

Insects of Western North America
**4. Survey of Selected Arthropod Taxa of Fort Sill,
Comanche County, Oklahoma. Part 3**

Chapter 1

Survey of Spiders (Arachnida, Araneae) of Fort Sill, Comanche Co., Oklahoma



Chapter 2

Survey of Selected Arthropod Taxa of Fort Sill, Comanche County, Oklahoma.

**III. Arachnida: Ixodidae, Scorpiones, Hexapoda: Ephemeroptera, Hemiptera, Homoptera,
Coleoptera, Neuroptera, Trichoptera, Lepidoptera, and Diptera**



**Contributions of the
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Colorado State University**

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Insects of Western North America
**4. Survey of Selected Arthropod Taxa of Fort Sill,
Comanche County, Oklahoma. III**

Edited by Paul A. Opler

Chapter 1

Survey of Spiders (Arachnida, Araneae) of Fort Sill, Comanche Co., Oklahoma

by

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Chapter 2

**Survey of Selected Arthropod Taxa of Fort Sill, Comanche County, Oklahoma.
III. Arachnida: Ixodidae, Scorpiones, Hexapoda: Ephemeroptera, Hemiptera, Homoptera,
Coleoptera, Neuroptera, Trichoptera, Lepidoptera, and Diptera**

by

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January 2005

**Contributions of the
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EXECUTIVE SUMMARY

Faunal and floral surveys on Federal lands are critical in the monitoring, conservation, and management of our Nation's natural resources. Integrating the knowledge gained from surveys, such as this, into management plans and activities on Fort Sill, Comanche County, Oklahoma may help reduce or prevent effects from activities associated with military construction and field exercises.

Moreover, such surveys are necessary to discover any species protected under the U.S. Endangered Species Act of 1973. Further, the presence of any other species listed by the State of Oklahoma as protected or sensitive, while not a legal mandate, can be included in management plans to prevent these species from becoming more vulnerable. The Endangered Species Act requires that no Federally funded activity, including those of the military, jeopardize the continued existence of listed Endangered or Threatened species or result in the destruction or adverse modification of their critical habitats.

Collection of such data is required for compliance with the National Environmental Policy Act of 1969. Identifying and documenting the locations of any listed, proposed, or candidate species on an installation are crucial to effectively balancing mission and conservation requirements. Army regulation 200-3 (1995) Sec. 11-11 states: "Installations will conduct initial, thorough inventories of plants, fish, wildlife, and habitat types on installation lands, using scientifically acceptable methodology. Installations will conduct a 100 percent inventory of suitable habitat for listed, proposed, or category 1 candidate species that may occur on the installation." Compliance with these policies and regulations requires knowledge of the numbers and habitats of rare species on an installation.

This is our third of a series of three reports on the inventory and status of selected insect and other arthropod groups at Fort Sill. In this publication, we report on the spiders, ticks, scorpions, mayflies, aquatic and semiaquatic true bugs, stink bugs, cicadas, alderflies, dobsonflies, fishflies, spongilla-flies, predaceous diving beetles, whirligig beetles, crawling water beetles, long-toed beetles, riffle beetles, water scavenger beetles, caddisflies, tortricid moths, geometrid moths, robber flies, and mydid flies found on Fort Sill. These groups of arthropods are important components of the ecosystems occurring on Fort Sill, and are considered good indicator groups for evaluating environmental disturbances (Samways, 1994). Our primary purpose was to discover whether any Federally listed, proposed, or candidate species occurred on Fort Sill. Secondarily, we wished to find out whether any sensitive or protected species listed by the State of Oklahoma occurred on the Fort.

Our 2004 survey revealed at least 573 species representing 168 species of spiders, five species of ticks, one species of scorpion, 19 species of mayflies, 27 species of aquatic and semiaquatic true bugs, 21 species of stink bugs, 2 species of alderflies, one species of dobsonfly, one species of fishfly, three species of spongilla-flies, 28 species of predaceous diving beetles, six species of whirligig beetles, eight species of crawling water beetles, 2 species of long-toed beetles, three species of riffle beetles, 31 species of water scavenger beetles, 59 species of caddisflies, 50 species of tortricid moths, 81 species of geometer moths, 55 species of

robberflies, and 2 species of mydas flies. None of these species are Federally listed, proposed or candidate species, and none are protected or being considered by the State of Oklahoma.

Summary and Management Considerations

Of the spiders, ticks, and insects included in this report and collected on Fort Sill, 38 spider species from 12 families are new records for Oklahoma including one undescribed species in the family Scytodidae and at least 40 insects are considered new state records for Oklahoma, a state that has been relatively well collected for many groups of arthropods (www.ento.okstate.edu/museum/museum.htm). The following new state records are noted: the water boatmen *Palmarcorixa nana walleye* Hungerford, the stink bugs *Agonoscelis puberula* Stål, *Andrallus spindens* (F.), and *Banasa calva* (Say); the spongilla fly *Climacia chapini* Parfin and Gurney (Hagen); the caddisflies *Oxyethira janella* Denning, *O. forcipata* Mosely, *Triaenodes helo* Milne, *Ylodes frontalis* (Banks); the robberflies *Atomosia sayii* Johnson, *A. tibialis* (Hull), *Cophura bella* (Loew), *Dicropaltum mesae* (Tucker), *Efferia monki* (Bromely), *E. plenus* (Hine), *E. subpilosus* (Schaeffer), *Haplopogon latus* (Coquillett), *Heteropogon lautus* (Bromley), *Ommatius tibialis* Say, *Laphria macquarti* (Banks), *Ospriocerus longulus* (Loew), *Philonicus limpidipennis* (Hine), *Proctacanthella leucopogon* (Williston), and *Promachus dimidiatus* Curran; the predaceous diving beetles *Acilius fraternus* Harris, *Coptotomus loticus* Hilsenhoff, *Desmopachria dispersa* (Crotch), *Graphoderus liberus* (Say), *Hydrovatus putulatus* (Melsheimer), *Hygrotus acaroides* (LeConte), and *Liodessus flavicollis* (LeConte); the whirligig beetles *Gyretes compressus* LeConte, and *Gyrinus woodruffi* Fall; the water crawling beetles *Haliphus fasciatus* Aube, *H. lewisii* Crotch, *H. tortilipenis* Brigham and Sanderson; the water scavenger beetles *Chaetarthria bicolor* and *Epimetopus* sp.; the geometrid moths *Eupithecia jejunata* McDunnough, *Eupithecia swettii* Grossbeck, *Eupithecia tenuata* (Hulst), *Anavitrinella atristrigaria* (Barnes and McDunnough), *Eusarca packardaria* (McDunnough), *Eusarca subflavaria* (Pearsall), *Exelis pyrolaria* Guenée, *Iridopsis perfectaria* (McDunnough), *Melanolophia signataria* (Walker), *Pimaphera sparsaria* (Walker), *Probole amicaria* (Herrich-Schäffer), and “*Semiothisa*” *cyda* (Druce), and the mydas fly *Mydas chrysostomus* Osten Sacken.

These species are discussed under each specific arthropod group. In regard to **Conservation Assessments**, no species was found during the survey that is a federally listed endangered or threatened species. In addition, no species collected during this survey was found that is considered a candidate for federal listing <http://endangered.fws.gov/wildlife.html> - **Species**. Additionally, no species listed by the Oklahoma Natural Heritage Working List of Rare Oklahoma Invertebrates (<ftp://www.biosurvey.ou.edu/pub/inverts0503.pdf>) were found on Fort Sill. Of all the spider, tick, and insect species collected on Fort Sill during the surveys, two of the more remarkable species found were a scientifically undescribed species in the spider family Scytodidae and the mydas fly *Mydas chrysostomus*, a species rarely collected throughout its poorly known range (Wilcox et al., 1989). Additional efforts should be made to locate other populations on Fort Sill. These areas should be protected from extensive disturbances.

Ticks are notorious as vectors for human and other animal diseases (Sonenshine et al., 2002). On Fort Sill, several common tick species, including the Lone Star Tick, American Dog Tick and Black-legged Tick are of public health importance. Lyme disease (*Borrelia burgdorferi*)

and bacterial tick fevers have been reported from Fort Sill. Continued use of personal protection is highly recommended, and in areas of intense human activities, acaricidal treatments and/or burning or clearing vegetation or even host removal is recommended.

It is highly recommended that all aquatic and terrestrial habitats on Fort Sill be managed for the least possible disturbances that are the result of military training and activities outside the cantonment and impact zones. Apparently, these activities have not currently substantially impacted much of the landscape outside the cantonment and impact zones. This approach should be maintained.

Kondratieff et al. (2004) have previously suggested management considerations for lakes, ponds, reservoirs and streams of Fort Sill. It is strongly recommended again that these suggestions be considered. For example, several permanent ponds should be left unstocked with fish to maintain populations of lake inhabiting species of mayflies, dragonflies and damselflies, true bugs, fishflies, alderflies, caddisflies, and aquatic beetles. In regard to streams, preventing unnecessary crossing of the major streams of Fort Sill by heavy vehicles should be restricted. Protecting streamside vegetation and any future alterations of the outlet structures of the dams or new dams should be carefully considered in terms impacts on aquatic biota.

It is strongly emphasized that **Fort Sill is truly an oasis of biodiversity** in the south-central region of Oklahoma. Its landscape traverses the elevated eastern edge of the Wichita Mountains on the Quanah Range to the rolling mixed and tall grasslands of the eastern part of the Fort. In almost all the groups of arthropods surveyed by Kondratieff et al. (2003; 2004) and this report, more than 1,330 species of arthropods were identified (Appendices A, C, D, E, F, G) with an average about 39% of the known Oklahoma species occurring on Fort Sill (Table 1). This fact should be made known to concerned organizations and commands associated with the Fort. The following recommendations that were noted in Kondratieff et al. (2004) are **re-emphasized**:

- 1. Designate appropriate-sized patches of grasslands throughout Fort Sill that are relatively permanently protected from disturbance, especially from sustained heavy vehicle use.**
- 2. Manage grasslands for maximum plant biodiversity by incorporating natural disturbances, such as fire and/or grazing to prevent shrubland or woodland encroachment.**
- 3. Keep activities and related impacts to a minimum along river/stream corridors such as along East Cache Creek, Blue Beaver, Post Oak Creek (Fig. 1), Rock Creek (Fig. 2) and West Cache Creek (Figs. 3 & 4) especially where there are areas of native aquatic vegetation or a native plant under story. These areas are particularly rich in a wide variety of arthropod species.**
- 4. Many of the lakes and ponds have especially dense surrounding vegetation and during especially dry periods or drought these areas have plants with nectar flowers that support butterflies during these especially harsh periods. We recommend that vegetation be maintained to the maximum practical extent in these areas.**

5. Maintain a managed database of the invertebrates for a long-term inventory. This information may be crucial to future natural resource management decisions.



Figure 1. Quanah Range, Post Oak Creek, South Boundary Road.



Figure 2. Quanah Range, Rock Creek, South Boundary Road.



Figure 3. Quanah Range, West Cache Creek, South Boundary Road.



Figure 4. Quanah Range, West Cache Creek, Border of Wichita Mountains National Wildlife Refuge.

Figures 1-4. Special aquatic habitats of Fort Sill, Comanche Co., Oklahoma.

Table 1. Selected taxa of Arthropods collected on Fort Sill as compared to known species recorded from Oklahoma in terms of percentage. Included groups were those that reliable distributional information was available. See Kondratieff et al., (2003, 2004) and this volume for sources.

Taxa	Fort Sill Species	Recorded Oklahoma Species	% of
Ixodidae	5	6	83%
Buthidae	1	1	100%
Ephemeroptera	22	89	25%
Odonata	68	133	51%
Acrididae	54	127	43%
Plecoptera	6	44	14%
Cicadidae	13	24	54%
Gerridae	5	15	33%
Hydrometridae	1	2	50%
Mesoveliidae	1	2	50%
Veliidae	4	11	36%
Belostomatidae	1	6	17%
Corixidae	8	22	36%
Gelastocoridae	1	1	100%
Nepidae	1	6	17%
Notonectidae	5	7	71%
Pleidae	1	1	100%
Pentatomidae	21	55	38%
Corydalidae	2	2	100%
Sialidae	2	5	40%
Sisyridae	3	2	150%
Carabidae	112	300	37%
Cicindelidae	17	27	63%
Dytiscidae	27	38	71%
Gyrinidae	6	11	55%
Haliplidae	8	10	80%
Cerambycidae	58	106	55%
Dryopidae	2	5	40%
Elmidae	3	26	12%
Hydrophilidae	31	55	56%
Scarabaeoidea	60	259	23%

Silphidae	4	15	27%
Asilidae	55	130	42%
Mydidae	2	3	67%
Trichoptera	59	146	40%
Hesperioidea	25	68	37%
Papilionoidea	49	114	43%
Arctiidae	24	37	65%
Notodontidae	23	17	135%
<i>Catocala</i>	19	59	32%
<i>Schinia</i>	17	41	42%
Sphingidae	16	32	50%
Saturniidae	4	13	31%
Apidae	5	12	42%
Formicidae	27	79	34%
Pompilidae	11	74	15%
Vespidae	22	89	25%
TOTAL	906	2,327	39%

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Chapter 1

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Summary

This report on the spiders of Fort Sill, Comanche County, Oklahoma is Chapter 1 of a larger report on selected insect taxa being produced by Kondratieff et al. from Colorado State University. The survey was conducted every other month from May 2004 through October 2004 with some additional material collected by Cushing, Kondratieff and others involved in the larger insect surveys during 2003.

We report on the diversity and status of spiders (Class Arachnida, Order Araneae) found in the major habitats on the base including short-grass prairie, mixed grass prairie, tall-grass prairie remnants, deciduous forest, dry xeric hillsides, riparian habitats and pond and lakeshore habitats. We also include data on species found in Fort Sill that have not previously been reported from Oklahoma as well as species found directly outside Fort Sill and in similar habitats in Oklahoma that are likely to also be found on the base but were not collected during the course of this study. We collected 168 species from 26 families of spiders on the base.

The primary purpose of this survey was to determine whether any federally or state listed, proposed, or candidate species occur on Fort Sill. No listed, proposed, or candidate spiders were collected during the course of this survey. Thirty-eight species from 12 families are new records for the state of Oklahoma including one undescribed species in the family Scytodidae. Sixty-nine species from 20 families had previously been collected from Comanche County, Oklahoma and may also be found on Fort Sill but were not collected during the present study. Five of these 20 families -- Ctenizidae, Cyrtoucheniidae, Diguetaeidae, Oecobiidae, and Titanoeidae -- are not represented by any species in our collecting efforts. Thus, the species list included in the present study does not include the full species assemblage of spiders found on Fort Sill.

Introduction

This is part of a larger study of the insect fauna of Fort Sill (U.S. Army), Comanche County, Oklahoma. Studies of the insect fauna have been submitted by Kondratieff et al., 2003, 2004 and present report). This chapter presents data on the spiders (Arthropoda, Araneae) collected on the base from March – September 2003 and May – October 2004. It is certain that more species than presented here exist on Fort Sill. As Nelson and Lake (1976) said, “a minimum of 5 to 10 years of consistent collecting in an area is required before a complete list can be approached.” Nevertheless, the list of spider species presented in this report likely represents a high percentage of the species diversity existing on the base.

Spiders are top predators in every terrestrial ecosystem on earth except Antarctica (Foelix, 1996). Some evidence exists suggesting that spiders may be good bioindicators of habitat quality. Predatory arthropods are slower to recolonize a restored, previously disturbed habitat than are herbivores (Williams, 1993). Therefore, they might be useful indicators of the success of projects aimed towards restoring habitats detrimentally affected by human activities such as overgrazing, urbanization, or pollution. It is thought that spider taxa in grasslands, freshwater marshes, and pristine woodlands in industrial countries are particularly at risk due to loss of habitat (Wells et al., 1983). In addition, burrowing spiders, cave dwellers, and others with specialized habitat requirements are vulnerable due to habitat destruction, mostly from urbanization (Coddington et al., 1990).

Despite these evident threats to spider populations, of the invertebrate species or populations listed under the U.S. Endangered Species Act, only eight are spiders (U.S. Fish and Wildlife Service, 2004). The IUCN Conservation Monitoring Centre lists only 15 spider species as potentially vulnerable (i.e., having restricted habitat requirements but with insufficient information to formally list them), vulnerable, threatened, or endangered (IUCN, 2003). The USDA Forest Service in the Rocky Mountain Region lists 167 species of plants and animals whose populations are considered sensitive due to limited ranges, impacted habitats, or declining population sizes. Of these, none are spiders and only five are arthropods (USDA Forest Service, personal communication). The NatureServe web site lists 156 spiders as vulnerable, threatened or endangered or with distribution data too deficient for listing (<http://www.natureserve.org>). Of these, the majority are cave dwelling spiders. This overall lack of representation in official listings of vulnerable or endangered wildlife as compared to the listings for vertebrate species reflects a significant lack of knowledge about Araneae.

We collected 168 species of spiders from 26 families on Fort Sill (Table 4). Of these none are listed as vulnerable, threatened or endangered on any federal or state list. However, a few of the species seem to have limited distributions on the base and several others have regional distribution data that is insufficient to evaluate the conservation status of the species according to the NatureServe site.

We collected four species thought to be of medical concern to humans: *Latrodectus mactans*, *L. variolus* (both in the family Theridiidae), *Loxosceles reclusa* (Sicariidae) and

Cheiracanthium inclusum (Miturgidae). The two species of *Latrodectus* are commonly referred to as black widow spiders. The venom from black widows is neurotoxic to humans and can cause severe systemic pain and other distinct symptoms after envenomation. However, these spiders are very timid and only bite when severely provoked. *Loxosceles reclusa* is commonly known as the brown recluse spider. Venom from this spider can cause necrotic lesions that take a very long time to heal. In severe cases of envenomation, large craters are left around the bite sites. These spiders are also timid and bite only when provoked. However, the populations of these spiders can be large within human habitations, increasing the chance of human-spider encounters. Bites occur most often when spiders seek refuge in shoes or clothing and bite when these articles are put on, effectively threatening the spider. Both black widows and brown recluses can also commonly be found in dark areas such as inside cabinets, behind furniture, or under logs or rocks in the garden. Caution should be taken before putting one's hands in these areas. The only other species found on the base that may be of medical concern is *Cheiracanthium inclusum*, commonly called the yellow sac spider. This species is commonly found inside houses and has been implicated in mild necrotic lesions or mildly painful bites. As with the other species with medically important venom, this species is unlikely to bite humans unless seriously provoked.

Objectives

The objectives of the Fort Sill spider survey were:

- document the species diversity of this taxonomic group on the base
- determine to what extent species diversity at Fort Sill is representative of the species diversity found throughout the state
- determine how different habitats found on this property affect diversity
- determine if any species exist that are of conservation concern

Materials and Methods

Several different collection methods are standard for collecting spiders: 1) aerial hand collecting, or collecting spiders found above knee level; 2) ground hand collecting, or collecting spiders found below knee level in the vegetation, leaf litter, or under rocks, logs and debris; 3) beating, using 1 m² (approximately) white sheet and a stick or handle of a net for beating spiders out of vegetation onto the sheet; 4) Berlese funnel extraction of leaf litter samples; 5) sweeping lower vegetation using a sweep net (similar to a butterfly net but with a canvas rather than a gauze net); and 6) headlamping at night (Coddington et al., 1991, 1996). Collecting was usually carried out for at least an hour at each site. More than one collecting technique was used. Since the majority of spiders are nocturnal (Foelix, 1996), we tried to include as much night collecting as feasible on the base.

Spiders collected using any of these techniques were placed immediately into 75% ethanol. The alcohol both killed and preserved the spiders. Collection labels containing locale data, date collected, ecological information, and collector's name were placed in the vials with

the specimens. The field data were also recorded in a field notebook. A handheld GPS unit was used to determine the latitude, longitude and elevation for the particular site.

Specimens were then returned to the Denver Museum of Nature & Science where they were identified to species. The collection data and taxonomic information was recorded in the museum-wide Argus database (Questor Company).

Table 2 lists the dates of the spider collecting trips for 2004 as well as the trips during which spiders were collected by Kondratieff, et al. incidentally while they conducted the insect survey in 2003. The collectors are also listed for each of the trips. During the July 2004 collecting trip, Walter Munsterman of the Wichita Mountain Wildlife Refuge joined Cushing and Francis.

Table 2. Dates of 2003 and 2004 collecting trips during which some spiders were collected along with insects (2003) or during which spiders were the focal group for collecting (2004).

Dates	Collectors
27 – 31 March 2003	Buckner, Garhart, Opler
24 – 28 April 2003	Kondratieff, Schmidt, Owens, Garhart, Opler
25 – 28 May 2003	Garhart
24 – 27 June 2003	Garhart
30 June – 3 July 2003	Owens, Schmidt
16 – 19 July 2003	Garhart
11 – 12 August 2003	Kondratieff, Leatherman, Owens, Schmidt
17 – 20 August 2003	Garhart, Harp
18 – 21 September 2003	Kondratieff, Schmidt, Zuellig, Cushing
26 – 29 September 2003	Garhart
29 – 30 May 2004	Cushing, Francis
2 – 11 July 2004	Cushing, Francis, Munsterman
1 – 3 October 2004	Cushing, Francis

The major habitat types found on the base include mixed-grass prairie, tall-grass prairie remnants, deciduous forest, dry xeric hillsides, riparian habitats, pond and lakeshore habitats, and one synanthropic habitat. The collecting locales representing each of these habitat types are listed in Table 3.

Table 3. Spider collecting sites on Fort Sill classified by habitat type. Besides the major habitat types found on base, we have also included the Natural Resources Building and area since some spiders are well adapted to thrive in and around human dwellings (this is designated below as Habitat Type “Synanthropic”).

Habitat Type	Site Location	Lat/Long
Tall Grass	East Range, East Boundary Rd	34°39'19"N, 98°16'57"W & 34°38'16"N, 98°19'11"W
Mixed Grass (Plate 1A)	East Range off Elgin Rd	34°44'16"N, 98°20'10"W & 34°44'31"N, 98°20'25"W
	Deer Creek Canyon Rd & Blue	34°42'07"N, 98°34'07"W

	Beaver Valley Rd	
	West Range, Quanah	34°38'22"N, 98°40'38"W
	Quanah Range, Rock Creek	34°38'28"N, 98°39'34"W
Forest	Medicine Bluff Historic Site	34°41'06"N, 98°24'54"W
	East Range, near Sitting Bear Creek	34°38'53"N, 98°22'07"W
	East Range, Geronimo's Grave	34°41'46"N, 98°22'12"W
	East Range, East Cache Creek nr Peachtree Xing	34°41'14"N, 98°22'51"W
	East Range, NE boundary of base	34°31'50"N, 98°16'59"W
	West Range, Medicine Creek	34°43'03"N, 98°29'26"W
	Quanah Range, near border Wichita Mountain National Wildlife Refuge	34°40'53"N, 98°39'03"W
Riparian (Plate 1B)	East Range, East Cache Creek	34°38'35"N, 98°21'41"W
	West Range, Four Mile Crossing	34°41'16"N, 98°26'46"W
	West Range, Blue Beaver Creek	34°39'09"N, 98°33'12"W
	Quanah Range, Rock Creek	34°38'26"N, 98°39'35"W
	Quanah Range, West Cache Creek	34°38'59"N, 98°39'00"W
Pond / Lake (Plate 1C)	East Range, Lake George	34°38'44"N, 98°20'35"W
	West Range, Ketch Lake	34°42'18"N, 98°35'30"W
	West Range, Mandam Pond	34°43'09"N, 98°34'25"W
	West Range, Engineer Lake	34°42'40"N, 98°34'04"W
	Lake Elmer Thomas Recreation Area (LETRA)	34°43'09"N, 98°31'47"W
	Quanah Range, Pottawattomi Pond	34°39'24"N, 98°38'24"W
	Quanah Range, 3 mi west Falcon Gate	34°38'18"N, 98°44'48"W
Dry xeric hillside (Plate 1D)	Hillside north Medicine Bluff	34°41'18"N, 98°24'52"W
	West Range, hillside near Engineer Lake	34°43'26"N, 98°33'53"W
	West Range, hillside near Mandam Pond	34°43'28"N, 98°33'50"W
	West Range, near Ketch Lake	34°42'15"N, 98°35'24"W
Synanthropic	Natural Resources Area	34°41'04"N, 98°24'30"W

Results and Discussion

Table 4 lists the spiders found in the different habitats on Fort Sill. The more common species are illustrated in the photographic plates referenced in Table 4 next to those species names. Individual database records including detailed information on numbers of specimens collected and exact locations of each are included in Appendix A. Worldwide there are over 38,000 spider species in 110 different families (Platnick, 2004). North America is home to at least 3,700 species in 68 families (Spiders of North America at <http://kaston.transy.edu/spiderlist/index.html#top>). We collected 168 species of spiders representing 26 families from Fort Sill (Table 4). Table 4 also provides information on new

county and state records. The species data collected from Fort Sill was compared to a database of specimens housed at the University of Oklahoma (Ken Hobson contact), araneids collected from Wichita Wildlife Refuge (D'Anna Mallow pers. comm.), as well as Oklahoma records from Peckham & Peckham (1909), Banks et al. (1932), Gertsch (1934, 1939, 1953, 1960), Levi (1954, 1955, 1957, 1959, 1964, 1972, 1973, 1975a, 1975b), Branson (1958, 1959, 1966, 1968), Harrel (1962, 1965), Schick (1965), Turnbull et al. (1965), Bailey & Chada (1968), Bailey et al. (1968), Branson & Drew (1972), Kaston (1973), Horner (1975), Opell & Beatty (1976), Rogers & Horner (1977), Dondale & Redner (1978, 1990), Brady (1979), Cokendolpher & Bryce (1980), Smith (1995), Maddison (1996), Buckle et al. (2001), Vogel (2004), Ubick (in press).

Table 5 lists species not collected during this survey of Fort Sill but reported from Wichita Mountain Wildlife Refuge in Comanche County, Oklahoma and likely to also be found at Fort Sill (Cokendolpher and Bryce, 1980; Mallow, personal communication). The lack of these species from our records does not necessarily indicate that these populations have been impacted or extirpated from Fort Sill but may simply be a reflection of insufficient collecting on the base or differences in microhabitats found on Fort Sill compared to habitats from other natural areas in Comanche County. In other words, these species may be cryptic or have such low population numbers that they were simply missed during our collection efforts or may have habitat requirements different from those found on the base.

General information on each of the families collected at Fort Sill is provided below Table 4. Within each family section, we also provide information on noteworthy species, species of potential conservation interest, or species whose distribution in Oklahoma or North America may be widespread but whose populations within the base appear to be limited to particular habitats.

Table 4. Spider species found on Fort Sill. Habitat types include F = forest; MG = mixed grass; TG = tall grass; PL = pond or lakeshore; R = riparian; X = xeric hillside; S = Synanthropic.

Family	Species	Habitat Type	New Record for Comanche County? (yes/no)	New Record for OK? (yes/no)
Agelenidae	<i>Agelenopsis emertoni</i> Chamb. & Ivie, 1935	PL, R, S	no	no
Agelenidae	<i>Agelenopsis naevia</i> (Walckenaer, 1842)	F, R	no	no
Agelenidae	<i>Agelenopsis oklahoma</i> (Gertsch, 1936) (Plate 2)	PL	yes	no
Amaurobiidae	<i>Coras lamellosus</i> (Keyserling, 1887)	F	yes	no
Anyphaenidae	<i>Anyphaena fraterna</i> (Banks, 1896)	F, R	no	no
Anyphaenidae	<i>Hibana gracilis</i> (Hentz, 1847)	R	no	no
Araneidae	<i>Acacesia hamata</i> (Hentz, 1847)	R	yes	no
Araneidae	<i>Acanthepeira stellata</i> (Walckenaer, 1805) (Plate 3)	R, PL	no	no
Araneidae	<i>Araneus cingulatus</i> (Walckenaer, 1842)	TG	yes	yes
Araneidae	<i>Araneus pagnia</i> (Walckenaer, 1842)	PL, R	no	no

Araneidae	<i>Argiope aurantia</i> Lucas, 1833 (Plate 3)	F, PL, R	no	no
Araneidae	<i>Argiope trifasciata</i> (Forskål, 1775) (Plate 3)	MG, PL, R, TG	no	no
Araneidae	<i>Cyclosa turbinata</i> (Walckenaer, 1842)	MG, R	no	no
Araneidae	<i>Eustala anastera</i> (Walckenaer, 1842)	R	no	no
Araneidae	<i>Eustala cepina</i> (Walckenaer, 1842)	MG, PL	no	no
Araneidae	<i>Eustala emertoni</i> (Banks, 1904) (Plate 3)	PL, R	no	no
Araneidae	<i>Hypsosinga rubens</i> (Hentz, 1847)	R	yes	no
Araneidae	<i>Larinia directa</i> (Hentz, 1847)	F, R, TG	no	no
Araneidae	<i>Larinioides cornutus</i> (Clerck, 1757) (Plate 3)	PL, R S	no	no
Araneidae	<i>Larinioides patagiatus</i> (Clerck, 1757)	PL	yes	no
Araneidae	<i>Mangora fascialata</i> Franganillo, 1936	MG	yes	yes
Araneidae	<i>Mangora gibberosa</i> (Hentz, 1847)	F, MG, TG	no	no
Araneidae	<i>Mangora maculata</i> (Keyserling, 1865)	F	yes	no
Araneidae	<i>Mangora placida</i> (Hentz, 1847)	F, PL, R	yes	no
Araneidae	<i>Mecynogea lemniscata</i> (Walckenaer, 1842)	F, MG, R, TG	no	no
Araneidae	<i>Metepeira labyrinthea</i> (Hentz, 1847)	F, PL	no	no
Araneidae	<i>Micrathena gracilis</i> (Walckenaer, 1805) (Plate 3)	F, R	no	no
Araneidae	<i>Neoscona arabesca</i> (Walckenaer, 1842) (Plate 3)	MG, PL, R, TG	no	no
Araneidae	<i>Neoscona crucifera</i> (Lucas, 1839)	F, PL, R, S	no	no
Araneidae	<i>Neoscona domiciliorum</i> (Hentz, 1847)	PL	no	no
Araneidae	<i>Neoscona oaxacensis</i> (Keyserling, 1864)	MG, PL	no	no
Araneidae	<i>Neoscona utahana</i> (Chamberlin, 1919)	PL	no	no
Araneidae	<i>Singa keyserlingi</i> McCook, 1894	F	yes	yes
Clubionidae	<i>Clubiona abboti</i> L. Koch, 1866 (Plate 4)	PL, R	yes	no
Clubionidae	<i>Elaver excepta</i> (L. Koch, 1866)	F	no	no
Corinnidae	<i>Castianeira gertschi</i> Kaston, 1945	F	yes	no
Corinnidae	<i>Phrurotimpus certus</i> Gertsch, 1941	PL	yes	yes
Corinnidae	<i>Scotinella redempta</i> (Gertsch, 1941)	R	yes	yes
Corinnidae	<i>Trachelas tranquillus</i> (Hentz, 1847)	F	yes	no
Dictynidae	<i>Dictyna bellans</i> Chamberlin, 1919 (Plate 4)	F, MG, PL, R, TG	no	no
Dictynidae	<i>Dictyna calcarata</i> Banks, 1904	R	yes	no
Dictynidae	<i>Dictyna foliacea</i> (Hentz, 1850)	MG, R, TG	yes	no
Dictynidae	<i>Dictyna volucris</i> Keyserling, 1881	F, MG, PL, S, TG	no	no
Dictynidae	<i>Emblyna sublata</i> (Hentz, 1850)	R	yes	no
Dictynidae	<i>Lathys delicatula</i> (Gertsch & Mulaik, 1936)	F	no	no
Dictynidae	<i>Phantyna segregata</i> (Gertsch & Mulaik, 1936)	PL	no	no
Filistatidae	<i>Kukulcania hibernalis</i> (Hentz, 1842) (Plate 4)	X	no	no
Gnaphosidae	<i>Callilepis imbecilla</i> (Keyserling, 1887)	R	no	no
Gnaphosidae	<i>Cesonia bilineata</i> (Hentz, 1847)	MG	no	no
Gnaphosidae	<i>Drassodes gosiutus</i> Chamberlin, 1919	F, R	yes	no
Gnaphosidae	<i>Drassyllus lepidus</i> (Banks, 1899)	X	yes	no
Gnaphosidae	<i>Gnaphosa fontinalis</i> Keyserling, 1887	R	no	no
Gnaphosidae	<i>Haplodrassus signifer</i> (C. L. Koch, 1839)	R	no	no
Gnaphosidae	<i>Herpyllus ecclesiasticus</i> Hentz, 1832	PL	no	no

Gnaphosidae	<i>Sergiolus capulatus</i> (Walckenaer, 1837)	F	yes	no
Gnaphosidae	<i>Talanites exlineae</i> (Platnick & Shadab, 1976)	R	no	no
Hahniidae	<i>Hahnia flaviceps</i> Emerton, 1913	R	yes	yes
Linyphiidae	<i>Ceratinella brunnea</i> Emerton, 1882	F	yes	no
Linyphiidae	<i>Eperigone albula</i> Zorsch & Crosby 1934	F	yes	yes
Linyphiidae	<i>Eperigone eschatologica</i> (Crosby, 1924)	PL	yes	no
Linyphiidae	<i>Eperigone maculata</i> (Banks, 1892)	F	yes	yes
Linyphiidae	<i>Frontinella communis</i> (Hentz, 1850) (Plate 4)	F, R	no	no
Linyphiidae	<i>Grammonota vittata</i> Barrows, 1919	F, R	yes	yes
Linyphiidae	<i>Meioneta dactylata</i> Chamberlin & Ivie, 1944)	X	yes	yes
Linyphiidae	<i>Meioneta leucophora</i> Chamberlin & Ivie, 1944	TG	yes	yes
Linyphiidae	<i>Neriere radiata</i> (Walckenaer, 1842) (Plate 4)	F, R	no	no
Lycosidae	<i>Allocosa funerea</i> (Hentz, 1844)	PL	no	no
Lycosidae	<i>Allocosa noctuabunda</i> (Montgomery, 1904)	R	no	no
Lycosidae	<i>Arctosa littoralis</i> (Hentz, 1844) (Plate 5)	PL, R	no	no
Lycosidae	<i>Hogna helluo</i> (Walckenaer, 1837)	PL	yes	no
Lycosidae	<i>Pardosa delicatula</i> Gertsch & Wallace, 1935	PL	yes	no
Lycosidae	<i>Pardosa mercurialis</i> Montgomery, 1904	R	no	no
Lycosidae	<i>Pardosa milvina</i> (Hentz, 1844)	PL	yes	no
Lycosidae	<i>Pardosa pauxilla</i> Montgomery, 1904	PL	no	no
Lycosidae	<i>Pardosa steva</i> Lowrie & Gertsch, 1955	R	yes	yes
Lycosidae	<i>Pirata apalacheus</i> Gertsch, 1940	R	no	no
Lycosidae	<i>Pirata insularis</i> Emerton, 1885	R	no	no
Lycosidae	<i>Rabidosia punctulata</i> (Hentz, 1844)	R	no	no
Lycosidae	<i>Rabidosia rabida</i> (Walckenaer, 1837) (Plate 5)	MG, PL, R, S	no	no
Lycosidae	<i>Schizocosa mccooki</i> (Montgomery, 1904)	R	no	no
Lycosidae	<i>Schizocosa ocreata</i> (Hentz, 1844)	R	no	no
Lycosidae	<i>Trochosa ruricola</i> (De Geer, 1778)	PL	yes	yes
Lycosidae	<i>Varacosa avara</i> (Keyserling, 1877)	F, R, TG	no	no
Lycosidae	<i>Varacosa shenandoa</i> (Chamberlin & Ivie, 1942)	F, PL	yes	no
Mimetidae	<i>Mimetus puritanus</i> Chamberlin, 1923	F, R	yes	yes
Miturgidae	<i>Cheiracanthium inclusum</i> (Hentz, 1847)	PL, R	yes	no
Oxyopidae	<i>Oxyopes salticus</i> Hentz, 1845 (Plate 5)	F, MG, PL, R, S, TG	no	no
Oxyopidae	<i>Peucea viridans</i> (Hentz, 1832)	R	yes	no
Philodromidae	<i>Apollophanes margareta</i> Lowrie & Gertsch, 1955	MG	yes	yes
Philodromidae	<i>Philodromus cespitum</i> (Walckenaer, 1802)	PL	yes	yes
Philodromidae	<i>Philodromus imbecillus</i> Keyserling, 1880	MG, PL, TG	yes	yes
Philodromidae	<i>Philodromus keyserlingi</i> Marx, 1890	PL	no	no
Philodromidae	<i>Philodromus marxi</i> Keyserling, 1884	PL, TG	yes	no
Philodromidae	<i>Philodromus pratariae</i> (Scheffer, 1904) (Plate 5)	F, MG, PL, R	no	no
Philodromidae	<i>Philodromus rufus</i> Walckenaer, 1826	R	yes	no
Philodromidae	<i>Thanatus rubicellus</i> Mello-Leitão, 1929	PL, TG	yes	no
Philodromidae	<i>Tibellus chamberlini</i> Gertsch, 1933	MG, PL	yes	yes
Philodromidae	<i>Tibellus duttoni</i> (Hentz, 1847) (Plate 5)	PL, R, TG	no	no

Pholcidae	<i>Psilochorus imitatus</i> Gertsch & Mulaik, 1940 (Plate 5)	F, PL, R, X	no	no
Pisauridae	<i>Pisaurina dubia</i> (Hentz, 1847)	R	no	no
Pisauridae	<i>Pisaurina mira</i> (Walckenaer, 1837) (Plate 5)	F, MG, R	no	no
Salticidae	<i>Eris militaris</i> (Hentz, 1845)	F, PL	no	no
Salticidae	<i>Habronattus cognatus</i> (Peckham & Peckham, 1901)	R	yes	no
Salticidae	<i>Habronattus texanus</i> (Chamberlin, 1924)	PL	yes	no
Salticidae	<i>Hentzia palmarum</i> (Hentz, 1832)	F, PL, R, TG	no	no
Salticidae	<i>Maevia inclemens</i> (Walckenaer, 1837)	PL, R, S	no	no
Salticidae	<i>Marpissa formosa</i> (Banks, 1892) (Plate 6)	F, PL, R	yes	no
Salticidae	<i>Marpissa pikei</i> (Peckham & Peckham, 1888)	MG, PL, R, TG	no	no
Salticidae	<i>Metacyrba taeniola</i> (Hentz, 1846)	F	no	no
Salticidae	<i>Metaphidippus chera</i> (Chamberlin, 1924)	PL	yes	no
Salticidae	<i>Paraphidippus aurantius</i> (Lucas, 1833)	R	yes	no
Salticidae	<i>Pelegrina galathea</i> (Walckenaer, 1837) (Plate 6)	F, MG, PL, R, TG	no	no
Salticidae	<i>Pelegrina peckhamorum</i> (Kaston, 1973)	F, PL, R, TG	yes	yes
Salticidae	<i>Pelegrina proterva</i> (Walckenaer, 1837)	R	yes	yes
Salticidae	<i>Pelegrina sabinema</i> Maddison, 1996	F, PL	yes	yes
Salticidae	<i>Phidippus ardens</i> Peckham & Peckham, 1901	PL	yes	yes
Salticidae	<i>Phidippus audax</i> (Hentz, 1845) (Plate 6)	F, PL, S	no	no
Salticidae	<i>Phidippus cardinalis</i> (Hentz, 1845) (Plate 6)	R, TG	yes	no
Salticidae	<i>Phidippus carolinensis</i> Peckham & Peckham, 1909	PL	yes	no
Salticidae	<i>Phidippus clarus</i> Keyserling, 1885	MG, PL, S	no	no
Salticidae	<i>Phidippus mystaceus</i> (Hentz, 1846)	R	no	no
Salticidae	<i>Phidippus pius</i> Scheffer, 1905	PL	no	no
Salticidae	<i>Phlegra hentzi</i> (Marx, 1890)	R, X	yes	yes
Salticidae	<i>Poultonella alboimmaculata</i> (Peckham & Peckham, 1883)	PL, TG	yes	no
Salticidae	<i>Salticus austinensis</i> Gertsch, 1936	R	no	no
Salticidae	<i>Sassacus papenhoei</i> Peckham & Peckham, 1895	PL, R	no	no
Salticidae	<i>Sassacus vitis</i> (Cockerell, 1894)	F, PL, R	yes	yes
Salticidae	<i>Thiodina puerpera</i> (Hentz, 1846)	F, MG, TG	no	no
Salticidae	<i>Thiodina sylvana</i> (Hentz, 1846)	F, R	yes	yes
Salticidae	<i>Tutelina elegans</i> (Hentz, 1846)	R, TG	yes	no
Salticidae	<i>Zygoballus rufipes</i> Peckham & Peckham, 1885	R	yes	yes
Scytodidae	<i>Scytodes</i> undescribed species	R	yes	yes
Sicariidae	<i>Loxosceles reclusa</i> Gertsch & Mulaik, 1940 (Plate 6)	F, PL, R, S, X	no	no
Tetragnathidae	<i>Glenognatha foxi</i> (McCook, 1894) (Plate 7)	PL	yes	no
Tetragnathidae	<i>Leucauge venusta</i> (Walckenaer, 1842)	R	no	no
Tetragnathidae	<i>Tetragnatha elongata</i> Walckenaer, 1842 (Plate 7)	F, PL, R	no	no
Tetragnathidae	<i>Tetragnatha guatemalensis</i> O. P.-Cambridge, 1889	PL	yes	no
Tetragnathidae	<i>Tetragnatha laboriosa</i> Hentz, 1850 (Plate 7)	F, MG, PL, R, S, TG	no	no
Tetragnathidae	<i>Tetragnatha pallescens</i> F. O. P.-Cambridge, 1903	F, PL, R, S	no	no

Theraphosidae	<i>Aphonopelma hentzi</i> (Girard, 1852)	MG, R	no	no
Theridiidae	<i>Argyrodes elevatus</i> Taczanowski, 1873 (Plate 7)	F, PL, TG	yes	yes
Theridiidae	<i>Euryopis lineatipes</i> O.P.-Cambridge, 1893	F, R	yes	yes
Theridiidae	<i>Latrodectus mactans</i> Chamberlin & Ivie, 1935 (Plate 7)	PL, R, S	no	no
Theridiidae	<i>Latrodectus variolus</i> Walckenaer, 1837	PL	yes	no
Theridiidae	<i>Steatoda medialis</i> (Banks, 1898)	PL	yes	yes
Theridiidae	<i>Steatoda triangulosa</i> (Walckenaer, 1802)	S	no	no
Theridiidae	<i>Stemmops ornatus</i> (Bryant, 1933)	R	yes	yes
Theridiidae	<i>Theridion differens</i> Emerton, 1882	PL	yes	no
Theridiidae	<i>Theridion goodnightorum</i> Levi, 1957	?	yes	yes
Theridiidae	<i>Theridion murarium</i> Emerton, 1882	F	no	no
Theridiidae	<i>Theridion rabuni</i> Chamberlin & Ivie, 1944	PL	yes	yes
Theridiidae	<i>Thymoites marxi</i> (Crosby, 1906)	F	yes	yes
Theridiidae	<i>Thymoites pallidus</i> (Emerton, 1913)	R	yes	yes
Theridiidae	<i>Wamba crispulus</i> (Simon, 1895)	F	yes	yes
Thomisidae	<i>Misumena vatia</i> (Clerck, 1757)	PL	yes	no
Thomisidae	<i>Misumenops asperatus</i> (Hentz, 1847)	PL, R, S	no	no
Thomisidae	<i>Misumenops celer</i> (Hentz, 1847) (Plate 8)	F, MG, PL, R, TG	no	no
Thomisidae	<i>Misumenops oblongus</i> (Keyserling, 1880)	X	no	no
Thomisidae	<i>Ozyptila monroensis</i> Keyserling, 1884	F	yes	yes
Thomisidae	<i>Synema parvulum</i> (Hentz, 1847)	R	yes	no
Thomisidae	<i>Tmarus angulatus</i> (Walckenaer, 1837)	R	no	no
Thomisidae	<i>Xysticus ampullatus</i> Turnbull, Dondale & Redner, 1965	TG	yes	yes
Thomisidae	<i>Xysticus auctificus</i> Keyserling, 1880	PL, R	no	no
Thomisidae	<i>Xysticus ferox</i> (Hentz, 1847)	PL	no	no
Thomisidae	<i>Xysticus funestus</i> Keyserling, 1880	F	no	no
Thomisidae	<i>Xysticus gulosus</i> Keyserling, 1880	PL	yes	no
Thomisidae	<i>Xysticus pallax</i> O. P.-Cambridge, 1894	R	no	no
Uloboridae	<i>Uloborus glomosus</i> (Walckenaer, 1842) (Plate 8)	F, R	no	no

Table 5. Species not collected during this survey of Fort Sill but reported from the literature from Comanche County, Oklahoma and likely to also be found at Fort Sill (Cokendolpher and Bryce, 1980; Mallow, personal communication).

Family	Species
Araneidae	<i>Araneus illaudatus</i> (Gertsch & Mulaik, 1936)
Araneidae	<i>Gea heptagon</i> (Hentz, 1850)
Araneidae	<i>Hypsosinga funebris</i> (Keyserling, 1892)
Clubionidae	<i>Clubiona pygmaea</i> Banks, 1892
Corinnidae	<i>Castianeira crocata</i> (Hentz, 1847)
Corinnidae	<i>Castianeira longipalpa</i> (Hentz, 1847)
Corinnidae	<i>Castianeira trilineata</i> (Hentz, 1847)
Corinnidae	<i>Phrurotimpus alarius</i> (Hentz, 1847)
Corinnidae	<i>Phrurotimpus borealis</i> (Emerton, 1911)
Ctenizidae	<i>Ummidia audouini</i> (Lucas, 1835)
Cyrtacheniidae	<i>Myrmekiaphila comstocki</i> Bishop & Crosby, 1926

Dictynidae	<i>Emblyna consulta</i> (Gertsch & Ivie, 1936)
Dictynidae	<i>Cicurina arizona</i> Chamberlin & Ivie, 1940
Diguetidae	<i>Diguetia canities</i> (McCook, 1889)
Gnaphosidae	<i>Drassodes auriculoides</i> Barrows, 1919
Gnaphosidae	<i>Drassyllus aprilius</i> , (Banks, 1904)
Gnaphosidae	<i>Gnaphosa sericata</i> (L. Koch, 1866)
Gnaphosidae	<i>Haplodrassus chamberlini</i> Platnick & Shadab, 1975
Gnaphosidae	<i>Zelotes hentzi</i> Barrows, 1945
Gnaphosidae	<i>Zelotes puritanus</i> Chamberlin, 1922
Lycosidae	<i>Alopecosa kochi</i> (Keyserling, 1877)
Lycosidae	<i>Geolycosa missouriensis</i> (Banks, 1895)
Lycosidae	<i>Hogna carolinensis</i> (Walckenaer, 1805)
Lycosidae	<i>Gladicosa pulchra</i> (Keyserling, 1877)
Lycosidae	<i>Schizocosa avida</i> (Walckenaer, 1837)
Lycosidae	<i>Schizocosa bilineata</i> (Emerton, 1885)
Lycosidae	<i>Schizocosa perplexa</i> Bryant, 1936
Lycosidae	<i>Schizocosa retrorosa</i> (Banks, 1911)
Lycosidae	<i>Schizocosa saltatrix</i> (Hertz, 1844)
Lycosidae	<i>Trochosa terricola</i> Thorell, 1856
Mimetidae	<i>Mimetus hesperus</i> Chamberlin, 1923
Mimetidae	<i>Mimetus syllepsicus</i> Hentz, 1832
Oecobiidae	<i>Oecobius cellariorum</i> (Dugés, 1836)
Oxyopidae	<i>Oxyopes apollo</i> Brady, 1964
Oxyopidae	<i>Oxyopes scalaris</i> Hentz, 1845
Philodromidae	<i>Ebo punctatus</i> Sauer & Platnick, 1972
Philodromidae	<i>Thanatus altimontis</i> Gertsch, 1933
Philodromidae	<i>Thanatus formicinus</i> (Clerck, 1757)
Pholcidae	<i>Physocyclus enaulus</i> Crosby, 1926
Pholcidae	<i>Psilochorus pullulus</i> (Hentz, 1850)
Pholcidae	<i>Spermophora senoculata</i> (Dugés, 1836)
Pisauridae	<i>Dolomedes scriptus</i> Hentz, 1845
Pisauridae	<i>Dolomedes triton</i> (Walckenaer, 1837)
Pisauridae	<i>Dolomedes vittatus</i> Walckenaer, 1837
Pisauridae	<i>Pisaurina undulata</i> (Keyserling, 1887)
Salticidae	<i>Naphrys pulex</i> (Hentz, 1846)
Salticidae	<i>Marpissa lineata</i> (C. L. Koch, 1846)
Salticidae	<i>Platycrypus undatus</i> (DeGeer, 1778)
Salticidae	<i>Pelegrina pervaga</i> (Peckham & Peckham, 1909)
Salticidae	<i>Terralonus unicus</i> (Chamberlin & Gertsch, 1930)
Salticidae	<i>Habronattus coecatus</i> (Hentz, 1846)
Salticidae	<i>Habronattus jucundus</i> (Peckham & Peckham, 1909)
Salticidae	<i>Pellenes limitatus</i> Peckham & Peckham, 1901
Salticidae	<i>Phidippus apacheanus</i> Chamberlin & Gertsch, 1929
Salticidae	<i>Phidippus texanus</i> Banks, 1906
Salticidae	<i>Phlegra fasciata</i> (Hahn, 1826)
Salticidae	<i>Sassacus barbipes</i> Peckham & Peckham, 1888
Salticidae	<i>Synageles noxiosus</i> (Hentz, 1850)
Segestriidae	<i>Ariadna bicolor</i> (Hentz, 1842)
Theridiidae	<i>Achaeearanea tepidariorum</i> (C. L. Koch, 1841)
Theridiidae	<i>Enoplognatha marmorata</i> (Hentz, 1850)
Theridiidae	<i>Euryopsis texana</i> Banks, 1908
Theridiidae	<i>Euryopsis weesei</i> Levi, 1963

Thomisidae	<i>Bossaniana vesicolor</i> (Keyserling, 1880)
Thomisidae	<i>Misumenoides formosipes</i> (Walckenaer, 1837)
Thomisidae	<i>Misumenops dubius</i> (Keyserling, 1880)
Thomisidae	<i>Xysticus apacheus</i> Gertsch, 1933
Thomisidae	<i>Xysticus triguttatus</i> Keyserling, 1880
Titanoecidae	<i>Titanoeca americana</i> Emerton, 1888

FAMILY AGELENIDAE

Spiders in the family Agelenidae are commonly called funnel web spiders (common names in the following family accounts are taken from Beane (2003)). The three species of *Agelenopsis* collected on Fort Sill build webs with a platform of silk and a funnel retreat (Plate 2). The spider remains in the funnel until it feels the vibrations of an insect on the web at which it rushes out to capture the prey. Funnel web spiders are found in a variety of habitats and some species are well adapted to human dwellings. None of the species of funnel web spiders were new records for the state (Table 4). No additional species of Agelenidae had previously been collected from Comanche County that were not also found on Fort Sill (Table 5).

FAMILY AMAUROBIIDAE

Amaurobiids typically live under rocks or logs where they make a loose web out of bluish colored cribellate silk (Levi and Levi, 1990). They are typically 4 mm or more in length and have a bipartite cribellum, or spinning plate (Ubick, in press a). One species of amaurobiid was collected on Fort Sill, *Coras lamellosus*, representing a new record for the county. No other species from this family had previously been reported from Comanche County (Table 5). This species had previously been reported from the state (Table 4).

FAMILY ANYPHAENIDAE

Spiders in the family Anyphaenidae are commonly called ghost spiders. They are similar in appearance to spiders in the family Clubionidae but are characterized by having a respiratory slit in the middle of the ventral surface of the abdomen rather than near the spinnerets as is typical in most spiders. They also have unique claw tufts consisting of flattened setae. These spiders typically hunt their prey on foliage and can, therefore, be collected while sweeping the vegetation (Kaston, 1978). One species, *Anyphaena fraterna*, was collected on Fort Sill in both forest and riparian habitats. This species had previously been reported from Comanche County (Table 4). No other species of anyphaenids had been reported from Comanche County (Table 5).

FAMILY ARANEIDAE

Spiders in the family Araneidae are commonly called orbweavers because of the round, wheel-shaped capture web they build. Common species found on Fort Sill are illustrated in Plate 3. The following species represent new state records: *Araneus cingulatus*, *Mangora fascialata* and *Singa keyserlingi* (Table 4). An additional five species represent new records for Comanche County (Table 4). Three species had previously been reported from Comanche County but were

not collected on Fort Sill: *Araneus illaudatus*, *Gea heptagon* and *Hypsosinga funebris* (Table 5). Orbweavers are found in every habitat on Fort Sill. They typically suspend their webs off the ground in relatively open areas where the webs will capture flying and jumping prey. Many species hide in the vegetation inside silken retreats during the day and only build their webs in the evening or at night. The largest species of orbweavers on Fort Sill are the two species in the genus *Argiope*: *A. aurantia* and *A. trifasciata* (Plate 3).

FAMILY CLUBIONIDAE

Spiders in the family Clubionidae are commonly called sac spiders. Sac spiders build a silken retreat in a rolled leaf or under rocks or stones (Levi and Levi, 1990). Two species, *Clubiona abboti* and *Elaver excepta* were collected on Fort Sill. *Clubiona abboti* was a new county record but neither species represented a new state record (Table 4). *Clubiona abboti* is illustrated in Plate 4. One additional species, *Clubiona pygmaea* had previously been reported from Comanche County (Table 5).

FAMILY CORINNIDAE

Spiders in the family Corinnidae are commonly called antmimic spiders since many of them resemble ants in general appearance and in behavior (Cushing, 1997). The antmimic spiders are often found running around on the ground and are very difficult to differentiate from ants that are often found in the same habitat. We collected four species of corinnids on Fort Sill: *Castianeira gertschi*, *Phrurotimpus certus*, *Scotinella redempta* and *Trachelas tranquillus*. All four species are new county records and *P. certus* and *S. redempta* represent new state records (Table 4). Five additional species of antmimic spiders had previously been reported from Comanche County but were not collected during the present study (Table 5).

FAMILY DICTYNIDAE

Spiders in the family Dictynidae are commonly called meshweavers. They typically build messy cribellate, or hackled silk, webs at the tips of vegetation such as grass blades or branches of bushes. They are generally small spiders, most species less than 6 mm in length (Bennett, in press and Plate 4). Spiders of this family are very common in open field habitats. We collected seven species of meshweavers on Fort Sill, three of which were new county records, none of which represented new state records (Table 4). Two additional species had previously been collected in Comanche County but were not collected on Fort Sill (Table 5).

FAMILY FILISTATIDAE

Spiders in the family Filistatidae are commonly called crevice weavers. They range in size from 1.5 mm to 18 mm. The species on Fort Sill, *Kulkulcania hibernalis* is a fairly large species (Plate 4). These are cribellate spiders that build bluish silken retreats in crevices under rocks or in holes on the sides or bases of buildings (Ubick, in press). Silken trip lines extend outward from the retreat (Plate 4). Only *K. hibernalis* is found on Fort Sill (Table 4). No other

species have been reported from Oklahoma. *Kukulcania hibernalis* is restricted to xeric rocky hillsides on the base where it builds its web under rocks. The population of this species seems to be fairly low. Although this is not an uncommon species in the state of Oklahoma, because it is restricted to xeric rocky hillsides on the base, impact by heavy machinery in these habitats should be kept to a minimum.

FAMILY GNAPHOSIDAE

Spiders in the family Gnaphosidae are commonly called stealthy ground spiders. They are typically found under rocks or logs or running along the ground. Most are nocturnal and are found during the day inside silken retreats (Ubick, in press b). They are extremely fast runners. They build silken retreats under rocks or logs and their flat blue, pink or white disk-shaped eggsacs can often be found adhering to the underside of these objects. Nine species of stealthy ground spiders were collected on Fort Sill; three of these representing new county (but not new state) records (Table 4). An additional six species have been reported from Comanche County but were not collected on the base (Table 5).

FAMILY HAHNIIDAE

Hahniids are small spiders with unusual spinneret arrangement. They have six spinnerets arranged in a single transverse row (Levi and Levi, 1990). Only one species of Hahniidae was found on Fort Sill, *Hahnia flaviceps*, but that species represents a new state record for Oklahoma.

FAMILY LINYPHIIDAE

Spiders in the family Linyphiidae are commonly called dwarf or sheetweb weavers. This is one of the largest families of spiders and includes some of the smallest spiders on earth. Most linyphiids are less than 4 mm in size and many are in the order of 1-2 mm. Most build small sheet webs near the ground, in the leaf litter, or under rocks and logs. Some species build their bowl-shaped webs in low bushes where several individuals can often be found in the same bush. Of the nine species found on Fort Sill, five represent new state records and another two represent new county records (Table 4). We sent most of the linyphiids to Don Buckle for identification and he indicated that the linyphiid fauna of Oklahoma is not well known and that some of the specimens we sent (not included in Table 4) may represent as yet undescribed species (Buckle, personal communication). Common species found on Fort Sill are illustrated in Plate 4.

FAMILY LYCOSIDAE

Spiders in the family Lycosidae are commonly called wolf spiders. Wolf spiders are large hunting spiders that use their fairly keen eyesight to locate prey. The eye pattern of wolf spiders is distinctive with the small anterior eyes in a row of four on the front of the cephalothorax and the posterior row of larger eyes so strongly curved that they appear to be two rows of two eyes each. Adult female wolf spiders attach their silken eggsac to the spinnerets and carry the eggsac with them until the babies hatch. Upon hatching, the mother tears a hole in the eggsac with her

fangs to facilitate escape by the spiderlings. The spiderlings crawl up onto the female's abdomen and hold onto specialized knobbed hairs. They are carried by the female until the yolk leftover from the egg is depleted at which time they disperse and hunt on their own (Foelix, 1996). Most species are active in the evening or at night. They are most common in moist areas near streams or ponds. Some of the largest spiders found on Fort Sill are from this family. We identified 18 species of wolf spiders from Fort Sill including two new state records – *Pardosa steva* and *Trochosa ruricola* and four new county records (Table 4). Common species are illustrated in Plate 5.

FAMILY MIMETIDAE

Spiders in the family Mimetidae are commonly called pirate spiders and specialize in hunting other spiders, particular spiders in the families Araneidae and Theridiidae (Lew and Mott, in press). They use specialized behavioral tactics to attract the web host close enough for the kill. One species of pirate spider, *Mimetus puritanus* was found on Fort Sill and represents a new state record (Table 4). Two other species had previously been collected in Comanche County, *Mimetus hesperus* and *Mimetus syllepsicus* and may also be found on the base (Table 5).

FAMILY MITURGIDAE

Spiders in the family Miturgidae are commonly called prowling spiders. The species found on Fort Sill, *Cheiracanthium inclusum* is called the yellow sac spider and is often found inside human dwellings. The members of this family are typically ground dwelling wandering spiders. However, *C. inclusum* is more typically found hunting on vegetation including up in trees (Ubick and Richman, in press). This species is a new county record but not a new state record. Species of *Cheiracanthium* have venom that may cause mild irritation or small slow-healing wounds in humans, although the symptomology of the venom is not severe enough to be of great concern (Ubick and Richman, in press).

FAMILY OXYOPIDAE

Spiders in the family Oxyopidae are commonly called lynx spiders. They can be found on grass, shrubs and trees and several species show a saltatory, or jumping, locomotion (Brady and Santos, in press). They have a pointed abdomen, spiny legs and eyes arranged like a hexagon. *Peucetia viridans* is bright green. Two species were collected on Fort Sill: *P. viridans* and *Oxyopes salticus* (Table 4 and Plate 5). Two additional species have been reported from Comanche County, *Oxyopes apollo* and *Oxyopes scalaris* and may also be present on Fort Sill (Table 5).

FAMILY PHILODROMIDAE

Spiders in the family Philodromidae are commonly called running crab spiders. Their legs are often laterigrade (held to the side of the body like a crab) except in species of the genus *Tibellus*. They are most commonly found on plant stems and leaves where they actively search

for prey (Dondale, in press a). We found 10 species of running crab spiders on Fort Sill including four never before reported from Oklahoma: *Apollophanes margareta*, *Philodromus cespitum*, *P. imbecillus* and *Tibellus chamberlini* (Table 4). Three additional species have previously been reported from Comanche County and may also be found on Fort Sill (Table 5). Common species of philodromids found on the base are illustrated in Plate 5.

FAMILY PHOLCIDAE

Spiders in the family Pholcidae are commonly called cellar or daddylonglegs spiders. They prefer building their sheet or cobwebs in dark microhabitats such as under rocks or logs, in leaf litter or in crevices in the soil or structures (Huber, in press). Some species are common inside human dwellings (syanthropic). These long-legged spiders typically sit in the center of the web and will vibrate the web violently when disturbed. Females tie the eggs together in a loosely constructed eggsac that they hold onto with their chelicerae. One species, *Psilochorus imitatus*, was collected on Fort Sill (Table 4) but another three species have previously been reported from Comanche County and are likely to also be found on the base (Table 5). *Psilochorus imitatus* is illustrated in Plate 5.

FAMILY PISAURIDAE

Spiders in the family Pisauridae are commonly called nursery web spiders. They are typically found near water where they monitor the water surface for vibrations produced by prey either on the water surface or below the water such as aquatic insects. A female pisaurid carries her silken eggsac with her chelicerae and suspends it within a nursery web. The female remains nearby the nursery web guarding the eggsac (Carico, in press). They have an amazing ability to maneuver on the water surface running, leaping and diving to capture prey or escape threats (Suter et al., 1997). We collected two species of fishing spider on Fort Sill (Table 4 and Plate 5): *Pisaurina dubia* and *Pisaurina mira*. Males of *P. mira* bind the female in a loose bridal veil of silk during copulation (Bruce and Carico, 1988). An additional three species have been reported from Comanche County and may also be on Fort Sill (Table 5).

FAMILY SALTICIDAE

Spiders in the family Salticidae are commonly called jumping spiders. The anterior median eyes of these spiders are enlarged; the eight eyes are arranged in three to four rows. The eye pattern of this family is very distinctive (Plate 6). Jumping spiders have extremely acute vision and hunt like cats, stalking and finally pouncing on their prey (Richman et al., In press). These spiders are often brightly colored and adorned with elaborate tufts of setae; the colors and setal tufts are often used as signals during courtship (Richman et al., In press). Jumping spiders are active during the day, looking for prey on shrubs, grasses and other vegetation. They are particularly common in grassy fields but can also be found in forests and xeric habitats. Females typically deposit their eggsacs inside silken retreats where the female guards the eggsac until the spiderlings hatch. We collected 30 different species of jumping spiders on Fort Sill including the following new state records: *Pelegrina peckhamorum*, *P. proterva*, *P. sabinema*, *Phidippus*

ardens, *Phlegra hentzi*, *Sassacus vitis*, *Thiodina sylvana* and *Zygoballus rufipes* (Table 4). Banks et al. (1932) reported *P. ardens* from Oklahoma but these specimens were subsequently re-examined by Cokendolpher and Bryce (1980) who determined that these specimens actually represented *Phidippus apacheanus*. Thus, our record of *P. ardens* is the first verified record of this species for the state. An additional 13 species of Salticidae have been reported from Comanche County and may also be present on Fort Sill (Table 5).

FAMILY SCYTODIDAE

Spiders in the family Scytodidae are commonly called spitting spiders. These spiders have a high domed cephalothorax that houses a large glue gland. The spitting spiders capture prey by ejecting a combination of glue and venom at the prey through the fangs. The species of spitting spider found on Fort Sill is currently undescribed and had previously only been known from Texas (Ubick, in press c).

FAMILY SICARIIDAE

Spiders in the family Sicariidae are commonly called sixeyed sicariid spiders. This family includes the notorious *Loxosceles reclusa*, or brown recluse spider, common throughout the Midwest and in Oklahoma. *Loxosceles reclusa* occurs in a variety of habitats including human dwellings. The spiders typically live in crevices lined with silk (Ubick, in press). The venom of this genus is of medical significance to humans and bites from *L. reclusa* can cause necrotic lesions or sores that are slow to heal. The spiders are fairly timid and only bite when provoked. Many diagnoses of brown recluse bites may, in fact, not be caused by spider bites at all (Vetter et al., 2003). *Loxosceles reclusa* (Plate 6) is the only species in this family found in Oklahoma.

FAMILY TETRAGNATHIDAE

Spiders in the family Tetragnathidae are commonly called longjawed orbweavers. These spiders typically build more or less horizontally oriented orb webs over or near water and are thus very common in pond or lakeshore habitats (Levi, in press a). The common name describes the long chelicerae that extend in front of the cephalothorax of many of the species (Plate 7). Six species of longjawed spiders were collected on Fort Sill. Two species are new county records; none are new state records (Table 4). *Glenognatha foxi* (Plate 7) is the smallest species found on the base with adults less than 2 mm in length and builds tiny webs in footprints or depressions very close to the water. No additional species of longjawed spiders have been reported from Comanche County that were not collected from Fort Sill (Table 5).

FAMILY THERAPHOSIDAE

Spiders in the family Theraphosidae are commonly called tarantulas. These large, hairy spiders are the largest spiders found on the base with adults often reaching 10 cm in length. The males are commonly seen wandering across roads on the base in the late summer and fall in

search of females. Males have hooks on the underside of the first pair of legs that they use to hook onto the females' fangs during mating. The tarantulas live in silk-lined subterranean burrows whose openings are often covered during the day with a thin gauze of silk and may be plugged with soil during the winter (Prentice, in press). Tarantulas are sit and wait predators, rarely venturing far from the entrance of the burrow (except the wandering adult males) (Prentice, in press). The females of some species of theraphosids can live 30 years or more in captivity and mature between 2 – 10 years of age. *Aphonopelma hentzi* is the only species of this family found on the base (Table 4). However, the taxonomy of the genus *Aphonopelma* is in need of revision (Prentice, in press) so the species, *A. hentzi*, currently thought to be fairly widespread in the southwestern states may turn out to represent more than one species.

FAMILY THERIDIIDAE

Spiders in the family Theridiidae are commonly called cobweb spiders. These spiders typically build irregular cobwebs in which they hang upside down. The webs often have sticky strands of silk extending to the substrate that break when a prey, such as a beetle or ant, comes in contact with the strand, effectively pulling the prey towards the center of the web (Levi, in press b). Some spiders remain in retreats off to the side during the day. The best known representative of this family on Fort Sill is the black widow, *Latrodectus mactans*, whose venom is neurotoxic to humans and can cause severe systemic pain and other distinct symptoms after envenomation. Black widows, are very timid spiders and only bite when severely provoked. We collected 14 species of cobweb weavers on Fort Sill of which nine are new state records (Table 4), including *Argyrodes elevatus* (Plate 7), a small species that lives in the webs of other spiders, feeding on the prey and, perhaps, also the eggs of the host (Levi, in press). Some of the theridiids found on Fort Sill are tiny spiders, less than 1.5 mm in length, which live in the leaf litter in forest habitats or in forests near riparian habitats. These tiny components of the fauna include: *Stemmops ornatus*, *Theridion goodnighorum*, *Thymoites marxi* and *T. pallidus* (Table 4). An additional four species of theridiids have been reported from Comanche County and may also be found on Fort Sill (Table 5).

FAMILY THOMISIDAE

Spiders in the family Thomisidae are commonly called crab spiders. Species in the genera *Misumena* and *Misumenops* are typically found on flower heads where they sit and wait for visits from pollinating insects (Dondale, in press b). They ambush these insects using large spiny front legs (Plate 8). *Misumena vatia* can change color to match the flower on which it is sitting (Dondale, in press b). Species in the genera *Ozyptila* and *Xysticus* are usually found wandering in or over leaf litter, at the bases of grasses, or under stones or logs; rarely are they found on plants (Dondale, in press b). We found 13 species of crab spiders on Fort Sill including two, *Ozyptila monroensis* and *Xysticus ampullatus*, that represent new state records (Table 4). An additional five species have been reported from Comanche County but were not collected on Fort Sill and may also be found on the base (Table 5).

FAMILY ULOBORIDAE

Spiders in the family Uloboridae are commonly called hackled orbweavers. The one member of this family found on Fort Sill, *Uloborus glomosus*, constructs small horizontal orb webs made of cribellate silk (Plate 8). These webs are constructed fairly close to the ground, typically in standing dead vegetation. Juvenile *U. glomosus* often incorporate a spiral band of thick silk, called stabilimentum, into the hub of the web (Plate 8). Adult spiders have either no stabilimentum or a linear band of thickened silk (Opell, in press).

