock's Oriole*
		<u>Present in Winter</u>
		Ferruginous Hawk
		Bald Eagle
		Brewer's Blackbird
		McCown's Longspur
		Chestnut-collared
		Longspur
		<u>Migrants</u>
		Lesser Snow Goose**
		American Golden Plover**
		Upland Plover
		Baird's Sandpiper
		Buff-breasted Sand-
		piper**
		Sprague's Pipit
		Savannah Sparrow
		Vesper Sparrow

*Most were probably Bullock's x Baltimore Hybrids.

**Reported by reliable observers.

Table 6. Amphibians observed in prairie dog towns in Oklahoma.

Occasional	Uncommon
Barred Tiger Salamander (<u>Ambystoma tigrinum</u>)	Green Toad (<u>Bufo debilis</u>)
Couch's Spadefoot Toad (<u>Scaphiopus couchi</u>)	Great Plains Narrow-mouthed Toad* (<u>Gastrophryne olivacea</u>)
Plains Spadefoot Toad (<u>Scaphiopus bombifrons</u>)	
Rocky Mountain Toad (<u>Bufo woodhousei</u>)	
Texas Toad (<u>Bufo compactilis</u>)	

*Reported by reliable observers.

Table 7. Reptiles observed in prairie dog towns in Oklahoma.

Frequent	Occasional	Uncommon
Ornate Box Turtle (<u>Terrapene ornata</u>)	Western Diamondback Rattlesnake* (<u>Crotalus atrox</u>)	Yellow Mud Turtle (<u>Kinosternon flavescens</u>)
Prairie Rattlesnake (<u>Crotalus viridis</u>)	Bullsnake (<u>Pituophis melanoleucus</u>)	Fence Lizard (<u>Sceloporus undulatus</u>)
	Spotted Whiptail (<u>Cnemidophorus gularis</u>)	
	Texas Horned Lizard (<u>Phrynosoma cornutum</u>)	
	Six-lined Racerunner (<u>Cnemidophorus sexlineatus</u>)	
	Lesser Earless Lizard (<u>Holbrookia maculata</u>)	

*Reported by reliable observers.

Table 8. Mammals observed in prairie dog towns in Oklahoma.

Frequent	Occasional	Uncommon
Desert Cottontail (<u>Sylvilagus auduboni</u>)	Eastern Mole (<u>Scalopus aquaticus</u>)	Spotted Ground Squirrel (<u>Citellus spilosoma</u>)
Plains Pocket Gopher (<u>Geomys bursarius</u>)	Blacktail Jackrabbit (<u>Lepus californicus</u>)	Raccoon (<u>Procyon lotor</u>)
Deer Mouse (<u>Peromyscus maniculatus</u>)	Thirteen-lined Ground Squirrel (<u>Citellus tridecemlineatus</u>)	Bobcat (<u>Lynx rufus</u>)
Coyote (<u>Canis latrans</u>)	Ord Kangaroo Rat (<u>Dipodomys ordi</u>)	
Badger (<u>Taxidea taxus</u>)	Southern Plains Woodrat (<u>Neotoma micropus</u>)	
Bison* (<u>Bison bison</u>)	Kit Fox (<u>Vulpes velox</u>)	
	Striped Skunk** (<u>Mephitis mephitis</u>)	

*Old wallow depressions were common in dogtowns.

**Reported by reliable observers.

Table 9. Animals using vacant prairie dog burrows in Oklahoma.

Amphibians	Reptiles	Birds	Mammals
Barred Tiger Salamander	Western Diamond-back Rattlesnake*	Burrowing Owl	Coyote
			Kit Fox
Rocky Mountain Toad	Prairie Rattlesnake		Raccoon
Texas Toad	Bullsnake		Badger
Great Plains Narrow-mouthed Toad*	Spotted Whiptail		Striped Skunk*
	Six-lined Race-runner		Thirteen-lined Ground Squirrel
	Fence Lizard		Spotted Ground Squirrel
	Ornate Box Turtle		Southern Plains Woodrat
			Desert Cotton-tail

*Reported by reliable observers.

Table 10. Protected prairie dog towns in Oklahoma.

County	Owner	Size in Acres	Section Number	Township-Range
Caddo	M. Goodman	7	22	5N-13W
Canadian	W. Waller	7	11	14N-5W
Cimarron	M. Benton	90	17	6N-4E
Comanche	W. Fulbright	4	8	3N-11W
Comanche	City of Lawton	2	30	2N-11W
Dewey	R. Craig	25	5	16N-22W
Dewey	E. Stidham	35	18 & 19	17N-16W
Ellis	I. Williams	10	7	16N-22W
Ellis	T. Larimore	35	10	19N-24W
Greer	B. Hollenback	7	33	4N-22W
Harper	N. Norton	9	19	28N-22W
Jackson	Republic Gypsum Co.	80	11	2N-23W
Kiowa	L. Bierman	80	36	5N-17W
Kiowa	B. Evatt	13	34	5N-14W
Texas	F. Dale	1	36	3N-14E
Washita	V. Raasch	6	4	10N-16W
Woods	H. Gardner	20	1	26N-16W
Woods	H. Schwartz	80	8	27N-19W
Woodward	H. Hamilton	20	9	20N-22W
Total		531		

number, 234 acres were located in the northwest, exclusive of the panhandle, 192 in the southwest, 91 in the panhandle, and 14 in west-central Oklahoma.

Water

Only 92 of 277 active prairie dog towns had surface water available year-round. The water tables beneath many of the dogtowns without water were known to be several times the depth of the deepest prairie dog burrow reported in the literature, about 15 feet (Merriam, 1902). Apparently, prairie dogs receive sufficient moisture from vegetation they eat without resorting to surface water. A young prairie dog captured July 8, 1966, was fed grass, forbs, and wheat grain, but was given no water. He lived until August 29, 1966, (51 days); however, the cause of death was thought to have been pneumonia, and not lack of water.

Albinos

On September 8, 1966, a white prairie dog was observed feeding among other prairie dogs in a large Beaver County dogtown by Mr. John Pickens, a government rodent and predator control agent, and me.

Reproduction

On January 23, 1967, I collected a female prairie dog with a perforate vagina in Comanche County, and the first pregnant female of 1967 was taken February 4, in the same county.

Earliest dates and localities for sighting young-of-year above ground were as follows:

<u>Date</u>	<u>Locality</u>
April 24, 1966	McClain Co. (Central Okla.)
April 8, 1967	Comanche Co. (Southwest Okla.)
April 9, 1967	Blaine Co. (West-central Okla.)
April 15, 1967	Kiowa Co. (Southwest Okla.)
April 24, 1967	Beaver Co. (Panhandle)
April 20, 1968	Comanche Co. (Southwest Okla.)

The average litter size, based on 49 early spring litter counts ranging in size from 2 to 10, was 4.9.

According to embryo counts of 11 pregnant females, the average number of young was 5.2, with extremes of 3 and 7.

CHAPTER IV

DISCUSSION

Distribution and Numbers of Prairie Dogs in Oklahoma

In Figure 2, the eastern distributional limits of the Black-tailed Prairie Dog in Oklahoma, Kansas, and Texas is shown.

Bailey (1905) mapped the range of the prairie dog in the Oklahoma Territory and included all of the present state of Oklahoma, except the Wichita Mountains, west of a north-northeast line from about the 98th meridian on the southern border to near the 97th meridian at the northern edge of the state. My data indicate a present eastern limit averaging 35 miles west of this line in the northern half of Oklahoma and 40 to 50 miles east of it in the southern half (Figure 2).

Reliable observers have reported that as recently as 1960 or 1961, a single ranch in Texas County contained 10,000 acres of occupied prairie dog habitat. Hardly that many acres are inhabited by prairie dogs throughout the entire state today (1967) because of continued widespread

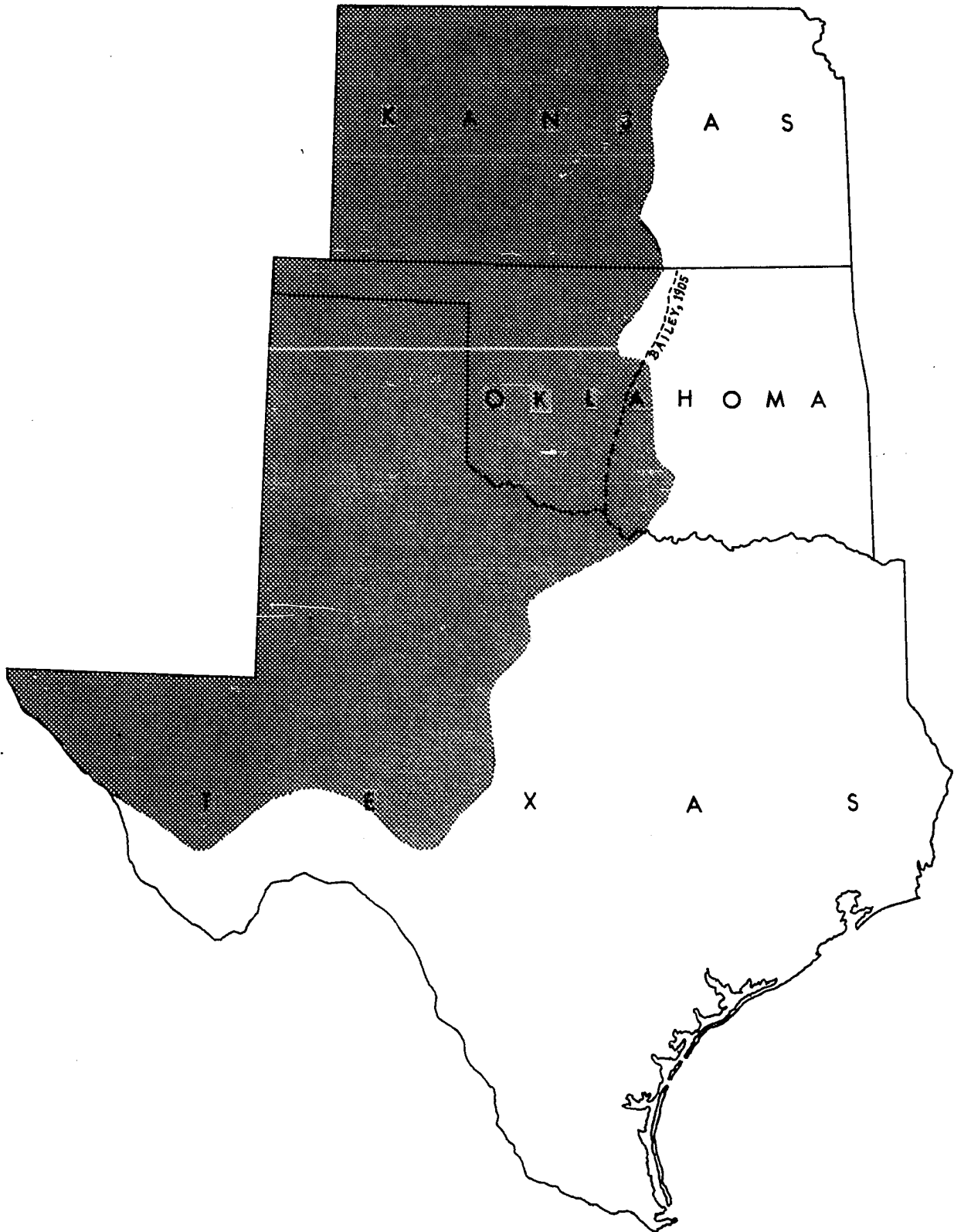


Figure 2. Distribution of the Black-tailed Prairie Dog in Oklahoma, Kansas (Smith, 1967), and Texas (Cottam and Caroline, 1965).

poisoning by government and private concerns. I therefore deemed it necessary to assess current numbers and distributional limits of the prairie dog in Oklahoma. It is hoped that this work will serve as a basis of comparison for future population estimates in each county.

A total of 280 prairie dog colonies in 34 western Oklahoma counties was investigated. These occupied some 9,522 acres and contained an estimated 34,511 prairie dogs. In 66 counties in Texas, Cottam and Caroline (1965) found more than 300 dogtowns, varying in size from a fraction of an acre to about 640, and averaging 43. It can be concluded from the foregoing that the total area covered by the Texas dogtowns was approximately 13,000 acres. In Kansas, Smith (1958) estimated that prairie dogs inhabited "no more than 57,045 acres" in 1957.

