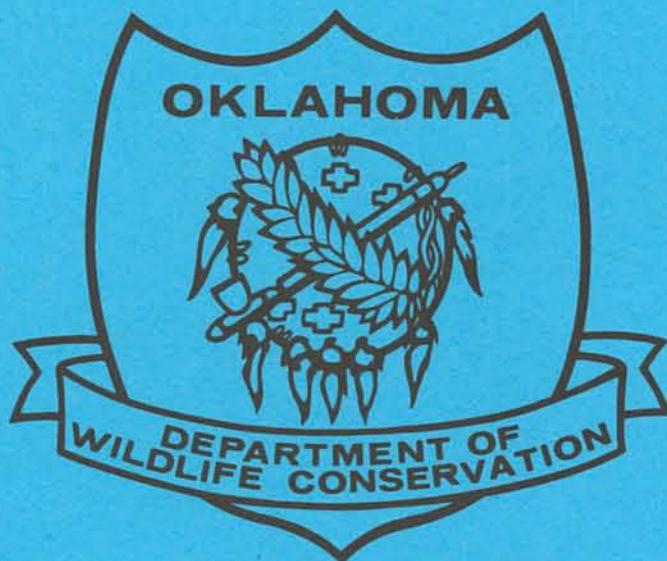


FINAL REPORT
SECTION 6
ENDANGERED SPECIES ACT



FEDERAL AID PROJECT E-18

DETERMINATION OF THE DISTRIBUTION AND ABUNDANCE OF THE
TEXAS HORNED LIZARD (Phrynosoma cornutum) IN OKLAHOMA

AUGUST 15, 1991 - MAY 31, 1993

FINAL REPORT

STATE: Oklahoma

PROJECT NO: E-18

PROJECT TITLE: Determination of the distribution and abundance of the Texas Horned Lizard (*Phrynosoma cornutum*) in Oklahoma.

PERIOD COVERED: 15 August 1991 - 31 May 1993

ABSTRACT

We assessed the historical and current distribution of the Texas Horned Lizard, *Phrynosoma cornutum*, in Oklahoma. Information on the historical distribution was gathered from (1) museum records from Oklahoma and major national museums, (2) non-museum records in the data base of the Oklahoma Biological Survey, (3) a review of the literature, (4) field notes of herpetologists who had worked in the state, (5) Oklahoma Department of Wildlife Conservation Scientific Collector Permit records, (6) a questionnaire mailed to 120 persons in Oklahoma with interests in herpetology and zoology, and (7) conversations and correspondence with knowledgeable people including herpetologists, naturalists and teachers. Selected field surveys were conducted during the summer of 1992 for *P. cornutum* at historical sites as well as sites where the lizard was likely to occur. All of the historical information accumulated indicates that the Texas Horned Lizard is rapidly disappearing in the eastern areas of Oklahoma where it was once known to occur in abundance. Our 1992 field surveys, although conservative estimates, have also led us to conclude that the number of sites in which *Phrynosoma* occur has been greatly reduced in the past 20 years.

I. PROGRAM NARRATIVE OBJECTIVE:

To assess the historical and current distribution and abundance of *Phrynosoma cornutum* in Oklahoma and relate presence/absence at sites to environmental factors.

II. JOB PROCEDURES:

1. Examine museum records from Oklahoma and major national museums, including non-museum records in the data base of the Oklahoma Biological Survey.
2. Review of pertinent literature.

3. Communicate with herpetologists, naturalists, teachers, and others who may be knowledgeable about the historical and present distribution.
4. Conduct selected field surveys in areas where *Phrynosoma cornutum* is known to occur and in areas where it historically occurred. Data will include the number of lizards observed, size, and sex. Environmental data to be gathered at each site will include time of day, air and soil temperature, weather conditions, habitat characteristics, and current land use. Historical land use at each site will be determined through interviews with local residents of SCS staff.
5. Analysis and synthesis of data and final report.
6. Provide management recommendations.

III. RESULTS

A. Historical Distribution of the Texas horned lizard (*Phrynosoma cornutum*) in Oklahoma.

1. General Historical Distribution.

The distribution of the Texas horned lizard was examined from a variety of sources, including appropriate field guides and other publications. These include the total known range for the species (Fig. 1. (E) Smith, 1946; (D) Reeve, 1952; (G) Smith and Brodie, 1982; (C) Price, 1990; (F) Conant and Collins, 1991), as well as, the distribution for Oklahoma (A) Webb, 1975; (B) Secor and Carpenter, 1984; Kansas (H) Collins, 1974) and Texas (I) Dixon, 1987).

These publications all presented distribution maps for their respective areas which are included as Fig. 1 (C-G). The total range maps indicated that this species was historically found throughout Oklahoma, with the exception being the extreme southeastern corner of the state, and are in agreement with the state distribution maps (Fig. 1 (A,B)). The maps for Kansas and Texas partly verify the maps for Oklahoma by showing that horned lizards range extensively along the borders of those states with Oklahoma. The scientific and popular literature relating to this species was thoroughly searched for distributional data (Carpenter and Krupa, 1989) and appropriately annotated.

2. Historical Distribution in Oklahoma.

(a) Museum Databases.

To determine the historical distribution of the Texas horned lizard we used two

separate computer data banks that had been previously set up by Dr. Carpenter. These data banks are housed at the Oklahoma Biological Survey and are:

(1) The catalogue for the Herpetology Collections in the Oklahoma Museum of Natural History (for which Dr. Carpenter served as Curator for over 30 years) and includes all catalogued specimens of the Texas horned lizard (*Phrynosoma cornutum*) from Oklahoma as well as from other areas of its range.

(2) The DOKARRS (Distribution of Oklahoma Amphibians and Reptiles by Recorded Sightings) data bank. Originally this data bank was set up by Dr. Carpenter to include all of his field sightings of these animals from 1952 to date, as well as field sightings and records of others in the state. Later, Dr. Carpenter decided to add any records that were not among our catalogued specimens. Thus, to enhance this data file, he wrote to all of the major natural history museums in the United States and requested their records of all Oklahoma specimens of reptiles and amphibians catalogued into their collections. The response to this request was very favorable and greatly extended the database for Oklahoma amphibians and reptiles, including data on the Texas Horned Lizard.

Using computer printouts we plotted a series of maps of Oklahoma, by counties and sequentially by decades beginning in 1920 (Fig. 2). The purpose of these maps was to determine if there were any indications of changes in distribution over the past approximately seventy years. Also plotted were the total OMNH (325) and DOKARRS records (317), respectively, for a total of all records (642) (Fig. 3).

These maps did not provide any significant information on the disappearance of *P. cornutum* from its known range, except a slight drop in the number of specimens reported from the southeastern region of the state. The maps did indicate that those counties with the greatest number of records were counties with large academic institutions (Cleveland County - the University of Oklahoma; Marshall County - University of Oklahoma Biological Station; Tulsa County - University of Tulsa, though many of these records can be attributed to a single person).

(b) Field Notes.

From 1952 until 1986 Dr. Carpenter conducted class field trips at the University of Oklahoma Biological Station in southern Oklahoma and from the Norman campus of the University. These classes were in Herpetology, Natural History of the Vertebrates and Animal Behavior. The Herpetology Class field trips from the Biological Station covered the southern tier of counties in Oklahoma, while the Norman campus field trips covered central, as well as, the southwestern corner of Oklahoma. In addition, Dr. Carpenter has led herpetology field trips for both the April and September field meetings of the Oklahoma Academy of Science, intermittently, for over 30 years.

During the 1950s and early 1960s this species was common in areas in Marshall County where it was frequently observed/collected by classes from the Biological Station. In the later 1960s very few Texas Horned Lizards were observed, and from the 1970s to date none have been recorded in the areas where they were once common (and their absence here was verified by the 1992 field survey). In a similar vein, areas of Norman where the species was frequently encountered in the 1950s are now apparently devoid of horned lizards.

The majority of Dr. Carpenter's records for this species from 1968 to 1986 were from the southwestern corner of the state: 2- crossing highway (1968); 1- juvenile (1978); 3- juveniles (1982); 4- juveniles (1984). The large number of specimens from Cleveland and Osage counties for this same period are misleading and represent intensive survey efforts of students at the University of Oklahoma for class projects in Cleveland County and an intensive survey effort by a state park biologist in Osage County.

Dr. Carpenter was the herpetologist involved (with one assistant) in two intensive herpetological surveys relating to environmental assessments (Carpenter, 1981) for industrial development. These were both in rural areas and provided a variety of habitats producing a good and varied herpetofauna representative of the area of the state in which they were located. Only two (2) Texas horned lizards were observed in Pawnee County, while none were seen in Mayes County. We believe these observations are evidence that *P. cornutum* has declined in these areas.

(c) Scientific Collectors Permits.

Oklahoma issues Scientific Collector Permits through the Oklahoma Department of Wildlife Conservation. We requested and were granted permission to examine recent permit requests and reports by those persons being issued such permits. A weakness in this following data is that of the 149 permits issued where requests were made to collect reptiles, less than 50% submitted required reports on collecting results. The following indicate that very few Texas horned lizards were acquired by these permit holders.