ADDITIONAL FAMILIES

The following families were not collected during the course of this study but have been reported from Comanche County and may also be found on the base: Ctenizidae, Cyrtacheniidae, Diguetaeidae, Oecobiidae, Segestriidae and Titanoecidae (Table 5).

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Appendix A. Database records of all spiders collected on Fort Sill, Comanche Co., Oklahoma sorted by taxon.

Family	Taxon	LOCALE DETAIL	Date Collected	Collected By	#	DMNS#
Agelenidae	<i>Agelenopsis emertoni</i>	LETRA	20 Sept 2003	Cushing P E	1	ZA.7056
Agelenidae	<i>Agelenopsis emertoni</i>	Natural Resources Area	19 Sept 2003	Cushing P E	1	ZA.7057
Agelenidae	<i>Agelenopsis emertoni</i>	East Range, East Cache Creek	03 Oct 2004	Cushing P E	2	ZA.7339
Agelenidae	<i>Agelenopsis naevia</i>	East Range, Geronimo's Grave	19 Sept 2003	Cushing P E	4	ZA.6867
Agelenidae	<i>Agelenopsis naevia</i>	East Range, near Sitting Bear Creek	09 July 2004	Cushing P E	3	ZA.7052
Agelenidae	<i>Agelenopsis naevia</i>	East Range, Geronimo's Grave	02 Oct 2004	Cushing P E	3	ZA.7364
Agelenidae	<i>Agelenopsis oklahoma</i>	Quanah Range, 3 mi west Falcon Gate	02 Oct 2004	Cushing P E	1	ZA.7366
Amaurobiidae	<i>Coras lamellosus</i>	East Range, NE boundary of base	03 Oct 2004	Cushing P E	1	ZA.7341
Anyphaenidae	<i>Anyphaena fraterna</i>	East Range, East Cache Creek	25 April 2003	Opler P et al	1	ZA.7036
Anyphaenidae	<i>Anyphaena fraterna</i>	Quanah Range, near border Wichita Mountain Wildlife Refuge	31 May 2004	Francis M	1	ZA.7037
Anyphaenidae	<i>Anyphaena fraterna</i>	West Range, ?	26 April 2003	Opler P	1	ZA.7038
Anyphaenidae	<i>Anyphaena fraterna</i>	Quanah Range, Rock Creek	27 April 2003	Schmidt J et al	1	ZA.7039
Anyphaenidae	<i>Hibana gracilis</i>	East Range, East Cache Creek	24 April 2003	Schmidt J	1	ZA.7047
Araneidae	<i>Acacesia hamata</i>	East Range, East Cache Creek	29 May 2004	Francis M	1	ZA.7136
Araneidae	<i>Acanthepeira stellata</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Cushing P E	6	ZA.7151
Araneidae	<i>Acanthepeira stellata</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Francis M	3	ZA.7182
Araneidae	<i>Acanthepeira stellata</i>	Quanah Range, West Cache Creek	19 Sept 2003	Cushing P E	1	ZA.7193
Araneidae	<i>Acanthepeira stellata</i>	East Range, Lake George	3 Oct 2004	Francis M	4	ZA.7304
Araneidae	<i>Acanthepeira stellata</i>	Quanah Range, Pottawatomie Twins	2 Oct 2004	Francis M	3	ZA.7383
Araneidae	<i>Araneus cingulatus</i>	East Range, East Boundary Rd	29 May 2004	Cushing P E	1	ZA.7169
Araneidae	<i>Araneus pegnia</i>	West Range, Engineer Lake	30 May 2004	Cushing P E	1	ZA.7148
Araneidae	<i>Araneus pegnia</i>	East Range, East Cache Creek	19 Sept 2003	Cushing P E	1	ZA.7180
Araneidae	<i>Argiope aurantia</i>	East Range, Lake George	19 Sept 2003	Kondratieff B	1	ZA.6865
Araneidae	<i>Argiope aurantia</i>	East Range, East Cache Creek	26 Sept 2003	Garhart M	1	ZA.7020
Araneidae	<i>Argiope aurantia</i>	West Range, Four Mile Crossing	10 July 2004	Cushing P E	1	ZA.7149
Araneidae	<i>Argiope aurantia</i>	Medicine Bluff Historic	2 Oct 2004	Francis M	1	ZA.7297

		Site				
Araneidae	<i>Argiope trifasciata</i>	Deer Creek Canyon Rd & Blue Beaver Valley Rd	20 Sept 2003	Cushing P E	1	ZA.6866
Araneidae	<i>Argiope trifasciata</i>	East Range, East Cache Creek	26 Sept 2003	Garhart M	1	ZA.7021
Araneidae	<i>Argiope trifasciata</i>	East Range, East Cache Creek	19 Sept 2003	Cushing P E	1	ZA.7023
Araneidae	<i>Argiope trifasciata</i>	Quanah Range, Pottawatomie Twins	19 Sept 2003	Kondratieff B	1	ZA.7139
Araneidae	<i>Argiope trifasciata</i>	East Range, East Boundary Rd.	03 Oct 2004	Francis M	1	ZA.7232
Araneidae	<i>Argiope trifasciata</i>	Quanah Range, Pottawatomie Twins	19 Sept 2003	Kondratieff B	1	ZA.7235
Araneidae	<i>Argiope trifasciata</i>	West Range, Quanah	19 Sept 2003	Cushing P E	2	ZA.7252
Araneidae	<i>Argiope trifasciata</i>	Quanah Range, Pottawatomie Twins	19 Sept 2003	Kondratieff B	1	ZA.7325
Araneidae	<i>Cyclosa turbinata</i>	Quanah Range, Rock Creek	31 May 2004	Francis M	2	ZA.7186
Araneidae	<i>Cyclosa turbinata</i>	East Range off Elgin Rd	3 Oct 2004	Cushing P E & Francis M	1	ZA.7259
Araneidae	<i>Eustala anastera</i>	Quanah Range, West Cache Creek	25 April 2003	Owens J	1	ZA.7019
Araneidae	<i>Eustala cepina</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Cushing P E	2	ZA.7142
Araneidae	<i>Eustala cepina</i>	East Range, Lake George	09 July 2004	Cushing P E	2	ZA.7177
Araneidae	<i>Eustala cepina</i>	West Range, Quanah	19 Sept 2003	Kondratieff B	1	ZA.7239
Araneidae	<i>Eustala cepina</i>	West Range, Quanah	19 Sept 2003	Cushing P E	1	ZA.7241
Araneidae	<i>Eustala cepina</i>	West Range, Mandam Pond	30 May 2004	Cushing P E	2	ZA.7249
Araneidae	<i>Eustala cepina</i>	West Range, Mandam Pond	30 May 2004	Cushing P E	2	ZA.7250
Araneidae	<i>Eustala emertoni</i>	West Range, Engineer Lake	10 July 2004	Francis M	3	ZA.7191
Araneidae	<i>Eustala emertoni</i>	Quanah, 3mi west Falcon gate	11 July 2004	Cushing P E	1	ZA.7215
Araneidae	<i>Eustala emertoni</i>	Quanah Range, Potawattomi Pond	11 July 2004	Munsterman W	2	ZA.7216
Araneidae	<i>Eustala emertoni</i>	West Range, Engineer Lake	10 July 2004	Francis M	3	ZA.7217
Araneidae	<i>Eustala emertoni</i>	West Range, Mandam Pond	10 July 2004	Francis M	2	ZA.7218
Araneidae	<i>Eustala emertoni</i>	West Range, Engineer Lake	10 July 2004	Cushing P E	1	ZA.7219
Araneidae	<i>Eustala emertoni</i>	East Range, Lake George	19 Sept 2003	Cushing P E	1	ZA.7220
Araneidae	<i>Eustala emertoni</i>	Quanah Range, 3mi west Falcon Gate	11 July 2004	Munsterman W	1	ZA.7221
Araneidae	<i>Eustala emertoni</i>	Quanah Range, West Cache Creek	11 July 2004	Munsterman W	1	ZA.7244
Araneidae	<i>Eustala emertoni</i>	Quanah Range, Pottawatomie Twins	31 May 2004	Francis M	1	ZA.7247

Araneidae	<i>Eustala emertoni</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Munsterman W	2	ZA.7248
Araneidae	<i>Eustala emertoni</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Munsterman W	2	ZA.7409
Araneidae	<i>Hypsosinga rubens</i>	East Range, East Cache Creek	24 April 2003	Owens J	2	ZA.7176
Araneidae	<i>Hypsosinga rubens</i>	East Range, East Cache Creek	24 April 2003	Schmidt J	1	ZA.7179
Araneidae	<i>Larinia directa</i>	Medicine Bluff Historic Site	30 May 2004	Cushing P E	1	ZA.7154
Araneidae	<i>Larinia directa</i>	West Range, Four Mile Crossing	30 May 2004	Francis M	1	ZA.7155
Araneidae	<i>Larinia directa</i>	East Range, East Boundary Rd	29 May 2004	Cushing P E	1	ZA.7170
Araneidae	<i>Larinioides cornutus</i>	West Range, Four Mile Crossing	10 July 2004	Cushing P E	3	ZA.7146
Araneidae	<i>Larinioides cornutus</i>	West Range, Four Mile Crossing	10 July 2004	Cushing P E	1	ZA.7150
Araneidae	<i>Larinioides cornutus</i>	Natural Resources Area	30 May 2004	Cushing P E	2	ZA.7152
Araneidae	<i>Larinioides cornutus</i>	West Range, Four Mile Crossing	30 May 2004	Cushing P E	1	ZA.7153
Araneidae	<i>Larinioides cornutus</i>	West Range, Ketch Lake	20 Sept 2003	Cushing P E	3	ZA.7163
Araneidae	<i>Larinioides cornutus</i>	East Range, East Cache Creek	29 May 2004	Cushing P E	1	ZA.7171
Araneidae	<i>Larinioides cornutus</i>	West Range, Ketch Lake	10 July 2004	Cushing P E	1	ZA.7192
Araneidae	<i>Larinioides cornutus</i>	West Range, Four Mile Crossing	20 Sept 2003	Cushing P E	2	ZA.7231
Araneidae	<i>Larinioides cornutus</i>	Quanah Range, 3 mi west Falcon Gate	2 Oct 2004	Cushing P E	2	ZA.7308
Araneidae	<i>Larinioides cornutus</i>	East Range, East Cache Creek	3 Oct 2004	Cushing P E	3	ZA.7310
Araneidae	<i>Larinioides cornutus</i>	Quanah Range, Pottawatomie Twins	2 Oct 2004	Cushing P E	3	ZA.7313
Araneidae	<i>Larinioides patagiatus</i>	West Range, Ketch Lake	20 Sept 2003	Cushing P E	1	ZA.7159
Araneidae	<i>Mangora fasciata</i>	East Range off Elgin Rd	29 May 2004	Cushing P E	1	ZA.7160
Araneidae	<i>Mangora gibberosa</i>	East Range, East Boundary Rd	29 May 2004	Cushing P E	4	ZA.7147
Araneidae	<i>Mangora gibberosa</i>	East Range, East Boundary Rd	29 May 2004	Cushing P E	1	ZA.7167
Araneidae	<i>Mangora gibberosa</i>	East Range, East Boundary Rd	29 May 2004	Cushing P E	1	ZA.7168
Araneidae	<i>Mangora gibberosa</i>	Medicine Bluff Historic Site	30 May 2004	Francis M	1	ZA.7184
Araneidae	<i>Mangora gibberosa</i>	Quanah Range, Rock Creek	31 May 2004	Francis M	1	ZA.7185
Araneidae	<i>Mangora gibberosa</i>	East Range, East Boundary Rd	29 May 2004	Cushing P E	3	ZA.7188
Araneidae	<i>Mangora gibberosa</i>	Quanah Range, Rock Creek	31 May 2004	Cushing P E	1	ZA.7195
Araneidae	<i>Mangora maculata</i>	Medicine Bluff Historic	09 July 2004	Cushing P E	1	ZA.7253

		Site				
Araneidae	<i>Mangora placida</i>	West Range, Ketch Lake	10 July 2004	Francis M	1	ZA.7140
Araneidae	<i>Mangora placida</i>	Quanah Range, Rock Creek	11 July 2004	Munsterman W	1	ZA.7181
Araneidae	<i>Mangora placida</i>	Medicine Bluff Historic Site	09 July 2004	Cushing P E	1	ZA.7242
Araneidae	<i>Mangora placida</i>	East Range, NE boundary of base	3 Oct 2004	Francis M	1	ZA.7360
Araneidae	<i>Mecynogea lemniscata</i>	Medicine Bluff Historic Site	30 May 2004	Cushing P E	13	ZA.7134
Araneidae	<i>Mecynogea lemniscata</i>	East Range, East Cache Creek	19 Sept 2003	Cushing P E	1	ZA.7162
Araneidae	<i>Mecynogea lemniscata</i>	Medicine Bluff Historic Site	09 July 2004	Cushing P E	5	ZA.7233
Araneidae	<i>Mecynogea lemniscata</i>	East Range, East Boundary Rd	29 May 2004	Cushing P E	6	ZA.7246
Araneidae	<i>Mecynogea lemniscata</i>	East Range off Elgin Rd	29 May 2004	Francis M	1	ZA.7255
Araneidae	<i>Mecynogea lemniscata</i>	West Range, Medicine Creek	20 Sept, 2003	Cushing P E	1	ZA.7407
Araneidae	<i>Metepeira labyrinthea</i>	Medicine Bluff Historic Site	30 May 2004	Cushing P E	9	ZA.7135
Araneidae	<i>Metepeira labyrinthea</i>	East Range, NE boundary of base	3 Oct 2004	Francis M	1	ZA.7298
Araneidae	<i>Metepeira labyrinthea</i>	Quanah, 3 mi west Falcon Gate	2 Oct 2004	Cushing P E	1	ZA.7307
Araneidae	<i>Metepeira labyrinthea</i>	East Range, NE boundary of base	3 Oct 2004	Cushing P E	1	ZA.7314
Araneidae	<i>Micrathena gracilis</i>	East Range, ?	10 June 2003	Schmidt J	1	ZA.7013
Araneidae	<i>Micrathena gracilis</i>	West Range, Medicine Creek	10 June 2003	Schmidt J	1	ZA.7015
Araneidae	<i>Micrathena gracilis</i>	West Range, Medicine Creek	20 Sept 2003	Cushing P E	1	ZA.7016
Araneidae	<i>Micrathena gracilis</i>	West Range, Four Mile Crossing	10 July 2004	Francis M	1	ZA.7144
Araneidae	<i>Micrathena gracilis</i>	Quanah, ?	12 Aug 2003	Owens J	1	ZA.7157
Araneidae	<i>Micrathena gracilis</i>	East Range, near Sitting Bear Creek	09 July 2004	Francis M	1	ZA.7187
Araneidae	<i>Micrathena gracilis</i>	Quanah Range, Rock Creek	11 July 2004	Cushing P E	1	ZA.7194
Araneidae	<i>Micrathena gracilis</i>	East Range, NE boundary of base	3 Oct 2004	Francis M	2	ZA.7260
Araneidae	<i>Micrathena gracilis</i>	East Range, NE boundary of base	3 Oct 2004	Cushing P E	1	ZA.7306
Araneidae	<i>Neoscona arabesca</i>	LETRA	20 Sep 2003	Kondratieff B	5	ZA.6589
Araneidae	<i>Neoscona arabesca</i>	West Range, Engineer Lake	20 Sept 2003	Cushing P E	4	ZA.7018
Araneidae	<i>Neoscona arabesca</i>	West Range, Quanah	19 Sept 2003	Cushing P E	2	ZA.7024
Araneidae	<i>Neoscona arabesca</i>	East Range, Lake George	19 Sept 2003	Cushing P E	1	ZA.7061
Araneidae	<i>Neoscona arabesca</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Cushing P E	5	ZA.7143
Araneidae	<i>Neoscona arabesca</i>	West Range, Four Mile	10 July 2004	Cushing P E	1	ZA.7145

		Crossing				
Araneidae	<i>Neoscona arabesca</i>	Quanah Range, Pottawatomie Twins	19 Sept 2003	Cushing P E	4	ZA.7156
Araneidae	<i>Neoscona arabesca</i>	East Range, East Boundary Rd	29 May 2004	Francis M	1	ZA.7158
Araneidae	<i>Neoscona arabesca</i>	East Range off Elgin Rd	29 May 2004	Francis M	1	ZA.7161
Araneidae	<i>Neoscona arabesca</i>	East Range off Elgin Rd	21 Sept 2003	Cushing P E	1	ZA.7165
Araneidae	<i>Neoscona arabesca</i>	West Range, Four Mile Crossing	20 Sept 2003	Cushing P E	1	ZA.7172
Araneidae	<i>Neoscona arabesca</i>	Quanah Range, Pottawatomie Twins	31 May 2004	Francis M	2	ZA.7173
Araneidae	<i>Neoscona arabesca</i>	East Range, Lake George	09 July 2004	Cushing P E	3	ZA.7178
Araneidae	<i>Neoscona arabesca</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Francis M	4	ZA.7183
Araneidae	<i>Neoscona arabesca</i>	East Range, Lake George	19 Sept 2003	Cushing P E	1	ZA.7189
Araneidae	<i>Neoscona arabesca</i>	West Range, Four Mile Crossing	30 May 2004	Francis M	1	ZA.7190
Araneidae	<i>Neoscona arabesca</i>	East Range, Lake George	09 July 2004	Francis M	1	ZA.7196
Araneidae	<i>Neoscona arabesca</i>	East Range off Elgin Rd	29 May 2004	Cushing P E	1	ZA.7234
Araneidae	<i>Neoscona arabesca</i>	West Range, Ketch Lake	20 Sept 2003	Cushing P E	1	ZA.7236
Araneidae	<i>Neoscona arabesca</i>	West Range, Quanah	19 Sept 2003	Cushing P E	6	ZA.7238
Araneidae	<i>Neoscona arabesca</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Munsterman W	5	ZA.7243
Araneidae	<i>Neoscona arabesca</i>	Quanah Range, West Cache Creek	11 July 2004	Munsterman W	1	ZA.7245
Araneidae	<i>Neoscona arabesca</i>	Quanah Range, Pottawatomie Twins	31 May 2004	Francis M	1	ZA.7256
Araneidae	<i>Neoscona arabesca</i>	East Range, Lake George	3 Oct 2004	Francis M	9	ZA.7299
Araneidae	<i>Neoscona arabesca</i>	East Range, off Elgin Rd	3 Oct 2004	Cushing P E & Francis M	2	ZA.7300
Araneidae	<i>Neoscona arabesca</i>	West Range, Four Mile Crossing	3 Oct 2004	Cushing P E	1	ZA.7301
Araneidae	<i>Neoscona arabesca</i>	West Range, Four Mile Crossing	3 Oct 2004	Francis M	3	ZA.7302
Araneidae	<i>Neoscona arabesca</i>	East Range, Lake George	3 Oct 2004	Francis M	10	ZA.7309
Araneidae	<i>Neoscona arabesca</i>	Quanah Range, Pottawattomi Pond	2 Oct 2004	Cushing P E	4	ZA.7311
Araneidae	<i>Neoscona arabesca</i>	Quanah Range, Pottawatomie Twins	2 Oct 2004	Francis M	5	ZA.7382
Araneidae	<i>Neoscona crucifera</i>	West Range, Four Mile Crossing	20 Sept 2003	Cushing P E	1	ZA.7138
Araneidae	<i>Neoscona crucifera</i>	Natural Resources Area	21 Sept 2003	Cushing P E	1	ZA.7197
Araneidae	<i>Neoscona crucifera</i>	Quanah, 3mi west Falcon Gate	2 Oct 2004	Francis M	1	ZA.7305
Araneidae	<i>Neoscona crucifera</i>	East Range, NE boundary of base	3 Oct 2004	Cushing P E	1	ZA.7312
Araneidae	<i>Neoscona domiciliorum</i>	Quanah Range,	19 Sept 2003	Kondratieff B	1	ZA.7166

		Pottawatomie Twins				
Araneidae	<i>Neoscona oaxacensis</i>	LETRA	20 Sep 2003	Kondratieff B	1	ZA.6588
Araneidae	<i>Neoscona oaxacensis</i>	Quanah Range, ?	11 July 2003	Owens J	1	ZA.7011
Araneidae	<i>Neoscona oaxacensis</i>	West Range, Quanah	19 Sept 2003	Cushing P E	1	ZA.7012
Araneidae	<i>Neoscona oaxacensis</i>	West Range, Engineer Lake	20 Sept 2003	Cushing P E	1	ZA.7014
Araneidae	<i>Neoscona oaxacensis</i>	LETRA	20 Sept 2003	Cushing P E	1	ZA.7017
Araneidae	<i>Neoscona oaxacensis</i>	Quanah Range, Pottawatomie Twins	19 Sept 2003	Cushing P E	4	ZA.7141
Araneidae	<i>Neoscona oaxacensis</i>	Quanah Range, Pottawatomie Twins	31 May 2004	Francis M	1	ZA.7174
Araneidae	<i>Neoscona oaxacensis</i>	Quanah Range, Pottawatomie Twins	19 Sept 2003	Kondratieff B	3	ZA.7175
Araneidae	<i>Neoscona oaxacensis</i>	West Range, Quanah	19 Sept 2003	Cushing P E	2	ZA.7237
Araneidae	<i>Neoscona oaxacensis</i>	Quanah Range, Pottawatomie Twins	31 May 2004	Francis M	1	ZA.7240
Araneidae	<i>Neoscona oaxacensis</i>	Quanah Range, Pottawatomie Twins	19 Sept 2003	Cushing P E	1	ZA.7251
Araneidae	<i>Neoscona utahana</i>	Quanah Range, Pottawatomie Twins	19 Sept 2003	Kondratieff B	1	ZA.7164
Araneidae	<i>Singa keyserlingi</i>	Medicine Bluff Historic Site	9 July 2004	Cushing P E	1	ZA.7254
Clubionidae	<i>Clubiona abboti</i>	East Range, East Cache Creek	12 June 2003	Schmidt J	1	ZA.7010
Clubionidae	<i>Clubiona abboti</i>	West Range, Four Mile Crossing	10 July 2004	Francis M	1	ZA.7222
Clubionidae	<i>Clubiona abboti</i>	East Range, Lake George	29 May 2004	Cushing P E	1	ZA.7223
Clubionidae	<i>Clubiona abboti</i>	Quanah Range, 3mi west Falcon gate	11 July 2004	Cushing P E	1	ZA.7224
Clubionidae	<i>Elaver excepta</i>	Quanah Range, near border Wichita Mountain National Wildlife Refuge	2 Oct 2004	Cushing P E	1	ZA.7267
Corinnidae	Castianeira gertschi	Quanah Range, near border Wichita Mountain National Wildlife Refuge	2 Oct 2004	Cushing P E	1	ZA.7266
Corinnidae	<i>Phrurotimpus certus</i>	Quanah Range, Pottawatomie Twins	31 May 2004	Cushing P E	1	ZA.7436
Corinnidae	<i>Scotinella redempta</i>	West Range, Four Mile Crossing	10 July 2004	Cushing P E	1	ZA.7435
Corinnidae	<i>Trachelas tranquillus</i>	Medicine Bluff Historic Site	2 Oct 2004	Cushing P E	1	ZA.7264
Dictynidae	<i>Dictyna bellans</i>	West Range, Mandam Pond	30 May 2004	Cushing P E	1	ZA.6918
Dictynidae	<i>Dictyna bellans</i>	West Range, Ketch Lake	10 July 2004	Francis M	1	ZA.6919
Dictynidae	<i>Dictyna bellans</i>	East Range, East Cache Creek	29 May 2004	Cushing P E	1	ZA.6920
Dictynidae	<i>Dictyna bellans</i>	Quanah Range, West Cache Creek	31 May 2004	Cushing P E	3	ZA.6921
Dictynidae	<i>Dictyna bellans</i>	Quanah, 3 mi west	11 July 2004	Cushing P E	2	ZA.6924

		Falcon Gate				
Dictynidae	<i>Dictyna bellans</i>	Quanah Range, West Cache Creek	11 July 2004	Cushing, P E & Francis M	3	ZA.6926
Dictynidae	<i>Dictyna bellans</i>	Quanah Range, Pottawatomie Twins	31 May 2004	Cushing P E	3	ZA.6934
Dictynidae	<i>Dictyna bellans</i>	East Range, Lake George	29 May 2004	Cushing P E	9	ZA.6935
Dictynidae	<i>Dictyna bellans</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Munsterman W	2	ZA.6938
Dictynidae	<i>Dictyna bellans</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Francis M	2	ZA.6939
Dictynidae	<i>Dictyna bellans</i>	East Range, East Cache Creek	12 June 2003	Schmidt J	1	ZA.6940
Dictynidae	<i>Dictyna bellans</i>	East Range, East Cache Creek	15 March 2003	Kondratieff B	1	ZA.6941
Dictynidae	<i>Dictyna bellans</i>	Quanah, 3 mi west Falcon Gate	11 July 2004	Munsterman W	1	ZA.6942
Dictynidae	<i>Dictyna bellans</i>	East Range, East Boundary Rd	9 July 2004	Cushing P E	1	ZA.6944
Dictynidae	<i>Dictyna bellans</i>	West Range, Four Mile Crossing	30 May 2004	Francis M	2	ZA.6945
Dictynidae	<i>Dictyna bellans</i>	Medicine Bluff Historic Site	9 July 2004	Cushing P E	4	ZA.6947
Dictynidae	<i>Dictyna bellans</i>	West Range, Engineer Lake	10 July 2004	Cushing P E	4	ZA.6949
Dictynidae	<i>Dictyna bellans</i>	East Range, Lake George	19 Sept 2003	Cushing P E	24	ZA.6951
Dictynidae	<i>Dictyna bellans</i>	West Range, Quanah	31 May 2004	Cushing P E	1	ZA.6952
Dictynidae	<i>Dictyna bellans</i>	Quanah Range, West Cache Creek	31 May 2004	Cushing P E	1	ZA.6953
Dictynidae	<i>Dictyna bellans</i>	Quanah Range, Pottawatomie Twins	31 May 2004	Francis M	1	ZA.6956
Dictynidae	<i>Dictyna bellans</i>	East Range, Lake George	9 July 2004	Cushing P E	1	ZA.6961
Dictynidae	<i>Dictyna bellans</i>	Quanah, 3 mi west Falcon Gate	11 July 2004	Francis M	1	ZA.6962
Dictynidae	<i>Dictyna bellans</i>	East Range, East Cache Creek	3 Oct 2004	Cushing P E	1	ZA.7335
Dictynidae	<i>Dictyna bellans</i>	East Range, East Cache Creek	29 May 2004	Cushing P E	1	ZA.7336
Dictynidae	<i>Dictyna bellans</i>	East Range, East Cache Creek	19 Sept 2003	Cushing P E	2	ZA.7337
Dictynidae	<i>Dictyna bellans</i>	East Range, East Cache Creek	3 Oct 2004	Cushing P E	1	ZA.7338
Dictynidae	<i>Dictyna calcarata</i>	West Range, Four Mile Crossing	20 Sept 2003	Cushing P E	1	ZA.7333
Dictynidae	<i>Dictyna calcarata</i>	East Range, East Cache Creek	29 May 2004	Cushing P E	1	ZA.7334
Dictynidae	<i>Dictyna foliacea</i>	East Range off Elgin Rd	29 May 2004	Francis M	1	ZA.6954
Dictynidae	<i>Dictyna foliacea</i>	West Range, Quanah	31 May 2004	Francis M	1	ZA.6955
Dictynidae	<i>Dictyna foliacea</i>	West Range, Blue Beaver Creek	30 May 2004	Francis M	1	ZA.6957
Dictynidae	<i>Dictyna foliacea</i>	Quanah Range, Rock	31 May 2004	Cushing P E	2	ZA.6958

		Creek				
Dictynidae	<i>Dictyna foliacea</i>	West Range, Blue Beaver Creek	30 May 2004	Cushing P E	1	ZA.6959
Dictynidae	<i>Dictyna foliacea</i>	East Range, East Boundary Rd.	29 May 2004	Francis M	1	ZA.6960
Dictynidae	<i>Dictyna foliacea</i>	East Range, East Cache Creek	29 May 2004	Cushing P E	1	ZA.6966
Dictynidae	<i>Dictyna volucripes</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Cushing P E	4	ZA.6922
Dictynidae	<i>Dictyna volucripes</i>	East Range, Lake George	9 July 2004	Cushing P E	5	ZA.6923
Dictynidae	<i>Dictyna volucripes</i>	East Range, Lake George	9 July 2004	Francis M	1	ZA.6925
Dictynidae	<i>Dictyna volucripes</i>	Natural Resources Area	31 March 2003	Garhart M., Opler P & Bekiver	2	ZA.6927
Dictynidae	<i>Dictyna volucripes</i>	West Range, ?	24 June 2003	Garhart M	2	ZA.6928
Dictynidae	<i>Dictyna volucripes</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Munsterman W	1	ZA.6929
Dictynidae	<i>Dictyna volucripes</i>	East Range, East Boundary Rd	9 July 2004	Francis M	1	ZA.6930
Dictynidae	<i>Dictyna volucripes</i>	East Range, Lake George	29 May 2004	Cushing P E	1	ZA.6931
Dictynidae	<i>Dictyna volucripes</i>	East Range off Elgin Rd	29 May 2004	Cushing P E	2	ZA.6932
Dictynidae	<i>Dictyna volucripes</i>	Quanah Range, Pottawatomie Twins	31 May 2004	Cushing P E	2	ZA.6933
Dictynidae	<i>Dictyna volucripes</i>	Quanah, 3 mi west Falcon Gate	11 July 2004	Cushing P E	5	ZA.6943
Dictynidae	<i>Dictyna volucripes</i>	East Range, East Boundary Rd	9 July 2004	Cushing P E	4	ZA.6946
Dictynidae	<i>Dictyna volucripes</i>	Medicine Bluff Historic Site	9 July 2004	Cushing P E	1	ZA.6948
Dictynidae	<i>Emblyna sublata</i>	East Range, East Cache Creek	25 April 2003	Schmidt J & Owens J	1	ZA.6937
Dictynidae	<i>Emblyna sublata</i>	West Range, Four Mile Crossing	30 May 2004	Francis M	2	ZA.7329
Dictynidae	<i>Emblyna sublata</i>	East Range, East Cache Creek	24 April 2003	Schmidt & Owens	1	ZA.7330
Dictynidae	<i>Lathys delicatula</i>	East Range, near Sitting Bear Creek	9 July 2004	Cushing P E	1	ZA.7331
Dictynidae	<i>Lathys delicatula</i>	Quanah Range, near border Wichita Mountain National Wildlife Refuge	02 Oct 2004	Cushing P E	2	ZA.7405
Dictynidae	<i>Phantyna segregata</i>	Quanah Range, Pottawatomie Pond	11 July 2004	Cushing P E	2	ZA.7332
Filistatidae	<i>Kukulcania hibernalis</i>	West Range, hillside near Engineer Lake	30 May 2004	Cushing P E	2	ZA.6965
Filistatidae	<i>Kukulcania hibernalis</i>	West Range, hillside near Engineer Lake	10 July 2004	Cushing P E	2	ZA.6967
Filistatidae	<i>Kukulcania hibernalis</i>	West Range, near Ketch Lake	10 July 2004	Cushing P E	2	ZA.7257
Gnaphosidae	<i>Callilepis imbecilla</i>	Quanah Range, Rock	31 May 2004	Cushing P E	1	ZA.7028

		Creek				
Gnaphosidae	<i>Cesonia bilineata</i>	West Range, Quanah	31 May 2004	Cushing P E et al	1	ZA.7032
Gnaphosidae	<i>Drassodes gosiutus</i>	Quanah Range, Rock Creek	2 Oct 2004	Cushing P E	1	ZA.7265
Gnaphosidae	<i>Drassodes gosiutus</i>	Quanah Range, near border Wichita Mountain National Wildlife Refuge	2 Oct 2004	Cushing P E	1	ZA.7268
Gnaphosidae	<i>Drassyllus lepidus</i>	West Range, hillside near Mandam Pond	10 July 2004	Cushing P E	2	ZA.7027
Gnaphosidae	<i>Gnaphosa fontinalis</i>	East Range, East Cache Creek	29 May 2004	Cushing P E	1	ZA.7029
Gnaphosidae	<i>Haplodrassus signifer</i>	Quanah Range, West Cache Creek	28 April 2003	Schmidt J	1	ZA.7031
Gnaphosidae	<i>Herpyllus ecclesiasticus</i>	Quanah Range, Pottawatomie Twins	12 Aug 2003	Owens J	1	ZA.7026
Gnaphosidae	<i>Herpyllus ecclesiasticus</i>	West Range, ?	28 March 2003	Garhart M	1	ZA.7030
Gnaphosidae	<i>Sergiolus capulatus</i>	East Range, near Sitting Bear Creek	9 July 2004	Cushing P E	1	ZA.7262
Gnaphosidae	<i>Talanites exlineae</i>	Quanah Range, Rock Creek	11 July 2004	Cushing P E	1	ZA.7025
Hahniidae	<i>Hahnia flaviceps</i>	East Range, East Cache Creek	2 Oct 2004	Cushing P E	4	ZA.7403
Linyphiidae	<i>Ceratinella brunnea</i>	East Range, NE boundary of base	3 Oct 2004	Cushing P E	1	ZA.7417
Linyphiidae	<i>Eperigone albula</i>	East Range, NE boundary of base	3 Oct 2004	Cushing P E	1	none
Linyphiidae	<i>Eperigone albula</i>	East Range, East Cache Creek nr Peachtree Xing	2 Oct 2004	Cushng P E	1	none
Linyphiidae	<i>Eperigone eschatologica</i>	East Range, Lake George	29 May 2004	Cushing P E	1	none
Linyphiidae	<i>Eperigone eschatologica</i>	East Range, Lake George	3 Oct 2004	Francis M	1	none
Linyphiidae	<i>Eperigone eschatologica</i>	Quanah Range; 3 mi west Falcon Gate	2 Oct 2004	Cushing P E	1	none
Linyphiidae	<i>Eperigone maculata</i>	Quanah Range, near border Wichita Mountain National Wildlife Refuge	2 Oct 2004	Cushing P E	1	none
Linyphiidae	<i>Frontinella communis</i>	West Range, Four Mile Crossing	10 July 2004	Cushing P E	2	ZA.7042
Linyphiidae	<i>Frontinella communis</i>	Medicine Bluff Historic Site	09 July 2004	Cushing P E	1	ZA.7043
Linyphiidae	<i>Frontinella communis</i>	West Range, Medicine Creek	20 Sept 2003	Cushing P E	2	ZA.7044
Linyphiidae	<i>Frontinella communis</i>	East Range, East Cache Creek	19 Sept 2003	Cushing P E	1	ZA.7045
Linyphiidae	<i>Frontinella communis</i>	Quanah Range, Rock Creek	11 July 2004	Cushing P E	1	ZA.7051
Linyphiidae	<i>Grammonota vittata</i>	Medicine Bluff Historic Site	30 May 2004	Cushing P E	1	ZA.7410
Linyphiidae	<i>Grammonota vittata</i>	East Range, East Cache	12 June 2003	Schmidt J	1	ZA.7412

		Creek				
Linyphiidae	<i>Meioneta dactylata</i>	Hillside north Medicine Bluff	2 Oct 2004	Cushing P E and Francis M	1	none
Linyphiidae	<i>Meioneta leucophora</i>	East Range, East Boundary Rd	3 Oct 2004	Cushing P E	1	none
Linyphiidae	<i>Nerienne radiata</i>	Quanah Range, near border Wichita Mountain National Wildlife Refuge	31 May 2004	Francis M	1	ZA.7040
Linyphiidae	<i>Nerienne radiata</i>	West Range, Medicine Creek	20 Sept 2003	Cushing P E	2	ZA.7041
Linyphiidae	<i>Nerienne radiata</i>	West Range, Blue Beaver Creek	20 Sept 2003	Cushing P E	2	ZA.7046
Linyphiidae	<i>Nerienne radiata</i>	East Range, near Sitting Bear Creek	09 July 2004	Cushing P E	4	ZA.7048
Linyphiidae	<i>Nerienne radiata</i>	East Range, East Cache Creek	19 Sept 2003	Cushing P E	2	ZA.7049
Linyphiidae	<i>Nerienne radiata</i>	Quanah Range, Rock Creek	11 July 2004	Munsterman W	1	ZA.7050
Linyphiidae	<i>Nerienne radiata</i>	East Range, Geromino's Grave	2 Oct 2004	Francis M	2	ZA.7361
Linyphiidae	<i>Nerienne radiata</i>	Quanah Range, Rock Creek	11 July 2004	Francis M	1	ZA.7362
Linyphiidae	<i>Nerienne radiata</i>	East Range, Geromino's Grave	2 Oct 2004	Cushing P E	3	ZA.7363
Lycosidae	<i>Allocosa funerea</i>	East Range, Lake George	9 July 2004	Cushing P E	1	ZA.7283
Lycosidae	<i>Allocosa noctuabunda</i>	East Range, East Cache Creek	24 April 2003	Schmidt J	1	ZA.7284
Lycosidae	<i>Arctosa littoralis</i>	West Range, Medicine Creek	03 July 2003	Owens J	1	ZA.7064
Lycosidae	<i>Arctosa littoralis</i>	Quanah Range, Pottawatomie Twins	12 April 2003	Owens J	1	ZA.7065
Lycosidae	<i>Arctosa littoralis</i>	West Range, Blue Beaver Creek	10 June 2003	Owens J	1	ZA.7066
Lycosidae	<i>Arctosa littoralis</i>	West Range, Engineer Lake	20 Sept 2003	Cushing P E	1	ZA.7069
Lycosidae	<i>Arctosa littoralis</i>	West Range, Blue Beaver Creek	10 July 2004	Cushing P E	2	ZA.7070
Lycosidae	<i>Arctosa littoralis</i>	West Range, Four Mile Crossing	10 July 2004	Cushing P E	4	ZA.7078
Lycosidae	<i>Arctosa littoralis</i>	Quanah Range, Pottawattomi pond	2 Oct 2004	Cushing P E	3	ZA.7272
Lycosidae	<i>Arctosa littoralis</i>	East Range, East Cache Creek	24 April 2003	Schmidt J	1	ZA.7276
Lycosidae	<i>Arctosa littoralis</i>	West Range, Four Mile Crossing	3 Oct 2004	Cushing P E	1	ZA.7278
Lycosidae	<i>Arctosa littoralis</i>	East Range, Lake George	3 Oct 2004	Francis M	1	ZA.7280
Lycosidae	<i>Arctosa littoralis</i>	Quanah Range, West Cache Creek	2 Oct 2004	Cushing P E	2	ZA.7281
Lycosidae	<i>Hogna helluo</i>	Quanah Range, Pottawatomie Pond	11 July 2004	Cushing P E	1	ZA.7288

Lycosidae	<i>Pardosa delicatula</i>	Quanah Range; 3 mi west Falcon Gate	11 July 2004	Cushing P E	1	ZA.7075
Lycosidae	<i>Pardosa mercurialis</i>	East Range, East Cache Creek	29 May 2004	Cushing P E	2	ZA.7060
Lycosidae	<i>Pardosa mercurialis</i>	West Range, Blue Beaver Creek	10 July 2004	Cushing P E	7	ZA.7063
Lycosidae	<i>Pardosa mercurialis</i>	West Range, Four Mile Crossing	10 July 2004	Cushing P E	1	ZA.7073
Lycosidae	<i>Pardosa mercurialis</i>	Quanah Range, West Cache Creek	2 Oct 2004	Cushing P E	1	ZA.7291
Lycosidae	<i>Pardosa mercurialis</i>	West Range, Four Mile Crossing	3 Oct 2004	Cushing P E	1	ZA.7294
Lycosidae	<i>Pardosa milvina</i>	West Range, Mandam Pond	30 May 2004	Cushing P E	1	ZA.7293
Lycosidae	<i>Pardosa pauxilla</i>	East Range, Lake George	09 July 2004	Cushing P E	3	ZA.7062
Lycosidae	<i>Pardosa pauxilla</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Cushing P E	1	ZA.7076
Lycosidae	<i>Pardosa pauxilla</i>	East Range, Lake George	3 Oct 2004	Francis M	1	ZA.7292
Lycosidae	<i>Pardosa steva</i>	Quanah Range, West Cache Creek	28 March 2003	Garhart M	2	ZA.7480
Lycosidae	<i>Pirata apalacheus</i>	Quanah Range, Rock Creek	11 July 2004	Cushing P E	1	ZA.7295
Lycosidae	<i>Pirata insularis</i>	East Range, East Cache Creek	12 June 2003	Schmidt J	1	ZA.7296
Lycosidae	<i>Rabidosa punctulata</i>	West Range, Four Mile Crossing	3 Oct 2004	Cushing P E	1	ZA.7290
Lycosidae	<i>Rabidosa rabida</i>	Deer Creek Canyon Rd & Blue Beaver Valley Rd	09 July 2004	Kondratieff B et al	2	ZA.6984
Lycosidae	<i>Rabidosa rabida</i>	East Range, East Cache Creek	01 July 2003	Schmidt J	1	ZA.7053
Lycosidae	<i>Rabidosa rabida</i>	Quanah Range, West Cache Creek	19 Sept 2003	Cushing P E	1	ZA.7054
Lycosidae	<i>Rabidosa rabida</i>	West Range, Four Mile Crossing	10 July 2004	Cushing P E	1	ZA.7055
Lycosidae	<i>Rabidosa rabida</i>	Quanah Range, ?	12 Aug 2003	Owens J	1	ZA.7068
Lycosidae	<i>Rabidosa rabida</i>	West Range, Blue Beaver Creek	20 Sept 2003	Cushing P E	1	ZA.7071
Lycosidae	<i>Rabidosa rabida</i>	West Range, Mandam Pond	30 May 2004	Cushing P E	1	ZA.7072
Lycosidae	<i>Rabidosa rabida</i>	Quanah Range, 3 mi west Falcon Gate	11 July 2004	Cushing P E	1	ZA.7074
Lycosidae	<i>Rabidosa rabida</i>	West Range, Four Mile Crossing	10 July 2004	Cushing P E	1	ZA.7077
Lycosidae	<i>Rabidosa rabida</i>	West Range, Engineer Lake	30 May 2004	Francis M	1	ZA.7079
Lycosidae	<i>Rabidosa rabida</i>	Natural Resources Area	30 May 2004	Weaver K	1	ZA.7209
Lycosidae	<i>Rabidosa rabida</i>	Quanah Range, West Cache Creek	2 Oct 2004	Cushing P E	1	ZA.7289
Lycosidae	<i>Schizocosa mccooki</i>	West Range, Four Mile Crossing	10 July 2004	Cushing P E	1	ZA.7285

Lycosidae	<i>Schizocosa ocreata</i>	Quanah Range, Rock Creek	31 May 2004	Cushing P E	6	ZA.7059
Lycosidae	<i>Schizocosa ocreata</i>	Quanah Range, Rock Creek	31 May 2004	Cushing P E	3	ZA.7277
Lycosidae	<i>Schizocosa ocreata</i>	Quanah range, Rock Creek	11 July 2004	Cushing P E	1	ZA.7286
Lycosidae	<i>Schizocosa ocreata</i>	Quanah Range, Rock Creek	31 May 2004	Francis M	1	ZA.7287
Lycosidae	<i>Schizocosa ocreata</i>	East Range, ?	02 May 2003	Kondratieff B, et al.	1	ZA.7434
Lycosidae	<i>Trochosa ruricola</i>	East Range, Lake George	3 Oct 2004	Francis M	1	ZA.7282
Lycosidae	<i>Varacosa avara</i>	Quanah Range, near border Wichita Mountain National Wildlife Refuge	2 Oct 2004	Cushing P E	3	ZA.7269
Lycosidae	<i>Varacosa avara</i>	West Range, Four Mile Crossing	3 Oct 2004	Cushing P E	9	ZA.7273
Lycosidae	<i>Varacosa avara</i>	East Range, East Boundary Rd	3 Oct 2004	Cushing P E	3	ZA.7274
Lycosidae	<i>Varacosa avara</i>	East Range, East Cache Creek	3 Oct 2004	Cushing P E	1	ZA.7275
Lycosidae	<i>Varacosa avara</i>	East Range, NE boundary of base	3 Oct 2004	Francis M	1	ZA.7279
Lycosidae	<i>Varacosa shenandoa</i>	West Range, ?	26 April 2003	Opler P	1	ZA.7067
Lycosidae	<i>Varacosa shenandoa</i>	East Range, Geronimo's Grave	2 Oct 2004	Cushing P E	1	ZA.7270
Lycosidae	<i>Varacosa shenandoa</i>	Quanah Range, Pottawatomie Twins	2 Oct 2004	Cushing P E	1	ZA.7271
Lycosidae	<i>Varacosa shenandoa</i>	LETRA	30 March 2003	Garhart M	1	ZA.7481
Mimetidae	<i>Mimetus puritanus</i>	West Range, Four Mile Crossing	10 July 2004	Cushing P E	1	ZA.7084
Mimetidae	<i>Mimetus puritanus</i>	East Range, near Sitting Bear Creek	09 July 2004	Cushing P E	1	ZA.7085
Miturgidae	<i>Cheiracanthium inclusum</i>	West Range, Engineer Lake	10 July 2004	Cushing P E	1	ZA.7033
Miturgidae	<i>Cheiracanthium inclusum</i>	West Range, Four Mile Crossing	10 July 2004	Francis M	1	ZA.7034
Miturgidae	<i>Cheiracanthium inclusum</i>	Quanah Range, West Cache Creek	31 May 2004	Cushing P E	1	ZA.7035
Miturgidae	<i>Cheiracanthium inclusum</i>	East Range, ?	10 July 2004	Schmidt & Kondratieff	1	ZA.7474
Oxyopidae	<i>Oxyopes salticus</i>	West Range, Quanah	19 Sept 2003	Cushing P E	1	ZA.6782
Oxyopidae	<i>Oxyopes salticus</i>	Natural Resources Area	12 Aug 2003	Owens J	2	ZA.6783
Oxyopidae	<i>Oxyopes salticus</i>	East Range, East Cache Creek	19 Sept 2003	Cushing P E	1	ZA.6784
Oxyopidae	<i>Oxyopes salticus</i>	Deer Creek Canyon Rd & Blue Beaver Valley Rd	20 Sept 2003	Cushing P E	1	ZA.6785
Oxyopidae	<i>Oxyopes salticus</i>	West Range, ?	24 June 2003	Garhart M	2	ZA.6786
Oxyopidae	<i>Oxyopes salticus</i>	East Range, East Boundary Rd	29 May 2004	Cushing P E	1	ZA.6787
Oxyopidae	<i>Oxyopes salticus</i>	West Range, Engineer	10 July 2004	Cushing P E	6	ZA.6788

		Lake				
Oxyopidae	<i>Oxyopes salticus</i>	West Range, Four Mile Crossing	10 July 2004	Francis M	2	ZA.6789
Oxyopidae	<i>Oxyopes salticus</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Munsterman W	2	ZA.6790
Oxyopidae	<i>Oxyopes salticus</i>	East Range off Elgin Rd	21 Sept 2003	Cushing P E	1	ZA.6791
Oxyopidae	<i>Oxyopes salticus</i>	East Range, Lake George	9 July 2004	Francis M	6	ZA.6792
Oxyopidae	<i>Oxyopes salticus</i>	East Range, Lake George	19 Sept 2003	Cushing P E	1	ZA.6793
Oxyopidae	<i>Oxyopes salticus</i>	East Range, East Cache Creek	25 April 2003	Garhart M & Opler P	2	ZA.6795
Oxyopidae	<i>Oxyopes salticus</i>	Quanah, 3 mi west Falcon Gate	11 July 2004	Munsterman W	11	ZA.6796
Oxyopidae	<i>Oxyopes salticus</i>	East Range, Lake George	09 July 2004	Cushing P E	1	ZA.7137
Oxyopidae	<i>Oxyopes salticus</i>	Medicine Bluff Historic Site	2 Oct 2004	Francis M	1	ZA.7261
Oxyopidae	<i>Peucetia viridans</i>	Quanah Range, West Cache Creek	11 July 2004	Munsterman W	1	ZA.6794
Philodromidae	<i>Apollophanes margareta</i>	East Range off Elgin Rd	29 May 2004	Cushing P E	1	ZA.6822
Philodromidae	<i>Philodromus cespitum</i>	East Range, Lake George	29 May 2004	Cushing P E	2	ZA.6800
Philodromidae	<i>Philodromus imbecillus</i>	East Range, East Boundary Rd	29 May 2004	Francis M	1	ZA.6807
Philodromidae	<i>Philodromus imbecillus</i>	East Range off Elgin Rd	29 May 2004	Francis M	2	ZA.6820
Philodromidae	<i>Philodromus imbecillus</i>	West Range, Engineer Lake	30 May 2004	Francis M	1	ZA.6821
Philodromidae	<i>Philodromus imbecillus</i>	East Range, Lake George	29 May 2004	Francis M	2	ZA.6828
Philodromidae	<i>Philodromus imbecillus</i>	West Range, Mandam Pond	30 May 2004	Cushing P E	2	ZA.6833
Philodromidae	<i>Philodromus imbecillus</i>	East Range off Elgin Rd	29 May 2004	Cushing P E	1	ZA.6834
Philodromidae	<i>Philodromus keyserlingi</i>	LETRA	12 June 2003	Schmidt J	1	ZA.6809
Philodromidae	<i>Philodromus keyserlingi</i>	West Range, Mandam Pond	30 May 2004	Cushing P E	1	ZA.6819
Philodromidae	<i>Philodromus marxi</i>	East Range, East Boundary Rd	29 May 2004	Cushing P E	1	ZA.6823
Philodromidae	<i>Philodromus marxi</i>	Quanah Range, Pottawatomie Twins	2 Oct 2004	Francis M	1	ZA.7326
Philodromidae	<i>Philodromus pratariae</i>	Deer Creek Canyon Rd & Blue Beaver Valley Rd	20 Sept 2003	Cushing P E	1	ZA.6797
Philodromidae	<i>Philodromus pratariae</i>	West Range, Rock Creek	19 Sept 2003	Cushing P E	3	ZA.6803
Philodromidae	<i>Philodromus pratariae</i>	East Range, East Cache Creek	19 Sept 2003	Cushing P E	2	ZA.6804
Philodromidae	<i>Philodromus pratariae</i>	East Range, East Cache Creek	19 Sept 2003	Cushing P E	1	ZA.6806
Philodromidae	<i>Philodromus pratariae</i>	East Range, ?	28 Sept 2003	Garhart M	1	ZA.6816
Philodromidae	<i>Philodromus pratariae</i>	Quanah Range, West Cache Creek	19 Sept 2003	Cushing P E	1	ZA.6818
Philodromidae	<i>Philodromus pratariae</i>	West Range, Quanah	19 Sept 2003	Cushing P E	1	ZA.7118

Philodromidae	<i>Philodromus pratariae</i>	Medicine Bluff Historic Site	2 Oct 2004	Cushing P E	1	ZA.7321
Philodromidae	<i>Philodromus pratariae</i>	East Range, Lake George	3 Oct 2004	Francis M	1	ZA.7322
Philodromidae	<i>Philodromus pratariae</i>	Medicine Bluff Historic Site	2 Oct 2004	Francis M	5	ZA.7323
Philodromidae	<i>Philodromus pratariae</i>	Medicine Bluff Historic Site	2 Oct 2004	Cushing P E and Francis M	3	ZA.7324
Philodromidae	<i>Philodromus pratariae</i>	East Range, East Boundary Rd	3 Oct 2004	Cushing P E	2	ZA.7327
Philodromidae	<i>Philodromus pratariae</i>	Quanah, 3mi west Falcon Gate	2 Oct 2004	Francis M	1	ZA.7328
Philodromidae	<i>Philodromus rufus</i>	East Range, East Cache Creek	24 April 2003	Schmidt J	1	ZA.6817
Philodromidae	<i>Thanatus rubicellus</i>	East Range, Lake George	29 May 2004	Francis M	1	ZA.6799
Philodromidae	<i>Thanatus rubicellus</i>	East Range, East Boundary Rd	29 May 2004	Francis M	1	ZA.6801
Philodromidae	<i>Thanatus rubicellus</i>	East Range, East Boundary Rd	9 July 2004	Cushing P E	1	ZA.6810
Philodromidae	<i>Thanatus rubicellus</i>	Quanah Range, 3 mi west Falcon Gate	11 July 2004	Munsterman W	1	ZA.7091
Philodromidae	<i>Tibellus chamberlini</i>	East Range off Elgin Rd	29 May 2004	Cushing P E	1	ZA.6824
Philodromidae	<i>Tibellus chamberlini</i>	West Range, Engineer Lake	10 July 2004	Francis M	2	ZA.7198
Philodromidae	<i>Tibellus duttoni</i>	Quanah Range, Pottawatomie Twins	31 May 2004	Cushing P E	5	ZA.6798
Philodromidae	<i>Tibellus duttoni</i>	East Range, East Boundary Rd	9 July 2004	Cushing P E	1	ZA.6802
Philodromidae	<i>Tibellus duttoni</i>	West Range, Engineer Lake	30 May 2004	Cushing P E	1	ZA.6805
Philodromidae	<i>Tibellus duttoni</i>	East Range, East Boundary Rd	29 May 2004	Francis M	1	ZA.6808
Philodromidae	<i>Tibellus duttoni</i>	East Range, Lake George	19 Sept 2003	Cushing P E	2	ZA.6811
Philodromidae	<i>Tibellus duttoni</i>	Quanah Range, Pottawatomie Twins	31 May 2004	Francis M	1	ZA.6812
Philodromidae	<i>Tibellus duttoni</i>	East Range, East Boundary Rd	29 May 2004	Cushing P E	1	ZA.6813
Philodromidae	<i>Tibellus duttoni</i>	West Range, ?	24 June 2003	Garhart M	1	ZA.6814
Philodromidae	<i>Tibellus duttoni</i>	West Range, Engineer Lake	10 July 2004	Francis M	1	ZA.6815
Philodromidae	<i>Tibellus duttoni</i>	East Range, East Boundary Rd	29 May 2004	Cushing P E	2	ZA.6826
Philodromidae	<i>Tibellus duttoni</i>	Quanah Range, 3 mi west Falcon Gate	11 July 2004	Munsterman W	3	ZA.6827
Philodromidae	<i>Tibellus duttoni</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Cushing P E	2	ZA.6830
Philodromidae	<i>Tibellus duttoni</i>	West Range, Engineer Lake	30 May 2004	Francis M	2	ZA.6831
Philodromidae	<i>Tibellus duttoni</i>	Quanah Range, West Cache Creek	11 July 2004	Munsterman W	1	ZA.6832
Philodromidae	<i>Tibellus duttoni</i>	Quanah Range, ?	12 Aug 2003	Owens J	1	ZA.6835

Philodromidae	<i>Tibellus duttoni</i>	East Range, Lake George	29 May 2004	Cushing P E	2	ZA.6964
Pholcidae	<i>Psilochorus imitatus</i>	West Range, hillside near Mandam Pond	10 July 2004	Cushing P E	5	ZA.7210
Pholcidae	<i>Psilochorus imitatus</i>	Quanah Range, Rock Creek	11 July 2004	Francis M	1	ZA.7367
Pholcidae	<i>Psilochorus imitatus</i>	West Range, Engineer Lake	10 July 2004	Cushing P E	1	ZA.7368
Pholcidae	<i>Psilochorus imitatus</i>	Quanah Range, Pottawatomie Twins	20 Sept 2003	Cushing P E	5	ZA.7369
Pholcidae	<i>Psilochorus imitatus</i>	Quanah Range, Rock Creek	31 May 2004	Francis M	1	ZA.7370
Pholcidae	<i>Psilochorus imitatus</i>	East Range, near Sitting Bear Creek	9 July 2004	Cushing P E	3	ZA.7371
Pholcidae	<i>Psilochorus imitatus</i>	East Range, near Sitting Bear Creek	9 July 2004	Francis M	1	ZA.7372
Pholcidae	<i>Psilochorus imitatus</i>	West Range, Engineer Lake	30 May 2004	Cushing P E	6	ZA.7373
Pholcidae	<i>Psilochorus imitatus</i>	Quanah Range, Rock Creek	31 May 2004	Cushing P E	5	ZA.7374
Pholcidae	<i>Psilochorus imitatus</i>	Quanah Range, near border Wichita Mountain National Wildlife Refuge	31 May 2004	Francis M	1	ZA.7375
Pisauridae	<i>Pisaurina dubia</i>	East Range, East Cache Creek	29 May 2004	Cushing P E	1	ZA.6825
Pisauridae	<i>Pisaurina dubia</i>	West Range, Four Mile Crossing	10 July 2004	Cushing P E	2	ZA.6968
Pisauridae	<i>Pisaurina mira</i>	West Range, Quanah	31 May 2004	Cushing P E et al	1	ZA.6969
Pisauridae	<i>Pisaurina mira</i>	West Range, Four Mile Crossing	3 Oct 2004	Cushing P E	1	ZA.7227
Pisauridae	<i>Pisaurina mira</i>	Quanah range, Rock Creek	2 Oct 2004	Cushing P E	1	ZA.7228
Pisauridae	<i>Pisaurina mira</i>	East Range, East Cache Creek	3 Oct 2004	Cushing P E	1	ZA.7229
Pisauridae	<i>Pisaurina mira</i>	East Range, NE boundary of base	3 Oct 2004	Cushing P E	2	ZA.7230
Salticidae	<i>Eris militaris</i>	Quanah, 3mi west Falcon Gate	2 Oct 2004	Francis M	1	ZA.7381
Salticidae	<i>Eris militaris</i>	Medicine Bluff Historic Site	2 Oct 2004	Cushing P E	1	ZA.7397
Salticidae	<i>Eris militaris</i>	Quanah, 3 mi west Falcon Gate	11 July 2004	Munsterman W	1	ZA.7398
Salticidae	<i>Habronattus cognatus</i>	Quanah Range, West Cache Creek	11 July 2004	Munsterman W	1	ZA.7437
Salticidae	<i>Habronattus texanus</i>	East Range, Lake George	9 July 2004	Francis M	1	ZA.6996
Salticidae	<i>Hentzia palmarum</i>	LETRA	12 June 2003	Schmidt J	1	ZA.6568
Salticidae	<i>Hentzia palmarum</i>	West Range, Medicine Creek	20 Sept 2003	Cushing P E	1	ZA.6843
Salticidae	<i>Hentzia palmarum</i>	East Range, East Boundary Rd	9 July 2004	Cushing P E	1	ZA.6881

Salticidae	<i>Hentzia palmarum</i>	West Range, Mandam Pond	30 May 2004	Cushing P E	1	ZA.6895
Salticidae	<i>Hentzia palmarum</i>	West Range, Ketch Lake	10 July 2004	Cushing P E	1	ZA.6902
Salticidae	<i>Hentzia palmarum</i>	Medicine Bluff Historic Site	2 Oct 2004	Cushing P E	2	ZA.7378
Salticidae	<i>Maevia inclemens</i>	East Range, East Cache Creek	29 May 2004	Cushing P E	1	ZA.6871
Salticidae	<i>Maevia inclemens</i>	East Range, East Cache Creek	29 May 2004	Francis M	1	ZA.6905
Salticidae	<i>Maevia inclemens</i>	LETRA	12 June 2003	Schmidt J	1	ZA.6915
Salticidae	<i>Maevia inclemens</i>	Natural Resources Area	24 April 2003	Owens J et al	1	ZA.6998
Salticidae	<i>Marpissa formosa</i>	LETRA	20 Sept 2003	Kondratieff B	5	ZA.6844
Salticidae	<i>Marpissa formosa</i>	East Range, East Cache Creek	29 May 2004	Cushing P E	2	ZA.6873
Salticidae	<i>Marpissa formosa</i>	Quanah Range, West Cache Creek	31 May 2004	Cushing P E	1	ZA.6878
Salticidae	<i>Marpissa formosa</i>	Quanah Range, ?	24 April 2003	Schmidt J	1	ZA.6888
Salticidae	<i>Marpissa formosa</i>	Quanah, 3 mi west Falcon Gate	11 July 2004	Francis M	1	ZA.6900
Salticidae	<i>Marpissa formosa</i>	West Range, Four Mile Crossing	10 July 2004	Cushing P E	1	ZA.6908
Salticidae	<i>Marpissa formosa</i>	West Range, Medicine Creek	30 June 2003	unknown	1	ZA.6910
Salticidae	<i>Marpissa formosa</i>	West Range, Blue Beaver Creek	30 May 2004	Francis M	1	ZA.6913
Salticidae	<i>Marpissa formosa</i>	East Range, East Cache Creek	12 June 2003	Schmidt J	3	ZA.6985
Salticidae	<i>Marpissa formosa</i>	West Range, Four Mile Crossing	30 May 2004	Cushing P E	1	ZA.6992
Salticidae	<i>Marpissa formosa</i>	West Range, Four Mile Crossing	30 May 2004	Cushing P E	1	ZA.6993
Salticidae	<i>Marpissa formosa</i>	West Range, Blue Beaver Creek	30 June 2003	Owens J	1	ZA.6994
Salticidae	<i>Marpissa formosa</i>	West Range, Four Mile Crossing	30 May 2004	Francis M	1	ZA.6995
Salticidae	<i>Marpissa formosa</i>	East Range, East Cache Creek	3 Oct 2004	Francis M	1	ZA.7379
Salticidae	<i>Marpissa formosa</i>	Medicine Bluff Historic Site	2 Oct 2004	Cushing P E	1	ZA.7380
Salticidae	<i>Marpissa formosa</i>	East Range, East Cache Creek	3 Oct 2004	Cushing P E	1	ZA.7394
Salticidae	<i>Marpissa formosa</i>	West Range, Blue Beaver Creek	9 July 2004	Schmidt & Kondratieff	1	ZA.7473
Salticidae	<i>Marpissa formosa</i>	West Range, Punch Bowl Rd & Letra Rd	28 May 2004	Schmidt & Kondratieff	1	ZA.7475
Salticidae	<i>Marpissa pikei</i>	LETRA	20 Sept 2003	Kondratieff B	2	ZA.6845
Salticidae	<i>Marpissa pikei</i>	East Range, Lake George	9 July 2004	Cushing P E	1	ZA.6869
Salticidae	<i>Marpissa pikei</i>	Quanah Range, West Cache Creek	31 May 2004	Cushing P E	1	ZA.6879
Salticidae	<i>Marpissa pikei</i>	West Range, Engineer Lake	30 May 2004	Francis M	2	ZA.6882

Salticidae	<i>Marpissa pikei</i>	East Range, East Boundary Rd	9 July 2004	Cushing P E	2	ZA.6883
Salticidae	<i>Marpissa pikei</i>	East Range, East Boundary Rd	29 May 2004	Cushing P E	2	ZA.6887
Salticidae	<i>Marpissa pikei</i>	West Range, Quanah	19 Sept 2003	Cushing P E	1	ZA.6889
Salticidae	<i>Marpissa pikei</i>	East Range off Elgin Rd	21 Sept 2003	Cushing P E	4	ZA.6890
Salticidae	<i>Marpissa pikei</i>	East Range, East Boundary Rd	29 May 2004	Francis, M	1	ZA.6891
Salticidae	<i>Marpissa pikei</i>	East Range, East Boundary Rd	29 May 2004	Francis M	2	ZA.6892
Salticidae	<i>Marpissa pikei</i>	Quanah, 3 mi west Falcon Gate	11 July 2004	Francis M	3	ZA.6901
Salticidae	<i>Marpissa pikei</i>	West Range, Engineer Lake	10 July 2004	Francis M	2	ZA.6903
Salticidae	<i>Marpissa pikei</i>	Quanah, 3 mi west Falcon Gate	11 July 2004	Cushing P E	3	ZA.6907
Salticidae	<i>Marpissa pikei</i>	West Range, Mandam Pond	30 May 2004	Francis M	3	ZA.6987
Salticidae	<i>Marpissa pikei</i>	West Range, Engineer Lake	10 July 2004	Cushing P E	4	ZA.6997
Salticidae	<i>Marpissa pikei</i>	Quanah, 3mi W. of Falcon Gate	2 Oct 2004	Cushing P E	1	ZA.7384
Salticidae	<i>Marpissa pikei</i>	East Range, East Boundary Rd	3 Oct 2004	Francis M	4	ZA.7387
Salticidae	<i>Marpissa pikei</i>	East Range, Lake George	03 Oct 2004	Francis M	1	ZA.7423
Salticidae	<i>Marpissa pikei</i>	East Range. East Boundary Rd.	03 Oct 2004	Cushing P E	1	ZA.7425
Salticidae	<i>Metacyrba taeniola</i>	Medicine Bluff Historic Site	9 July 2004	Cushing P E	1	ZA.6884
Salticidae	<i>Metaphidippus chera</i>	Quanah, 3 mi west Falcon Gate	11 July 2004	Cushing P E	2	ZA.7439
Salticidae	<i>Paraphidippus aurantius</i>	Quanah Range, Rock Creek	11 July 2004	Cushing P E	1	ZA.6876
Salticidae	<i>Paraphidippus aurantius</i>	West Range, Medicine Creek	3 July 2003	Owens J	1	ZA.6886
Salticidae	<i>Pelegrina galathea</i>	Quanah Range, West Cache Creek	19 Sept 2003	Cushing P E	1	ZA.6855
Salticidae	<i>Pelegrina galathea</i>	West Range, Four Mile Crossing	30 May 2004	Cushing P E	1	ZA.6856
Salticidae	<i>Pelegrina galathea</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Francis M	1	ZA.6857
Salticidae	<i>Pelegrina galathea</i>	East Range, Lake George	9 July 2004	Cushing P E	5	ZA.6858
Salticidae	<i>Pelegrina galathea</i>	West Range, Engineer Lake	10 July 2004	Cushing P E	4	ZA.6859
Salticidae	<i>Pelegrina galathea</i>	West Range, Mandam Pond	30 May 2004	Francis M	1	ZA.6860
Salticidae	<i>Pelegrina galathea</i>	Medicine Bluff Historic Site	09 July 2004	Cushing P E	1	ZA.6861
Salticidae	<i>Pelegrina galathea</i>	East Range off Elgin Rd	29 May 2004	Cushing P E	2	ZA.6862
Salticidae	<i>Pelegrina galathea</i>	West Range, Mandam Pond	30 May 2004	Cushing P E	3	ZA.6863

Salticidae	<i>Pelegrina galathea</i>	West Range, Post Oak Grassland	26 April 2003	Opler P	1	ZA.6864
Salticidae	<i>Pelegrina galathea</i>	Quanah, 3 mi west Falcon Gate	2 Oct 2004	Cushing P E	1	ZA.7385
Salticidae	<i>Pelegrina galathea</i>	Quanah, 3mi W of Falcon Gate	2 Oct 2004	Francis M	1	ZA.7388
Salticidae	<i>Pelegrina galathea</i>	Quanah Range, Pottawatomie Pond	11 July 2004	Cushing P E	2	ZA.7390
Salticidae	<i>Pelegrina galathea</i>	Quanah, 3mi west Falcon Gate	11 July 2004	Munsterman W	4	ZA.7392
Salticidae	<i>Pelegrina galathea</i>	East Range, Lake George	3 Oct 2004	Francis M	3	ZA.7393
Salticidae	<i>Pelegrina galathea</i>	East Range, Lake George	29 May 2004	Cushing P E	1	ZA.7420
Salticidae	<i>Pelegrina galathea</i>	Quanah Range, West Cache Creek	11 July 2004	Cushing P E, et al.	1	ZA.7424
Salticidae	<i>Pelegrina galathea</i>	East Range, East Boundary Rd.	03 Oct 2004	Cushing P E	3	ZA.7438
Salticidae	<i>Pelegrina galathea</i>	East Range off Elgin Rd	29 May 2004	Cushing P E	1	ZA.7441
Salticidae	<i>Pelegrina galathea</i>	Quanah, 3 mi west Falcon Gate	11 July 2004	Cushing P E	4	ZA.7443
Salticidae	<i>Pelegrina galathea</i>	East Range off Elgin Rd	29 May 2004	Francis M	1	ZA.7444
Salticidae	<i>Pelegrina galathea</i>	East Range, East Boundary Rd	09 July 2004	Cushing P E	6	ZA.7445
Salticidae	<i>Pelegrina peckhamorum</i>	Medicine Bluff Historic Site	30 May 2004	Cushing P E	1	ZA.7427
Salticidae	<i>Pelegrina peckhamorum</i>	East Range, East Boundary Rd	29 May 2004	Cushing P E	2	ZA.7428
Salticidae	<i>Pelegrina peckhamorum</i>	East Range, East Cache Creek	25 April 2003	Garhart M, et al.	1	ZA.7429
Salticidae	<i>Pelegrina peckhamorum</i>	East Range, Lake George	09 July 2004	Francis M	3	ZA.7430
Salticidae	<i>Pelegrina peckhamorum</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Munsterman, W	1	ZA.7431
Salticidae	<i>Pelegrina peckhamorum</i>	West Range, Engineer Lake	10 July 2004	Francis M	1	ZA.7433
Salticidae	<i>Pelegrina peckhamorum</i>	East Range, East Cache Creek	25 April 2003	Owens J	1	ZA.7442
Salticidae	<i>Pelegrina proterva</i>	East Range, East Cache Creek	3 Oct 2004	Cushing P E	1	ZA.7401
Salticidae	<i>Pelegrina sabinema</i>	East Range, Geronimo's Grave	2 Oct 2004	Cushing P E	1	ZA.7402
Salticidae	<i>Pelegrina sabinema</i>	Quanah Range, Pottawatomie Twins	31 May 2004	Cushing P E	1	ZA.7446
Salticidae	<i>Phidippus ardens</i>	LETRA	12 June 2003	Schmidt J	1	ZA.6914
Salticidae	<i>Phidippus audax</i>	West Range, ?	26 April 2003	Opler P	1	ZA.6874
Salticidae	<i>Phidippus audax</i>	Natural Resources Area	30 May 2004	Cushing P E	1	ZA.6897
Salticidae	<i>Phidippus audax</i>	Natural Resources Area	30 May 2004	Weaver K	1	ZA.6986
Salticidae	<i>Phidippus audax</i>	Medicine Bluff Historic Site	28 Sept 2003	Garhart M	1	ZA.7007
Salticidae	<i>Phidippus audax</i>	Quanah Range, Pottawatomie Twins	2 Oct 2004	Francis M	1	ZA.7376
Salticidae	<i>Phidippus audax</i>	Quanah Range,	2 Oct 2004	Cushing P E	2	ZA.7386