The largest prairie dog colony in the state encompassed 1,000 acres of the east firing range on the Fort Sill Military Reservation near Lawton. The population estimate of 2,800 animals for this town was certainly conservative.

Vegetation in Dogtowns

Buffalograss was the dominant ground cover in 80 per cent of 258 Oklahoma dogtowns and blue grama in 7 per cent. Koford (1958) reported that buffalograss was the most common dominant plant in dogtowns he studied throughout the Great Plains except on relatively light soils and in the north, where blue grama was dominant.

The commonest species of weedy vegetation on 42 per cent of 223 prairie dog towns in Oklahoma was prickly-pear. According to Koford (1958), this cactus is favored by drought, not heavy grazing. He further asserted that, although prairie dogs eat prickly-pear, they probably do not tend to eliminate it. Kelso (1939) found that prickly-pear leaves constituted 6 per cent of the total food volume of 247 prairie dog stomachs.

Koford (1958) summarized the characteristic vegetation of dogtowns as consisting of "an abundance of short perennial grass, a large variety of forbs, annual and perennial, and a scarcity of shrubs."

Types of Habitat in Which Dogtowns Were Located

Blair and Hubbell (1938) divided Oklahoma into ten "biotic districts" based on distribution of mammals and orthopterans. The Mixed-grass Plains biotic district encompasses most of western Oklahoma exclusive of the panhandle and extreme northwest, which compose the Short-grass Plains district. The Mesquite Plains district occurs in the southwestern tip of the state. Areas along the major watercourses in the Mixed-grass and Short-grass districts are covered by sandsage variously mixed with grasses and shrubs. These are called "Sand areas" by Blair and Hubbell, but are here considered a major habitat type: Sandsage-Grassland. Although more prairie dog colonies were situated

in the panhandle counties than elsewhere, they were not all in the Short-grass Plains per se, for many occupied the Sand-sage-Grassland habitat within that district. In fact, a larger percentage of the 280 active dogtowns investigated throughout the state (35 per cent) were found in this type of habitat than any other. The second largest percentage (30 per cent) occurred in the Mixed-grass Plains district. In a few places, prairie dogs had become established in tall-grass areas heavily overgrazed to a mixed-grass condition; 9 per cent of the Oklahoma dogtowns were found in areas of this type (Table 4).

Blair (1939) reported the distribution of Cynomys ludovicianus in Oklahoma as follows: "Probably all of Oklahoma west of the Osage Savanna biotic district. Recorded from the Short-grass Plains, Mixed-grass Plains, Mesa de Maya, and Wichita Mountain biotic districts. Said by local residents to occur in the Mesquite Plains district. Possibly existed at one time in the Osage Savanna district." The Osage Savanna district referred to covers much of the eastern half of the state and "Mesa de Maya" alludes to the Black Mesa region at the northwest corner of the panhandle. I found only one active dogtown in the last area.

Vertebrate Associates

I recorded 7 species of amphibians, 10 reptiles, 56 birds, and 16 mammals in the 280 Oklahoma prairie dog towns (Tables 5 to 9). Each species will now be considered separately. "Recorded" means that I observed the species

in or near a dogtown. "Reported" indicates that reliable observers have contributed information on a particular species. "GMS" refers to records from Dr. George M. Sutton's field notebook at the University of Oklahoma. Seasons are arbitrarily divided as follows: Summer: June 1 - August 31; Fall: September 1 - November 30; Winter: December 1 - February 28; and Spring: March 1 - May 31.

AMPHIBIANS

Barred Tiger Salamander-Recorded 3 times, reported once.

August 24, 1966, one seen in shallow, water-filled prairie dog hole in Jackson County after heavy rains; April 14, 1967, remains (part of head missing) found at entrance of burrow used by Burrowing Owls in Cimarron County; May 6, 1967, one collected from beneath limestone rock at edge of small dogtown in Jackson County; summer, 1966, one routed from prairie dog hole in Canadian County with poison gas and collected by Mr. John Pickens, a government predator and rodent control agent.

Couch's Spadefoot Toad-Recorded twice.

August 24, 1966, 24 individuals, 10 pairs amplexing, observed in temporary pools and inundated bison wallows in large dogtown in Tillman County after heavy rains, many more heard; May 6, 1967, remains of one dropped by Burrowing Owl in small dogtown in Jackson County.

Plains Spadefoot Toad-Recorded once, reported once.

June 1, 1967, three seen, two amplexing, in puddle at edge of dogtown in Woods County. May 7, 1953, Dave Parmelee found two with backs broken, but still alive, at entrance to prairie dog burrow used by Burrowing Owls in Cleveland County (GMS).

Rocky Mountain Toad-Recorded twice.

April 26, 1966, adult captured in steel trap at entrance to prairie dog burrow in Cleveland County; September 9, 1966, one observed sitting in mouth of damp prairie dog hole in Beaver County.

Texas Toad-Recorded twice.

August 24, 1966, one seen in mouth of prairie dog burrow after rains in Jackson County; September 4, 1966, specimen seen in old prairie dog hole in Kiowa County (thought to have been this species).

Green Toad-Recorded twice.

August 24, 1966, two in amplexus collected from water-filled Bison wallow in Tillman County dogtown after heavy rains; May 6, 1967, four found beneath limestone rocks at edge of small dogtown in Jackson County.

Great Plains Narrow-mouthed Toad-Reported once.

July 3, 1966, seven flooded out of burrows in Oklahoma City dogtown by city zoo personnel. The toads were in cracks of the burrow wall, approximately a foot below the ground surface.

Gilles (1966) described a "small dry land frog" as being common in a dogtown in southwest Oklahoma in 1902. It was "as broad as two fingers, and two and one-half inches long, with a narrow green stripe down the outer side of the back." The frog was seen at burrow entrances in the early morning or late in the evening. The toad in this area of the state most closely matching the foregoing description is the Rocky Mountain Toad, which has a light mid-dorsal stripe down the back; it was recorded in dogtowns twice during this study (see species account, above). Scheffer (1937) reported "several toads" in burrow excavations in a small prairie dog town in central Kansas: ... "Two of them in packed earth at a depth of seven feet below the prairie sod. Others had been flooded out earlier...by pouring water into some of the burrows." Smith (1967) observed the Great Plains Toad (Bufo

cognatus) in prairie dog burrows in south-central Kansas on three occasions, but never "away from the mounds." This species was not recorded in Oklahoma dogtowns.

REPTILES

Yellow Mud Turtle-Recorded 5 times.

Seen after heavy spring or summer rains in temporary pools or inundated Bison wallows in dogtowns on four occasions; shell found in one dogtown.

Ornate Box Turtle-Recorded 21 times.

The most abundant reptile in Oklahoma dogtowns. Areas of Oklahoma where species was observed in dogtowns: Central: 1; North-central: 1; South-central: 2; Panhandle: 2; West-central: 3; Northwest: 3; and Southwest: 9. Species seen May 13 to October 30. Observed in prairie dog burrows seven times, took refuge in them twice. June 2, 1967, two noted in water-filled Bison wallows in Woods County dogtown. Seen in open shortgrass of dogtowns six times. August 18, 1966, observed feeding on prickly-pear bud in Washita County dogtown. Shells found on eight occasions: September 2, 1966, two large shells and a small one discovered at entrance to active burrow; as many as four shells seen in one dogtown. January 21, 1967, dead turtle found at entrance to prairie dog burrow recently dug out by Badger in Jackson County.

Smith (1967) also reported this species as the most abundant reptile in the dogtown he studied in south-central Kansas. He stated: "It was not at all unusual to have 6 to 8 feeding or moving about in the area of blind No. 1 in early morning or late evening." They were largely ignored by the prairie dogs. In one instance, a prairie dog attempted to play with a turtle which at first withdrew into its shell, but shortly protruded its head and snapped at the prairie dog. Smith further reported: "Ornate Box Turtles use

prairie dog burrows for refuges and hibernate in them.

Mostly old burrows of the slanting type are used, but three or more times in spring, in as many burrows, I have looked into a burrow that went straight down for six or eight feet and with the aid of a flashlight observed an Ornate Box Turtle vainly trying to leave a burrow much too wide for the turtle to climb."

Lesser Earless Lizard-Recorded 4 times.

March 12, 1967, adult found in buffalograss of large dogtown in Comanche County; April 12, 1967, adult collected in large prairie dog colony in Cimarron County; April 16, 1967, juvenile attempting to retreat into prairie dog hole collected in Cimarron County; May 3, 1967, one emerged from prairie dog burrow in Ellis County when fumigant gas was sprayed into it.

Smith (1967) saw this species both in the burrows and aboveground in the dogtown he studied in south-central Kansas.

Fence Lizard-Recorded twice.

August 14, 1966, a brownish lizard retreated into prairie dog burrow in active dogtown and, although identification was uncertain, was thought to have been this species; September 8, 1966, adult (which took refuge in active prairie dog burrow) collected in Beaver County dogtown.

Texas Horned Lizard-Recorded twice, reported once.

August 26, 1966, remains of six individuals found at old Cynomys holes being used by Burrowing Owls in small Jackson County dogtown; May 6, 1967, in same dogtown, a freshly killed adult was dropped by Burrowing Owl, 8 other adults found among flat limestone rocks at edge of dogtown. Dr. Charles Carpenter has often collected horned lizards from a dogtown in Greer County during April.

Six-lined Racerunner-Recorded 3 times.

June 4, 1966, 10 observed in McClain County dogtown, eight of which took refuge in prairie dog holes; June 27, 1966,

in same colony, three more seen, all retreated into prairie dog burrows; often hid under wavy-leaved thistle in dogtown. April 20, 1967, adult seen among tall weeds and tangle of wire at edge of small dogtown in Texas County.

Spotted Whiptail-Recorded twice.

September 2, 1966, two adults and one juvenile observed in Jackson County dogtown, one adult escaped into old prairie dog hole, the other hid beneath clump of prickly-pear; May 6, 1967, two juveniles and an adult male found under limestone rocks at edge of small Jackson County dogtown; they took refuge beneath clumps of prickly-pear.

Bullsnake-Recorded 3 times, reported once.

September 9, 1966, Bullsnake about three feet long found dead in mouth of Cynomys burrow in Beaver County; November 22, 1966, a shed snakeskin approximately four feet in length found at edge of prairie dog hole in Texas County; June 24, 1967, a shed snakeskin measuring seven feet and ten inches found in recently inactivated dogtown in Washita County; Mr. Balis Evatt, who protects a small dogtown in Kiowa County, watched a large Bullsnake enter a prairie dog burrow which was immediately covered with dirt by four or five prairie dogs (pers. comm.). Government predator and rodent control agents occasionally see this species in both active and inactive dogtowns.

Burnett (1915) advocated protection of Bullsnares since they reportedly catch young prairie dogs. King (1955) stated: "Only one Bullsnake was seen in the Shirttail Canyon town. It was caught emerging from a prairie dog burrow, but showed no evidence of having recently eaten the inhabitant." When staked out in the dogtown, the Bullsnake elicited curiosity but no fear from the prairie dogs. King further maintained that Bullsnares probably prey upon prairie dogs "only for the short period from the time when the snakes come out of hibernation until the prairie dogs are too large for them." Smith (1967) saw only one Bullsnake in the dogtown

he studied for two and one-half years in Kansas. It was taken from an abandoned burrow in an area long abandoned by prairie dogs where considerable numbers of Perognathus and Peromyscus were trapped.

Western Diamondback Rattlesnake-Reported 4 times.

Reported from dogtowns in Greer, Beckham, Caddo, and Comanche Counties, where they are said to use old prairie dog burrows. Occasionally reported from dogtowns by government rodent and predator control personnel.