Data from Records of Oklahoma Scientific Collectors Permits (1985 - 1990).

- (1) 149 permits from across Oklahoma - 55 (37%) reporting
- (2) *Phrynosoma cornutum* - 20 collected by 4 permit holders.
 - Harmon County = 1 (C.C.Carpenter)
 - Woods County = 15 + 1 = 16 (Hankemeyer, Lardie)
 - Garfield Co. = 1 (Lardie)
 - Texas County = 1 (McCoy)
 - Cimarron Co. = 1 (McCoy)

- (3) All but 1 collected in NW Oklahoma counties

(d) Questionnaire and Responses.

In the spring of 1990 we prepared a questionnaire on the status of the Texas horned lizard (*Phrynosoma cornutum*) which we mailed to approximately 120 persons in Oklahoma with interests in herpetology and field zoology, including the membership list of the Oklahoma Herpetological Society. Of these, 42% went to individuals in some way associated with educational institutions (universities, colleges and museums). We received 56 (47%) replies which we considered a good response.

The purpose of the questionnaire was to gather information relating to past and recent observations of this lizard, its plight and related causes, indications of its decline, and possible recommendations relating to its protection. A copy of the questionnaire is included as Appendix 1. Below we summarize the questionnaire responses:

Most of the responders ranged in age from 25 to 45 for all areas of the state, but the majority were from central Oklahoma (area with the greatest population concentration). Twenty seven different counties in Oklahoma (Oklahoma has 77 counties) were listed by those responding, with the greatest number of these being counties in central and western Oklahoma. Most of those responding had seen a horned lizard within the last 2 to 3 years, but some had not seen any in 10 to 20 years. Comparatively, seventy five percent had seen fewer horned lizards in recent years than previously observed. Fifty seven percent stated they had last encountered a horned lizard in central and northeastern Oklahoma, which would be expected from the area of the responses. Seventy nine percent indicated that they thought the Texas Horned Lizard's presence was declining, with only four percent suggesting that they were holding their own. Fifteen counties were listed as areas of decline. Sixty eight percent believed that the Texas Horned Lizard in Oklahoma is threatened, while twenty percent believed it is endangered, as a species in Oklahoma. Ninety one percent were of the belief that it should be offered some sort of protection.

The consensus of those answering the questionnaire as to possible causes of its decline are as follows:

Housing development has had a major impact. Many commented that they first observed horned lizards when they moved into a new development, but that they soon had disappeared. Habitat change has had a great impact on the horned lizard. Agricultural practices were believed to have had an impact, though none offered direct evidence. They suggested that the increased use of insecticides, which would impact their major food source (ants) has had an effect. Predation (e.g. by introduced predators such as cats) was suggested as a moderate impact. Pet trade. This was suggested as having a moderate impact in two ways. Those bringing in horned lizards as pets and not knowing how to care for them, resulting in death, and perhaps professional collectors selling them to pet dealers. Some suggested that automobiles kill a large number since the horned lizard is known to bask on roads. Others

suggested pollution might be a factor in this species decline.

A number of suggestions were offered as means of protecting the horned lizard which included:

1. Make the public aware of the plight of this lizard.
2. Educate the youth of Oklahoma on the plight and how they should be protected.
3. Banning insecticide use.
4. Suspension of the pet trade in horned lizards from Oklahoma.
5. The need for monitored field studies to indicate the status of the horned lizard.

(e) Anecdotal Information.

The following are random anecdotes relating to the status of the Texas horned lizard in Oklahoma today. These were obtained by soliciting, but in some cases they were presented to us without any provocation.

(1) Oklahoma Academy of Science Meeting, Fall, 1991. Osage Hills State Park. From conversations with participants at field meeting. Jim Norman from eastern Oklahoma, without provocation, asked what has happened to this lizard. He had not seen any for a long time in his area, whereas they used to be common around Muskogee. He is a field ornithologist. Paul Buck of Tulsa had not seen any horned lizards recently. He is an active field botanist. A teacher from Pauls Valley had not seen any recently. When members on the herpetology field trip were asked, they mostly answered that they do not see horned lizards anymore. All seemed to agree that the decline of this lizard was in most cases associated with urban development.

(2) David Grow, Curator at the Oklahoma City Zoo Herpetarium. He and his sons, on 19th of May, were checking a field west of his house in Kelly Park, Edmond, a mixed grass prairie, a developing area with streets set up and left as that. He observed 13 *Phrynosoma cornutum*, 9 of them juveniles. This was significantly more than he had seen in past years.

(3) Don Perkins, via phone conversation on 11 Sept. 1991. He has not seen a horned lizard on his ranch in Pottawatomie County since 1977.

(4) Several University of Oklahoma Zoology faculty and graduate students that live in rural areas east of Norman reported seeing no or few *Phrynosoma* in areas that are just beginning to be developed.

(5) Art Harris (6 Nov. 1991) has lived in Rush Springs since the 1950s. When asked when he last saw a horned lizard he replied that he can't remember seeing any in recent years. He uses insecticides on his property. It is in an area also experiencing irrigation.

(6) Sonja Jahrsdoerfer (USFWS) saw a single horned lizard in her backyard in Tulsa (T19NR12E Sec. 9) in July and August, 1992.

(7) Dennis Feken of Perry, OK, reported "a lot" of horned lizards on his property to ODWC in 1992.

(8) Richard Lardie reported the following horned lizard sightings:

<u>observed/collected</u>	<u>time</u>	<u>locale</u>	<u>remarks</u>
5 June 91	11:55	2.1 mi. W. Enid via Chestnut St., .3 mi. S. on Imo Rd. Garfield, Co., OK	AOR on surfaced road, prob. female, areas sandy, bottom creek, large acreage housing development, fresh cut grass on east, disturbed grass area west. Coll. and released same location 16 June 92.
7 June 92	11:00 ⁺	4.0 mi. W. Enid via Chestnut from Garland, Garfield Co., OK	AOR, sandy road, off to North side of road and lost in disturbed area of grass.
13 June 91		1 mi. W. Enid via Chestnut from Garland	area sandy

(9) Ken Collins (USFWS) reported the following information from Skiatook, OK:
"I observed two horned lizards in my yard during the month of September approximately 2 weeks apart. On the first occasion, I saw a single, brownish colored individual. On the second occasion, I also observed a single individual, but the coloration was more grayish than brown. The location is (NW1/4, SE1/4, Sec. 26, T. 22 N., R. 12 E.). Each of the sightings was in the extreme eastern edge of my backyard. The area behind my house is a large fallow field that, prior to about two years ago, had been planted to wheat. Vegetation in the area is now fairly dense. Soils in the vicinity are generally silty clay to heavy clay."

(10) ODWC reported one sight record of *P. cornutum* from Fort Sill. The lizard was seen on July 19, 1992, in a short grass field with scattered mesquite and a sandy soil, on the west range of Fort Sill (T2N, R13W, Sec. 17). Drs. Janalee Caldwell and Laurie Vitt found one horned lizard at Fort Sill during their intensive herpetological survey of this area in 1992.

(11) 3 July 1992. A ranching couple that live northwest of Kingston, Marshall Co., and with whom we talked during the field survey, mentioned that the species seemed to be in decline before we could prompt them with such a suggestion.

(12) 23 July 1992. Pat McLarty, a rancher in Hitchcock, Blaine Co., said they are still as common as ever if one gets into "the right kind of country". His wife, however, mentioned that horned lizards are no longer seen in Hitchcock but they used to be.

B. Literature Review.

A review of all the literature pertaining to the Texas Horned Lizard in Oklahoma (Carpenter and Krupa, 1989) was carried out, and each reference was examined and annotated (see Bibliography). The great majority of these references merely listed this lizard as being present in certain locations with little or no indication of abundance. The majority of Texas Horned Lizard locations given in the literature were included in the Museum or DOKARRS records. The bibliography also includes the literature cited in this report.

Some of these papers indicate that this lizard was once abundant (Bonn and McCarley, 1953; Carpenter, 1955; Force, 1930; Lardie and Black, 1981; Moore and Rigney, 1941; Ortenburger and Freeman, 1930; Overdeer, 1991; Webb, 1975; Zimmerman and Brown, 1952). The dates of these publications refer to field observations 30 or more years ago. There are no indications that this lizard is abundant in these areas today. For those publications listing this species, it is probable that they are referring to one to three specimens only.

C. Natural History

Phrynosoma cornutum has a flat and robust body and is thus slow moving and slow to escape. It is cryptically colored and may lie motionless to escape predation. It is covered with a spiny integument which offers some protection. It has a wide distribution, from northeastern Kansas to southeastern Arizona, and east to Louisiana (Figure 1). The habitat it occupies is variable, but generally is located around its food supply of ants. The general habitats include grasslands and deserts, especially open areas, i.e. prairie dog towns. This lizard is a food specialist feeding primarily on ants (particularly members of the genus *Pogonomyrmex*). It has a large stomach (13% of body mass) to hold these chitinous insects which are hard to digest. It forages for long periods at various temperatures. Ants have a clumped distribution and the horned lizard is patchily distributed around this concentrated food supply. They exist in local populations with small activity areas. This lizard is eurythermal (active at many temperatures), possibly resulting from the lizard's need for long feeding periods. This makes them highly vulnerable to predation. Females produce large clutches of eggs (high reproductive investment) and have rotund bodies with which to support these clutches. As far as social behavior is concerned, this lizard is generally non-territorial

and non-aggressive, though they do exhibit weak aggressive displays.