		Pottawattomi Pond				
Salticidae	<i>Phidippus cardinalis</i>	East Range, East Cache Creek	3 Oct 2004	Francis M	1	ZA.7389
Salticidae	<i>Phidippus cardinalis</i>	East Range, East Boundary Rd	3 Oct 2004	Cushing P E	2	ZA.7395
Salticidae	<i>Phidippus cardinalis</i>	East Range, East Boundary Rd	03 Oct 2004	Cushing P E	1	ZA.7426
Salticidae	<i>Phidippus carolinensis</i>	West Range, Ketch Lake	10 July 2004	Cushing P E	1	ZA.6877
Salticidae	<i>Phidippus clarus</i>	Natural Resources Area	12 Aug 2003	Owens J	1	ZA.6848
Salticidae	<i>Phidippus clarus</i>	Deer Creek Canyon Rd & Blue Beaver Valley Rd	20 Sept 2003	Cushing P E	1	ZA.6885
Salticidae	<i>Phidippus clarus</i>	East Range off Elgin Rd	21 Sept 2003	Cushing P E	2	ZA.6893
Salticidae	<i>Phidippus clarus</i>	East Range, Lake George	19 Sept 2003	Cushing P E	1	ZA.6894
Salticidae	<i>Phidippus clarus</i>	Quanah Range, Pottawatomie Twins	12 April 2003	Owens J	1	ZA.6988
Salticidae	<i>Phidippus clarus</i>	Quanah Range, Pottawatomie Twins	19 Sept 2003	Cushing P E	1	ZA.7004
Salticidae	<i>Phidippus clarus</i>	East Range, Lake George	3 Oct 2004	Francis M	1	ZA.7391
Salticidae	<i>Phidippus mystaceus</i>	West Range, Blue Beaver Creek	20 Sept 2003	Cushing P E	3	ZA.7003
Salticidae	<i>Phidippus pius</i>	Quanah Range, Pottawatomie Twins	31 May 2004	Francis M	1	ZA.6904
Salticidae	<i>Phlegra hentzi</i>	West Range, hillside near Mandam Pond	10 July 2004	Cushing P E	4	ZA.6916
Salticidae	<i>Phlegra hentzi</i>	East Range, East Cache Creek	24 April 2003	Schmidt J	1	ZA.6989
Salticidae	<i>Poultonella alboimmaculata</i>	West Range, Mandam Pond	30 May 2004	Francis M	1	ZA.7005
Salticidae	<i>Poultonella alboimmaculata</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Munsterman W	1	ZA.7006
Salticidae	<i>Poultonella alboimmaculata</i>	West Range, Engineer Lake	30 May 2004	Cushing P E	1	ZA.7086
Salticidae	<i>Poultonella alboimmaculata</i>	East Range East Boundary Rd	09 July 2004	Cushing P E	1	ZA.7440
Salticidae	<i>Salticus austinensis</i>	West Range, Four Mile Crossing	30 May 2004	Cushing P E	1	ZA.6990
Salticidae	<i>Sassacus papenhoei</i>	Quanah Range, West Cache Creek	31 May 2004	Cushing P E	1	ZA.6880
Salticidae	<i>Sassacus papenhoei</i>	West Range, Mandam Pond	30 May 2004	Cushing P E	1	ZA.6896
Salticidae	<i>Sassacus papenhoei</i>	West Range, Mandam Pond	30 May 2004	Francis M	1	ZA.6899
Salticidae	<i>Sassacus papenhoei</i>	West Range, Ketch Lake	10 July 2004	Cushing P E	3	ZA.7421
Salticidae	<i>Sassacus papenhoei</i>	East Range, Lake George	03 Oct 2004	Francis M	1	ZA.7422
Salticidae	<i>Sassacus papenhoei</i>	West Range, Blue Beaver Creek	27 May 2004	Schmidt & Kondratieff	1	ZA.7477
Salticidae	<i>Sassacus papenhoei</i>	East Range, ?	27 May 2004	Schmidt	1	ZA.7478

Salticidae	<i>Sassacus vitis</i>	East Range, Lake George	9 July 2004	Cushing P E	2	ZA.6870
Salticidae	<i>Sassacus vitis</i>	East Range, East Cache Creek	29 May 2004	Cushing P E	1	ZA.6872
Salticidae	<i>Sassacus vitis</i>	East Range, Lake George	9 July 2004	Francis M	1	ZA.6917
Salticidae	<i>Sassacus vitis</i>	West Range, Medicine Creek	30 June 2003	unknown	1	ZA.7002
Salticidae	<i>Sassacus vitis</i>	West Range, Ketch Lake	10 July 2004	Cushing P E	1	ZA.7419
Salticidae	<i>Thiodina puerpera</i>	East Range, East Boundary Rd	9 July 2004	Cushing P E	1	ZA.6909
Salticidae	<i>Thiodina puerpera</i>	East Range, East Boundary Rd	9 July 2004	Francis M	1	ZA.6912
Salticidae	<i>Thiodina puerpera</i>	East Range off Elgin Rd	21 Sept 2003	Cushing P E	1	ZA.6999
Salticidae	<i>Thiodina puerpera</i>	East Range, ?	02 May 2003	unknown	2	ZA.7000
Salticidae	<i>Thiodina puerpera</i>	Medicine Bluff Historic Site	28 Sept 2003	Garhart M	1	ZA.7008
Salticidae	<i>Thiodina sylvana</i>	East Range, East Cache Creek	25 April 2003	Garhart & Opler	1	ZA.6875
Salticidae	<i>Thiodina sylvana</i>	Medicine Bluff Historic Site	30 May 2004	Cushing P E	1	ZA.6911
Salticidae	<i>Thiodina sylvana</i>	Medicine Bluff Historic Site	28 Sept 2003	Garhart M	1	ZA.7009
Salticidae	<i>Tutelina elegans</i>	Quanah Range, Quanah Creek	31 May 2004	Cushing P E et al	3	ZA.6898
Salticidae	<i>Tutelina elegans</i>	West Range, Blue Beaver Creek	30 May 2004	Cushing P E	3	ZA.6991
Salticidae	<i>Tutelina elegans</i>	East Range, East Boundary Rd	29 May 2004	Cushing P E	1	ZA.7001
Salticidae	<i>Zygoballus rufipes</i>	East Range, East Cache Creek	3 Oct 2004	Francis M	1	ZA.7377
Scytodidae	<i>Scytodes undesc. sp.</i>	East Range, East Cache Creek	26 April 2003	Owens	1	ZA.7258
Sicariidae	<i>Loxosceles reclusa</i>	West Range, Ketch Lake	10 July 2004	Cushing P E	1	ZA.6970
Sicariidae	<i>Loxosceles reclusa</i>	East Range, near Sitting Bear Creek	9 July 2004	Cushing P E	1	ZA.6971
Sicariidae	<i>Loxosceles reclusa</i>	Quanah Range, Rock Creek	11 July 2004	Francis M	2	ZA.6972
Sicariidae	<i>Loxosceles reclusa</i>	Natural Resources Area	30 May 2004	Weaver K	3	ZA.6973
Sicariidae	<i>Loxosceles reclusa</i>	West Range, Blue Beaver Creek	30 May 2004	Cushing P E	1	ZA.6974
Sicariidae	<i>Loxosceles reclusa</i>	Natural Resources Area	11 July 2003	Owens J	1	ZA.6975
Sicariidae	<i>Loxosceles reclusa</i>	East Range, near Sitting Bear Creek	09 July 2004	Cushing P E	3	ZA.6976
Sicariidae	<i>Loxosceles reclusa</i>	Quanah Range, Rock Creek	31 May 2004	Cushing P E	1	ZA.6977
Sicariidae	<i>Loxosceles reclusa</i>	Natural Resources Area	15 March 2004	Kondratieff B	1	ZA.6978
Sicariidae	<i>Loxosceles reclusa</i>	West Range, hillside near Mandam Pond	10 July 2004	Cushing P E	1	ZA.6979
Sicariidae	<i>Loxosceles reclusa</i>	East Range, near Sitting Bear Creek	9 July 2004	Francis M	1	ZA.6980

Sicariidae	<i>Loxosceles reclusa</i>	East Range, Lake George	29 May 2004	Cushing P E	1	ZA.6981
Sicariidae	<i>Loxosceles reclusa</i>	East Range, East Cache Creek	29 May 2004	Cushing P E	1	ZA.6982
Sicariidae	<i>Loxosceles reclusa</i>	Quanah Range, Pottawatomie Twins	20 Sept 2003	Cushing P E	1	ZA.6983
Tetragnathidae	<i>Glenognatha foxi</i>	Quanah, 3 mi west Falcon Gate	11 July 2004	Francis M	1	ZA.6741
Tetragnathidae	<i>Glenognatha foxi</i>	West Range, Engineer Lake	10 July 2004	Francis M	1	ZA.6742
Tetragnathidae	<i>Glenognatha foxi</i>	Quanah, 3 mi west Falcon Gate	11 July 2004	Cushing P E	5	ZA.6743
Tetragnathidae	<i>Glenognatha foxi</i>	East Range, Lake George	9 July 2004	Cushing P E	6	ZA.6748
Tetragnathidae	<i>Glenognatha foxi</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Cushing P E	5	ZA.6779
Tetragnathidae	<i>Glenognatha foxi</i>	East Range, Lake George	29 May 2004	Cushing P E	7	ZA.7208
Tetragnathidae	<i>Glenognatha foxi</i>	Quanah Range, 3 mi west Falcon Gate	11 July 2004	Munsterman W	2	ZA.7263
Tetragnathidae	<i>Glenognatha foxi</i>	East Range, Lake George	3 Oct 2004	Francis M	1	ZA.7303
Tetragnathidae	<i>Glenognatha foxi</i>	Quanah Range, 3 mi west Falcon Gate	2 Oct 2004	Cushing P E	3	ZA.7355
Tetragnathidae	<i>Leucauge venusta</i>	Quanah Range, Rock Creek	11 July 2004	Cushing P E	1	ZA.6739
Tetragnathidae	<i>Tetragnatha elongata</i>	Quanah Range, 3 mi west Falcon Gate	11 July 2004	Cushing P E	6	ZA.6747
Tetragnathidae	<i>Tetragnatha elongata</i>	West Range, Four Mile Crossing	10 July 2004	Cushing P E	7	ZA.6761
Tetragnathidae	<i>Tetragnatha elongata</i>	West Range, Medicine Creek	20 Sept 2003	Cushing P E	1	ZA.6763
Tetragnathidae	<i>Tetragnatha elongata</i>	Quanah Range, West Cache Creek	19 Sept 2003	Cushing P E	2	ZA.6764
Tetragnathidae	<i>Tetragnatha elongata</i>	Medicine Bluff Historic Site	30 May 2004	Cushing P E	1	ZA.6765
Tetragnathidae	<i>Tetragnatha elongata</i>	West Range, Ketch Lake	20 Sept 2003	Cushing P E	1	ZA.6775
Tetragnathidae	<i>Tetragnatha elongata</i>	East Range, East Cache Creek	3 Oct 2004	Cushing P E	2	ZA.7353
Tetragnathidae	<i>Tetragnatha elongata</i>	Quanah Range, 3 mi west Falcon Gate	2 Oct 2004	Francis M	1	ZA.7354
Tetragnathidae	<i>Tetragnatha elongata</i>	West Range, Four Mile Crossing	3 Oct 2004	Cushing P E	5	ZA.7358
Tetragnathidae	<i>Tetragnatha elongata</i>	Quanah Range, Pottawanomi Pond	2 Oct 2004	Cushing P E	13	ZA.7359
Tetragnathidae	<i>Tetragnatha elongata</i>	West Range, Punch Bowl Rd & Letra Rd	28 May 2004	Schmidt & Kondratieff	1	ZA.7476
Tetragnathidae	<i>Tetragnatha guatemalensis</i>	Quanah, 3 mi west Falcon Gate	2 Oct 2004	Cushing P E	11	ZA.7352
Tetragnathidae	<i>Tetragnatha guatemalensis</i>	Quanah Range, Pottawatomie Twins	2 Oct 2004	Cushing P E	2	ZA.7357
Tetragnathidae	<i>Tetragnatha laboriosa</i>	Quanah Range,	31 May 2004	Francis M	10	ZA.6744

		Pottawatomie Pond				
Tetragnathidae	<i>Tetragnatha laboriosa</i>	Quanah, 3 mi west Falcon Gate	11 July 2004	Munsterman W	1	ZA.6745
Tetragnathidae	<i>Tetragnatha laboriosa</i>	East Range, Lake George	9 July 2004	Cushing P E	3	ZA.6749
Tetragnathidae	<i>Tetragnatha laboriosa</i>	West Range, Four Mile Crossing	30 May 2004	Cushing P E	6	ZA.6751
Tetragnathidae	<i>Tetragnatha laboriosa</i>	East Range, Lake George	9 July 2004	Francis M	2	ZA.6752
Tetragnathidae	<i>Tetragnatha laboriosa</i>	East Range, East Cache Creek	24 April 2003	Schmidt J	2	ZA.6754
Tetragnathidae	<i>Tetragnatha laboriosa</i>	East Range, Lake George	29 May 2004	Cushing P E	5	ZA.6755
Tetragnathidae	<i>Tetragnatha laboriosa</i>	Medicine Bluff Historic Site	28 Sept 2003	Garhart M	5	ZA.6756
Tetragnathidae	<i>Tetragnatha laboriosa</i>	LETRA	20 Sept 2003	Cushing P E	2	ZA.6757
Tetragnathidae	<i>Tetragnatha laboriosa</i>	Quanah Range, Rock Creek	19 Sept 2003	Cushing P E	4	ZA.6758
Tetragnathidae	<i>Tetragnatha laboriosa</i>	East Range, East Cache Creek	19 Sept 2003	Cushing P E	1	ZA.6762
Tetragnathidae	<i>Tetragnatha laboriosa</i>	East Range, Lake George	29 May 2004	Cushing P E	25	ZA.6767
Tetragnathidae	<i>Tetragnatha laboriosa</i>	East Range, East Boundary Rd	29 May 2004	Cushing P E	4	ZA.6769
Tetragnathidae	<i>Tetragnatha laboriosa</i>	West Range, Four Mile Crossing	30 May 2004	Francis M	1	ZA.6771
Tetragnathidae	<i>Tetragnatha laboriosa</i>	Medicine Bluff Historic Site	30 May 2004	Cushing P E	2	ZA.6773
Tetragnathidae	<i>Tetragnatha laboriosa</i>	West Range, Post Oak Grassland	26 April 2003	Opler P	4	ZA.6776
Tetragnathidae	<i>Tetragnatha laboriosa</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Munsterman W	7	ZA.6778
Tetragnathidae	<i>Tetragnatha laboriosa</i>	West Range, Mandam Pond	30 May 2004	Cushing P E	2	ZA.6780
Tetragnathidae	<i>Tetragnatha laboriosa</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Cushing P E	4	ZA.6781
Tetragnathidae	<i>Tetragnatha laboriosa</i>	Quanah Range; Pottawatomie Twins	31 May 2004	Cushing P E	11	ZA.6836
Tetragnathidae	<i>Tetragnatha laboriosa</i>	East Range, East Cache Creek	29 May 2004	Francis M	1	ZA.6838
Tetragnathidae	<i>Tetragnatha laboriosa</i>	East Range, East Cache Creek	12 June 2003	Schmidt J	1	ZA.6839
Tetragnathidae	<i>Tetragnatha laboriosa</i>	LETRA	20 Sept 2003	Kondratieff B	3	ZA.6840
Tetragnathidae	<i>Tetragnatha laboriosa</i>	East Range, Lake George	29 May 2004	Francis M	14	ZA.6841
Tetragnathidae	<i>Tetragnatha laboriosa</i>	West Range, Blue Beaver Creek	10 July 2004	Cushing P E et al	1	ZA.6842
Tetragnathidae	<i>Tetragnatha laboriosa</i>	East Range, Lake George	19 Sept 2003	Cushing P E	3	ZA.6846
Tetragnathidae	<i>Tetragnatha laboriosa</i>	Quanah Range, West Cache Creek	31 May 2004	Cushing P E	3	ZA.6847
Tetragnathidae	<i>Tetragnatha laboriosa</i>	West Range, Blue Beaver Creek	30 June 2003	Kondratieff B et al	1	ZA.6851

Tetragnathidae	<i>Tetragnatha laboriosa</i>	Natural Resources Area	31 March 2003	Garhart M et al	1	ZA.6852
Tetragnathidae	<i>Tetragnatha laboriosa</i>	West Range, Ten Mile Crossing	26 April 2003	Opler P	1	ZA.6853
Tetragnathidae	<i>Tetragnatha laboriosa</i>	Quanah Range, West Cache Creek	19 Sept 2003	Cushing P E	1	ZA.6854
Tetragnathidae	<i>Tetragnatha pallescens</i>	Quanah Range, Pottawatomie Pond	11 July 2004	Cushing P E	5	ZA.6740
Tetragnathidae	<i>Tetragnatha pallescens</i>	East Range, Lake George	9 July 2004	Cushing P E	1	ZA.6746
Tetragnathidae	<i>Tetragnatha pallescens</i>	West Range, Engineer Lake	10 July 2004	Francis M	1	ZA.6750
Tetragnathidae	<i>Tetragnatha pallescens</i>	Quanah Range, Pottawatomie Pond	11 July 2004	Francis M	5	ZA.6753
Tetragnathidae	<i>Tetragnatha pallescens</i>	LETRA	20 Sept 2003	Kondratieff B	13	ZA.6759
Tetragnathidae	<i>Tetragnatha pallescens</i>	East Range, Lake George	9 July 2004	Cushing P E	24	ZA.6760
Tetragnathidae	<i>Tetragnatha pallescens</i>	Natural Resources Area	31 March 2003	Garhart M, Opler P, Buckner	1	ZA.6766
Tetragnathidae	<i>Tetragnatha pallescens</i>	Quanah Range, Pottawatomie Pond	19 Sept 2003	Cushing P E	6	ZA.6768
Tetragnathidae	<i>Tetragnatha pallescens</i>	Quanah Range, Pottawatomie Twins	19 Sept 2003	Cushing P E	1	ZA.6770
Tetragnathidae	<i>Tetragnatha pallescens</i>	East Range, Lake George	29 May 2004	Cushing P E	2	ZA.6772
Tetragnathidae	<i>Tetragnatha pallescens</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Cushing P E	5	ZA.6774
Tetragnathidae	<i>Tetragnatha pallescens</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Munsterman W	3	ZA.6777
Tetragnathidae	<i>Tetragnatha pallescens</i>	Medicine Bluff Historic Site	28 Sept 2003	Garhart M	2	ZA.6837
Tetragnathidae	<i>Tetragnatha pallescens</i>	West Range, Engineer Lake	20 Sept 2003	Cushing P E	4	ZA.6850
Tetragnathidae	<i>Tetragnatha pallescens</i>	West Range, Four Mile Crossing	3 Oct 2004	Francis M	1	ZA.7214
Tetragnathidae	<i>Tetragnatha pallescens</i>	Quanah Range, Pottawatomie Twins	2 Oct 2004	Francis M	3	ZA.7350
Tetragnathidae	<i>Tetragnatha pallescens</i>	East Range, Lake George	3 Oct 2004	Francis M	1	ZA.7351
Theraphosidae	<i>Aphonopelma hentzi</i>	West Range, along Boundary Rd	29 May 2004	Kondratieff B	11	ZA.7315
Theraphosidae	<i>Aphonopelma hentzi</i>	West Range, ?	24 June 2003	Gerhart M	1	ZA.7316
Theraphosidae	<i>Aphonopelma hentzi</i>	West Range, ?	11 June 2003	Owens J	1	ZA.7317
Theraphosidae	<i>Aphonopelma hentzi</i>	East Range, East Cache Creek	22 Sept 2003	Garhart, M	1	ZA.7479
Theridiidae	<i>Argyrodes elevatus</i>	Medicine Bluff Historic Site	09 July 2004	Cushing P E	2	ZA.7081
Theridiidae	<i>Argyrodes elevatus</i>	East Range, East Boundary Rd	03 Oct 2004	Cushing P E	4	ZA.7411
Theridiidae	<i>Argyrodes elevatus</i>	East Range, NE boundary of base	03 Oct 2004	Cushing P E	1	ZA.7414
Theridiidae	<i>Argyrodes elevatus</i>	East Range, NE boundary of base	03 Oct 2004	Francis M	1	ZA.7415

Theridiidae	<i>Argyrodes elevatus</i>	Quanah, 3 mi west Falcon Gate	02 Oct 2004	Francis M	1	ZA.7416
Theridiidae	<i>Euryopis lineatipes</i>	East Range, near Sitting Bear Creek	9 July 2004	Cushing P E	1	ZA.7344
Theridiidae	<i>Euryopis lineatipes</i>	Quanah Range, Rock Creek	11 July 2004	Cushing P E	3	ZA.7345
Theridiidae	<i>Latrodectus mactans</i>	Natural Resources Area	20 Sept 2003	Cushing P E	1	ZA.6829
Theridiidae	<i>Latrodectus mactans</i>	West Range, Medicine Creek	15 March 2004	Kondratieff et al	1	ZA.7103
Theridiidae	<i>Latrodectus mactans</i>	West Range, Engineer Lake	30 May 2004	Francis M	1	ZA.7132
Theridiidae	<i>Latrodectus mactans</i>	West Range, Ten Mile Crossing	26 April 2003	Opler P	2	ZA.7447
Theridiidae	<i>Latrodectus variolus</i>	Quanah 3mi west Falcon Gate	2 Oct 2004	Cushing P E	1	ZA.7346
Theridiidae	<i>Steatoda medialis</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Munsterman W	1	ZA.7133
Theridiidae	<i>Steatoda triangulosa</i>	Natural Resources Area	30 May 2004	Cushing P E	2	ZA.7082
Theridiidae	<i>Stemmops ornatus</i>	East Range, East Cache Creek	02 Oct 2004	Cushing P E	1	ZA.7404
Theridiidae	<i>Stemmops ornatus</i>	East Range, NE boundary of base	3 Oct 2004	Cushing P E	1	none
Theridiidae	<i>Theridion differens</i>	West Range, Ketch Lake	10 July 2004	Cushing P E	2	ZA.7348
Theridiidae	<i>Theridion goodnightorum</i>	West Range, ?	24 June 2003	Gargart M	1	none
Theridiidae	<i>Theridion murarium</i>	Medicine Bluff Historic Site	30 May 2004	Cushing P E	1	ZA.7343
Theridiidae	<i>Theridion rabuni</i>	West Range, Ketch Lake	20 Sept 2003	Cushing P E	1	ZA.7080
Theridiidae	<i>Thymoites marxi</i>	East Range, NE boundary of base	3 Oct 2004	Cushing P E	1	none
Theridiidae	<i>Thymoites pallidus</i>	West Range, Four Mile Crossing	10 July 2004	Cushing P E	1	ZA.7083
Theridiidae	<i>Wamba crispulus</i>	Medicine Bluff Historic Site	30 May 2004	Cushing P E	1	ZA.7342
Thomisidae	<i>Misumena vatia</i>	East Range, Lake George	29 May 2004	Cushing P E	6	ZA.7110
Thomisidae	<i>Misumena vatia</i>	East Range, Lake George	3 Oct 2004	Francis M	1	ZA.7318
Thomisidae	<i>Misumenops asperatus</i>	East Range, East Cache Creek	25 April 2003	Garhart & Opler	1	ZA.6385
Thomisidae	<i>Misumenops asperatus</i>	Natural Resources Area	31 March 2003	Garhart M et al	1	ZA.7112
Thomisidae	<i>Misumenops asperatus</i>	West Range, Blue Beaver Creek	30 May 2004	Francis M	1	ZA.7113
Thomisidae	<i>Misumenops asperatus</i>	LETRA	12 June 2003	Schmidt J	1	ZA.7123
Thomisidae	<i>Misumenops celer</i>	Quanah, 3 mi west Falcon Gate	11 July 2004	Munsterman W	16	ZA.7087
Thomisidae	<i>Misumenops celer</i>	East Range, Lake George	09 July 2004	Cushing P E	6	ZA.7092
Thomisidae	<i>Misumenops celer</i>	West Range, Mandam Pond	30 May 2004	Francis M	1	ZA.7094
Thomisidae	<i>Misumenops celer</i>	East Range, East Boundary Rd	09 July 2004	Cushing P E	2	ZA.7095

Thomisidae	<i>Misumenops celer</i>	West Range, Engineer Lake	30 May 2004	Francis M	1	ZA.7096
Thomisidae	<i>Misumenops celer</i>	Quanah, 3 mi west Falcon Gate	11 July 2004	Francis M	2	ZA.7097
Thomisidae	<i>Misumenops celer</i>	Quanah Range, Pottawatomie Twins	31 May 2004	Cushing P E	5	ZA.7098
Thomisidae	<i>Misumenops celer</i>	East Range, East Cache Creek	29 May 2004	Francis M	1	ZA.7099
Thomisidae	<i>Misumenops celer</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Cushing P E	1	ZA.7100
Thomisidae	<i>Misumenops celer</i>	East Range, East Cache Creek	29 May 2004	Cushing P E	1	ZA.7101
Thomisidae	<i>Misumenops celer</i>	Quanah Range, West Cache Creek	31 May 2004	Cushing P E	2	ZA.7105
Thomisidae	<i>Misumenops celer</i>	East Range, Lake George	29 May 2004	Cushing P E	11	ZA.7107
Thomisidae	<i>Misumenops celer</i>	West Range, Mandam Pond	30 May 2004	Cushing P E	2	ZA.7108
Thomisidae	<i>Misumenops celer</i>	East Range, East Boundary Rd	10 June 2003	Schmidt J	2	ZA.7109
Thomisidae	<i>Misumenops celer</i>	East Range, East Boundary Rd	29 May 2004	Francis M	2	ZA.7111
Thomisidae	<i>Misumenops celer</i>	Quanah Range, Pottawatomie Twins	11 July 2004	Munsterman W	2	ZA.7114
Thomisidae	<i>Misumenops celer</i>	West Range, Medicine Creek	30 June 2003	unknown	2	ZA.7116
Thomisidae	<i>Misumenops celer</i>	Medicine Bluff Historic Site	30 May 2004	Cushing P E	1	ZA.7119
Thomisidae	<i>Misumenops celer</i>	West Range, ?	24 June 2003	Garhart M	5	ZA.7120
Thomisidae	<i>Misumenops celer</i>	East Range, Lake George	09 July 2004	Francis M	1	ZA.7121
Thomisidae	<i>Misumenops celer</i>	West Range, Quanah	31 May 2004	Cushing P E et al	1	ZA.7122
Thomisidae	<i>Misumenops celer</i>	East Range off Elgin Rd	29 May 2004	Cushing P E	6	ZA.7124
Thomisidae	<i>Misumenops celer</i>	East Range, Lake George	29 May 2004	Francis M	8	ZA.7125
Thomisidae	<i>Misumenops celer</i>	East Range, Lake George	29 May 2004	Cushing P E	1	ZA.7127
Thomisidae	<i>Misumenops celer</i>	Quanah Range, West Cache Creek	11 July 2004	Munsterman W	5	ZA.7128
Thomisidae	<i>Misumenops celer</i>	West Range, Engineer Lake	10 July 2004	Cushing P E	3	ZA.7129
Thomisidae	<i>Misumenops celer</i>	West Range, post oak grassland	26 April 2003	Opler P	4	ZA.7130
Thomisidae	<i>Misumenops celer</i>	Quanah Range, Pottawatomie Twins	31 May 2004	Cushing P E	13	ZA.7131
Thomisidae	<i>Misumenops celer</i>	West Range, Engineer Lake	30 May 2004	Cushing P E	4	ZA.7212
Thomisidae	<i>Misumenops oblongus</i>	West Range, hillside near Mandam Pond	10 July 2004	Cushing P E	1	ZA.7093
Thomisidae	<i>Ozyptila monroensis</i>	East Range, near Sitting Bear Creek	09 July 2004	Cushing P E	9	ZA.7089
Thomisidae	<i>Ozyptila monroensis</i>	East Range, NE	3 Oct 2004	Cushing P E	1	ZA.7320

		boundary of base				
Thomisidae	<i>Synema parvulum</i>	West Range, Medicine Creek	25 April 2003	Schmidt J	1	ZA.7104
Thomisidae	<i>Tmarus angulatus</i>	East Range, East Cache Creek	11 June 2003	Schmidt J	1	ZA.7126
Thomisidae	<i>Xysticus ampullatus</i>	East Range, East Boundary Rd	29 May 2004	Francis M	1	ZA.7115
Thomisidae	<i>Xysticus auctificus</i>	Quanah Range, Rock Creek	31 May 2004	Francis M	1	ZA.7090
Thomisidae	<i>Xysticus auctificus</i>	East Range, Lake George	29 May 2004	Francis M	1	ZA.7102
Thomisidae	<i>Xysticus ferox</i>	East Range, Lake George	29 May 2004	Francis M	1	ZA.7117
Thomisidae	<i>Xysticus funestus</i>	Ft Sill, no locale detail	2 March 2003	Garhart M	1	ZA.6367
Thomisidae	<i>Xysticus funestus</i>	Medicine Bluff Historic Site	2 Oct 2004	Cushing P E	1	ZA.7319
Thomisidae	<i>Xysticus gulosus</i>	Quanah, 3mi west Falcon Gate	2 Oct 2004	Cushing P E	1	ZA.7213
Thomisidae	<i>Xysticus pellax</i>	Quanah, Rock Creek	19 Sept 2003	Cushing P E	1	ZA.7106
Uloboridae	<i>Uloborus glomosus</i>	East Range, near Sitting Bear Creek	9 July 2004	Cushing P E	2	ZA.7200
Uloboridae	<i>Uloborus glomosus</i>	West Range, Four Mile Crossing	10, July 2004	Cushing P E	6	ZA.7201
Uloboridae	<i>Uloborus glomosus</i>	Quanah Range, Rock Creek	11 July 2004	Cushing P E	4	ZA.7202
Uloboridae	<i>Uloborus glomosus</i>	Medicine Bluff Historic Site	9 July 2004	Cushing P E	2	ZA.7203
Uloboridae	<i>Uloborus glomosus</i>	East range, East Code Creek	25 April 2004	Owens	1	ZA.7204
Uloboridae	<i>Uloborus glomosus</i>	Quanah Range, Rock Creek	11 July 2004	Munsterman W	3	ZA.7205
Uloboridae	<i>Uloborus glomosus</i>	Medicine Creek at Punchbowl Rd	30 June 2003	unknown	2	ZA.7206
Uloboridae	<i>Uloborus glomosus</i>	East Range, near Sitting Bear Creek	9 July 2004	Cushing P E	1	ZA.7207

Plate 1. Typical views of the various habitat types. (5) Mixed grass, (6) Riparian, (7) Pond / Lake, (8) Dry xeric hillside.



5



6



7



8

Plate 2. Funnel web spider in the family Agelenidae.



Figure 9. *Agelenopsis oklahoma* photo by P.E. Cushing



Figure 10. Funnel web of an agelenid spider, photo by P.E. Cushing

Plate 3. Common spiders from the family Araneidae.



Figure 11. *Argiope trifasciata*,
photo by P.E. Cushing



Figure 12. *Acanthepeira stellata*,
photo by P.E. Cushing



Figure 13. *Argiope aurantia*,
photo by P.E. Cushing



Figure 14. *Eustala emertoni*
photo by J. Slowik



Figure 15. *Larinioides cornutus*,
photo by J. Slowik



Figure 16. *Micrathena gracilis*,
photo by J. Slowik



Figure 17. *Neoscona arabesca*,
photo by J. Slowik

Plate 4. Common spiders from the families Clubionidae, Dictynidae, Filistatidae and Linyphiidae.



Figure 18. *Clubiona abboti* (Clubionidae), photo by J. Slowik



Figure 19. *Dictyna bellans* (Dictynidae), photo by J. Slowik



Figure 20. *Kukulcania hibernalis* (Filistatidae), photo by P.E. Cushing



Figure 21. *Kukulcania hibernalis* silk, photo by P.E. Cushing



Figure 22. *Frontinella communis* (Linyphiidae), photo by J. Slowik



Figure 23. *Neriene radiata* (Linyphiidae), photo by J. Slowik

Plate 5. Common spiders from the families Lycosidae, Oxyopidae, Philodromidae, and Pholcidae.



Figure 24. *Arctosa littoralis* (Lycosidae) photo by J. Slowik



Figure 25. *Rabidosa rabida* (Lycosidae), photo by P.E. Cushing



Figure 26. *Oxyopes salticus* (Oxyopidae), photo by J. Slowik



Figure 27. *Philodromus pratariae* (Philodromidae), photo by J. Slowik



Figure 28. *Tibellus duttoni* (Philodromidae), photo by J. Slowik



Figure 29. *Psilochorus imitatus* (Pholcidae), photo by J. Slowik

Plate 6. Common spiders from the families Pisauridae, Salticidae, and Sicariidae.



Figure 30. *Marpissa formosa* (Salticidae),
photo by J. Slowik



Figure 31. *Pelegrina galathea* (Salticidae),
photo by J. Slowik



Figure 32. *Phidippus audax* (Salticidae),
photo by DMNS



Figure 33. *Phidippus cardinalis* (Salticidae),
photo by J. Slowik



Figure 34. *Loxosceles reclusa* (Sicariidae),
photo by J. Slowik

Plate 7. Common spiders from the families Tetragnathidae and Theridiidae.



Figure 35. *Glenognatha foxi*, (Tetragnathidae), photo by J. Slowik



Figure 36. *Tetragnatha elongata* (Tetragnathidae), photo by J. Slowik



Figure 37. *Tetragnatha laborious*, (Tetragnathidae), photo by Slowik



Figure 37. *Argyrodes elevatus* (Theridiidae), photo by J. Slowik



Figure 38. *Latrodectus mactans*, (Theridiidae), juvenile, photo by P.E. Cushing

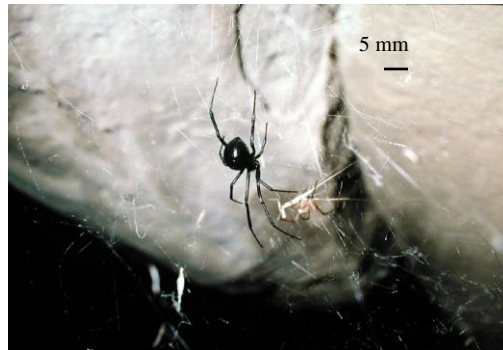


Figure 39. *Latrodectus mactans* adult, photo by J. Slowik

Plate 8. Common spiders from the families Thomisidae and Uloboridae.



Figure 40. *Misumenops celer* (Thomisidae),
Photo by J. Slowik



Figure 41. *Uloborus glomosus*
(Uloboridae), photo by J. Slowik



Figure 42. *Uloborus glomosus* juvenile on web with
circular stabilimentum, photo by P.E. Cushing

Chapter 2

**Survey of Selected Arthropod Taxa of Fort Sill, Comanche County, Oklahoma.
III. Arachnida: Ixodidae, Scorpiones, Hexapoda: Ephemeroptera, Hemiptera, Homoptera,
Coleoptera, Neuroptera, Trichoptera, Lepidoptera, and Diptera**

by

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Introduction

An inventory of selected arthropod species, Ixodidae, Scorpiones; Hexapoda: Ephemeroptera; Hemiptera: Nepomorpha, Gerromorpha, Pentatomatidae; Homoptera: Cicadidae; Coleoptera: Gyridae, Haliplidae, Dytiscidae, Hydrophilidae, Dryopidae, Elmidae; Neuroptera: Megaloptera, Sisyridae; Trichoptera; Lepidoptera: Tortricidae, Geometridae; Diptera: Asilidae, was made from Fort Sill, Comanche County, Oklahoma from April 2003 to October 2004.

Methods and Materials

Sampling was carried out during appropriate times from April 2003 to October 2004. General methods, applications, and rationale were taken from New (1998). Each survey was for a minimum of three days by one to two experienced collectors. A voucher series of each taxon was preserved following standard protocols as outlined by Steyskal et al. (1986), and deposited in the C.P. Gillette Museum of Arthropod Diversity, Colorado State University (all taxa except spiders) and the Denver Museum of Nature and Science (spiders). Information on the species sampled will be served on the USGS Insects and Related Arthropods web site under U.S. Army, Fort Sill.



Figure 43. Use of a kick net, West Cache Creek.

The primary methods for collecting ticks included handpicking and dragging (Gladney, 1978). The technique of dragging is effective in the collection of larvae, nymphs, and adults of many three-host ixodid species.

Pit traps were utilized, along with searching appropriate microhabitats, for collecting scorpions. Collecting efforts also included using an ultraviolet light at night to locate foraging scorpions.



Figure 44. Use of a beating sheet.

For the mayflies, aquatic and semiaquatic bugs, and aquatic beetles, standing water and flowing water habitats on Fort Sill as identified previously by Vaughn and Obermeyer (2002) were sampled using standard techniques, such as dip netting (Fig. 43), beating sheets (Fig. 44), black light traps (Fig. 45), and rearing (Merritt and Cummins, 1996).

For the stinkbugs, cicadas, robber flies and mydas flies were collected using standard aerial

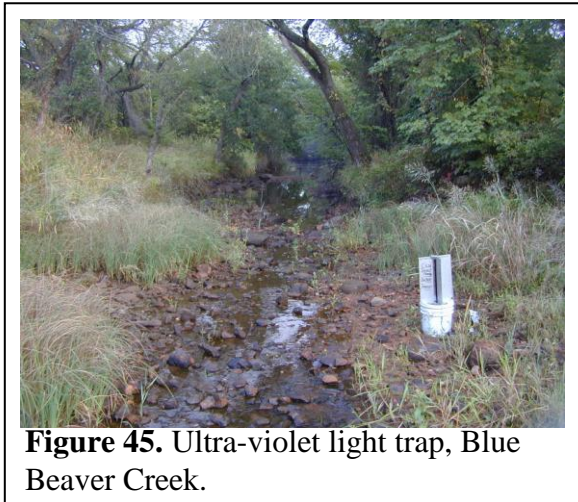


Figure 45. Ultra-violet light trap, Blue Beaver Creek.

and sweep netting (Fig. 46), malaise trapping, and searching known microhabitats. A review of these methods is available in Southwood (1978).

Field collections for Lepidoptera were obtained during monthly trips from April 2003 through May 2004. Lepidoptera were sampled during each visit by ultra-violet light traps (5 separate traps on each of two nights). Trap locations for the moth sampling are given below. This year's report concentrates on the Tortricidae and Geometridae collected during 2003. A few specimens collected in 2004 augmented these collections. Where possible, a voucher series of each moth surveyed was pinned, spread and

deposited in the C.P. Gillette Museum of Arthropod Diversity at Colorado State University (see Winter, 2000). Where identity of the moths surveyed was in doubt, dissections were made (Winter, 2000) or the services of experts were sought. Lepidoptera (moths) were sampled using standard sampling methods (Winter, 2000). The C.P. Gillette Museum has a strong North American collection of this group and contains references for identification of species not in its collections. Two trips to the National Museum of Natural History, Smithsonian Institution, Washington, D. C. and American Museum of Natural History, New York were made to make selected identifications. The following sites were sampled using light traps:



Figure 46. Aerial net.

Fort Sill, Comanche Co., Oklahoma Moth Light Trap Locations

E-1	Broomweed Pond -----	N34°42'32.3", W98°16'59.9"	East Range
E-2	1 mile northeast of Menoher Hill---	N34°39'5", W98°17'30"	East Range
E-3	East Cache Creek-----	N34°38'36.1", W98°21'37.4"	East Range
M-1	Natural Resource Bldg woods -----	N34°41'6.4", W98°24'23.2"	East Range
M-2	Medicine Bluff -----	N34°41'13.1", W98°24'55.6"	East Range
W-1	Near Lower Rabbit -----	N34°42'23.3", W98°25'40.7"	West Range
W-2	10 Mile Crossing -----	N34°42'58.2", W98°29'9.7"	West Range
W-3	Lower LETRA -----	N34°43'12.7", W98°31'49"	West Range
W-4	Upper LETRA -----	N34°43'10.6", W98° 31'56"	West Range
W-5	Ketch Lake -----	N34°42'38.4", W98°35'28.9"	West Range

Investigators consulted with the Natural Resources Office staff at Fort Sill to help select appropriate sites in each habitat that would not conflict with military training or the safety of the investigators.

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Sources of Taxonomic Names Used

Unless otherwise indicated, the scientific names used in this report for the species of insects are from the checklist, *Nomina Insecta Nearctica* by Poole and Gentili (1996a; 1996b; 1996c; 1997).

The following experts other than the authors identified or verified specimens:

Ticks: Joel H. Hutcheson, Arthropod Infectious Disease Laboratory, Colorado State University, Fort Collins, Colorado 80523

Semiaquatic and aquatic bugs: Richard Durfee, 329 Canyon Creek Road, Hamilton, Montana 59840

Pentatomidae: Don Thomas, USDA-ARS Subtropical Research Center, 2413 East Highway 83,

Building 200, Weslaco, Texas 78596

Aquatic and Semiaquatic Beetles: (Dytiscidae, Gyrinidae, Haliplidae, Hydrophilidae) Richard Durfee, 329 Canyon Creek Road, Hamilton, Montana 59840; (Elmidae) Cheryl B. Barr, Essig Museum of Entomology, University of California, Berkeley, California 94720

Caddisflies: Dave Ruiter, 6260 South Grant Street, Centennial, Colorado 80121

Moths: (Tortricidae) John Brown, Systematic Entomology Laboratory, USDA, Washington, D.C. 20240; (Geometridae) Clifford D. Ferris, Laramie, Wyoming; Edward C. Knudson, Houston, Texas

Robber Flies: C. Riley Nelson, Department of Integrative Biology, Brigham Young University, Provo, Utah 84602

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Table. 6. Synopsis of Higher Taxonomy of the Arthropoda Taxa Survey at Fort Sill, Comanche Co., Oklahoma, 2003-2004.

Arachnida (Ticks, Scorpions)

Scorpiones, Buthidae (Scorpions)

Acari, Ixodidae (Hard ticks)

Hexapoda (Insects)

Order Ephemeroptera (Mayflies)

Order Hemiptera [Heteroptera] (True bugs)

Suborder Nepomorpha

Family Belostomatidae (Giant Water Bugs)

Family Corixidae (Water Boatmen)

Family Notonectidae (Backswimmers)

Family Pleidae (Pygmy Backswimmer)

Family Gelastocoridae (Toad Bugs)

Suborder Gerromorpha

Family Gerridae (Water Striders, Pond Skaters, Wherrymen)

Family Hydrometridae (Marsh Treaders, Water Measurers)

Family Veliidae (Small Striders, Riffle Bugs)

Family Mesoveliidae (Water Treaders)

Suborder Pentatomomorpha

Family Pentatomatidae (Stink bugs)

Order Homoptera (Cicadas, leafhoppers, scale insects)

Suborder Auchenorrhyncha (Cicadas, leafhoppers, treehoppers, planthoppers)

Family Cicadidae (Cicadas)

Order Coleoptera (Beetles)

Suborder Adephaga

Family Dytiscidae (Predaceous diving beetles)

Family Gyrinidae (Whirligig beetles)

Family Haliplidae (Crawling water beetles)

Suborder Polyphaga

Family Dryopidae (Long-toed water beetles)

Family Elmidae (Riffle beetles)

Family Hydrophilidae (Water scavenger beetles)

Order Neuroptera (Alderflies, dobsonflies, fishflies, snakeflies, lacewings, antlions)

Suborder Planipennia (Lacewings, antlions, owlflies)

Family Sisyridae (Spongilla-flies)

Suborder Order Megaloptera (Dobsonflies, fishflies, alderflies)

Family Corydalidae (Dobsonflies, fishflies)
Family Sialidae (Alderflies)

Order Trichoptera (Caddisflies)

Order Lepidoptera (Moths and Butterflies)

Family Tortricidae (Tortricid moths)
Family Geometridae (Geometer moths)

Order Diptera (Flies)

Family Mydidae (Mydas flies)
Family Asilidae (Robber flies)

Ticks (Ixodidae)

The ticks are obligate, blood-feeding ectoparasites of vertebrates, primarily mammals and birds. Ticks transmit a greater variety of infectious organisms than any other group of blood-feeding arthropods. They are considered second only to the mosquitoes in terms of public health and veterinary importance (Sonenshine et al., 2002). About 800 species of ticks are known worldwide. A single family, the Ixodidae, the **hard ticks** include almost all the species of medical and veterinary importance. Only a few **soft ticks** or Argasidae are known to transmit diseases.

The life cycle of ticks includes four stages: egg, the six legged-larva, the eight-legged nymph, and the reproductively mature eight-legged adult. During the development of these stages, blood meals are required. All of the ticks collected on Fort Sill have a three-host life cycle. Larvae begin to quest several days to a few weeks after hatching. After finding a suitable host, usually a small mammal or bird, the larvae begin to feed. On completion of feeding the larvae drop to the ground, where two to three weeks later, they molt to the nymph. Depending on environmental conditions, the nymphs begin to quest for a second host. After feeding, the nymph drops off to the ground and in approximately one-month it molts to the adult. After a variable period, the adult quests for a host, usually a medium to large mammal. On the final host, the ticks mate and then engorge, except for *Ixodes* spp., which mate either before or during feeding. Following the blood meal, adult females drop to the ground and each lays a single batch containing thousands of eggs.

Keirans (1992) presents an excellent overview on the taxonomy of the Ixodidae in North American. Keirans and Litwak (1989) provide pictorial keys to the adults of hard ticks. Moreover, the web site maintained by Dr. A. Alan Kocan, Oklahoma State University <http://www.cvm.okstate.edu/instruction/kocan/ticksok.htm> provides additional information on the ticks of Oklahoma. Hard ticks collected at Fort Sill are listed in Appendix C.

Dr. Joel H. Hutcheson, Arthropod Infectious Disease Laboratory, Colorado State University, and a tick expert reviewed this section.

Amblyomma americanum (Linnaeus) (Lone Star Tick)

This three-host tick ranges from the middle Atlantic States to Florida and west into the Central U.S., and is considered a very common tick in Oklahoma. The host range of this tick is extensive, with many mammals and birds suitable; however it is rarely found on rodents. Generally, adults are found more frequently on medium to large mammals, especially raccoons, domestic animals and deer, whereas immatures can be common on birds. Rabbits seem not to be infested. Seasonal activity is primarily from March or April for adults, peaking in June or July, whereas nymphal activity peaks in August and September.

The Lone Star Tick is involved in the transmission of canine ehrlichiosis, human ehrlichiosis, tularemia, Q fever, and cervid theileriosis in Oklahoma. This tick has been implicated in severe injury and death of White-tailed Deer in Oklahoma (Bolte et al., 1970).

Often, during high tick infestations, tissue destruction and secondary infections are common on host animals.

Adults of the Lone Star Tick are more common in the woodlands of Fort Sill than the open grassland areas. Adult females can be recognized by the white spot on the dorsal scutum.

Amblyomma maculatum Koch (Gulf Coast Tick)

This three-host tick is considered common in the southeastern U.S. west to Oklahoma (Fig. 47). This tick also occurs from Mexico south into South America. Host diversity is broad, but there is a preference for large mammals, especially cattle, horses, and deer. Migratory birds and livestock may transport the Gulf Coast Tick. Attachment and feeding by ticks in the ears of cattle, horses, and deer often results in tissue damage that produces deformities known as “gotch ear.” Adult activity is in late spring and continues throughout the summer. Disease transmission by this species is poorly known. It might become a possible vector of heartwater, a disease of ruminants (Uilenburg, 1982), should the pathogen be introduced into the United States.

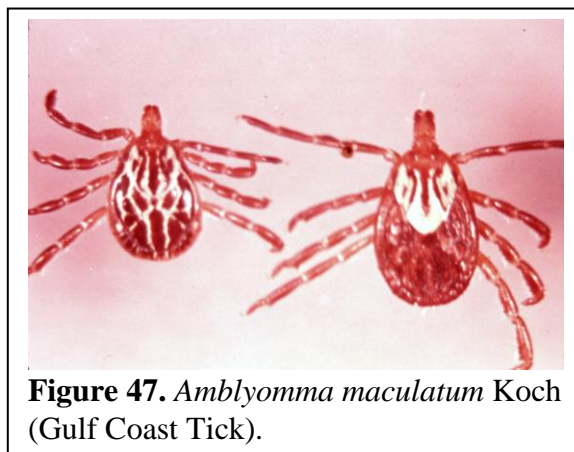


Figure 47. *Amblyomma maculatum* Koch (Gulf Coast Tick).

This tick was recorded to have first permanent populations in south central and northern Oklahoma in the 1960’s and becoming a major pest by 1970 (Semtner and Hair, 1973). The zoogeography of this tick is well summarized by Williams et al., <http://ticsys.tamu.edu/HEATHERSPROJ.htm>.

Dermacentor variabilis (Say) (American Dog Tick)

Another three-host tick, this species is distributed from southern Canada and much of eastern and central United States west to the Rocky Mountains. Established breeding populations also occur in western North America, from Washington to California. Adults of this tick prefer medium to large-sized mammals, including man, dogs, and raccoons. Activity in Oklahoma begins in April and peaks in June, declining through the fall. Populations of this species often are high along field-forest edges. The American Dog Tick is a vector of agents causing Rocky Mountain Spotted Fever, anaplasmosis, feline cytauxzoonosis, and tick paralysis (the latter via toxins in the saliva).

Dermacentor albipictus (Packard) (Winter Tick)

This one-host tick is found throughout North America, feeding on larger mammals, both wild and domestic, during the cooler months. Horses and deer are commonly attacked from fall through early spring. Heavy infestations on horses may cause emaciation and anemia. After

hatching from the egg, larvae attach to a host, feed and detach, remaining on the animal. Subsequently, they molt to the nymphal stage, resume feeding and detach again. After they develop into adults and feed once again, they drop to the ground and lay their eggs. The winter tick is responsible for winter anaplasmosis outbreaks in cattle.

Ixodes scapularis Say (Black-legged Tick)

The Black-legged Tick is a common species throughout the eastern United States. This tick is the common vector for Lyme disease in eastern North America. Much of the literature concerning this species was published under the synonym *Ixodes dammini*. The larvae feed on lizards, birds and small animals, such as squirrels and mice; whereas adults are found on medium-sized mammals and deer. More than 100 species of hosts have been recorded for this tick (Durden and Keirans, 1996). The adults are cold weather ticks, remaining on the host through the winter months. In Oklahoma, this tick has been implicated in the transmission of tularemia, human and animal babesiosis, and tick paralysis.

The Centers for Disease Control (CDC), Division of Vector-Borne Infectious Diseases have an excellent home page for Lyme disease <http://www.cdc.gov/ncidod/dvbid/lyme/>

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Williams, H. R., P. D. Teel, O. F. Strey, R. E. Wright, and D. E. Mock. Zoogeography of the Gulf Coast tick, *Amblyomma maculatum* Koch. <http://ticsys.tamu.edu/HEATHERSPROJ.htm>

Scorpions (Scorpiones: Buthidae)

Scorpions are venomous arthropods and are relatives of the spiders, mites, ticks and harvestmen. There are approximately 1,300 species of scorpions worldwide, and about 90 species are known from the United States. An elongated body and a segmented tail that is tipped with a venomous stinger characterize these arachnids. Scorpions are considered desert animals, but are often common in grasslands, deciduous forests, montane pine forests, rain forests and caves. Scorpions are easily recognized by their mouthparts called chelicerae, a pair of pincerlike pedipalps, and four pairs of legs. The pincerlike pedipalps are used primarily for prey capture and defense, but are also covered with various types of sensory hairs.

The largest scorpions in the United States are members of the genus *Hadrurus* (giant desert hairy scorpions), obtaining a length of about 5 inches (12.7 cm). Scorpions are nocturnal, predatory animals that feed on a variety of insects, spiders, centipedes, and other scorpions. The venom of scorpions is used for both prey capture and defense. Scorpion venoms are complex mixtures of neurotoxins (toxins which affect the victim's nervous system) and other substances; each species has a unique mixture (Keegan, 1980). Despite their fearful reputation, only one species in the United States and about 20 others worldwide have venom potent enough to be considered dangerous to humans (Polis, 1990). The United States species, *Centruroides exilicauda* (Wood)(formerly called *C. sculpturatus*), is found over much of Arizona. A small population occurs in extreme southeastern California, and a few records exist for southern Utah. The venom of this scorpion may produce severe pain and swelling at the site of the sting, numbness, frothing at the mouth, difficulties in breathing (including respiratory paralysis), muscle twitching, and convulsions. Death is rare, especially in more recent times. Antivenom is available for severe cases.

Stockwell (1992) reviewed the North American families and genera of scorpions. Only a single species of scorpion, the common striped scorpion, *Centruroides vittatus* (Say) occurs in Oklahoma (Fet et al., 2000, <http://www.angelfire.com/tx4/scorpiones/states.html>). This species is considered the most widely distributed American scorpion, and has been reported as the “only species encountered by most persons in the United States” (Keegan, 1980). The common striped scorpion is so named because of two broad, brown longitudinal stripes on the dorsum of the

abdomen. Baerg (1961) reported that this species mates in the fall, spring, and early summer. Litter sizes vary from 20-47. Adults can live for more than four years. The sting of *C. vittatus* is not considered to be dangerous, producing only temporary local pain and some swelling (Keegan, 1980).

Centruroides vittatus is a commonly encountered species throughout Fort Sill (Appendix C, Fig. 48) found under rocks, debris, in decaying wood, and sometimes entering buildings. Adults often can be observed waiting for prey just at the edge of lit areas at night during the summer.



Figure 48. The common striped scorpion, *Centruroides vittatus* (Say).

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Mayflies (Order Ephemeroptera)

The Ephemeroptera, or mayflies, is a primitive order of aquatic insects that, as adults, are easily distinguished by the presence of two pairs of membranous wings, with the front wings larger and triangular in shape, and with the hind wings much smaller or sometimes absent. The antennae are bristle-like, and two or three long segmented caudal filaments or 'tails' extend from end of the abdomen. Adults are usually found at, or near, bodies of water.

Most mayfly adults have two winged stages; one termed the subimago, and the other the imago. The subimago, the winged stage after the molt from the nymphal stage after a period of time that varies from an hour to days, will molt to the imago or adult stage. The angler or fly fisherman terms the subimago the *dun* and the imago the *spinner*. The imago stage is ready to reproduce, the only biological function of this stage. Some mayflies remain as a subimago and still can reproduce. In fact some subimagos have vestigial or nonfunctional legs, and can only fly and mate then die! *Tortopus puella* (Pictet), a species found in East Cache Creek, is such a species. Adult mayflies often form enormous nuptial flights, during which mating takes place. Swarming behavior can take place over the water, or sometimes remote from a body of water, and at various times of the day from dawn to dusk, or at night. Swarming mayflies are commonly observed during the warmer months along West Cache Creek, Medicine Creek and East Cache Creek. Often, *Tricorythodes minutus* Traver form especially dense swarms along East Cache Creek. The eyes of the male imago are modified, apparently for better acuity for aerial mating. Mated females return to the stream or pond to oviposit. Eggs of most mayflies are modified for different aquatic environments, usually with specialized attachment structures.

Mayfly immatures or nymphs can be distinguished from other aquatic insects with hemimetabolous or incomplete metamorphosis, the presence of two or three caudal filaments or tails at the end of the abdomen, and one claw on each leg. Additionally, gills are attached to various segments on the side of the abdomen, either as flattened plates or filaments. The body length ranges from 2 to almost 35 mm, not including the caudal filaments. The largest mayfly found on Fort Sill is *Hexagenia limbata* (Serville) (Fig. 49), measuring 18-20mm in total length, to smallest, *Caenis* ranging from 2.8-4.5mm.



Figure 49. *Hexagenia limbata* (Serville).

Immature mayflies occur in many different habitats, both lotic (flowing waters, streams, rivers) and lentic (standing waters, ponds, lakes, reservoirs). However, the greatest diversity of mayflies is found in lotic habitats, especially those of higher elevations. Some groups such as members of the family Heptageniidae (flatheaded mayflies) have flattened bodies, and are adapted to cling to rocks or other firm substrates in fast-flowing streams. In contrast, others such as members of the Baetidae (small minnow mayflies) are well adapted for swimming, and the Ephemeridae (common burrower mayflies) are burrowers in soft sediments of lakes, ponds and large rivers.

Currently, about 676 species are recognized from North America in twenty-one families. A comprehensive index to North American mayfly species is provided at the web site, <http://www.entm.purdue.edu/entomology/research/mayfly/mayfly.html>.

McCafferty et al. (1997), Baumgardner and Kennedy (2000), and the USGS web site www.npwrc.usgs.gov/resource/distr/insects/mfly/chklist/states/ok.htm report at least 89 species of mayflies from Oklahoma. A relative high diversity of mayflies occurs in the western Ozarks. For example, Baumgardner and Kennedy (2000) listed 56 species in 29 genera and 11 families from the Kiamichi River watershed of southeastern Oklahoma. Another study of a stream in the Arbuckle Mountains in nearby Murray County by Reisen (1975) listed only 10 taxa. In comparison, the more sluggish or intermittent streams of the mixed and tall grass prairies of Oklahoma support a low diversity of species. Twenty-two species of mayflies were collected during this survey (Appendix C), representing 25% of the known Oklahoma species (Table 1). Vaughn and Obermeyer (2002) reported 11 species previously from Fort Sill. Several species, *Stenonema femorata* (Say), *Pseudocloeon dardanum* (McDunnough), and *Isonychia rufa* McDunnough are common in the larger streams of Fort Sill. The burrower mayfly, *H. limbata* is common in Lake Elmer Thomas and the larger lakes of the Fort. Often the surrounding hillsides of Lake Elmer Thomas and Engineer Lake have large numbers of adults hanging on vegetation throughout the summer. Additionally, most lakes and ponds of Fort Sill support species of *Caenis* and *Callibaetis*. *Plauditus texanus* Wiersema is a new state record for Oklahoma. This species was originally described from the Hill Country region of central Texas (Wiersema, 1999).

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Semiaquatic and Aquatic Bugs (Order Hemiptera: Heteroptera)

The true bugs contain at least 16 families of aquatic and semiaquatic species, most of which prey on other invertebrates. The only exceptions are the Corixidae, or water boatman, with many species that feed on bottom ooze or suck out the contents of algal cells. Several families of aquatic and semiaquatic Hemiptera are represented at Fort Sill. Five families are totally aquatic, only leaving the water during dispersal flights or brief periods: Belostomatidae (Giant Water Bugs), Corixidae (Water Boatmen), Nepidae (Water Scorpions), Notonectidae (Backswimmers), and Pleidae (Pygmy Backswimmer). Three families live on the water surface: Gerridae (Water Striders, Pond Skaters, Wherrymen), Hydrometridae (Marsh Treaders, Water Measurers), and Veliidae (Small Striders, Riffle Bugs). Two families dwell on the shores of streams, ponds, and reservoirs: Gelastocoridae (Toad Bugs) and Mesoveliidae (Water Treaders). More specific information on the biology of these bugs can be found in Brooks and Kelton (1967), Menke (1979), and Sanderson (1982). Distributional information is available in Henry and Froeschner (1988), and the web site maintained by Oklahoma State University (<http://www.ento.okstate.edu/museum/hemipterafam.htm>). The latter provides a summary of the species previously recorded by Schaefer (1969), Schaefer and Drew (1964, 1967, 1968, 1969). At least 27 species of aquatic and semiaquatic bugs were collected from Fort Sill during the surveys (Appendix C), representing about 38% of the known Oklahoma fauna (Table 1).

Generally, water bugs overwinter as adults and lay their eggs in the spring and summer. Eggs are laid below or at the water surface, inserted into plant tissues, or on land in mud and sand. Almost all of these bugs have five nymphal instars, and generations can be completed in one or two months.

Belostomatidae (Giant Water Bugs)

These bugs are the giants of the aquatic Heteroptera, with some species exceeding 110 mm in length. Other names given to these fierce sedentary hunters are “toe-biters” and “electric light bugs.” These bugs have airstraps at the tip of the abdomen, which obtain atmospheric air for their subhemelytral airstore. About 21 species occur in North America, and six species have been recorded from Oklahoma (<http://www.ento.okstate.edu/museum/hemipterafam.htm>). Only the common and transcontinental species, *Belostoma flumineum* Say was collected at Fort Sill, representing 17% of the known Oklahoma species



Figure 50. Male *Belostoma* with eggs on back.

(Table 1). Females of this species glue their eggs on the back of the male, who then carries and cares for them until they hatch (Fig. 50). Schaefer and Drew (1969) reported only this giant water bug from Comanche County.

Corixidae (Water Boatmen)

Members of this family inhabit almost all types of aquatic habitats, and are the largest and most successful family of aquatic bugs. More than 140 species have been reported from the United States, and 22 species are known from Oklahoma

(<http://www.ento.okstate.edu/museum/hemipterafam.htm>). At least eight species

(Appendix C) or 36% of the known Oklahoma species (Table 1) were collected on Fort Sill, with *Palmacorixa*

nana walleyi Hungerford being a new state record for Oklahoma. The mouthparts of water boatmen are modified to utilize benthic ooze as food. However, several genera are considered predaceous. Adults are excellent flyers and often migrate long distances. Corixids can be found in all types of aquatic habitat of Fort Sill. *Sigara alternata* (Say) (Fig. 51) a widespread North American species is especially common on Fort Sill. Previous to this survey, only *S. modesta* (Abbott) was reported from Comanche County (Schaefer; 1969).



Figure 51. Typical water boatman, *Sigara* sp.

Gelastocoridae (Toad Bugs)

Toadbugs deserve their common names, resembling miniature toads. Only the geographically widespread species, *Gelastocoris oculatus* (F.) is known from Oklahoma (<http://www.ento.okstate.edu/museum/hemipterafam.htm>), and this species is common around most muddy or sandy edges or banks of streams, ponds, and lakes of Fort Sill.

Gerridae (Water Striders, Pond Skaters, Wherry-men)

Gerrids are familiar sights on the surface of standing water habitats and stream pools. These agile opportunistic predators move rapidly across the surface, using their middle legs for propulsion and their front and hind legs acts as balancers. Approximately 47 species are known from North America,

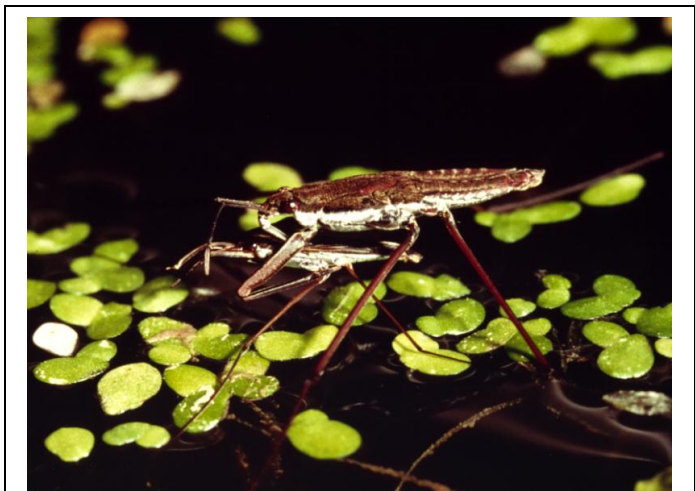


Figure 52. Typical water strider, *Gerris* sp.

and 15 reported from Oklahoma (<http://www.ento.okstate.edu/museum/hemipterafam.htm>). Five species were collected during the survey (Appendix C) representing 33% of the known Oklahoma species (Table 1). *Gerris remigis* Say (Fig. 52) prefers streams, whereas *G. marginatus* Say, *Trepobates knighti* Drake and Harris, and *T. subnitidus* Esaki occur both on streams and ponds. *Neogerris hesione* (Kirkaldy) is a species of ponds and lakes. Previously, Schaefer and Drew (1966) listed only *Gerris marginatus* and *G. remigis* from Comanche County.

Hydrometridae (Marsh Treaders, Water Measurers)

The marsh treaders are a small group of highly distinctive bugs that use floating mats of vegetation to move about the surface of still-water habitats. Adults overwinter and females start laying eggs in May. Several generations are completed throughout the summer. Hydrometrids attack insects that happen to fall onto floating mats of vegetation, and often several individuals will feed on a single prey item. Of the two recorded Oklahoma species of this family, *Hydrometra martini* Kirkaldy (Fig. 53)

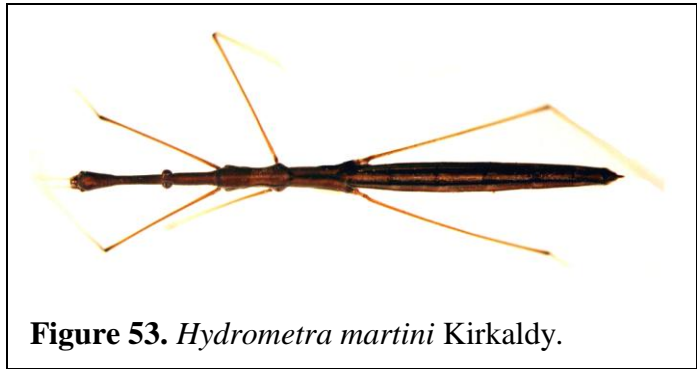


Figure 53. *Hydrometra martini* Kirkaldy.

was found at Fort Sill. Nine species are recorded for this family in North America.

Mesoveliidae (Water Treaders)

Mesoveliids live on the surface of standing water habitats, or occasionally on the edges of sluggish streams. These active bugs prefer areas that have floating or emergent aquatic vegetation. Water treaders feed by “spearing” dead or injured insects found on the water surface or on floating vegetation. They skate on the surface using alternating strokes of three legs at one time (Anderson, 1976). Three species are known from North America, and two species have been recorded from Oklahoma. *Mesovelia mulsanti* White (Fig. 54) is the only species of this family collected from the numerous suitable habitats on Fort Sill.

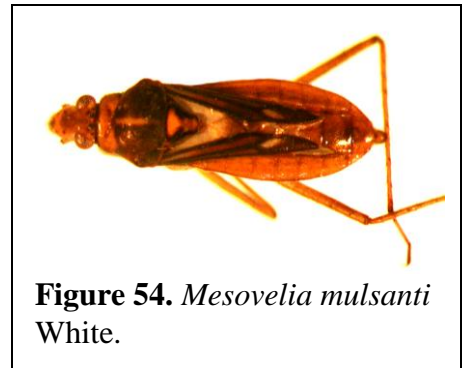


Figure 54. *Mesovelia mulsanti* White.

Nepidae (Water Scorpions)

These bugs can be abundant along the shallow edges of streams, ponds, and lakes of Fort Sill, blending in with dark colored debris or plants. Only *Ranatra nigra* was collected at Fort Sill. Species in this genus resemble walking sticks with a long siphon tube at the end of the body. Six of the 13 known North American water scorpion species have been recorded from Oklahoma (<http://www.ento.okstate.edu/museum/hemipterafam.htm>). Sites and Polhemus (1994) indicated that the species known from Fort Sill, *R. nigra* Herrich-Schaeffer, has a range similar to the

original eastern deciduous forest of North America. Schaefer and Drew (1966) previously listed this species from Comanche County.