One June 28, 1947, in a small, almost depopulated dogtown in the Wichita Mountains Wildlife Refuge, mesquite limbs were used by refuge personnel to force three large rattlesnakes out of active prairie dog burrows. A total of seven snakes were located in the holes by listening for their "buzzing." Of the three captured, the largest measured 52 inches, the other two "about four feet." Before the capture of the snakes, several young prairie dogs had shown reluctance to enter the holes occupied by the rattlers. By August 16, 1947, no sign of prairie dogs could be found in the dogtown, and it was speculated that the rattlesnakes had contributed to their demise (Osborn and Allen, 1949).

Prairie Rattlesnake-Recorded 3 times, reported 9 times.

The second most abundant reptile in Oklahoma prairie dog towns. November 17, 1966, adult was sunning at entrance to active prairie dog hole in Texas County; November 22, 1966, one captured at mouth of prairie dog burrow in old dogtown in Beaver County was more than two feet long; April 16, 1967, adult captured on mound of abandoned prairie dog burrow in active part of Cimarron County dogtown; a prairie dog was feeding only a few feet away. All three of these snakes attempted to retreat into prairie dog holes. Reported from Cimarron County four times, Beaver County twice, Beckham

County twice, and Texas County once. October 21, 1966, two teen-age boys reportedly killed 12 prairie rattlers with .22 rifles in a large dogtown on the Bud Ellsworth Ranch in Cimarron County. In October of 1965, Mr. John Pickens, government predator and rodent control agent, saw about 50 Prairie Rattlesnakes, 27 of which he killed, in an active Cimarron County dogtown, apparently denning up for winter.

Since the time of Lewis and Clark, travellers on the Great Plains have reported seeing rattlesnakes in prairie dog colonies. In "Jame's account of S. H. Long's Expedition, 1819-1820" (Thwaites, 1905), is recorded: "The confluent rattlesnakes are very abundant, particularly in and about the prairie dog villages." Kendall (1847) stated: "Rattlesnakes, too, and of immense size, dwell in the same lodges with the dogs;We killed one a short distance from a burrow, which had made a meal of a half-grown dog; and although I do not think they can master the larger animals, the latter are still compelled to let them pass in and out without molestation--a nuisance,that cannot be got rid of." Allen (1877) asserted that "Rattlesnakes (Crotalophorus confluentus) bring terror to these little Marmots whenever they appear, upon which they largely subsist. They usually, however, make their homes in one particular burrow, from which they may have driven the rightful owner, but doubtless enter others in search of food." Merriam (1902) stated that early plains travellers spoke of "...finding young prairie dogs in the stomachs of rattlers killed in the dog towns." The usual number so found appeared to be one or two, but as many as three have been reported; one author claimed

that in Texas rattlesnakes did more, perhaps, to keep down the numbers of prairie dogs than all other agencies (Merriam, 1902). Koford (1958) maintained that Prairie Rattlers, although "common in most of the range of the prairie dog, is seldom more than two and one-half feet long, and appears to be too small to swallow an adult prairie dog." The literature contains many accounts of denning of Prairie Rattlers in dogtowns. Koford (1958) stated: "On the plains, where there are few rock outcrops, deep burrows provide the snakes with suitable refuges. Dozens or even hundreds of snakes may congregate on a dog town in fall and stay deep in the burrows until spring. During periods of many days, usually in April and October, the snakes lie-out near the burrow entrances and can be captured." King (1955) reported seeing four rattlesnakes in the Shirttail Canyon dogtown during his study. Three of them were found at the edge of the town, in prairie dog burrows seldom used by prairie dogs. They were small snakes and probably could not have swallowed young prairie dogs after they had killed them. He continued: "The period during which the pups serve as prey for snakes must be short in Shirttail Canyon, because the snakes are probably still hibernating when the pups are small. By the middle of June most of the pups weight about six to eight ounces and are probably too large for many rattlesnakes. It is likely that ground squirrels and deermice, which also live in the town, are the principal

items of prey of these snakes." When a rattler was staked out in King's dogtown, it was cautiously approached by curious prairie dogs, but apparently not feared.

BIRDS

Lesser Snow Goose-Reported once.

"April 13 to May 9, 1954, species seen repeatedly on and near prairie dog colony near Moore (Cleveland Co.); on April 13 and 29 flock was composed of 20 adult Snow Geese, nine immature Snow Geese, and one Blue Goose; principal grazing ground, between pond and prairie dog colony, covered with droppings on that date; May 8, 9, one adult Snow Goose seen each date in area (S. C. Hanson)" (GMS).

Turkey Vulture-Recorded 9 times.

Species often seen soaring low over dogtowns. Observed on two occasions in spring, four in summer, and three in fall.

Smith (1967) reported that prairie dogs would feed to within 15 to 20 feet of a vulture on the ground, but would omit the predator bark if the vulture soared over the town.

Mississippi Kite-Recorded 5 times.

A total of 9 was seen flying low over dogtowns, hunting insects. Three observed simultaneously over one dogtown in Dewey County. Species noted in Alfalfa, Blaine, Dewey, Jackson, and Woodward Counties.

Red-tailed Hawk-Recorded 26 times, reported 4 times.

Often observed soaring low over dogtowns. Alighted in dogtowns 4 times; prairie dogs ran to burrows and barked, but did not go underground. Red-tails perched on fence-posts, trees, etc. near dogtowns 8 times. In a Cimarron County dogtown, Dr. George Sutton watched a Red-tail capture an adult prairie dog October 1, 1932 (Sutton, 1934). In February or March of 1960, John Steele, manager of the Canton Lake Game Management Area, saw a pair of Red-tails fly from a small dogtown in Blaine County, one carrying a prairie dog;

in same dogtown, the assistant manager, Mr. Bud White, saw one Red-tail get the attention of a prairie dog while another caught the rodent from the rear in the spring of 1965 (pers. comm.). Mr. Roy Crawford, a government control agent, reported observing Red-tails catch prairie dogs in southeast Ellis County; predation usually occurred in early mornings during the summer (pers. comm.).

Bent (1937) mentioned prairie dogs as part of the food of the Eastern Red-tailed Hawk. Longhurst (1944) found remains of prairie dogs (C. gunnisoni) in two of three Red-tail stomachs he examined and watched two hawks make unsuccessful attempts to catch prairie dogs in Colorado. King (1955) and Koford (1958) reported occasionally seeing Red-tails soaring over dogtowns. They are probably minor predators of prairie dogs in Oklahoma during spring and summer.

Swainson's Hawk-Recorded 34 times.

Species usually seen circling high over dogtowns. Seen on ground in dogtowns 3 times, perched on fenceposts alongside dogtowns 5 times. May 4, 1967, one swooped low over dogtown in Harper County and 4 small prairie dogs plunged into their burrow when 2 adult 'dogs barked a warning. June 2, 1967, in Garfield County, a Swainson's Hawk was ignored by prairie dogs when it lit on a highline pole in the dogtown.

Koford (1958) reported that this species seems to be a minor enemy of prairie dogs. My observations tend to support his conclusion.

Rough-legged Hawk-Recorded 20 times.

Seen on 12 occasions in fall, 8 in winter. Lit in dogtowns 6 times, on fenceposts near dogtowns twice. Usually observed soaring low over dogtowns. November 22, 1966, in Beaver County, I flushed a Rough-leg from a freshly-killed, partially devoured prairie dog carcass; much tooth wear indicated that it was an old prairie dog.

Cameron (1907) reported that prairie dogs were the favorite food of Rough-legs in Montana. However, McAtee (1935) found prairie dog remains in only one of 99 Rough-leg stomachs he examined. Koford (1958) stated that most prairie dogs taken by hawks are probably young, weak, or abnormal. He cited an instance in Colorado in which about 20 hawks, mostly Rough-legs and Prairie Falcons, fed on dead and dying prairie dogs which had been poisoned the previous day.

Ferruginous Hawk-Recorded 8 times, reported twice.

Species usually observed soaring over dogtowns. On 5 occasions, Ferruginous Hawks were seen resting and preening on the ground in dogtowns. They were noted 3 times in dogtowns in winter, twice in spring, and 3 times in fall. On September 30, 1932, Dr. George Sutton reported seeing one at a prairie dog colony near Kenton, in Cimarron County (Sutton, 1934). A government trapper, Mr. John Pickens, reported seeing an estimated 5,000 Ferruginous Rough-legs in wheat fields in Beaver County as they migrated through the panhandle on October 3, 1967 (pers. comm.).

Fisher (1894) reported that prairie dogs were occasionally eaten by Ferruginous Hawks. Prairie dogs were apparently the staple food of Ferruginous Hawks in eastern Montana about the turn of the century (Cameron, 1907).

Cameron (1914) witnessed a pair of these hawks capture a prairie dog in Montana on May 28, 1893. Longhurst (1944) found remains of Gunnison Prairie Dogs in four of six stomachs he examined from Colorado. Koford (1958) stated: "In spring and summer, the most common large raptor on the open plains is the Ferruginous Hawk (B. regalis). It usually nests before young prairie dogs appear above ground, and as each

pair raises about twice as many young as a pair of eagles, probably more prairie dogs are taken to feed young Ferruginous Hawks than to feed eaglets."

Golden Eagle-Recorded 4 times, reported once.

Species observed circling over prairie dog towns 4 times in Cimarron County. December 1, 1966, immature individual seen on fencepost alongside large dogtown, later circled over town. February, 1967, in the Wichita Mountains Wildlife Refuge, Mr. Cal Lovelace reported an immature Golden Eagle perched on a cage containing the last 4 or 5 prairie dogs of the "official" dogtown (pers. comm., Arthur Halloran).

Several authors have recorded Golden Eagle predation on prairie dogs. Dr. D. E. Lantz reported seeing Golden Eagles feeding on dead and dying prairie dogs after a poisoning operation in Kansas (Oberholser, 1906), and Gloyd (1925) cited a study in Kansas in which prairie dog remains were found in nine of 30 Golden Eagle stomachs examined during a 22-year period. Spencer (1943), Arnold (1954), and D'Ostilio (1954) reported prairie dog remains at nest sites in Colorado. Detailed accounts of actual Golden Eagles attacks on prairie dogs have been given by Cameron (1908) and Arnold (1954). Sutton (1965) saw one of these birds flying with a prairie dog in its talons in the Black Mesa country at the northwest tip of the Oklahoma panhandle. In Oklahoma, especially the panhandle, Golden Eagles may prey more heavily on prairie dogs than any other predator except the Badger during winter and spring.

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Bald Eagle-Recorded 3 times, reported once.

Seen among prairie dog burrows on two occasions, but usually soared high above the towns. Recorded all 3 times in Cimarron County. December 1, 1966, an adult and a young bird circled over a very large dogtown in company with an immature Golden Eagle. December 2, 1966, an adult flew from same dogtown carrying a cottontail. Mr. Balis Evatt, who lives near Meers, Oklahoma, in Comanche County, reports that 2 Bald Eagles regularly winter near his farm, which contains a small dogtown.

Fisher (1887), Oberholser (1906) and McAtee (1935) have reported finding prairie dog remains in stomachs of Bald Eagles and among nest debris. Smith (1967) saw an occasional eagle near the dogtown he studied in Kansas, but did not consider them important predators of prairie dogs. Bald Eagles probably take an occasional prairie dog in Oklahoma, and are most abundant, especially in the panhandle, during winter and spring.

Marsh Hawk-Recorded 69 times.

Usually seen drifting low over dogtowns or patrolling overgrown fencerows nearby; seen 9 times resting on ground in towns. Species seen 26 times in winter, 12 times in spring, and 25 times in fall. December 13, 1966, in Dewey County, I flushed one from a partially devoured prairie dog carcass in a large dogtown; the prairie dog had been killed suddenly, as evidenced by its broken neck and the grass still in its mouth.

Koford (1958) flushed a Marsh Hawk from a fresh, partly-eaten carcass of a prairie dog, but considered them to be minor enemies of prairie dogs. This hawk is probably not large enough to be of much importance in prairie dog predation.

Prairie Falcon-Recorded twice.

Seen near dogtowns in Texas County twice, once in fall and once in winter. November 18, 1966, a Prairie Falcon killed a pheasant hen in middle of large Texas County dogtown.