D. 1992 Field Surveys

(1) Survey Methods

Field surveys were designed to cover as much of the state and as many sites as possible. We divided the state into four ecological regions based on predominant vegetation from Duck and Fletcher (1943), (Figure 4). These vegetation types were shortgrass-high plains, mixed grass eroded plains, tallgrass prairie and post oak-blackjack forest. Figure 4 gives historical location of *P. cornutum* from the Oklahoma Museum of Natural History specimen and DOKARRS databases (see section 2(a), this report), eliminating those records without precise location data (e.g. "Cimarron Co., OK") and those in present day cities (e.g. "Oklahoma City, Oklahoma, Co., OK"). Historic sites were selected for surveying partly by convenience; we decided on a route that passed through a maximum number of sites to allow for more "search time". Nonhistoric sites were selected on the basis of (a) apparent habitat suitability (i.e. - not cropland); (b) nearby historical records; and (c) protected areas were favored (i.e. - state parks, Nature Conservancy holdings). Forested areas were not surveyed because they are known to be unsuitable habitat and were not well represented in the historical records.

Historical sites, i.e. sites where horned lizards had been observed in the past, were thoroughly searched on foot and/or by road-cruising by two field biologists. Any changes in land use at these sites were recorded. The technique for finding horned lizards at non-historic sites was initially the "hunt and search" technique long employed by herpetologists surveying large areas and/or areas unfamiliar to them (Dodd et al. 1989, Mendelson and Jennings 1992). This technique involved driving secondary roads at approximately 20 mph with two observers in the car. If horned lizards were spotted, the site was then thoroughly searched on foot. Surveying was most intensive at dusk and dawn when horned lizards are most active (Pianka and Parker 1975). Surveys were conducted in June through September, 1992 (Table 1).

Data recorded at each site included specific location information, date, historic status, a description of the habitat type (e.g. "mesquite scrubs grass land"), soil type, current land uses, any known past land uses, surrounding land uses, potential threats, presence/absence of harvester ants (the lizard's primary food), and associated reptile species. Environmental parameters recorded for each site included time, ambient temperature (air, ground), ground cover, vegetation type, and potential predators (such as roadrunners).

Standard Oklahoma Natural Heritage Inventory Site Survey Forms were filled out for each site and detailed field notes were taken. At the request of ODWC, these sources of information have not been included here. Rather, the highlights from these two

sources have been combined and are included as Appendix 2.

When horned lizards were observed and captured they were measured and their sex noted. Measurements included snout vent length (SVL), total length (TL), mass, and cloacae temperature.

(2) Survey Results:

We surveyed 31 sites for *P. cornutum* in 1992. This number does not include areas where we "hunted and searched" for horned lizards but did not actually record sight information. Of these 31 sites, 15 were sites where *P. cornutum* had been observed in the past and 16 were sites that we judged to be suitable habitat for horned lizards (Table 1, Appendix 2). Of the 15 historic sites, seven were under cultivation and judged to no longer be suitable habitat. The remaining eight historical sites were judged to be at least potentially suitable because the land was only partly disturbed. No horned lizards were observed at any of the historical sites. Horned lizards were found at seven (7) of the non-historical sites (Tables 1 and 2, Appendix 2). *Pogonomyrmex* ants were active on six sites, and co-occurred with *P. cornutum* at two sites.

Surveying involved driving or walking through specific sites (as described above), as well as time spent in transit between sites. Disregarding the time spent in transit a total of 76.5 hours were spent actually searching sites during the 1992 field season. This under-represents the total time spent in *Phrynosoma* habitat, since we usually drove from site to site using back roads, on which it would have been possible to locate lizards. In fact, two of the six lizards found during the summer months (June-August) were found while we were driving between sites. During the 76.5 hours of search-time, we found six lizards (0.078 lizards/hour). This disregards the 11 *Phrynosoma* found on 11 September 1992. These were found by a group of 15 herpetology students in a vacant lot; all but one of the lizards were juveniles and this may have represented an unusually high density following the hatching of a single clutch of eggs in the area. To break down the total search time by time of day, we divided the day into arbitrary units:

	Total hours searched	Percent of total time
Early morning (before 0900):	8	10.5%
Late morning (0900-1200)	18	23.5%
Early afternoon (1200-1600)	23.5	30.7%
Late aft./evening (1600-2100)	27	35.3%

Because road surveys miss animals that are associated with cover, our estimates represent conservative estimates of presence/absence and abundance.

V. CONCLUSIONS, EVALUATIONS, AND RECOMMENDATIONS.

A. Probable Present Status

All of the historical information accumulated indicates that the Texas Horned Lizard is rapidly disappearing in the eastern areas of Oklahoma where it was once known to occur in abundance. Our 1992 field surveys, although conservative estimates, have also led us to conclude that the number of sites in which *Phrynosoma* occur has been greatly reduced in the past 20 years. Although we believe horned lizards have/are declining, anecdotal information and discussions with knowledgeable people (i.e. herpetologists, park naturalists) show that they can be locally abundant. For example, in one small vacant lot in Norman 11 lizards were found in one afternoon. Therefore, horned lizard populations can thrive in undeveloped areas with appropriate habitat.

B. Possible Factors Contributing to Decline:

This extreme patchiness of distribution makes horned lizards extremely vulnerable to changes in habitat, especially the loss of their major food, *Pogonomyrmex* ants. Intensive cultivation would be expected to render habitat unsuitable for horned lizards. Possible direct effects of this cultivation are that plowing could destroy adult lizards and their eggs, and pesticides would destroy the harvester ants, *Phrynosoma*'s favored food.

The following is a list of possible causes contributing to the demise of this lizard.

- (1) Housing development with urban expansion.
- (2) Habitat alteration.
- (3) Change in agricultural practices
 - a. Use of insecticides
 - 1) Insecticides kill food supply (ants).
 - 2) Insecticides may be directly toxic to Texas Horned Lizards, with egg viability and sensitivity of the hatchlings being the weak link.
 - b. Agricultural irrigation/excessive lawn watering may negatively impact the survival of this species.
- (4) Over collecting by those seeking pets and by collectors for the pet trade.
- (5) Predation
 - a. Automobiles. Many of these lizards have been killed while basking on roads.
 - b. Feral cats.

C. Recommendations:

Texas horned lizards should be able to maintain themselves in protected areas throughout the state. Because they do well in areas as small as city parks and vacant lots, the presence of horned lizard populations should be recognized and simple measures taken to preserve these local sites. These measures should include prohibition of collecting of lizards and restriction of biocides. The high fecundity of these lizards (30 eggs per clutch - Ballinger 1974, Pianka and Parker 1975) suggests that re-introduction to suitable habitat may be profitable.

The localized nature of the populations suggests efforts should be directed towards advertisement of the plight of the horned lizards at the local level. For example, a video produced by the Horned Lizard Conservation Society is available which targets school children. Education of the public may therefore prompt a farmer to allow a field to remain fallow if horned lizards are present or refrain from using pesticides on harvester ant nests.

Knowing the distribution of harvester ants (*Pogonomyrmex*) may tell us much about the potential distribution of horned lizards. Though harvester ants often persist in very disturbed areas such as towns, they may be declining in areas of agricultural pesticide use. These ants can be surveyed efficiently because their nest entrances are distinctive in appearance, and during the day in the summer the ants themselves are easily collected. Regional surveys of *Pogonomyrmex* ants might therefore prove beneficial.

**VI: ANNOTATED BIBLIOGRAPHY ON *PHRYNOSOMA CORNUTUM*
IN OKLAHOMA**

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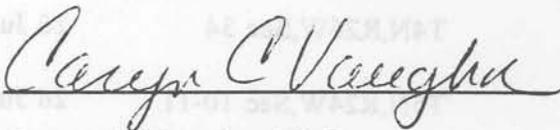
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VII. PREPARED BY:

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 Oklahoma Biological Survey
 University of Oklahoma
 2001 Priestly Ave., Bldg. 605
 Norman, Oklahoma 73019

DATE: Revised, 30 September 1993

APPROVED: Oklahoma Department of Wildlife Conservation

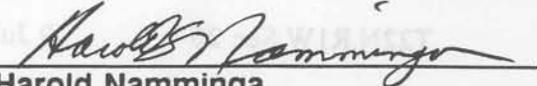
BY: 
Harold Namminga
 Federal Aid/Research Coordinator

Table 1. Results of survey efforts for Phrynosoma cornutum in Oklahoma.