Notonectidae (Backswimmers)

Backswimmers swim on their backs. These common insects can be seen underwater swimming with jerky movements and rising to the surface of the water for additional oxygen. Notonectids prefer small ponds and edges of large lakes, often with abundant aquatic vegetation. They are fiercely predaceous--feeding on small crustaceans, insects, and even small fish. All species of *Notonecta* overwinter as adults, and can be observed at Fort Sill during all months of the year. Egg laying begins in the spring and lasts throughout the summer. At least five species in the genera *Notonecta* (Fig. 55) and *Buenoa* were collected at Fort Sill (Appendix C). Seven species are known from Oklahoma (<http://www.ento.okstate.edu/museum/hemipterafam.htm>). Thirty-two species are represented in the North American fauna. *Buenoa confusa* Truxal is a new state record for Oklahoma.

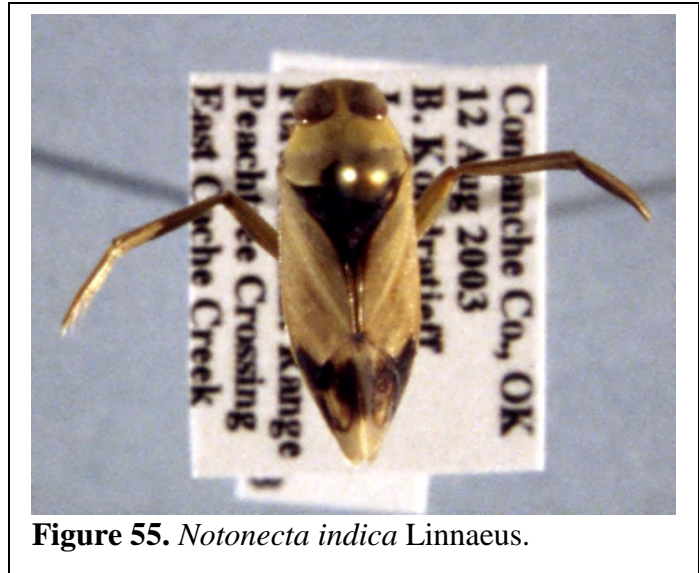


Figure 55. *Notonecta indica* Linnaeus.

Pleidae (Pygmy Backswimmer)

The pygmy backswimmers are closely related to notonectids, and are easily recognized by their small size (1.7-2.8 mm in length), strongly arched habitus, and the long hind legs that they use to propel themselves underwater. *Neoplea striola* (Feiber) is a common species of shallow ponds and lakes of Fort Sill, and is the only species recorded from Oklahoma (<http://www.ento.okstate.edu/museum/hemipterafam.htm>). Five species are known from North America.

Veliidae (Small Water Striders, Riffle Bugs)

These small dark water surface-dwelling bugs are often common, but sometimes cryptic, along the edges of still water aquatic habitats or in shaded areas along edges of riffles and runs. The genus *Rhagovelia* is known as riffle or ripple bugs and is confined to streams. The last tarsal segment of each leg is modified with a fan-like structure of long ciliated hairs that are used as a swimming aid. In general, *Microvelia* can be found along the edges of all types of aquatic habitats, skating quickly between floating plants and debris to open water. Often wingless forms are more common than winged forms. The species of this family are predaceous, and feed on any small organisms trapped in the water film or floating on the surface. Eleven of the 34 North American species have been recorded from Oklahoma, and four of these species or 36% of the Oklahoma species were collected during our survey at Fort Sill (Appendix C, Table 1).

Microvelia pulchella Westwood has also been listed from Comanche County (Shaefer and Drew, 1966), and may occur on the Fort.

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Pentatomidae (Stink bugs)

The Pentatomidae or stink bugs are one of the largest and well-known groups of Heteroptera (True Bugs). Within the bugs, their 5-segmented antennae, being broadly oval, and somewhat shield-shaped distinguish them. Most species are plant feeders, especially on grasses. The adults and immatures prefer immature fruits and seeds (Schuh and Slater, 1995). The members of the subfamily Asopinae are predaceous--a secondary adaptation. A species in this subfamily found on Fort Sill, *Podisus maculiventris* (Say) has been reported to feed on more than 90 species of insects.

Stink bugs are characterized by having scent glands, and often have distinctive pungent odors. This substance apparently is used as a chemical defense, repelling ants and other predators.

More than 220 species of stink bugs are known from North America. Twenty-two species were collected on Fort Sill in 2002-2004 (Appendix C). The web site maintained by the K. C. Emerson Entomology Museum, Oklahoma State University lists 55 species from Oklahoma (<http://www.ento.okstate.edu/museum/hemipterafam.htm>). Arnold and Drew (1988) have provided an excellent review of the 53 species of stink bugs that were known from Oklahoma at that time. Additional information is also available in Froeschner (1988). Three species, *Agonoscelis puberula* Stål, *Andrallus spindens* (Fabricius), and *Banasa calva* (Say), were collected on Fort Sill during 2002-2004, and represent new state records for Oklahoma (Appendix C). We follow the classification of the family as presented by Froeschner (1988).

Biological information of the following species is summarized from McPherson (1982) and Arnold and Drew (1988).

Acrosternum hilare (Say)

This species is known as the green stink bug (Fig. 56) and is widespread over much of North America. It is considered an economic pest of various commercially grown beans (especially soybeans), tomatoes, and even sugar beets. This large green bug overwinters in the adult stage and has two generations each year at Fort Sill. Sometimes this species is included in the genus *Chinavia*.

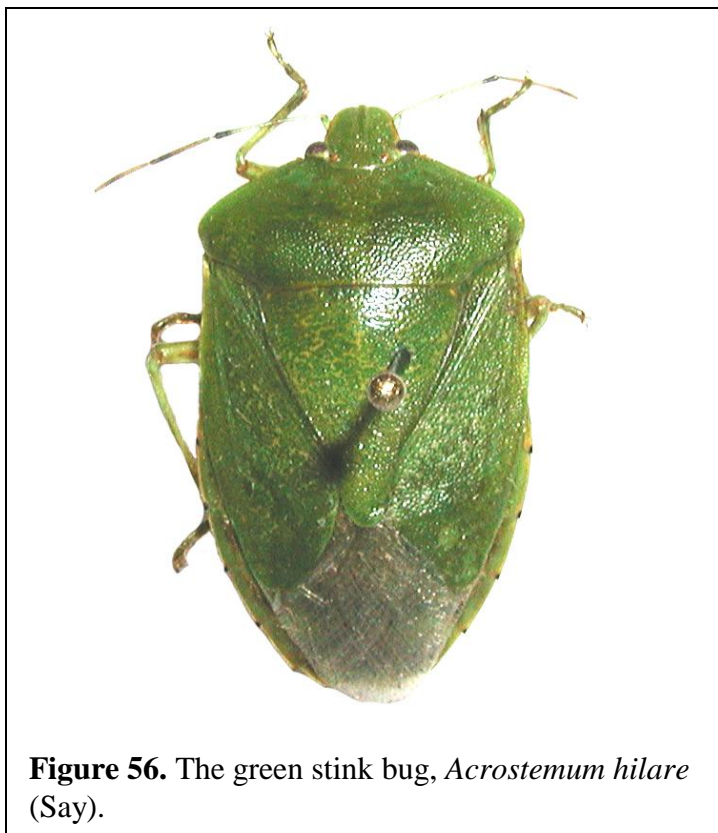


Figure 56. The green stink bug, *Acrosternum hilare* (Say).

Agonoscelis puberula Stål

Thomas et al. (2003) reported the occurrence of the African cluster bug for the first time in the United States, collected in Arizona, New Mexico, and Texas. The Fort Sill record represents a new state record for Oklahoma. This stink bug is associated with the pandemic weed, common horehound, *Marrubium vulgare* L. Johnson et al. (1990) did not report this species from Fort Sill.

Amaurochrous cinctipes (Say)

This podopine bug is known from northeastern North America to South Carolina west to Texas and north to Minnesota and Nebraska. This species is usually associated with moist areas. Arnold and Drew (1988) considered *A. cinctipes* an uncommon species in Oklahoma.

Andrallus spindens (F.)

Previously known from Louisiana and Texas, the Fort Sill record represents a new state record for Oklahoma. This species is predaceous on caterpillars of a variety of moths. Adults of *A. spindens* overwinter.

Apateticus cynicus (Say)

This predaceous stink bug is usually associated with trees and shrubs, and ranges from Canada to Florida, west to Montana and Arizona. *Apateticus cynicus* overwinters in the egg stage, and has two generations each year in Oklahoma. Arnold and Drew (1988) considered this large brown bug uncommon in Oklahoma.

Banasa calva (Say)

This species occurs throughout most of North America, and both immatures and adults feed on a variety of tree and shrub species. It overwinters as an adult, and there is one generation per year. The specimens collected during this study represent a new state record.

Banasa euchlora Stål

This bright green stink bug occurs on juniper and is widely distributed from New York south to Florida and west to Nevada.

Brochymena arborea (Say)

This large, gray species has been recorded from Canada south to Florida, west to New Mexico and north to South Dakota. This stink bug is associated with a number of tree species, including oak. It overwinters as an adult--usually under bark--and has one generation each year. Arnold and Drew (1988) considered this species as the least common Oklahoma *Brochymena*.

Brochymena cariosa Stål

This stink bug ranges from the Midwest south to Texas and Florida. This species feeds on oak and pine. It overwinters as an adult, and as the previous species, has one generation per year.

Brochymena quadripustulata (F.)

Known as the rough stink bug, this species ranges across southern Canada and throughout the conterminous United States. It is known to feed on a variety of trees including oak and is a predator on other insects. It has a reported one-year life cycle.

Euschistus servus (Say)

The brown stink bug has a conterminous United States distribution. This species feeds on a great variety of plant species, including soybean, cabbage, beans, tomato, ragweed, grasses, and many other plants. This species is common on Fort Sill.

Euschistus tristigma (Say)

The dusky stink bug ranges over much of North America, and can be recognized by the black spots on the abdominal segments. It feeds on many different plant species, including several agricultural crops such as soybeans. It can be common on oak. In Oklahoma, this species has at least two generations per year.

Euschistus variolarius (Palisot de Beauvois)

Known as the one-spotted stink bug, this species ranges from Quebec to Florida west to California south to Mexico. It has been observed feeding on numerous plants species, but also is a predator of aphids and scale insects. Arnold and Drew (1988) reported this species to overwinter as adults in Oklahoma.

Holcostethus limbolarius (Stål)

This species is a widespread bug, known from Canada to Mexico. It is known to feed on a variety of plants including goldenrod, clover, corn, and others. This species has two generations per year in Oklahoma.

Mecidea major Sailer

This stink bug ranges from Arizona to Texas and north to Illinois. Host plants include a variety of grasses.

Menecles insertus (Say)

This is another common species of stink bug that occurs across much of North America. This species is nocturnal and is usually found associated with trees. It is considered a plant feeding species, but has also been reported to feed on caterpillars. This species may have two generations per year and overwinters as an adult. Arnold and Drew (1988) indicated that adults could be taken during almost all months of the year in Oklahoma.

Murgantia histrionica (Hahn)

The harlequin bug is a well-known pest of crucifers, both cultivated and wild. This species ranges throughout the southern portion of the United States. It is a native of Central America and Mexico. The harlequin bug has at least two generations per year.

Oebalus pugnax (F.)

The rice stink bug can be a common species throughout the continental United States, and is considered a pest of rice. It also feeds on numerous grass species, including corn. This species overwinters as an adult and may have two generations per year.

Podisus maculiventris (Say)

The spined soldier bug ranges over much of the United States. It is considered an important predator, and has potential use as a biological control agent for controlling forest and agricultural pests. It may have more than three generations per year in Oklahoma.

Prionosoma podopioides Uhler

This species is known from western Canada to Baja California, Mexico, and east to Michigan and Illinois. It is often found associated with grasses. Only a single specimen was collected at the Quanah Range of Fort Sill.

Thyanta custator (F.)

This stink bug has been reported from the Gulf Coast states to New England, and west to the Midwest. A very common species on Fort Sill, this species feeds on a variety of plants including goldenrod, pokeweed, ironweed, and alfalfa. Arnold and Drew (1988) may have reported this species under the name *T. accerra* McAtee. It is readily attracted to ultraviolet light traps.

Trichopelma semivittata (Say)

A wide ranging small, brown species from southern Canada to Mexico, it has been recorded feeding on many different plants such as goldenrod, asters, daisies, and clovers.

Three other species of stink bugs have been reported by Arnold and Drew (1988) from Comanche County: *Aelia americana* Dallas, *Mecidea minor* Ruckes, and *Neottiglossa sulcifrons* Stål.

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Cicadas (Cicadidae)

Cicadas are easily recognized by their large size (greater than 1 inch) and transparent wings that are held rooflike over their abdomens. Most adult cicadas are strong fliers that spend their time high in the trees, such as in oak woodlands of Fort Sill. Their life cycles are long, usually involving multiple years spent underground as nymphs, followed by a brief (roughly 2-6 weeks) adult life above ground. As nymphs and adults, they feed on the xylem fluid of woody plants using their piercing and sucking mouthparts. As adults, males produce a loud species-specific mate-attracting song using specialized sound-producing organs called tymbals. These sounds are among the loudest produced by any insect. In some species, the male calling song attracts both males and females to mating aggregations, while in other species males remain dispersed. Female cicadas do not have tymbals, but in some species the females produce clicking or snapping sounds with their wings.

Cicadas are often called “locusts,” but locusts are a type of grasshopper, a group of insects distantly related to the cicadas. The term locust supposedly was given to these insects after the first white Europeans in Eastern North America experienced large emergences of the periodical cicada, and associated them incorrectly with the locust hordes mentioned in the Bible.

Females lay their eggs in slits in branches formed by their ovipositors or egg laying devices. Often, these slits weaken terminal branches and twigs, and breakage often occurs causing a “flagging” injury. Especially, after a large emergence of the periodical cicada, *Magicicada* spp, this damage is often conspicuous in the oak woodlands of Fort Sill, such as in 2002.

Nymphs hatching from eggs drop to the ground and burrow into the soil and then locate a root to insert their beak for feeding. The duration of nymphal feeding varies from one year to 17 years depending on the species. Usually, a few weeks before emerging, nymphs construct exit tunnels to the surface. On the night of emergence, nymphs leave their burrows after sunset and climb up on tree trunks or other suitable spots, and complete their final molt to an adult. Their characteristic and familiar “skin” is left on trunk, and can be found many months later.

Drew et al. (1974) recorded 24 species of cicadas from Oklahoma. During our surveys conducted from 2002-2004, 13 species were collected from Fort Sill (Appendix C). This represents about 54% of the total number of species known from Oklahoma. The cicadas of Fort Sill can be divided into two groups based on their general habitat occurrence--grassland and woodland species. Seven species are closely associated with the oak woodlands of the Fort. Included are the “dog-day cicadas”--*Tibicen aurifera* (Say), *T. dealbata* (Davis), *T. lyricen* (DeGeer), *T. pruinosa* (Say), and *T. superbis* (Fitch). These species are widely distributed and associated with a number of deciduous trees including the oak species found on Fort Sill. The

songs of these cicadas serenade the region during the summer and fall. The Cicada web site http://insects.ummz.lsa.umich.edu/fauna/Michigan_cicadas/Michigan/Index.html at the University of Michigan provides songs of some of the Fort Sill cicadas.

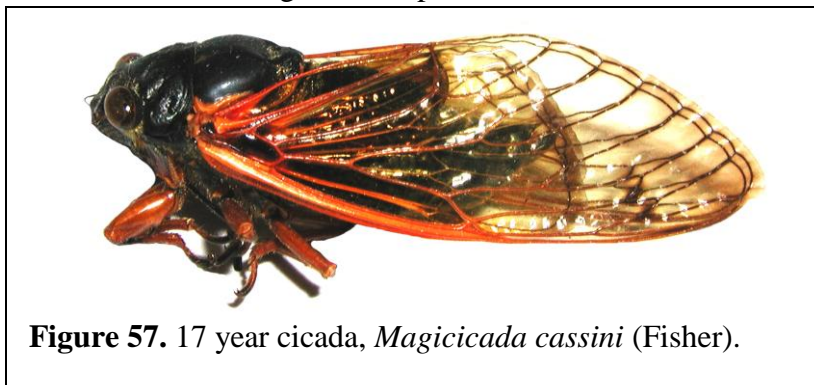


Figure 57. 17 year cicada, *Magicicada cassini* (Fisher).

The most famous of all North American cicadas are the periodical cicadas or *Magicicada* cicadas of the East. The adults of *Magicicada* have black bodies, striking red eyes and wing veins, and a black “W” near the tips of the forewings (Fig. 57). These cicadas emerge in May and June, and live for only a few weeks. There are seven species--four species with 13-year life cycles, and three with 17-year cycles. The three 17-year species are generally northern in distribution, while the 13-year species are generally southern and midwestern. *Magicicada* are so synchronized developmentally that they are nearly absent as adults in the 12 or 16 years between emergences. Emergences are often huge, forming dense aggregations. Nearly all of the periodical

cicadas in a given location emerge in the same year, known collectively as a single "brood" (or "year-class"). The resulting broods are designated by Roman numerals, and there are 12 broods of 17-year cicadas (with the remaining five year-classes apparently containing no cicadas), and 3 broods of 13-year cicadas (with ten empty year-classes) (Marshall and Cooley, 2000). As a result, it is possible to find adult periodical cicadas in almost any year by traveling to the appropriate location (Simon, 1988; Williams and Simon, 1995). The next large emergence of this cicada in Oklahoma will be in 2015 for a 17-year brood, and in 2011 for a 13-year brood (<http://www.ummz.lsa.umich.edu/magicicada/Periodical/index.html>). The brood observed on Fort Sill in 2002 was probably a late emerging population of brood IV of 17-year cicada, representing *M. cassini* (Fisher) (John R. Cooley, University of Connecticut, personal communication).

Beameria venosa (Uhler), *Cicadetta calliope*, *C. kansa*, *Diceroprocta azteca* (Say), and *T. dorsata* are grassland species, with *T. dorsata* (Fig. 58) known as the "giant grassland cicada." This large 32-39 mm (1.27-1.53 inches) long species can be flushed commonly from undisturbed grassy areas of the West and Quanah ranges. *Beameria venosa*, *C. calliope* and *C. kansa* are small cicadas, about 13-14 mm (0.51-0.55 inches) in length. *Beameria venosa* is closely associated with grassland areas of Arizona, Colorado, Kansas, Nebraska, New Mexico, Oklahoma, and Texas. The bright grassy green head and pronotum of *D. azteca* makes identification of this medium-size cicada easy in the field. Males tend to perch and sing on taller vegetation in grassland areas of the Fort. Both sexes of *C. kansa* and the female of *C. calliope* are green or straw-colored, and extremely cryptic in the more moist mixed grasslands of the East Range of Fort Sill. The songs of both species are nearly inaudible, like a faint winding of a watch. *Cicadetta calliope* is a widespread species, known from Florida to Michigan and south to Texas, whereas *C. kansa* is known only from Colorado, Kansas, Oklahoma, and Texas. *Tibicen aurifera* was sometimes found commonly singing in shrubs and small trees interspersed among the grasslands of the West and Quanah Ranges. This cicada was especially common around Engineer Lake.



Figure 58. *Tibicen dorsata* (Say).

Pacarina puella is a common species of the mesquite region of west Texas and has been reported from Harmon and Carter counties, Oklahoma (Drew et al., 1974). At Fort Sill, this little cicada is easily recognized by the small size and anterior cross veins infuscated, was collected only from the mesquite areas of the Quanah Range. The song, a prolonged trill, is characteristic for this species.

Two additional species of cicadas that may occur on Fort Sill include *Diceroprocta vitripennis* (Say) and *T. resh* (Haldeman) (Drew et al., 1974).

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Aquatic and Semiaquatic Beetles (Coleoptera)

The beetles are the largest and most diverse group of organisms on Earth (Arnett et al., 2001; White and Brigham, 1996; Lawrence, 1991). There are more than 350,000 described species of beetles recognized worldwide, with 25,000 of these being represented in America north of Mexico (Lawrence, 1991). Five thousand North American species are recognized as being “aquatic” which includes fully aquatic species, semi-aquatic species, and species that have a life stage that is fully or semi-aquatic (White and Brigham, 1996). The North American species are grouped into two suborders (Adephaga and Polyphaga), 22 families containing aquatic representatives, 184 genera, and 1,919 species (White and Brigham, 1996). The families include: Amphizoidae (trout-stream beetles), Carabidae (ground beetles), Chrysomelidae (leaf beetles), Curculionidae (weevils or snout beetles), Dryopidae (long-toed water beetles), Dytiscidae (predaceous diving beetles), Elmidae (riffle beetles), Gyrinidae (whirligig beetles), Haliplidae (crawling water beetles), Hydraenidae (minute moss beetles), Hydrophilidae (water scavenger beetles), Hydroscaphidae (skiff beetles), Limnichidae (minute marsh-loving beetles), Lutrochidae (travertine beetles), Melyridae (soft-winged flower beetles), Microsporidae (minute bog beetles), Noteridae (burrowing water beetle), Psephenidae (water penny beetles), Ptilodactylidae (toed-winged beetles), Salpingidae (narrow-waisted bark beetles), Scirtidae (marsh beetles), and Staphylinidae (rove beetles) (White and Brigham, 1996).

Beetles can be found in almost every habitat type with the exception of fully marine habitats (White and Brigham, 1996; Arnett et al., 2001). Habitats include lentic systems, slow moving or stationary habitats such as lakes and ponds, and lotic systems, fast moving aquatic habitats such as rivers and streams, as well as brackish water and littoral zones (White and Brigham, 1996). Beetles live primarily in the substrate of their habitats with the exception of some beetles, such as dytiscids, that are considered good swimmers (White and Brigham, 1996). Because of some species' preference for clear, fast moving water devoid of toxins, beetles can be good water quality indicators (White and Brigham, 1996; Ceigler, 2003).

Aquatic species have diverse life histories, but some generalities can be made. Generally, larvae pass through three to eight molts before they pupate terrestrially under objects or in constructed pupal cases in the soil or debris. Most species have only a single generation per year. Adult beetles have two types of respiration--a self-contained system and a plastron or "physical gill". Larvae of most families undergo transcuticular respiration (White and Brigham, 1996). Larval beetles can be predaceous, herbivorous, or feed on specialized organisms. Adults beetles can be herbivorous, predaceous, or scavengers (White and Brigham, 1996). Appendix C lists the species of aquatic and semiaquatic beetles from various aquatic habitats on Fort Sill.

Dryopidae (Long-toed Water Beetles)

In the United States, the family Dryopidae (long-toed water beetles) is relatively small consisting of 13 species placed into five genera. Adults of the North American genus *Helichus* are primarily aquatic with species in the genera *Dryops* and *Pelonomus* considered riparian in habit, occurring on semi-aquatic plants (Shepard, 2002b). Some female dryopids have sharp ovipositors used to deposit eggs within plant tissue, or moist soil. Larval dryopids are terrestrial living in decomposing vegetative material or damp soil. Pupation occurs in damp streamside soil. Both adults and larvae are herbivorous, feeding on decomposing plant tissues and the tips of developing roots (Brown, 1991; Shepard, 2002b).

Two of the five species or 40% of the Dryopidae (Table 1) recorded from Oklahoma were collected during this survey (Appendix C). Both species were collected using black light traps at night. *Helichus suturalis* LeConte was also collected in riffle areas of streams using a dip net.

Helichus suturalis LeConte

This beetle is distributed from central Oklahoma west to California and south to Guatemala. It commonly occurs under rocks and debris in riffle areas of small streams. In contrast to *Pelonomus*, species of *Helichus* are truly aquatic with no need to take in ambient air (Brown, 1972; Brown, 1991). This species is uncommon in both East Cache Creek and Medicine Creek.

Pelonomus obscurus LeConte

This species is distributed from Florida west to Texas, and north to Illinois. *Pelonomus obscurus* is semi-aquatic or riparian in habit, principally occurring on emergent riparian

vegetation in still waters. It is rarely collected without the use of a light trap (Brown, 1972; Brown, 1991).

Elmidae (Riffle Beetles)

The riffle beetles, family Elmidae, are found on every continent with the exception of Antarctica. In the United States, riffle beetles are common inhabitants of fast flowing, cool

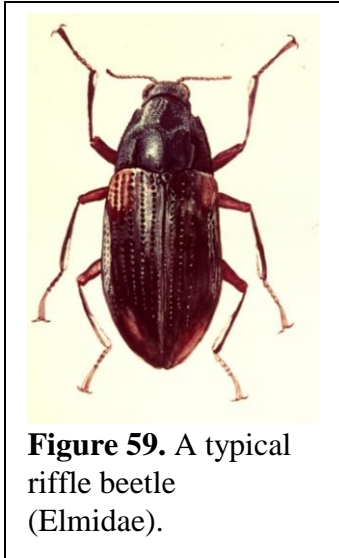


Figure 59. A typical riffle beetle (Elmidae).

streams with some genera preferring warmer lentic habitats, or even caves (Shepard, 2002a). The habitat preference of these beetles makes them good water quality indicators (Ciegler, 2003). Most species are completely aquatic, and feed largely on detritus and algae. They may be found living in sunken woody debris and log jams, among roots of plants, or under larger submerged rocks.

Larvae will undergo 5-8 instars or 6-36 months of development before pupation, depending on temperature and food availability. When full-grown, larvae crawl out of the water and pupate in the marginal habitat. After pupation, adults (Fig. 59) of most species will take their only dispersal flight and return to the water never to leave it again. Collecting using black light traps is especially productive during this dispersal period. Copulation takes place under water and eggs are deposited on suitable substrates (Brown, 1987a). In habitats with high levels of dissolved minerals, older adults may be coated with a thick shell-like coating of the

particulates or they may be coated with mud or algae. This coupled with the beetle's slow movement and small size can make collecting difficult (Brown, 1983; Brown, 1987a).

Twenty-six species of Elmidae are reported to occur in Oklahoma from the Oklahoma State University web site <http://www.ento.okstate.edu/museum/beetles.html>. Three of the twelve species or 25% of the *Stenelmis* species recorded from Oklahoma were collected from Fort Sill (Table 1, Appendix C).

Stenelmis cheryl Brown

Stenelmis cheryl is a widespread, commonly collected riffle beetle formerly confused with *Stenelmis bicarinata* LeConte. It ranges from New York south to the Gulf Coast; west to Oklahoma and Texas; south through Coahuila, Mexico (Brown, 1987b). This species is the common riffle beetle of the streams of Fort Sill.

Stenelmis occidentalis Schmude and Brown

This species of *Stenelmis* is known to occur in the northwestern United States, and is restricted to the states west of the Mississippi River and one of the few species that reaches its southern distributional limits in northern Mexico. It inhabits a wide variety of lotic habitats ranging from warm slow moving creeks to fast moving deep rivers (Schmude and Brown, 1991).

Stenelmis sexlineata Sanderson

This riffle beetle inhabits streams throughout much of the Midwest south into Oklahoma and Texas, and is tolerant of moderate levels of sewage, phosphate, and other pollutants (Brown, 1972; 1983). This species was collected from the two permanent flowing streams of Fort Sill, East Cache Creek and Medicine Creek.

Dytiscidae (Predaceous Diving Beetles)

Predaceous diving beetles (family Dytiscidae) may be locally abundant in a wide variety of habitats ranging from small vegetated ponds, lakes, and margins of slow stream to fast, cold-water streams or hot springs. They spend most of their life in tangles of vegetation or buried under the substrate. Adults scavenge or are predaceous on a wide variety of invertebrates and small aquatic vertebrates such as fish and larval amphibians. Larvae feed on similar prey but are not known to scavenge. Most species of predaceous diving beetle are univoltine, having only one generation per year. A generalized life cycle consists of eggs being laid in the spring by overwintering adults, larvae hatching and undergoing three instars throughout the spring and early summer, pupation occurring in the soil just above the water-line throughout the summer, adults emerging and mating in late summer and fall followed by the overwintering process in the water or on land. Most species are strong swimmers, however, some spend their lives crawling in and around the gravel and surrounding vegetation.

Adults (Fig. 60) are strong flyers and may take flight when colonizing new habitats or may leave their habitat if conditions become

unfavorable. Adult respiration requires the use of a “physical gill,” a system where a small bubble of air is trapped between the elytra or wing covers body and the abdomen of the beetle. When the oxygen content of the bubble runs low, the beetle returns to the surface to replenish it. In environments with high dissolved oxygen or in particularly small species, beetles may rarely, if ever, replenish their bubbles. These species are thought to obtain oxygen from cuticular respiration (through the skin) or from small bubbles on the substrate (Larson et al., 2000).

In North America, there are about 500 species of dytiscid beetles, 38 of which are previously known to occur in Oklahoma. Twenty-eight species or 71% of the Oklahoma species were collected during this survey (Table 1, Appendix C); 17 were previously recorded from Oklahoma and eight species represent new state records.

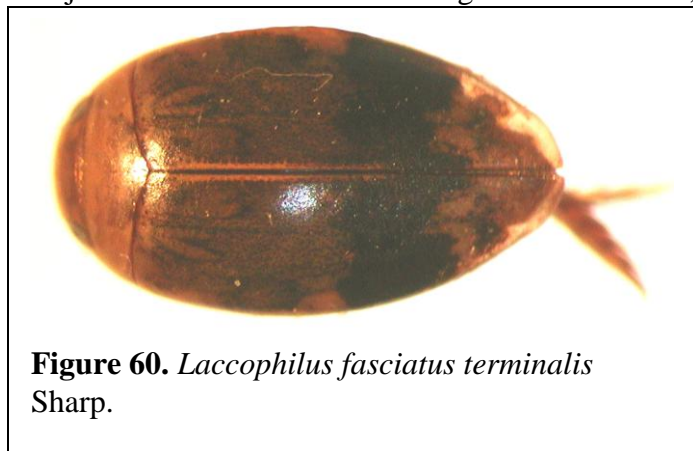


Figure 60. *Laccophilus fasciatus terminalis* Sharp.

Acilius fraternus Harris

This beetle ranges from New York south to Florida and Texas. This Oklahoma collection represents a new state record. It occurs in shaded woodland pools (Larson et al., 2000). This beetle was collected from the shaded pools of Rock Creek, Quanah Range.

Agabus disintegratus (Crotch)

This species is transcontinental in distribution, occurring from Delaware to Georgia, Ontario to Texas, and British Columbia to California. It is a common inhabitant of temporary ponds, puddles, and ditches (Larson et al., 2000; Ciegler, 2003).

Agabus semivittatus LeConte

This beetle occurs in Quebec, Canada, northcentral Mexico and the United States from New York to southeastern California excluding the Pacific Northwest, the Southeast, Montana, and North Dakota. It prefers habitats with flowing water, such as streams and seeps, but may also be found in some lentic habitats (Larson et al., 2000).

Celina hubbelli Young

This species ranges from Colorado and Texas east to Florida and north into eastern Canada. *Celina hubbelli* seems to prefer muddy or thick detritus bottoms of ponds and lakes (Larson et al., 2000; Ciegler, 2003).

Copelatus chevrolati renovatus Guignot

This subspecies of *C. chevrolati* ranges primarily from the eastern edge of the Great Plains west to California and south through Mexico. It is commonly found in both flowing and standing water habitats, and is known to be one of the first aquatic beetles to colonize newly formed aquatic habitats such as temporary pools (Larson et al., 2000; Ciegler, 2003).

Copelatus glyphicus (Say)

Occurring throughout the United States east of the Great Plains and in California and Oregon, to Ontario east to the Atlantic Provinces, this species can be found inhabiting a variety of lentic habitats from temporary pools to permanent ponds (Larson et al., 2000; Ciegler, 2003). Single specimens were collected from the West Range in a light trap and East Range, East Cache Creek, South Boundary Road.

Coptotomus loticus Hilsenhoff

Coptotomus loticus is distributed in the United States from Wisconsin south to Texas east to Maine and Florida and in Canada from Ontario to Quebec. This Fort Sill collection represents a new state record for this species and expands its known range. Its habitat preference is

vegetated margins of flowing waters (Larson et al., 2000). One specimen was collected from Blue Beaver Creek where it crosses McKenzie Hill Road on the West Range.

Coptotomus venustus (Say)

Previously known from Virginia south to Florida and west into Texas and Mexico, the Fort Sill collection of *C. venustus* represents a new state record for Oklahoma. It is known to occur in a wide variety of habitats from rivers to lakes and ditches to gravel pits (Ciegler, 2003). This beetle was collected from two localities on Fort Sill--East Cache Creek off South Boundary Road and North Boundary Road, 0.2 miles east of LETRA Road in a black light trap.

Cybister fimbriolatus (Say)

This species is distributed throughout the United States east of the Great Plains. Its preferred habitat appears to be in deeper regions of standing water, although it has been recorded from shallow habitats (Larson et al., 2000; Ciegler, 2003).

Desmopachria dispersa Crotch

This genus of small beetles ranging from 1.3-1.7 mm is largely Neotropical in distribution. *Desmopachria dispersa* is known from Texas to California, and these specimens represent a new state record for Oklahoma.

Eretes explicitus Miller

Miller (2002) indicated that this species occurs in central and southwestern North America, including Oklahoma. This beetle occurs in warm, open pools and may be collected at lights away from its habitat. On Fort Sill, two individuals were collected, one from the Quanah Range, Pottawatami Twins and another from the West Range, Ketch Lake. Both ponds are similar in habitat with mud bottoms and thick emergent vegetation.

Graphoderus liberus (Say)

This species is known to occur in forested regions. It is distributed from Minnesota southeast to Florida and from Washington to Idaho. It is known to be localized in distribution and prefers habitats of boggy ponds, lakes, sinks, and rivers (Larson et al., 2000; Ciegler, 2003). Only one individual was collected from an unnamed pond located 2.5 miles north of Bald Ridge Road on the East Range, Fort Sill. This collection represents a new state record and extends the known range of this species.

Heterosternuta diversicornis (Sharp)

Distributed from Kansas south to Texas, these beetles inhabit springs, rocky or sometimes silty margins of lakes and streams, temporary ponds, and vegetated, overhanging banks of flowing streams (Matta and Wolfe, 1981; Alarie and Fritz, 1998).

Hydaticus bimarginatus (Say)

In the United States, this species occurs from New York south to Florida and east to Texas, it and also occurs in Cuba and the Bahamas. Habitat preferences include Carolina bays, ponds, ditches, streams and creeks (Ciegler, 2003). One individual was collected from Pottawatami Twins.

Hydrovatus pustulatus (Melsheimer)

It is associated with organic debris in lotic situations (Ciegler, 2003). The Fort Sill collection is a new state record for Oklahoma.

Hygrotus acaroides (LeConte)

This species is distributed throughout the central United States from Montana and North Dakota east to Ohio south to Texas and Alabama and southern Manitoba. Additionally, a single record exists from Oregon. They may be found in vegetated pools created by slow moving streams or in muddy-bottomed ponds (Larson et al., 2000). The Fort Sill record represents a new state record for Oklahoma. One specimen was collected in mid-September from the West Range, Engineer Lake, and one individual was collected from Pottawatami Twins.

Laccophilus fasciatus terminalis Sharp

This pioneering subspecies inhabits temporary ponds, sluggish streams, and even street gutter pools throughout the Great Plains from South Dakota to Jalisco, Mexico and west through New Mexico and to southern California. This subspecies is the most common dytiscid in the southwestern United States (Zimmerman, 1970).

Laccophilus fasciatus rufus Melsheimer

This subspecies is found throughout the eastern United States from Texas to South Dakota east to Florida and north to Vermont (Ciegler, 2003). It occurs from March to December inhabiting lakes, ditches, streams, and even sewage lagoons. Zimmerman (1970) and Ciegler (2003) consider it as a pioneering species. This subspecies is sympatric with the more western form, *L. fasciatus terminalis*, supporting Larson et al. (2000) suggestion, that both forms should be recognized as valid species.

Laccophilus pictus insignis Sharp

Known from Kansas south to Texas, west to Arizona thence south to Veracruz, Mexico, this species is considered one of the most common *Laccophilus* in the central Texas Hill Country. It prefers habitats of small ponds or pools with gravelly substrates situated within oak

woodlands (Zimmerman, 1970). One specimen was collected in late June from a light trap on the West Range, North Boundary Road, 2 miles east of LETRA Gate.

Laccophilus proximus Say

This species occurs throughout the United States east of the Rocky Mountains; north to southern Ontario, Canada; south to the Yucatan and the West Indies. It is one of the first species of aquatic Coleoptera to colonize newly formed habitat and is a common inhabitant of temporary water sources (Larson et al., 2000).

Laccophilus q. quadrilineatus Horn

Distributed throughout the Great Plains from Kansas south through Texas, and the semi-arid southwest to California and into northern Mexico, this species prefers sparsely vegetated temporary ponds with muddy substrate. It has been noted as, in some seasons, one of the most common *Laccophilus* in stock ponds in the Southwest (Zimmerman, 1970).

Laccophilus p. insignis, *L. proximus*, and *L. q. quadrilineatus* were not listed as occurring in Oklahoma by the web site Checklist of the Coleoptera of Oklahoma <http://www.ento.okstate.edu/museum/beetles.html>, however, records were found in Zimmerman (1970) for all species and Larson et al. (2000) for *L. proximus* which support widespread distributions of the species throughout the state.

Liodesus flavicollis (LeConte)

Previously known in the United States from New Hampshire south to Florida and west to the Missouri, and in Canada from southern Quebec, Ontario, and Manitoba, the Fort Sill collection represents a new state record for Oklahoma (Larson et al., 2000; Whiteman and Sites 2003). These very small beetles are most commonly collected from deep, clear water pools and ponds with sandy substrates (Larson et al., 2000). Adults are usually found in algal mats. On Fort Sill, one individual was collected from Ketch Lake, West Range and eleven additional individuals were collected from West Cache Creek along the junction of South Boundary Road in late April.

Neobidessus pullus (LeConte)

This beetle is distributed from South Carolina south through Florida and west to Texas. Its primary habitat preference is lakes and it may be attracted to ultraviolet lights (Larson et al., 2000; Ciegler, 2003).

Neoporus dimidiatus (Gemminger and Harold)

This beetle is distributed throughout the Appalachian and Rocky Mountain ranges. It has been collected from beaver ponds, spring-fed pools, and around emergent vegetation (Ciegler,

2003). *Neoporus dimidiatus* is an abundant species on Fort Sill, commonly found along the edges of permanent streams.

Neoporus undulatus (Say)

This species occurs from Newfoundland south throughout the eastern United States from North Dakota and Kansas east to Maine south to Arkansas and Georgia and parts of Florida, with populations also in Washington and Oregon. It is usually found in slow moving aquatic bodies such as beaver ponds or marshy streams (Larson et al., 2000; Ciegler, 2003). Most specimens were collected in the spring at Fort Sill.

Thermonectus ornaticollis (Aube)

There is some debate over the correct name for this species. Most authors feel that this species is a subspecies of *T. nigrofasciatus*, but no formal subspecific status has been published. It is distributed from Vermont south to Florida, west to the Rocky Mountains, south to Mexico, inhabiting wooded ponds (Larson et al., 2000; Ciegler, 2003).

Thermonectus basillaris (Harris)

Occurring from New York to Florida and west to Wisconsin south through Texas, this beetle can be found in many different habitats including rivers, ponds, creeks, ditches, and associated with sewage (Ciegler, 2003).

Uvarus lacustris (Say)

Larson et al. (2000) lists this beetle's habitat as clay or mud-bottomed pools or warm water along edges of larger ponds. It is a common species distributed throughout the eastern United States from Ontario south to Florida west to South Dakota and south through Texas (Ciegler, 2003).

Uvarus texanus (Sharp)

Very little is known about this species. Only single individuals of each of the *Uvarus* species were collected during the Fort Sill survey (Appendix C). This collection represents a new state record for Oklahoma.

Gyrinidae (Whirligig Beetles)

The whirligig beetles, family Gyrinidae, can be found throughout the world, with the exception of Antarctica. Usually, these beetles inhabit shallow, heavily vegetated areas of both lotic and lentic habitats including the surface of ponds, edges of large rivers, and pools formed in fast flowing streams. Most species can be found floating on the surface of the water, however some species are known to aggregate and cling to roots or undercut banks. Adults feed

opportunistically on dead and dying arthropods, whereas larvae are predaceous on smaller arthropods (Roughley, 2001a; Ciegler, 2003). Females deposit their eggs in masses on vegetation in the spring. Larvae undergo three molts before exiting the water to pupate on land. Once on land, larvae will create pupal cocoons out of vegetation or soil substrates (Spangler, 1991a).

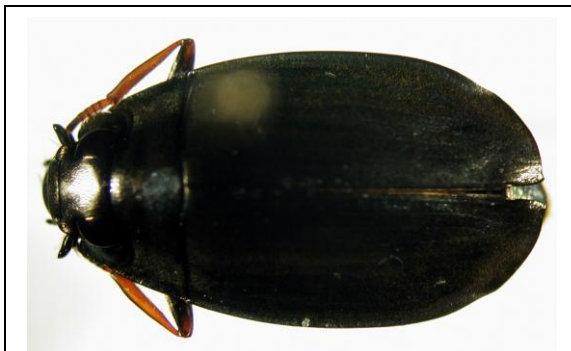


Figure 61. *Dineutus assimilis* Kirby.

This group of beetles has a unique adaptation designed for life on the water's surface. They have flattened, ovate boat-like bodies, modified swimming legs, and divided eyes to see above and below the surface of the water at the same time (Fig. 61). They swim in whirling circles when alarmed, giving rise to their common name, and are capable of producing a unique defensive secretion that smells like green apples which is believed to have anti-predatory properties (Roughley, 2001a; Ciegler, 2003).

There are 56 species of gyrenids placed into four genera in North America, with 11 species in two genera reported from Oklahoma. During the Fort Sill survey, six species in three genera or 45% were collected (Table 1, Appendix C). Two new state records are reported.

Dineutus assimilis Kirby

Widely distributed from Maine south to Florida and west to New Mexico, this beetle may be found in a wide variety of lentic and lotic environments (Hilsenhoff, 1990; Chapman, 1998). This species is the common whirligig beetle of Fort Sill, occurring in many different aquatic habitats from streams to ponds.

Dineutus ciliatus (Forsberg)

This species is distributed widely throughout the eastern United States from the Atlantic coastal states west to Kansas and Texas and is to be found in small streams and ponds in shaded areas (Ciegler, 2003).

Dineutus horni Roberts

Hilsenhoff (1990), reports this species is found in lentic habitats but it occasionally flies into streams. It is distributed from New York south to South Carolina and west to Indiana and Texas (Ciegler, 2003). On Fort Sill, this species is only known from one individual collected from Blue Beaver Creek.

Gyretes compressus LeConte

This species is distributed from Illinois south to Texas, and east to Tennessee. Adults are found almost exclusively in cool, flowing waters under the covered areas of undercut banks and root tangles. When captured, they can use abdominal segments as a means for spring-like propulsion of up to two inches in height (Wallis, 1974). Three individuals were collected on the 27 of April 2002 from the West Range, Medicine Creek at 10 Mile Crossing. The collection of this species represents a new state record for Oklahoma

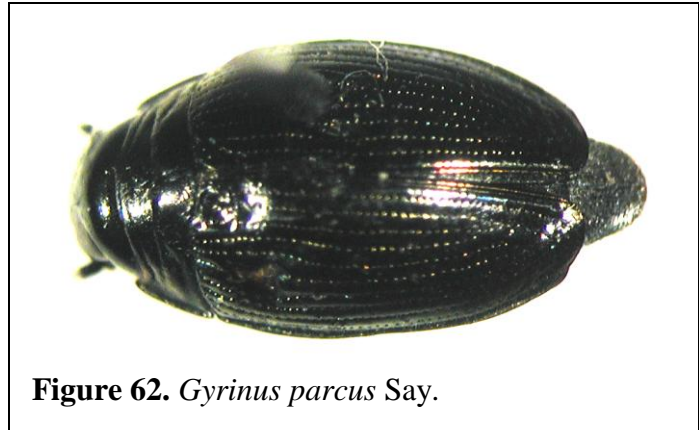


Figure 62. *Gyrimus parvus* Say.

Gyrimus parvus Say

Occurring primarily in lentic habitats, this species is distributed from North Dakota south through southern Texas, east to Illinois with a disjunct population in Florida (Oygur and Wolfe, 1991). This is the common *Gyrimus* of both streams and ponds of Fort Sill (Fig. 62).

Gyrimus woodruffi Fall

This beetle can be found from New York south through the southeastern United States, west to Texas. It is most often associated with lotic habitats but may be collected from lentic habitats (Oygur and Wolfe, 1991; Ciegler, 2003). Three individuals were collected on 5 February 2003 from the Quanah Range, West Cache Creek at the junction South Boundary Road. The Fort Sill collection represents a new state record.

Haliplidae (Crawling Water Beetles)

Crawling water beetles, family Haliplidae, are distributed nearly worldwide. Species richness tends to be high in temperate regions and decreases toward the tropics. The adults have modified legs for swimming but are poor swimmers and tend to spend much of their time crawling along substrate and vegetation (Fig. 63). Adult beetles prefer habitats of pond or lake edges, quiet streams (*Peltodytes* and *Haliphus*), wave-swept lakeshores, and vernal pools. Both adults and larvae feed on filamentous algae, however adults will also feed on insect eggs and hydrozoans, and, if starved, they will attack and consume other animal food sources. Respiration is achieved by utilizing a “physical gill” to obtain oxygen from



Figure 63. *Haliphus tortilipennis* Brigham and Sanderson.

the ambient air at the surface of the water. Adult crawling water beetles can be active year round and females lay eggs in the spring or early summer. The larvae undergo three instars before leaving the water to pupate (Hickman, 1931; Roughley, 2001b).

There are 67 species recorded from North America (Ciegler, 2003) with ten reported from Oklahoma (Table 1). Eight species were collected during this survey with three species representing new state records (Appendic C).

Haliphus deceptus Matheson

Combining the information found in Wallis (1933) and the OSU Collection web site <http://www.ento.okstate.edu/museum/beetles.html> this species is known from the southwestern United States from Oklahoma south to Texas west to Wyoming and New Mexico. Little habitat information is available. On Fort Sill, *H. deceptus* was collected from a light trap placed near Medicine Creek near the Natural Resources Building.

Haliphus fasciatus Aube

This species occurs throughout the eastern United States from Wisconsin south to Texas east to Maine and Florida. This species occurs in a variety of habitat types including slow-moving streams, creeks, ponds, lakes, and swamps. (Matta, 1976; Ceigler, 2003). One individual was collected on 13 September 2002 from the West Range, Engineer Lake. This collection is apparently a new state record.

Haliphus lewisii Crotch

Wallis (1933) reports this species from Texas and includes doubtful records from Wisconsin and Indiana. One individual was collected from a light trap placed on the East Range of Fort Sill on 28 April 2002. This collection represents a new state record.

Haliphus tortilipenis Brigham and Sanderson

This species is known from Wisconsin, South Dakota, Kansas, and Illinois, and was recently reported in Missouri by Whiteman and Sites (2003). The Fort Sill collection represents a new state record. Brigham and Sanderson (1972) report the first collections of this species from a clay-bottomed cemetery pond with heavy emergent vegetation in both the center and margins. Subsequent reports of collections were made from similar pond habitats with varying degrees of surrounding vegetation cover. One specimen was collected on the 11 of June 2003 from the flowing waters of East Cache Creek at South Boundary Road, East Range. This portion of East Cache Creek is a slow moving stretch where the substrate is a mixture of sand and silt. There is thick emergent vegetation on the sides of the creek and thick algal mats on the bottom.

Haliplus triopsis Say

This species inhabits rivers, lakes, ponds, ditches, and is known to be attracted to UV lights (Ceigler, 2003). *Haliplus triopsis* occurs throughout the United States east of the Great Plains from Manitoba east to Quebec south to Texas and Florida.

Peltodytes duodecimpunctatus (Say)

This species is found in eastern North America from Canada south to Florida west to Nebraska, and Texas. It prefers farm ponds and stream margins (Matta, 1976; Ceigler, 2003; Whiteman and Sites, 2003).

Peltodytes litoralis Matheson

Peltodytes litoralis is distributed in the Midwest from Indiana and Illinois west to Kansas and Texas (Slater, 1979). Collections have been made from ponds with varying vegetation types and stream margins (Ceigler, 2003; Whiteman and Sites, 2003).

Peltodytes sexmaculatus Roberts

This beetle is distributed in the eastern United States from Maine south to Florida west to Wisconsin and Texas to Quebec, Canada. These beetles are found in rivers, margins of ponds and lakes, streams, and ditches (Matta, 1976; Ceigler, 2003).



Figure 64. Typical hydrophilid beetle with air bubble under wing cover.

Hydrophilidae (Water Scavenger Beetles)

Hydrophilids or water scavenger beetles, family Hydrophilidae, are a large ecologically important group of aquatic beetles with several terrestrial representatives. Several species of birds and fish utilize hydrophilids as food. Water scavenger beetles inhabit a wide variety of habitats including temporary puddles, brackish water, stagnant pools, shallow lake or pond margins, and shallow vegetated stream margins. Adults feed primarily on decaying plant material and, to a lesser extent, live plants, spores, and algae, although some species are predators on small invertebrates or snails (Spangler, 1991b; Archangelsky, 1997; Van Tassell, 2001). Immatures are primarily predaceous on almost any organism they can overpower and, in captivity, will even accept hamburger

(Spangler, 1991b). Adult respiration is achieved by their rising to the surface of the water headfirst, breaking the surface film with the antennae, then forming a funnel for the air with the antennae and space between the head and prothorax (Fig. 64). The air is then directed to their

plastron bubble. Some species have been noted to have highly developed tibial setae that are thought to aid in locomotion, however some workers think that these setae serve as a means of “secretion grooming” or aeration of the plastron bubble in low oxygen environments (Smetana, 1988; Spangler, 1991b; Van Tassell, 2001).

After mating in the water, females will lay eggs either singly with a protective silk cover or in silk cases containing few to more than 100 eggs. After hatching, the larvae will undergo three instars. Duration of each instar is thought to be dependant on food availability and water temperature. Full-grown larvae leave the water and dig pupation chambers in the muddy banks or shoreline. Pupation takes place within the earthen chamber and the adult will emerge several days to weeks after entering the chamber (Smetana, 1988; Tassell, 2001).

Combining the information from <http://www.ento.okstate.edu/museum/beetles.html> and Smetana (1988), fifty-five species have been recorded from Oklahoma. Thirty-two species were collected during this survey (Appendix C) with two representing new state records.

Berosus exiguus (Say)

This beetle is distributed in the United States from New York south to Florida, west to Oklahoma and Kansas. It is often associated with algal mats in ponds and swamps, and along lake margins and heavily vegetated streams (Van Tassell, 1966; Testa and Lago, 1994).

Berosus infuscatus LeConte

This species is distributed throughout the southern United States from the Pacific Coast of California east to the Atlantic Coast of North Carolina. It has also been recorded from southern Mexico and the West Indies. It occurs in many types of lentic habitats from swamps and ponds to backwater areas and brackish waters; it is also attracted to lights at night (Van Tassell, 1966; Testa and Lago, 1994).

Berosus miles LeConte

Berosus miles occur from South Dakota south through Texas, Arizona, and Mexico. Little habitat information is available (Van Tassell, 1966).

Berosus pantherinus LeConte

This species occurs from West Virginia south to Mississippi, west to Nebraska and Texas. It inhabits a wide variety of aquatic habitats, such as swamp margins, woodland ponds, vegetated ponds, and backwaters of the Mississippi River (Van Tassell, 1966; Testa and Lago, 1994; Chapman, 1998).

Berosus peregrinus (Herbst)

This beetle is distributed throughout much of the United States. It is a common inhabitant of a wide variety of lentic habitats including temporary pools, stagnant creeks, algal mats in ponds and lakes, and some lotic habitats such as vegetated margins of slow moving streams. It is attracted to lights at night (Van Tassell, 1966; Testa and Lago, 1994; Chapman, 1998). This species is one of the most common aquatic beetles found in all types of aquatic habitats on Fort Sill.

Berosus stylifer Horn

This species is distributed in the central and western United States from Michigan south to Texas west to Montana south through Arizona (Van Tassell, 1966; Smetana, 1988). Little information on its habitat exists. On Fort Sill, only single specimens were collected from light traps on the East Range, and Quanah Range, Post Oak Creek junction at South Boundary Road and Pottawatami Twins.

Chaetarthria bicolor Sharp

This southwestern species has been recorded from California, New Mexico, Arizona, and Texas, south to Costa Rica. At the generic level, this genus is easily identified by its small size (1.1 to 2.5 mm, 0.004-0.010 inches) and a gelatinous mass held on the ventral side of the abdomen (its function is unknown), but at the species level identification is difficult.

Little biological information exists on this species, but adults this genus are known to inhabit the sandy banks of slow moving streams where they spend the day in their burrows and emerge at night. They prefer clean sand with little silt or mud (Miller, 1974).

On Fort Sill, a large series of individuals was collected with the use of a UV light trap placed along the margin of Blue Beaver Creek on the West Range on 1 July 2003. The Fort Sill collections represent a new state record for this species.

Crenitis sp.

This genus is distributed worldwide with 12 species in the United States. It is distributed in the northeastern states and has an additional population on the Pacific Coast. One species, *C. digestus* (LeConte), has been previously recorded from Oklahoma.
<http://www.ento.okstate.edu/museum/beetles.html>.

Cymbiodyta beckeri Smetana

This species is distributed throughout the Great Plains from Colorado and Kansas south to New Mexico and Texas. Little information about habitat exists for this species but generally, species in this genus can be found in both lentic and lotic habitats and are attracted to light. This

is primarily a New World genus with 23 recognized species. In the United States, species are distributed throughout the eastern states (Smetana, 1974, 1988; Testa and Lago, 1994).

Dibolocelus ovatus (Gemminger and Harold)

This species can be found in the eastern United States, from Michigan east to New York south to Florida to Florida and Texas. It prefers thick emergent vegetation in deeper ponds and lakes (Smetana, 1988). The two specimens from Fort Sill represent a new county record. One was collected on August 19, 2003 from a light trap placed by the Natural Resources Building, East Range, which is near Medicine Creek, while the other was collected from a light trap placed along side of East Cache Creek, East Range, near the junction with South Boundary Road. Archangelsky and Durand (1992) listed a record for this species from Latimer County, Oklahoma.

Enochrus cinctus (Say)

This beetle can be found throughout eastern Canada and the United States from Maine south to Florida west to Wisconsin and south to Texas. It exists in a wide variety of aquatic habitats (Smetana, 1988; Ciegler, 2003).

Enochrus hamiltoni (Horn)

This extremely common species is widely distributed throughout the United States and Canada. It inhabits a wide variety of aquatic environments (Smetana, 1988).

Enochrus ochraceus (Melsheimer)

This is a common species in the United States, and is known from Maine south to Florida and west to California. It also occurs in northern Canada, Mexico, and Central America (Testa and Lago, 1994). It has been collected every month of the year inhabiting a wide variety of aquatic habitats (Testa and Lago, 1994; Ciegler, 2003).

Enochrus pygmaeus (Say)

Enochrus pygmaeus can be found in eastern North America west to Wyoming south to Texas. It can occupy a wide variety of habitats but prefers heavily vegetated, shallow, permanent ponds (Smetana, 1988).

Enochrus sayi Gunderson

This beetle is found in the eastern United States and Ontario, Canada. It prefers well-established lentic habitats (Testa and Lago, 1994).

Epimetopus costatus complex

Four species of *Epimetopus* have been recorded from the United States. They are all southwestern in distribution from Arizona east to Texas (Rocha, 1969; Perkins, 1979; Van Tassell, 2001). Gilbert (1980) reported specimens of this species complex from Kansas. This genus has not been previously recorded from Oklahoma, and the Fort Sill represents a new state record for the genus. Six female specimens of *Epimetopus* sp. were collected from the Blue Beaver Creek drainage, West Range (Fig. 65). Males are required to determine a specific name. These specimens may represent either *E. costatus* LeConte or *E. punctipennis* Perkins.



Figure 65. West Range, Blue Beaver Creek, McKenzie Hill Road.

Helochares maculicollis Mulsant

This species can be found from Virginia south to Florida, west to Texas and Mexico. It occurs on emergent vegetation along pond and stream margins (Ciegler, 2003).

Hydrochara leechi Smetana

These beetles are distributed in the United States east of the Rocky Mountains, excluding the southeastern states. It also occurs from North Dakota south to Texas, New Mexico and Mexico, northeast to Pennsylvania. No habitat information is available (Smetana, 1980).

Hydrochara occulta (d'Orchymont)

This species is distributed from Massachusetts south to Florida, west to Oklahoma and Texas (Smetana, 1980; Ciegler, 2003). This species can occur in a variety of habitats.

Hydrochara soror Smetana

Beetles can be found in a wide variety of habitats including ditches, stream and lake margins, and salt marshes in the eastern United States from Connecticut south to Florida west to Kansas, and Texas (Smetana, 1980; Ciegler, 2003).

Hydrochara spangleri Smetana

This species can be found in the central and southeastern United States from Nebraska south to Texas along the Gulf Coast to Florida and the states surrounding the Great Lakes. Little habitat information exists. It is known to be attracted to light traps (Smetana, 1980).

Hydrochus sp.

Twenty-six species have been reported from the Nearctic Region and are extremely difficult to separate without examining male genitalia. Only one specimen was collected in March from Blue Beaver Creek, West Range. Only one recorded species of *Hydrochus* is known from Oklahoma, *H. undulatus* Hellman <http://www.ento.okstate.edu/museum/beetles.html>.

Hydrophilus triangularis Say

This large, common species is found throughout Canada and the United States, and prefers large, deep ponds (Ciegler, 2003).

Laccobius minutoides Orchymont

This species is found in Canada including, New Brunswick, Ontario, and Quebec. It is also found in the eastern United States from Maine south to South Carolina, west to Texas. The adults are found in small streams with fine sand (Cheary, 1971; Ciegler, 2003). One specimen was collected from Rock Creek, Quanah Range--a sandy bottomed, and intermittent stream.

Laccobius teneralis Cheary

This beetle is found in southern Ontario, Canada, and the United States in Texas, Oklahoma, Missouri, Kansas, and Nebraska (Cheary, 1971; Smetana, 1988).

Paracymus confusus Woolridge.

This Nearctic genus contains 15 recognized species spread among 6 distinct species groups. The species are difficult to identify. *Paracymus confusus* has been recorded from British Columbia, and throughout the United States south to Mexico. Generally they are very small beetles and may pass through coarse net mesh sizes or will remain motionless in the sample making collecting difficult. These beetles are usually collected from decaying vegetation or living plants (Testa and Lago, 1994; Van Tassell, 2001). The Fort Sill specimens represent a new state record for Oklahoma.

Tropisternus blatchleyi Orchymont

Tropisternus blatchleyi is located in the eastern United States from Iowa south to Texas, east to New Jersey, and south to Florida. It occurs in a wide variety of habitats including ponds, lakes, flowing water, and beach drift (Spangler, 1960; Ciegler, 2003).

Tropisternus collaris (Fabricius)

This species is located in the eastern United States from Kansas south to Texas, east to Virginia, and south to Florida. It can be found in a wide variety of habitats such as, ponds, lakes, flowing water, and beach drift (Ciegler, 2003). This species of water scavenger beetle is abundant in most aquatic habitats of the Fort.

Tropisternus ellipticus (LeConte)

Tropisternus ellipticus is distributed from Washington east to Iowa, south through Texas to Panama (Spangler, 1960).

Tropisternus lateralis nimbatus (Say)

This common Fort Sill hydrophilid is found in the United States east of the Rocky Mountains and southern Canada; Mexico south through Panama and the West Indies. It can be found in lentic and lotic brackish and fresh habitats, carrion, and sewage (Spangler, 1960; Smetana, 1988; Ciegler, 2003).

Tropisternus natator d'Orchymont

Distributed throughout the eastern United States from Maine to Georgia west to South Dakota and Texas; and Quebec, Canada, this species can be found in a wide variety of habitats such as, ponds, lakes, flowing water, and beach drifts (Spangler, 1960; Ciegler, 2003)

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Spongilla-flies (Neuroptera: Sisyridae)

The order Neuroptera, an order known for lacewings, antlions, and owlflies, includes only one strictly aquatic family, the Sisyridae. The larvae are well-known parasites of freshwater sponges (Parfin and Gurney, 1956). Females deposit eggs into a crevice or depression on objects that overhang the water. Hatching occurs in about a week, and the first instar larvae drop to the surface of the water, penetrate the surface film and seek out a sponge host. The larvae insert their elongate style-like mouthparts into sponges to feed. There are three instars. Upon completion of development, larvae migrate out of the water to seek a site to spin a silken cocoon. Brown (1952) studied the life cycle of *Climacia areolaris* (Hagen).

Two genera and species of spongilla-flies were previously known from Oklahoma, *Sisyra vicaria* (Walker) and *C. areolaris*. Both species are rather widespread over North America (Parfin and Gurney, 1956), and both were collected from Fort Sill (Appendix C). However, the collection of *C. chapini* Parfin and Gurney adults at the end of September from Medicine Creek represents a new state record. This spongilla fly is considered rare, known previously only from Texas, New Mexico, and Mexico (Parfin and Gurney, 1956; Flint, 1998).

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Dobsonflies and Fishflies (Neuroptera: Megaloptera: Corydalidae)

The subfamily Chauliodinae includes three eastern genera of fishflies: *Chauliodes*, *Neohermes*, and *Nigrionia*. During this survey, only one species of *Chauliodes* was collected. This genus includes two species found in standing water (lentic). The larvae are found clinging to logs in marshes, lakes, ponds,



Figure 66. *Chauliodes rastricornis* (Rambur).



Figure 67. A male dobsonfly, *Corydalus cornutus* (Linnaeus)

swamps, and oxbows of streams. Only *C. rastricornis* (Rambur) (Fig. 66) is known from Oklahoma (Tarter et al., 1976; Arnold and Drew, 1987). Larvae of this species are common in ponds, lakes, and backwater areas of Fort Sill (Appendix C).

The Corydalinae contain some of the largest insects in the world, with wing span exceeding 15 cm (5.9 inches). One species, *Corydalus cornutus* (Linnaeus) (Fig. 67) is the common eastern North American species (Contreras-Ramos, 1998), occurring in the permanent streams of Fort Sill, Medicine Creek

and East Cache Creek. This remarkable insect is known as the Eastern Dobsonfly and the larva is known as the Hellgrammite (Fig. 68). Adult males with their long sickle-like mandibles (Fig. 67) catch the attention of even the casual observer of nature.

Adults of *C. cornutus* are nocturnal. From June to mid-July, females lay characteristic round white egg masses on overhanging leaves, tree trunks, or other surfaces over streams, including bridges that are not exposed to direct sunlight (Fig. 69). These masses are conspicuous on leaves of overhanging vegetation along Medicine Creek. After hatching, larvae drop into the water and are predators of various aquatic invertebrates, especially hydropsychid caddisflies and black flies (Stewart et al., 1973). After a year or more, larvae leave the stream and build pupation chambers under rocks or logs near stream margins (Bowles 1990). Adults hatch after a few weeks and have a short life span (Brown and Fitzpatrick, 1978).



Figure 68. Larval dobsonfly or Hellgrammite



Figure 69. *Corydalus cornutus* (Linnaeus) eggs on vegetation.

Sialidae (Alderflies)

The Sialidae or alderflies are represented in North America by 24 species (Ross, 1937, Arnold and Drew, 1987; Whiting, 1991a; Whiting, 1991b). Whiting (1991a) summarized the distribution of *Sialis* in North America, recording five species from Oklahoma. Two species or 40% were collected from Fort Sill, both being species associated with standing water habitats. Adults are easily recognized by their dark coloration and wings held roof-like over their bodies (Fig. 70).

Sialis mate on the leaves, stems, or twigs of riparian vegetation. Eggs are usually laid about 1-2 m above the water surface on leaves or stems such that the newly hatched larvae can fall directly into the water. Larvae are generally considered predators, but apparently much detritus is ingested as well. The life cycle of *Sialis* generally spans one year.

Sialis itasca Ross

Sialis itasca is a species known from eastern Canada into the Southeast, west to Kansas, and Texas, including Oklahoma. Arnold and Drew (1987) and Whiting (1991a) recorded this species from Murray, Noble, Pawnee, and Payne counties. This species is associated with lakes and ponds.

Sialis mohri Ross

Sialis mohri is a common and widespread species of eastern and central North America (Whiting, 1991a). Oklahoma records are available from Pawnee, Payne, Pittsburg, and Tulsa

counties. The eggs of this species are laid upright on twigs. The larvae are found in large lakes and impoundments. This species was especially abundant at Lake Elmer Thomas.



Figure 70. A typical alderfly, *Sialis*.

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Trichoptera (Caddisflies)

Most Trichoptera (caddisflies) are restricted to cool lotic habitats; all North American families have representatives in cool running waters. However, the order is also well represented in warm streams and lakes of the world, with close to 10,000 described species known worldwide (Wiggins, 1996). Caddisfly larvae collectively occupy a diverse array of habitats and feeding types (Wiggins 2004). Wiggins and MacKay (1978) attribute this high ecological diversity to niche segregation made possible by silk production by the larvae. The use of silk by caddisfly larvae has significantly enhanced their biological diversity, making cases, retreats, and capture nets, and ability to partition habitats (Wiggins and Mackay, 1978). The ecological role of caddisflies is immense, because they transfer energy and nutrients through trophic levels in freshwater habitats. For example, different mesh sizes (Fig. 71) of net-spinning species enable segregation of food resources between closely related forms.

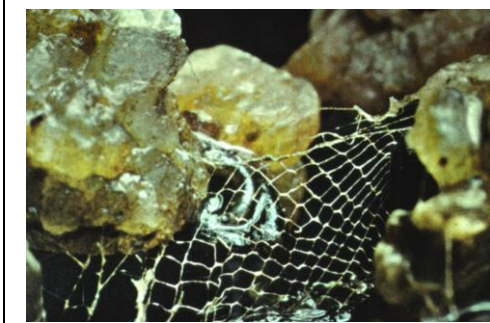


Figure 71. Capture net of hydropsychid caddisfly larvae.

A checklist of the North American species is available (Morse 1993), and a world checklist is available using J. C. Morse's web site

<http://entweb.clemson.edu/database/trichopt/>

Approximately 1,360 species of caddisflies are known from North America. Bowles and Mathis (1992) reported 145 caddisflies from Oklahoma and Moulton and Stewart (1996) listed 146, both treatments emphasized the more mountainous eastern portion of the state. Vaughn and Obermeyer (2002) previously reported 34 species from Fort Sill. In this survey we report 59 species of caddisflies from Fort Sill (Appendix C) including four new state records for Oklahoma: *Oxyethira janella* Denning, *O. forcipata* Mosely, *Trienodes helo* Milne, and *Ylodes frontalis* (Banks). The greatest diversity was in the families that are case makers or net spinners as immatures, Leptoceridae [Longhorned Case Makers](18 species), Hydroptilidae [Purse Case Makers](15 species), and Hydropsychidae [Common Netspinners](12 species). These three families comprised 76 % of the caddisfly fauna of the Fort.



Figure 72. East Range, East Cache Creek, South Boundary Road.

The Leptoceridae is a large family of case makers, with more than 100 species known from North America. Both adults and larvae are characterized by long antenna. Larvae are common in warmer streams and lakes, and genera such as *Leptocerus*, *Triaenodes* and *Ylodes* are found among aquatic plants in lakes.

The microcaddisflies or Hydroptilidae are the smallest of the Trichoptera, with most adults 2-3 mm (0.08-0.1 inches) in length. This family is a large and diverse group, with more than 225 species occurring in North America. Larvae can be found in all types of water. Larvae make “purse cases” as a last or fifth instar. The first four instars are free living without a case. Larvae generally feed on the cellular content of algae.

The Hydropsychidae, or net spinning caddisflies are one of the dominant groups of aquatic insects in running water throughout the world. The larvae are considered important ecological components of streams because of their great abundance and biomass. The most common caddisflies found on Fort Sill are species of this family, in the genera *Cheumatopsyche* and *Hydropsyche* (Appendix C). These species were abundant in both East Cache Creek (Fig. 72) and Medicine Creek (Figs. 73, 74).

Brief distributional information is presented for the three new state records. *Triaenodes helo* Milne was originally described from North Carolina and has been reported from Alabama and Florida (Harris et al., 1991; Glover, 1996). The Fort Sill specimens represent a significant range extension. This species is very close to *T. pernus* Ross, previously recorded from Oklahoma by Bowles and Mathis (1992). Larvae of *Triaenodes* are usually associated with aquatic plants; the case is spiraled and made from longitudinal pieces of aquatic plants. Most specimens of *T. helo* were collected at the Natural Resources building of Fort Sill (Appendix C), presumably originating from small impoundments of Medicine



Figure 73. West Range, Medicine Creek, 10-mile Crossing.



Figure 74. West Range, Medicine Creek, near Natural Resource Building.