Bailey and Niedrach (1933) witnessed a Prairie Falcon attack and kill a young prairie dog. McAtee (1935) mentioned finding prairie dog remains in 1 of 15 Prairie Falcon stomachs he examined. Smith (1967) watched a Prairie Falcon resting and preening in a Kansas dogtown for 35 minutes. Koford (1958) twice flushed this species from fresh prairie dog carcasses, but considered them to be minor enemies of these rodents. Because of their small size and relative scarcity, Prairie Falcons are probably of minor importance in prairie dog predation in Oklahoma.

Sparrow Hawk-Recorded 18 times.

Species seen 5 times in winter, 3 times in spring, 4 times in summer, and 6 times in fall. Most often seen flying low over dogtowns or perched on some prominence nearby. They were ignored by prairie dogs. April 26, 1966, 5 males were seen on highline wires within a quarter-mile of a dogtown in McClain County.

Lesser Prairie Chicken-Recorded 3 times, reported once.

Seen in Beaver and Harper Counties. April 24, 1967, one flew out of patch of sandsage in dogtown in Beaver County. May 4, 1967, in Harper County, 9 were observed in courtship activity in large dogtown; most were walking about in pairs, chattering loudly and enlarged gular pouches and "horns" were noted in one male. July 6, 1967, a hen and 10 half-grown chicks were flushed from edge of grassy fallow field alongside an almost extirpated dogtown in Harper County. Mr. Claude Eastham, who lives near Arnett in Ellis County, reported having seen prairie chickens booming on a grassy ridge in his dogtown (pers. comm., May 2, 1967). On May 19, 1936, Dr. George Sutton saw several chickens booming among prairie dogs during early morning in Ellis County (pers. comm.). In all cases, the chickens were paid no attention by the prairie dogs.

Koford (1958) has stated that prairie dog activities may locally affect the habitat of less common birds such as Sharp-tailed Grouse. In Theodore Roosevelt Memorial Park, South Dakota, he reported that one dogtown is a favorite dancing ground for grouse, and that as many as 100 have been seen there at one time by rangers.

Bobwhite Quail-Reported 7 times.

Males often used fenceposts alongside dogtowns as calling sites. Observed feeding in prairie dog colonies on 3 occasions.

Scaled Quail-Recorded 6 times.

Species recorded twice in Texas County, 4 times in Cimarron County. December 21, 1966, about 20 were observed running along edge of large dogtown in Cimarron County. April 12, 1967, covey of 25 seen around junkpile in large Cimarron County dogtown. April 14, 1967, in Cimarron County, 8 were observed feeding in a dogtown in which 3 Bobwhites were also seen.

Killdeer-Recorded 62 times, reported 14 times.

A total of 152 observed feeding and running about in dogtowns. Ignored or tolerated by prairie dogs. Seen 4 times in winter, 31 times in spring, 16 times in summer, and 11 times in fall. April 20, 1967, nest with one egg found in dogtown in Texas County. May 11, 1967, in Ellis County dogtown, 2 adults and 3 fuzzy chicks were seen. May 12, 1967, in Harper County, 9 seen in courtship activity, chasing and mock-fighting in a dogtown. May 13, 1967, 3 were seen chasing each other in a Woodward County dogtown. From April 12, 1953 to September 10, 1956, Dr. George Sutton recorded 13 instances of seeing Killdeers in a prairie dog colony at Norman in Cleveland County; April 8, 1956, Dave Parmelee found a nest with 2 eggs near the same colony; April 27, 1956, Dr. Sutton et al. found a nest with 4 eggs at a dogtown near Buffalo in Harper County (GMS).

Smith (1967) reported Killdeer abundant in the dogtown he studied in Kansas, especially around a pond there, where they "nested and secured their food." He often saw 7 to 8

Meadowlarks and 7 to 8 Killdeer feeding in a group of 10 to 12 prairie dogs, and stated: "The birds flew back and forth over the prairie dogs, walked all around them and in all my observations were totally ignored by the prairie dogs."

Mountain Plover-Recorded twice, reported 3 times.

Twice seen feeding in Cimarron County dogtowns in spring. April 17, 1967, one seen running about in almost defunct dogtown; April 18, 1967, pair seen feeding in large dogtown; a male collected on this date west of Boise City had much enlarged testes. April 12, 1953, Dr. George Sutton saw this species among flocks of Golden Plovers and Killdeers in dogtown near Norman; May 14, 1961, Dr. Sutton and class saw one in prairie dog colony north of Boise City in Cimarron County; July 23, 1963, 40 or more seen, same colony, by D. A. James et al. (GMS).

In Montana, Cameron (1907) reported that two or three pairs of Mountain Plovers bred annually on the prairie dog colonies he observed, and he recorded finding a nest containing two chicks and an egg in the center of a dogtown on June 15, 1898. Koford (1958) has stated that prairie dog activities may locally affect the habitat of less common birds such as Mountain Plovers.

American Golden Plover-Reported 6 times.

"April 12-15, 1953. Species seen repeatedly with Killdeers in prairiedog town just northeast of Norman; loose flock of about 50 seen April 12, 14; two females in worn winter feather (UOMZ 608, GMS 11630) shot April 12; one gray bird seen April 15 (G. M. Sutton, R. R. Graber, Jean W. Graber)."
 "April 23, 1953. Flock of 20 seen in prairie dog town just northeast of Norman: all were gray except one, which had much black on throat and chest (G.M.S. et al.)."
 May 8, 1955, two (one in breeding plumage, one in winter plumage) seen in prairie dog town near Moore, Cleveland County (J. C. Johnson Jr.)" (GMS).

Long-billed Curlew-Recorded 7 times, reported twice.

Seen feeding in shortgrass of dogtowns 6 times, flying over dogtown once. Species observed in Beaver, Cimarron (4 times), Harper, and Jackson Counties. I saw total of 15 curlews. Recorded 6 times in spring, once in summer. April 2, 1954, Stanley Hanson saw one along edge of pond near prairie dog colony a few miles west of Moore, in Cleveland County; May 14, 1961, one seen by Dr. George Sutton and class in dogtown north of Boise City in Cimarron County (GMS).

Upland Plover-Recorded 11 times, reported 7 times.

Species usually seen feeding in open grass of dogtowns. A total of 51 birds was noted in Custer, Grant, Harper, Jackson, Kiowa, Tillman, and Washita Counties. Recorded twice in spring, 8 times in summer, and once in fall. August 23, 1953, in Tillman County, 6 were seen feeding in a dogtown during a downpour; they would occasionally flutter their feathers and stretch their wings. From April 16, 1953, to April 29, 1955, Dr. George Sutton recorded this species in a prairie dog colony at Norman 7 times, 4 in April and 3 in August (GMS).

Baird's Sandpiper-Recorded twice, reported 5 times.

In May, 1967, 3 observed feeding in dogtown in Ellis County, 4 in prairie dog colony in Harper County. Dr. George Sutton recorded this species at a dogtown in Norman (Cleveland County) 3 times in April, 1953, once in April, 1954, and once in September, 1954 (GMS).

Buff-breasted Sandpiper-Reported once.

Large flock observed in prairie dog town near Moore in Cleveland County on May 14, 1954, by J. C. Johnson Jr. (GMS).

Rock Dove (Domestic Pigeon)-Recorded 12 times.

Species seen feeding on ground in dogtowns near buildings 8 times, flying low over dogtowns 4 times; ignored by prairie dogs.

Mourning Dove-Recorded 83 times.

A very common bird in prairie dog colonies, frequently seen feeding among the prairie dogs, or perched on some prominence near dogtowns. Species seen 4 times in winter, 33 times in spring, 34 times in summer, and 12 times in fall. Doves were twice noticed eating gravel from fresh prairie dog mounds. July 1, 1967, in Tillman County, 3 nests were found

in mesquite trees in large dogtown, 2 containing 2 eggs each, and 1 with 2 very young birds.

Koford (1958) reported Mourning Doves common on most dogtowns he visited throughout the Great Plains.

Burrowing Owl-Recorded 193 times, reported 22 times.

A total of 788 owl counted in dogtowns in 24 of 34 counties in Oklahoma containing active prairie dog colonies. Increasingly abundant westward, especially in the panhandle (I counted 41 owls in Harper County, 138 in Beaver, 110 in Texas, and 270 in Cimarron County). They were observed in 121 of 305 dogtowns investigated, including 20 extirpated colonies. Probably fewer than 1,000 remained in Oklahoma as of August, 1967; rapidly diminishing in number with widespread eradication of prairie dog colonies (I saw only one owl not associated with prairie dog burrows). August 26, 1966, 30 owls noted in a three-acre dogtown containing 30-35 prairie dogs in Jackson County. April 14, 1967, in 9 dogtowns in Cimarron County, I counted 146 owls. Much less abundant in fall and winter than in spring and summer; probably migrate each year, but a few are thought to be permanent residents in Oklahoma. Food items identified included: grasshoppers, dung beetles, ground beetles, darkling beetles, red ants, kangaroo rats, gophers, grasshopper mice, Horned Larks, Lark Sparrows, horned lizards, leopard frogs, spadefoot toads (2 spp.), and tiger salamanders. The heads of the larger animals were eaten first. Earliest dates on which young owls were sighted were June 22, 1966 (Custer County) and June 3, 1967 (Grant County). Scissor-tails, Barn Swallows, Horned Larks, and Western Kingbirds were observed chasing Burrowing Owls at various times. Dr. George Sutton has recorded Burrowing Owl sightings in Oklahoma prairie dog towns 22 times from September, 1932, to May, 1966; most of these (13) were made in spring, and only 1 in winter. His observations were from the following counties: Alfalfa, Cimarron, Cleveland, Comanche, Ellis, Greer, Harper, Jefferson, and Oklahoma (GMS; see also Sutton, 1967).

Many early travellers on the Great Plains described this little owl when writing about prairie dogs. Perhaps the best of these accounts was given by James in his journal of S. H. Long's expedition in 1820 (Thwaites, 1905).

Although F. M. Bailey (1928) listed prairie dogs as part of

the diet of Burrowing Owls, Longhurst (1944) found no remains in nearly 100 pellets he collected in Colorado. Scheffer (1937) and Smith (1967) reported Burrowing Owls in prairie dog towns in Kansas, the former observing "about 20" in a 20-acre colony. Koford (1958) found five pairs of owls in one six-acre dogtown in South Dakota.

Common Nighthawk-Recorded 11 times.

Seen flying low over dogtowns in pursuit of insects 8 evenings and in mid-afternoon 3 times. Observed 3 times in spring, 8 in summer.

Yellow-shafted Flicker-Recorded 25 times.

Species noted on ground in dogtowns, probably seeking ants, (ant beds were often located on or near burrow mounds), 20 times, on trees or fenceposts in colonies 8 times. Observed 16 times in winter, 6 in spring, 2 in summer, and once in fall. February 7, 1967, 6 seen in one dogtown in Comanche County.

Red-shafted Flicker-Recorded 12 times.

Species noted on ground in dogtowns, probably seeking ants, 9 times, on trees or fenceposts in colonies 4 times. Observed 9 times in winter, 3 in spring.

Ladder-backed Woodpecker-Recorded 4 times.

Noted on mesquite trees in dogtowns in the following counties in southwest Oklahoma: Comanche, Harmon, and Kiowa. Observed once in winter, 3 times in summer.

Eastern Kingbird-Recorded 8 times.

A total of 11 seen, most often on fences alongside dogtowns; often pursued airborne insects over the shortgrass of the colonies. Species recorded 4 times in spring, 4 times in summer.

Western Kingbird-Recorded 23 times.

Total of 55 seen, frequently perched on some prominence in dogtowns; very acrobatic and vociferous as they snatched insects flying over. Species observed 11 times in spring,

12 times in summer. May 13, 1967, in Harper County, 12 were seen on ground in one small dogtown, along with 3 Eastern Kingbirds.

Scissor-tailed Flycatcher-Recorded 53 times.

A total of 136 were noted, with as many as 8 in a single prairie dog colony. Usually seen catching insects over the dogtowns or perched on fences nearby. Nests found in trees in dogtowns 4 times (mesquite--2; post oak--1; cottonwood--1). Species seen in spring 21 times, summer 28 times, and fall 4 times.

Horned Lark-Recorded 144 times, reported 10 times.