County	Location	Date	Habitat	<u>Phrynosoma</u> <u>cornutum</u> four
Comanche	T3N,R15W,Sec 26	19 Jun 92	mixed-grass eroded plains	
Comanche	T3N,R13W,Sec 13	19 Jun 92	gravel lake bed	
Kiowa ¹	T6N,R18W,Sec 5-8	24 Jun 92	cropland	
Greer	T5N,R20W	25 Jun 92	sand-shortgrass	
Kiowa	T6N,R20W,Sec 33	25 Jun 92	stabilized dune	
Jackson ¹	T1S,R23W,Sec 8,9	25 Jun 92	cropland	
Harmon	T2N,R26W,Sec 21	25 Jun 92	mixed-grass sand	
Harmon ¹	T4N,R26W,Sec 34	26 Jun 92	sand grassland	
Greer ¹	T5N,R24W,Sec 10-11	26 Jun 92	sand grassland, former prairie dog town	
Beckham/ Greer	T7N,R25W,Sec 25-6,35-6 T7N,R24W,Sec 3	26 Jun 92	eroded hills, mesquite grassland	
Greer ¹	T5N,R23W,Sec 7	26 Jun 92	mesquite grassland	
Marshall ¹	T6S,R5E,Sec 9-11, 13-16,21-28	3,4 Jul 92	postoak forest, mixed-grass	
Bryan ¹	T8S,R7E,Sec 9,16	4 Jul 92	sand, cropland	
Noble ¹	T22N,R1W,Sec 26	9 Jul 92	cropland	
Osage	T28N,R9E,Sec 31-32	9 Jul 92	tallgrass prairie	
Okfuskee ¹	T12N,R8E,Sec 18-19,30	10 Jul 92	shortgrass	
Lincoln ¹	T12N,R5E,Sec 7,8,17,18	10 Jul 92	sand grassland	

¹ Historic record

Garfield ¹	T20N-T21N,R6W	19 Jul 92	rangeland	no
Garfield ¹	T22N,R5W-R4W	19 Jul 92	sand grassland	no
Garfield	T23,R8W,Sec 22	19 Jul 92	sand grassland	yes
Woods	T24N,R16W,Sec 26	20 Jul 92	stabilized dune	no
Cleveland	T9N,R2W,Sec 20	21 Jul 92	post oak-blackjack forest	yes
Blaine	T17N,R12W,Sec 24	23 Jul 92	mixed-grass eroded hills	no
Blaine	T17N,R11W,Sec 32,33	23 Jul 92	post oak, eroded hills	no
Custer ¹	T12N,R19W,Sec 10,12	9 Sep 92	stabilized dune	no
Cleveland	T8N,R2W,Sec 5	11 Sep 92	sand	yes
Harper ¹	T27N,R24W	14 Sep 92	mixed-grass eroded plains	no
Harper	T27N,R24W	14 Sep 92	sand grassland	no
Woodward	T26N,R18W	14 Sep 92	eroded hills	no
Beaver	T27N,R25E	25 Sep 92	eroded hills	yes
Beaver	R24E,T28N	25 Sep 92	prairie dog town, sand	no

Table 2. Environmental data for *Phrynosoma cornutum* captures and sightings. SVL is snout-vent length, TL is total length, temperatures are cloacal (C), air (A) and ground (G). Unknown indicates a sighting rather than a capture.

County	Location	Date	Time	Sex	Length(cm) (SVL/TL)	Mass(g)	Temperature (C/A/G)
Harmon	T2N,R26W,Sec21	25 Jun 92	19:35		---unknown---		NA/28.7/31.0
Beckham/ Greer	T7N,R25W,Sec25- 26,35-36,T7N,R24W, Sec3	26 Jun 92	12:20	F	8.5/11.5	26.5	37.2/28.7/34.7
Osage	T28N,R9E,Sec31-32	9 Jul 92	19:45	F	7.0/9.5	24.0	33.8/31.8/31.0
Osage	T28N,R9E,Sec31-32	9 Jul 92	10:10	M	6.6/8.8	17.5	31.9/30.4/29.4
Garfield	T23W,R8W,Sec22	19 Jul 92	18:20		---unknown---		NA/33.1/33.2
Cleveland	T9N,R2W,Sec20	21 Jul 92	12:00	J	5.4/7.2	10.9	N/A
Cleveland	T8N,R2W,Sec5	11 Sep 92	14:00	11 lizards (juveniles SVL 3.1,2.8,2.7,3.2, 2.9 female 6.8, 18 G)			
Beaver	T27N,R25E	25 Sep 92	10:00		---unknown---		Dead on road

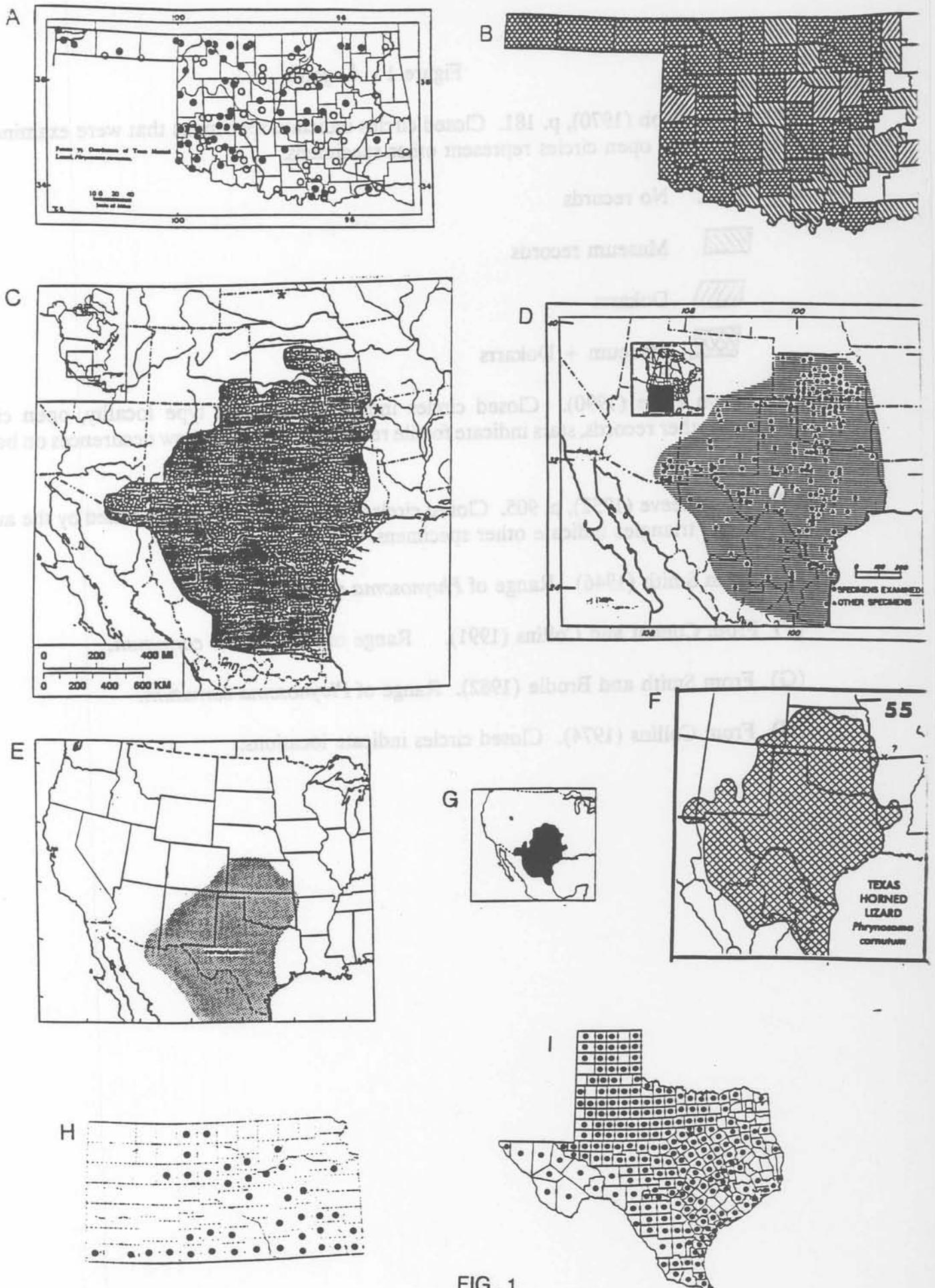


FIG. 1

Figure 1 - Legend

(A) From Webb (1970), p. 181. Closed circles indicate specimens that were examined by the author and open circles represent other specimens.

(B)  No records

 Museum records

 Dokarrs

 Museum + Dokarrs

(C) From Price (1990). Closed circles indicated restricted type locality, open circles represent other records, stars indicate fossile records, and arrows show occurrences on barrier islands.

(D) From Reeve (1952), p. 905. Closed circles indicate specimens examined by the author and closed triangles indicate other specimens.

(E) From Smith (1946). Range of *Phrynosoma cornutum*.

(F) From Conant and Collins (1991). Range of *Phrynosoma cornutum*.

(G) From Smith and Brodie (1982). Range of *Phrynosoma cornutum*.

(H) From Collins (1974). Closed circles indicate locations.