Creek. *Ylodes frontalis* (Banks) is a widespread species, known from Alaska south to Colorado, and records are known from Michigan. Larvae are associated with aquatic plants in ponds and lakes. Three specimens were collected from the East Range of Fort Sill (Appendix C).

The almost cosmopolitan genus *Oxyethira* are found in both streams and lakes. Green alga is the preferred food for the larvae. *Oxyethira forcipata* Mosely is a species known from Eastern Canada south to Georgia west to Michigan, south to Arkansas and now Oklahoma. Specimens of this species were collected from Medicine Creek and Ketch Lake (Appendix C).

Twenty-seven species are considered endemics (Allen, 1990; Moulton and Stewart, 1996) of the total number of 229 caddisfly species known from Interior Highlands of North America, which includes the Ozark, Ouachita, Arbuckle, and Wichita mountains of Missouri, Arkansas, and Oklahoma. However, none of these endemic species are known from the Wichita Mountains, a continuation of this area is included in the western edge of Fort Sill. Moulton and Stewart (1990) reported six species from these mountains, *Helicopsyche borealis* (Hagen), *Paranyctiophylax affinis* (Banks), *Oecetis cinerascens* (Hagen), *O. nocturna* Ross, *Triaenodes injustus* (Hagen), and *T. tardus* Milne.

Remarkably, the streams, reservoirs, and lakes of Fort Sill support 40 % of the total caddisflies known from of Oklahoma. Several species such as *Leptocerus americanus* (Banks), *Triaenodes marginatus* (Sibley), *Orthotrichia cristata* Morton, *O. janella* and *Chimarra angustipennis* (Banks) are considered rare species of this region.

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Lepidoptera (Tortricidae and Geometridae)

Moths of two families, Tortricidae and Geometridae, were sampled at Fort Sill, primarily in 2003. Trap numbers, trap locations, GPS'ed coordinates, and range are given in methods section. Unless stated otherwise collection dates were in 2003.

The taxonomic sources for the moth's names used were Hodges (1983) for Tortricidae and Scoble (1999) for the Geometridae (see references for complete citations).

Tortricidae (Leaf-rollers, tortricids)

This is the third largest family of North American moths with about 1160 described species known for North America. There is no published list for the family in Oklahoma, but the list for Texas (Knudson and Bordelon, 1999) includes 368 species for that state. A very rough and somewhat arbitrary estimate for Oklahoma would be about 40% of Texas' total or about 150 species of Tortricidae. In our survey, we found 50 species of identifiable taxa of the family, roughly a third of the total expected for the state. A thorough survey of this family would involve not only intensive light collecting, but also crepuscular netting of adults, collection and rearing of larvae, as well as trapping with pheromones. Since there is no state list for this family and faunal treatments and compendia are rare, we were not able to state which species might be new state records.

Tortricid adults are small to medium-sized moths, many of which have a characteristic bell-like outline when perched. Despite the commonality in general size and wing shape, the adults and larvae have a wide range of life history adaptations and behaviors (Powell, 2003). The adults are perhaps equally divided between those with nocturnal flight and those that fly at dusk. In addition, a small number of species have diurnal flight.

The caterpillars of many species cause significant damage to forests, orchards, shade trees, and cultivated crops are often referred to as leaf-rollers as a group, because many feed in rolled leaf shelters. Despite the common name, the larvae of many species have other than leaf-feeding habits. The larvae of many species, especially in the Eucosmini, bore in roots and stems

of perennial plants or feed within galls. Other species have larvae that feed within fruiting structures. The larvae of most species feed solitarily, yet quite a number of species form communal webs within which a large number of larvae may feed.

Subfamily Olethreutinae

Tribe Olethreutini

?*Episimus* species

Caterpillars of *Episimus argutanus* (Clemens) live in rolled leaf shelters on several kinds of broad-leaved shrubs and small trees (Miller, 1987). **Collection data**//West Range: Medicine Bluff--Trap M-2, July 18, 2003

Eumaroza malachitana (Zeller, 1875)

Host plants are various broad-leaved trees and occasional herbaceous plants (Miller, 1987; Robinson et al., 2002). **Collection data**//West Range: Ketch Lake—Trap W-5, April 27, 2003.

Tribe Eucosmini

Chimoptesis gerulae (Heinrich, 1923)

No range or biological information is available for this moth. **Collection data**//West Range: Natural Resource Building woods--Trap M-1, March 31, 2003(25); Medicine Bluff--Trap M-2, March 31, 2003 (14); Ketch Lake--Trap W-5, April 27, 2003.

Chimoptesis pennsylvaniana (Kearfott, 1907)

Caterpillars feed on leaves of oaks (*Quercus*). There is but a single early spring flight (Wagner et al., 1995; this report). **Collection data**//West Range: Natural Resource Building woods--Trap M-1, March 31, 2003 (10); Medicine Bluff--Trap M-2, March 31, 2003 (1).

Epiblema boxcana (Kearfott, 1907)

The moth is distributed in the eastern U.S. from the central Atlantic coast west to Illinois and Texas (Heinrich, 1923). Larvae of *Epiblema* often form and feed inside galls on the stems of composites (family Asteraceae). Two broods are indicated on Fort Sill. **Collection data**//West Range: 10-Mile Crossing--Trap W-2, April 27, 2003, August 17, 2003; Lower Rabbit--Trap W-1, July 18, 2003.

Epiblema desertana (Zeller, 1875)

This moth is found from New York south to Florida and west to Kansas and Texas (Heinrich, 1923). Larvae feed mainly in stems of goldenrods (*Solidago* species) (Miller, 1987). **Collection data/** West Range: Medicine Bluff--Trap M-2, April 28, 2003 (3).

Epiblema strenuana (Walker, 1863)

This moth is distributed from coast to coast in the United States (Heinrich, 1923). Larvae bore into the stems and branches of *Chenopodium*, *Xanthium*, and *Ambrosia* (Miller, 1987). **Collection data//**East Range: Broomweed Pond--Trap E1, August 17, 2003. West Range: Lower Rabbit--Trap W-1, April 28, 2003; 10-Mile Crossing--Trap W-2, July 16, 2003, Upper LETRA--Trap W-4, April 27, 2003, Ketch Lake--Trap W-5, April 27, 2003.

Epiblema tripartitana (Zeller, 1875)

This moth ranges from Florida west to Oklahoma and Texas (Heinrich, 1923; this report). Larvae feed in flower heads and stems of *Rudbeckia* (Asteraceae) (Miller, 1987). **Collection data//**West Range: 10-Mile Crossing--Trap W-2, April 27, 2003; Ketch Lake--Trap W-5, April 27, 2003.

Epiblema scudderiana (Clemens, 1860)

The species ranges from Ontario and Massachusetts south to North Carolina and then west to Oklahoma and Manitoba (Heinrich, 1923; this report). Larvae feed mainly in stems of goldenrods (*Solidago* species) (Miller, 1987). **Collection data//** West Range: Medicine Bluff--Trap M-2, June 26, 2003 (2); Upper LETRA--Trap W-4, April 27, 2003, Ketch Lake--Trap W-5, April 27, 2003 (2).

Eucosma comatulana (Zeller, 1875)

This moth ranges from Iowa and Texas south to western Mexico and west to California and Utah (Heinrich, 1923). **Collection data//**East Range: Broomweed Pond--Trap E1, August 17, 2003(2); West Range: Medicine Bluff--Trap M-2, July 18, 2003 (3); near Lower Rabbit--Trap W-1, July 18, 2003(2); 10-Mile Crossing--Trap W-2, July 16, 2003; Ketch Lake--Trap W-5, April 27, 2003 (4).

Eucosma gilletteana Dyar, 1903

This species ranges from Oklahoma and Texas west to Arizona and Utah (Heinrich, 1923; this report). **Collection data//** West Range: Medicine Bluff--Trap M-2, April 28, 2003.

Eucosma matutina (Grote, 1873)

This moth occurs in Oklahoma and Texas (Heinrich, 1923; this report). Adults fly from June to August (Miller, 1987). There is likely a single brood on Fort Sill. **Collection data**//East Range: East Cache Creek--Trap E3, June 24, 2003; West Range: 10-Mile Crossing--Trap W-2, June 25, 2003, Upper LETRA--Trap W-4, May 27, 2003; Ketch Lake--Trap W-5, July 16, 2003.

Eucosma palabundana Heinrich, 1923

This species is found in Manitoba, Indiana, and Oklahoma (Heinrich, 1923; this report). Adults fly from June-August (Miller, 1987; this report), and there is like just a single brood. **Collection data**//East Range: East Cache Creek--Trap E3, June 24, 2003.

Eucosma pulveratana (Walsingham, 1884)

Heinrich (1923) reported this moth from California and Mexico City, Mexico. The record from Fort Sill seems to be a distributional extension. **Collection data**//West Range: Lower Rabbit--Trap W-1, April 28, 2003.

Eucosma ridingsana (Robinson, 1869)

The species occurs from Manitoba and Illinois west to the Pacific Coast (Heinrich, 1923). Larvae feed in roots of *Gutierrezia* and other woody composites (Miller, 1987; unpublished), despite seemingly erroneous reports to the contrary (Robinson et al., 2002). The adults have a single flight in mid- to late summer (Miller, 1987; CSU collection; this report). **Collection data**//East Range: Broomweed Pond—Trap E-1, Sept. 26, 2003 (2). West Range: Ketch Lake--W-5, September 27, 2003.

Eucosma species, *E. ridingsana* complex

No range or biological information is available for this moth. **Collection data**//East Range: 1 mile northeast of Menoher Hill—Trap E-2, September 26, 2003

Eucosma robinsonana (Grote, 1872)

This moth ranges from New Jersey south to Florida and then west to Oklahoma and Colorado (Heinrich, 1923; CSU collection; this report). Adults fly from late April to August (Miller, 1987; this report) and there would seem to be two broods at Fort Sill. **Collection data**//East Range: 1 mile northeast of Menoher Hill—Trap E-2, July 17, 2003. West Range: 10-Mile Crossing—Trap W-2, July 16, 2003, Upper LETRA—Trap W-4, April 27, 2003, July 16, 2003; Blue Beaver Creek near junction North Boundary Road and Blue Beaver Valley Road, May 28, 2004 (Kondratieff and Schmidt).

Eucosma sombreana Kearfott, 1905 species group

The species occurs from Connecticut south to North Carolina and west to Manitoba and Oklahoma (Heinrich, 1923; this report). Caterpillars feed in sunflower (*Helianthus* species) rootstalks (Miller, 1987). Adults have been captured from June to August and there seems to be but a single brood. **Collection data**//East Range: East Cache Creek--Trap E-3, July 17, 2003.

Eucosma similar to *vagana* McDunnough, 1925

The larvae of *Eucosma vagana* feed in the roots of sunflowers (*Helianthus* species) according to Miller, 1987). The adults fly from June to August and there seems to be but a single brood. **Collection data**//East Range: Broomweed Pond—Trap E-1, August 17, 2003.

Eucosma similar to *watertonana* McDunnough, 1925

No range or biological information is available for this moth. **Collection data**//East Range: East Cache Creek--Trap E-3, June 24, 2003.

Gretchena ?amatana Heinrich, 1923

Heinrich (1923) reported this moth from Massachusetts south to New Jersey and Pennsylvania. This record from Oklahoma would be far outside of its recorded range. Adults have been captured from late April to August and two broods are possible (Miller, 1987; this report). **Collection data**//West Range: Ketch Lake--Trap W-5, April 27, 2003,

Hystriophora vestaliana (Zeller, 1875)

The moth is recorded from Iowa south to Florida and west to Wyoming and Colorado (Heinrich, 1923). Adults may be captured from April to August (Miller, 1987; CSU collection; this report) and two broods are indicated. **Collection data**//East Range: Broomweed Pond--Trap E-1, May 26, 2003; West Range: 10-Mile Crossing--Trap W-2, April 27, 2003 (3), Ketch Lake--Trap W-5, April 27, 2003, June 25, 2003.

Pelochrista scintillana (Clemens, 1865)

The moth is recorded from Iowa south to Virginia and west to Manitoba, South Dakota, and Texas (Heinrich, 1923). Caterpillars feed on sunflowers (*Helianthus* species) according to Miller, 1987, and many other authors. Adults may be captured from late April to August and two broods are possible (Miller, 1987). **Collection data**//East Range: East Cache Creek--Trap E-3, April 26, 2003 (2); East Cache Creek, Boundary Road, May 30, 2004 (Kondratieff and Schmidt). West Range: Medicine Bluff--Trap M-2, June 26, 2003 (2); Ketch Lake--Trap W-5, April 27, 2003 (2). Quannah Range: West Cache Creek at Wichita Mts. Nat. Wildlife Refuge boundary, May 29, 2004 (Kondratieff and Schmidt).

Pelochrista zomonana (Kearfott, 1907)

This moth ranges from Pennsylvania south to Missouri and west to Missouri and Oklahoma (Heinrich, 1923; this report). Caterpillars feed in *Chrysanthemum* roots and stems (Miller, 1987). Adults have been captured from June to September (Miller, 1987) and there may be two broods. **Collection data**//East Range: 1 mile northeast of Menoher Hill—Trap E-2, August 17, 2003. West Range: Lower Rabbit--Trap W-1, August 19, 2003(2).

Phaneta delphinoides (Heinrich, 1923)

This moth is known from Oklahoma, Utah, and Colorado (Heinrich, 1923; this report). **Collection data**//East Range: East Cache Creek--Trap E3, April 26, 2003. West Range: Medicine Bluff--Trap M-2, April 28, 2003(3); Lower Rabbit--Trap W-1, April 28, 2003; Ketch Lake--Trap W-5, April 27, 2003(3).

Phaneta kiscana? (Kearfott, 1907)

The species range is New Jersey south to Virginia and west to Ohio and Oklahoma (Heinrich, 1923; this report). **Collection data**// West Range: Medicine Bluff--Trap M-2, April 28, 2003.

Phaneta pallidicostana? (Walsingham, 1879)

The species is known from Manitoba and California and now from Oklahoma (Heinrich, 1923; this report). **Collection data**// West Range: Medicine Bluff--Trap M-2, April 28, 2003.

Phaneta near *varecundana* Blanchard

No range or biological information is available for this moth. **Collection data**//West Range: Upper LETRA--Trap W-4, April 27, 2003,

Phaneta unidentified species

No range or biological information is available for this moth. **Collection data**// West Range: Medicine Bluff--Trap M-2, June 26, 2003.

Tribe Laspeyresiini

Ofatulena duodecimstriata (Walsingham, 1884)

The species' range is from Oklahoma and Texas west to Nevada and California (Heinrich, 1926; this report). The caterpillars feed in seeds and pods of mesquite (*Prosopis*) according to Robinson et al. (2002). **Collection data**// West Range: Medicine Bluff--Trap M-2, July 18, 2003; Lower Rabbit--Trap W-1, July 18, 2003(2); Ketch Lake--Trap W-5, July 16, 2003.

Cydia caryana (Fitch, 1856)

The moth is distributed from New Jersey south to Florida west to Oklahoma and Texas (Heinrich, 1926; this report). Caterpillars feed in husks and fruits of hickories (*Carya* species) (Miller, 1987). Adults have been collected from late April to September (Miller, 1987; this report); but may have but a single protracted emergence period. **Collection data**// West Range: Medicine Bluff--Trap M-2, April 28, 2003, September 28, 2003(2).

Cydia latiferreanus (Walsingham, 1879) [Filbert Worm]

The moths have been found from Connecticut south to North Carolina and thence west to the Pacific coast (Heinrich, 1926). Larvae bore into and feed inside acorns (Miller, 1987; many other authors). The adults have been collected from May to October and have several broods (Miller, 1987). -- **Collection data**//East Range: Broomweed Pond--Trap E1, August 17, 2003. West Range: Upper LETRA--Trap W-4, August 18, 2003 (3), September 27, 2003.

Subfamily Tortricinae

Tribe Tortricini

Acleris semipurpurana (Kearfott, 1905) [Oak Leaf-tier Moth]

The moth ranges over most of temperate eastern North America (Covell, 1984). The caterpillars feed on oak leaves and fly from April to July in a single flight (Covell, 1984). **Collection data**//West Range: Lower Rabbit--Trap W-1, April 28, 2003; 10-Mile Crossing--Trap W-2, May 27, 2003.

Tribe Archipini

Archips argyrospila (Walker, 1863) [Fruit-tree Leafroller Moth]

This sometimes-destructive moth is common over much of temperate North America (Covell, 1984; many other authors). The caterpillars feed on the leaves of many trees, shrubs, and even herbaceous perennials (Covell, 1984). Adults fly from late April to August depending on location and may have but a single brood in any one locality (Covell, 1984; this report). **Collection data**// West Range: Medicine Bluff--Trap M-2, April 28, 2003 (5); 10-Mile Crossing--Trap W-2, April 27, 2003.

Archips rileyana (Grote, 1868)

The caterpillars feed on a wide variety of broad-leaved trees and shrubs (Robinson et al., 2002). **Collection data**//East Range: East Cache Creek--Trap E-3, May 26, 2003.

Choristoneura rosaceana (Harris, 1841) [Oblique-banded Leafroller Moth]

This common moth is found over much of temperate North America (Covell, 1984; other authors). The caterpillars feed on a wide variety of woody plants, primarily broad-leaved (Covell, 1984; Robinson et al. 2002). Flight is from late April to October and there are two broods in most localities (Covell, 1984). **Collection data**//East Range: 1 mile northeast of Menoher Hill--Trap E-2, July 17, 2003; East Cache Creek—Trap E-3, June 24, 2003. West Range: 10-Mile Crossing--Trap W-2, July 16, 2003.

Clepsis virescana (Clemens, 1865)

This common moth ranges over much of temperate North America, but not the more southern austral regions (Powell, 1964). There are apparently two or more broods on Fort Sill. The caterpillars likely feed on rosaceous plants and possibly other woody plants as well (Powell, 1964). **Collection data**//East Range: East Cache Creek--Trap E3, April 26, 2003 (2); West Range: Medicine Bluff--Trap M-2, September 28, 2003; Upper LETRA--Trap W-4, April 27, 2003 (4); Ketch Lake--Trap W-5, April 27, 2003

Tribe Sparganothidini

Platynota labiosana (Zeller, 1875)

The caterpillars feed on a variety of herbaceous perennials (Robinson et al., 2002). **Collection data**// West Range: Medicine Bluff--Trap M-2, April 28, 2003; 10-Mile Crossing--Trap W-2, April 27, 2003; Ketch Lake--Trap W-5, July 16, 2003.

Platynota nigrocervinana Walsingham, 1895

The caterpillars feed on a wide variety of broad-leaved herbaceous and vine-like perennials, and reputedly, corn (Robinson et al. 2002). **Collection data**//East Range: Broomweed Pond--Trap E1, August 17, 2003; 1 mile northeast of Menoher Hill--Trap E-2, July 17, 2003; East Cache Creek--Trap E3, June 24, 2003 (2). West Range: Lower Rabbit--Trap W-1, April 28, 2003; Ketch Lake--Trap W-5, July 16, 2003.

Sparganothis belfrageana (Zeller, 1875)

No range or biological information is available for this moth. **Collection data**//West Range: 10-Mile Crossing--Trap W-2, July 16, 2003; Upper LETRA--Trap W-4, July 16, 2003; Ketch Lake--Trap W-5, April 27, 2003, June 25, 2003.

Sparganothis caryae (Robinson, 1869)

The caterpillars feed on a variety of trees and shrubs (Robinson, 2002). **Collection data**//West Range: Natural Resources Building woods--Trap M-1, May 28, 2003.

Sparganothis diluticostana (Walsingham, 1879)

The caterpillars feed on a variety of broad-leaved trees and shrubs (Robinson et al., 2002). **Collection data**//West Range: Ketch Lake--Trap W-5, July 16, 2003.

Sparganothis directana (Walker, 1863)

The caterpillars feed on a variety of conifers and broad-leaved trees and shrubs (Robinson et al., 2002). **Collection data**// West Range: Medicine Bluff--Trap M-2, June 26, 2003; 10-Mile Crossing--Trap W-2, July 16, 2003.

Sparganothis possibly *pettitana* (Robinson, 1869)

This species occurs in much of eastern North America and west across Canada (Covell, 1984). The caterpillars feed on leaves of a wide array of broad-leaved deciduous trees (Covell, 1984; Robinson et al., 2002). Adults occur from May to August, with possibly a single extended flight (Covell, 1984; this report). **Collection data**//West Range: Lower Rabbit--Trap W-1, August 19, 2003

Sparganothis sulfurena (Clemens, 1860) [*Sparganothis* Fruitworm Moth]

This moth is common throughout most of temperate eastern North America (Covell, 1984; other authors). The caterpillars, sometimes a pest of cranberries, feed on an extremely wide variety of native and cultivated plants, including both angiosperms and conifers (Covell, 1984; Robinson, 2002). The moths fly from late April to October and two broods are indicated (Covell, 1984; this report). **Collection data**//East Range: East Cache Creek--Trap E3, July 17, 2003; West Range: Medicine Bluff--Trap M-2, April 28, 2003, September 28, 2003; Lower Rabbit--Trap W-1, April 28, 2003; 10-Mile Crossing--Trap W-2, July 16, 2003; Upper LETRA--Trap W-4, April 27, 2003, July 16, 2003 (3); Ketch Lake--Trap W-5, April 27, 2003(3).

Sparganothoides lentiginosana (Walsingham, 1879)

No range or biological information is available for this moth. **Collection data**//East Range: 1 mile northeast of Menoher Hill--Trap E-2, July 17, 2003;

Subfamily Cochylinae

Unidentified genus and species

No range or biological information is available for this moth. **Collection data**// West Range: Medicine Bluff--Trap M-2, April 28, 2003.

Aethes argentiimitana (Robinson, 1869)

No range or biological information is available for this moth. **Collection data**//West
Range: Upper LETRA--Trap W-4, April 27, 2003

Aethes seriatana (Zeller, 1875)

No range or biological information is available for this moth. **Collection data**// West
Range: Medicine Bluff--Trap M-2, April 28, 2003, June 26, 2003; 10-Mile Crossing--Trap W-2,
July 16, 2003; Upper LETRA--Trap W-4, April 27, 2003; Ketch Lake--Trap W-5, April 27,
2003.

“*Carolella*” *bimaculana* (Robinson, 1869)

No range or biological information is available for this moth. **Collection data**//East
Range: Broomweed Pond--Trap E1, August 17, 2003.

Geometridae (Measuringworms, Loopers, Geometers)

This is the secondmost species-rich Lepidoptera family in North America with 1390 species. Not only is there not a published state list of Oklahoma Geometridae, there has been no published report of the geometrid fauna of any single locality or area. There is both a state list for Texas as well as reports from a number of localities, parks, and regions (Knudson and Bordelon, 1999). The Texas list enumerates about 460 species for that state, and a rough estimate for all of Oklahoma would be about 40% of the Texas list or 180 species. Our light trapping survey at Fort Sill produced 81 identifiable geometrid species, roughly 45% of the projected species-richness for Oklahoma. Since there is no state list for Geometridae, it is difficult to state which of the species we found at Fort Sill might be new state records. For species that seem to be new northern or western range extensions, we are somewhat confident in detections of state records. The geometrids that seem to new for Oklahoma include *Eupithecia jejuna* McDunnough, *Eupithecia swettii* Grossbeck, *Eupithecia tenuata* (Hulst), *Anavitrinella atristrigaria* (Barnes and McDunnough), *Eusarca packardaria* (McDunnough), *Eusarca subflavaria* (Pearsall), *Exelis pyrolaria* Guenée, *Iridopsis perfectaria* (McDunnough), *Melanolophia signataria* (Walker), *Pimaphera sparsaria* (Walker), *Probole amicaria* (Herrich-Schäffer), and “*Semiothisa*” *cyda* (Druce).

Geometrid adults range from very small to quite large in size. Moreover, their wing shapes, postures, and colors are all quite variable, although the adults of most species perch with their wings appressed to the substrate, and grays, tans, and browns are frequent wing colors.

The adults of most species are nocturnal and are generally susceptible to being sampled at light. Some species fly by day, particularly those that fly in the early spring. Some winter and spring species have flightless females with vestigial or reduced wings and mouthparts.

The caterpillars are most often referred to as “inchworms,” and they lack legs from the middle part of the abdomen, and, as a result, walk with a looping progression. The caterpillars lack hair, but are normally cryptically colored, often in shades of green or brown. They may have varied body forms or protuberances, and most appear like or blend in with twigs, foliage, or flowers. Their appearance is interpreted as a way to avoid predators (Powell, 2003).

The majority of species have larvae that feed on perennial woody plants and, as a result, regions with forested or dense shrubbery are richest in species, and grasslands are generally the most depauperate. As can be seen by our survey, grassland trap locations E-1 and E-2 had few species of this family.

The vast majority of species is not of economic concern, but a few are sometime serious defoliators of shade or forest trees, e.g. *Paleacrita vernata*, *Alsophila pomataria*, and *Lambdina fiscellaria*.

Geometrinae

Chlorochlamys chloroleucaria (Guenée, 1858). [Blackberry Looper Moth]

This common moth ranges through eastern North America from Manitoba east to Nova Scotia and south to South Texas east to Florida. The caterpillars feed on a number of perennial herbaceous plants, especially Asteraceae, and several woody shrubs (Ferguson, 1985). There are probably two or more flights each year at Fort Sill. **Collection data:** West Range: Medicine Bluff—Trap M-2, June 26 (1); July 18 (1); 10 Mile Crossing—Trap W-2, July 16 (1) September 27 (1); Ketch Lake—Trap W5, April 27 (2).

Synchlora aerata (Fabricius, 1798). [Wavy-lined Emerald]

This small green geometrine ranges from coast to coast in North America from southern Canada to the southern United States. Its caterpillars feed on the buds and flowers of a wide variety of plants, especially Asteraceae (Ferguson, 1985). There seem to be three broods at Fort Sill. **Collection data:** East Range: 1 mile northeast of Menoher Hill--Trap E-2, July 17 (1) East Cache Creek--Trap E-3 May 26 (1). West Range: Natural Resource Building woods--Trap M-1, May 28 (1), August 19 (2), Medicine Bluff--Trap M-2, July 18 (2), September 28 (1); Near Lower Rabbit--Trap W-1, July 18 (3), August 19 (3), September 27 (1).

Sterrhinae

Cyclophora nanaria (Walker, 1861)

This moth ranges from Nebraska south to Texas and thence west to southern California south to Guerrero, Mexico (National Museum of Natural History). Host or life history information was not available. **Collection data:** East Range: Broomweed Pond--Trap E1, April 26 (1), East Cache Creek--Trap E3, March 31(2), May 26 (1), June 24(1), August 17(1); West Range: Natural Resource Building woods--Trap M-1, March 31 (2), June 26(1), August 19(2);

Medicine Bluff--Trap M-2, March 14 (1); March 28(1); April 28(3), May 28(1); Near Lower Rabbit--Trap W-1, April 27(2), May 28 (4); 10-Mile Crossing--Trap W-2, June 25(1), July 16 (1); Lower LETRA--Trap W-3, May 27(1); Upper LETRA--Trap W-4, April 27(1); May 27 (4); Ketch Lake--Trap W-5, May 27(2), June 25(1), July 16 (1).

Euacidalia sericearia Packard, 1873

The caterpillar host is unreported (Robinson et al., 2002). On Fort Sill, the moth was collected from May to “August and two broods are indicated. **Collection data**//East Range: Broomweed Pond--Trap E1, May 26 (2), August 17(1); East Cache Creek--Trap E3, June 24 (4), July 17 (1); West Range: Medicine Bluff--Trap M-2, July 18 (1); Cottonwood Grove, near Lower Rabbit--Trap W-1, July 18(2).

Haematopsis grataria (Fabricius, 1798). [Chickweed Geometer]

This unique-appearing moth is found in open weedy areas from the east coast of North America west through the Great Plains. The caterpillars feed on a variety of low herbaceous plants (Covell, 1984). Covell reports that the moth flies for a long period each year, probably indicating at least two broods. **Collection data**//East Range: Broomweed Pond--Trap E1, August 17 (1). West Range: Near Lower Rabbit--Trap W-1, July 18 (1).

Idaea demissaria (Hübner, 1831). [Red-bordered Wave]

Covell (1984) reports that this moth occurs from southeastern Canada south to Florida and thence west to Texas and Nebraska. The caterpillar hosts are unrecorded. The moth has been recorded from April to October and likely has at least two broods (Covell, 1984). **Collection data**// West Range: Medicine Bluff--Trap M-2, September 28 (1); near Lower Rabbit--Trap W-1, August 19 (1).

Idaea species near *productata* (Packard, 1876)

The caterpillar host is unreported (Robinson et al., 2002). Collection records on Fort Sill are from April through September indicating two or three broods. **Collection data**//East Range: Broomweed Pond--Trap E1, April 26 (1), 1 mile northeast of Menoher Hill--Trap E-2, September 26 (1); East Cache Creek--Trap E3, June 24(1); West Range: Natural Resource Building woods--Trap M-1, August 19 (1); Medicine Bluff--Trap M-2, September 28 (3); 10-mile Crossing--Trap W-2, July 16 (1), September 27 (1), Ketch Lake Trap--W-5 June 25 (1), September 27 (1).

Leptostales rubromarginaria (Packard, 1871). [Dark-ribboned Wave]

The small orangeish moth, found commonly on Fort Sill, is found throughout much of eastern North America and west to the Pacific Coast (Covell, 1984, National Museum of Natural History). The caterpillar hosts are unrecorded. Because of its long flight period on Fort Sill, there would seem to be at least three broods. **Collection data**//East Range: Broomweed Pond--Trap E-1, May 26 (3), 1 mile northeast of Menoher Hill--Trap E-2, May 26 (1), July 17 (1),

August 17 (1), East Cache Creek--East Cache Creek--Trap E3, March 28 (1), April 26 (2), May 26 (3), June 24 (11), August 17 (3); West Range: Natural Resource Building woods--Trap M-1, March 31 (2), April 26 (1), May 28 (1), June 26 (1), July 18 (2), August 19(1), Medicine Bluff--Trap M-2, March 31 (2), April 28 (3), June 26 (1), July 18 (4), August 19 (9); Near Lower Rabbit--Trap W-1, July 19 (5), 10-Mile Crossing--Trap W-2, June 25 (4), July 16 (2), August 18 (1), Upper LETRA --Trap W-4, May 27 (1), July 16(1), August 18 (5), Ketch Lake--Trap W-5, April 27 (2), June 25 (1).

Lobocleta ossularia (Geyer, 1837). [Drab Brown Wave]

This moth is found commonly in much of eastern North America (Covell, 1984). The caterpillar hosts are bedstraws (*Galium* species) and other low plants according to Covell. The moth may fly from March to October and likely has several flights. **Collection data**// West Range: Medicine Bluff--Trap M-2, June 26 (1).

Lobocleta plemyraria (Guenée, 1858). [Straight-lined Wave]

The moth occurs through much of the eastern United States (Covell, 1984). That author reports that the moth flies from June to October and that its caterpillar host is unknown. **Collection data**//West Range: 10-Mile Crossing--Trap W-2, September 27 (1).

Scopula ancillata (Hulst, 1887)

This species ranges from Michigan and Indiana west to British Columbia and Arizona (Covell, 1970). The life history is unreported (Covell, 1970). The moths fly from May to September (Covell, 1970). **Collection data**//West Range: 10-Mile Crossing--Trap W-2, April 27 (1).

Scopula inductata (Guenée, 1858). [Soft-lined Wave]

This moth is common throughout eastern North America west to Oregon and Washington (Covell, 1970, 1984; National Museum of Natural History). The caterpillars are reported by Covell to feed on several herbaceous legumes, composites, as well as *Prunus* species. Covell reports that the adults fly from May through September. It may be assumed that the species has at least two broods. **Collection data**//East Range: East Cache Creek--Trap E3, June 24 (1).

Scopula limboundata (Haworth, 1809). [Large Lace Border]

The adults range widely in temperate North America (Covell, 1970, 1984). The caterpillars are reported by Covell to feed on a variety of herbaceous plants as well as woody perennials. Although found on Fort Sill only in April and May, the species can be found elsewhere to September and it likely has two or more broods at Fort Sill. **Collection data**//West Range: 10-mile Crossing--Trap W-2, April 27 (1), May 25 (1).

Timandra amaturaria (Walker, 1866). [Cross-lined Wave]

This species ranges widely in eastern North America (Covell, 1984). The caterpillars feed on plants in the buckwheat family (Polygonaceae), including *Polygonum* and *Rumex* (Covell, 1984). The species was found on Fort Sill from June to September and there are likely two broods. The species is found primarily during daylight and it is most likely much more abundant on Fort Sill than our few records indicate. **Collection data**//East Range: East Cache Creek--Trap E-3, June 24 (1). West Range: 10-Mile Crossing--Trap W-2, July 16 (2), September 29 (1).

Larentiinae

Archirhoe neomexicana (Hulst, 1896)

This moth occurs from Oklahoma and Texas west to southern California (National Museum of Natural History). McFarland (1965) reported that the caterpillar feeds on *Mirabilis* (Nyctaginaceae). **Collection data**//West Range: 10-Mile Crossing--Trap W-2, September 27 (1).

Costaconvexa centrostrigaria (Wollasten, 1858)

This moth ranges from Quebec and Ontario west to California and south to the tropics (Forbes, 1948). The only reported host is knotweed (*Polygonum*) (Forbes, 1948). The moth flies from April to September with apparently 2-3 broods (Forbes, 1948; this report). **Collection data**//West Range: 10-Mile Crossing--Trap W-2, April 27 (1).

Eubaphe mendica (Walker, 1854). [The Beggar]

According to Covell (1984) and the National Museum of Natural History this small moth is common throughout eastern North America west to Idaho and British Columbia. The caterpillars feed on violets, and the moths fly from May through September in 3 broods (Covell, 1984). **Collection data**//East Range: East Cache Creek--Trap E3, April 26 (1).

Eubaphe unicolor (Robinson, 1869)

According to the National Museum of Natural History collection data this species ranges from Kansas south to Texas and west to Colorado and Arizona. The caterpillar host is reported to be violets (Violaceae) by Robinson et al. (2002). The collections dates at Fort Sill of from April through August indicate at least two broods. **Collection data**// West Range: Medicine Bluff--Trap M-2, April 28 (5), August 19 (1); 10-Mile Crossing--Trap W-2, July 16 (2); Upper LETRA--Trap W-4, May 27 (1), June 25 (1); Ketch Lake--Trap W-5, April 27 (2)

Eulithis gracilineata (Guenée, 1858). [Greater Grapevine Looper Moth]

According to Covell (1984) and the National Museum of Natural History collection data this moth ranges throughout most of temperate eastern North America west to Manitoba and Colorado. Its caterpillars feed on leaves of grape vines and Virginia creeper. On Fort Sill, the

moths are found from May to September and two broods are indicated. **Collection data**//East Range: Broomweed Pond--Trap E1, May 26 (1); West Range: Natural Resource Building woods--Trap M-1, May 28 (2); Near Lower Rabbit--Trap W-1, May 28 (1); 10-Mile Crossing--Trap W-2, May 27 (2), September 27 (4); Lower LETRA--Trap W-3, May 27 (4); Upper LETRA --Trap W-4, May 27 (5); Ketch Lake--Trap W-5, May 27 (4).

Eupithecia bolterii (Hulst, 1900)

Little has been reported about this rare moth. Its distribution includes New Jersey, Texas, Oklahoma (this report), and Arizona (McDunnough, 1949). Its host plant and life history are unreported. **Collection data**//West Range: Lower LETRA—Trap W-3, March 15, 2004 (1).

Eupithecia jejunata McDunnough, 1949

This moth ranges from the Southeast west to Texas and Oklahoma (McDunnough, 1949; present report). The caterpillar host is unknown. There is one annual spring flight in March and April (McDunnough, 1949; present report). **Collection data**//East Range: East Cache Creek--Trap E3, March 28 (1); West Range: Natural Resource Building woods--Trap M-1, March 31 (8).

Eupithecia miserulata Grote, 1863 [Common Eupithecia]

This is the commonest of about 40 *Eupithecia* species found in eastern North America (Covell, 1984). According to Covell the moth is common throughout eastern North America and the caterpillars eat a wide variety of herbaceous and woody broad-leaved angiosperms. Covell records its flight from April to October. There are likely two flights at Fort Sill. **Collection data**//East Range: 1 mile northeast of Menoher Hill--Trap E-2, July 17(1); East Cache Creek--Trap E3, March 28(2), April 26(1); West Range: Natural Resource Building woods--Trap M-1, March 31 (7); Medicine Bluff--Trap M-2, April 28(1), September 28(1); Ketch Lake--Trap W-5, April 27 (2).

Eupithecia swettii Grossbeck, 1907

This uncommon moth ranges from Quebec and Massachusetts south to the District of Columbia and Pennsylvania thence west to Oklahoma and Texas (McDunnough, 1949; this report). Caterpillar hosts are reported as apple and willows by Bolte (1990), and there is a single spring flight from March to May (McDunnough, 1949; this report). **Collection data**// West Range: Natural Resource Building woods--Trap M-1, March 31 (1).

Eupithecia tenuata Hulst, 1880

This seems to be a western species ranging from British Columbia and South Dakota south to New Mexico and Colorado (McDunnough, 1949; this report). According to McDunnough the caterpillar host is unknown and the flight period is April to August with two broods indicated. **Collection data**//West Range: Ketch Lake--Trap W-5, April 27 (2).

Hammaptera parinotata (Zeller, 1872)

This moth ranges from Florida west to Texas and Oklahoma (National Museum of Natural History collection data; this report). The life history is unreported according to Robinson et al. (2002). Based on Fort Sill collections in July and September, there would seem to be at least two broods. **Collection data**//East Range: 1 mile northeast of Menoher Hill--Trap E-2, July 17(1); East Cache Creek--Trap E3, September 26 (1).

Hydrelia unidentified species

According to Covell (1984), one eastern species in this genus *Hydrelia inornata* (Hulst) has larvae feeding on white and yellow birch. The species found on Fort Sill like has two broods each year. **Collection data**//East Range: East Cache Creek--Trap E3, April 26 (4). West Range: Natural Resource Building woods--Trap M-1, April 26 (8), August 19 (2); Medicine Bluff--Trap M-2, April 28 (3); 10-Mile Crossing--Trap W-2, June 25 (2), July 16 (1), August 18 (2); Ketch Lake--Trap W-5, April 27 (1).

Hydriomena pluviata (Guenée, 1857). [Sharp Green Hydriomena]

Covell (1984) reports this moth to be common through much of the eastern U.S. Covell also reports that the caterpillar host is unknown and the adults fly in a single spring brood. **Collection data**//East Range: East Cache Creek--Trap E3, March 28 (20). West Range: Natural Resource Building woods--Trap M-1, March 31(18); Medicine Bluff--Trap M-2, March 31 (2); 10-Mile Crossing--Trap W-2, March 15, 2004 (1).

Orthonama obstipata (Fabricius, 1794). [The Gem]

Covell (1984) reports that this very common moth is found world-wide. The caterpillars feed on a wide variety of herbaceous plants and, occasionally, on trees (Covell, 1984). There should several broods on Fort Sill. **Collection data**// West Range: Natural Natural Resource Building woods--Trap M-1, May 28(1); 10-Mile Crossing--Trap W-2, April 27(1).

Ennominae

Ancamptodes dataria (Grote, 1882)

This moth ranges from Arizona to Texas and Oklahoma as well as northern Mexico (Rindge, 1966; this report). The caterpillar host is unknown and collection records of adults range from February through November (Rindge, 1966). The moth has at least two broods. **Collection data**//East Range: East Cache Creek—Trap E-3, June 24 (1); West Range: Natural resources Building woods—Trap M-41, August 18 (1); Near Lower Rabbit—Trap W-1, July 18 (1); Upper LETRA—Trap W-4, August 18 (1).

Anavitrinella atristrigaria (Barnes and McDunnough, 1913)

This was the most abundant geometrid moth found on Fort Sill. This species is known from Kansas, Oklahoma, and Texas (specimen data from the National Museum of Natural History; this report). The caterpillar host is unreported according to Robinson et al. (2002). On Fort Sill, extensive collections from March through September indicate three broods. **Collection data**//East Range: Broomweed Pond--Trap E1, July 17 (1); 1 mile northeast of Menoher Hill--Trap E-2, April 26 (3), July 17 (2), September 26 (1); East Cache Creek--Trap E3, April 26 (16), May 26 (5), June 24 (9), September 26 (1); West Range: Natural Resource Building woods--Trap M-1, March 31 (6), April 26 (8), May 28 (2), June 26 (5), July 18 (1), August 19 (3); Medicine Bluff--Trap M-2, March 14 (1), May 28 (1), June 26 (2), July 18 (6), August 19 (8), September 28 (4); Near Lower Rabbit--Trap W-1, July 18 (1), August 19 (1); 10-Mile Crossing--Trap W-2, April 27 (1), June 25 (9), July 16 (5), August 19 (3), September 27(2); Lower LETRA--Trap W-3, August 18 (1); Upper LETRA--Trap W-4, April 27 (3), May 27 (1), June 25 (4), September 27 (1); Ketch Lake--Trap W-5, April 27 (1), May 27 (1), June 25 (4), July 16 (3), September 28 (2).

Cabera quadrifasciaria (Packard 1873). [Four-lined Cabera]

This moth is found from the southern Midwest to the central Great Plains (Covell, 1984). Covell reports that the moth is uncommon to rare and that its caterpillar host is unknown. There seems to be just a single spring flight (Covell, 1984). **Collection data**//East Range: East Cache Creek-- Trap E3, April 26 (2).

Digrammia continuata (Walker, 1862). [Curve-lined Angle]

Covell (1984) reported that this species flies throughout temperate eastern North America. The caterpillar hosts are red cedar and possibly hackberry. According to Covell the moth is locally common and likely has two flights each year. **Collection data**// West Range: Natural Resource Building woods--Trap M-1, July 18 (1); Medicine Bluff--Trap M-2, March 21 (1), July 18 (3); 10-Mile Crossing--Trap W-2, April 27(1); Upper LETRA--Trap W-4, April 27 (1).

Digrammia excurvata (Packard, 1874)

This common moth is found along the Pacific coast states east to Oklahoma and Texas (specimen data from the National Museum of Natural History). The caterpillar host is reported to be juniper and possibly cypress by Robinson et al. (2002). Collection records from March through August would indicate three broods. **Collection data**//East Range:1 mile northeast of Menoher Hill--Trap E-2, May26 (1); East Cache Creek--Trap E3, March 28 (1); West Range: Natural Resource Building woods--Trap M-1, March 31 (1); Medicine Bluff--Trap M-2, May 28 (1). West Range: Lower LETRA--Trap W-3, May 27 (1); Upper LETRA --Trap W-4, May 27 (1), June 25 (1), August 18 (1),; Ketch Lake--Trap W-5, June 25 (1).

Digrammia gnophosaria (Guenée, 1858). [Hollow-spotted Angle]

Covell (1984) reports the moth to be common throughout much of temperate eastern North America. Covell reports that the caterpillars are known to feed on larch [not found natively on Fort Sill] and willows. The moth likely has two annual flights at Fort Sill. **Collection data**//East Range: Trap E-2, June 24 (1); East Cache Creek--Trap E3, June 24 (1). West Range: Natural Resource Building woods--Trap M-1, May 28 (2), August 19 (1); 10-Mile Crossing--Trap W-2, June 25 (2); Upper LETRA --Trap W-4, August 18 (3); Ketch Lake--Trap W-5, July 16 (3).

Digrammia irrorata (Packard, 1876)

This species ranges from South Dakota south to Texas and west to California (specimen data from the National Museum of Natural History). Robinson et al. (2002) include several reports of poplar and willow as the caterpillar host. Collection records on Fort Sill from April to August indicate at least two broods. **Collection data**//East Range: Broomweed Pond--Trap E1, May 26 (3); East Cache Creek--Trap E3, July 17 (1). West Range: Natural Resource Building woods—Trap M-1, August 19 (1); Near Lower Rabbit--Trap W-1, July 18 (3), August 19 (2); Lower LETRA--Trap W-3, May 27 (1); Ketch Lake--Trap W-5, April 27 (1).

Digrammia ocellinata (Guenée, 1858). [Faint-spotted Angle]

Covell (1984) reports the moth to fly throughout much of temperate eastern North America west to the Great Plains. The caterpillars are reported to feed on locust trees by Covell and Wagner et al. (2001). The moths fly from May to August on Fort Sill and probably have two flights. **Collection data**//East Range: 1 mile northeast of Menoher Hill--Trap E-2, May 26 (3), August 17 (2); East Cache Creek--Trap E3, June 24 (1). West Range: Medicine Bluff--Trap M-2, June 26 (1); Near Lower Rabbit--Trap W-1, August 19 (1).

Digrammia ordinata (Walker, 1862)

The caterpillar host is unreported according to Robinson et al. (2002). Collections at Fort Sill from April to August indicate at least two broods. **Collection data**// West Range: Natural Resource Building woods--Trap M-1, August 19; Medicine Bluff--Trap M-2, April 28(1), July 18 (1); Cottonwood grove near Lower Rabbit--Trap W-1, July 16(1), August 19(1); 10-Mile Crossing--Trap W-2, July 16(1); Lower LETRA--Trap W-3, May 27(2); Upper LETRA--Trap W-4, July 16(2), August 18(1); Ketch Lake--Trap W-5, July 16 (1).

Digrammia pallidata (Packard, 1873)

The caterpillar host is unreported according to Robinson et al. (2002). Collection records at Fort Sill from April to August indicate at least two broods. **Collection data**//East Range: 1 mile northeast of Menoher Hill--Trap E-2, April 26 (4), May 26 (4); East Cache Creek--Trap E3, April 26 (2). West Range: Upper LETRA--Trap W-4, June 25 (3), August 18 (1).

Digrammia ?pervolata (Hulst, 1880)

This moth is found from Oklahoma and Texas west to Arizona and Utah (specimen data from the National Museum of Natural History). Robinson et al. (2002) report *Ribes* as the caterpillar host. **Collection data**// West Range: Medicine Bluff--Trap M-2, April 28(1); 10-Mile Crossing--Trap W-2, April 27 (2); Ketch Lake--Trap W-5, April 27 (1), June 25(1).

Digrammia subminiata (Packard, 1876)

Forbes (1948) reports the range as Pennsylvania and Tennessee westward. The caterpillar host has been reported as *Gleditsia* (Fabaceae) by Robinson et al. (2002). The moth has a single late spring flight in May and June (Forbes, 1948, this report). **Collection data**//West Range: Lower LETRA--Trap W-3, May 27 (1).

?*Ectropis* unidentified species

Ectropis crepuscularia, the most likely species to be found at Fort Sill, ranges from Oklahoma and Texas west to the Pacific Coast and north to Alaska (specimen data from the National Museum of Natural History; this report). **Collection data**// West Range: Natural Resource Building woods--Trap M-1, August 19 (1); Upper LETRA--Trap W-4, August 18 (1).

Euchlaena effecta (Walker, 1860)

The range reported by Forbes (1948) is Quebec to Virginia west to Texas, Colorado, and Oregon (supplemented by specimen data from the National Museum of Natural History). Forbes reports that the caterpillar feeds on wild cherry. The species has two broods. **Collection data**//East Range: Broomweed Pond--Trap E1, May 26 (1). West Range: Upper LETRA--Trap W-4, June 25(1).

Euchlaena johnsonaria (Fitch, 1870). [Johnson's *Euchlaena*]

According to Covell (1984) the moth occurs throughout much of temperate eastern North America. It also ranges west to Alberta, Kansas, and Texas (supplemented by specimen data from the National Museum of Natural History). Covell states that this moth's caterpillars feed on a wide variety of broad-leaved trees. On Fort Sill, the moths fly from May through September and there are likely two or three flights. **Collection data**//East Range: 1 mile northeast of Menoher Hill--Trap E-2, May 26 (2), August 17 (1). West Range: Natural Resource Building woods--Trap M-1, September 8 (1); Medicine Bluff--Trap M-2, July 18 (2), August 19 (2), September 28 (1); 10-Mile Crossing--Trap W-2, May 27 (1); Upper LETRA --Trap W-4, June 25 (1), September 27 (1); Ketch Lake--Trap W-5, June 25, (2)

Euchlaena madusaria (Walker, 1860)

The species ranges from Oklahoma and Texas west to British Columbia, Idaho, and Arizona (specimen data from the National Museum of Natural History). The caterpillar hosts are

reported as several woody conifers and broad-leaved plants (Robinson et al., 2002). The collection records on Fort Sill from June to late September indicate two broods. **Collection data**//East Range: East Cache Creek--Trap E3, June 24(1). West Range: Natural Resource Building woods--Trap M-1, June 26 (1), August 19 (8), September 28 (2); Medicine Bluff--Trap M-2, September 28 (1); Near Lower Rabbit--Trap W-1, July 18 (1); 10 mile Crossing Trap--W-2, July 16 (3); Upper LETRA --Trap W-4, July 16 (6), September 29 (1); Ketch Lake--Trap W-5, June 25 (1), July 16 (3).

Euchlaena obtusaria (Hübner, 1813). [Obtuse Euchlaena]

Covell (1984) reports that the moth ranges from New Jersey south to Florida west to Manitoba, Kansas, and Texas. According to Covell, the caterpillar eats rose and impatiens. On Fort Sill, the moths fly from April to September and probably have two or three flights. **Collection data**//East Range: East Cache Creek--Trap E3, May 26 (1), August 17 (1). West Range: Medicine Bluff--Trap M-2, July 18 (1). 10-Mile Crossing--Trap W-2, April 27 (1), July 16 (1); Lower LETRA--Trap W-3, May 27 (1),

Euchlaena pectinaria Denis & Schiffermüller, 1775). [Forked Euchlaena]

Covell (1984) reports the range as from New Jersey south to Florida and west to Manitoba and Texas. The caterpillars feed of wild cherry according to Covell. On Fort Sill, the moths fly from March through September and there are likely two or three broods. **Collection data**//East Range: East Cache Creek--Trap E3, March 31(3), August 17(1), September 27(1). West Range: Natural Resource Building woods--Trap M-1, March 31(2); Near Lower Rabbit--Trap W-1, September 29(1); 10-Mile Crossing--Trap W-2, May 27 (1), September 27 (1); Upper LETRA --Trap W-4, April 27 (1), May 27 (4), September 29 (1).

Euchlaena tigrinaria (Guenée, 1858) [Mottled Euchlaena]

This species occurs through much of the eastern U.S. west to the Great Plains according to Covell. It then ranges further west to the Pacific Coast from British Columbia south to Oregon (supplemented by specimen data from the National Museum of Natural History). The caterpillars eat oak, aspen, and birch (Covell, 1984). The common moth flies from April to August and possibly has two to three broods. **Collection data**// West Range: Medicine Bluff--Trap M-2, July 18 (1).

Euchlaena unidentified species.

No range or biological information is available for this moth. **Collection data**//West Range: 10-Mile Crossing--Trap W-2, April 27 (5); Upper LETRA --Trap W-4, April 27(3).

Eumacaria latiferrugata (Walker, 1863). [Broad-bordered Geometer]

According to Covell (1984), this common moth ranges over most of temperate eastern North America. Its caterpillars feed on woody trees and shrubs in the Rose family (Rosaceae)

(Wagner et al., 2001). On Fort Sill, collection records are from March to September and there are likely three broods annually. **Collection data**//East Range: Broomweed Pond--Trap E1, July 17 (1), August 17 (1); 1 mile northeast of Menoher Hill--Trap E-2, May 26 (4); East Cache Creek--Trap E3, September 17 (1). West Range: Natural Resource woods--Trap M-1, May 28 (1), June 26 (1), July 18 (1), August 19 (2); Medicine Bluff--Trap M-2, March 31 (1), April 28 (2), May 28 (2), June 26 (2), July 18 (1), August 19 (2); Near Lower Rabbit--Trap W-1, May 28 (1), August 19 (1); 10-Mile Crossing--Trap W-2, May 27 (1); Upper LETRA--Trap W-4, May 28 (1), July 16 (4), August 18 (3); Ketch Lake--Trap W-5, April 27 (1), July 16 (3).

Eusarca packardaria (McDunnough, 1940)

This moth was known previously only from Texas (specimen data from the National Museum of Natural History). The specimen collected during this survey represents a new northern record and an Oklahoma state record. The caterpillar host is unknown according to Robinson et al. (2002). **Collection data**//East Range: East Cache Creek--Trap E3, September 26 (1).

Eusarca subflavaria (Pearsall, 1906)

The range of this moth is primarily Texas (specimen data from the National Museum of Natural History). The records in this report represent a northern range extension and new Oklahoma state record. **Collection data**//East Range: 1 mile northeast of Menoher Hill--Trap E-2, April 26(1), May 26(4); East Cache Creek--Trap E3, May 26(4); September 26(2). West Range: Natural Resource Building woods--Trap M-1, May 26(3), August 19 (1); Medicine Bluff--Trap M-2, May 28(1), September 28 (1); Cottonwood grove, near Lower Rabbit--Trap W-1, September 28 (2); 10-Mile Crossing--Trap W-2, April 27(1); May 27(2), September 27 (1); Lower LETRA --Trap W-3, May 27(1); Upper LETRA --Trap W-4, August 18 (1); September 27 (5); Ketch Lake--Trap W-5, May 27(1).

Exelis pyrolaria Guenée, 1857. [Five-lined Gray]

Covell (1984) reports that this moth ranges from New York south to central Florida and west to Louisiana and Illinois. The Fort Sill record would seem to be a significant westward range extension and new Oklahoma record. The caterpillars eat persimmon and common pipissewa according to Covell. The moth appears to have spring and late summer flights. **Collection data**//West Range: Lower LETRA --Trap W-3, April 27(1); Ketch Lake--Trap W-5, April 27(6).

Hypagyrtis unipunctata (Haworth, 1809). [One-spotted Variant]

Covell (1984) reports this species to be common throughout eastern North America. It also ranges west to British Columbia, Idaho, and Oregon (specimen data from the National Museum of Natural History). The caterpillars feed on of both conifers and broad-leaved trees. Covell states that the moths fly from April to September and likely have two to three broods.

Collection data//East Range: East Cache Creek--Trap E-3, June 24 (1). West Range: Natural Resource Building woods--Trap M-1, August 19(2); Upper LETRA Trap--W-4, August 18 (1).

Hypomecis gnopharia (Guenée, 1858)

This species occurs from New Jersey south to Florida and thence west to Oklahoma and Texas (CSU, specimen data from the National Museum of Natural History). The caterpillar host is unknown according Robinson et al. (2002). At Fort Sill, collections from April to August indicate at least two broods. **Collection data**//West Range: Near Lower Rabbit--Trap W-1, August 19 (1); 10-Mile Crossing--Trap W-2, July 16 (2); Lower LETRA--Trap W-3, May 27 (1), August 18 (4); Upper LETRA --Trap W-4, April 27 (10), May 27 (2), June 25 (2), July 16 (2), August 18 (6).

Hypomecis unidentified species.

No range or biological information is available for this moth. **Collection data**//West Range: Upper LETRA--Trap W-4, April 27 (1).

Iridopsis perfectaria (McDunnough, 1940)

This moth is known from Oklahoma and Texas (specimen data from the National Museum of Natural History; this report). The caterpillar host is unknown according Robinson et al. (2002). At Fort Sill, collections from April to September indicate three broods. **Collection data**//East Range: Broomweed Pond--Trap E1, July 17 (3); 1 mile northeast of Menoher Hill--Trap E-2, May 26 (1), July 17(1); East Cache Creek--Trap E-3 May 26 (1), September 26(2). West Range: Natural Resource Building woods--Trap M-1, March 13, 2004, May 28 (4), June 26 (2), July 18 (1), August 19 (7); Medicine Bluff--Trap M-2, July 18 (4), August 19 (2); Near Lower Rabbit--Trap W-1, May 28(1); 10 mile Crossing Trap--W-2, May 27(1), July 16 (2), August 18 (2), September 27 (1).

Isturgia dislocaria (Packard, 1876). [Pale-veined *Isturgia*]

Covell (1984) reports that this moth ranges from the Appalachians west to South Dakota and Texas. The caterpillar host is hackberry (Wagner et al., 2001). The adults fly during March and April on Fort Sill where there is likely but a single flight. **Collection data**//East Range: Broomweed Pond--Trap E1, March 31 (1); East Cache Creek--Trap E3, March 31 (3), March 14 (1). West Range: Natural Resource Building woods--Trap M-1, March 31 (2), April 26 (1); Medicine Bluff--Trap M-2, March 28 (2); Upper LETRA --Trap W-4, April 27 (1).

Lychnosea intermicata (Walker, 1862)

Forbes (1948) reports the range as southern states west to Kansas and Texas (supplemented by specimen data from the National Museum of Natural History). The life history is unreported. Based on our results from Fort Sill, the moth appears to be at least double-brooded—flying from May to September. **Collection data**//West Range: Natural Resource

Building woods--Trap M-1, May 28(1), September 28(1); Lower LETRA--Trap W-3, May 27(1); Ketch Lake—Trap W-5, July 16(1), September 27(1).

Lycia ypsilon (Forbes, 1885). [Woolly Gray]

Rindge (1975) reports that this moth ranges from coast to coast in temperate North America. Covell (1984) reports the caterpillars on apple trees. On Fort Sill, the moth flies in March and likely early April as well, one annual spring flight is indicated. **Collection data**//East Range: Broomweed Pond--Trap E1, March 31 (1); East Cache Creek--Trap E3, March 31 (1). West Range: Medicine Bluff--Trap M-2, March 31 (1), March 14, 2004 (1); 10-Mile Crossing--Trap W-2, March 15, 2004 (1); Lower LETRA--Trap W-3, March 15, 2004 (3); Upper LETRA --Trap W-4, March 31 (2).

Lytrosis unitaria (Herrich-Schäffer, 1854). [Common Lytrosis]

Covell (1984) indicates the species ranges through much of the eastern U.S. as well as southern Quebec. The caterpillars feed on a few kinds of broad-leaved shrubs and trees according to Covell. The flight period is May to August. **Collection data**//West Range: 10-Mile Crossing--Trap W-2, May 27 (1).

Macaria aemulataria Walker, 1861. [Common Angle]

This moth ranges throughout much of temperate North America from coast to coast (Wagner et al., 2001). According to Wagner et al. its caterpillars eat maples, including box elder. There are likely three broods at Fort Sill. **Collection data**//East Range: Broomweed Pond--Trap E1, July 17 (4); 1 mile northeast of Menoher Hill--Trap E-2, July 17 (1); East Cache Creek--Trap E3, March 31 (1), April 26 (3), May 26 (1), June 24 (3). West Range: Natural Resource Building woods—Trap M-1, March 31(1), August 19(1); 10-Mile Crossing--Trap W-2, July 16 (2); Upper LETRA--Trap W-4, July 16 (2).

Macaria coortaria? (Hulst, 1887). [Four-spotted Macaria]

This moth ranges through much of temperate eastern North America (Covell, 1984) and west to Nevada and Utah, supplemented by specimen data from the National Museum of Natural History. Covell and Wagner et al. (2001) report that the caterpillars feed on hawthorn, cherry, and apple. The moths fly from May to August and likely have two flights. **Collection data**// West Range: Natural Resource Building woods--Trap M-1, May 28 (1).

Macaria promiscuata (Ferguson, 1974). [Promiscuous Angle]

Covell (1984) reports this moth is found from Maryland south to Florida and west to Missouri and Texas. The caterpillar host of this common moth is unknown according to Covell and it flies from March to September. On Fort Sill, there are likely three flights. **Collection data**//East Range: Broomweed Pond--Trap E-1, July 17 (2); 1 mile northeast of Menoher Hill—Trap E-2, July 17 (5); East Cache Creek--Trap E3, March 31 (1), April 26 (1).

Macaria punctolineata Packard, 1873

This species ranges from Kansas and Oklahoma south to the tropics (Forbes, 1948; this report). The life history is unreported (Robinson et al, 2002). The moth flies from June to September in possibly two broods. **Collection data**//East Range: East Cache Creek-- Trap E3, June 24 (1). West Range: Natural Resource Building woods--Trap M-1, July 18 (1); Near Lower Rabbit--Trap W-1 July 18 (2).

Macaria ribearia Fitch, 1848. [Currant Spanworm Moth]

Covell (1984), supplemented by specimen data from the National Museum of Natural History, reports that this species is found from Maine and Quebec south to New Jersey thence west to Manitoba, Colorado, and Utah. The caterpillars feed on wild currants according to Covell and Wagner et al. (2001). The moth has a single annual flight—late May at Fort Sill. **Collection data**// West Range: Natural Resource Building woods--Trap M-1, May 28 (3); Ketch Lake--Trap W-5, May 27 (1).

Macaria unidentified species

Collection data//East Range: Broomweed Pond--Trap E-1, July 17 (3); 1 mile northeast of Menoher Hill--Trap E-2, July 17 (2); East Cache Creek--Trap E-3, June 24 (1). West Range: Natural Resource Building woods--Trap M-1, April 26 (1), July 18 (5), August 19 (7); Upper LETRA--Trap W-4, June 25 (1).

Melanolophia signataria (Walker, 1860). [Signate Melanolophia]

Covell (1984) reports that this moth ranges through much of temperate eastern North America. These Fort Sill records are an apparent range extension westward (Rindge, 1964). The caterpillars feed on the leaves of a variety of both coniferous and broad-leaved trees according to Covell. The moths fly from March to August and two broods are likely. **Collection data**//East Range: East Cache Creek--Trap E3, March 31 (2), April 26(1). West Range: Natural Resource Building woods--Trap M-1, March 31(13); Medicine Bluff--Trap M-2, March 31(2).

Melilla xanthometata (Walker, 1862) [Orange Wing]

This small moth is found from New Jersey south to North Carolina west to Oklahoma and Texas (Covell, 1984). **Collection data**//East Range: Broomweed Pond--Trap E-1, July 17 (3); 1 mile northeast of Menoher Hill--Trap E-2, July 17 (2); East Cache Creek—Trap E-3, VI-24 (1). West Range: Natural Resource Building woods—Trap M-1, IV-26 (1), VII-18 (5), VIII-19-2003 (7); Medicine Bluff—Trap M-2, VI-26 (1); Upper LETRA—Trap W-4, VI-25 (1).

Metanema inatomaria Guenée, 1858. [Pale Metanema]

This moth is found sporadically across temperate North America from coast to coast (Covell, 1984). Its caterpillars feed on a variety of coniferous and broad-leaved trees. Flight is from May to October and two flights are indicated. **Collection data**//West Range: Near Lower Rabbit--Trap W-1, May 28 (1).

Nacophora quernaria (J.E. Smith, 1797). [Oak Beauty]

This moth is found throughout much of temperate eastern North America according to Covell (1984). Covell reports that the caterpillars feed on a variety of broad-leaved trees. The moths fly from March to October and two to three flights are indicated. **Collection data**//West Range: Lower LETRA--Trap W-3, March 15, 2004 (2).

Narraga fimetaria (Grote & Robinson, 1870)

This moth ranges from Georgia and Arkansas west to eastern California and Oregon (specimen data from the National Museum of Natural History). The caterpillars of this moth feed on several composite shrubs (Robinson et al., 2002). Collection records at Fort Sill from April to August indicate at least two broods. **Collection data**//East Range: Broomweed Pond--Trap E1, May 26 (1); 1 mile northeast of Menoher Hill--Trap E-2, August 17 (3). West Range: Medicine Bluff--Trap M-2, April 28 (1); Near Lower Rabbit--Trap W-1, August 19 (2).

Nematocampa limbata (Haworth). [Horned Spanworm Moth]

Covell (1984) reports that this moth occurs throughout much of temperate eastern North America and that the caterpillars feed on a wide variety of herbaceous plants and trees. The moth flies from May to August and two flights are indicated. **Collection data**//East Range: East Cache Creek--Trap E3, May 26(1).

Paleacrita vernata (Peck, 1795). [Spring Cankerworm Moth]

According to Rindge (1975), this common moth is found through much of temperate North America west to Colorado. Its caterpillars feed on a wide variety of broad-leaved deciduous trees and shrubs and may cause serious defoliation (Covell, 1984). The adults have a single annual late winter-early spring flight. **Collection data**//East Range: East Cache Creek--Trap E3, March 14, 2004(2). West Range: Medicine Bluffs-- Trap M-2, March 14, 2004(1).

Pimaphera sparsaria (Walker, 1863)

This moth ranges from Florida west to Oklahoma and Texas (specimen data from the National Museum of Natural History; this report). The caterpillar host is unknown according to Robinson et al. (2002). According to collections at Fort Sill from March through July, the species has at least two broods. **Collection data**//East Range: East Cache Creek--Trap E3, March 14, 2004 (1), March 31 (3). West Range: Natural Resource Building woods--Trap M-1, March 31

(3), May 28 (2), July 28(1); Lower LETRA--Trap W-3, May 27 (1); Upper LETRA--Trap W-4, May 27 (1), June 25 (1).

Prionomelia spododea (Hulst, 1896)

This moth ranges from Oklahoma and Texas west to Utah and Arizona (specimen data from the National Museum of Natural History; this report). The caterpillar host is unknown according Robinson et al. (2002). On Fort Sill, the number of collections in March indicates a single spring flight. **Collection data**//East Range: East Cache Creek--Trap E3, March 14 (4). West Range: Natural Resource Building woods--Trap M-1, March 31 (3); Medicine Bluff--Trap M-2, March 31 (2); 10-Mile Crossing--Trap W-2, March 15, 2004 (Garhart, Kondratieff, Zuellig).

Probole amicaria (Herrich-Schäffer, 1855). [Friendly Probole]

Covell (1984) reports this common moth to be found from southern New England south to Virginia thence west to Wisconsin and Illinois. Its occurrence at Fort Sill would seem to be a significant southwestward range extension and state record. The caterpillar hosts are a wide variety of broad-leaved and coniferous trees (Robinson et al., 2002). It flies from April to August on Fort Sill and two flights are indicated. **Collection data**//East Range: Broomweed Pond--Trap E1, August 17; 1 mile northeast of Menoher Hill--Trap E-2, April 26 (1); East Cache Creek--Trap E3, March 31 (1), April 26 (4). West Range:10-Mile Crossing--Trap W-2, April 27 (1), May 27 (1), July 16(2); August 18 (1); Upper LETRA --Trap W-4, June 25 (1), July 18 (1).

Prochoerodes lineola (Goeze, 1781)

The caterpillar host is unknown according Robinson et al. (2002). At Fort Sill, the collection records from June and July indicate a single flight. **Collection data**//East Range: East Cache Creek--Trap E3, June 24 (2). West Range: Resource Building woods--Trap M-1, June 26 (1); 10-Mile Crossing--Trap W-2, June 25 (1), July 16 (2); Upper LETRA --Trap W-4, June 25 (1), July 16 (1); Ketch Lake—Trap W-5, June 25 (1).

Protoboarmia porcelaria (Guenee, 1857). [Porcelain Gray]

This moth occurs throughout temperate eastern North America and its caterpillars feed on a variety of conifers and deciduous broad-leaved trees. It flies from May to September and apparently has two annual flights on Fort Sill. **Collection data**//West Range: Upper LETRA—Trap W-4, May 27(1), August 18(1).

“*Semiothisa*” *cyda* (Druce, 1893)

This is a moth that ranges from Texas west to Arizona and California and thence south into Mexico (CSU collection; National Museum of Natural History collection data). Its occurrence in Oklahoma is a new northern range extension and state record. The caterpillar hosts are mesquite and another congeneric plant (*Prosopis* species) (Robinson et al., 2002). At Fort

Sill, the moth was collected from March through September and probably has two to three broods. It flies for much longer periods in southern Texas, e.g. to November (CSU collection). **Collection data**//East Range: East Cache Creek--Trap E-3, March 31(1), June 24(1), September 26 (1). West Range: Natural Resource Building woods—Trap M-1, July 18 (1); Medicine Bluff--Trap M-2, July 18 (1), August 19 (2); 10-Mile Crossing--Trap W-2, June 25, (1), August 18 (1), September 27 (1); Upper LETRA --Trap W-4, June 25 (3), July 16 (2); Ketch Lake--Trap W-5, July 16 (1).

Tornos scolopacinaria (Guenée, 1858). [Dimorphic Gray]

Covell (1984) reports this species ranges from Connecticut south to Florida and west to Wisconsin and Texas. The moth's caterpillar hosts are herbaceous composites. It flies from February to November and has multiple broods according to Covell. **Collection data**//East Range: Broomweed Pond--Trap E1, March 31 (4), May 26 (5), August 17 (1); 1 mile northeast of Menoher Hill--Trap E-2, May 26 (3), August 17 (1); East Cache Creek--Trap E3, March 31 (5), June 24 (3), July 17 (1). West Range: Natural Resource Building woods--Trap M-1, March 31 (5), June 26 (1), July 18 (2); Medicine Bluff--Trap M-2, March 31 (3), May 28 (5), June 26 (2), July 18 (3), August 19 (3); Near Lower Rabbit--Trap W-1, August 18 (5); 10-Mile Crossing--Trap W-2, May 27(1), June 25 (1), July 16 (1), August 18(2); Lower LETRA--Trap W-3, May 27 (3); Upper LETRA--Trap W-4, June 25 (4), July 16 (2), August 18 (1); Ketch Lake--Trap W-5, April 27 (1), July 16 (2).