Large flocks regularly observed feeding in dogtowns; estimated total of 4,300 seen. Recorded 44 times in winter, 64 times in spring, 6 times in summer, and 32 times in fall. Occasionally consorted with Chestnut-collared or Lapland Longspurs. April 20, 1967, in a Texas County dogtown, a stub-tailed, non-flying juvenile was collected (GMS 15185), and Horned Lark feathers were found at entrance of a Burrowing Owl hole. Dr. George Sutton recorded this species in a prairie dog colony in Norman (Cleveland Co.) 8 times from March 8 to April 25, 1953; June 23-25, 1960, he saw them near the "official" dogtown in the Wichita Mountains Wildlife Refuge; in a small dogtown north of Boise City in Cimarron County, he saw several hundred Horned Larks mingled with Lapland Longspurs on January 1, 1963 (GMS).

Koford (1958) reported Horned Larks common on dogtowns throughout the Great Plains.

Barn Swallow-Recorded 41 times.

Usually 1 to 5 seen skimming very low over the colonies catching airborne insects; noted flying over water in or near dogtowns only 6 times. Total of 126 seen. Recorded in spring 10 times, summer 29 times and fall twice.

Cliff Swallow-Recorded 10 times, reported once.

Total of 26 seen flying low over dogtowns, hunting insects. Observed 8 times in spring, twice in summer. May 4, 1956, near Reed, in Greer County, one was collected from a flock of "several hundred" flying over prairie dog colony by Dr. Carl Riggs (GMS).

White-Necked Raven-Recorded twice.

Seen in two different dogtowns in Cimarron County on April 15, 1967; a pair was seen at windmill which housed one complete and one partial nest. Two were feeding on the ground in the other dogtown.

Common Crow-Recorded 40 times.

Most-frequently, 1 to 4 seen feeding on ground in dogtowns; largest number observed in one dogtown was 8. On two occasions, I saw Crows feeding on dead prairie dogs. Species observed 16 times in winter, 11 in spring, 9 in summer, and 6 in fall.

Mockingbird-Recorded 14 times.

Total of 17 observed; perched near dogtowns 9 times, fed in dogtowns on ground 5 times. Always solitary, except on March 27, May 13, and May 31, 1967, when pairs were sighted. Old nests found in shrubs in dogtowns 3 times. Observed once in winter, 6 times in spring, 5 times in summer, and twice in fall.

Sprague's Pipit-Recorded twice, reported once.

November 8, 1966, 20 to 30 seen in open shortgrass areas of dogtown in McClain County. March 27, 1967, one collected amidst prickly-pear and grass in Canadian County dogtown. On November 5, 1955, Dr. George Sutton heard and saw one as it sprang from grass and rocks of a prairie dog colony near Reed, in Greer County. (GMS).

Loggerhead Shrike-Recorded 29 times.

Total of 34 seen, nearly always solitary, but pairs sighted on three occasions usually perched near dogtowns, scouting for insects. Species noted in winter 10 times, spring 7 times, summer 6 times, and fall 6 times.

Starling-Recorded 11 times.

Observed feeding in dogtowns or perched nearby. Species observed in winter 6 times, spring once, summer twice, and fall twice.

House Sparrow-Recorded 6 times.

Usually seen feeding around dogtowns near buildings. Species observed once in winter, twice in spring, twice in summer, and once in fall.

Meadowlark (Both Eastern and Western species)-Recorded 183 times.

Very commonly observed feeding among prairie dogs. Usually fewer than 10 seen in a colony, but about 50 were in dogtowns on three occasions in fall and winter. Species observed 58 times in winter, 62 times in spring, 33 times in summer, and 35 times in fall.

Meadowlarks have been reported in the literature as commonly occurring in prairie dog colonies by Smith (1967) and Koford (1958).

Redwinged Blackbird-Recorded 10 times.

Usually perched on fences or in trees in or near dogtowns; observed on ground in one colony, feeding among Brown-headed Cowbirds and Brewer's Blackbirds. Species seen twice in winter, 4 times in spring, 3 times in summer, and once in fall.

Bullock's Oriole (Most were probably Bullock's x Baltimore hybrids)-Recorded 11 times.

Frequently perched on fences or prominences in or near dogtowns. A total of 24 were seen, usually 1 to 4 at a time. May 13, 1967, pair seen building nest in tree in dogtown in Woodward County.—Species seen 3 times in spring, once in summer.

Brewer's Blackbird-Recorded twice.

Twice seen in dogtowns feeding among Brown-headed Cowbirds and Redwinged Blackbirds; approximately 40 seen February 28, 1967, in Jefferson County, and about 30 observed March 16, 1967, in Roger Mills County.

Boat-tailed Grackle-Recorded once, reported once.

December 31, 1966, about 18 noted feeding in dogtown in Cleveland County; ignored by prairie dogs. Mr. Louis McGee reported seeing them often on a small dogtown in Lawton (Comanche County).

Brown-headed Cowbird-Recorded 23 times.

Normally fed among cattle in prairie dog colonies, sometimes in flocks of 25-200. Observed among Redwinged Blackbirds and Brewer's Blackbirds on one occasion. Species recorded once in winter, 11 times in spring, and 11 times in summer.

Lark Bunting-Recorded 5 times.

Always observed feeding in dogtowns in small flocks of 10 or fewer except on April 15, 1967, when 40 were seen in a dogtown in Cimarron County characterized by sandsage and short grasses. Species seen in Beaver, Cimarron, and Texas Counties. Recorded 4 times in spring and once in fall.

Koford (1958) and Smith (1967) commonly observed

Lark Buntings in prairie dog towns.

Savannah Sparrow-Recorded 4 times.

Occasionally observed "sneaking" through taller grasses or feeding in dogtowns. Seen twice in winter and twice in spring.

Vesper Sparrow-Recorded 10 times.

Observed feeding in dogtowns in Beaver, Texas, and Cimarron counties 10 times from April 12 to 24, 1967.

Lark Sparrow-Recorded 47 times.

The commonest sparrow in dogtowns. Usually noted 1 to 4 at a time, feeding among prairie dogs. August 26, 1966, 13 noted in an abandoned dogtown in Kiowa County. Species observed 23 times in spring, 24 in summer.

McCown's Longspur-Recorded twice, reported once.

March 9, 1967, flock of some 450 seen feeding among prairie dogs in Comanche County dogtown; March 18, 1967, flock of 21 seen in small dogtown in Washita County. Dr. George Sutton recorded seeing two small flocks totalling possibly 30 birds near a small prairie dog colony north of Boise City in Cimarron County (GMS).

Lapland Longspur-Recorded 18 times, reported once.

Fewer than 10 usually seen feeding in dogtowns, but flocks of several hundred often seen. February 9, 1967, about 500 estimated in large prairie dog colony in Comanche County. Fed among Horned Larks 6 times. Species recorded 15 times in winter, twice in spring, and once in fall. January 1, 1962, Dr. George Sutton saw scattered individuals in a flock of Horned Larks near Boise City in Cimarron County, (GMS).

Chestnut-collared Longspur-Recorded 4 times.

Flocks containing as few as 4 and as many as 250 individuals seen in dogtowns in Comanche, Grady, Jefferson, and Stephens Counties. Noted in winter twice, spring twice.

MAMMALS

Eastern Mole-Recorded 7 times.

Evidence (tunnel ridges) noted in sandier dogtowns in Caddo, McClain, Custer, Washita, Harmon, and Ellis Counties.

Desert Cottontail-Recorded 59 times.

A total of 144 seen in 13 western Oklahoma counties; species most abundant in the panhandle where 76 were observed, and southwest, where 40 were seen. Only 3 recorded east of 99th meridian. Number of cottontails seen, by county: Jackson (40); Cimarron (33); Texas (22); Beaver (21); Ellis (9); Woodward (5); Harper (5); Roger Mills (2); Greer (2); Tillman (2); Stephens (1); Washita (1); and Beckham (1). Seen in 63 of 285 dogtowns, only 5 of which were inactive. Species took refuge in prairie dog burrows on 59 occasions. Seen grazing in dogtowns among prairie dogs 5 times. Usually ignored by prairie dogs. Dead cottontails were found in dogtowns 3 times. August 24, 1966, in a Jackson County dogtown, 24 were counted grazing among dense prickly-pear with prairie dogs in afternoon after a heavy rain. December 2, 1966, although air temperature was 18°F, one cottontail was seen at entrance of prairie dog burrow in large dogtown in Cimarron County; on same date, adult bald eagle flew from large dogtown in same vicinity carrying a cottontail. December 20, 1966, in Texas County, 6 were seen in a dogtown after dark, 2 retreated to prairie dog burrows, others attempted to hide among grass clumps and weeds.

There are many accounts in the literature concerning the relationship between the Desert Cottontail and prairie dogs. Bailey (1931) said that their habit of depending upon burrows for safety was so general that they were commonly called "prairie dog rabbits" by the ranchmen. Dano (1953), King (1955), and Smith (1967) observed that cottontails and

prairie dogs seemingly ignore each other while feeding together during the day. Dano (1953), however, stated that the rabbits were most active at night, remaining in the burrows during most of the day. They were abundant in the dogtowns studied by him, but either absent or relatively scarce in surrounding vicinities; in areas without burrows, they were completely absent. Usually, only one rabbit used a hole (I have seen as many as three near one burrow), and it was seldom occupied by prairie dogs. He found rabbits more numerous in active dogtowns than in those exterminated for more than a year; he summarized: "Extermination of the prairie dogs undoubtedly reduces the rabbit population by destroying a source of burrows." Smith (1967) reported both cottontails and jackrabbits abundant in the dogtown he studied in Kansas, and caught many cottontails in live traps, especially at night. Koford (1958) observed that the vegetation of prairie dog towns appears to favor an abundance of cottontails, which compete with prairie dogs for food. He further stated: "As these rabbits are one of the principal foods of Golden Eagles, Coyotes, and Bobcats, they act as alternate or buffer prey for enemies of the prairie dogs." My observations support Koford's findings.

Blacktail Jackrabbit-Recorded 54 times.

Species seen in dogtowns in Beaver, Caddo, Canadian, Cimarron, Cotton, Custer, Dewey, Garfield, Grant, Jackson, Kiowa, McClain, Texas, Tillman, Washita, and Woodward Counties. Often seen grazing, loitering, or sitting in shade of weeds, grass clumps, or fenceposts in dogtowns. Usually ignored by

prairie dogs. Largest number seen in one dogtown was 20, on September 3, 1966, resting in shade of wavy-leaved thistle, (Kiowa County). June 3, 1967, total of 45 observed in 4 Grant County dogtowns (16 in one, 14, 8, and 7 in other), all but a few in shade of fenceposts. Seen grazing in dogtowns 11 times. Dead jackrabbits were found in dogtowns 6 times. April 26, 1966, while watching prairie dogs in a McClain County dogtown, I heard a rustling sound in the grass behind me - three jackrabbits were running toward me in single file. They noticed me and swerved at the last minute, circled through the edge of the dogtown, then re-entered the pasture where I was sitting. After a few minutes, one loped almost up to me from the side, but veered to miss me. Five minutes later, the same rabbit came to within five feet of me from the rear before changing course. These jackrabbits, apparently courting, were seen repeatedly in the dogtown that morning.

In an active dogtown in McClain County, Phillips (1935) found, according to pellet counts, slightly more cottontails than jackrabbits. In an abandoned Cleveland County town, however, pellet counts revealed that jackrabbits were twice as plentiful as cottontails. Koford (1958) reported occasionally seeing White-tailed Jackrabbits at the mouths of prairie dog burrows, which they used as forms and refuges. Concerning Blacktail Jackrabbits, he stated: "Although Blacktail Jackrabbits might benefit from eating the forbs near prairie dog burrows, these hares are seldom common on dog towns. This scarcity may be caused by lack of shrubs and other tall cover, which prairie dogs eliminate." Smith (1967) reported that jackrabbits were more abundant than cottontails in the Kansas dogtown which he studied. In summer, he observed a kind of early morning "play activity" in which six to ten jackrabbits regularly formed a circle near the dogtown and took turns circling the group, two at a time, as

they all emitted guttural noises. The prairie dogs watched the jackrabbits curiously from atop their burrow mounds.