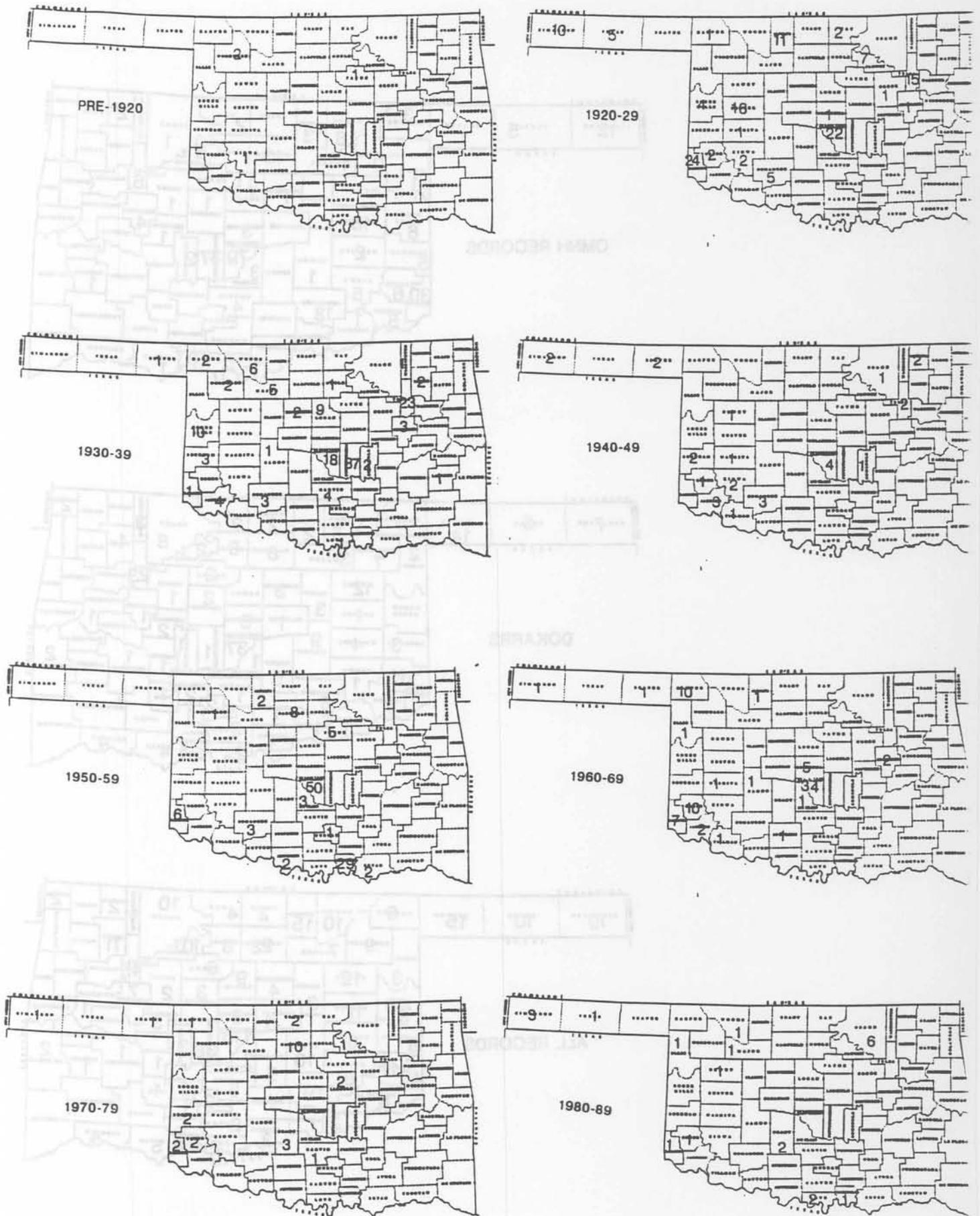
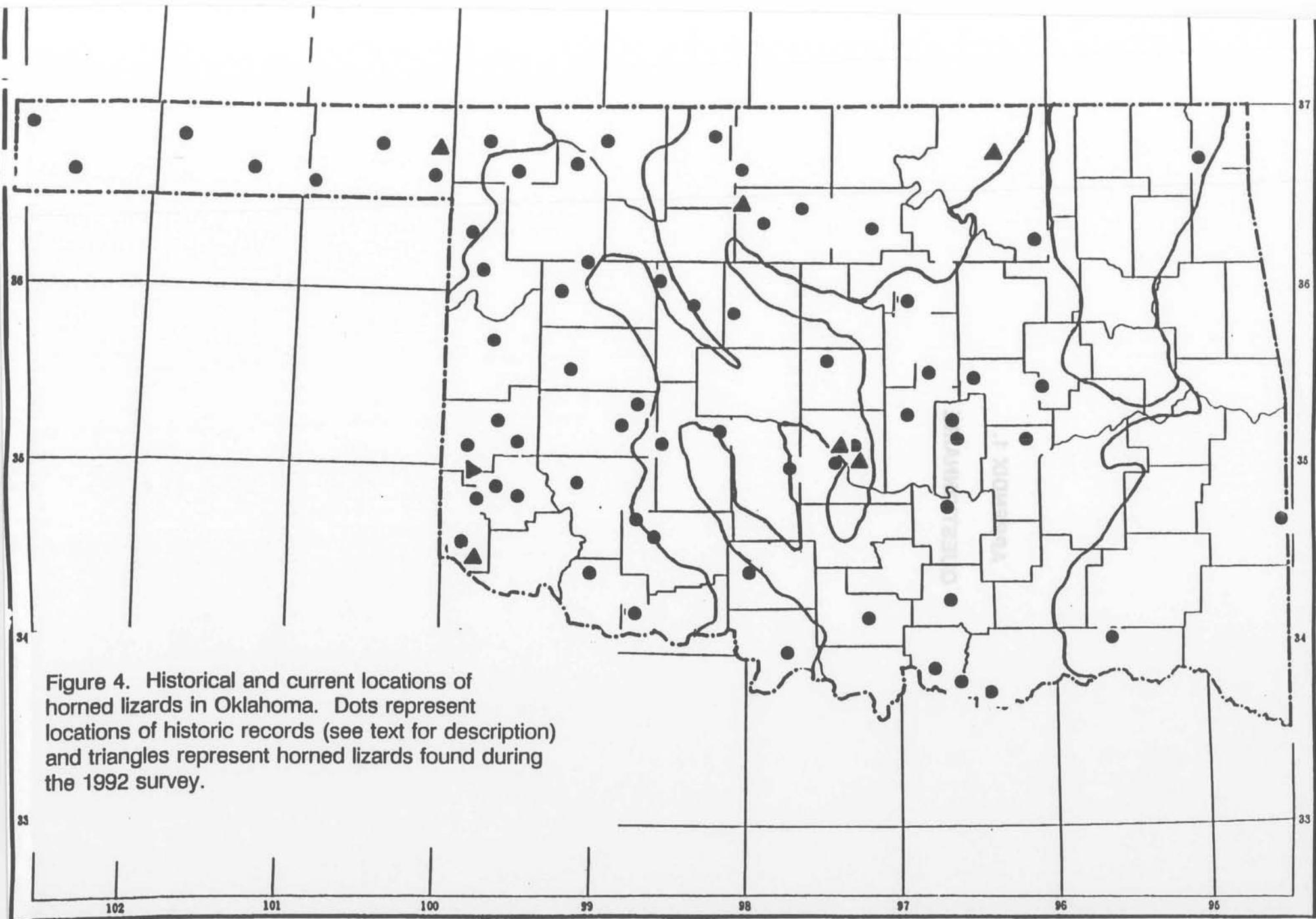
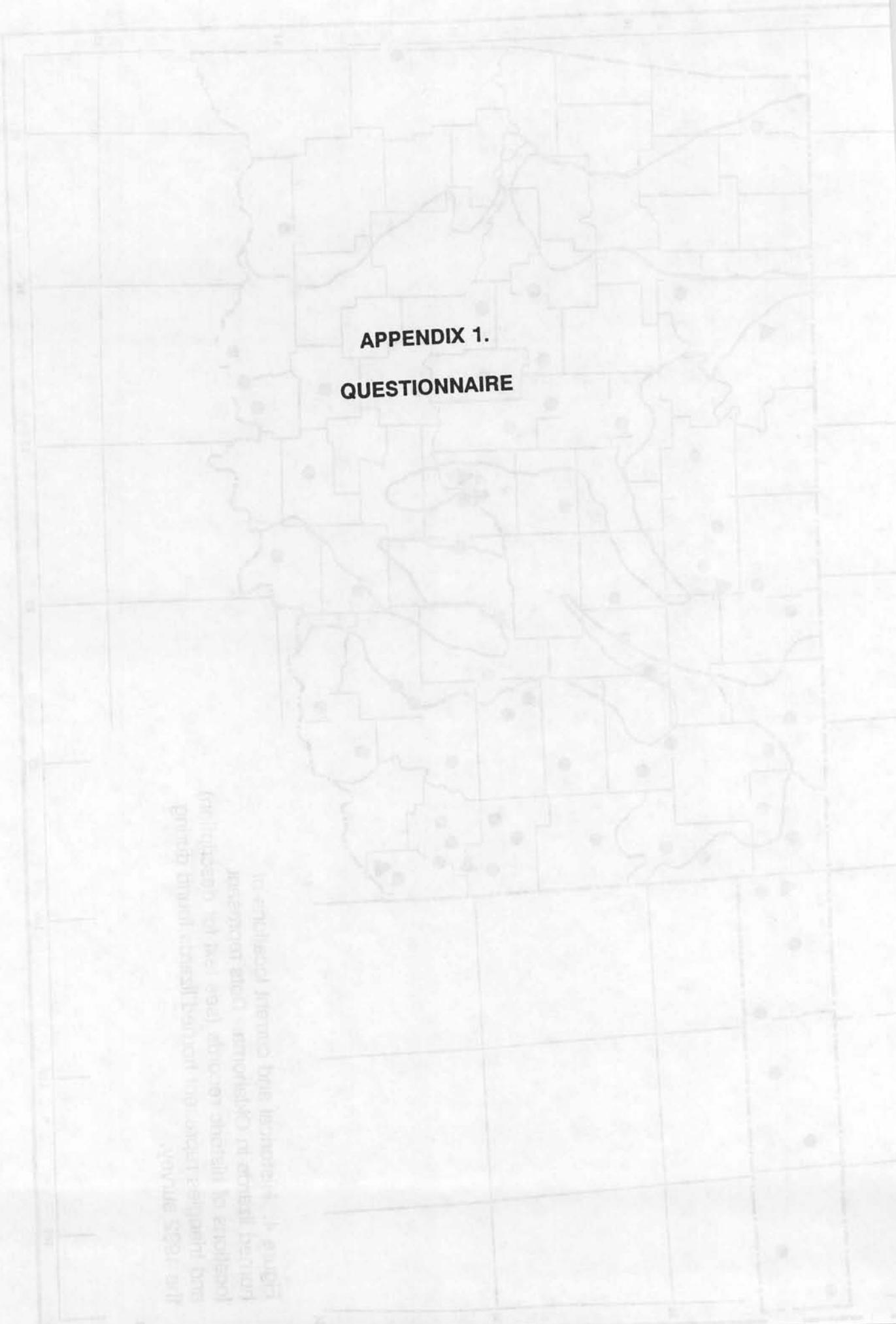