Additions and corrections to the Lepidoptera

Butterflies and skippers (Papilionoidea and Hesperioidea)

No additional butterfly or skipper species were collected in 2004; however a correction of a previous identification was made. The skipper identified as the Confused Cloudywing (*Thorybes confusis* Bell) was corrected to the Southern Cloudywing (*Thorybes bathyllus* (J.E. Smith)) by Andrew D. Warren. The individuals were of the spring flight of the Southern Cloudywing which is very similar to the former species. This leaves the total skipper species at 25 species (25% of the total recorded for the state). There are likely several resident species on Fort Sill that we failed to locate during our surveys.

Tiger Moths (Arctiidae)

Two additional tiger moths are added to the Fort Sill list. The species identified as *Hypoprepia miniata* (Kirby) was actually a mixed series of both that species in addition to *Hypoprepia fucosa* Hübner. Both species were collected at the same general locations on the Fort. In addition, a specimen of *Lycomorpha pholus* (Drury) was collected on flowers in the daytime on the West Range on 11 August 2002 and at LETRA on 28 May 2004. These additions increase the number of tiger moth species known from Fort Sill to 26 species (67%) of the total known for Oklahoma.

Hawk Moths (Sphingidae)

One Additional species, *Xylophanes tersa* (Linnaeus) was collected in 2004 on the West Range. This increases the total to 16 species (Table 1).

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Robber Flies (Asilidae)

The robber flies are a large family of conspicuous flies, including almost 1000 species in North America (Fisher and Wilcox, 1997). Many robber flies are closely associated with arid landscapes, especially of the American Southwest. However, these flies are important components of grasslands throughout North America. They are easily distinguished from related flies by the “bearded and bristly” appearance, with a well-developed downward directed proboscis (Fig. 75) and wings that lie flat and over the abdomen at rest. These insects are voracious visual predators, attacking prey from perches or from the air. Some robber flies specialize on certain prey species, for example the genus *Sarcopogon* are known as “bee-catchers, and the genus *Proctacanthus* as “bee killing robber flies.” As visual predators the eyes are large, often bulging and usually with the top of the head between the eyes sunken, which gives them an ominous appearance and an effective visual field.



Figure 75. Frontal view of an adult robberfly, showing the downward directed proboscis.

Many species of robber flies are geographically restricted and associated with distinct habitats (Hull, 1962). Larvae of robber flies generally dwell in the soil or decaying wood. Apparently, larvae are predators, but the ecology of the immatures is poorly known.

No comprehensive treatment of the robber flies of Oklahoma is available, and only about 32 species have been previously indicated as being present in the state. From studies of surrounding states, such as Texas [164 species] (Bromley, 1934, 1935) and Kansas [122] (<http://windsofkansas.com/Basilidae/ksasilid.html>), at least 130 species should occur in Oklahoma. During our survey at least 55 species were identified (Appendix C), representing about 42% of the expected fauna (Table 1). The robber flies of Fort Sill represent two major geographical patterns, species with widespread eastern and central North American affinities, and those known currently only from Oklahoma and Texas. However, much is yet to be learned for the species listed below. We did not follow all the generic combinations listed by Geller-Grimm (2003), especially in the *Efferia* complex of genera (C. Riley Nelson, personal communication).

Dr. C. Riley Nelson, Brigham Young University, Provo, Utah, and a specialist in this group of flies reviewed this section.

Asilus spp. (Asilinae)

A large diverse group of robber flies, with specific identifications difficult. Several species have been reported from the region (Fisher and Wilcox, 1997). At least two different species were collected from Fort Sill.

Atomosia melanopogon Hermann (Laphriinae)

This widespread species is known from California to Texas to South Dakota south to Iowa.

Atomosia puella (Wiedeman)

This species has been recorded from Ohio to the East Coast south to Florida and west to Texas.

Atomosia sayii Johnson

A species of robber fly known from Pennsylvania, Texas, and Florida, and apparently the Fort Sill collections represent a new state record.

Atomosia tibialis (Hull)

This little robber fly has been previously recorded from Texas.

Cerotainiops abdominalis (Brown) (Laphriinae)

This is a widespread Southwest species previously known from Oklahoma.

Cophura bella (Loew) (Dasyopogoninae)

This is a new state record, previously known from Arizona, New Mexico, and Texas.

Three additional species in this genus, *C. pollinosa* Curran, *C. stylosa* Curran, and *C. texana* Bromley have been recorded from Oklahoma (Martin and Wilcox, 1983).

Dicropaltum mesae (Tucker) (Asilinae)

This is a species that ranges from California to Alberta to Kansas, and is a new state record for Oklahoma.

Diogmites angustipennis Loew (Dasyopogoninae)

This robber fly is a common species of Fort Sill. *Diogmites angustipennis* is known from prairie areas of Colorado to Illinois south to Texas and New Mexico. This species often feeds on honeybees and various wasps. Its green eyes, long legs, and velvety reddish-brown body easily distinguished this species from all other robber flies found on Fort Sill. This robber fly makes a distinct buzzing sound when flushed. Individuals of this species often approached or seemed conspecific with *D. synmachus* (Loew). As Bromley (1934) pointed out, separation of these two

species is difficult, and perhaps only one species is involved. Lavigne and Holland (1969) present an excellent review of the biology of this species.

Diogmites neoternatus (Bromley)

Originally described from Russell County, Kansas this species ranges from Colorado to South Carolina and west to Texas.

Other species of *Diogmites* known or possibly occurring in Oklahoma include *D. misellus* Loew, *D. platypterus* Loew, *D. pritchardi* Bromley, *D. synmachus* (Loew), and *D. ternatus* Loew.

Efferia aestuans (Linnaeus) (Asilinae)

This is a widespread species from Wyoming to eastern Canada south to Florida and west to New Mexico. The bright white band on the posterior portion of the abdomen is distinctive for this species.

Efferia albibarbis (Macquart)

This is a common species on Fort Sill, known from almost the entire U.S., south to Costa Rica. It is known to feed on grasshoppers. The banded appearance of the abdomen of both sexes makes this species recognizable in the field. They are regularly associated with sandy habitats, often common yet restricted to edges of waterways and dunes.

Efferia helenae (Bromley)

This species is known from Alberta to Manitoba south to Arizona and Texas through Mexico. A robust population occurs on the rocky hillsides surrounding Lake Elmer Thomas. The male is easily recognized in the field by abdominal segment six and seven being silver-white. *Efferia helenae* preys upon a wide range of insects (Lavigne and Holland, 1969). This species is a member of the *Pogonias* group that includes *E. kelloggi* and others. Species in this group are difficult to separate, and a review of these species is needed.

Efferia kelloggi Wilcox

Originally described from Arizona, New Mexico, and Mexico. This species is apparently a new state record for Oklahoma. *Efferia kelloggi* is the largest species of *Efferia* on Fort Sill.

Efferia monki (Bromley)

This species was described from Texas, and is considered a rare species (Wilcox, 1966). Our records are a new state record for Oklahoma.

Efferia nemoralis (Hine)

A known Oklahoma species, that ranges from Kansas to Texas to North Carolina and Georgia.

Efferia plenus (Hine)

A species previously recorded from Texas and Kansas. The Fort Sill specimens represent a new state record for Oklahoma.

Efferia subpilosus (Schaeffer)

A species known previously from Utah, and apparently a new state record for Oklahoma (Fisher and Wilcox, 1997).

Efferia texana (Banks)

Efferia texana is a species known from Oklahoma, also from Kansas, New Mexico and Texas, and Mexico (Fig. 76).

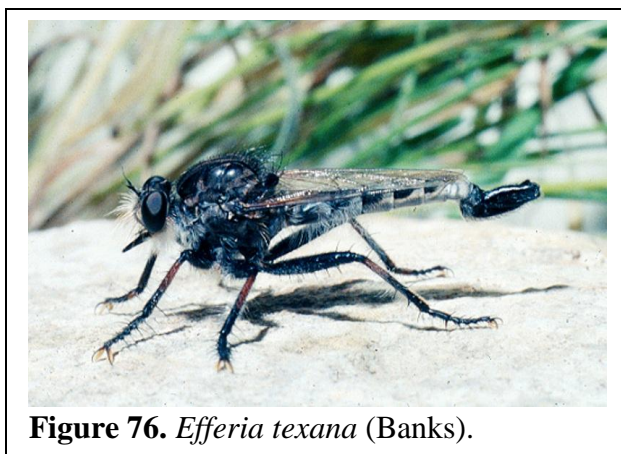


Figure 76. *Efferia texana* (Banks).

Efferia tuberculatus (Coquillett)

This robberfly was described from Texas, but is also known from Arizona, New Mexico, and Oklahoma (Wilcox, 1966).

Other species of *Efferia* known from Oklahoma include *E. argentifrons* (Hine), *E. kansensis* (Hine), *E. leucocoma* (Williston), *E. luna* Wilcox, *E. prairiensis* (Bromley), *E. rapax* (Osten Sacken), and *E. snowi* (Hine).

Haplopogon latus (Coquillett)

This robber fly species was originally described from Texas, and the Fort Sill specimens represent a new state record.

Heteropogon lautus (Bromley) (Dasypogoninae)

This robber fly species was originally described from Texas, and the Fort Sill specimens represent also a new state record.

Holopogon snowi Back (Dasypogoninae)

This small robber fly was originally described from Kansas, and is known from Oklahoma and Texas.

Lampria bicolor (Wiedemann) (Laphriinae)

This widespread species is known from northeastern U.S. to Florida west to Texas, north to Kansas.

Lampria rubriventris (Macquart)

This species is known from Wyoming and Colorado to Texas, east to Illinois. Individuals commonly perch on tips of plants in July throughout the grasslands of Fort Sill.

Laphria flavicollis Say (Laphriinae)

An excellent bumblebee mimic, it is a rather widespread species, reported from Canada to Iowa, Texas and to Florida. Larvae of this genus are found in downed wood, and adults were collected perching on dead wood accumulations in sunny areas at Fort Sill.

Laphria macquarti (Banks)

A common species in Texas, it apparently has not been previously reported from Oklahoma (Fig. 77).

Leptogaster murinus Loew

This grass fly is known from South Dakota to Nebraska east to Ohio and west to Arkansas and Texas. This slender robber fly picks off small flies and aphids from grass stems.

Leptogaster virgata Coquillett is also known from Oklahoma (Martin and Wilcox, 1883).

Machimus sp. (Asilinae)

A complex of species, many of which are difficult to distinguish.

Machimus snowi (Hine) has been collected in Oklahoma (Fisher and Wilcox, 1997)

Microstylum morsum Loew (Stenopogoninae)

This robber fly is considered to be the largest species of this family in North America, with a body length exceeding 50 mm in some individuals. It is known to attack large cicadas, grasshoppers and wasps. Beckemeyer and Charlton (2000) provide records for 13 counties in

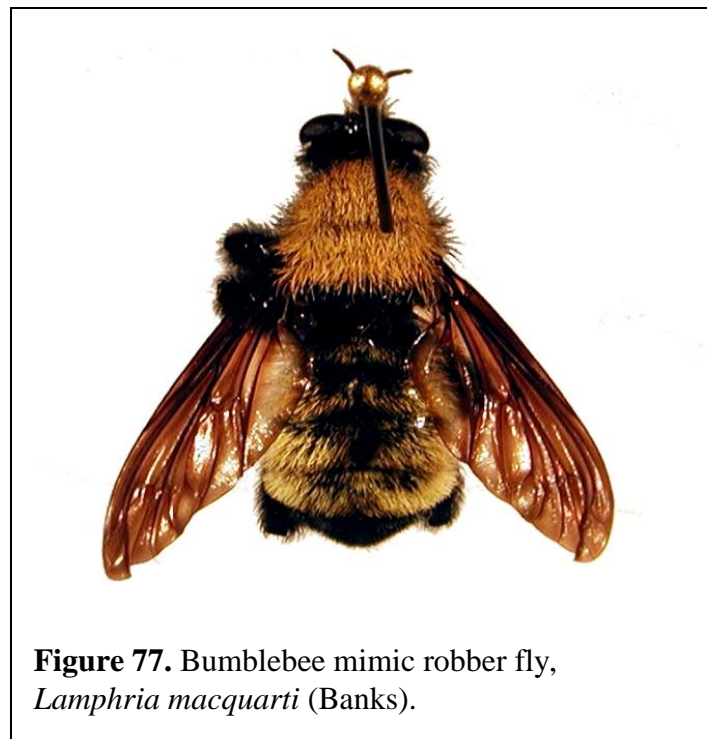


Figure 77. Bumblebee mimic robber fly, *Lamphria macquarti* (Banks).

Oklahoma. Comanche County is a new county record. This fly is impressive as it lumbers across open areas to perch on trees and shrubs in search of prey. It is a common species on Fort Sill.

Neoitamus orphne (Walker)

This is a species of robber fly known from Maine to North Carolina, west to Colorado. The Fort Sill specimens represent a new state record. The genus is easily recognized by having hairs on the back of the top of the head bent at right angles in forward direction.

Ommatius ouachitensis Bullington and Lavigne (Asilinae)

This species was originally described from Pushmataha County, and represents a new county record. Having long hairs on the style of the antenna easily distinguishes this genus.

Ommatius tibialis Say

Bullington and Lavigne (1984) indicate that this species is primarily associated with the eastern deciduous forest. The Fort Sill specimen represents a new state record for Oklahoma.

Other species in this genus known from Oklahoma include *O. gemma* Brimley and *O. oklahomensis* Bullington and Lavigne (Bullington and Lavigne 1984).

Ospriocercus abdominalis (Wiedemann) (Stenopogoninae)

A species distributed from Nebraska south to California and Texas. This robber fly is distinctive in the field with its black body and red marked abdomen, but is smaller than *O. rhadamanthus* Loew.

Ospriocercus latipennis (Loew)

This is a common species known from Colorado to South Dakota south to Texas.

Ospriocercus longulus (Loew)

Previously, this species was known from Arizona, New Mexico, and Texas. Apparently, the Fort Sill specimens are a new state record.

Ospriocercus rhadamanthus Loew

A beautiful black species, often marked with red abdominal segments is considered uncommon throughout its range, which includes Kansas to Texas and west to New Mexico. Adults were found associated with short to medium vegetation on south facing hillsides of the West Range of Fort Sill.

Other species of this genus recorded from Oklahoma include *O. latipennis* Loew and *O. pumilis* Coquillett.

Philonicus limpidipennis (Hine) (Asilinae)

This species has been recorded from Arizona and Colorado, and represents a new state record for Oklahoma.

Other *Philonicus* species that have been reported from Oklahoma include *P. rufipennis* Hine.

Proctacanthella cacopiloga (Hine) (Asilinae)

A rather common species often associated with bare soil, especially sandy areas, is known from Colorado to Illinois and New Jersey west to Oklahoma and Texas.

Proctacanthella leucopogon (Williston)

The Fort Sill record for this robber fly represents a new state record. It has been recorded from South Dakota to Colorado south to Arizona and Texas (Bromley, 1937; Martin and Wilcox, 1983).

Proctacanthella exquisita (Osten Sacken) has also been reported from Oklahoma.

Proctacanthus hinei Bromley
(Asilinae)

A beautiful large species of robber fly often observed perching on sandy areas surrounding larger streams. It ranges from Ontario to Massachusetts south to North Carolina west Texas. The orange coloration of this species is distinctive, and was occasionally common along exposed sandy edges of East Cache Creek.

Proctacanthus milbertii
Macquart



Figure 78. A typical robber fly.

This species is widespread, known from much of the United States, often abundant in native pristine grasslands (Fig. 78).

Proctacanthus rodecki James

A species known from Colorado to North Dakota, south to New Mexico, Oklahoma, and Texas. It is generally has a lighter cast to its overall coloration than does *P. milbertii*.

Prolepsis tristis (Walker) (Stenopogoninae)

This beautiful species ranges from California to Missouri to North Carolina. Records are also available from Texas and Mexico. The male is black and resembles sphecid wasps, whereas the female is red, brown and black, and is similar to *Polistes* paper wasps. But a wide range of color forms mixing reds, yellows, browns, and black is possible throughout its range. This amazing color polymorphism led to this species being described many times as different species.

Promachus bastardii (Macquart) (Asilinae)

Fisher and Wilcox (1997) recorded this species from Ontario to Florida, west to Colorado, and north to Michigan

Promachus dimidiatus Curran

A more western species of the genus, recorded from Alberta to Utah, New Mexico, and Kansas. The Fort Sill specimens represent a new state record.

Promachus fitchii Osten Sacken

Fisher and Wilcox (1997) indicate that this species is known from Connecticut south to Florida, west to Nebraska and south to Texas.

Promachus hinei Bromley

A beautiful, large robber fly known from Ohio west to Kansas, south to Texas and into the Southwest. The striking banded pattern of yellow and black will attract the attention of most any collector. This species is common on Fort Sill, often seen perching on trees and shrubs along or among grasslands ready to ambush prey.

Another species of *Promachus* known from Oklahoma is *P. oklahomensis* Pritchard.

Psilocurus birdi Curran (Laphystiinae)

This is a species known from Oklahoma and Mississippi (Martin and Wilcox 1983).

Psilocurus nadiusculus Loew

Previously, this species has been recorded from Louisiana, Mississippi, and Texas.

Saropogon dispar Coquillett (Dasypogoninae)

Martin and Wilcox (1983) reported this species from Oklahoma and Texas. Adults perched or slowly flew among tall vegetation throughout the grasslands of Fort Sill. Common prey were usually wasps, especially Scoliidae.

Saropogon combustus Loew is another species of this genus known from Oklahoma. It can be a common species in Colorado, Kansas, Nebraska, and Texas.

Scleropogon helvolus Loew (Stenopogoninae)

A common species distributed from Colorado to South Dakota south to Oklahoma and Texas.

Additional species of *Scleropogon*, *S. sublatus* (Wiedemann) and *S. indistinctus* (Bromley) are known from Oklahoma.

Stichopogon trifasciatus (Say) (Stichopogoninae)

A very common species, characteristic of bare, sandy, or gravel areas surrounding bodies of water. This species is common around the streams, lakes and ponds of Fort Sill. Lavigne and Holland (1969) provide a good discussion of this species' biology.

Triola interruptus (Macquart)

This is a robber fly species known from coast to coast, into Central America. It is often found perched on bare soil or sand surrounding bodies of water, and occurred at Fort Sill along most streams.

Other species known from Oklahoma and may occur on Fort Sill include *Ceraturgus oklahomensis* (Bromley) (Dasypogoninae), *Echthodopa pubera* Loew (Stenopogoninae), *Hadrokolos pritchardi* Martin (Stenopogoninae), *Heteropogon currani* Pritchard, *H. texanus* (Bromley) (Dasypogoninae), *Holopogon snowi* Back (Stenopogonidae), *Laphystia varipes* Curran, *L. bromleyi*, Wilcox, *L. varipes* Curran (Laphistinae), *Lasiopogon oklahomensis* Cole and Wilcox (Dasypogoninae), *Megaphorus acrus* (Curran), and *M. guildiana* (Williston) (Asilinae).

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Mydas Flies (Mydidae)

The Mydidae or mydas flies are distributed worldwide, but preferring arid to semi-arid environments with open vegetation. These flies also occur in tropical rainforests. This family includes the largest known flies in body length. These flies are primarily collected during the hottest hours of the day flying over or sitting on bare soil or on objects such as downed wood or stumps in direct sunlight. Interestingly, most species seem to be habitat-specific. They have a brief activity period during the year; mydas flies are considered rare insects, prized by collectors, and usually infrequently observed.

Approximately 52 species of mydas flies are known from North America. The California species, the Delhi Sands Flower-loving fly, *Rhaphiomidas terminatus abdominalis* Cazier, is a listed endangered species. At least three species are known from Oklahoma. Two species, *Mydas clavatus* (Drury) and *M. chrysostomus* Osten Sacken were collected on Fort Sill.



Figure 78. *Mydas clavatus* (Drury).

Mydas clavatus ranges from Ontario to Florida west to Nebraska, south to Texas, and is considered the most common of all mydas flies. The larvae of this species are found in decaying logs, presumably attacking beetle larvae. Adults are typically found near log piles, or old wood stacks of saw mills or log jams associated with flood plains of streams. On Fort Sill, all adults of *Mydas clavatus* were collected or observed associated with these habitats (Appendix C).

Mydas chrysostomus is considered a rare species of the *M. fulvifrons* complex (Welch and Kondratieff, 1990), known from Georgia, Illinois, Kansas, Mississippi, and Texas (Wilcox et al., 1989). The Fort Sill collections represent a new state record. Adults were found perching or flying in clearings in oak woodlands near the junction of LETRA Gate Road and North Boundary Road. These specimens represent a major addition to the known collections of this species.

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Appendix B. Cumulative checklist of the Arthropoda collected on Fort Sill, Comanche Co., Oklahoma from 2002-2004 (Kondratieff et al. 2003, 2004 and this report, not including the spiders [See Chapter 1]).

Order	Suborder	Family	Subfamily	Scientific Name
Class Arachnida				
Acari		Ixodidae		<i>Amblyomma americanum</i> (Linnaeus) <i>Amblyomma maculatum</i> Koch <i>Dermacentor albipictus</i> (Packard) <i>Dermacentor variabilis</i> (Say) <i>Ixodes scapularis</i> Say
Scorpiones		Buthidae		<i>Centruroides vittatus</i> (Say)
Class Hexapoda				
Ephemeroptera		Baetidae		<i>Baetis intercalaris</i> McDunnough <i>Callibaetis floridanus</i> Banks <i>Callibaetis montanus</i> Eaton <i>Callibaetis</i> sp. <i>Fallceon quilleri</i> (Dodds) <i>Plauditus texanus</i> Wiersema <i>Plauditus dubius</i> (Walsh) <i>Pseudocloeon dardanum</i> (McDunnough) <i>Procloeon</i> sp <i>Pseudocloeon ephippiatus</i> (Traver)
		Caenidae		<i>Brachycercus lacustris</i> (Needham) <i>Caenis amica</i> Hagen <i>Caenis latipennis</i> Banks <i>Caenis punctata</i> McDunnough
		Ephemeridae		

			<i>Hexagenia limbata</i> (Serville)
		Heptageniidae	
			<i>Stenonema femorata</i> (Say)
		Isonychiidae	
			<i>Isonychia rufa</i> McDunnough
		Leptohyphidae	
			<i>Tricorythodes minutus</i> Traver
			<i>Tricorythodes</i> sp.
		Leptophlebiidae	
			<i>Neochoroterpes oklahoma</i> (Traver)
		Polymitarcyidae	
			<i>Tortopus puella</i> (Pictet)
Odonata			
	Anisoptera		
		Aeshnidae	
			<i>Anax junius</i> (Drury)
			<i>Basiaeschna janata</i> (Say)
		Cordulegastridae	
			<i>Cordulegaster obliqua</i> (Say)
		Corduliidae	
			<i>Somatochlora linearis</i> (Hagen)
		Corduliinae	
			<i>Epitheca cynosura</i> (Say)
			<i>Epitheca petechialis</i> (Muttkowski)
			<i>Epitheca princeps</i> Hagen
			<i>Epitheca semiaquea</i> (Burmeister)
		Macromiinae	
			<i>Didymops transversa</i> (Say)
			<i>Macromia illinoiensis georgina</i> (Selys)
			<i>Macromia pacifica</i> Hagen
		Gomphidae	
			<i>Dromogomphus spinosus</i> Selys
			<i>Dromogomphus spoliatus</i> (Hagen)
			<i>Erpetogomphus designatus</i> Hagen in Selys
			<i>Gomphus externus</i> Hagen
			<i>Gomphus militaris</i> Hagen
			<i>Gomphus ozarkensis</i> Westfall
			<i>Hagenius brevistylus</i> Selys
			<i>Phyllogomphoides stigmatus</i> (Say)

		<i>Progomphus obscurus</i> (Rambur)
		<i>Stylurus plagiatus</i> (Selys)
	Libellulidae	
		<i>Brechmorhoga mendax</i> (Hagen)
		<i>Celithemis eponina</i> (Drury)
		<i>Celithemis fasciata</i> Kirby
		<i>Dythemis fugax</i> Hagen
		<i>Dythemis velox</i> Hagen
		<i>Erythrodiplax umbrata</i> (Linnaeus)
		<i>Erythemis simplicicollis</i> (Say)
		<i>Ladona deplanata</i> (Rambur)
		<i>Libellula incesta</i> Hagen
		<i>Libellula luctuosa</i> Burmeister
		<i>Libellula lydia</i> Drury
		<i>Libellula pulchella</i> Drury
		<i>Orthemis ferruginea</i> (Fabricius)
		<i>Pachydiplax longipennis</i> (Burmeister)
		<i>Pantala flavescens</i> (Fabricius)
		<i>Pantala hymenaea</i> (Say)
		<i>Perithemis tenera</i> (Say)
		<i>Sympetrum corrupta</i> (Hagen)
		<i>Sympetrum vicina</i> (Hagen)
		<i>Tramea lacerata</i> Hagen
		<i>Tramea onusta</i> Hagen
Zygoptera		
	Calopterygidae	
		<i>Calopteryx maculata</i> (Beauvois)
		<i>Hetaerina americana</i> (Fabricius)
		<i>Hetaerina titia</i> (Drury)
	Coenagrionidae	
		<i>Argia apicale</i> (Say)
		<i>Argia fumipennis</i> (Burmeister)
		<i>Argia immunda</i> (Hagen)
		<i>Argia moestum</i> (Hagen)
		<i>Argia sedula</i> (Hagen)
		<i>Argia translata</i> Hagen in Selys
		<i>Enallagma aspersum</i> (Hagen)
		<i>Enallagma basidens</i> Calvert
		<i>Enallagma civile</i> (Hagen)
		<i>Enallagma divagans</i> Selys
		<i>Enallagma exsulans</i> (Hagen)
		<i>Enallagma praevarum</i> (Hagen)
		<i>Enallagma signatum</i> (Hagen)
		<i>Enallagma vesperum</i> Calvert
		<i>Ischnura demorsa</i> (Hagen)

			<i>Ischnura denticollis</i> (Burmeister) <i>Ischnura hastata</i> (Say) <i>Ischnura perparva</i> (McLachlan in Selys) <i>Ischnura posita</i> (Hagen) <i>Ischnura verticalis</i> (Say) <i>Telebasis salvum</i> (Hagen)
		Lestidae	
			<i>Lestes alacer</i> Hagen <i>Lestes disjunctus australis</i> Walker
Orthoptera	Caelifera		
		Acrididae	
			<i>Acrolophitus hirtipes</i> (Say) <i>Ageneotettix deorum</i> (Scudder) <i>Arphia conspersa</i> (Scudder) <i>Arphia xanthoptera</i> (Burmeister) <i>Boopedon auriventris</i> McNeill <i>Boopedon gracile</i> Rehn <i>Campylacantha olivacea</i> (Scudder) <i>Chortophaga viridifasciatum</i> (DeGeer) <i>Dactylotum bicolor</i> (Charpentier) <i>Dendrotettix quercus</i> (Packard) <i>Dissosteira carolinus</i> (Linnaeus) <i>Encoptolophus costalis</i> (Scudder) <i>Hadrotettix trifasciatus</i> (Say) <i>Hesperotettix speciosa</i> (Scudder) <i>Hesperotettix viridis pratensis</i> (Thomas) <i>Hesperotettix viridis viridis</i> (Thomas) <i>Hippiscus ocelote</i> (Saussure) <i>Hypochlora alba</i> (Dodge) <i>Leptysma marginicollis</i> (Serville) <i>Melanoplus angustipennis</i> (Dodge) <i>Melanoplus bispinosus</i> Scudder <i>Melanoplus bivittatus</i> (Say) <i>Melanoplus confusus</i> Scudder <i>Melanoplus differentialis nigricans</i> (Thomas) <i>Melanoplus femurrubrum</i> (DeGeer) <i>Melanoplus foedus</i> Scudder <i>Melanoplus glaucipes</i> (Scudder) <i>Melanoplus keeleri</i> (Thomas) <i>Melanoplus packardii</i> Scudder <i>Melanoplus plebejus</i> (Stal) <i>Melanoplus ponderosus</i> (Scudder) <i>Melanoplus sanguinipes</i> (Fabricius) <i>Melanoplus scudderi</i> (Uhler) <i>Melanoplus splendidus</i> Hebard

			<i>Melanoplus texanus</i> (Scudder)
			<i>Mermiria bivittata</i> (Serville)
			<i>Mermiria picta</i> (Walker)
			<i>Opeia obscurus</i> (Thomas)
			<i>Ophulella speciosus</i> (Scudder)
			<i>Paratylotropidia brunneri</i> Scudder
			<i>Pardalophora saussurei</i> (Scudder)
			<i>Paropomala</i> sp.
			<i>Phoetaliotes nebrascensis</i> (Thomas)
			<i>Pseudopomala brachyptera</i> (Scudder)
			<i>Psoloessa texana</i> Scudder
			<i>Schistocerca alutacea</i> (Harris)
			<i>Schistocerca americana</i> (Drury)
			<i>Schistocerca obscurus</i> (Fabricius)
			<i>Spharagemon collaris</i> (Scudder)
			<i>Spharagemon equale</i> (Say)
			<i>Syrbula admirabilis</i> (Uhler)
			<i>Trachyrhachys kiowa</i> (Thomas)
			<i>Trimerotropis maritima</i> (Harris)
			<i>Trimerotropis pallidipennis</i> (Burmeister)
			<i>Xanthippus corallipes</i> (Haldeman)
Plecoptera			
		Capniidae	
			<i>Allocapnia granulata</i> (Claassen)
		Leuctridae	
			<i>Zealeuctra claasseni</i> (Frison)
		Perlidae	
			<i>Neoperla choctaw</i> Stark and Baumann
			<i>Perlesta decipiens</i> (Walsh)
		Perlodidae	
			<i>Hydroperla crosbyi</i> (Needham and Claassen)
		Taeniopterygidae	
			<i>Taeniopteryx burksi</i> Ricker and Ross
Heteroptera			
	Gerromorpha		
		Gerridae	
			<i>Gerris marginatus</i> Say
			<i>Gerris remigis</i> Say
			<i>Gerris</i> sp.
			<i>Neogerris hesione</i> (Kirkaldy)

		<i>Trepobates knighti</i> Drake and Harris
		<i>Trepobates subnitidus</i> Esaki
	Hydrometridae	
		<i>Hydrometra martini</i> Kirkaldy
	Mesoveliidae	
		<i>Mesovelia mulsanti</i> White
	Veliidae	
		<i>Microvelia paludicola</i> Champion
		<i>Microvelia</i> sp.
		<i>Rhagovelia choreutes</i> Hussey
		<i>Rhagovelia knighti</i> Drake and Harris
Nepomorpha		
	Belostomatidae	
		<i>Belostoma fluminea</i> Say
	Corixidae	
		<i>Corisella edulis</i> (Champion)
		<i>Hesperocorixa obliqua</i> (Hungerford)
		<i>Morphocorixa compacta</i> (Hungerford)
		<i>Palmacorixa nana walleyi</i> Hungerford
		<i>Sigara alternata</i> (Say)
		<i>Sigara modesta</i> (Abbott)
		<i>Trichocorixa calva</i> (Say)
		<i>Trichocorixa kanza</i> Sailer
	Gelastocoridae	
		<i>Gelastocoris oculata</i> (Fabricius)
	Nepidae	
		<i>Ranatra nigra</i> Herrich-Schaffer
	Notonectidae	
		<i>Buenoa confusa</i> Truxal
		<i>Buenoa margaritacea</i> Torre-Bueno
		<i>Buenoa scimitra</i> Bare
		<i>Buenoa</i> sp.
		<i>Notonecta indica</i> Linnaeus
		<i>Notonecta undulata</i> Say
	Pleidae	
		<i>Neoplea striola</i> (Fieber)
Pentatomomorpha		
	Pentatomidae	

Homoptera

Auchenorrhyncha

Cicadidae

Acrosternum hilaris (Say)
Amaurochrous cinctipes (Say)
Andrallus spinidens (Fabricius)
Apateticus cynicus (Say)
Banasa calva (Say)
Banasa euchlora Stål
Brochymena arborea (Say)
Brochymena cariosa Stål
Brochymena quadripustulatus (Fabricius)
Euschistus servus (Say)
Euschistus tristigmus (Say)
Euschistus variolarius (Palisot)
Holcostethus limbolarius (Stål)
Mecidea major Sailer
Menecles inserta (Say)
Murgantia histrionica (Hahn)
Oebalus pugnax (Fabricius)
Podisus maculiventris (Say)
Prionosoma podopioides Uhler
Thyanta custator (Fabricius)
Trichopepla semivittata (Say)

Neuroptera

Megaloptera

Corydalidae

Beameria venosa (Uhler)
Cicadetta calliope (Walker)
Cicadetta kansa (Davis)
Diceroprocta azteca (Kirkaldy)
Magicicada cassinii (Fisher)
Neocicada hieroglyphica (Say)
Pacarina puella Davis
Tibicen aurifera (Say)
Tibicen dealbata (Davis)
Tibicen dorsata (Say)
Tibicen lyricen (DeGeer)
Tibicen pruinosa (Say)
Tibicen superba (Fitch)

Sialidae

Chauliodes rastricornis Rambur
Corydalis cornutus (Linnaeus)

Sialis itasca Ross
Sialis mohri Ross

Planipennia

Sisyridae

Climacia areolaris (Hagen)
Climacia chapini Parfin and Gurney
Sisyra vicaria (Walker)

Coleoptera

Adephaga

Carabidae

Acupalpus partiaris (Say)
Acupalpus pauperculus Dejean
Acupalpus testaceus Dejean
Agonum decora (Say)
Agonum extensicollis (Say)
Agonum pallipes (Fabricius)
Agonum punctiformis (Say)
Amara fortis LeConte
Amara impuncticollis (Say)
Amara pennsylvanica Hayward
Amara sp.
Amphasia sericeus (Harris)
Anisodactylus dulcicollis (Laferte)
Anisodactylus harpaloides (Laferte)
Anisodactylus merula (Germar)
Anisodactylus opaculus (LeConte)
Anisodactylus rusticus (Say)
Ardistomis schaumii LeConte
Aspidoglossa subangulatus (Chaudoir)
Bembidion americanum Dejean
Bembidion chalceum Dejean
Bembidion confusum Hayward
Bembidion cordatus (LeConte)
Bembidion coxendix Say
Bembidion rapidum (LeConte)
Bembidion texanum Chaudoir
Bembidion variegatum Say
Brachinus elongatulus (Chaudoir)
Brachinus adustipennis Erwin
Brachinus alternans Dejean
Brachinus elongatulus (Chaudoir)
Brachinus janthinipennis (Dejean)
Brachinus kansanus LeConte
Brachinus phaeocerus Chaudoir
Brachinus tenuicollis LeConte
Brachinus sp.
Bradycellus neglectus (LeConte)
Bradycellus sp.
Calathus opaculus LeConte

Calosoma macrum LeConte
Calosoma marginalis Casey
Calosoma obsoleta Say
Calosoma scrutator (Fabricius)
Calosoma wilcoxi LeConte
Carabus finitimus Haldeman
Chlaenius brevilabris LeConte
Chlaenius erythropus Germar
Chlaenius laticollis Say
Chlaenius platyderus Chaudoir
Chlaenius sericeus (Forster)
Chlaenius tomentosus (Say)
Chlaenius tricolor Dejean
Clivina dentipes Dejean
Colliuris pensylvanicus (Linnaeus)
Cratacanthus dubius (Beauvois)
Cyclotrachelus incisa (LeConte)
Cyclotrachelus torvus deceptus (Casey)
Cymindis laticollis Say
Cymindis pilosus Say
Dicaelus elongatus Bonelli
Diplocheila impressicollis (Dejean)
Diplocheila obtusus (LeConte)
Discoderus parallelus (Haldeman)
Discoderus sp.
Dyschirius erythrocerus LeConte
Dyschirius globulosa (Say)
Galerita bicolor Drury
Galerita mexicana Chaudoir
Harpalus caliginosus (Fabricius)
Harpalus compar LeConte
Harpalus faunus Say
Harpalus fulgens Csiki
Harpalus gravis LeConte
Harpalus katieae Battoni
Harpalus laticeps LeConte
Harpalus longicollis LeConte
Helluomorphoides praeustus bicolor (Harris)
Helluomorphoides texana (LeConte)
Lachnophorus elegantulus Mannerheim
Lebia grandis Hentz
Lebia pulchella Dejean
Lebia solea Hentz
Lebia viridis Say
Morion monilicornis (Latreille)
Notiobia maculicornis (Chaudoir)
Notiobia sayi (Blatchley)
Notiobia terminata (Say)

Omophron americanum Dejean
Omophron nitidum LeConte
Oodes amaroides Dejean
Panagaeus fasciatus Say
Pasimachus californicus Chaudoir
Pasimachus elongatus LeConte
Poecilus chalcites (Say)
Poecilus lucublanda (Say)
Poecilus scitulus LeConte
Pogonodaptus mexicana (Bates)
Pterostichus permunda (Say)
Scaphinotus cavicollis (LeConte)
Scaphinotus elevatus (Fabricius)
Scarites quadriceps Chaudoir
Scarites subterraneus Fabricius
Scarites sp.
Schizogenius brevisetosus Whitehead
Schizogenius falli Whitehead
Schizogenius lineolatus (Say)
Schizogenius ozarkensis Whitehead
Schizogenius scopaeus Whitehead
Selenophorus ellipticus Dejean
Selenophorus hylacis (Say)
Selenophorus pedicularis Dejean
Semiardistomis viridis (Say)
Stenocrepis cupreus (Chaudoir)
Stenolophus conjunctus (Say)
Stenolophus dissimilis Dejean
Stenolophus lecontei (Chaudoir)
Stenolophus lineola (Fabricius)
Stenolophus ochropeza (Say)
Stenolophus sp.
Stenomorphus californicum rufipes LeConte
Zuphium americanum Dejean
Zuphium sp.

Cicindelidae

Cicindela cleripes LeConte
Cicindela cuprascens LeConte
Cicindela duodecimguttata Dejean
Cicindela hirticollis Say
Cicindela obsoleta vulturina LeConte
Cicindela ocellata rectilatera Chaudoir
Cicindela punctulata Olivier
Cicindela repanda Dejean
Cicindela rufiventris cumatilis LeConte
Cicindela scutellaris Say
Cicindela sericea (Casey)

Dytiscidae

Cicindela sexguttata Fabricius
Cicindela splendida Hentz
Cicindela tenuisignata LeConte
Cicindela trifasciata Fabricius
Megacephala carolina (Linnaeus)
Megacephala virginica (Linnaeus)

Acilius fraternus Harris
Agabus disintegratus (Crotch)
Agabus semivittatus LeConte
Agabus sp.
Celina hubbelli Young
Copelatus chevrolati renovatus Guignot
Copelatus glyphicus (Say)
Coptotomus loticus Hilsenhoff
Coptotomus venustus (Say)
Cybister fimbriolatus (Say)
Desmopachria sp.
Eretes explicitus Miller
Graphoderus liberus (Say)
Heterosternuta diversicornis (Sharp)
Heterosternuta sp.
Hydaticus bimarginatus (Say)
Hygrotus acaroides (LeConte)
Laccophilus fasciatus rufus Melsheimer
Laccophilus fasciatus terminalis Sharp
Laccophilus pictus insignis Sharp
Laccophilus proximus Say
Laccophilus quadrilineatus quadrilineatus Horn
Liodessus flavicollis (LeConte)
Neobidessus pullus (LeConte)
Neoporus dimidiatus (Gemminger and Harold)
Neoporus undulatus (Say)
Neoporus sp.
Thermonectes ornatcollis Aube
Thermonetus basillaris (Harris)
Uvarus lacustris (Say)
Uvarus texanus (Sharp)

Gyrinidae

Dineutus assimilis Kirby
Dineutus ciliatus (Forsberg)
Dineutus horni Roberts
Gyretes compressus LeConte
Gyrinus parvus Say
Gyrinus woodruffi Fall

Haliplidae

Polyphaga

Cerambycidae

Haliplus deceptus Matheson
Haliplus fasciatus Aube
Haliplus lewisii Crotch
Haliplus tortilipenis Brigham and Sanderson
Haliplus triopsis Say
Peltodytes duodecimpunctatus (Say)
Peltodytes litoralis Matheson
Peltodytes sexmaculatus Roberts

Aethcerinus wilsonii (Horn)
Aneflomorpha sp.
Anelaphus villosus (Fabricius)
Anelphus moestus moestus (LeConte)
Ataxia crypta (Say)
Ataxia hubbardi Fisher
Batyle ignicollis (Say)
Batyle suturalis cylindrella Casey
Batyle suturalis suturalis (Say)
Crossidius d. discoideum (Say)
Distenia undatus (Fabricius)
Dorcaschema alternatum (Say)
Ecyrus dasycerus (Say)
Elaphidion mucronatus (Say)
Enaphalodes atomarius (Drury)
Enaphalodes rufulum (Haldeman)
Euderces picipes occidentalis Linsley
Euderces reichei LeConte
Graphisurus triangulifer (Haldeman)
Hemierana marginata ardens LeConte
Hippopsis lemniscata (Fabricius)
Knulliana cincta cincta (Drury)
Leptostylopsis transversus (Gyllenhal)
Leptura emarginata Fabricius
Liopinus sp.
Mecas cana saturnina (LeConte)
Mecas marginella LeConte
Mecas pergrata (Say)
Megacyllene decora (Olivier)
Molorchus bimaculatus Say
Moneilema armatum LeConte
Neoclytus mucronatus mucronatus (Fabricius)
Oberea ocellata Haldeman
Oberea oculaticollis (Say)
Oberea tripunctata (Swederus)
Obrium maculatum (Olivier)
Obrium rufulum Gahan

	<i>Oncideres cingulata</i> (Say)
	<i>Phymatodes varius</i> (Fabricius)
	<i>Plectrodera scalator</i> (Fabricius)
	<i>Plinthocoelium suaveolens</i> (Linnaeus)
	<i>Psyrassa unicolor</i> (Randall)
	<i>Saperda tridentata</i> Olivier
	<i>Smodicum cucujiforme</i> (Say)
	<i>Stenocorus cinnamoptera</i> (Randall)
	<i>Stenosphenus notatus</i> (Olivier)
	<i>Sternidius variegatus</i> (Haldeman)
	<i>Strangalia luteicornis</i> (Fabricius)
	<i>Strangalia sexnotata</i> Haldeman
	<i>Strangalia virilis</i> LeConte
	<i>Tessaropa tenuipes</i> (Haldeman)
	<i>Tetraopes texanus</i> Horn
	<i>Trigonarthris atrata</i> (LeConte)
	<i>Tylonotus bimaculatus</i> Haldeman
	<i>Typocerus confluens</i> Casey
	<i>Typocerus octonotata</i> (Haldeman)
	<i>Typocerus velutina nobilis</i> (Newman)
	<i>Xylotrechus colonus</i> (Fabricius)
Ceratocanthidae	
	<i>Germarostes aphodioides</i> (Illiger)
	<i>Germarostes globosus</i> (Say)
Dryopidae	
	<i>Helichus suturalis</i> LeConte
	<i>Helichus</i> sp.
	<i>Pelonomus obscurus</i> LeConte
Elmidae	
	<i>Stenelmis cheryl</i> Brown
	<i>Stenelmis occidentalis</i> Schmude & Brown
	<i>Stenelmis sexlineata</i> Sanderson
	<i>Stenelmis</i> sp.
Geotrupidae	
	<i>Bolbocerosoma pusillum</i> Dawson and McCollock
	<i>Geotrupes opacus</i> Haldeman
Hybosoridae	
	<i>Hybosorus illigeri</i> Reiche
Hydrophilidae	
	<i>Berosus exiguus</i> (Say)
	<i>Berosus infuscatus</i> LeConte
	<i>Berosus miles</i> LeConte
	<i>Berosus peregrinus</i> (Herbst)

Berosus stylifer Horn
Chaetarthria bicolor Sharp
Chaetarthria sp.
Crenitis sp.
Cymbiodyta beckeri Smetana
Cymbiodyta sp.
Dibolocelus ovatus (Gemminger and Harold)
Enochrus cinctus (Say)
Enochrus hamiltoni (Horn)
Enochrus ochraceus (Melsheimer)
Enochrus pygmaeus (Fabricius)
Enochrus sayi Gunderson
Epimetopus sp.
Helochares maculicollis Mulsant
Hydrochara leechi Smetana
Hydrochara occulta (d'Orchymont)
Hydrochara soror Smetana
Hydrochara spangleri Smetana
Hydrochus sp.
Hydrophilus triangularis Say
Hydrovatus pustulatus (Melsheimer)
Laccobius minutoides Orchymont
Laccobius teneralis Cheary
Paracymus confusus Wooldridge
Paracymus sp.
Tropisternus blatchleyi Orchymont
Tropisternus collaris (Fabricius)
Tropisternus ellipticus (LeConte)
*Tropisternus lateralis nimbatu*s (Say)
Tropisternus natator d'Orchymont

Ochodaeidae

Ochodaeus biarmatus LeConte

Scarabaeidae

Anomala flavipennis Burmeister
Anomala innuba (Fabricius)
Anomala marginata (Fabricius)
Aphodius rubeolus Beauvois
Aphodius rusicola Melsheimer
Ataenius cognata (LeConte)
Ataenius figurator Harold
Ataenius gracilis (Melsheimer)
Ataenius hesperius Cartwright
Ataenius inquisitus Horn
Ataenius spretulus (Haldeman)
Ataenius strigatus (Say)
Ateuchus histeroides Weber

Canthon perplexus LeConte
Canthon pilularium (Linnaeus)
Canthon viridis (Beauvois)
Cotinis nitida (Linnaeus)
Cyclocephala hirta LeConte
Cyclocephala melanocephala (Fabricius)
Diplotaxis frondicola (Say)
Diplotaxis harperi Blanchard
Diplotaxis maura Fall
Diplotaxis truncatula LeConte
Dyscinetus morator (Fabricius)
Euetheola humilis (Burmeister)
Euphoria kerni Haldeman
Euphoria sepulcralis (Fabricius)
Ligyris gibbosus (DeGeer)
Martineziella dutertrei (Chalumeau)
Onthophagus gazella (Fabricius)
Onthophagus hecate (Panzer)
Onthophagus orpheus (Panzer)
Parastasia brevipes (LeConte)
Pelidnota punctatus (Fabricius)
Phanaeus vindex MacLeay
Phileurus valgus (Linnaeus)
Phyllophaga crenulata (Froelich)
Phyllophaga cribrata (LeConte)
Phyllophaga crinita (Burmeister)
Phyllophaga forbesi Glasgow
Phyllophaga lanceolata (Say)
Phyllophaga rubiginosa (LeConte)
Phyllophaga submucida (LeConte)
Phyllophaga torta (LeConte)
Polyphylla hammondi LeConte
Strigoderma arvicola (Fabricius)
Trichiotinus texanus (Horn)
Trigonopeltastes delta (Forster)

Silphidae

Necrodes surinamensis (Fabricius)
Nicrophorus orbicollis Say
Nicrophorus pustulatus Hersch
Oiceoptoma inaequalis (Fabricius)

Trogidae

Trox robinsoni Vaurie
Trox spinulosus Robinson
Trox suberosus Fabricius
Trox variolatus Melsheimer

Asilidae

Asilini

Asilus sp.*Atomosia melanopogon* Hermann*Atomosia puella* (Wiedemann)*Atomosia sayii* Johnson*Atomosia tibialis* (Hull)*Cerotainiops abdominalis* (Brown)*Cophura bella* (Loew)*Dicropaltum mesae* (Tucker)*Diogmites angustipennis* Loew*Diogmites neoternatus* (Bromley)*Diogmites symmachus* Loew*Efferia aestuans* (Linnaeus)*Efferia albibarbis* (Macquart)*Efferia helenae* (Bromley)*Efferia kelloggi* Wilcox*Efferia monki* (Bromley)*Efferia nemoralis* (Hine)*Efferia plena* (Hine)*Efferia subpilosus* (Schaeffer)*Efferia texana* (Banks)*Efferia tuberculatus* (Coquillett)*Haplopogon latus* (Coquillett)*Heteropogon lautus* Loew*Holopogon snowi* Back*Lampria bicolor* (Wiedemann)*Lampria rubriventris* (Macquart)*Laphria flavicollis* Say*Laphria macquarti* (Banks)*Leptogaster murinus* Loew*Machimus* sp.*Microstylum morosum* Loew*Neoitamus orphne* (Walker)*Ommatius ouachitensis* Bullington and Lavigne*Ommatius tibialis* Say*Ospriocercus abdominalis* Say*Ospriocercus latipennis* (Loew)*Ospriocercus rhadamanthus* Loew*Ospriocercus longulus* (Loew)*Philonicus limpidipennis* (Hine)*Philonicus* sp.*Proctacanthella leucopogon* (Williston)*Proctacanthus cacopilogus* (Hine)*Proctacanthus hinei* Bromley

		<i>Proctacanthus milbertii</i> Macquart
		<i>Proctacanthus rodecki</i> James
		<i>Prolepsis tristis</i> (Walker)
		<i>Promachus bastardii</i> (Macquart)
		<i>Promachus dimidiatus</i> Curran
		<i>Promachus fitchii</i> Osten Sacken
		<i>Promachus hinei</i> Bromley
		<i>Psilocurus birdi</i> Curran
		<i>Psilocurus nadiusculus</i> Loew
		<i>Saropogon dispar</i> Coquillett
		<i>Stenopogon helvolus</i> (Loew)
		<i>Stichopogon trifasciatus</i> (Say)
		<i>Triola interruptus</i> (Macquart)
	Mydidae	
		<i>Mydas chrysostomas</i> Osten Sacken
		<i>Mydas clavatus</i> (Drury)
Trichoptera		
	Helicopsychidae	
		<i>Helicopsyche borealis</i> (Hagen)
		<i>Helicopsyche limnella</i> Ross
		<i>Helicopsyche piroa</i> Ross
		<i>Helicopsyche</i> sp.
	Hydropsychidae	
		<i>Cheumatopsyche analis</i> (Banks)
		<i>Cheumatopsyche campyla</i> Ross
		<i>Cheumatopsyche lasia</i> Ross
		<i>Cheumatopsyche pasella</i> Ross
		<i>Cheumatopsyche</i> sp.
		<i>Hydropsyche bidens</i> Ross
		<i>Hydropsyche orris</i> Ross
		<i>Hydropsyche rossi</i> Flint et al.
		<i>Hydropsyche scalaris</i> Hagen
		<i>Hydropsyche simulans</i> Ross
		<i>Hydropsyche</i> sp.
		<i>Potomyia flava</i> (Hagen)
		<i>Smicridea fasciatella</i> McLachlan
		<i>Smicridea signata</i> (Banks)
	Hydroptilidae	
		<i>Hydroptila ajax</i> Ross
		<i>Hydroptila angusta</i> Ross
		<i>Hydroptila armata</i> Ross
		<i>Hydroptila consimilis</i> Morton
		<i>Hydroptila hamata</i> Morton

	<i>Hydroptila perdita</i> Morton
	<i>Hydroptila waubesiana</i> Betten
	<i>Hydroptila</i> sp.
	<i>Ochrotrichia tarsalis</i> (Hagen)
	<i>Orthotrichia aegerfasciella</i> (Chambers)
	<i>Orthotrichia cristata</i> Morton
	<i>Oxyethira azteca</i> (Mosely)
	<i>Oxyethira forcipata</i> Mosely
	<i>Oxyethira janella</i> Denning
	<i>Oxyethira pallida</i> (Banks)
	<i>Oxyethira zeronia</i> Ross
	<i>Oxyethira</i> sp.
Leptoceridae	
	<i>Ceraclea cancellata</i> (Betten)
	<i>Ceraclea maculata</i> (Banks)
	<i>Ceraclea punctata</i> (Banks)
	<i>Ceraclea</i> sp.
	<i>Leptocerus americanus</i> (Banks)
	<i>Nectopsyche candida</i> (Hagen)
	<i>Nectopsyche pavida</i> (Hagen)
	<i>Nectopsyche</i> sp.
	<i>Oecetis avara</i> (Banks)
	<i>Oecetis cinerascens</i> (Hagen)
	<i>Oecetis ditissa</i> Ross
	<i>Oecetis inconspicua</i> (Walker)
	<i>Oecetis nocturna</i> Ross
	<i>Oecetis persimilis</i> (Banks)
	<i>Oecetis</i> sp.
	<i>Triaenodes helo</i> Milne
	<i>Triaenodes injustus</i> (Hagen)
	<i>Triaenodes marginata</i> Sibley
	<i>Triaenodes perna</i> Ross
	<i>Triaenodes tardus</i> Milne
	<i>Triaenodes</i> sp.
	<i>Ylodes frontalis</i> (Banks)
Limnephilidae	
	<i>Pycnopsyche lepida</i> (Hagen)
Philopotamidae	
	<i>Chimarra angustipennis</i> Banks
	<i>Chimarra feria</i> Ross
	<i>Chimarra obscura</i> (Walker)
Polycentropodidae	
	<i>Cernotina calcea</i> Ross

Lepidoptera

Tortricidae

Cernotina spicata Ross
Cernotina sp.
Cymellus fraternus (Banks)
Paranyctiophylax affinis (Banks)
Paranyctiophylax moestus Banks
Paranyctiophylax sp.
Polycentropus centralis Banks
Polycentropus sp.

Olethreutini

?*Episimus* species
Eumarozia malachitana (Zeller)
Eucosmini
Chimoptesis gerulae (Heinrich)
Chimoptesis pennsylvaniana (Kearfott)
Epiblema boxcana (Kearfott)
Epiblema desertana (Zeller)
Epiblema strenuana (Walker)
Epiblema tripartitana (Zeller)
Epiblema scudderiana (Clemens)
Eucosma comatulana (Zeller)
Eucosma gilletteana Dyar
Eucosma matutina (Grote)
Eucosma palabundana Heinrich
Eucosma pulveratana (Walsingham)
Eucosma ridingsana (Robinson)
Eucosma species, *E. ridingsana* complex
Eucosma robinsonana (Grote)
Eucosma sombreana Kearfott species group
Eucosma similar to *vagana* McDunnough
Eucosma similar to *watertonana* McDunnough
Gretchena ?*amatana* Heinrich
Hystericophora vestaliana (Zeller)
Pelochrista scintillana (Clemens)
Pelochrista zomonana (Kearfott)
Phaneta delphinoides (Heinrich)
Phaneta kiscana? (Kearfott)
Phaneta pallidicostana? (Walsingham)
Phaneta near *varecundana* Blanchard
Phaneta unidentified species

Laspeyresiini

Ofatulena duodecimstriata (Walsingham)

Cydia caryana (Fitch)
Cydia latiferreanus (Walsingham)

Tortricini

Acleris semipurpurana (Kearfott)
Archipini
Archips argyrospila (Walker)-
Archips rileyana (Grote)
Choristoneura rosaceana (Harris)
Clepsis virescana (Clemens)

Sparganothidini

Platynota labiosana (Zeller)
Platynota nigrocervinana Walsingham
Sparganothis belfrageana (Zeller)
Sparganothis caryae (Robinson)
Sparganothis diluticostana (Walsingham)
Sparganothis directana (Walker)
Sparganothis possibly *pettitana* (Robinson)
Sparganothis sulfurena (Clemens)
Sparganothoides lentiginosana (Walsingham)

Cochylinae

Unidentified genus and species
Aethes argentiimitana (Robinson)
Aethes seriatana (Zeller)
“*Carolella*” *bimaculana* (Robinson)

Hesperiidae

Epargyreus clarus (Cramer)
Staphylus hayhurstii (W.H. Edwards)
Thorybes bathyllus (J.E. Smith)
Erynnis juvenalis (Fabricius)
Erynnis horatius (Scudder & Burgess)
Erynnis funeralis (Scudder & Burgess)
Erynnis baptiseae (Forbes)
Pyrgus communis (Grote)
Celotes nesus (W.H. Edwards)
Pholisora catullus (Fabricius)
Ancyloxipha numitor (Fabricius)
Copaeodes aurantiaca (Hewitson)
Hylephila phyleus (Drury)
Atalopedes campestris (Boisduval)
Wallengrenia otho (J.E. Smith)
Atrytone arogos (Boisduval & LeConte)
Anatrytone logan (W.H. Edwards)

Poanes zabulon (Boisduval & LeConte)
Euphyes dion (W.H. Edwards)
Euphyes vestris (Boisduval)
Amblyscirtes aenus W.H. Edwards
Amblyscirtes eos (W.H. Edwards)
Amblyscirtes vialis (W.H. Edwards)
Amblyscirtes belli H.A. Freeman
Lerodea eufala (W.H. Edwards)

Papilionidae

Battus philenor (Linnaeus)
Papilio polyxenes Fabricius
Papilio glaucus Linnaeus
Papilio cressphontes Cramer

Pieridae

Pontia protodice (Boisduval & LeConte)
Pieris rapae (Linnaeus)
Euchloe olympia (W.H. Edwards)
Anthocharis midea (Hübner)
Colias philodice (Godart)
Colias eurytheme (Boisduval)
Zerene cesonia (Stoll)
Phoebis sennae (Linnaeus)
Eurema mexicana (Boisduval)
Pyrisitia lisa (Boisduval & LeConte)
Abaeis nicippe (Cramer)
Nathalis iole Boisduval

Lycaenidae

Lycaena dione (Scudder)
Atlides halesus (Cramer)
Calycopis cecrops (Fabricius)
Callophrys gryneus (Hübner)
Satyrium favonius (J.E. Smith)
Satyrium titus (Fabricius)
Satyrium calanus (Hübner)
Phaeostrymon alcestis (W.H. Edwards)
Strymon melinus (Hübner)
Cupido comyntas (Godart)
Echinargus isola (Reakirt)

Nymphalidae

Libytheana carinenta (Cramer)
Danaus plexippus (Linnaeus)
Danaus gilippus (Cramer)
Agraulis vanillae (Linnaeus)
Euptoieta claudia (Cramer)
Chlosyne gorgone (Hübner)
Chlosyne nycteis Doubleday
Phyciodes graphica (R. Felder)
Phyciodes phaon (W.H. Edwards)
Phyciodes tharos (Drury)
Junonia coenia Hübner
Polygonia interrogationis (Fabricius)
Nymphalis antiopa (Linnaeus)
Vanessa atalanta (Linnaeus)
Vanessa cardui (Linnaeus)
Vanessa virginiensis (Drury)
Limentis archippus (Cramer)
Anaea andria Scudder
Asterocampa celtis (Boisduval & LeConte)
Asterocampa clyton (Boisduval & LeConte)
Megisto cymela (Cramer)
Cercyonis pegala (Fabricius)

Geometridae

Geometrinae

Chlorochlamys chloroleucaria (Guenée)
Synchlora aerata (Fabricius)

Sterrhinae

Cyclophora nanaria (Walker)
Euacidalia sericearia Packard
Haematopis grataria (Fabricius)
Idaea demissaria (Hübner)
Idaea species near *productata* (Packard)
Leptostales rubromarginaria (Packard)
Lobocleta ossularia (Geyer)
Lobocleta plemyraria (Guenée)
Scopula ancillata (Hulst)
Scopula inductata (Guenée)

Scopula limboundata (Haworth)
Timandra amaturaria (Walker)

Larentiinae

Archirhoe neomexicana (Hulst)
Costaconvexa centrostrigaria (Wollasten)
Eubaphe mendica (Walker)
Eubaphe unicolor (Robinson)
Eulithis gracilineata (Guenée)
Eupithecia bolteri Hulst
Eupithecia jejuna McDunnough
Eupithecia miserulata Grote
Eupithecia swettii Grossbeck
Eupithecia tenuata Hulst
Hamaptera parinotata (Zeller)
Hydrelia unidentified species
Hydriomena pluviata (Guenée)
Orthonama obstipata (Fabricius)

Ennominae

Ancamptodes dataria (Grote)
Anavitrinella atristrigaria (Barnes and McDunnough)
Cabera quadrifasciaria (Packard)
Digrammia continuata (Walker)
Digrammia excurvata (Packard)
Digrammia gnophosaria (Guenée)
Digrammia irrorata (Packard)
Digrammia ocellinata (Guenée)
Digrammia ordinata (Walker)
Digrammia pallidata (Packard)
Digrammia ?pervolata (Hulst)
Digrammia subminiata (Packard)
?Ectropis unidentified species
Euchlaena effecta (Walker)
Euchlaena johnsonaria (Fitch)
Euchlaena madusaria (Walker)
Euchlaena obtusaria (Hübner)
Euchlaena pectinaria Denis & Schiffermüller
Euchlaena tigrinaria (Guenée)
Euchlaena unidentified species.
Eumacaria latiferrugata (Walker)
Eusarca packardaria (McDunnough)
Eusarca subflavaria (Pearsall)

Exelis pyrolaria Guenée
Hypagyrtis unipunctata (Haworth)
Hypomecis gnopharia (Guenée)
Hypomecis unidentified species.
Iridopsis perfectaria (McDunnough)
Isturgia dislocaria (Packard)
Lychnosea intermicata (Walker)
Lycia ypsilon (Forbes)
Lytrosis unitaria (Herrich-Schäffer)
Macaria aemulataria Walker
Macaria coortaria? (Hulst)
Macaria promiscuata (Ferguson)
Macaria punctolineata Packard
Macaria ribearia Fitch
Macaria unidentified species
Melanolophia signataria (Walker)
Melilla xanthometata (Walker)
Metanema inatomaria Guenée
Nacophora quernaria (J.E. Smith)
Narraga fimetaria (Grote & Robinson)
Nematocampa limbata (Haw.)
Pimaphera sparsaria (Walker)
Paleacrita vernata (Peck)
Prionomelia spododea (Hulst)
Probole amicaria (Herrich-Schäffer)
Prochoerodes lineola (Goeze)
Protoarmia porcelaria (Guenée)
“*Semiothisa*” *cyda* (Druce)
Tornos scolopacinaria (Guenée)

Family Sphingidae

Amphion floridensis Clark
Ceratonia amyntor (Geyer)
Ceratonia catalpae (Boisduval)
Ceratonia undulosa (Walker)
Darapsa myron (Cramer)
Deidamia inscriptum (Harris)
Eumorpha achemon (Drury)
Hemaris diffinis (Boisduval)
Hyles lineata (Fabricius)
Amorpha juglandis (J.E. Smith)
Manduca quinquemaculata (Haworth)
Manduca sexta (Linnaeus)
Paonias excaecatus (J.E. Smith)
Smerinthus jamaicensis (Drury)
Sphecodina abbottii (Swainson)

Family Saturniidae

Xylophanes tersa (Linnaeus)

Actias luna (Linnaeus)

Antheraea polyphemus (Cramer)

Automeris io (Fabricius)

Sphingicampa bicolor (Harris)

Family Arctiidae

Apantesis nais (Drury)

Apantesis phalerata (Harris)

Apantesis vittata (Fabricius)

Cisseps fulvicollis (Hübner)

Cisthene tenuifascia Harvey

Cisthene unifascia Grote & Robinson

Cycnia oregonensis (Stretch)

Cycnia tenera Hübner

Cycnia sp.

Estigmene acrea (Drury)

Euerythra phasma Harvey

Grammia arge (Drury)

Grammia figurata (Drury)

Grammia oithona (Strecker)

Grammia parthenice (Kirby)

Haploa clymene (Brown)

Haploa reversa (Stretch)

Holomelina aurantiaca (Hübner)

Holomelina costata (Stretch)

Hyphantria cunea (Drury)

Hypoprepia fuscata Hübner

Hypoprepia miniata (Kirby)

Lycomorpha pholus (Drury)

Spilosoma congrua (Walker)

Spilosoma dubia (Walker)

Spilosoma virginica (Fabricius)

Family Noctuidae

Catocala abbreviatella Grote

Catocala amatrix (Hübner)

Catocala amestris Strecker

Catocala amica (Hübner)

Catocala coccinata Grote

Catocala delilah Strecker

Catocala herodias Strecker

Catocala ilia (Cramer)

Catocala illecta Walker

Catocala innubens Guenée

Catocala maestosa Hulst

Catocala micronympha Guenée
Catocala minuta Edwards
Catocala muliercula Guenée
Catocala nuptialis Walker
Catocala piatrix Grote
Catocala similis Hy. Edwards
Catocala ultronia (Hübner)
Catocala unidentified species related to *semirelicta* Grote
Melaporphyria immortua Grote
Schinia alencis (Harvey)
Schinia arcigera (Guenée)
Schinia chrysellata (Grote)
Schinia citrinella (Grote & Robinson)
Schinia cupes (Grote)
Schinia gaurae (Smith.)
Schinia gracilentata Hübner
Schinia jaguarina (Guenée)
Schinia lynx (Guenée)
Schinia mortua (Grote)
Schinia obscurata Strecker
Schinia rivulosa (Guenée)
Schinia saturata (Grote)
Schinia snowi (Grote)
Schinia trifascia (Hübner)
Schinia voluptaria (Fitch)

Family Notodontidae

Cerura candida Lintner
Clostera apicalis (Walker)
Dasylophia anguina (Smith)
Datana angusii Grote & Robinson
Datana perspicua Grote & Robinson
Furcula cinerea (Lintner)
Gluphisia lintneri (Grote)
Gluphisia septentrionis Walker
Heterocampa guttivitta (Walker)
Heterocampa obliqua Packard
Heterocampa subrotata Harvey
Heterocampa umbrata Walker
Hippia packardii (Morrison)
Hyarpax venus Neumoegen
Hyperaeschra tortuosa Tepper
Litodonta hydromeli Harvey
Lochmaeus bilineata (Packard)
Nadata gibbosa (Smith)
Nerice bidentata Walker

Hymenoptera

Apocrita

Andrenidae

Oligocentria lignicolor (Walker)
Peridea basitriens (Walker)
Schizura leptinoides (Grote)
Schizura unicornis (Smith)

Andrena sp. 1
Andrena sp. 2
Andrena sp. 3
Andrena sp. 4
Andrena sp. 5
Andrena sp. 6
Protandrena sp.
Pseudopanurgus sp.

Anthophoridae

Anthophora bomboides Kirby
Anthophora walshii Cresson
Centris lanosa Cresson
Ceratina sp.
Epeoloides sp.
Ericrocis lata (Cresson)
Melissodes sp. 1
Melissodes sp. 2
Savstra obliqua (Say)
Triepeolus sp.
Triopasites sp.
Xylocopa virginica (Linnaeus)

Apidae

Apis mellifera Linnaeus
Bombus affinis Cresson
Bombus appositus Cresson
Bombus fraternus (Smith)
Bombus pensylvanica (DeGeer)

Argidae

Arge humeralis (Beauvois)
Sphacophilus sp. 1
Sphacophilus sp. 2
Sphacophilus sp. 3

Braconidae

Agathis sp. 1
Agathis sp. 2

Agathis sp. 3
Aleiodes sp. 1
Aleiodes sp. 2
Aleiodes sp. 3
Apanteles sp.
Bracon sp. 1
Bracon sp. 2
Cardiochiles explorator (Say)
Cardiochiles viator (Say)
Chelonus sp.
Cyanopterus sp.
Digonogastra sp.
Doryctes sp.
Homolobus sp.
Microplitis sp.
Vipio vulgaris (Cresson)
Vipio sp.

Colletidae

Colletes sp.
Hylaeus sp.

Formicidae

Aphaenogaster tenneseensis (Mayr)
Camponotus americanus Mayr
Camponotus castaneus (Latreille)
Camponotus nearcticus Emery
Camponotus pennsylvanicus (DeGeer)
Crematogaster laeviuscula Mayr
Crematogaster lineolata (Say)
Crematogaster punctulata Emery
Dorymyrmex flavus McCook
Forelius mccooki (McCook)
Forelius pruinosus (Roger)
Formica pallidefulva Latreille
Formica sp.
Lasius neoniger Emery
Linepithema humilis (Mayr)
Monomorium minima (Buckley)
Neivamyrmex nigrescens (Cresson)
Neivamyrmex sp.
Paratrechina parvula (Mayr)
Pheidole hyatti Emery
Pheidole sp.
Pogonomyrmex barbata (Smith)
Pogonomyrmex comanche Wheeler
Prenolepis imparis (Say)
Solenopsis geminata (Fabricius)

Halictidae

Tapinoma sessilis (Say)
Trachymyrmex septentrionalis (McCook)

Agapostemon texanus (Cresson)
Augochlora purus (Say)
Augochlorella sp.
Augochloropsis metallica (Fabricius)
Dieunomia heteropoda kirbii (Smith)
Halictus confusus Smith
Halictus ligatus Say
Lasioglossum sp. 1
Lasioglossum sp. 2
Lasioglossum sp. 3
Lasioglossum sp. 4
Lasioglossum sp. 5
Nomia nortoni Cresson

Ichneumonidae

Agrypon sp.
Arbelus sp.
Astiphronma sp.
Baryceros fortis (Cresson)
Barytarbes sp.
Campopleginae
Campoplex sp.
Catadelphus sp.
Compsocryptus texensis Townes
Conocalama rileyi (Cresson)
Cratichneumon sp.
Cremastinae
Cremastus sp.
Cteniscus sp.
Ctenopelmatinae
Dusona sp. 1
Dusona sp. 2
Enicospilus americanus (Christ)
Enicospilus merdarius (Gravenhorst)
Enicospilus sp.
Erigorgus sp.
Exyston sp.
Glypta sp.
Habronyx sp.
Hadrodactylus sp.
Hemitelini
Itoplectis conquisitor (Say)
Megarhyssa atratus (Fabricius)
Melanichneumon sp.