Blacktail jackrabbits probably act as buffer species for prairie dogs against eagles, the larger hawks, and Badgers. In early December, 1966, Rough-legged Hawks and eagles were preying heavily on Blacktail Jackrabbits within a mile of a very large prairie dog town three miles west of Boise City, in Cimarron County. In Badger scats from a Kiowa County dogtown harboring at least 20 jackrabbits I found jackrabbit remains, but no evidence of prairie dog predation.

Thirteen-lined Ground Squirrel-Recorded 25 times.

Total of 31 seen in dogtowns. Observed feeding in dogtowns 6 times; took refuge in deserted prairie dog holes 13 times, active holes twice, and their own burrows 4 times. Ignored by prairie dogs. Preferred open shortgrass situations typical of dogtowns. Observed in Beaver, Beckham, Cimarron, Custer, Dewey, Harper, Jackson, Kay, Kiowa, Texas, Tillman, and Woods Counties.

King (1955), Koford (1958), and Smith (1967) have reported seeing Thirteen-lined Ground Squirrels using prairie dog burrows as refuges in South Dakota, Colorado, and Kansas, respectively. King stated: "The prairie dogs under observation occasionally tried to investigate the ground squirrels, but the latter usually ran away." Smith said that, in most cases, "the prairie dog would utter deep throaty or guttural growls and chase the ground squirrel until it found shelter in a burrow." Koford thought them not important competitors of prairie dogs, especially since they hibernate about half the year.

Spotted Ground Squirrel-Recorded once.

May 13, 1967, two seen in small, sandy, almost depopulated dogtown in Harper County. One ran down an old prairie dog hole, although several ground squirrel burrows were present in the dogtown.

Plains Pocket Gopher-Recorded 88 times.

Mounds noted in sandy soil of 88 dogtowns in following counties: Alfalfa, Beaver, Beckham, Blaine, Caddo, Canadian, Comanche, Custer, Dewey, Ellis, Garvin, Grady, Harmon, Harper, Jackson, McClain, Major, Roger Mills, Stephens, Texas, Tillman, Washita, and Woodward.

Koford (1958) stated: "Pocket gophers (Thomomys, Geomys) and other small rodents may also occur on dogtowns." In central Oklahoma, Phillips (1935) found pocket gopher mounds on and around an active prairie dog colony, but no evidence of their presence in extirpated dogtowns.

Ord Kangaroo Rat-Recorded 7 times.

Burrows noted in 5 dogtowns in Cimarron, Dewey, and Texas Counties. Remains were found at mouths of prairie dog holes being used by Burrowing Owls twice during April, 1967, in Cimarron County.

Koford (1958) reported: "I also trapped Kangaroo rats (Dipodomys ordi) on dog towns, but they were scarce there as compared to adjacent areas with sandier soils."

Deer Mouse-Recorded 3 times.

November 24, 1966, 5 found in clumps of prickly-pear in small Jackson County dogtown; March 12, 1967, one found dead in large prairie dog colony in Comanche County; July 12 to 13, 1967, 4 trapped in dogtown in McClain County. Small holes noticed in several dogtowns may have been dug by Deer Mice.

King (1955) reported that Deer Mice used old prairie dog burrows for temporary refuges in South Dakota. Smith (1967) trapped Deer Mice in the dogtown he studied in Kansas. He

stated: "These inhabit old or little used prairie dog burrows." Deer Mice were at times abundant on the town, but usually made their nests under rocks. Koford (1958) called the Deer Mouse the "commonest mammal on most prairie dog towns." He found that they were active occasionally throughout winter, digging through snow to enter or leave prairie dog burrows. He further asserted that the vegetation characteristic of dogtowns may favor Deer Mice, and that they probably are buffer prey for prairie dogs. A rattlesnake he killed near a dogtown contained two Deer Mice and he often found their remains in the pellets of Burrowing Owls.

Southern Plains Woodrat-Recorded 12 times.

Nests found in 12 dogtowns in Beaver, Beckham, Cimarron, Greer and Jackson Counties. Nests were usually hemispherical tangles of prickly-pear leaves, cow dung, mesquite limbs, weeds, sticks, etc.; nests built over prairie dog holes were seen 7 times. May 6, 1967, female with 3 young attached to nipples found under limestone rock at edge of small dogtown in Jackson County.

Northern Grasshopper Mouse-Recorded once.

May 6, 1967, in a small Jackson County dogtown, an adult male with head eaten away found at mouth of burrow used by Burrowing Owls.

Koford (1958) found this species on "some dog towns." Smith (1967) trapped them within a dogtown in Kansas and observed: "These inhabit old or little used prairie dog burrows. In winter a prairie dog burrow inhabited by Onychomys is readily noticeable because the entrance to the burrow is stuffed with dry grass except for a hole about the size of a half dollar. The reactions of the prairie dog to

these animals are not known. Because the Grasshopper Mice are nocturnal there is probably little occasion for conflict."

Coyote-Recorded 19 times, reported 13 times.

Species observed in dogtowns on 3 occasions; seen in Cimarron, Dewey and Texas Counties. Tracks or scats seen in 13 dogtowns, especially on burrow mounds, which coyotes often used as defecation sites and urination signposts. Coyote droppings were sometimes found shredded in front of prairie dog holes used by Burrowing Owls. Mr. John Pickens, a predator and rodent control agent, reported that Coyotes frequently raise young in enlarged prairie dog holes and often avoid the summer heat by reposing in them, especially in the panhandle counties. On June 16, 1966, in a dogtown in Dewey County, I watched a Coyote amble lazily through a dogtown; the prairie dogs ran to their burrows, barked incessantly, but did not go down. The Coyote walked over a ridge, temporarily out of sight, but when he appeared again, was carrying in his mouth an animal I strongly suspected of being a prairie dog (no cottontails were ever seen in this town, although I visited it often). The Coyote ate the animal in the dogtown, cautiously looking around after every bite. When finished, he walked slowly out of the town, making no effort to catch nearby prairie dogs. I could find no remains of the prey, although I searched at length immediately after the Coyote left. On December 2, 1966, I observed a Coyote wandering about in a large dogtown in Cimarron County; he trotted over a ridge when he saw me. In Texas County, I watched one Coyote and heard two others in a very large (ca. 220 acres) prairie dog colony on December 20, 1966. Mr. Lyle Rexroat, a government trapper, reported trapping a female Coyote across the road from a dogtown with half a prairie dog in her mouth which she was apparently taking to her nine pups (pers. comm., January 14, 1967).

Coyotes reportedly hunt prairie dogs by hiding at the edge of a colony until an unwary prairie dog wanders too far from its burrow, then rushing for the rodent before it can get back to its hole. Sperry (1941) reported finding prairie dog remains regularly in Coyote stomachs where the ranges of the two animals overlap. He stated: "50 Coyotes collected in Montana in July and 349 taken in Colorado in August and

September had made 9 per cent of their last meals on prairie dogs. Frequently the stomachs were 100 per cent filled with these rodent remains, and occasionally parts of 2 or 3 individuals were present." Longhurst (1944) mentioned seeing 15 Coyotes in or near a colony of Gunnison Prairie Dogs in Colorado during the summer of 1941, and described three instances in which they had actually eaten prairie dogs. Although Smith (1967) saw no Coyotes in the dogtown he studied in Kansas, tracks indicated that they were frequent nocturnal visitors there. He considered predation on prairie dogs by Coyotes negligible to non-existent in the area of his study. Koford (1958) occasionally saw a Coyote "nosing among the burrows" of a South Dakota dogtown and heard a Coyote chorus at close range there every night. He maintained that both Coyotes and wolves were important rodent predators on the Great Plains a century ago, but that Coyotes are so few in number nowadays as to have little effect on prairie dog numbers.

Kit Fox-Recorded 4 times, reported twice.

In Texas County, Judge F. Hiner Dale stocked an acre in the Guymon City Park with about 50 prairie dogs in 1964, but by the spring of 1965, they had all been killed by Kit Foxes; a pair even raised a litter of pups in the dogtown. November 22, 1966, 5 freshly enlarged prairie dog holes used by Kit Foxes were found in one Texas County dogtown and 2 in another; in the latter, a prairie dog's tail was found near one of the dens. December 20, 1966, a Kit Fox skull was found near a den in a prairie dog town in Texas County. Mr. Marvin Elliot reported a Kit Fox den in his dogtown at Griggs, in Cimarron County, in which a pair raised young during the spring of 1964. April 20, 1967, adult fox was watched at length as it poked its head out of den in Texas County dogtown; two prairie dog skulls and jackrabbit remains were found at den entrance.

Raccoon-Recorded once.

November 15, 1966, in extirpated dogtown southeast of Hardesty, in Texas County, I observed an adult Raccoon about 4 or 5 feet down an enlarged prairie dog burrow approximately 150 yards from Palo Duro Creek.

Badger-Recorded 79 times.

Badgers were seen in dogtowns twice: September 3, 1966, I watched one at length in a Kiowa County dogtown; he wandered about, then disappeared into his den in the middle of the town. Twenty jackrabbits were in this prairie dog colony and Badger scats picked up in the dogtown were full of jackrabbit remains. On November 30, 1966, government trappers told me of seeing a Badger in a large (ca. 100 acres) prairie dog colony in Cimarron County which they had poisoned the same day. On April 16, 1967, I visited this town and saw two Badgers; they had dug out about half the prairie dog burrows in the colony, which was still quite active. In Blaine County, Mr. James Patterson owns a 140-acre prairie dog town in which he has sometimes found two or three prairie dog carcasses dug out by Badgers the previous night. This is a very old dogtown, and some of the burrows have been dug out by Badgers so often that the mounds are over two feet high and approximately ten feet in diameter. January 21, 1967, in a Greer County dogtown, a prairie dog carcass was found at the mouth of a burrow dug out by a Badger. Badgers are undoubtedly the most successful predators of prairie dogs in Oklahoma.

Koford (1958) and Smith (1967) also concluded that Badgers were the most effective natural enemies of Blacktailed Prairie Dogs and Tileston and Lechleitner (1966) reached the same conclusion regarding both Black and White-tailed Prairie Dogs. In a Kansas dogtown, Smith (1967) reported that three Badgers killed nine prairie dogs in one night. On three occasions Badgers killed prairie dogs in his mesh-wire traps, and he twice saw a Badger chase a prairie dog. Badgers are highly nocturnal, but Koford (1958) saw one or two at prairie dog burrows in the daytime. He found little evidence of

Badgers in dogtowns during the winter, but many of their diggings in late summer. Near Nunn, Colorado, Koford found fresh remains of prairie dog recently dug out of its hole by a Badger. He stated: "The effects of Badgers on prairie dogs are difficult to judge from observations of their excavations, for they may dig out burrows in the search for cottontails or mice, and they often feed on carrion." Badgers have often been reported digging in dogtowns recently poisoned by control agents.

Cahalane (1950) has reported Badgers and Coyotes hunting prairie dogs in the same dogtown, and it has been suggested that the two predators sometimes hunt as a team.

Striped Skunk-Recorded twice, reported 10 times.

April 24, 1966, one found dead at edge of McClain County dogtown; May 12, 1966, carcass found in large dogtown in Cimarron County. Reported from Beckham, Cimarron, Cotton, Custer, Greer, Kiowa, McClain, Major, and Washita Counties. Mr. Lyle Rexroat, a government predator and rodent control agent, told me of killing about 40 skunks in a large Kiowa County dogtown in 1960 or 1961 with cyanide guns set for Coyotes (pers. comm.). On February 12, 1967, Mrs. Pearl Peterson, who lives in Cotton County, told of a skunk giving birth to five or six young in an old prairie dog hole in an active dogtown on her farm; the burrow flooded, and the female pulled the little skunks out (pers. comm.). Mr. Balis Evatt of Meers, Oklahoma, reported seeing prairie dogs bury a skunk which entered a burrow in his dogtown in Kiowa County (pers. comm.).

Bobcat-Reported twice.