FIG. 2



APPENDIX 1.
QUESTIONNAIRE



11-10-1985
New York State
Department of Environmental Conservation
Division of Fish and Wildlife
1000 State Street
Albany, New York 12247



APPENDIX 1.

Oklahoma
Natural Heritage Inventory

OKLAHOMA BIOLOGICAL SURVEY
2001 Priestly Avenue, Building 605
Norman, Oklahoma 73019-0543
(405) 325-1985
FAX: (405) 325-7702

TEXAS HORNED LIZARD SURVEY

Would you please take a few minutes to read and answer some questions about the status of the TEXAS HORNED LIZARD (*Phrynosoma cornutum*) in Oklahoma. Each of us is, no doubt aware of the decline of this endemic member of our fauna. Your response will contribute to the formulation of a program which may help in implementing actions to promote the conservation of this species in Oklahoma. Please reply even if you haven't ever seen the species or haven't seen it for a long time.

(An addressed and stamped envelope is enclosed for your convenience in returning your reply)

Your name and address _____

Professional association (if any) _____

What is your age group: _____ 25-40 _____ 40-55 _____ 55 >

Area(s) of Oklahoma with which you have best familiarity.

_____ Northeastern Oklahoma _____ Eastcentral Oklahoma _____

_____ Southeastern Oklahoma _____ Northcentral Oklahoma _____

_____ Central Oklahoma _____ Southcentral Oklahoma _____

_____ Northwestern Oklahoma _____ Westcentral Oklahoma _____

_____ Southwestern Oklahoma _____ Oklahoma Panhandle _____

When did you last encounter this species in Oklahoma?

1989 _____, 1985-89 _____, 1980-84 _____.

Over 10 years ago _____.

Over 20 years ago _____.

How many individuals have you observed recently when compared to past years. _____

Where did you last encounter this species.

_____ NE OK _____ EC OK _____ SE OK _____ NC OK _____ C OK _____

_____ SC OK _____ NW OK _____ WC OK _____ SW OK _____

_____ OK Panhandle _____.

Where have you observed this species in its greatest abundance (List county or more specific - if you can)

Have you noticed decline in the presence of this species? _____
What areas do you know of where this species was once abundant, but is now rare or has disappeared? (List country and nearest town) _____

Do you have any knowledge of the past history of this species in Oklahoma?

Do you have any possible clues or suggestions on why there is a decline in the presence of this species?

Insecticides _____ Housing development _____
Eradication of ants (especially fire ants) _____
Habitat change _____ Agricultural practices _____
Predation, i.e., feral or pet house cats? _____
Other _____
Extirpation of native ants by fire ants _____

Have you heard others of your acquaintance mention the decline of this species?

Do you know of any anescdotes or stories (i.e., from your parents or grandparents, etc.) which relate to the presence and decline of this species?

Do you have any particular personal observations or comments on the presence and decline of this species?

Do you think that this species is threatened _____, endangered _____ in Oklahoma?

Should it be protected to help recover from decline? _____

Do you have any suggestions on how this species may be protected from further decline? (use separate paper, if necessary)

May we contact you again if more information is needed? _____

Thank you for your time and interest.

Charles C. Carpenter
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Norman, OK 73019

Caryn C. Vaughn
Zoologist
Oklahoma Natural Heritage Inventory
Oklahoma Biological Survey
(405) 325-2440

APPENDIX 2

RETURN FORMS TO: Oklahoma Natural Heritage Inventory
Oklahoma Biological Survey
2001 Priestly Avenue, Building 605
Norman, OK 73019-5301

May we contact you again if more information is needed?

Thank you for your time and interest.

Carin C. Yarnall
Zoologist
Oklahoma Natural Heritage Inventory
Oklahoma Biological Survey
(405) 325-2440

Charles L. Conner
Professor Emeritus of Zoology
Curator Emeritus of Reptiles and
Amphibians
Department of Zoology
University of Oklahoma
Norman, OK 73019

APPENDIX 2.

DESCRIPTIONS OF SITES SURVEYED DURING 1992

Oklahoma Biological Survey
2001 Pearly Avenue, Building 602
Norman, OK 73019-2001

County: Comanche County, Oklahoma

Township/Range/Section: T3N, R13W, Sec 13

Location: Approximately 1.3 miles west of Medicine Park on paved Refuge Road. South on dirt road to northern arm of Elmer Thomas Lake, now drained.

Date Visited: 19 June, 1992

Historic Status: C. C. Carpenter's field notes.

Habitat Description: Mesquite scrub grassland

Soil Type: Gravel and Silt

Current Land Uses: Grassland

Past Land Uses: Unknown

Surrounding Land Uses: Cropland/grazing

Potential Threats: None listed.

***Pogonomyrmex* Present:** Yes

***Phrynosoma* Present:** No

Associated Herps: *Cnemidophorus sexlineatus*

County: Kiowa County, Oklahoma

Township/Range/Section: T6N, R18W, Sec's 5,6,7&8

Location: 2 miles west of Hobart, then west 1 mile, south 3 miles, east 3 miles.

Date Visited: 24 June, 1992

Historic Status: O.U. museum record for *Phrynosoma cornutum*.

Habitat Description: Riparian forest and cropland

Soil Type: Clay, sand.

Current Land Uses: Cropland

Past Land Uses: Unknown

Surrounding Land Uses: Cropland

Potential Threats: Complete cover of agricultural crops and pesticide use.

***Pogonomyrmex* Present:** No

***Phrynosoma* Present:** No

Associated Herps: *Terrapene ornata*

County: Kiowa County, Oklahoma

Township/Range/Section: T6N, R20W, Sec 33

Location: Northeast shore Lake Altus, Quartz Mountain State Park

Date Visited: 25 June, 1992

Historic Status: None

Habitat Description: Sand dune scrub, much woody vegetation, grass tufts, *Yucca* present, scattered juniper and mesquite.

Soil Type: Sand

Current Land Uses: Grassland, lakeshore, recreation

Past Land Uses: Unknown

Surrounding Land Uses: Grassland, cropland, pasture/range, reservoir

Potential Threats: Capture and disturbance by humans, pesticides.

***Pogonomyrmex* Present:** Yes

***Phrynosoma* Present:** No

Associated Herps: *Cnemidophorus sexlineatus*, *Bufo cognatus*

County: Greer County, Oklahoma

Township/Range/Section: T5N, R20W

Location: Lake Altus Oklahoma, Quartz Mountain State Park

Date Visited: 25 June, 1992

Historic Status: None

Habitat Description: Sandy and dry, grass cover and some woody vegetation.

Soil Type: Fine sandy soil.

Current Land Uses: Managed area

Past Land Uses: Unknown

Surrounding Land Uses: Cropland and range land, some lakeshore.

Potential Threats: Pesticides, capture and disturbance by humans.