	<i>Mesochorus</i> sp.
	<i>Mesostenus longicaudis</i> Cresson
	<i>Netelia</i> sp.
	<i>Ophion bilineatus</i> Say
	<i>Platylabus</i> sp.
	<i>Triclistus propinquus</i> (Cresson)
	<i>Trieceus</i> sp.
	<i>Trychosis montivagus</i> (Provancher)
	<i>Trychosis</i> sp.
Leucospididae	
	<i>Leucospis</i> sp.
Megachilidae	
	<i>Coelioxys</i> sp.
	<i>Dianthidium curvatum</i> (Smith)
	<i>Hoplitis producta</i> (Cresson)
	<i>Lithurge apicalis</i> (Cresson)
	<i>Megachile</i> sp. 1
	<i>Megachile</i> sp. 2
Mutillidae	
	<i>Acanthophtopsis</i> sp.
	<i>Dasymutilla atrifimbriata</i> Mickel
	<i>Dasymutilla bioculata</i> (Cresson)
	<i>Dasymutilla bollii</i> (Fox)
	<i>Dasymutilla clotho</i> (Blake)
	<i>Dasymutilla creusa</i> (Cresson)
	<i>Dasymutilla electra</i> (Blake)
	<i>Dasymutilla gorgon</i> (Blake)
	<i>Dasymutilla klugii</i> (Gray)
	<i>Dasymutilla leda</i> (Blake)
	<i>Dasymutilla macra</i> (Cresson)
	<i>Dasymutilla magnifica</i> Mickel
	<i>Dasymutilla medea</i> (Cresson)
	<i>Dasymutilla nitidula</i> Mickel
	<i>Dasymutilla occidentalis</i> (Linnaeus)
	<i>Dasymutilla quadriguttata</i> (Say)
	<i>Dasymutilla scaevola</i> (Blake)
	<i>Dasymutilla vandala</i> Mickel
	<i>Dasymutilla vesta</i> (Cresson)
	<i>Dasymutilla vestita</i> (Lepeletier)
	<i>Dasymutilla waco</i> (Blake)
	<i>Dasymutilla zelaya</i> (Blake)
	<i>Myrmilloides grandiceps</i> (Blake)
	<i>Odontophtopsis</i> sp.
	<i>Photomorphus</i> sp.
	<i>Pseudomethoca oceola</i> (Blake)

Pseudomethoca propinqua (Cresson)
Spaerophthalma boweri Schuster
Sphaerophthalma auripilis (Blake)
Sphaerophthalma imperialiformis (Viereck)
Sphaerophthalminae sp.
Timulla dubitata (Smith)
Timulla oajaca (Blake)
Timulla rufosignata (Bradley)
Timulla vagans (Fabricius)

Pompilidae

Anoplius americanus (Beauvois)
Anoplius cleora (Banks)
Anoplius lepidus atramentarius (Dahlbom)
Aporinellus fasciatus (Smith)
Dipogon papago anomalus Dreisbach
Entypus fulvicornis (Cresson)
Entypus texanus (Cresson)
Pepsis mildei Stål
Pepsis thisbe Lucas
Phanagenia bombycinus (Cresson)
Poecilopompilus interrupta (Say)

Scoliidae

Campsomeris plumipes (Drury)

Trielis octomaculata (Say)

Sphecidae

Ammophila cleopatra Menke
Ammophila juncea Cresson
Ammophila pictipennis Walsh
Ammophila procera Dahlbom
Ammophila strenua Cresson
Ammophila urnalia Dahlbom
Astata bechteli Parker
Astata unicolor Say
Bicyrtes quadrifasciata (Say)
Cerceris bicornuta Guerin-Meneville
Cerceris fumipennis Say
Chalybion californicus (Saussure)
Ectemnius decemmaculatus (Say)
Ectemnius stirpicola (Packard)
Eremnophila aureonotata (Cameron)
Fernaldina lucae Saussure
Glenostictia pictifrons (Smith)
Isodontia auripes (Fernald)
Isodontia philadelphica (Lepeletier)

	<i>Larra analis</i> Fabricius
	<i>Palmodes dimidiatus</i> (DeGeer)
	<i>Philanthus gibbosus</i> (Fabricius)
	<i>Podalonia robusta</i> (Cresson)
	<i>Podium luctuosum</i> Smith
	<i>Prionyx atrata</i> (Lepeletier)
	<i>Solierella plenoculoides</i> (Fox)
	<i>Sphecius speciosus</i> (Drury)
	<i>Sphex habena</i> Say
	<i>Sphex ichneumonea</i> (Linnaeus)
	<i>Sphex texana</i> Cresson
	<i>Tachytes distinctus</i> Smith
	<i>Tachytes pennsylvanicus</i> Banks
	<i>Trypoxylon clavatum</i> Say
	<i>Trypoxylon politum</i> Say
	<i>Trypoxylon texense</i> Saussure
	<i>Zanysson texanus</i> (Cresson)
Tiphiidae	<i>Myzinum quinquecincta</i> (Fabricius)
	<i>Tiphia</i> sp.
Torymidae	
	Torymidae
Vespidae	
	<i>Ancistrocerus catskill</i> (Saussure)
	<i>Eumenes bollii</i> Cresson
	<i>Eumenes fraterna</i> Say
	<i>Eumenes smithii</i> Saussure
	<i>Eumenes</i> sp.
	<i>Euodynerus annulatus arvensis</i> (Saussure)
	<i>Euodynerus castigatus</i> (Saussure)
	<i>Euodynerus crypticus</i> (Say)
	<i>Euodynerus foraminatus</i> (Saussure)
	<i>Euodynerus megaera</i> (Lepeletier)
	<i>Euodynerus pratensis</i> (Saussure)
	<i>Euodynerus</i> sp.
	<i>Manobia quadridens</i> (Linnaeus)
	<i>Parancistrocerus pedestris</i> (Saussure)
	<i>Polistes carolina</i> (Linnaeus)
	<i>Polistes fuscata</i> (Fabricius)
	<i>Polistes metrica</i> Say
	<i>Pseudodynerus quadrisectus</i> (Say)
	<i>Stenodynerus anormis</i> (Say)
	<i>Stenodynerus histrionalis</i> (Robertson)
	<i>Stenodynerus microstictus</i> (Viereck)
	<i>Symmorphus canadensis</i> (Saussure)

Symphyta

Cimbicidae

Cimbex americana Leach

Orussidae

Orussus sayii (Westwood)

Pergidae

Acordulecera sp.

Tenthredinidae

Allantinae

Eutomostethus luteiventris (Klug)

Heterarthrinae

Lycaota sodalis (Cresson)

Nematinae

Nematus sp.

Taxonus epicera (Say)

Zaschizonyx montana (Cresson)

Appendix C. Arthropod taxa and locations on Fort Sill, Comanche Co., Oklahoma, 2004.
 Hab_Afil=locations collected; No_Spec=number of specimens collected during samping.

Order Suborder Family Scientific Name

Acari

Ixodidae

***Amblyomma americanum* (Linnaeus)**

Hab_Afil	No_Spec	Date
East Range, East Cache Creek, South Boundary Road	1	6/11/2003
East Range, East Cache Creek, South Boundary Road	2	4/24/2003
East Range, East Cache Creek, South Boundary Road	3	6/13/2002
East Range, mixed grass	1	6/10/2003
West Range, Natural Resource Building	1	3/31/2003
West Range, Natural Resource Building	2	7/1/2003
East Range, Parks Hill	2	6/13/2003
Fort Sill, in car	2	7/1/2003
Quanah Range, West Cache Creek, South Boundary Road	1	3/21/2003
West Range	1	3/30/2003
West Range, along North Boundary Road	2	6/30/2003
West Range, along North Boundary Road	2	7/3/2003
West Range, Blue Beaver Creek, McKenzie Hill Road	2	6/10/2003
West Range, Medicine Creek, 10 mile Crossing	1	4/26/2003
West Range, post oak grassland	2	4/26/2003

***Ambylomma maculatum* Koch**

Hab_Afil	No_Spec	Date
East Range	1	8/10/2002
East Range	1	3/27/2003
East Range, mixed grass	1	6/13/2002
East Range, mixed grass	1	6/10/2003
West Range, Natural Resource Building	2	7/1/2003
East Range, tall grass	3	6/12/2002
On a deer	1	10/1/2003
Quanah Range, West Cache Creek, South Boundary Road	3	7/1/2003
West Range, short grass	1	7/8/2002

***Dermacentor albipictus* (Packard)**

Hab_Afil	No_Spec	Date
On a deer	10	10/1/2003

***Dermacentor variabilis* (Say)**

Hab_Afil	No_Spec	Date
East Range, East Cache Creek, South Boundary Road	1	4/25/2003
East Range, East Cache Creek, South Boundary Road	1	6/10/2003

Order Suborder Family Scientific Name

East Range, East Cache Creek, South Boundary Road	1	6/11/2003
East Range, mixed grass	1	6/10/2003
West Range, Natural Resource Building	1	7/1/2003
East Range, Parks Hill	2	6/13/2003
East Range, tall grass	5	6/10/2003
Quanah Range, West Cache Creek, South Boundary Road	1	4/21/2003
Quanah Range, West Cache Creek, South Boundary Road	1	4/27/2003
Quanah Range, West Cache Creek, South Boundary Road	1	8/12/2003
Quanah Range, West Cache Creek, South Boundary Road	2	7/1/2003
West Range, along North Boundary Road	1	6/30/2003
West Range, along North Boundary Road	1	7/3/2003
West Range, along North Boundary Road	2	6/11/2003
West Range, Blue Beaver Creek, McKenzie Hill Road	1	6/30/2003
West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/1/2003
West Range, Blue Beaver Creek, McKenzie Hill Road	3	6/10/2003
West Range, short grass	1	7/8/2002
West Range, tributary to Blue Beaver Creek	2	3/15/2004

***Ixodes scapularis* Say**

Hab_Afil	No_Spec	Date
On a deer	36	10/1/2003
West Range	1	3/28/2003
West Range	1	3/30/2003

Scorpiones

Buthidae

***Centruroides vittatus* (Say)**

Hab_Afil	No_Spec	Date
West Range, Natural Resource Building	1	7/10/2004
West Range, Natural Resource Building	2	4/24/2003
West Range	1	3/30/2003
West Range, Lake Elmer Thomas Recreation Area	1	4/25/2003

Ephemeroptera

Baetidae

***Baetis intercalaris* McDunnough**

Hab_Afil	No_Spec	Date
East Range, East Cache Creek, South Boundary Road	11	9/19/2003
West Range, Medicine Creek, 10-mile Crossing	1	4/26/2002
West Range, Medicine Creek, 10-mile Crossing	4	9/20/2003

Order Suborder Family Scientific Name

***Callibaetis floridanus* Banks**

Hab_Afil	No_Spec	Date
East Range, East Cache Creek, South Boundary Road	1	6/11/2003
West Range	3	7/19/2003
West Range, Lake Elmer Thomas Recreation Area	1	6/10/2003

***Callibaetis montanus* Eaton**

Hab_Afil	No_Spec	Date
East Range, East Cache Creek, South Boundary Road	1	5/30/2004
East Range, East Cache Creek, South Boundary Road	7	9/19/2003

***Callibaetis* sp.**

Hab_Afil	No_Spec	Date
East Range, East Cache Creek, South Boundary Road	1	9/19/2003

***Fallceon quilleri* (Dodds)**

Hab_Afil	No_Spec	Date
East Range, East Cache Creek, South Boundary Road	8	9/19/2003
East Range, East Cache Creek, South Boundary Road	17	3/15/2004
East Range, East Cache Creek, South Boundary Road	21	3/15/2004
West Range, Medicine Creek, 4mile Crossing	1	9/20/2003
West Range, Medicine Creek, 10-mile Crossing	3	10/11/2002

***Plauditus dubius* (Walsh)**

Hab_Afil	No_Spec	Date
East Range, East Cache Creek, South Boundary Road	1	4/26/2002
East Range, East Cache Creek, South Boundary Road	2	3/15/2004

***Plauditus texanus* Wiersema**

Hab_Afil	No_Spec	Date
West Range, Medicine Creek, 4mile Crossing	1	4/23/2003
West Range, Medicine Creek, 4mile Crossing	5	9/20/2003
West Range, Medicine Creek, 4mile Crossing	46	9/20/2003
West Range, Medicine Creek, 10-mile Crossing	1	2/5/2003
West Range, Medicine Creek, 10-mile Crossing	3	4/26/2002

***Procloeon* sp.**

Hab_Afil	No_Spec	Date
East Range, East Cache Creek, South Boundary Road	7	5/30/2004

***Pseudocloeon dardanum* (McDunnough)**

Hab_Afil	No_Spec	Date
East Range, East Cache Creek, South Boundary Road	3	9/19/2003
West Range, Medicine Creek, 4mile Crossing	1	9/20/2003
West Range, Medicine Creek, 4mile Crossing	32	9/20/2003
West Range, Medicine Creek, 10-mile Crossing	1	9/20/2003

***Pseudocloeon ephippiatus* (Traver)**

Hab_Afil	No_Spec	Date
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Order	Suborder	Family	Scientific Name		
			West Range, Medicine Creek, 4mile Crossing	1	9/20/2003
		Caenidae			
			<i>Brachycercus lacustris</i> (Needham)		
			Hab_Afil	No_Spec	Date
			West Range, Engineer Lake	1	9/13/2002
			<i>Caenis amica</i> Hagen		
			Hab_Afil	No_Spec	Date
			East Range, Clear Pond	1	6/12/2003
			East Range, East Cache Creek, South Boundary Road	1	6/11/2003
			East Range, Lake George	42	9/19/2003
			West Range, Natural Resource Building	1	4/24/2003
			Quanah Range, Pottawatami Twins (Pond)	5	9/19/2003
			Quanah Range, Pottawatami Twins (Pond)	19	7/10/2004
			Quanah Range, West Cache Creek, South Boundary Road	1	4/26/2003
			Quanah Range, West Cache Creek, South Boundary Road	22	9/20/2003
			West Range, Engineer Lake	1	9/20/2003
			West Range, Medicine Creek, 4mile Crossing	1	9/20/2003
			West Range, Medicine Creek, 4mile Crossing	20	9/20/2003
			<i>Caenis latipennis</i> Banks		
			Hab_Afil	No_Spec	Date
			East Range, Lake George	19	8/12/2003
			Quanah Range, Post Oak Creek	3	3/15/2004
			West Range, Medicine Creek, 10-mile Crossing	1	4/26/2002
			<i>Caenis punctata</i> McDunnough		
			Hab_Afil	No_Spec	Date
			West Range, Medicine Creek, 4mile Crossing	3	9/20/2003
			<i>Caenis</i> sp.		
			Hab_Afil	No_Spec	Date
			West Range, Medicine Creek, 10-mile Crossing	1	6/12/2002
		Ephemeridae			
			<i>Hexagenia limbata</i> (Serville)		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	6	8/12/2003
			East Range, Lake George	2	7/9/2004
			East Range, Lake George	3	9/19/2003
			East Range, Lake George	4	8/12/2003
			East Range, Lake George	8	8/12/2003
			East Range, Lake George	23	9/19/2003
			West Range, Natural Resource Building	1	6/24/2003
			West Range, Natural Resource Building	4	7/7/2002

Order Suborder Family Scientific Name

East Range, pond off Elgin Road	3	5/27/2004
East Range, pond off Elgin Road	3	5/27/2004
Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	1	5/29/2004
Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	1	5/29/2004
West Range, Engineer Lake	1	6/30/2003
West Range, Engineer Lake	6	6/14/2002
West Range, Engineer Lake	6	9/14/2002
West Range, Lake Elmer Thomas Recreation Area	1	6/10/2003
West Range, Lake Elmer Thomas Recreation Area	1	9/19/2003
West Range, Lake Elmer Thomas Recreation Area	6	9/14/2002

Heptageniidae

***Stenonema femorata* (Say)**

Hab_Afil	No_Spec	Date
East Range	1	5/2/2003
East Range, East Cache Creek, South Boundary Road	1	6/10/2003
East Range, East Cache Creek, Peachtree Crossing	1	9/30/2004
Quanah Range, Pottawatami Twins (Pond)	1	7/10/2004
Quanah Range, Rock Creek, South Boundary Road	1	4/27/2003
Quanah Range, Rock Creek, South Boundary Road	1	7/2/2003
Quanah Range, Rock Creek, South Boundary Road	1	9/19/2003
Quanah Range, West Cache Creek, border of Wichita National Wildlife Refuge	7	7/10/2004
Quanah Range, West Cache Creek, South Boundary Road	3	4/25/2003
Quanah Range, West Cache Creek, South Boundary Road	3	7/2/2003
Quanah Range, West Cache Creek, South Boundary Road	4	7/2/2003
Quanah Range, West Cache Creek, South Boundary Road	27	9/19/2003
West Range, Blue Beaver Creek, McKenzie Hill Road	1	2/5/2003
West Range, Blue Beaver Creek, McKenzie Hill Road	1	6/10/2003
West Range, Blue Beaver Creek, McKenzie Hill Road	6	7/1/2003
West Range, Blue Beaver Creek, McKenzie Hill Road	7	4/25/2003
West Range, Blue Beaver Creek, McKenzie Hill Road	9	9/20/2003
West Range, Blue Beaver Creek, McKenzie Hill Road	24	5/28/2004
West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	2	5/28/2004
West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	3	5/28/2004
West Range, Medicine Creek, 4mile Crossing	1	9/20/2003
West Range, Medicine Creek, 10-mile Crossing	1	4/25/2003
West Range, near junction of Blue Beaver Valley Road and Deer Creek	25	5/28/2004
West Range, tributary to Blue Beaver Creek	2	10/1/2004

Isonychiidae

***Isonychia rufa* McDunnough**

Hab_Afil	No_Spec	Date
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Order Suborder Family Scientific Name

East Range	1	6/24/2003
East Range, East Cache Creek, Hoyle Bridge	9	4/27/2003
East Range, East Cache Creek, South Boundary Road	1	6/11/2003
East Range, East Cache Creek, South Boundary Road	1	6/12/2003
East Range, East Cache Creek, South Boundary Road	1	5/30/2004
East Range, East Cache Creek, South Boundary Road	2	6/10/2003
East Range, East Cache Creek, South Boundary Road	2	9/19/2003
East Range, Medicine Creek, Medicine Bluffs	3	6/11/2002
West Range, Natural Resource Building	1	7/1/2003
West Range, Natural Resource Building	16	6/10/2002
West Range, Lake Elmer Thomas Recreation Area	1	6/10/2003
West Range, Medicine Creek, 4mile Crossing	1	9/20/2003
West Range, Medicine Creek, 10-mile Crossing	3	7/2/2003
West Range, Medicine Creek, 10-mile Crossing	1	2/5/2003
West Range, Medicine Creek, 10-mile Crossing	2	4/26/2002

Leptohyphidae

***Tricorythodes minutus* Traver**

Hab_Afil	No_Spec	Date
East Range, East Cache Creek, South Boundary Road	32	9/19/2003
West Range, Medicine Creek, 10-mile Crossing	17	6/12/2002

***Tricorythodes* sp.**

Hab_Afil	No_Spec	Date
West Range, Medicine Creek, 10-mile Crossing	7	9/14/2002

Leptophlebiidae

***Neochoroterpes oklahoma* (Traver)**

Hab_Afil	No_Spec	Date
East Range, East Cache Creek, South Boundary Road	1	9/19/2003
East Range, East Cache Creek, South Boundary Road	2	4/26/2002
East Range, East Cache Creek, South Boundary Road	8	3/15/2004
East Range, East Cache Creek, South Boundary Road	5	9/19/2003
East Range, East Cache Creek, Peachtree Crossing	1	4/26/2002

Polymitarcyidae

***Tortopus puella* (Pictet)**

Hab_Afil	No_Spec	Date
East Range, East Cache Creek, South Boundary Road	1	9/13/1999

Order Suborder Family Scientific Name
Heteroptera

Gerromorpha

Gerridae

***Gerris marginatus* Say**

Hab_Afil	No_Spec	Date
East Range, East Cache Creek, South Boundary Road	2	6/11/2003
Quanah Range, Pottawatami Twins (Pond)	2	5/28/2004
Quanah Range, Pottawatami Twins (Pond)	4	7/9/2004
Quanah Range, Rock Creek, South Boundary Road	1	4/24/2003
West Range, Mandam Pond	1	3/15/2004

***Gerris remigis* Say**

Hab_Afil	No_Spec	Date
Quanah Range, Rock Creek, South Boundary Road	7	9/20/2003
West Range, Ketch Lake	1	4/28/2003

***Gerris* sp.**

Hab_Afil	No_Spec	Date
Quanah Range, Rock Creek, South Boundary Road	1	4/24/2003
West Range, Ketch Lake	1	4/28/2003

***Neogerris hesione* (Kirkaldy)**

Hab_Afil	No_Spec	Date
East Range, East Cache Creek, South Boundary Road	1	6/11/2003
East Range, East Cache Creek, South Boundary Road	1	9/29/2003
East Range, Medicine Creek, Archery Range	1	6/11/2003
Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	6	9/19/2003
West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/8/2004
West Range, Ketch Lake	3	7/9/2004
West Range, Medicine Creek, 4mile Crossing	6	9/20/2003
West Range, Medicine Creek, 10-mile Crossing	1	10/11/2002

***Trepobates knighti* Drake and Harris**

Hab_Afil	No_Spec	Date
Quanah Range, Rock Creek, South Boundary Road	4	5/28/2004
Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	2	5/29/2004

***Trepobates subnitidus* Esaki**

Hab_Afil	No_Spec	Date
West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/9/2004
West Range, Ketch Lake	2	7/9/2004

Hydrometridae

***Hydrometra martini* Kirkaldy**

Hab_Afil	No_Spec	Date
East Range, East Cache Creek, Hoyle Bridge	19	6/12/2003
West Range, Ketch Lake	1	7/9/2004

Order	Suborder	Family	Scientific Name		No_Spec	Date
			<i>Hydrometra sp.</i>			
			Hab_Afil			
			West Range, Ketch Lake		1	4/28/2003
		Mesoveliidae				
			<i>Mesovelia mulsanti</i> White			
			Hab_Afil			
			West Range, Natural Resource Building		1	3/31/2003
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate		1	9/19/2003
			West Range, Engineer Lake		1	9/19/2003
			West Range, Ketch Lake		2	7/9/2004
		Veliidae				
			<i>Microvelia paludicola</i> Champion			
			Hab_Afil			
			Quanah Range, Post Oak Creek		10	5/28/2004
			<i>Microvelia sp.</i>			
			Hab_Afil			
			East Range, East Cache Creek, Peachtree Crossing		1	8/12/2003
			Quanah Range, Rock Creek, South Boundary Road		1	4/24/2003
			Quanah Range, Rock Creek, South Boundary Road		1	7/2/2003
			<i>Rhagovelia choreutes</i> Hussey			
			Hab_Afil			
			East Range, East Cache Creek, South Boundary Road		5	6/11/2003
			<i>Rhagovelia knighti</i> Drake and Harris			
			Hab_Afil			
			East Range, East Cache Creek, South Boundary Road		1	10/11/2002
Nepomorpha						
		Belostomatidae				
			<i>Belostoma fluminea</i> Say			
			Hab_Afil			
			East Range, Clear Pond		1	4/27/2003
			East Range, East Cache Creek, South Boundary Road		1	4/24/2002
			East Range, East Cache Creek, South Boundary Road		1	9/13/2002
			East Range, East Cache Creek, South Boundary Road		2	6/11/2003
			East Range, East Cache Creek, South Boundary Road		4	9/13/2002
			East Range, Medicine Creek, Archery Range		1	6/11/2003
			West Range, Engineer Lake		1	9/13/2002
		Corixidae				
			<i>Corisella edulis</i> (Champion)			
			Hab_Afil			
					No_Spec	Date

Order	Suborder	Family	Scientific Name		
			West Range	1	8/18/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	2	7/1/2003
			<i>Hesperocorixa obliqua</i> (Hungerford)		
			Hab_Afil	No_Spec	Date
			East Range, Clear Pond	1	4/25/2003
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	4	8/12/2003
			Quanah Range, Pottawatami Twins (Pond)	6	5/28/2004
			Quanah Range, West Cache Creek, South Boundary Road	1	7/2/2003
			West Range	1	8/18/2003
			West Range, Mandam Pond	2	3/15/2004
			<i>Morphocorixa compacta</i> (Hungerford)		
			Hab_Afil	No_Spec	Date
			Quanah Range, Pottawatami Twins (Pond)	1	5/28/2004
			<i>Palmacorixa nana walleyi</i> Hungerford		
			Hab_Afil	No_Spec	Date
			West Range, Engineer Lake	1	9/19/2003
			<i>Sigara alternata</i> (Say)		
			Hab_Afil	No_Spec	Date
			East Range	1	8/17/2003
			East Range, 0.5 south east of Parks Hill on road to Parks Hill	2	5/30/2004
			East Range, Clear Pond	10	6/10/2003
			West Range, Natural Resource Building	8	4/28/2002
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	2	5/29/2004
			Quanah Range, Pottawatami Twins (Pond)	1	8/12/2003
			Quanah Range, Pottawatami Twins (Pond)	3	5/28/2004
			Quanah Range, Rock Creek, South Boundary Road	1	4/24/2003
			Quanah Range, Rock Creek, South Boundary Road	1	3/15/2004
			Quanah Range, Rock Creek, South Boundary Road	2	4/24/2003
			Quanah Range, Rock Creek, South Boundary Road	2	7/8/2003
			Quanah Range, Rock Creek, South Boundary Road	2	9/20/2003
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	4	7/10/2004
			Quanah Range, West Cache Creek, South Boundary Road	4	7/2/2003
			West Range	1	8/18/2003
			West Range, Blue Beaver Creek, Blue Beaver Valley Road	1	5/28/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	3	7/1/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	3	7/8/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	18	7/1/2003
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	3	5/28/2004
			West Range, Mandam Pond	5	3/15/2004
			<i>Sigara modesta</i> (Abbott)		
			Hab_Afil	No_Spec	Date

Order Suborder Family Scientific Name

West Range, Mandam Pond 2 3/15/2004

***Trichocorixa calva* (Say)**

Hab_Afil	No_Spec	Date
East Range, 0.5 south east of Parks Hill on road to Parks Hill	1	5/30/2004
East Range, East Cache Creek, South Boundary Road	1	9/19/2003
East Range, East Cache Creek, South Boundary Road	2	5/30/2004
East Range, East Cache Creek, South Boundary Road	3	6/11/2003
East Range, Medicine Creek, Archery Range	6	6/11/2003
East Range, East Cache Creek, Peachtree Crossing	2	6/11/2003
Quanah Range, West Cache Creek, South Boundary Road	2	7/2/2003
West Range	2	8/18/2003
West Range	12	7/8/2003
West Range, Blue Beaver Creek, McKenzie Hill Road	1	3/15/2004
West Range, Blue Beaver Creek, McKenzie Hill Road	4	7/1/2003
West Range, Blue Beaver Creek, McKenzie Hill Road	6	7/8/2004
West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1	5/28/2004

***Trichocorixa kanza* Sailer**

Hab_Afil	No_Spec	Date
Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	1	7/10/2004
Quanah Range, West Cache Creek, South Boundary Road	1	7/2/2003
West Range	2	7/8/2003
West Range, Blue Beaver Creek, McKenzie Hill Road	20	7/1/2003

Gelastocoridae

***Gelastocoris oculata* (Fabricius)**

Hab_Afil	No_Spec	Date
East Range	1	4/24/2002
East Range	1	8/11/2002
East Range, East Cache Creek, South Boundary Road	3	3/3/2003
East Range, Lake George	1	4/27/2003
Quanah Range, Pottawatami Twins (Pond)	3	9/20/2003
Quanah Range, Rock Creek, South Boundary Road	14	4/24/2003
West Range, Engineer Lake	3	9/13/2002
West Range, Lake Elmer Thomas Recreation Area	2	10/11/2002

Nepidae

***Ranatra nigra* Herrich-Schaffer**

Hab_Afil	No_Spec	Date
East Range, East Cache Creek, Hoyle Bridge	1	6/12/2003
East Range, East Cache Creek, South Boundary Road	2	9/13/2002
East Range, East Cache Creek, South Boundary Road	2	6/11/2003
East Range, East Cache Creek, Peachtree Crossing	2	10/11/2002

Order Suborder Family Scientific Name

Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	1	9/19/2003
Quanah Range, Rock Creek, South Boundary Road	1	4/24/2003
West Range, Ketch Lake	1	7/9/2004
West Range, Ketch Lake	6	4/28/2003
West Range, Medicine Creek, 10-mile Crossing	1	10/11/2002

Notonectidae

***Buenoa confusa* Truxal**

Hab_Afil	No_Spec	Date
Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	3	5/29/2004

***Buenoa margaritacea* Torre-Bueno**

Hab_Afil	No_Spec	Date
East Range, small pond, 2.5 mile North of Bald Ridge Road	6	9/13/2002

***Buenoa scimitra* Bare**

Hab_Afil	No_Spec	Date
Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	1	5/29/2004
Quanah Range, Pottawatami Twins (Pond)	1	5/28/2004
Quanah Range, Pottawatami Twins (Pond)	4	9/20/2003
Quanah Range, Pottawatami Twins (Pond)	6	8/12/2003

***Buenoa* sp.**

Hab_Afil	No_Spec	Date
Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	2	5/28/2004
Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	5	5/29/2004
Quanah Range, West Cache Creek, South Boundary Road	1	7/2/2003
West Range, Mandam Pond	2	3/15/2004

***Notonecta indica* Linnaeus**

Hab_Afil	No_Spec	Date
East Range, East Cache Creek, Peachtree Crossing	1	8/12/2003
East Range, small pond, 2.5 mile North of Bald Ridge Road	4	9/13/2002
Quanah Range, Pottawatami Twins (Pond)	5	9/20/2003

***Notonecta undulata* Say**

Hab_Afil	No_Spec	Date
Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	6	8/12/2003

Pleidae

***Neoplea striola* (Fieber)**

Hab_Afil	No_Spec	Date
East Range, Clear Pond	2	4/25/2003
East Range, East Cache Creek, South Boundary Road	2	6/11/2003
East Range, Lake George	4	4/27/2003
Quanah Range, Rock Creek, South Boundary Road	1	4/24/2003
West Range, Engineer Lake	1	9/19/2003

Order	Suborder	Family	Scientific Name		
			West Range, Engineer Lake	9	10/11/2003
			West Range, Ketch Lake	5	7/9/2004
			West Range, Ketch Lake	15	4/28/2003

Pentatomomorpha

Pentatomidae

***Acrosternum hilaris* (Say)**

Hab_Afil	No_Spec	Date
East Range	3	
East Range, East Cache Creek, South Boundary Road	3	
West Range, Medicine Bluffs	1	
East Range, mixed grass	1	
West Range, Natural Resource Building	4	
Quanah Range, Pottawatami Twins (Pond)	1	
West Range	9	

***Amaurochrous cinctipes* (Say)**

Hab_Afil	No_Spec	Date
Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	1	

***Andrallus spinidens* (Fabricius)**

Hab_Afil	No_Spec	Date
West Range, Natural Resource Building	1	

***Apateticus cynicus* (Say)**

Hab_Afil	No_Spec	Date
East Range, East Cache Creek, South Boundary Road	4	

***Banasa calva* (Say)**

Hab_Afil	No_Spec	Date
East Range	1	

***Banasa euchlora* Stål**

Hab_Afil	No_Spec	Date
West Range, Medicine Bluffs	1	
West Range, Natural Resource Building	1	
Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	1	
Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	1	

***Brochymena arborea* (Say)**

Hab_Afil	No_Spec	Date
East Range, Quinette Road at RR	1	
East Range, East Cache Creek, South Boundary Road	1	
West Range	1	
West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1	

***Brochymena cariosa* Stål**

Hab_Afil	No_Spec	Date

Order	Suborder	Family	Scientific Name			
			East Range		1	
			West Range, Lake Elmer Thomas Recreation Area		1	
			<i>Brochymena quadripustulatus</i> (Fabricius)			
			Hab_Afil	No_Spec		Date
			East Range, East Cache Creek, South Boundary Road		1	
			East Range, tall grass		1	
			Quanah Range, Pottawatami Twins (Pond)		1	
			<i>Euschistus servus</i> (Say)			
			Hab_Afil	No_Spec		Date
			East Range		5	
			East Range, Quinette Road at RR		1	
			East Range, East Cache Creek, South Boundary Road		2	
			West Range, Medicine Bluffs		1	
			West Range, Natural Resource Building		6	
			East Range, Parks Hill		1	
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge		1	
			West Range		6	
			West Range, Blue Beaver Creek, McKenzie Hill Road		3	
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.		2	
			West Range, Ketch Lake		1	
			West Range, Medicine Creek, 10-mile Crossing		2	
			<i>Euschistus tristigmus</i> (Say)			
			Hab_Afil	No_Spec		Date
			East Range		1	
			East Range, East Cache Creek, South Boundary Road		1	
			West Range, Natural Resource Building		1	
			<i>Euschistus variolarius</i> (Palisot)			
			Hab_Afil	No_Spec		Date
			East Range		9	
			East Range, Quinette Road at RR		1	
			East Range, East Cache Creek, South Boundary Road		2	
			East Range, mixed grass		1	
			West Range		1	
			West Range, Lake Elmer Thomas Recreation Area		1	
			West Range, Medicine Creek, 10-mile Crossing		2	
			<i>Holcostethus limbolarius</i> (Stal)			
			Hab_Afil	No_Spec		Date
			West Range, Natural Resource Building		1	
			East Range, near Geronimo Grave		1	
			Quanah Range, Pottawatami Twins (Pond)		1	
			Quanah Range, West Cache Creek, South Boundary Road		1	

Order	Suborder	Family	Scientific Name	
			<i>Mecidea major</i> Sailer	
			Hab_Afil	No_Spec
			East Range	1
			West Range, above Natural Resource Building	2
			West Range, Natural Resource Building	2
			East Range, Parks Hill	1
			East Range, Quonsett	1
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	5
			West Range	1
			West Range, Blue Beaver Creek, Blue Beaver Valley Road	5
			West Range, Blue Beaver Creek, McKenzie Hill Road	2
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1
			<i>Meneclis inserta</i> (Say)	
			Hab_Afil	No_Spec
			East Range, Clear Pond	4
			East Range, East Cache Creek, South Boundary Road	3
			East Range, Lake George	1
			West Range, Medicine Bluffs, near archery range	1
			East Range, mixed grass	1
			West Range, Natural Resource Building	2
			East Range, tall grass	1
			Quanah Range, Pottawatami Twins (Pond)	1
			Quanah Range, West Cache Creek, South Boundary Road	1
			West Range, Blue Beaver Creek, Blue Beaver Valley Road	1
			West Range, Blue Beaver Creek, McKenzie Hill Road	1
			West Range, Lake Elmer Thomas Recreation Area	6
			<i>Murgantia histrionica</i> (Hahn)	
			Hab_Afil	No_Spec
			Quanah Range, Pottawatami Twins (Pond)	1
			West Range, Blue Beaver Creek, McKenzie Hill Road	1
			<i>Oebalus pugnax</i> (Fabricius)	
			Hab_Afil	No_Spec
			East Range, East Cache Creek, South Boundary Road	1
			East Range, Parks Hill	2
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	2
			Quanah Range, Rock Creek, South Boundary Road	1
			West Range, Engineer Lake	1
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1
			West Range, off Elgin Road, south of Frisco Ridge	4
			<i>Podisus maculiventris</i> (Say)	
			Hab_Afil	No_Spec

Order	Suborder	Family	Scientific Name	
			West Range, Natural Resource Building	1
			West Range, Ketch Lake	1
			<i>Prionosoma podopioides</i> Uhler	
			Hab_Afil	No_Spec
			Quanah Range, Rock Creek, South Boundary Road	1
			<i>Thyanta custator</i> (Fabricius)	
			Hab_Afil	No_Spec
			East Range	11
			East Range, 0.5 south east of Parks Hill on road to Parks Hill	2
			East Range, East Cache Creek, South Boundary Road	7
			West Range, Medicine Bluffs	11
			East Range, mixed grass	1
			West Range, Natural Resource Building	9
			East Range, Parks Hill	1
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	11
			Quanah Range, Pottawatami Twins (Pond)	19
			Quanah Range, Rock Creek, South Boundary Road	4
			West Range	35
			West Range, Blue Beaver Creek, Blue Beaver Valley Road	1
			West Range, Blue Beaver Creek, McKenzie Hill Road	12
			West Range, Engineer Lake	1
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1
			West Range, Ketch Lake	1
			West Range, Lake Elmer Thomas Recreation Area	1
			West Range, off Elgin Road, south of Frisco Ridge	3
			<i>Trichopepla semivittata</i> (Say)	
			Hab_Afil	No_Spec
			East Range, East Cache Creek, South Boundary Road	7
			Quanah Range, Pottawatami Twins (Pond)	1
			Quanah Range, Rock Creek, South Boundary Road	1
			West Range	2
Homoptera				
	Auchenorrhyncha			
		Cicadidae		
			<i>Beameria venosa</i> (Uhler)	
			Hab_Afil	No_Spec
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	8
			West Range, Blue Beaver Creek, McKenzie Hill Road	1
			West Range, Blue Beaver Creek, McKenzie Hill Road	2
			<i>Cicadetta calliope</i> (Walker)	
			Hab_Afil	No_Spec

Order	Suborder	Family	Scientific Name	
			East Range	1
			East Range, 0.5 south east of Parks Hill on road to Parks Hill	1
			East Range, East Cache Creek, near Hoyle Bridge	1
			East Range, mixed grass	2
			East Range, Parks Hill	2
			East Range, tall grass	2
			<i>Cicadetta kansa</i> (Davis)	
			Hab_Afil	No_Spec
			East Range, 0.5 south east of Parks Hill on road to Parks Hill	3
			East Range, East Cache Creek, near Hoyle Bridge	1
			East Range, mixed grass	4
			West Range	1
			<i>Diceroprocta azteca</i> (Kirkaldy)	
			Hab_Afil	No_Spec
			East Range, Parks Hill	1
			West Range, Blue Beaver Creek, McKenzie Hill Road	8
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	3
			<i>Magicicada cassinii</i> (Fisher)	
			Hab_Afil	No_Spec
			East Range	4
			East Range, Quinette Road at RR	11
			West Range, Natural Resource Building	2
			<i>Neocicada hieroglyphica</i> (Say)	
			Hab_Afil	No_Spec
			West Range, Natural Resource Building	1
			Quanah Range, Pottawatami Twins (Pond)	2
			West Range	7
			West Range, Blue Beaver Creek, McKenzie Hill Road	1
			West Range, Lake Elmer Thomas Recreation Area	5
			West Range, Medicine Creek, 10-mile Crossing	2
			West Range, short grass	1
			<i>Pacarina puella</i> Davis	
			Hab_Afil	No_Spec
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	9
			<i>Tibicen aurifera</i> (Say)	
			Hab_Afil	No_Spec
			East Range	2
			East Range, 0.5 south east of Parks Hill on road to Parks Hill	3
			East Range, East Cache Creek, South Boundary Road	2
			East Range, Lake George	3
			East Range, mixed grass	9

Order	Suborder	Family	Scientific Name	
			East Range, tall grass	24
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	6
			West Range, Engineer Lake	2
			West Range, Ketch Lake	1
			West Range, Lake Elmer Thomas Recreation Area	2
			West Range, short grass	3
			<i>Tibicen dealbata</i> (Davis)	
			Hab_Afil	No_Spec
			East Range, East Cache Creek, South Boundary Road	1
			East Range, Lake George	1
			East Range, East Cache Creek, Peachtree Crossing	1
			West Range, Blue Beaver Creek, McKenzie Hill Road	2
			<i>Tibicen dorsata</i> (Say)	
			Hab_Afil	No_Spec
			East Range, Lake George	2
			East Range, Quonsett	2
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	4
			Quanah Range, Pottawatami Twins (Pond)	1
			Quanah Range, West Cache Creek, South Boundary Road	1
			West Range, Blue Beaver Creek, McKenzie Hill Road	4
			West Range, Lake Elmer Thomas Recreation Area	1
			<i>Tibicen lyricen</i> (DeGeer)	
			Hab_Afil	No_Spec
			East Range	1
			East Range, near Lark Pond	1
			West Range	3
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1
			<i>Tibicen pruinosa</i> (Say)	
			Hab_Afil	No_Spec
			West Range, Natural Resource Building	2
			East Range, Parks Hill	3
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	1
			West Range, Ketch Lake	1
			<i>Tibicen superba</i> (Fitch)	
			Hab_Afil	No_Spec
			East Range, East Cache Creek, South Boundary Road	2
			East Range, Lake George	1
			West Range, Natural Resource Building	1

Neuroptera

Megaloptera

Corydalidae

Order Suborder Family Scientific Name

***Chauliodes rastricornis* Rambur**

Hab_Afil	No_Spec	Date
East Range	1	6/24/2003
East Range	4	4/26/2003
East Range, Clear Pond	1	6/10/2003
East Range, East Cache Creek, South Boundary Road	1	4/25/2003
West Range, Natural Resource Building	1	8/19/2003
West Range, Natural Resource Building	2	7/1/2003
West Range, Natural Resource Building	4	9/21/2003
East Range, south east of Parks Hill on road to Parks Hill	4	4/26/2003
Quanah Range, Pottawatami Twins (Pond)	1	7/1/2003
Quanah Range, West Cache Creek, South Boundary Road	1	4/24/2003
West Range	1	4/26/2003
West Range	1	4/28/2003
West Range, Blue Beaver Creek, McKenzie Hill Road	8	7/1/2003

***Corydalis cornutus* (Linnaeus)**

Hab_Afil	No_Spec	Date
East Range	3	6/17/2003
East Range, East Cache Creek, South Boundary Road	1	6/11/2002
East Range, East Cache Creek, South Boundary Road	2	6/17/2003
East Range, Medicine Creek, Archery Range	3	6/10/2003
West Range, Natural Resource Building	1	8/19/2003
West Range, Natural Resource Building	2	5/27/2003
West Range, Natural Resource Building	14	6/19/2003
Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	2	6/10/2003
West Range	9	6/19/2003
West Range, Medicine Creek, 10-mile Crossing	1	6/30/2003
West Range, Medicine Creek, 10-mile Crossing	8	6/19/2003

Sialidae

***Sialis itasca* Ross**

Hab_Afil	No_Spec	Date
East Range, Clear Pond	9	4/27/2003
West Range	4	4/25/2002
West Range, Lake Elmer Thomas Recreation Area	26	4/25/2002
West Range, Lake Elmer Thomas Recreation Area	41	4/25/2002

***Sialis mohri* Ross**

Hab_Afil	No_Spec	Date
East Range, Lake George	43	4/27/2003

Planipennia

Sisyridae

Order	Suborder	Family	Scientific Name			
			<i>Climacia areolaris</i> (Hagen)			
			Hab_Afil	No_Spec		
			West Range, Natural Resource Building	1		
			<i>Climacia chapini</i> Parfin and Gurney			
			Hab_Afil	No_Spec	Date	
			West Range, Medicine Creek, 10-mile Crossing	1	9/20/2003	
			West Range, Medicine Creek, 10-mile Crossing	19	9/30/2004	
			<i>Sisyra vicaria</i> (Walker)			
			Hab_Afil	No_Spec	Date	
			East Range, 0.5 south east of Parks Hill on road to Parks Hill	1	5/30/2004	

Coleoptera

Adephaga

Dytiscidae

***Acilius fraternus* Harris**

Hab_Afil	No_Spec	Date
Quanah Range, Rock Creek, South Boundary Road	2	9/20/2003

***Agabus disintegratus* (Crotch)**

Hab_Afil	No_Spec	Date
East Range, Clear Pond	1	4/27/2003
West Range, Mandam Pond	2	3/15/2004
West Range, Medicine Creek, 10-mile Crossing	1	4/25/2002

***Agabus semivittatus* LeConte**

Hab_Afil	No_Spec	Date
East Range	1	4/24/2002
East Range, East Cache Creek, South Boundary Road	1	9/13/2002
Quanah Range, Rock Creek, South Boundary Road	1	4/24/2003
Quanah Range, Rock Creek, South Boundary Road	1	4/24/2003
Quanah Range, Rock Creek, South Boundary Road	1	3/15/2004
West Range, Blue Beaver Creek, McKenzie Hill Road	1	3/15/2004
West Range, Mandam Pond	1	3/15/2004

Agabus sp.

Hab_Afil	No_Spec	Date
West Range, Medicine Creek, 10-mile Crossing	1	4/27/2002

***Celina hubbelli* Young**

Hab_Afil	No_Spec	Date
Quanah Range, Pottawatami Twins (Pond)	1	7/9/2004

***Copelatus chevrolati renovatus* Guignot**

Hab_Afil	No_Spec	Date
East Range	7	8/17/2003
East Range, 0.5 south east of Parks Hill on road to Parks Hill	13	5/30/2004
East Range, East Cache Creek, South Boundary Road	1	9/13/2002

Order	Suborder	Family	Scientific Name		
			East Range, East Cache Creek, South Boundary Road	1	9/26/2003
			East Range, East Cache Creek, South Boundary Road	2	5/30/2004
			East Range, East Cache Creek, Peachtree Crossing	2	8/12/2003
			West Range, Natural Resource Building	1	7/7/2002
			West Range, Natural Resource Building	1	9/13/2002
			Quanah Range, Pottawatami Twins (Pond)	1	7/1/2003
			Quanah Range, Pottawatami Twins (Pond)	1	9/20/2003
			Quanah Range, Pottawatami Twins (Pond)	1	7/9/2004
			Quanah Range, Rock Creek, South Boundary Road	1	7/2/2003
			Quanah Range, Rock Creek, South Boundary Road	1	9/20/2003
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	1	5/29/2004
			West Range, Blue Beaver Creek, Blue Beaver Valley Road	3	10/1/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/8/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	3	10/1/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1	6/30/2003
			West Range, Lake Elmer Thomas Recreation Area	1	7/1/2003
			<i>Copelatus glyphicus</i> (Say)		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	1	5/30/2004
			West Range	1	8/17/2003
			<i>Coptotomus loticus</i> Hilsenhoff		
			Hab_Afil	No_Spec	Date
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/1/2003
			<i>Coptotomus venustus</i> (Say)		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	1	7/7/2002
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	4	6/30/2003
			<i>Cybister fimbriolatus</i> (Say)		
			Hab_Afil	No_Spec	Date
			East Range	2	8/17/2003
			East Range, East Cache Creek, South Boundary Road	1	9/27/2003
			Quanah Range, Pottawatami Twins (Pond)	1	7/1/2003
			<i>Desmopachria</i> sp.		
			Hab_Afil	No_Spec	Date
			West Range, Blue Beaver Creek, McKenzie Hill Road	2	7/8/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1	5/28/2004
			<i>Eretes explicitus</i> Miller		
			Hab_Afil	No_Spec	Date
			Quanah Range, Pottawatami Twins (Pond)	1	7/1/2003
			West Range, Ketch Lake	1	9/27/2003

Order	Suborder	Family	Scientific Name		No_Spec	Date
			<i>Graphoderus liberus</i> (Say)			
			Hab_Afil			
			East Range, small pond, 2.5 mile North of Bald Ridge Road		1	9/13/2002
			<i>Heterosternuta diversicornis</i> (Sharp)			
			Hab_Afil			
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge		2	7/10/2004
			Quanah Range, West Cache Creek, South Boundary Road		2	7/2/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road		1	7/1/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road		1	7/8/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.		2	6/30/2003
			<i>Heterosternuta</i> sp.			
			Hab_Afil			
			West Range, Medicine Creek, 4mile Crossing		1	4/26/2002
			<i>Hydaticus bimarginatus</i> (Say)			
			Hab_Afil			
			Quanah Range, Pottawatami Twins (Pond)		1	7/1/2003
			<i>Hydrovatus pustulatus</i> Melcheimer			
			Hab_Afil			
			West Range, Blue Beaver Creek, McKenzie Hill Road		1	3/15/2004
			<i>Hygrotus acaroides</i> (LeConte)			
			Hab_Afil			
			West Range, Engineer Lake		1	9/13/2002
			<i>Laccophilus fasciatus rufus</i> Melsheimer			
			Hab_Afil			
			East Range, East Cache Creek, South Boundary Road		1	5/30/2004
			<i>Laccophilus fasciatus terminalis</i> Sharp			
			Hab_Afil			
			East Range, East Cache Creek, South Boundary Road		3	9/19/2003
			East Range, Medicine Creek, Archery Range		1	6/11/2003
			East Range, East Cache Creek, Peachtree Crossing		1	8/12/2003
			East Range, small pond, 2.5 mile North of Bald Ridge Road		4	9/13/2002
			Quanah Range, Pottawatami Twins (Pond)		3	5/28/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.		1	7/2/2003
			<i>Laccophilus pictus insignis</i> Sharp			
			Hab_Afil			
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.		1	6/30/2003
			<i>Laccophilus proximus</i> Say			
			Hab_Afil			
			East Range		1	8/17/2003
			Quanah Range, West Cache Creek, South Boundary Road		1	7/2/2003
			West Range, Engineer Lake		2	9/13/2002

Order	Suborder	Family	Scientific Name		
			West Range, Medicine Creek, 10-mile Crossing	2	4/27/2002
			<i>Laccophilus q. quadrilineatus</i> Horn		
			Hab_Afil	No_Spec	Date
			Quanah Range, Pottawatami Twins (Pond)	1	7/1/2003
			Quanah Range, Pottawatami Twins (Pond)	1	5/28/2004
			Quanah Range, Pottawatami Twins (Pond)	5	7/9/2004
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	1	7/10/2004
			<i>Liodesus flavicollis</i> (LeConte)		
			Hab_Afil	No_Spec	Date
			Quanah Range, West Cache Creek, South Boundary Road	11	4/25/2003
			West Range, Ketch Lake	1	4/28/2003
			<i>Neobidessus pullus</i> (LeConte)		
			Hab_Afil	No_Spec	Date
			Quanah Range, Pottawatami Twins (Pond)	1	8/12/2003
			<i>Neoporus dimidiatus</i> (Gemminger and Harold)		
			Hab_Afil	No_Spec	Date
			East Range	1	8/17/2003
			East Range	2	7/1/2003
			East Range, 0.5 south east of Parks Hill on road to Parks Hill	1	5/30/2004
			East Range, East Cache Creek, Hoyle Bridge	3	4/23/2003
			East Range, East Cache Creek, South Boundary Road	3	6/11/2003
			East Range, Medicine Creek, Archery Range	1	6/11/2003
			East Range, East Cache Creek, Peachtree Crossing	2	8/12/2003
			East Range, East Cache Creek, Peachtree Crossing	21	4/26/2002
			East Range, East Cache Creek, Peachtree Crossing	22	9/13/2002
			West Range, Natural Resource Building	1	6/13/2003
			Quanah Range, Rock Creek, South Boundary Road	1	9/20/2003
			Quanah Range, Rock Creek, South Boundary Road	2	4/24/2003
			Quanah Range, Rock Creek, South Boundary Road	5	4/24/2003
			Quanah Range, West Cache Creek, South Boundary Road	14	7/2/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/1/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/8/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	3	3/15/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1	5/28/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	4	7/2/2003
			West Range, Lake Elmer Thomas Recreation Area	1	10/11/2002
			West Range, Medicine Creek, 4mile Crossing	12	4/26/2002
			West Range, Medicine Creek, 10-mile Crossing	2	4/26/2002
			West Range, Medicine Creek, 10-mile Crossing	2	10/11/2002
			<i>Neoporus sp.</i>		
			Hab_Afil	No_Spec	Date

Order	Suborder	Family	Scientific Name		
			East Range, East Cache Creek, Peachtree Crossing	2	4/26/2002
			East Range, Parks Hill	1	7/11/2002
			West Range, Medicine Creek, 10-mile Crossing	1	4/27/2002
			<i>Neoporus undulatus</i> (Say)		
			Hab_Afil	No_Spec	Date
			East Range, 0.5 south east of Parks Hill on road to Parks Hill	1	5/30/2004
			Quanah Range, Rock Creek, South Boundary Road	1	3/15/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	4	3/15/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1	5/28/2004
			West Range, Mandam Pond	2	3/15/2004
			<i>Thermonectes ornaticollis</i> Aube		
			Hab_Afil	No_Spec	Date
			East Range, Medicine Creek, Archery Range	1	5/27/2003
			West Range, Natural Resource Building	3	8/19/2003
			East Range, small pond, 2.5 mile North of Bald Ridge Road	2	9/13/2002
			Quanah Range, Pottawatami Twins (Pond)	1	7/1/2003
			Quanah Range, Pottawatami Twins (Pond)	1	5/28/2004
			West Range	3	7/19/2003
			<i>Thermonetus basillaris</i> (Harris)		
			Hab_Afil	No_Spec	Date
			East Range, 0.5 south east of Parks Hill on road to Parks Hill	1	5/30/2004
			East Range, Clear Pond	3	6/10/2003
			East Range, East Cache Creek, South Boundary Road	2	9/19/2003
			Quanah Range, Pottawatami Twins (Pond)	2	7/1/2003
			Quanah Range, Pottawatami Twins (Pond)	2	5/28/2004
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	1	5/29/2004
			West Range	1	7/19/2003
			<i>Uvarus lacustris</i> (Say)		
			Hab_Afil	No_Spec	Date
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/1/2003
			<i>Uvarus texanus</i> (Sharp)		
			Hab_Afil	No_Spec	Date
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	3/15/2004
		Gyrinidae			
			<i>Dineutus assimilis</i> Kirby		
			Hab_Afil	No_Spec	Date
			East Range	1	4/24/2002
			East Range, Clear Pond	2	6/10/2003
			East Range, East Cache Creek, Hoyle Bridge	4	4/28/2002
			East Range, Knob Hill Road	1	9/13/2002
			East Range, Medicine Creek, Archery Range	1	7/3/2003

Order	Suborder	Family	Scientific Name	No_Spec	Date
			East Range, East Cache Creek, Peachtree Crossing	23	9/13/2002
			West Range, Natural Resource Building	1	8/19/2003
			West Range, Natural Resource Building	2	7/1/2003
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	7	8/12/2003
			Quanah Range, Pottawatami Twins (Pond)	1	7/1/2003
			Quanah Range, Pottawatami Twins (Pond)	2	9/20/2003
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	2	5/29/2004
			Quanah Range, West Cache Creek, South Boundary Road	4	2/5/2003
			Quanah Range, West Cache Creek, South Boundary Road	5	8/12/2003
			Quanah Range, West Cache Creek, South Boundary Road	5	3/15/2004
			Quanah Range, West Cache Creek, South Boundary Road	21	4/24/2003
			West Range	1	7/19/2003
			West Range	1	8/18/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	5/28/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	2	6/10/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	2	3/15/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	3	7/8/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	10	9/20/2003
			West Range, Medicine Creek, 10-mile Crossing	2	6/12/2002
			West Range, Medicine Creek, 10-mile Crossing	8	4/27/2002
			West Range, Medicine Creek, 10-mile Crossing	11	10/11/2002
			West Range, Medicine Creek, 10-mile Crossing	12	9/29/2003
			<i>Dineutus ciliatus</i> (Forsberg)		
			Hab_Afil	No_Spec	Date
			Quanah Range, Rock Creek, South Boundary Road	4	4/24/2003
			Quanah Range, Rock Creek, South Boundary Road	18	9/20/2003
			Quanah Range, West Cache Creek, South Boundary Road	1	7/1/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	6	7/1/2003
			West Range, Medicine Creek, 4mile Crossing	4	4/24/2002
			West Range, Medicine Creek, 10-mile Crossing	3	4/27/2002
			<i>Dineutus horni</i> Roberts		
			Hab_Afil	No_Spec	Date
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	9/20/2003
			<i>Gyretes compressus</i> LeConte		
			Hab_Afil	No_Spec	Date
			West Range, Medicine Creek, 10 mile Crossing	3	4/27/2002
			<i>Gyrinus parvus</i> Say		
			Hab_Afil	No_Spec	Date
			East Range, Clear Pond	1	4/25/2003
			East Range, East Cache Creek, South Boundary Road	8	4/25/2003
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	2	9/19/2003

Order	Suborder	Family	Scientific Name		
			Quanah Range, Pottawatami Twins (Pond)	4	7/9/2004
			Quanah Range, Pottawatami Twins (Pond)	8	7/1/2003
			Quanah Range, Rock Creek, South Boundary Road	1	5/28/2004
			Quanah Range, Rock Creek, South Boundary Road	4	4/24/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	7	4/25/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	7	5/28/2004
			West Range, Mandam Pond	3	3/15/2004
			West Range, Medicine Creek, 10-mile Crossing	3	4/27/2002
			<i>Gyrinus woodruffi</i> Fall		
			Hab_Afil	No_Spec	Date
			Quanah Range, West Cache Creek, South Boundary Road	3	2/5/2003
		Haliplidae			
			<i>Haliplus deceptus</i> Matheson		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	1	5/30/2004
			West Range, Natural Resource Building	1	7/7/2002
			<i>Haliplus fasciatus</i> Aube		
			Hab_Afil	No_Spec	Date
			West Range, Engineer Lake	1	9/13/2002
			<i>Haliplus lewisii</i> Crotch		
			Hab_Afil	No_Spec	Date
			East Range	1	4/28/2002
			<i>Haliplus tortilipenis</i> Brigham and Sanderson		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	1	6/11/2003
			<i>Haliplus triopsis</i> Say		
			Hab_Afil	No_Spec	Date
			East Range, small pond, 2.5 mile North of Bald Ridge Road	1	9/13/2002
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	7	9/19/2003
			Quanah Range, West Cache Creek, South Boundary Road	4	2/5/2003
			West Range, Engineer Lake	2	9/13/2002
			West Range, Ketch Lake	1	4/28/2003
			West Range, Mandam Pond	2	3/15/2004
			West Range, Medicine Creek, 10-mile Crossing	2	4/27/2002
			<i>Peltodytes duodecimpunctatus</i> (Say)		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	1	3/15/2004
			East Range, East Cache Creek, South Boundary Road	2	10/11/2002
			East Range, Medicine Creek	2	9/13/2002
			East Range, East Cache Creek, Peachtree Crossing	1	4/26/2002
			East Range, East Cache Creek, Peachtree Crossing	5	9/13/2002

Order	Suborder	Family	Scientific Name		
			Quanah Range, Rock Creek, South Boundary Road	2	9/20/2003
			Quanah Range, Rock Creek, South Boundary Road	3	4/24/2003
			Quanah Range, West Cache Creek, South Boundary Road	1	2/5/2003
			Quanah Range, West Cache Creek, South Boundary Road	5	4/25/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	3/15/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	6	7/8/2004
			West Range, Medicine Creek, 4mile Crossing	5	4/26/2002
<i>Peltodytes litoralis</i> Matheson					
			Hab_Afil	No_Spec	Date
			East Range, Clear Pond	3	4/25/2003
			East Range, East Cache Creek, South Boundary Road	1	10/11/2002
			East Range, East Cache Creek, South Boundary Road	1	5/30/2004
			East Range, East Cache Creek, South Boundary Road	6	6/11/2003
			East Range, Medicine Creek	1	6/11/2003
			East Range, Medicine Creek, Archery Range	1	6/11/2003
			East Range, East Cache Creek, Peachtree Crossing	1	6/12/2003
			West Range, Natural Resource Building	4	7/7/2002
			East Range, Parks Hill	4	7/11/2002
			Quanah Range, Rock Creek, South Boundary Road	2	4/24/2003
			Quanah Range, West Cache Creek, South Boundary Road	1	4/25/2003
			West Range	1	8/18/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	3/15/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1	5/28/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	3	6/30/2003
			West Range, Ketch Lake	1	7/9/2004
			West Range, Mandam Pond	4	3/15/2004
			West Range, Medicine Creek, 10-mile Crossing	1	10/11/2002
<i>Peltodytes sexmaculatus</i> Roberts					
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	2	10/11/2002
			East Range, East Cache Creek, South Boundary Road	2	10/12/2002
			East Range, East Cache Creek, South Boundary Road	3	9/13/2002
			East Range, East Cache Creek, South Boundary Road	7	6/11/2003
			East Range, Lake George	2	4/27/2003
			East Range, East Cache Creek, Peachtree Crossing	31	9/13/2002
			West Range, Natural Resource Building	1	9/13/2002
			East Range, Parks Hill	3	7/11/2002
			Quanah Range, West Cache Creek, South Boundary Road	1	4/25/2003
			Quanah Range, West Cache Creek, South Boundary Road	5	2/5/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/8/2004
			West Range, Ketch Lake	1	4/28/2003

Order	Suborder	Family	Scientific Name		
			West Range, Medicine Creek, 10-mile Crossing	4	10/11/2002
	Polyphaga				
		Dryopidae			
			<i>Helichus sp.</i>		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	2	3/15/2004
			West Range, Medicine Creek, 10-mile Crossing	2	10/11/2002
			<i>Helichus suturalis</i> LeConte		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	2	6/11/2003
			West Range, Medicine Creek, 4mile Crossing	7	9/20/2003
			West Range, Medicine Creek, 10-mile Crossing	2	10/11/2002
			<i>Pelonomus obscurus</i> LeConte		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	3	6/12/2002
			East Range, Medicine Creek, Archery Range	7	6/11/2003
			West Range, Natural Resource Building	2	7/7/2002
			East Range, near Quonsett (Pond)	1	6/12/2002
			Quanah Range, Pottawatami Twins (Pond)	1	7/9/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/1/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	3	7/8/2004
			West Range, Lake Elmer Thomas Recreation Area	1	6/9/2003
			West Range, Medicine Creek, 10-mile Crossing	2	6/12/2002
		Elmidae			
			<i>Stenelmis cheryl</i> Brown		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	1	9/13/2002
			East Range, East Cache Creek, South Boundary Road	1	10/11/2002
			East Range, East Cache Creek, South Boundary Road	1	6/11/2003
			East Range, East Cache Creek, South Boundary Road	1	9/19/2003
			East Range, East Cache Creek, South Boundary Road	10	3/15/2004
			East Range, Parks Hill	1	7/11/2002
			West Range	4	8/6/2002
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	3/15/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1	7/7/2002
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	3	6/30/2003
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	3	7/2/2003
			West Range, Lake Elmer Thomas Recreation Area	3	7/1/2003
			<i>Stenelmis occidentalis</i> Schmude & Brown		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	1	7/7/2002

Order	Suborder	Family	Scientific Name		
			East Range, East Cache Creek, South Boundary Road	1	10/11/2002
			East Range, East Cache Creek, Peachtree Crossing	1	8/1/2003
			West Range	1	6/8/2002
			West Range	1	8/18/2003
			<i>Stenelmis sexlineata</i> Sanderson		
			Hab_Afil	No_Spec	Date
			West Range, Medicine Creek, 10-mile Crossing	1	4/28/2003
			<i>Stenelmis</i> sp.		
			Hab_Afil	No_Spec	Date
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	1	5/29/2004
			Quanah Range, West Cache Creek, South Boundary Road	1	3/15/2004
			Hydrophilidae		
			<i>Berosus exiguus</i> (Say)		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, Peachtree Crossing	1	8/12/2003
			West Range	1	8/18/2003
			West Range, Blue Beaver Creek, Blue Beaver Valley Road	1	10/1/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/1/2003
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	3	5/28/2004
			<i>Berosus infuscatus</i> LeConte		
			Hab_Afil	No_Spec	Date
			East Range	9	8/17/2003
			East Range, 0.5 south east of Parks Hill on road to Parks Hill	2	5/30/2004
			East Range, East Cache Creek, South Boundary Road	1	4/28/2003
			East Range, East Cache Creek, South Boundary Road	1	5/30/2004
			East Range, East Cache Creek, South Boundary Road	2	8/12/2003
			East Range, Lake George	3	8/12/2003
			East Range, Medicine Creek, Archery Range	1	6/11/2003
			West Range, Natural Resource Building	1	6/13/2003
			West Range, Natural Resource Building	2	6/13/2002
			Quanah Range	2	9/19/2003
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	1	5/29/2004
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	2	7/10/2004
			Quanah Range, Pottawatami Twins (Pond)	1	8/12/2003
			Quanah Range, Pottawatami Twins (Pond)	1	9/20/2003
			Quanah Range, Pottawatami Twins (Pond)	4	7/9/2004
			Quanah Range, Pottawatami Twins (Pond)	7	7/1/2003
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	1	5/29/2004
			West Range	2	8/18/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/1/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	5/28/2004

Order	Suborder	Family	Scientific Name		
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	4	6/30/2003
			West Range, Lake Elmer Thomas Recreation Area	1	9/13/2002
			West Range, Mandam Pond	2	3/15/2004
			West Range, Medicine Creek, 10-mile Crossing	3	4/27/2002
			West Range, near Engineer Lake	1	7/10/2002
			<i>Berosus miles</i> LeConte		
			Hab_Afil	No_Spec	Date
			West Range, Natural Resource Building	1	6/13/2002
			Quanah Range, Pottawatami Twins (Pond)	2	7/9/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/8/2004
			West Range, Engineer Lake	1	9/13/2002
			<i>Berosus pantherinus</i> LeConte		
			Hab_Afil	No_Spec	Date
			East Range, Parks Hill	2	7/11/2002
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/8/2004
			<i>Berosus peregrinus</i> (Herbst)		
			Hab_Afil	No_Spec	Date
			East Range	3	8/17/2003
			East Range, 0.5 south east of Parks Hill on road to Parks Hill	1	5/30/2004
			East Range, East Cache Creek, South Boundary Road	1	6/13/2002
			East Range, East Cache Creek, South Boundary Road	2	6/11/2003
			East Range, East Cache Creek, South Boundary Road	2	8/12/2003
			East Range, East Cache Creek, South Boundary Road	3	10/11/2002
			East Range, Lake George	12	8/12/2003
			East Range, Medicine Creek, Archery Range	1	6/11/2003
			East Range, East Cache Creek, Peachtree Crossing	2	4/26/2002
			West Range, Natural Resource Building	1	7/7/2002
			Quanah Range, Pottawatami Twins (Pond)	1	8/12/2003
			Quanah Range, Pottawatami Twins (Pond)	7	7/9/2004
			Quanah Range, Rock Creek, South Boundary Road	3	7/2/2003
			Quanah Range, Rock Creek, South Boundary Road	4	4/24/2003
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	5	7/10/2004
			Quanah Range, West Cache Creek, South Boundary Road	1	4/25/2003
			Quanah Range, West Cache Creek, South Boundary Road	11	7/2/2003
			West Range	1	7/8/2003
			West Range	3	8/18/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/1/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	3/15/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	3	7/8/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	4	7/1/2003
			West Range, Engineer Lake	2	9/13/2002

Order	Suborder	Family	Scientific Name		
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1	5/28/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	3	7/2/2003
			West Range, Lake Elmer Thomas Recreation Area	5	10/11/2002
			West Range, Mandam Pond	2	3/15/2004
			West Range, Medicine Creek, 10-mile Crossing	3	10/11/2002
			West Range, Medicine Creek, 10-mile Crossing	7	10/11/2002
			West Range, Medicine Creek, 10-mile Crossing	17	6/12/2002
			<i>Berosus stylifer</i> Horn		
			Hab_Afil	No_Spec	Date
			East Range	1	8/17/2003
			Quanah Range, Post Oak Creek	1	5/28/2004
			Quanah Range, Pottawatami Twins (Pond)	1	7/9/2004
			<i>Chaetarthria bicolor</i> Sharp		
			Hab_Afil	No_Spec	Date
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	3	7/10/2004
			West Range, Blue Beaver Creek, Blue Beaver Valley Road	3	10/1/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	3	10/1/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	7	7/8/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	52	7/1/2003
			<i>Chaetarthria</i> sp.		
			Hab_Afil	No_Spec	Date
			West Range, Medicine Creek, 10-mile Crossing	2	6/12/2002
			<i>Crenitis</i> sp.		
			Hab_Afil	No_Spec	Date
			Quanah Range, Rock Creek, South Boundary Road	1	7/2/2003
			<i>Cymbiodyta beckeri</i> Smetana		
			Hab_Afil	No_Spec	Date
			East Range, 0.5 south east of Parks Hill on road to Parks Hill	1	5/30/2004
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	2	5/29/2004
			West Range, Blue Beaver Creek, Blue Beaver Valley Road	6	5/28/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1	5/28/2004
			<i>Cymbiodyta</i> sp.		
			Hab_Afil	No_Spec	Date
			East Range	1	4/24/2002
			East Range, East Cache Creek, South Boundary Road	1	6/12/2002
			East Range, East Cache Creek, South Boundary Road	1	6/10/2003
			East Range, near Quonsett (Pond)	2	6/12/2002
			Quanah Range, West Cache Creek, South Boundary Road	2	7/2/2003
			<i>Dibolocelus ovatus</i> (Gemming and Harold)		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	1	4/27/2003

Order	Suborder	Family	Scientific Name		
			West Range, Natural Resource Building	1	8/19/2003
			<i>Enochrus cinctus</i> (Say)		
			Hab_Afil	No_Spec	Date
			East Range, Medicine Creek, Archery Range	1	6/11/2003
			West Range, Lake Elmer Thomas Recreation Area	1	6/9/2003
			<i>Enochrus hamiltoni</i> (Horn)		
			Hab_Afil	No_Spec	Date
			East Range, 0.5 south east of Parks Hill on road to Parks Hill	1	5/30/2004
			East Range, East Cache Creek, South Boundary Road	1	5/30/2004
			Quanah Range, Pottawatami Twins (Pond)	1	7/9/2004
			Quanah Range, West Cache Creek, South Boundary Road	2	7/2/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/8/2004
			West Range, Medicine Creek, 10-mile Crossing	1	6/12/2002
			<i>Enochrus ochraceus</i> (Melsheimer)		
			Hab_Afil	No_Spec	Date
			East Range, 0.5 south east of Parks Hill on road to Parks Hill	1	5/30/2004
			<i>Enochrus pygmaeus</i> (Fabricius)		
			Hab_Afil	No_Spec	Date
			East Range	2	8/17/2003
			East Range, 0.5 south east of Parks Hill on road to Parks Hill	1	5/30/2004
			East Range, East Cache Creek, South Boundary Road	3	6/10/2003
			East Range, East Cache Creek, Peachtree Crossing	6	8/12/2003
			Quanah Range, Pottawatami Twins (Pond)	2	7/1/2003
			Quanah Range, Pottawatami Twins (Pond)	8	9/20/2003
			Quanah Range, Rock Creek, South Boundary Road	1	9/20/2003
			Quanah Range, Rock Creek, South Boundary Road	2	7/2/2003
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	4	7/10/2004
			Quanah Range, West Cache Creek, South Boundary Road	1	7/2/2003
			Quanah Range, West Cache Creek, South Boundary Road	11	7/2/2003
			West Range	1	6/8/2002
			West Range, Blue Beaver Creek, Blue Beaver Valley Road	2	10/1/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	3	10/1/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	5	7/8/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1	5/28/2001
			West Range, Medicine Creek, 10-mile Crossing	1	6/12/2002
			<i>Enochrus sayi</i> Gunderson		
			Hab_Afil	No_Spec	Date
			East Range	1	8/17/2003
			East Range, Lake George	6	8/12/2003
			East Range, East Cache Creek, Peachtree Crossing	1	8/12/2003
			Quanah Range, Pottawatami Twins (Pond)	1	8/12/2003

Order Suborder Family Scientific Name

Epimetopus sp.