Occasionally observed in large Greer County dogtown by owner; once seen "crouching and jumping" at another animal, possibly a prairie dog or a rabbit in the dogtown. Only a few hundred yards from this dogtown is a deep, rocky canyon with many caves where Bobcats are said to rear young. Mr. Don Hawthorne, a government predator and rodent control agent, reported that several men had seen a Bobcat in a small dogtown near Cache,

in Comanche County; the cat allegedly lived on a small granitic knoll nearby. Bobcats are probably insignificant as predators of prairie dogs in Oklahoma.

Near a prairie dog town in Theodore Roosevelt National Memorial Park, South Dakota, a custodian witnessed a Bobcat eating a prairie dog in a tree while a Coyote and Badger watched (Cahalane, 1950). Koford (1958) reported that Bobcats may frequent dogtowns bordered by brushy slopes or canyons, and, as they have fairly limited home ranges, may prey heavily on a local rodent population. Observations by King (1955) show that Bobcats do occasionally prey on prairie dogs. He saw Bobcats on three different occasions in or near the dogtown he was studying in South Dakota and wrote:

"The first time was on August 11, 1949, when one was seen carrying a large prairiedog in its mouth along the canyon floor. When frightened, the cat dropped its prey and ran across the town, disappearing in some rocks on the other side of the canyon. The prairie dog was an adult male and was still warm.

White-tailed Deer-Recorded once, reported once.

October, 1965, John Steele, of the Oklahoma Department of Wildlife Conservation, saw 17 deer in a very large (1,000 acres) prairie dog town near Fort Sill in Comanche County; a Coyote was watching the herd. March 12, 1967, in the same dogtown, I saw six deer in a ravine and found the carcass of a doe.

In Wind Cave National Park, South Dakota, King (1955) reported that White-tailed Deer, Mule Deer, and Elk entered a dogtown at night to feed on the abundant forbs, and occasionally congregated on the town during the day.

Bison-Recorded 54 times.

Old wallow depressions common in dogtowns throughout western Oklahoma. Because water is retained longer in the wallows than on surrounding areas, vegetation is usually greener there in spring and summer. Wallows were usually about 6 or 8 feet in diameter and 3 to 5 inches deep. August 24, 1966, in a large Tillman County dogtown, 10 pairs of Couch's spadefoot toads and one pair of green toads were observed amplexing in Bison wallows inundated during extended rainy period. June 1, 1967, a Yellow Mud Turtle was seen in water-filled wallow in small dogtown in Woods County. June 2, 1967, a Yellow Mud Turtle, two Ornate Box Turtles, and a Pectoral Sandpiper were seen in large inundated Bison wallow in Woods County dogtown.

Smith (1967) has stated that an overgrazed condition is necessary for prairie dogs to become established, and that Bison originally filled the niche later taken over by cattle. King (1955) actually observed the affects of Bison on a prairie dog town in Wind Cave National Park, South Dakota. He reported that the burrow mounds were favorite sites for the start of wallows because of the denuded earth around them. Koford (1958) described the plant species found in Bison wallows during different seasons of the year in the prairie dog town studied by King.

Water

Merrian (1902) reported: "With respect to the theory that their burrows are deep enough to reach water, it need only be said that in some of the dog towns artesian wells have been sunk to the depth of 1,000 feet without striking water." During the eight and one-half years Young (1944) kept two prairie dogs captive, neither was known to drink

water. Koford (1958) theorized that prairie dog colonies often appear close to windmills or water impoundments because of the succulent vegetation, but cattle are also attracted to water sources, where they trample the ground and eat down the surrounding forage. He stated: "Grazing not only affects plants directly but it compacts the soil and changes its structure which, in turn, influences soil water and plant growth."

I often searched in vain for prairie dog tracks in muddy areas near dogtowns. Likewise, King (1955) never observed prairie dogs to drink any of the free water occasionally present in dogtowns after a summer rainfall.

Albinos

Albino prairie dogs have occasionally been mentioned in the literature. In a dogtown near Byers, Colorado, a dozen pure white prairie dogs could sometimes be seen at a time in 1905 (Cary, 1911). Koford (1958) was shown a colony near Ludlow, South Dakota, containing at least 30 white prairie dogs. During the year I was in the field, I saw only one albino, and Mr. John Pickens reported that he had seen only one during 30 years of rodent control work in Oklahoma.

Reproduction

Stockard (1929) reported that rupture of the vaginal membrane indicates the onset of breeding activity. The first female prairie dog I collected in this condition was

taken January 23, 1967, and the first pregnant female February 4, 1967, both from Comanche County. Anthony and Foreman (1951) studied prairie dogs from the same county and stated that "Mating probably occurs during the last week in January to early February," so that our findings coincide. They collected pregnant females from January 23 to March 28, 1950. Wade (1928) gave early February and Smith (1967) late January as the times for breeding to commence in southern Kansas, but the latter author stated that the date varied with the availability of food and severity of weather.

I first saw young-of-year prairie dogs on April 24 in both 1966 and 1967 but they were reported as early as April 8, 1967, by a government trapper in Comanche County. Johnson (1927) and Smith (1967) reported first sighting baby prairie dogs in mid-May in Kansas. Anthony and Foreman (1951) observed young prairie dogs in the Wichita Mountains (Comanche County) on April 17 in 1949 and 1950, and Glass and Halloran (1961) reported that young usually appear in the Wichitas between the first and third weeks of April.

Many factors influence litter size, such as the method used in determining the average, the fact that yearlings normally have smaller litters than adults, and that not all embryos result in viable young.

I found the average litter size to be 4.9, based on 49 litter counts ranging in size from 2 to 10. Embryo counts of 11 females gave an average litter size of 5.2,

with extremes of 3 and 7. In Kansas, Lantz (1905) and Smith (1967) both reported 4 as the average litter, but Wade (1928) found 5 the average of 48 embryo counts. Anthony and Foreman (1951) indicated an average litter size of 4.6, based on specimens from the Wichita Mountains in southwest Oklahoma.

Recommendations

Widespread poisoning of prairie dogs in Oklahoma has greatly diminished their former numbers. I found only 9,522 acres of active dogtowns throughout Oklahoma in 1967, but just six or seven years earlier, some 10,000 acres were poisoned on one ranch in Texas County (pers. comm., John Pickens). From actual count-estimates (actual count plus 0-15%, depending on temperature, rainfall, wind, and other factors that influenced prairie dog activity) at each of 280 colonies, a total of 34,511 prairie dogs was compiled. From these observations, I would estimate that approximately 10,200 acres of active prairie dog colonies and about 37,000 prairie dogs remained in Oklahoma as of August, 1967.

Colonies larger than 100 acres still existed in Beaver, Beckham, Blaine, Cimarron, Comanche, Texas, and Woods Counties. Dogtowns in more densely populated counties tended to be smaller than those in more open ones, e.g., Cimarron County. The three panhandle counties contained more and larger dogtowns, and greater numbers of prairie dogs, than did other counties in the state. Oklahoma prairie dog colonies averaged 34 acres in size.

As dogtowns are poisoned out, so are the Burrowing Owls and Desert Cottontails which live communally in abandoned prairie dog burrows. I counted only 788 owls and 144 cotton-tails in all the prairie dog colonies I investigated in Oklahoma. However, I saw no signs of the rare Black-footed Ferret in any of these dogtowns.

To preserve the Black-tailed Prairie Dog, and thus the Burrowing Owl and Desert Cottontail for posterity in Oklahoma, it is recommended that a policy of local control, but not complete decimation of prairie dogs, be followed by landowners. Week-end prairie dog hunts, especially during the fall, could provide sport and control simultaneously. When "drowned out" during April and May, young prairie dogs prove to be amusing pets that are both intelligent and clean. One fact stands out: only those who control the land are in a position to protect the dwindling prairie dog populations in Oklahoma.

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APPENDIX I

Appendix I. Location of prairie dog towns in Oklahoma
(August, 1967)

County	Section Number	Township-Range	Size in Acres	Owners
Alfalfa	23	26N-9W	3	Unknown
Total			<u>3</u>	
Beaver	5	4N-21E	1	Unknown
"	25	5N-21E	2	Unknown
"	33	5N-28E	2	Unknown
"	6	4N-27E	6	Bill Dyer
"	26	4N-21E	6	Floyd Myers
"	36	5N-22E	6	Blakemore Ranch
"	32	4N-24E	7	Unknown
"	10	4N-25E	7	Barby Ranch
"	26	5N-27E	8	Unknown
"	5	2N-23E	9	Evan Pierce
"	10	6N-25E	12	XIT Ranch
"	34	3N-21E	12	Lester Pyle
"	20	4N-22E	13	Unknown
"	27	6N-23E	15	Unknown
"	32	1N-24E	15	Unknown
"	26	6N-21E	25	Clifford Wakefield
"	31	4N-24E	30	E. A. McGrew
"	13	4N-27E	35	Edna Davidson
"	26	4N-23E	35	Irtle Gregg
"	16	2N-23E	36	Unknown
"	24	4N-21E	40	Unknown

County	Section Number	Township-Range	Size in Acres	Owners
Beaver	31	4N-28E	40	Otto Barby
"	18	4N-20E	80	B. Randles
"	33	4N-28E	100	Otto Barby
"	16 & 21	3N-21E	100	Laverne Davis
"	19	4N-22E	140	Unknown
"	18	3N-21E	140	Urid Gabler
"	14	6N-22E	160	Ted Lofland
"	16	6N-23E	200	XIT Ranch
"	18 & 19	2N-20E	240	Unknown
Total			1,522	
Beckham	16	8N-26W	2	Indian Land
"	21	11N-26W	2	Clarence Blevins
"	13	7N-25W	4	Leonard Mills
"	25	8N-26W	4	B. R. Smith
"	7	8N-24W	5	Fred Head
"	22	11N-26W	14	Clarence Blevins
"	16	10N-23W	50	Unknown
"	18	8N-24W	80	Tom Head
"	1	8N-27W	130	Alan Trimble
"	22	12N-21W	160	N. M. Cox and O. L. Spurlock
Total			451	
Blaine	6	18N-13W	1	Drexel Paden
"	26	15N-12W	5	Elmer Dickson
"	24	19N-13W	7	Pansy Ott
"	21	18N-12W	8	Harry Haigler, Jr.
"	24	18N-13W	12	Clarence Heath
"	12	13N-11W	15	E. Dillon
"	13	15N-12W	19	Jim Pierce
"	15	19N-10W	20	Unknown
"	7	14N-12W	65	Unknown
"	23	15N-11W	140	James Patterson
Total			292	

County	Section Number	Township-Range	Size in Acres	Owners
Caddo	15	6N-9W	5	Robert Myers
"	12	10N-9W	6	Odie Humphry
"	22	5N-13W	7	Morris Goodman
"	15	9N-9W	7	Walter Singleton
"	30	9N-10W	12	Audry Hancock
"	7	5N-13W	20	Lee Richardson
"	36	9N-9W	35	Vernon Fletcher
Total			92	
Canadian	32	13N-5W	1	Unknown
"	27	12N-6W	1.5	Oklahoma City, Okla.
"	11	12N-7W	2	Unknown
"	10	12N-9W	2	Pearl Boone
"	27	14N-8W	4.5	George Heupel
"	24	11N-10W	6	Levi Brogden
"	11	14N-5W	7	Wesley Waller
"	13	13N-5W	17	L. P. Kelley
"	33	12N-7W	35	Rose Lesle
Total			76	
Carter	2	3S-1W	30	Dean Fitzgerald
Total			30	
Cimarron	17	4N-2E	2	Unknown
"	22	3N-1E	3	Unknown
"	33	2N-9E	3	John & Marvin Elliot
"	13	1N-4E	3	Joe James
"	31	1N-6E	4	Joe James
"	32	5N-6E	4	R. D. Burnett
"	36	1N-6E	4	Perkins & Prothro Ranch
"	9	4N-3E	5	Charles Moore, Jr.
"	12 & 13	2N-3E	6	Unknown