***Pogonomyrmex* Present:** Yes

***Phrynosoma* Present:** No

Associated Herps: *Cnemidophorus sexlineatus*

County: Jackson County, Oklahoma

Township/Range/Section: T1S, R23W, Sec's 8&9

Location: 1 mile North of Eldorado

Date Visited: 25 June, 1992

Historic Status: DOKARRS record, 1938

Habitat Description: Cropland with several man-made structures: buildings, plantations, roads and bridges.

Soil Type: Red silt and clay mixture.

Current Land Uses: Agriculture

Past Land Uses: Unknown

Surrounding Land Uses: Cropland

Potential Threats: Spread of agricultural area, pesticides.

***Pogonomyrmex* Present:** No

***Phrynosoma* Present:** No

Associated Herps: None found.

County: Harmon County, Oklahoma

Township/Range/Section: T2N, R26, Sec 21

Location: 3.25 miles southwest of Hollis.

Date Visited: 25 June, 1992

Historic Status: Confirmed habitat

Habitat Description: Open rangeland, grassy with herbaceous growth on outer edge and no woody growth.

Soil Type: Sandy

Current Land Uses: Cropland adjacent to road.

Past Land Uses: Unknown

Surrounding Land Uses: Roadside, plantation, pasture or range, and cropland.

Potential Threats: Overgrazing by cattle or cutting the roadside vegetation.

***Pogonomyrmex* Present:** Unknown

***Phrynosoma* Present:** Yes

Associated Herps: *Crotalus atrox*

County: Beckham and Greer Counties, Oklahoma

Township/Range/Section: T7N, R24W, Sec 3, T7N, R25W, Sec's 25,26,35,36

Location: Minnow Creek at Sandy Sanders Wildlife Management Area.

Date Visited: 26 June, 1992

Historic Status: None

Habitat Description: Grassland adjacent to road, shortgrass prairie with scattered junipers and small oaks on dry plateau area. Some erosion has occurred.

Soil Type: Sandy soil with scattered gypsum gravel.

Current Land Uses: Grassland near stream on managed area next to road. Area used by quail and deer hunters.

Past Land Uses: Unknown

Surrounding Land Uses: Pasture or rangeland, cropland and grassland.

Potential Threats: Fairly secure area. Disturbances include grazing, hunting and adjacent roads.

***Pogonomyrmex* Present:** Unknown

***Phrynosoma* Present:** Yes

Associated Herps: *Cnemidophorus gularis*, *Kinosternon flavescens*, *Rana blairi*, *Bufo debilis*.

County: Harmon County, Oklahoma

Township/Range/Section: T4, R26W, Sec 34

Location: 1 mile west and 6 miles north of Hollis.

Date Visited: 26 June, 1992

Historic Status: North of historic site.

Habitat Description: Short bunchgrass (sedge?) with small patches of bare ground, no woody plants

Soil Type: Sandy soil

Current Land Uses: Roadside grassland

Past Land Uses: Unknown

Surrounding Land Uses: Cropland and roadside

Potential Threats: Small area, less than a mile in length and 1/4 mile in width, roadside is also a disturbance.

***Pogonomyrmex* Present:** No

***Phrynosoma* Present:** No

Associated Herps: None listed.

County: Greer County, Oklahoma

Township/Range/Section: T5N, R24W, Sec 10 & 11

Location: 1 mile northwest of Reed.

Date Visited: 26 June, 1992

Historic Status: DOKARRS record for *Phrynosoma cornutum*, 1960.

Habitat Description: Old prairie dog town, prairie dogs apparently no longer present. Dense shortgrass prairie, no woody plants.

Soil Type: Sandy soil

Current Land Uses: Grassland, possibly used for cattle grazing, adjacent to intersection of two county roads.

Past Land Uses: Prairie dog town.

Surrounding Land Uses: Roadway and more grassland.

Potential Threats: Roadway.

***Pogonomyrmex* Present:** Yes

***Phrynosoma* Present:** No

Associated Herps: None found

County: Greer County, Oklahoma

Township/Range/Section: T5N, R23W, Sec 7

Location: 1 mile east then 1.5 miles north, on east side of road and south side of house.

Date Visited: 26 June, 1992

Historic Status: DOKARRS record for *Phrynosoma cornutum*, 1974.

Habitat Description: Mesquite grassland

Soil Type: Sandy soil

Current Land Uses: Grassland near house.

Past Land Uses: Unknown

Surrounding Land Uses: Not cited

Potential Threats: Not cited

***Pogonomyrmex* Present:** Not checked

***Phrynosoma* Present:** No

Associated Herps: *Cnemidophorus gularis*, *Kinosternon flavescens*, *Rana blairi*, *Bufo debilis*

County: Marshall County, Oklahoma

Township/Range/Section: T6S, R5E, Sec 9-11,13-16, 21-24, 25-28

Location: South of Madill, east to first road then north over Buncombe Creek to paved road parallel to Highway 70, to gravel road (named *Phrynosoma* Road, C. Carpenter, 1960.)

Date Visited: 3 & 4 July, 1992

Historic Status: DOKARRS record, 1960

Habitat Description: Grazing land, low topological relief with few small cattle ponds in area.

Soil Type: Sand and clay mix

Current Land Uses: Cattle grazing, wetland.

Past Land Uses: Unknown

Surrounding Land Uses: Pasture, roadside

Potential Threats: Roadway

***Pogonomyrmex* Present:** No

***Phrynosoma* Present:** No

Associated Herps: *Terrapene ornata*

County: Bryan County, Oklahoma

Township/Range/Section: T8S, R7E, Sec's 9 & 16

Location: 1 to 2 miles west of Cartwright/ north of Cartwright on Highway 70 through Platter to Mead.

Date Visited: 4 July, 1992

Historic Status: DOKARRS record

Habitat Description: Public beach bordering hardwood forest and lake area, seminatural grassland further inland (cruised areas.) Well manicured area around beach.

Soil Type: Sandy red soil

Current Land Uses: Lakeshore and recreation area

Past Land Uses: Unknown

Surrounding Land Uses: Wetland, cropland and range

Potential Threats: Human recreation, maintenance of area, pesticides and overgrazing.

***Pogonomyrmex* Present:** No

***Phrynosoma* Present:** No

Associated Herps: *Terrapene carolina*, *T. ornata*, *Chrysemys scripta*

County: Noble County, Oklahoma

Township/Range/Section: T22N, R1W, Sec 26

Location: 4 miles north of Perry, right after Black Bear Creek, 1 mile east then left on dirt road for 1 mile, then left on another dirt road.

Date Visited: 9 July, 1992

Historic Status: DOKARRS record

Habitat Description: Cropland with scattered woodland around creek and open range.

Soil Type: Gravel, although soil not investigated closely.

Current Land Uses: Cropland, roadside

Past Land Uses: Unknown

Surrounding Land Uses: Roadside and cropland

Potential Threats: Farming and pesticides, roadway also hazard.

***Pogonomyrmex* Present:** None observed

***Phrynosoma* Present:** No

Associated Herps: None observed.

County: Osage County, Oklahoma

Township/Range/Section: T28N, R9E, Sec's 31 & 32

Location: Tallgrass Prairie Preserve

Date Visited: 9 July, 1992

Historic Status: Confirmed site

Habitat Description: Tallgrass prairie vegetation.

Soil Type: Gravel and loam

Current Land Uses: Managed land

Past Land Uses: Grazing

Surrounding Land Uses: Grassland

Potential Threats: None

***Pogonomyrmex* Present:** Yes

***Phrynosoma* Present:** Yes

Associated Herps: *Thamnophis proximus*, *Terrapene ornata*

County: Lincoln County, Oklahoma

Township/Range/Section: T12N, R5E, Sec's 7, 8, 17, & 18

Location: 5-6 miles east of Meeker

Date Visited: 10 July, 1992

Historic Status: Ortenburger Expedition record, 1920's

Habitat Description: Non-riparian woods and open grassland area.

Soil Type: Sandy soil

Current Land Uses: Cropland and/or pasture, roadside

Past Land Uses: Unknown

Surrounding Land Uses: Cropland, grazing

Potential Threats: Encroachment of woods, pesticides from farming and roadside hazards.

***Pogonomyrmex* Present:** None observed

***Phrynosoma* Present:** No

Associated Herps: None

County: Okfuskee County, Oklahoma

Township/Range/Section: T12N, R8E, Sec's 18, 19, & 30

Location: 4 miles east of Paden, 1 mile west of Boley

Date Visited: 10 July, 1992

Historic Status: Historic site

Habitat Description: Rangeland with scrub trees and grass

Soil Type: Silt

Current Land Uses: Pasture and shrubland next to roadway.

Past Land Uses: Unknown

Surrounding Land Uses: Roadway, pasture

Potential Threats: Unprotected from agriculture or overgrazing.

***Pogonomyrmex* Present:** None observed

***Phrynosoma* Present:** No

Associated Herps: *Terrapene ornata*, *Cnemidophorus sexlineatus*

County: Garfield County, Oklahoma

Township/Range/Section: T20-21N, R6W

Location: South of Enid.

Date Visited: 19 July, 1992

Historic Status: DOKARRS record for *Phrynosoma cornutum*.