County	Section Number	Township-Range	Size in Acres	Owners
Cimarron	8	4N-3E	8	Charles Moore, Jr.
"	6	4N-6E	11	Newt James
"	9	1N-5E	20	Roy Nall
"	21	1N-6E	20	Joe Bob James
"	31	4N-6E	20	Vernon Powers
"	33 & 34	5N-6E	24	R. D. Burnett
"	20	3N-6E	30	Roy Witten
"	6	3N-6E	30	Vernon Powers
"	29	2N-9E	40	John & Marvin Elliot
"	15 & 16	1N-6E	40	Joe Bob James
"	11	1N-4E	45	Louise Brooks
"	7	1N-7E	50	Perkins & Prothro Ranch
"	29	3N-6E	65	Kiser Moore
"	19	4N-3E	70	Charles Moore, Jr.
"	17	6N-4E	90	Marvin Benton
"	33	1N-3E	130	D. B. Thrash
"	22	2N-7E	140	Mac Archer
"	17	1N-1E	250	T. A. Griffins Cattle
"	20	3N-4E	300	June Walker & Bud Ellsworth
"	24 & 25	3N-4E	420	Z. F. Henshaw
Total			1,837	
Cleveland	11	10N-4W	8	Phillip Burgess
Total			8	
Comanche	30	2N-11W	2	Lawton, Oklahoma
"	10	2N-14W	5	U.S. Gov't
"	32	2N-14W	5	Indian Land
"	12	1S-11W	7	W. H. Dorsey
"	9	2N-10W	8	Unknown
"	10	4N-11W	8	Unknown

County	Section Number	Township-Range	Size in Acres	Owners
Comanche	18 --	2N-13W	8	Jack Howenstein
"	21	2N-15W	11	Indian Land
"	9 & 16	2N-14W	14	U.S. Gov't
"	4 & 8	3N-11W	24	Worth Fulbright Est.
"	1	2S-14W	25	Galen Robinson
"	2	1N-14W	40	Unknown
"	9	2N-9W	40	Henry Duesman
"	22	2N-10W	50	W. H. Wilson
"	10 & 15	2N-11W	250	U.S. Gov't
"	1, 12, 13, 14 & 24	3N-11W	1,000	U.S. Gov't
Total			1,497	
Cotton	31	1S-12W	1	Unknown
"	19	3S-12W	8	Unknown
"	20	1S-10W	11	Richard Walker, Jr.
"	9	3S-10W	15	William Froese
"	3	2S-10W	20	Everett Priddy
"	16	3S-11W	40	Pearl Peterson
Total			95	
Custer	6	14N-18W	2	Lee Smith
"	36	13N-15W	35	Anna Hamburger
"	20	12N-18W	40	Unknown
"	9	12N-16W	44	Isaac Fransen
Total			121	
Dewey	35	18N-17W	0.5	Loran Calkins
"	30	19N-14W	2.5	Ben Robinson
"	25	18N-18W	3	Clifford Calkins
"	3	16N-14W	5	Rollin Shaw
"	33	19N-16W	5	Ervin & Howard Kimbell
"	35	17N-18W	8	Ralph Chain

County	Section Number	Township-Range	Size in Acres	Owners
Dewey	7	18N-14W	10	Ben Robinson
"	14	16N-16W	10	Unknown
"	33	19N-14W	12	Lilly Robinson
"	5	16N-20W	25	Roy Craig
"	18 & 19	17N-16W	35	Earl Stidham
Total			116	
Ellis	20	23N-23W	1	Maxie Harvey
"	26	23N-24W	2	Irvin Sisters
"	15	23N-23W	2	Unknown
"	5	22N-23W	3	Unknown
"	35	23N-24W	4	Irvin Sisters &
"	2	22N-24W		Melvin Moyer
"	7	23N-23W	7	Unknown
"	7	16N-22W	10	Ivan Williams
"	10	19N-24W	35	Tom Larimore
"	14	23N-24W	50	Melvin Moyer
"	21	23N-26W	50	Unknown
Total			164	
Garfield	4	21N-6W	40	John Conway
Total			40	
Garvin	22	4N-2E	1	Unknown
"	20	4N-4W	3	J. A. Trammell
"	5	3N-3W	8	Unknown
Total			12	
Grady	19	7N-6W	1	Melvin Silvia
"	4	5N-7W	5	Grover C. Thomas
"	20	5N-5W	6	Stanley Driskell
"	4	3N-7W	7	Doyle Pendley &
"	30	7N-6W	7	Marlow, Oklahoma
"				Bill McMahan

County	Section Number	Township-Range	Size in Acres	Owners
Grady	35	10N-8W	9	Bob Scott
"	25	3N-6W	15	Luther Bagley & Clarence Stepick
"	7	9N-8W	15	Unknown
"	27	3N-5W	17	Don Howell
"	32	2N-6W	18	Joe Walker
"	24	7N-6W	23	Joe Humphreys
"	16	8N-8W	40	Edward Ewton & Chester Harned
Total			163	
Grant	21	27N-7W	2	Floyd Shafer
"	4	28N-7W	2	Speed Elliot, III
"	14	27N-7W	4	Ken Copeland
"	21	29N-6W	13	Oda Dickey
Total			21	
Greer	19	6N-25W	7	J.W. Hart
"	33	4N-22W	7	B. C. Hollenbeck
"	10 & 11	3N-22W	8	Unknown
"	8	5N-23W	15	Unknown
"	29 & 30	7N-24W	50	Dennis Vines & Leonard Mills
Total			87	
Harmon	9	4N-25W	2	Unknown
"	34	6N-26W	12	Unknown
"	24	5N-26W	25	J. W Hart
"	32	3N-26W	40	Glynn Bennett
"	20	6N-26W	50	Unknown
Total			129	
Harper	36	26N-24W	1	Eldon Crawford
"	30	27N-20W	4	Bob Selman
"	23	25N-23W	6	Glen Easterwood

County	Section Number	Township-Range	Size in Acres	Owners
Harper	36	29N-22W	7	Ples Barnett
"	19	28N-22W	9	Noel Norton
"	13 & 24	25N-24W	10	Vincent O'Hern & Doug Benbrook
"	5	25N-23W	12	Glen Easterwood
"	14	28N-26W	15	Lynn Allen
"	33	27N-22W	20	Otho Catlin
"	36	25N-24W	25	Unknown
"	23	26N-21W	50	Lockhart & Adams Ranch
Total			159	
Jackson	3	2N-22W	3	Kizziar Feed Lots
"	27	3N-23W	3	Hubert Blasingame
"	22	4N-19W	4	Bill Roach
"	28	1N-23W	17	Gordon Woods
"	31	1N-19W	43	Leona Southern
"	11	2N-23W	80	Republic Gypsum Co.
Total			150	
Jefferson	10	6S-6W	3	Glen Major
"	1	6S-4W	3	Guy Porter
"	17	7S-6W	4	B. R. England & Mozelle Wilcoxon
"	24	5S-7W	45	Glen Major
"	20	5S-8W	80	C. H. Rainwater
"	25	5S-4W	90	Shorty Absher
Total			225	
Kay	31	29N-1W	4	Unknown
"	19	29N-1E	35	Unknown
Total			39	
Kiowa	28	6N-16W	4	W. H. Schmidt & Wilbert Heller

County	Section Number	Township-Range	Size in Acres	Owners
Kiowa	18	6N-14W	6	Estil Zimmerman
"	34	5N-18W	9	Unknown
"	18	7N-15W	11	Carl Srock
"	36	3N-16W	11	Frank Fullingim
"	34	5N-14W	13	Balis Evatt
"	10	7N-19W	27	V. L. Smith
"	36	5N-17W	80	L. C. Bierman
Total			161	
McClain	28	5N-2W	1	J.C.Richmond, <u>et al.</u>
"	34	8N-4W	10	Unknown
"	6	5N-3W	70	F. L. Hart
"	30	5N-3W	80	Bill Harrison
Total			161	
Major	31	22N-15W	3	W. R. Hutchinson
"	32	20N-16W	3	T. Guffey
"	30	21N-15W	12	Helen Hoskins
"	33	20N-11W	20	Arlo Reames
"	5	21N-16W	65	Willis Smith & Gene Blumer
"	8	21N-15W	80	Unknown
Total			183	
Roger Mills	31	12N-24W	8	W. M. Bain
"	11	11N-23W	15	W. M. Millington
"	8	11N-26W	45	S. A. Burkhalter & Beloe Phyrer
"	10	13N-26W	65	Mary Barker & Billy Burns
Total			133	
Stephens	13	1S-6W	5	Phil Lowery, Jr.
"	12	2N-6W	6	Jim Whaley
"	17	2S-4W	7	Ken Jackson

County	Section Number	Township-Range	Size in Acres	Owners
Stephens	20	2S-7W	13	Unknown
"	1	3N-6W	15	Unknown
"	35	2N-4W	20	J. W. Ardrey
"	28	2S-6W	20	Unknown
"	35	1N-8W	25	Frank Kiser
"	26	2S-7W	40	Unknown
"	26	2N-4W	60	Duncan, Okla.
Total			211	
Texas	25	1N-15E	1	Unknown
"	36	3N-14E	1	H. F. Dale
"	24	3N-14E	2	Unknown
"	11	4N-16E	2	R. Q. Lowery
"	2	5N-13E	3	Unknown
"	19	1N-17E	3	R. Wagner
"	29	3N-11E	3	Unknown
"	1	3N-13E	5	T. J. Baker
"	29	2N-19E	8	Joe Morris
"	31	6N-19E	10	V. Hecox
"	1	4N-16E	10	Anna Honeman
"	8	2N-14E	10	Unknown
"	2	1N-10E	12	B. Johnson
"	5	4N-17E	15	Unknown
"	22	1N-18E	15	Unknown
"	36	1N-16E	20	Dave Wagner
"	12	4N-19E	25	C. Randles
"	17	1N-10E	25	P. S. Worley
"	7 & 18	1N-19E	40	Unknown
"	24	4N-18E	47	G. D. Chance
"	10	3N-13E	50	Ted Powell
"	2	1N-13E	50	D. Noble

County	Section Number	Township-Range	Size in Acres	Owners
Texas	18	2N-13E	90	G. L. Grice
"	21	2N-10E	100	Bearl Elliot
"	27	5N-13E	220	C. A. Blake
Total			697	
Tillman	9	3S-19W	5	Unknown
"	17	3S-17W	32	Unknown
"	33	1N-16W	52	Ed Stillman
"	26	1N-16W	80	Unknown
Total			169	
Washita	23	11N-16W	3	George Reimer
]	1	10N-17W	4	Emil Megert
"	33	11N-14W	4	Buel Lasley
"	21	11N-15W	5	D. W. Fischer
"	4	10N-16W	6	Vergil Raasch
"	23	10N-14W	9	Herman Howery
"	16	10N-14W	13	Henry Heidebrecht
"	4	9N-14W	16	Unknown
"	33	8N-16W	17	Ken Rice & Carl Hanzie
Total			77	
Woods	13	23N-13W	6	Frank Lawrence
"	1	26N-16W	20	Harry Gardner
"	30	25N-15W	25	Claude Seaman
"	10	26N-16W	75	Elbert Piper & Jean Jones
"	8	27N-19W	80	Harold Schwartz
"	16	27N-15W	120	H. A. Easterly
Total			326	
Woodward	34	21N-18W	2	R. H. Kirkwood (Leasee)
"	15	21N-20W	8	Claude Clark

County	Section Number	Township-Range	Size in Acres	Owners
Woodward	10	21N-20W	15	Joe Lock
"	9	20N-22W	20	Ham Hamilton
"	14	21N-22W	21	R. D. Adams
Total			66	
Overall Total			9,530	

APPENDIX II

Appendix II. Scientific names of plants used in the text.

Common Name	Scientific Name
Bermudagrass	<u>Cynodon dactylon</u>
Blue Grama	<u>Bouteloua gracilis</u>
Buffalograss	<u>Buchloe dactyloides</u>
Hairy Grama	<u>Bouteloua hirsuta</u>
Little Bluestem	<u>Andropogon scoparius</u>
Mesquite	<u>Prosopis juliflora</u>
Prairie Three-awn	<u>Aristida oligantha</u>
Prickly-pear	<u>Opuntia spp.</u>
Sandsage	<u>Artemisia filifolia</u>
Shinnery Oak	<u>Quercus spp.</u> (scrubby forms in western Oklahoma)
Soapweed	<u>Yucca glauca</u>
Wavy-leaved Thistle	<u>Cirsium undulatum</u>
Windmillgrass	<u>Chloris verticillata</u>