Habitat Description: Crop and rangeland near dirt road.

Soil Type: Sandy silt

Current Land Uses: Crop and rangeland, some scrubland, near dirt road.

Past Land Uses: Unknown

Surrounding Land Uses: Plantations, roadway and outbuildings.

Potential Threats: Cultivation and pesticides.

***Pogonomyrmex* Present:** None observed

***Phrynosoma* Present:** No

Associated Herps: None observed

County: Garfield County, Oklahoma

Township/Range/Section: T23N, R8W, Sec 22

Location: West of Enid

Date Visited: 19 July, 1992

Historic Status: None

Habitat Description: Shrubby area between a roadway and a plowed field.

Soil Type: Sandy soil

Current Land Uses: Roadside area bordering plowed cropland.

Past Land Uses: Unknown

Surrounding Land Uses: Roadway, cropland, and grazing.

Potential Threats: Roadway and plowed cropland expose lizard to death by machine and pesticide.

***Pogonomyrmex* Present:** Unknown

***Phrynosoma* Present:** Yes

Associated Herps: *Terrapene ornata*, *Kinosternum flavescens*

County: Garfield County, Oklahoma

Township/Range/Section: T22N, R5W-4W

Location: East of Enid

Date Visited: 19 July, 1992

Historic Status: DOKARRS record

Habitat Description: Grassland with some cropland, a few creeks intersect

Soil Type: Silt and gravel

Current Land Uses: Land adjacent roadside, cropland, rangeland with shrubs, and some oil and gas production.

Past Land Uses: Unknown

Surrounding Land Uses: Grazing, croplands, roadside, oil and gas production

Potential Threats: Possibility of overgrazing, pesticide use

***Pogonomyrmex* Present:** None observed

***Phrynosoma* Present:** No

Associated Herps: *Bufo cognatus*

County: Woods County, Oklahoma

Township/Range/Section: T24N, R16W, Sec 26

Location: Little Sahara State Park

Date Visited: 20 July 1992

Historic Status: None

Habitat Description: Sand dune plant community, *Artemesia* present along with tall Poaceae, *Yucca* and *Opuntia*. Many other wildflowers observed on top of gypsum sand dunes.

Soil Type: Sand

Current Land Uses: Recreational area

Past Land Uses: Unknown

Surrounding Land Uses: Shrubland and some pasture and cropland

Potential Threats: Off road vehicles have destroyed surrounding areas and may also affect the areas inhabitable by horned lizards.

***Pogonomyrmex* Present:** None observed possibly because of weather conditions.

***Phrynosoma* Present:** None observed possibly because of weather conditions.

Associated Herps: None observed possibly because of weather conditions.

County: Cleveland County, Oklahoma

Township/Range/Section: T9N, R2W, Sec 20

Location: George Sutton Urban Wilderness Park, Norman

Date Visited: 21 July, 1992

Historic Status: None

Habitat Description: Disturbed grassland with cedar and deciduous thickets, marshy wetlands and a pond, and small meadows containing tall grasses, cultivated irises, Lilac shrubs and non-cultivated flowering plants.

Soil Type: Loam or sand with clay lenses.

Current Land Uses: Managed park area with no access to motor vehicles.

Past Land Uses: In part, an old farmhouse site.

Surrounding Land Uses: Roadway and more unmowed fields.

Potential Threats: Bicycle and pedestrian traffic poses no threat if maintained at low levels.

***Pogonomyrmex* Present:** Unknown

***Phrynosoma* Present:** Yes

Associated Herps: None observed

County: Blaine County, Oklahoma

Township/Range/Section: T17N, R11W, Sec's 32 & 33

Location: 1 mile east of Roman Nose State Park

Date Visited: 23 July, 1992

Historic Status: None

Habitat Description: Hay pasture on east of roadway, juniper and scrub oak on west.

Soil Type: Sandy with gravel road.

Current Land Uses: Pasture, shrubland next to roadway.

Past Land Uses: Unknown

Surrounding Land Uses: Roadway, pasture/hay field.

Potential Threats: Children

***Pogonomyrmex* Present:** None observed

***Phrynosoma* Present:** No

Associated Herps: None observed

County: Blaine County, Oklahoma

Township/Range/Section: T17N, R12 W, Sec 24

Location: Roman Nose State Park , behind stables

Date Visited: 23 July, 1992

Historic Status: None

Habitat Description: Diverse plant community with some arid-adapted plants, ground cover ranges from 40-70%. Low areas have dense oak and juniper scrub, whereas tops of bluffs have open grassland with widely scattered juniper, oak, and sumac, some *Yucca* and *Opuntia*, and diverse wildflowers. Exposed crystalline gypsum outcroppings with subsequent erosion create small caves, forming possible retreats for collared lizards.

Soil Type: Gypsum rock and sandy soil.

Current Land Uses: Recreation

Past Land Uses: Unknown

Surrounding Land Uses: Forest, recreation, and roadway.

Potential Threats: None

***Pogonomyrmex* Present:** No

***Phrynosoma* Present:** No

Associated Herps: None observed

County: Cleveland County, Oklahoma

Township/Range/Section: T8N, R2W, Sec 5

Location: Norman, 1/2 mile east of the University of Oklahoma

Date Visited: 11 September, 1992

Historic Status: None

Habitat Description: Low weeds, 60-70% ground cover. Many plants typically associated with disturbed habitats. No shrubs or trees.

Soil Type: Sandy soil.

Current Land Uses: Vacant field

Past Land Uses: Unknown

Surrounding Land Uses: Tract adjacent to railroad tracks and near water tower and roadway.

Potential Threats: Site is small and isolated and is susceptible to further disturbance. Pesticides are probably present in nearby areas.

***Pogonomyrmex* Present:** Yes

***Phrynosoma* Present:** Yes

Associated Herps: None observed

County: Custer County, Oklahoma

Township/Range/Section: T12N, R19W, Sec's 10 & 12

Location: Foss State Park picnic area

Date Visited: 13 Sept, 1992

Historic Status: DOKARRS record

Habitat Description: Dry grassland next to reservoir that has sandy dry areas around it.

Soil Type: Silt and sand

Current Land Uses: Recreation area

Past Land Uses: Unknown

Surrounding Land Uses: Roads, dam

Potential Threats: Grass mowing

***Pogonomyrmex* Present:** Yes

***Phrynosoma* Present:** No

Associated Herps: None observed

County: Harper County, Oklahoma

Township/Range/Section: T27N, R24W

Location: Highway 46 to intersection 145, north 3 miles, site is on east side of road.

Date Visited: 14 September, 1992

Historic Status: None

Habitat Description: Grassland with hills

Soil Type: Gravel, silt and sand

Current Land Uses: Pasture and oil production

Past Land Uses: Unknown

Surrounding Land Uses: Roadway, pasture and oil production.

Potential Threats: None cited

***Pogonomyrmex* Present:** No

***Phrynosoma* Present:** No

Associated Herps: None observed

County: Harper County, Oklahoma

Township/Range/Section: T27N, R24W

Location: Doby Springs

Date Visited: 14 September, 1992

Historic Status: DOKARRS record

Habitat Description: Grassland

Soil Type: Silt

Current Land Uses: Cropland, pasture and roadside

Past Land Uses: Unknown

Surrounding Land Uses: Cropland, pasture and roadway

Potential Threats: Agriculture

***Pogonomyrmex* Present:** No

***Phrynosoma* Present:** No

Associated Herps: None observed

County: Woodward County, Oklahoma

Township/Range/Section: T26N, R18W

Location: Alabaster Caverns State Park

Date Visited: 14 September, 1992

Historic Status: None

Habitat Description: Red cedar, brush in canyon with stream running through.

Soil Type: Bedrock and gravel

Current Land Uses: Recreation

Past Land Uses: Hideout for infamous outlaws in the latter 19th century.

Surrounding Land Uses: Recreation

Potential Threats: None cited

***Pogonomyrmex* Present:** No

***Phrynosoma* Present:** No

Associated Herps: None observed

County: Beaver County, Oklahoma

Township/Range/Section: T28N, R24E

Location: Mayo Ranch

Date Visited: 25 September, 1992

Historic Status: None

Habitat Description: Prairie dog town with short (cropped) grass.

Soil Type: Gravel

Current Land Uses: Range

Past Land Uses: Unknown

Surrounding Land Uses: Ranching

Potential Threats: None listed

***Pogonomyrmex* Present:** No

***Phrynosoma* Present:** No

Associated Herps: None observed

County: Beaver County, Oklahoma

Township/Range/Section: T27N, R25E

Location: West on Highway 64, from gate 14 miles, right on dirt road, 2 miles.

Date Visited: 25 September, 1992

Historic Status: None

Habitat Description: Dry rangeland with some grass on a plateau with rocky semi-desert appearance.

Soil Type: Bedrock and gravel

Current Land Uses: Paleontological site

Past Land Uses: Unknown

Surrounding Land Uses: Roadway, pasture

Potential Threats: Roadway

***Pogonomyrmex* Present:** Unknown

***Phrynosoma* Present:** Yes, one dead (killed by vehicle)

Associated Herps: *Heterodon nasicus*