Hab_Afil	No_Spec	Date
Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	1	7/10/2004
West Range, Blue Beaver Creek, McKenzie Hill Road	1	10/1/2004
West Range, Blue Beaver Creek, McKenzie Hill Road	2	7/8/2004
West Range, Blue Beaver Creek, McKenzie Hill Road	4	7/1/2003

***Helochares maculicollis* Mulsant**

Hab_Afil	No_Spec	Date
Quanah Range, Rock Creek, South Boundary Road	1	9/20/2003

***Hydrochara leechi* Smetana**

Hab_Afil	No_Spec	Date
East Range	2	8/17/2003
East Range	4	6/17/2003
West Range, Natural Resource Building	1	8/19/2003
Quanah Range, Pottawatami Twins (Pond)	1	7/9/2004
West Range	1	8/17/2003
West Range	2	7/19/2003

***Hydrochara occulta* (d'Orchymont)**

Hab_Afil	No_Spec	Date
West Range	2	7/19/2003

***Hydrochara soror* Smetana**

Hab_Afil	No_Spec	Date
East Range	1	5/27/2003
East Range	1	5/27/2003
East Range	7	6/24/2003
East Range, 0.5 south east of Parks Hill on road to Parks Hill	2	5/30/2004
East Range, East Cache Creek, Hoyle Bridge	2	6/10/2003
East Range, East Cache Creek, South Boundary Road	1	7/11/2002
East Range, East Cache Creek, South Boundary Road	1	6/10/2003
East Range, East Cache Creek, South Boundary Road	1	6/13/2003
East Range, East Cache Creek, South Boundary Road	2	5/30/2004
East Range, East Cache Creek, South Boundary Road	3	4/28/2003
East Range, East Cache Creek, South Boundary Road	4	7/7/2002
East Range, East Cache Creek, South Boundary Road	6	6/12/2002
West Range, Natural Resource Building	1	6/11/2002
West Range, Natural Resource Building	1	4/27/2003
West Range, Natural Resource Building	7	7/7/2002
East Range, Parks Hill	1	7/11/2002
Quanah Range, Pottawatami Twins (Pond)	1	7/1/2003
West Range, Lake Elmer Thomas Recreation Area	2	6/12/2003

Order	Suborder	Family	Scientific Name		No_Spec	Date
			<i>Hydrochara spangleri</i> Smetana			
			Hab_Afil		No_Spec	Date
			East Range, East Cache Creek, Hoyle Bridge		3	6/10/2003
			East Range, East Cache Creek, South Boundary Road		1	6/10/2003
			East Range, Medicine Creek, Archery Range		1	6/11/2003
			West Range, Natural Resource Building		1	4/27/2003
			East Range, Parks Hill		1	6/12/2003
			Quanah Range, Rock Creek, South Boundary Road		1	7/2/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road		1	6/9/2003
			<i>Hydrochus sp.</i>			
			Hab_Afil		No_Spec	Date
			Quanah Range, Pottawatami Twins (Pond)		1	7/9/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road		1	3/15/2004
			<i>Hydrophilus triangularis</i> Say			
			Hab_Afil		No_Spec	Date
			East Range, Lake George		2	8/12/2003
			West Range, Natural Resource Building		2	8/19/2003
			Quanah Range, Pottawatami Twins (Pond)		3	7/1/2003
			West Range		12	7/19/2003
			<i>Hydrovatus pustulatus</i> (Melsheimer)			
			Hab_Afil		No_Spec	Date
			West Range, Blue Beaver Creek, McKenzie Hill Road		1	3/15/2004
			<i>Laccobius minutoides</i> Orchymont			
			Hab_Afil		No_Spec	Date
			Quanah Range, Rock Creek, South Boundary Road		1	4/24/2003
			<i>Laccobius teneralis</i> Cheary			
			Hab_Afil		No_Spec	Date
			East Range, East Cache Creek, Peachtree Crossing		1	4/26/2002
			<i>Paracymus confusus</i> Wooldridge			
			Hab_Afil		No_Spec	Date
			West Range, Blue Beaver Creek, Blue Beaver Valley Road		3	10/1/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road		1	10/1/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road		2	7/8/2004
			<i>Paracymus sp.</i>			
			Hab_Afil		No_Spec	Date
			East Range, East Cache Creek, South Boundary Road		1	6/11/2003
			East Range, Lake George		1	8/12/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road		1	7/1/2003
			West Range, Medicine Creek, 10-mile Crossing		1	6/12/2002
			<i>Tropisternus blatchleyi</i> Orchymont			
			Hab_Afil		No_Spec	Date

Order	Suborder	Family	Scientific Name	No_Spec	Date
			West Range, Natural Resource Building	3	8/9/2002
			<i>Tropisternus collaris</i> (Fabricius)		
			Hab_Afil	No_Spec	Date
			East Range	2	8/17/2003
			East Range, Clear Pond	2	6/10/2003
			East Range, East Cache Creek, South Boundary Road	1	7/11/2002
			East Range, East Cache Creek, South Boundary Road	1	9/26/2003
			East Range, East Cache Creek, South Boundary Road	2	9/19/2003
			East Range, East Cache Creek, South Boundary Road	3	6/10/2003
			East Range, East Cache Creek, South Boundary Road	6	6/12/2002
			East Range, Lake George	1	8/12/2003
			East Range, Medicine Creek, Archery Range	1	6/11/2003
			East Range, Medicine Creek, Archery Range	1	6/11/2003
			East Range, East Cache Creek, Peachtree Crossing	4	8/12/2003
			West Range, Natural Resource Building	1	7/7/2002
			West Range, Natural Resource Building	1	6/13/2003
			West Range, Natural Resource Building	1	8/19/2003
			West Range, Natural Resource Building	3	8/9/2002
			East Range, near Quonsett (Pond)	1	6/12/2002
			East Range, small pond, 2.5 mile North of Bald Ridge Road	2	9/13/2002
			Quanah Range, Pottawatami Twins (Pond)	1	7/9/2004
			Quanah Range, Pottawatami Twins (Pond)	7	9/20/2003
			Quanah Range, Rock Creek, South Boundary Road	1	7/2/2003
			Quanah Range, West Cache Creek, South Boundary Road	2	7/1/2003
			West Range	3	8/18/2003
			West Range	11	7/19/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/1/2003
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1	6/30/2003
			West Range, Lake Elmer Thomas Recreation Area	2	9/13/2002
			West Range, Lake Elmer Thomas Recreation Area	4	6/12/2003
			West Range, Medicine Creek, 10-mile Crossing	1	6/12/2002
			West Range, near Engineer Lake	1	7/10/2002
			<i>Tropisternus ellipticus</i> (LeConte)		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	2	6/11/2003
			East Range, Medicine Creek, Archery Range	2	6/11/2003
			Quanah Range, Rock Creek, South Boundary Road	1	9/20/2003
			West Range, Medicine Creek, 10-mile Crossing	1	3/15/2004
			<i>Tropisternus lateralis nimbatus</i> (Say)		
			Hab_Afil	No_Spec	Date
			East Range	2	8/17/2003

Order	Suborder	Family	Scientific Name	No_Spec	Date
			East Range, Clear Pond	1	6/12/2003
			East Range, East Cache Creek, South Boundary Road	1	6/11/2002
			East Range, East Cache Creek, South Boundary Road	1	6/12/2002
			East Range, East Cache Creek, South Boundary Road	4	6/10/2003
			East Range, Lake George	3	8/12/2003
			East Range, East Cache Creek, Peachtree Crossing	1	8/12/2003
			East Range, East Cache Creek, Peachtree Crossing	3	8/12/2003
			West Range, Natural Resource Building	1	8/19/2003
			West Range, Natural Resource Building	2	6/13/2002
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	1	8/12/2003
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	1	5/29/2004
			Quanah Range, West Cache Creek, South Boundary Road	2	7/1/2003
			West Range	1	8/18/2003
			West Range	13	7/19/2003
			West Range, Engineer Lake	7	9/13/2002
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1	7/2/2003
			West Range, Mandam Pond	2	3/15/2004
			West Range, Medicine Creek, 10-mile Crossing	1	6/12/2002
			<i>Tropisternus natator</i> d'Orchymont		
			Hab_Afil	No_Spec	Date
			East Range, Medicine Creek, Archery Range	1	6/11/2003
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	1	9/19/2003

Trichoptera

Helicopsychidae

Helicopsyche borealis (Hagen)

Hab_Afil	No_Spec	Date
East Range	1	6/24/2003
East Range, East Cache Creek, South Boundary Road	3	4/25/2003
East Range, East Cache Creek, South Boundary Road	42	5/30/2004
East Range, East Cache Creek, Peachtree Crossing	1	6/12/2003
East Range, East Cache Creek, Peachtree Crossing	5	10/1/2004
West Range, Natural Resource Building	1	4/28/2002
West Range, Natural Resource Building	2	6/10/2002
West Range, Natural Resource Building	3	5/28/2003
Fort Sill	7	4/25/2003
West Range	1	4/22/2003
West Range	4	4/27/2002
West Range, Blue Beaver Creek, McKenzie Hill Road	1	10/1/2004
West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1	7/1/2003
West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	2	5/28/2004

Order	Suborder	Family	Scientific Name		
			West Range, Medicine Creek, 10-mile Crossing	2	6/12/2002
			<i>Helicopsyche limnella</i> Ross		
			Hab_Afil	No_Spec	Date
			West Range, Natural Resource Building	1	9/13/2002
			<i>Helicopsyche piroa</i> Ross		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	1	5/30/2004
			East Range, East Cache Creek, Peachtree Crossing	35	9/13/1999
			<i>Helicopsyche sp.</i>		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	1	6/13/2002
			East Range, East Cache Creek, South Boundary Road	1	7/7/2002
			West Range, Natural Resource Building	1	8/9/2002
			West Range, Natural Resource Building	5	5/28/2003
			Hydropsychidae		
			<i>Cheumatopsyche analis</i> (Banks)		
			Hab_Afil	No_Spec	Date
			East Range	1	5/2/2003
			East Range	1	6/24/2003
			East Range, Medicine Creek, Medicine Bluffs	1	7/3/2003
			East Range, East Cache Creek, Peachtree Crossing	23	10/1/2004
			West Range, Natural Resource Building	8	9/13/2002
			East Range, near Quonsett (Pond)	1	6/11/2002
			East Range, south east of Parks Hill on road to Parks Hill, BLT	1	5/30/2004
			Quanah Range	7	7/2/2003
			Quanah Range	21	7/2/2003
			Quanah Range, Rock Creek, South Boundary Road	33	7/2/2003
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	31	7/10/2004
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	82	5/29/2004
			Quanah Range, West Cache Creek, South Boundary Road	6	5/29/2004
			West Range	1	4/27/2002
			West Range	1	4/22/2003
			West Range	2	4/27/2002
			West Range	6	6/17/2003
			West Range	25	6/24/2003
			West Range	41	7/1/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	2	10/1/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	3	5/28/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	3	7/9/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	7	9/27/1999
			West Range, Blue Beaver Creek, McKenzie Hill Road	24	7/1/2004

Order	Suborder	Family	Scientific Name	No_Spec	Date
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	3	7/1/2003
			West Range, Medicine Creek, 10-mile Crossing	11	6/12/2002
			West Range, Medicine Creek, 10-mile Crossing	16	6/12/2002
			West Range, Medicine Creek, 10-mile Crossing	26	6/12/2002
			West Range, near junction of Blue Beaver Valley Road and Deer Creek Canyon Road	11	10/1/2004
			West Range, near junction of Blue Beaver Valley Road and Deer Creek Canyon Road	43	5/28/2004
			<i>Cheumatopsyche campyla</i> Ross		
			Hab_Afil	No_Spec	Date
			East Range	1	6/17/2003
			East Range	25	6/24/2003
			East Range	38	5/28/2003
			East Range, 0.5 south east of Parks Hill on road to Parks Hill	1	5/30/2004
			West Range, Apache Gate Road, north of Natural Resource Building	6	6/13/2002
			East Range, East Cache Creek, South Boundary Road	1	9/14/2002
			East Range, East Cache Creek, South Boundary Road	5	6/13/2002
			East Range, East Cache Creek, South Boundary Road	5	7/7/2002
			East Range, East Cache Creek, South Boundary Road	17	6/10/2002
			East Range, East Cache Creek, South Boundary Road	19	4/25/2003
			East Range, East Cache Creek, South Boundary Road	22	4/25/2003
			East Range, East Cache Creek, South Boundary Road	97	4/1/2003
			East Range, East Cache Creek, South Boundary Road	126	5/30/2004
			East Range, East Cache Creek, South Boundary Road	301	6/13/2002
			East Range, Medicine Creek, Medicine Bluffs	6	7/3/2003
			East Range, East Cache Creek, Peachtree Crossing	5	10/1/2004
			West Range, Natural Resource Building	1	6/8/2002
			West Range, Natural Resource Building	4	6/11/2002
			West Range, Natural Resource Building	5	4/24/2003
			West Range, Natural Resource Building	8	7/6/2002
			West Range, Natural Resource Building	9	3/31/2003
			West Range, Natural Resource Building	13	8/9/2002
			West Range, Natural Resource Building	22	4/28/2002
			West Range, Natural Resource Building	24	5/1/2003
			West Range, Natural Resource Building	26	7/7/2002
			West Range, Natural Resource Building	34	6/12/2002
			West Range, Natural Resource Building	135	5/28/2003
			East Range, near Quonsett (Pond)	1	6/11/2002
			East Range, Parks Hill	7	7/11/2002
			Fort Sill	17	4/25/2003
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	16	5/29/2004
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	24	7/10/2004
			West Range	4	6/24/2003

Order	Suborder	Family	Scientific Name		
			West Range	6	7/19/2003
			West Range	18	4/22/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	10/1/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	3	7/9/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	72	6/12/2002
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	11	7/1/2003
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	70	5/28/2004
			West Range, Lake Elmer Thomas Recreation Area	5	5/26/2003
			West Range, Medicine Creek, 10-mile Crossing	51	6/12/2002
			West Range, Medicine Creek, 10-mile Crossing	72	6/12/2002
			West Range, near junction of Blue Beaver Valley Road and Deer Creek Canyon Road	9	10/1/2004
<i>Cheumatopsyche lasia</i> Ross					
			Hab_Afil	No_Spec	Date
			East Range	16	5/28/2003
			East Range	16	6/24/2003
			East Range, East Cache Creek, South Boundary Road	2	6/10/2002
			East Range, East Cache Creek, South Boundary Road	2	6/13/2002
			East Range, East Cache Creek, South Boundary Road	3	4/25/2003
			East Range, East Cache Creek, South Boundary Road	4	6/13/2002
			East Range, East Cache Creek, South Boundary Road	4	4/25/2003
			East Range, East Cache Creek, South Boundary Road	12	8/12/2003
			East Range, East Cache Creek, South Boundary Road	24	5/30/2004
			East Range, East Cache Creek, South Boundary Road	110	6/13/2002
			West Range, Natural Resource Building	1	9/13/2002
			West Range, Natural Resource Building	3	7/6/2002
			West Range, Natural Resource Building	4	5/28/2003
			West Range, Natural Resource Building	5	4/28/2002
			West Range, Natural Resource Building	5	6/12/2002
			West Range, Natural Resource Building	8	8/9/2002
			West Range, Natural Resource Building	11	7/7/2002
			East Range, Parks Hill	3	7/11/2002
			Fort Sill	13	4/25/2003
			Quanah Range, Pottawatomie Twins	2	7/10/2004
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	2	7/10/2004
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	4	5/29/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/9/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1	5/28/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	3	7/1/2003
<i>Cheumatopsyche pasella</i> Ross					
			Hab_Afil	No_Spec	Date
			East Range, 0.5 miles east of Menoher Hill	1	4/24/2002

Order Suborder Family Scientific Name

Cheumatopsyche sp.

Hab_Afil	No_Spec	Date
East Range, East Cache Creek, Hoyle Bridge	1	6/9/2002
Quanah Range	3	7/2/2003
West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	3	7/1/2003

Hydropsyche bidens Ross

Hab_Afil	No_Spec	Date
East Range	1	8/12/2003
East Range	12	6/17/2003
East Range	67	6/24/2003
East Range	70	5/28/2003
East Range, East Cache Creek, South Boundary Road	9	4/1/2003
East Range, East Cache Creek, South Boundary Road	13	4/25/2003
East Range, Medicine Creek, Medicine Bluffs	15	7/3/2003
West Range, Natural Resource Building	18	5/1/2003
West Range, Natural Resource Building	23	5/28/2003
Fort Sill	7	4/25/2003
Quanah Range	1	7/2/2003
West Range	4	6/17/2003
West Range	10	7/19/2003
West Range	32	4/22/2003
West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	48	7/1/2003

Hydropsyche orris Ross

Hab_Afil	No_Spec	Date
East Range, East Cache Creek, South Boundary Road	1	6/13/2002
East Range, Medicine Creek, Medicine Bluffs	6	7/3/2003
West Range, Natural Resource Building	1	5/28/2003
West Range, Natural Resource Building	5	5/1/2003
East Range, near Quonsett (Pond)	14	6/11/2002
East Range, south east of Parks Hill on road to Parks Hill, BLT	1	5/30/2004
Quanah Range	2	7/2/2003
Quanah Range	3	7/2/2003
Quanah Range, Pottawatomie Twins	16	7/10/2004
Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	3	5/29/2004
Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	31	7/10/2004
West Range	2	6/24/2003
West Range, Blue Beaver Creek, McKenzie Hill Road	1	6/12/2002
West Range, Blue Beaver Creek, McKenzie Hill Road	76	7/9/2004
West Range, Medicine Creek, 10-mile Crossing	1	6/12/2002
West Range, near junction of Blue Beaver Valley Road and Deer Creek Canyon Road	1	5/28/2004

Order Suborder Family Scientific Name

***Hydropsyche rossi* Flint et al.**

Hab_Afil	No_Spec	Date
West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/9/2004

***Hydropsyche scalaris* Hagen**

Hab_Afil	No_Spec	Date
West Range, Natural Resource Building	2	3/31/2003
West Range	1	6/24/2003
West Range, Blue Beaver Creek, McKenzie Hill Road	14	6/10/2003
West Range, Medicine Creek, 10-mile Crossing	2	6/12/2002

***Hydropsyche simulans* Ross**

Hab_Afil	No_Spec	Date
East Range, 0.5 miles east of Menoher Hill	1	4/24/2002
West Range, Apache Gate Road, north of Natural Resource Building	7	6/13/2002
East Range, East Cache Creek, South Boundary Road	1	5/30/2004
East Range, East Cache Creek, South Boundary Road	2	6/13/2002
East Range, East Cache Creek, South Boundary Road	3	7/7/2002
East Range, East Cache Creek, South Boundary Road	5	4/25/2003
East Range, East Cache Creek, South Boundary Road	14	6/10/2002
East Range, East Cache Creek, South Boundary Road	17	9/14/2002
East Range, East Cache Creek, South Boundary Road	19	9/14/2002
East Range, East Cache Creek, South Boundary Road	53	5/30/2004
East Range, East Cache Creek, South Boundary Road	67	6/13/2002
East Range, East Cache Creek, Peachtree Crossing	144	10/1/2004
West Range, Natural Resource Building	1	4/24/2003
West Range, Natural Resource Building	2	6/11/2002
West Range, Natural Resource Building	7	4/28/2002
West Range, Natural Resource Building	9	7/6/2002
West Range, Natural Resource Building	12	8/9/2002
West Range, Natural Resource Building	32	9/13/2002
West Range, Natural Resource Building	39	6/12/2002
West Range, Natural Resource Building	43	7/7/2002
West Range	1	4/27/2002
West Range	8	6/24/2003
West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	4	7/1/2003
West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	16	5/28/2004
West Range, Medicine Creek, 10 mile Crossing	12	4/26/2003
West Range, Medicine Creek, 10-mile Crossing	65	6/12/2002
West Range, Medicine Creek, 10-mile Crossing	182	6/12/2002

***Hydropsyche* sp.**

Hab_Afil	No_Spec	Date
West Range, Natural Resource Building	2	6/8/2002

Order	Suborder	Family	Scientific Name	No_Spec	Date
			West Range	3	9/14/2002
			West Range	16	6/24/2003
			<i>Potomyia flava</i> (Hagen)		
			Hab_Afil	No_Spec	Date
			East Range	2	8/12/2003
			East Range	20	6/17/2003
			East Range, East Cache Creek, South Boundary Road	1	6/10/2002
			East Range, East Cache Creek, South Boundary Road	18	8/12/2003
			East Range, Medicine Creek, Medicine Bluffs	1	7/3/2003
			East Range, Medicine Creek, Medicine Bluffs	57	7/3/2003
			West Range, Natural Resource Building	1	7/6/2002
			West Range, Natural Resource Building	1	9/13/2002
			West Range, Natural Resource Building	5	7/7/2002
			West Range, Natural Resource Building	12	5/1/2003
			Quanah Range, Pottawatomie Twins	37	7/10/2004
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	1	5/29/2004
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	62	7/10/2004
			West Range	13	7/19/2003
			West Range	19	6/24/2003
			West Range	35	6/17/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	2	10/1/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	13	7/9/2004
			<i>Smicridea fasciatella</i> McLachlan		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, Peachtree Crossing	3	9/13/1999
			East Range, East Cache Creek, Peachtree Crossing	3	9/13/2002
			East Range, East Cache Creek, Peachtree Crossing	40	10/1/2004
			West Range, Natural Resource Building	3	9/13/2002
			West Range, Natural Resource Building	9	5/28/2003
			West Range, Natural Resource Building	10	5/1/2003
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	4	7/1/2003
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	4	5/28/2004
			<i>Smicridea signata</i> (Banks)		
			Hab_Afil	No_Spec	Date
			West Range, Medicine Creek, 10-mile Crossing	1	9/20/2003
			Hydroptilidae		
			<i>Hydroptila ajax</i> Ross		
			Hab_Afil	No_Spec	Date
			East Range, Lake George	1	8/12/2003
			East Range, Medicine Creek, Medicine Bluffs	14	9/12/1999
			East Range, East Cache Creek, Peachtree Crossing	84	10/1/2004

Order	Suborder	Family	Scientific Name		
			Quanah Range, West Cache Creek, South Boundary Road	2	9/25/1999
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/9/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	2	7/10/2004
			<i>Hydroptila angusta</i> Ross		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	2	9/25/1999
			East Range, East Cache Creek, South Boundary Road	22	10/2/1999
			East Range, East Cache Creek, Peachtree Crossing	44	9/13/1999
			West Range, Natural Resource Building	2	9/13/2002
			<i>Hydroptila armata</i> Ross		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, Peachtree Crossing	39	10/1/2004
			West Range	1	4/22/2003
			<i>Hydroptila consimilis</i> Morton		
			Hab_Afil	No_Spec	Date
			West Range, Blue Beaver Creek, McKenzie Hill Road	15	7/10/2004
			<i>Hydroptila hamata</i> Morton		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	1	8/12/2003
			Quanah Range	2	7/2/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	9/27/1999
			West Range, Blue Beaver Creek, McKenzie Hill Road	5	10/1/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	15	7/10/2004
			<i>Hydroptila perdita</i> Morton		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, Peachtree Crossing	18	9/26/1999
			Quanah Range, West Cache Creek, South Boundary Road	2	9/25/1999
			<i>Hydroptila sp.</i>		
			Hab_Afil	No_Spec	Date
			West Range, Natural Resource Building	1	3/13/2003
			West Range, Natural Resource Building	1	3/31/2003
			<i>Hydroptila waubesiana</i> Betten		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	1	5/30/2004
			West Range, Medicine Creek, 10 mile Crossing	2	10/2/1999
			<i>Ochrotrichia tarsalis</i> (Hagen)		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	5	8/12/2003
			East Range, East Cache Creek, Peachtree Crossing	33	10/1/2004
			West Range, Natural Resource Building	1	9/13/2002

Order	Suborder	Family	Scientific Name			
			<i>Orthotrichia aegefaciella</i> (Chambers)			
			Hab_Afil	No_Spec	Date	
			East Range	22	8/12/2003	
			East Range	39	8/12/2003	
			East Range, East Cache Creek, Peachtree Crossing	5	10/1/2004	
			East Range, East Cache Creek, Peachtree Crossing	11	9/12/1999	
			East Range, East Cache Creek, Peachtree Crossing	18	9/12/1999	
			Quanah Range, West Cache Creek, South Boundary Road	14	9/25/1999	
			West Range, Blue Beaver Creek, McKenzie Hill Road	2	7/9/2004	
			West Range, Blue Beaver Creek, McKenzie Hill Road	2	10/1/2004	
			West Range, Lake Elmer Thomas Recreation Area	1	5/17/2000	
			West Range, Lake Elmer Thomas Recreation Area	2	5/26/2003	
			<i>Orthotrichia cristata</i> Morton			
			Hab_Afil	No_Spec	Date	
			West Range	1	8/12/2003	
			West Range, Lake Elmer Thomas Recreation Area	4	9/27/2003	
			West Range, Medicine Creek, 4mile Crossing	3	9/12/1999	
			<i>Oxyethira azteca</i> (Mosely)			
			Hab_Afil	No_Spec	Date	
			West Range	1	8/18/2003	
			<i>Oxyethira forcipata</i> Mosely			
			Hab_Afil	No_Spec	Date	
			East Range, East Cache Creek, Peachtree Crossing	7	9/25/1999	
			West Range, Ketch Lake	3	9/27/1999	
			<i>Oxyethira janella</i> Denning			
			Hab_Afil	No_Spec	Date	
			East Range, East Cache Creek, Peachtree Crossing	27	10/1/2004	
			West Range, Blue Beaver Creek, McKenzie Hill Road	2	10/1/2004	
			<i>Oxyethira pallida</i> (Banks)			
			Hab_Afil	No_Spec	Date	
			East Range, East Cache Creek, Peachtree Crossing	7	10/1/2004	
			West Range, Natural Resource Building	2	5/28/2003	
			Quanah Range, West Cache Creek, South Boundary Road	6	9/25/1999	
			West Range, Lake Elmer Thomas Recreation Area	8	9/27/2003	
			West Range, near junction of Blue Beaver Valley Road and Deer Creek Canyon Road	2	10/1/2004	
			<i>Oxyethira sp.</i>			
			Hab_Afil	No_Spec	Date	
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	1	5/29/2004	
			<i>Oxyethira zeronia</i> Ross			
			Hab_Afil	No_Spec	Date	
			East Range, East Cache Creek, Peachtree Crossing	1	10/1/2004	

Order	Suborder	Family	Scientific Name		
			West Range	9	8/18/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	11	10/1/2004
			West Range, Ketch Lake	2	5/17/2000
			West Range, Lake Elmer Thomas Recreation Area	3	5/26/2003
			West Range, Lake Elmer Thomas Recreation Area	30	9/27/2003
			Leptoceridae		
			<i>Ceraclea cancellata</i> (Betten)		
			Hab_Afil	No_Spec	Date
			West Range, Natural Resource Building	3	8/9/2002
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	9/27/1999
			<i>Ceraclea maculata</i> (Banks)		
			Hab_Afil	No_Spec	Date
			East Range	1	8/12/2003
			East Range, East Cache Creek, South Boundary Road	1	6/13/2002
			East Range, East Cache Creek, South Boundary Road	1	5/30/2004
			East Range, East Cache Creek, Peachtree Crossing	5	10/1/2004
			East Range, East Cache Creek, Peachtree Crossing	16	9/26/1999
			West Range, Natural Resource Building	2	5/1/2003
			West Range, Natural Resource Building	9	5/28/2003
			Quanah Range	1	7/2/2003
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	3	5/29/2004
			Quanah Range, West Cache Creek, South Boundary Road	13	9/25/1999
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/9/2004
			West Range, Lake Elmer Thomas Recreation Area	49	5/26/2003
			West Range, Medicine Creek, 10-mile Crossing	1	6/12/2002
			<i>Ceraclea punctata</i> (Banks)		
			Hab_Afil	No_Spec	Date
			West Range, Apache Gate Road, north of Natural Resource Building	1	6/13/2002
			West Range, Natural Resource Building	1	7/7/2002
			<i>Ceraclea sp.</i>		
			Hab_Afil	No_Spec	Date
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	5	5/28/2004
			<i>Leptocerus americanus</i> (Banks)		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	1	6/13/2002
			West Range, Natural Resource Building	1	4/28/2002
			West Range, Natural Resource Building	4	5/28/2003
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	6	5/29/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	3	5/28/2004
			West Range, Lake Elmer Thomas Recreation Area	1	5/26/2003
			West Range, near junction of Blue Beaver Valley Road and Deer Creek Canyon Road	1	5/28/2004

Order	Suborder	Family	Scientific Name		No_Spec	Date
			<i>Nectopsyche candida</i> (Hagen)			
			Hab_Afil		No_Spec	Date
			West Range, Blue Beaver Creek, McKenzie Hill Road		4	7/9/2004
			<i>Nectopsyche pavidata</i> (Hagen)			
			Hab_Afil		No_Spec	Date
			East Range, East Cache Creek, South Boundary Road		1	9/19/2003
			West Range, Medicine Creek, 10-mile Crossing		2	9/20/2003
			<i>Nectopsyche sp.</i>			
			Hab_Afil		No_Spec	Date
			East Range, East Cache Creek, Hoyle Bridge		1	6/9/2002
			East Range, Medicine Creek, Medicine Bluffs		2	7/3/2003
			East Range, East Cache Creek, Peachtree Crossing		2	10/1/2004
			West Range, Natural Resource Building		2	5/1/2003
			Quanah Range, Pottawatomie Twins		7	7/10/2004
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge		10	7/10/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road		3	7/9/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.		1	5/28/2004
			West Range, Lake Elmer Thomas Recreation Area		3	5/26/2003
			West Range, Medicine Creek, 10-mile Crossing		1	6/12/2002
			<i>Oecetis avara</i> (Banks)			
			Hab_Afil		No_Spec	Date
			East Range		1	4/24/2002
			East Range		2	6/24/2003
			West Range, Apache Gate Road, north of Natural Resource Building		1	6/13/2002
			East Range, East Cache Creek, South Boundary Road		1	7/7/2002
			East Range, East Cache Creek, South Boundary Road		1	5/30/2004
			East Range, East Cache Creek, South Boundary Road		3	6/10/2002
			East Range, East Cache Creek, South Boundary Road		3	4/25/2003
			East Range, East Cache Creek, South Boundary Road		10	4/25/2003
			East Range, East Cache Creek, South Boundary Road		18	6/13/2002
			East Range, East Cache Creek, South Boundary Road		23	5/30/2004
			East Range, East Cache Creek, Peachtree Crossing		1	6/11/2003
			East Range, East Cache Creek, Peachtree Crossing		1	6/12/2003
			West Range, Natural Resource Building		1	9/13/2002
			West Range, Natural Resource Building		10	5/28/2003
			East Range, Parks Hill		16	7/11/2002
			Fort Sill		4	4/25/2003
			Quanah Range		1	4/26/2003
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge		1	7/10/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.		1	5/28/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.		2	7/1/2003

Order	Suborder	Family	Scientific Name		
			West Range, Lake Elmer Thomas Recreation Area	1	5/26/2003
			West Range, Medicine Creek, 10 mile Crossing	1	4/26/2003
			West Range, Medicine Creek, 4mile Crossing	1	6/11/2003
			West Range, Medicine Creek, 10-mile Crossing	1	6/12/2002
			<i>Oecetis cinerascens</i> (Hagen)		
			Hab_Afil	No_Spec	Date
			East Range	2	5/28/2003
			East Range	14	8/12/2003
			East Range, 0.5 south east of Parks Hill on road to Parks Hill	3	5/30/2004
			East Range, East Cache Creek, South Boundary Road	1	6/10/2003
			East Range, Lake George	17	8/12/2003
			East Range, East Cache Creek, Peachtree Crossing	7	10/1/2004
			West Range, Natural Resource Building	1	5/28/2003
			West Range, Natural Resource Building	2	9/13/2002
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	3	5/29/2004
			Quanah Range, Pottawatomie Twins	2	7/10/2004
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	2	5/29/2004
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	2	7/10/2004
			West Range	2	6/24/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	10/1/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	4	5/28/2004
			West Range, Lake Elmer Thomas Recreation Area	31	5/26/2003
			West Range, Medicine Creek, 10 mile Crossing	1	4/26/2003
			West Range, Medicine Creek, 4mile Crossing	1	6/11/2003
			West Range, near junction of Blue Beaver Valley Road and Deer Creek Canyon Road	1	10/1/2004
			<i>Oecetis ditissa</i> Ross		
			Hab_Afil	No_Spec	Date
			East Range	1	8/12/2003
			East Range, Lark Pond	1	9/12/1999
			East Range, Medicine Creek, Medicine Bluffs	1	7/3/2003
			East Range, East Cache Creek, Peachtree Crossing	1	9/13/1999
			East Range, East Cache Creek, Peachtree Crossing	1	10/1/2004
			Quanah Range, Pottawatami Twins (Pond)	1	9/20/2003
			West Range	1	6/17/2003
			West Range	1	7/19/2003
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1	7/1/2003
			<i>Oecetis inconspicua</i> (Walker)		
			Hab_Afil	No_Spec	Date
			East Range	1	4/25/2003
			East Range	1	5/28/2003
			East Range	1	6/17/2003

Order	Suborder	Family	Scientific Name		
			East Range	1	6/24/2003
			East Range	3	8/12/2003
			East Range, 0.5 south east of Parks Hill on road to Parks Hill	11	5/30/2004
			East Range, East Cache Creek, Hoyle Bridge	1	6/9/2002
			East Range, East Cache Creek, South Boundary Road	1	6/13/2002
			East Range, East Cache Creek, South Boundary Road	1	9/14/2002
			East Range, East Cache Creek, South Boundary Road	1	4/25/2003
			East Range, East Cache Creek, South Boundary Road	1	6/10/2003
			East Range, East Cache Creek, South Boundary Road	1	8/12/2003
			East Range, East Cache Creek, South Boundary Road	2	4/25/2003
			East Range, Medicine Creek, Medicine Bluffs	2	7/3/2003
			East Range, East Cache Creek, Peachtree Crossing	202	10/1/2004
			West Range, Natural Resource Building	1	4/28/2002
			West Range, Natural Resource Building	1	6/12/2002
			West Range, Natural Resource Building	1	9/13/2002
			West Range, Natural Resource Building	3	7/6/2002
			West Range, Natural Resource Building	3	5/28/2003
			West Range, Natural Resource Building	14	5/1/2003
			East Range, near Quonsett (Pond)	1	6/11/2002
			East Range, Parks Hill	2	7/11/2002
			Quanah Range	2	4/26/2003
			Quanah Range	2	7/2/2003
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	4	5/29/2004
			Quanah Range, Pottawatomie Twins	65	7/10/2004
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	89	5/29/2004
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	189	7/10/2004
			Quanah Range, West Cache Creek, South Boundary Road	1	5/29/2004
			West Range	1	6/24/2003
			West Range	1	7/1/2003
			West Range	2	6/17/2003
			West Range	10	7/19/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	6/12/2002
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	6/10/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	5	10/1/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	10	7/9/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1	7/1/2003
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	6	5/28/2004
			West Range, Lake Elmer Thomas Recreation Area	73	5/26/2003
			West Range, Medicine Creek, 10 mile Crossing	1	4/26/2003
			West Range, Medicine Creek, 10-mile Crossing	1	6/12/2002
			West Range, near junction of Blue Beaver Valley Road and Deer Creek Canyon Road	2	10/1/2004

Order	Suborder	Family	Scientific Name		
			West Range, near junction of Blue Beaver Valley Road and Deer Creek Canyon Road	20	5/28/2004
			<i>Oecetis nocturna</i> Ross		
			Hab_Afil	No_Spec	Date
			East Range	4	5/28/2003
			East Range	6	5/28/2003
			East Range, East Cache Creek, South Boundary Road	1	4/25/2003
			East Range, East Cache Creek, South Boundary Road	4	4/25/2003
			East Range, East Cache Creek, South Boundary Road	10	5/30/2004
			East Range, Lake George	13	9/12/1999
			East Range, East Cache Creek, Peachtree Crossing	1	6/12/2003
			East Range, East Cache Creek, Peachtree Crossing	3	9/13/1999
			Fort Sill	3	4/25/2003
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	1	5/29/2004
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	1	7/10/2004
			<i>Oecetis persimilis</i> (Banks)		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, Peachtree Crossing	1	6/11/2003
			West Range, Natural Resource Building	1	7/7/2002
			West Range, Natural Resource Building	6	5/28/2003
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	5	5/28/2004
			<i>Oecetis</i> sp.		
			Hab_Afil	No_Spec	Date
			West Range		9/14/2002
			<i>Triaenodes helo</i> Milne		
			Hab_Afil	No_Spec	Date
			East Range	1	5/28/2003
			East Range, East Cache Creek, South Boundary Road	1	4/25/2003
			West Range, Natural Resource Building	1	6/10/2002
			West Range, Natural Resource Building	1	8/9/2002
			West Range, Natural Resource Building	32	5/28/2003
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	1	7/10/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	7/9/2004
			West Range, near junction of Blue Beaver Valley Road and Deer Creek Canyon Road	5	5/28/2004
			<i>Triaenodes injustus</i> (Hagen)		
			Hab_Afil	No_Spec	Date
			East Range	2	5/28/2003
			East Range	2	6/17/2003
			East Range, East Cache Creek, Peachtree Crossing	1	10/1/2004
			West Range, Natural Resource Building	16	5/28/2003
			Fort Sill	1	4/25/2003
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	3	5/29/2004

Order	Suborder	Family	Scientific Name		
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	7	7/10/2004
			West Range	2	4/22/2003
			West Range	4	6/17/2003
			West Range	16	6/24/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	10/1/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	4	5/28/2004
			West Range, Lake Elmer Thomas Recreation Area	38	5/26/2003
			West Range, Medicine Creek, 10 mile Crossing	2	10/2/1999
			<i>Triaenodes marginata</i> Sibley		
			Hab_Afil	No_Spec	Date
			West Range, Medicine Creek, 10 mile Crossing	5	10/2/1999
			<i>Triaenodes perna</i> Ross		
			Hab_Afil	No_Spec	Date
			West Range, Natural Resource Building	1	6/10/2002
			West Range, Natural Resource Building	1	8/9/2002
			<i>Triaenodes sp.</i>		
			Hab_Afil	No_Spec	Date
			East Range	2	8/12/2003
			West Range, Natural Resource Building	1	6/8/2002
			West Range, Medicine Creek, 10 mile Crossing	2	4/26/2003
			<i>Triaenodes tardus</i> Milne		
			Hab_Afil	No_Spec	Date
			East Range	1	6/17/2003
			East Range	8	8/12/2003
			East Range, 0.5 south east of Parks Hill on road to Parks Hill	2	5/30/2004
			East Range, East Cache Creek, South Boundary Road	1	9/14/2002
			East Range, East Cache Creek, South Boundary Road	1	8/12/2003
			West Range, Natural Resource Building	4	5/1/2003
			Fort Sill	1	4/25/2003
			Quanah Range, Pottawatomie Twins	2	7/10/2004
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	3	7/10/2004
			West Range	1	4/22/2003
			West Range	1	7/1/2003
			West Range	4	6/24/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	2	7/10/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	3	10/1/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	4	7/9/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	4	7/1/2003
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	10	7/1/2003
			West Range, Lake Elmer Thomas Recreation Area	14	5/26/2003
			West Range, Medicine Creek, 10 mile Crossing	1	4/26/2003

Order	Suborder	Family	Scientific Name		
			West Range, near junction of Blue Beaver Valley Road and Deer Creek Canyon Road	1	10/1/2004
			West Range, near junction of Blue Beaver Valley Road and Deer Creek Canyon Road	5	5/28/2004
			<i>Ylodes frontalis</i> (Banks)		
			Hab_Afil	No_Spec	Date
			East Range	3	6/24/2003
			Limnephilidae		
			<i>Pycnopsyche lepida</i> (Hagen)		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, Peachtree Crossing	10	10/1/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	3	5/30/2004
			Philopotamidae		
			<i>Chimarra angustipennis</i> Banks		
			Hab_Afil	No_Spec	Date
			East Range, Medicine Creek, Medicine Bluffs	2	9/12/1999
			<i>Chimarra feria</i> Ross		
			Hab_Afil	No_Spec	Date
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	1	7/10/2004
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	2	5/29/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	5	7/10/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1	5/28/2004
			West Range, near junction of Blue Beaver Valley Road and Deer Creek Canyon Road	3	5/28/2004
			<i>Chimarra obscura</i> (Walker)		
			Hab_Afil	No_Spec	Date
			East Range	1	8/12/2003
			East Range, 0.5 south east of Parks Hill on road to Parks Hill	1	5/30/2004
			West Range, Apache Gate Road, north of Natural Resource Building	5	6/13/2002
			East Range, East Cache Creek, South Boundary Road	4	5/30/2004
			East Range, East Cache Creek, South Boundary Road	14	6/13/2002
			East Range, East Cache Creek, Peachtree Crossing	23	10/1/2004
			West Range, Natural Resource Building	4	7/6/2002
			West Range, Natural Resource Building	5	5/28/2003
			West Range, Natural Resource Building	8	6/12/2002
			West Range, Natural Resource Building	10	7/7/2002
			West Range, Natural Resource Building	20	9/13/2002
			Quanah Range	93	7/2/2003
			Quanah Range, Pottawatomie Twins	6	7/10/2004
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	74	5/29/2004
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	104	7/10/2004
			Quanah Range, West Cache Creek, South Boundary Road	3	5/29/2004
			West Range	2	7/1/2003
			West Range	2	7/19/2003

Order	Suborder	Family	Scientific Name		
			West Range	19	6/17/2003
			West Range, Blue Beaver Creek, McKenzie Hill Road	1	10/1/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	6	7/10/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	40	7/9/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	3	5/28/2004
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	4	7/1/2003
			West Range, Medicine Creek, 10-mile Crossing	9	6/12/2002
			West Range, Medicine Creek, 10-mile Crossing	17	6/12/2002
			West Range, near junction of Blue Beaver Valley Road and Deer Creek Canyon Road	2	10/1/2004
			West Range, near junction of Blue Beaver Valley Road and Deer Creek Canyon Road	19	5/28/2004
			<i>Chimarra sp.</i>		
			Hab_Afil	No_Spec	Date
			West Range, Natural Resource Building	1	6/8/2002
			Quanah Range	1	7/2/2003
			Quanah Range, Rock Creek, South Boundary Road	10	7/2/2003
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1	7/1/2003
			West Range, Medicine Creek, 10-mile Crossing	1	4/25/2003
			Polycentropodidae		
			<i>Cernotina calcea</i> Ross		
			Hab_Afil	No_Spec	Date
			East Range, Lake George	3	8/12/2003
			East Range, East Cache Creek, Peachtree Crossing	2	9/13/1999
			Quanah Range, Pottawatami Twins (Pond)	1	9/20/2003
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	2	7/10/2004
			West Range, Lake Elmer Thomas Recreation Area	38	5/26/2003
			<i>Cernotina sp.</i>		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	1	8/12/2003
			East Range, East Cache Creek, South Boundary Road	1	7/10/2004
			<i>Cernotina spicata</i> Ross		
			Hab_Afil	No_Spec	Date
			West Range, Blue Beaver Creek, McKenzie Hill Road	3	7/9/2004
			West Range, Lake Elmer Thomas Recreation Area	1	5/26/2003
			West Range, Medicine Creek, 10-mile Crossing	1	6/12/2002
			West Range, Medicine Creek, 10-mile Crossing	1	7/1/2003
			<i>Cynellus fraternus</i> (Banks)		
			Hab_Afil	No_Spec	Date
			East Range	8	8/12/2003
			West Range, Natural Resource Building	1	6/11/2002
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	8	7/10/2004
			West Range, Blue Beaver Creek, McKenzie Hill Road	6	7/9/2004

Order	Suborder	Family	Scientific Name	No_Spec	Date
			West Range, Ketch Lake	2	9/12/1999
			West Range, Lake Elmer Thomas Recreation Area	5	5/26/2003
			<i>Paranyctiophylax affinis</i> (Banks)		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, Peachtree Crossing	15	9/26/1999
			West Range, Natural Resource Building	1	4/24/2003
			West Range, Natural Resource Building	20	5/28/2003
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	5	7/10/2004
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	23	5/29/2004
			Quanah Range, West Cache Creek, South Boundary Road	14	9/25/1999
			West Range	1	6/24/2003
			West Range	2	6/17/2003
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	2	7/1/2003
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	3	5/28/2004
			West Range, Lake Elmer Thomas Recreation Area	21	5/26/2003
			<i>Paranyctiophylax moestus</i> (Banks)		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, South Boundary Road	3	10/2/1999
			Quanah Range, West Cache Creek, South Boundary Road	3	9/26/1999
			<i>Paranyctiophylax sp.</i>		
			Hab_Afil	No_Spec	Date
			West Range, Natural Resource Building	1	6/11/2002
			West Range, Natural Resource Building	2	9/13/2002
			<i>Polycentropus centralis</i> Banks		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, Peachtree Crossing	1	10/1/2004
			Quanah Range, Rock Creek, South Boundary Road	4	7/2/2003
			<i>Polycentropus sp.</i>		
			Hab_Afil	No_Spec	Date
			East Range, East Cache Creek, Peachtree Crossing	2	10/1/2004
			West Range	1	4/22/2003
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1	7/1/2003
			West Range, near junction of Blue Beaver Valley Road and Deer Creek Canyon Road	1	5/28/2004

Diptera

Asilidae

Asilini

Hab_Afil	No_Spec
East Range, East Cache Creek, South Boundary Road	1
West Range, Medicine Bluffs, near archery range	1
West Range, Medicine Bluffs, near archery range	1

Order	Suborder	Family	Scientific Name	
			East Range, Parks Hill	1
			West Range, Lake Elmer Thomas Recreation Area	1
			<i>Asilus sp.</i>	
			Hab_Afil	No_Spec
			East Range	1
			East Range, Quinette Road at RR	2
			West Range, Natural Resource Building	1
			West Range	1
			<i>Atomosia melanopogon Hermann</i>	
			Hab_Afil	No_Spec
			East Range, mixed grass	6
			East Range, 0.5 miles south east of Parks Hill on road to Parks Hill	3
			<i>Atomosia puella (Wiedemann)</i>	
			Hab_Afil	No_Spec
			East Range, mixed grass	1
			West Range, Natural Resource Building	2
			<i>Atomosia sayii Johnson</i>	
			Hab_Afil	No_Spec
			East Range, mixed grass	1
			<i>Atomosia tibialis (Hull)</i>	
			Hab_Afil	No_Spec
			East Range, mixed grass	1
			<i>Cerotainiops abdominalis (Brown)</i>	
			Hab_Afil	No_Spec
			East Range, East Cache Creek, near Hoyle Bridge	1
			East Range, East Cache Creek, South Boundary Road	1
			Quanah Range, Pottawatami Twins (Pond)	2
			<i>Cophura bella (Loew)</i>	
			Hab_Afil	No_Spec
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	2
			Quanah Range, Rock Creek, South Boundary Road	10
			<i>Dicropaltum mesae (Tucker)</i>	
			Hab_Afil	No_Spec
			West Range, Lake Elmer Thomas Recreation Area	7
			<i>Dicropaltum sp.</i>	
			Hab_Afil	No_Spec
			East Range, Quonsett	1
			<i>Diogmites angustipennis Loew</i>	
			Hab_Afil	No_Spec
			East Range	3
			East Range, East Cache Creek, South Boundary Road	4
			East Range, Lake George	1
			East Range, mixed grass	2
			East Range, tall grass	7
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	3

Order	Suborder	Family	Scientific Name	
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	16
			Quanah Range, Pottawatami Twins (Pond)	4
			Quanah Range, West Cache Creek, South Boundary Road	2
			West Range	2
			West Range, Blue Beaver Creek, McKenzie Hill Road	6
			West Range, Engineer Lake	4
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	4
			West Range, Lake Elmer Thomas Recreation Area	5
			West Range, Medicine Creek, 10-mile Crossing	1
			West Range, Pratt Hill	1
			West Range, short grass	3
			<i>Diogmites neoternatus</i> (Bromley)	
			Hab_Afil	No_Spec
			West Range, Pratt Hill	2
			<i>Diogmites symmachus</i> Loew	
			Hab_Afil	No_Spec
			East Range, East Cache Creek, South Boundary Road	1
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	5
			West Range, Blue Beaver Creek, Blue Beaver Valley Road	3
			West Range, Blue Beaver Creek, McKenzie Hill Road	5
			<i>Efferia aestuans</i> (Linnaeus)	
			Hab_Afil	No_Spec
			East Range, East Cache Creek, South Boundary Road	1
			East Range, mixed grass	3
			East Range, tall grass	4
			West Rnge, junction of North Boundary Road and East of LETRA Gate	1
			<i>Efferia albibarbis</i> (Macquart)	
			Hab_Afil	No_Spec
			East Range	1
			East Range, East Cache Creek, South Boundary Road	2
			East Range, Parks Hill	1
			East Range, Quonsett	1
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	1
			Quanah Range, Post Oak Creek	2
			Quanah Range, Pottawatami Twins (Pond)	2
			Quanah Range, Rock Creek, South Boundary Road	7
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	3
			Quanah Range, West Cache Creek, South Boundary Road	3
			West Range, Blue Beaver Creek, McKenzie Hill Road	6
			West Range, Lake Elmer Thomas Recreation Area	2
			West Range, Medicine Creek, 10-mile Crossing	1
			<i>Efferia helenae</i> (Bromley)	
			Hab_Afil	No_Spec

Order	Suborder	Family	Scientific Name	
			West Range, Blue Beaver Creek, McKenzie Hill Road	1
			West Range, Engineer Lake	1
			West Range, Lake Elmer Thomas Recreation Area	14
			<i>Efferia kelloggi</i> Wilcox	
			Hab_Afil	No_Spec
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	1
			Quanah Range, Pottawatami Twins (Pond)	5
			West Range, Blue Beaver Creek, McKenzie Hill Road	4
			West Range, Ketch Lake	3
			West Range, Lake Elmer Thomas Recreation Area	2
			West Range, Medicine Creek, 10-mile Crossing	1
			<i>Efferia monki</i> (Bromley)	
			Hab_Afil	No_Spec
			East Range, East Cache Creek, near Hoyle Bridge	1
			East Range, Parks Hill	3
			West Range, Blue Beaver Creek, McKenzie Hill Road	1
			<i>Efferia nemoralis</i> (Hine)	
			Hab_Afil	No_Spec
			East Range, East Cache Creek, South Boundary Road	1
			West Range	5
			West Range, short grass	2
			<i>Efferia plena</i> (Hine)	
			Hab_Afil	No_Spec
			East Range, East Cache Creek, South Boundary Road	12
			West Range, Blue Beaver Valley Road before Gruber Hill	5
			<i>Efferia subpilosus</i> (Schaeffer)	
			Hab_Afil	No_Spec
			East Range, tall grass	1
			West Range	9
			West Range, Lake Elmer Thomas Recreation Area	5
			<i>Efferia texana</i> (Banks)	
			Hab_Afil	No_Spec
			West Range, Blue Beaver Creek, Blue Beaver Valley Road	1
			West Range, Blue Beaver Creek, McKenzie Hill Road	1
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1
			West Range, Lake Elmer Thomas Recreation Area	1
			<i>Efferia tuberculatus</i> (Coquillett)	
			Hab_Afil	No_Spec
			Quanah Range, West Cache Creek, South Boundary Road	2
			<i>Haplopogon latus</i> (Coquillett)	
			Hab_Afil	No_Spec
			West Range, Blue Beaver Creek, McKenzie Hill Road	1

Order	Suborder	Family	Scientific Name	
			<i>Heteropogon lautus</i> Loew	
			Hab_Afil	No_Spec
			West Range, near junction of Blue Beaver Valley Road and Deer Creek Canyon Road	2
			<i>Holopogon snowi</i> Back	
			Hab_Afil	No_Spec
			West Range, near junction of Blue Beaver Valley Road and Deer Creek Canyon Road	2
			<i>Lampria bicolor</i> (Wiedemann)	
			Hab_Afil	No_Spec
			Quanah Range, Pottawatami Twins (Pond)	1
			<i>Lampria rubriventris</i> (Macquart)	
			Hab_Afil	No_Spec
			East Range	2
			East Range, East Cache Creek, near Hoyle Bridge	3
			East Range, Lake George	2
			West Range, Medicine Bluffs	3
			East Range, Parks Hill	5
			East Range, Quonsett	2
			West Range, Blue Beaver Creek, McKenzie Hill Road	1
			West Range, Lake Elmer Thomas Recreation Area	1
			<i>Laphria flavicollis</i> Say	
			Hab_Afil	No_Spec
			East Range	5
			East Range, East Cache Creek, South Boundary Road	2
			Quanah Range, Rock Creek, South Boundary Road	2
			<i>Laphria macquarti</i> (Banks)	
			Hab_Afil	No_Spec
			East Range, East Cache Creek, South Boundary Road	2
			Quanah Range, Rock Creek, South Boundary Road	1
			<i>Leptogaster murinus</i> Loew	
			Hab_Afil	No_Spec
			East Range, East Cache Creek, South Boundary Road	1
			<i>Machimus</i> sp.	
			Hab_Afil	No_Spec
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	1
			West Range, Lake Elmer Thomas Recreation Area	1
			West Range, Medicine Creek, 10-mile Crossing	1
			<i>Microstylum morosum</i> Loew	
			Hab_Afil	No_Spec
			East Range	1
			East Range, East Cache Creek, South Boundary Road	1
			East Range, Lake George	2
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	1
			<i>Neoitamus orphne</i> (Walker)	
			Hab_Afil	No_Spec
			East Range	1

Order	Suborder	Family	Scientific Name	
			<i>Ommatius ouachitensis</i> Bullington and Lavigne	
			Hab_Afil	No_Spec
			East Range, tall grass	1
			<i>Ommatius tibialis</i> Say	
			Hab_Afil	No_Spec
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1
			<i>Ospriocercus abdominalis</i> Say	
			Hab_Afil	No_Spec
			West Range, Blue Beaver Creek, McKenzie Hill Road	2
			<i>Ospriocercus longulus</i> (Loew)	
			Hab_Afil	No_Spec
			Quanah Range, West Cache Creek, South Boundary Road	1
			<i>Ospriocercus latipennis</i> (Loew)	
			Hab_Afil	No_Spec
			West Range, Blue Beaver Valley Road before Gruber Hill	1
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	1
			<i>Ospriocercus rhadamanthus</i> Loew	
			Hab_Afil	No_Spec
			West Range	4
			West Range, Blue Beaver Creek, Blue Beaver Valley Road	2
			West Range, Blue Beaver Creek, McKenzie Hill Road	2
			West Range, Lake Elmer Thomas Recreation Area	2
			West Range, Pratt Hill	1
			West Range, short grass	3
			<i>Philonicus limpidipennis</i> (Hine)	
			Hab_Afil	No_Spec
			East Range, East Cache Creek, South Boundary Road	1
			East Range, Quinette Road at RR	2
			Quanah Range, Rock Creek, Falcongate Road	3
			Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	1
			<i>Philonicus</i> sp.	
			Hab_Afil	No_Spec
			East Range, East Cache Creek, South Boundary Road	2
			East Range, Lake George	1
			Quanah Range, West Cache Creek, South Boundary Road	1
			West Range, Lake Elmer Thomas Recreation Area	1
			West Range, Medicine Creek, 10-mile Crossing	1
			<i>Proctacanthella leucopogon</i> (Williston)	
			Hab_Afil	No_Spec
			East Range, East Cache Creek, South Boundary Road	1
			<i>Proctacanthus cacopilogus</i> (Hine)	
			Hab_Afil	No_Spec
			West Range, Lake Elmer Thomas Recreation Area	2
			<i>Proctacanthus hinei</i> Bromley	
			Hab_Afil	No_Spec
			East Range	2

Order Suborder Family Scientific Name

East Range, East Cache Creek, South Boundary Road	9
East Range, Lake George	2
West Range, Medicine Bluffs	2
East Range, East Cache Creek, Peachtree Crossing	1
East Range, Parks Hill	2
East Range, Quonsett	1
Quanah Range, Pottawatami Twins (Pond)	1
Quanah Range, West Cache Creek, South Boundary Road	1
West Range	2
<i>Proctacanthus milbertii</i> Macquart	
Hab_Afil	No_Spec
East Range, mixed grass	4
West Range	1
<i>Proctacanthus rodecki</i> James	
Hab_Afil	No_Spec
East Range, East Cache Creek, near Hoyle Bridge	1
<i>Proleptis tristis</i> (Walker)	
Hab_Afil	No_Spec
East Range, East Cache Creek, South Boundary Road	1
<i>Promachus bastardii</i> (Macquart)	
Hab_Afil	No_Spec
East Range, East Cache Creek, South Boundary Road	1
West Range	1
West Range, Blue Beaver Creek, McKenzie Hill Road	4
West Range, Lake Elmer Thomas Recreation Area	6
West Range, short grass	9
<i>Promachus dimidiatus</i> Curran	
Hab_Afil	No_Spec
Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	6
Quanah Range, Pottawatami Twins (Pond)	2
Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge	2
West Range, Lake Elmer Thomas Recreation Area	1
West Range, Blue Beaver Valley Road before Gruber Hill	2
West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1
West Range, short grass	1
<i>Promachus fitchii</i> Osten Sacken	
Hab_Afil	No_Spec
East Range, mixed grass	4
East Range, tall grass	3
West Range, short grass	1
<i>Promachus hinei</i> Bromley	
Hab_Afil	No_Spec
East Range, Lake George	2
<i>Psilocurus birdi</i> Curran	
Hab_Afil	No_Spec
East Range, tall grass	1

Order	Suborder	Family	Scientific Name	
			<i>Psilocurus nudiusculus</i> Loew	
			Hab_Afil	No_Spec
			East Range, Lake George	1
			<i>Saropogon dispar</i> Coquillett	
			Hab_Afil	No_Spec
			East Range	1
			East Range, East Cache Creek, South Boundary Road	3
			East Range, Parks Hill	1
			East Range, Quonsett	1
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	5
			Quanah Range, West Cache Creek, South Boundary Road	1
			West Range, Blue Beaver Creek, Blue Beaver Valley Road	4
			West Range, Blue Beaver Creek, McKenzie Hill Road	1
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	1
			<i>Stenopogon helvolus</i> (Loew)	
			Hab_Afil	No_Spec
			East Range, East Cache Creek, South Boundary Road	1
			<i>Stichopogon trifasciatus</i> (Say)	
			Hab_Afil	No_Spec
			East Range, East Cache Creek, South Boundary Road	3
			East Range, Parks Hill	1
			Quanah Range, West Cache Creek, South Boundary Road	10
			West Range, Blue Beaver Creek, McKenzie Hill Road	1
			West Range, Lake Elmer Thomas Recreation Area	1
			<i>Triola interruptus</i> (Macquart)	
			Hab_Afil	No_Spec
			East Range	1
			East Range, Quonsett	2
			East Range, tall grass	1
			Quanah Range, Jackson Hole (Pond), 0.5 miles East of Falcon Gate	10
			Quanah Range, Pottawatami Twins (Pond)	2
			Quanah Range, West Cache Creek, South Boundary Road	1
			West Range, Blue Beaver Creek, Blue Beaver Valley Road	3
			West Range, Lake Elmer Thomas Recreation Area	2
			West Range, off Elgin Road, south of Frisco Ridge	1
			West Range, short grass	1
		Mydidae		
			<i>Mydas chrysostomas</i> Osten Sacken	
			Hab_Afil	No_Spec
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	9
			<i>Mydas clavatus</i> (Drury)	
			Hab_Afil	No_Spec
			East Range, East Cache Creek, South Boundary Road	5
			Quanah Range, West Cache Creek, South Boundary Road-Site Record	2
			West Range, Blue Beaver Creek, McKenzie Hill Road	1
			West Range, jct. of North Boundary Rd. and LETRA Gate Rd.	3
			West Range, Pratt Hill	1

Appendix D. Additions to the Checklist of Odonata (Dragonflies and Damselflies) of Fort Sill, Comanche Co., Oklahoma.

Suborder Family
Scientific Name

Anisoptera

Corduliidae

***Somatochlora linearis* (Hagen)**

Habitat Affiliation	No_ Spec	Date
Quanah Range, Rock Creek, north of Jackson Hole	3	7/9/2004

Libellulidae

***Erythrodiplax umbrata* (Linnaeus)**

Habitat Affiliation	No_ Spec	Date
West Range, Medicine Creek, Punch Bowl Rd	2	9/30/2004

***Orthemis ferrugineus* (Fabricius)**

Habitat Affiliation	No_ Spec	Date
Quanah Range, Jackson Hole	4	5/28/2004
West Range, Hwy 49 entrance	1	5/28/2004

Zygoptera

Calopterygidae

***Calopteryx maculata* (Beauvois)**

Habitat Affiliation	No_ Spec	Date
Quanah Range, Post Oak Creek	4	5/28/2004

Coenagrionidae

***Argia fumipennis* (Burmeister)**

Habitat Affiliation	No_ Spec	Date
West Range, Blue Beaver Creek, McKenzie Hill Road	3	5/28/2004

***Enallagma divagans* Selys**

Habitat Affiliation	No_ Spec	Date
Quanah Range, West Cache Creek, South Boundary Road	1	5/28/2004
West Range, Medicine Creek, 10-mile Crossing	1	5/28/2004

***Ischnura hastata* (Say)**

Habitat Affiliation	No_ Spec	Date
Quanah Range, small pond near Pottawatami Twins (Pond)	2	5/28/2004

Kondratieff et al. (2003) listed 61 species of dragonflies and damselflies from Fort Sill. An additional six species were collected in 2004, bringing the total to 68 species or 51% of the known Oklahoma fauna. Bick and Bick (1957) reported an additional nine species from Comanche County not currently known from Fort Sill.

Literature Cited

Bick, G. H. and J. C. Bick. 1957. The Odonata of Oklahoma. *The Southwestern Naturalist* 2: 1-18.

Kondratieff, P. A. Opler, M. C. Garhart, and J. Schmidt. 2004. Survey of selected insect taxa of Fort Sill, Comanche County, Oklahoma. Dragonflies (Odonata), stoneflies (Plecoptera) and selected moths (Lepidoptera). C. P. Gillette Museum of Arthropod Diversity, Department of Bioagricultural Sciences and Pest Management, Colorado State University, Fort Collins. 91 pp.

Appendix E. Additions to the Checklist of the Longhorned Beetles (Coleoptera: Cerambycidae) of Fort Sill, Comanche Co., Oklahoma.

Family	Scientific Name	Author	
Cerambycidae	<i>Aethcerinus latecinctus</i>	(Horn)	
	Habitat Affiliations		No_ Spec
	West Range, Engineer Lake		1
	<i>Batyle suturalis</i>	(Say)	
	Habitat Affiliations		No_ Spec
	East Range, near Geronimo Grave		2
	<i>Liopinus sp.</i>		
	Habitat Affiliations		No_ Spec
	East Range, East Cache Creek, South Boundary Road		1
	<i>Mecas marginella</i>	LeConte	
	Habitat Affiliations		No_ Spec
	East Range, 0.5 southeast of Parks Hill on road to Parks Hill		2
	Quanah Range, 0.5 miles east of Falcon Gate		1
	<i>Psyrassa unicolor</i>	(Randall)	
Habitat Affiliations		No_ Spec	
Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge		1	
<i>Strangalia luteicornis</i>	(Fabricius)		
Habitat Affiliations		No_ Spec	
Quanah Range, Rock Creek, South Boundary Road		1	
West Range		1	
<i>Tylonotus bimaculatus</i>	Haldeman		
Habitat Affiliations		No_ Spec	
East Range, East Cache Creek, South Boundary Road		1	

As of 2004, 58 species of longhorned beetles are recorded from Fort Sill, almost 55% of the known Oklahoma fauna.

Appendix F. Additions to the Checklist of the Ground Beetles (Coleoptera: Carabidae) of Fort Sill, Comanche Co., Oklahoma.

Family	Scientific Name	Author	
Carabidae	<i>Acupalpus pauperculus</i>	Dejean	
	Habitat Affiliations		No_ Spec
	West Range, Engineer Lake		1
	<i>Brachinus kansanus</i>	LeConte	
	Habitat Affiliations		No_ Spec
	Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge		1
	<i>Poecilus scitulus</i>	LeConte	
	Habitat Affiliations		No_ Spec
	Quanah Range, Pottawatami Twins (Pond)		1
	<i>Schizogenius lineolatus</i>	(Say)	
	Habitat Affiliations		No_ Spec
	Quanah Range, West Cache Creek, border of Wichita Mts. Nat. Wildlife Refuge		1

As of 2004, 112 species of ground beetles are recorded from Fort Sill, almost 37% of the known Oklahoma fauna. *Poecilus scitulus* LeConte is a new state record for Oklahoma.

CATALOGUE AND ORDER FORM

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and P.A. Opler. 1996. (\$12.00)

A set of maps showing the county-by-county distribution of "Oecophoridae" in the western conterminous United States. There is an introduction to the volume that discuss several taxonomic problems and the changed concept for the family. There is an index to all species mapped. Of special interest are the maps for some species of *Ethmia* discussed but not mapped in Powell's monograph of the Western Hemisphere species.

Lepidoptera of North America

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An extensive annotated treatment of the butterflies of Kern and Tulare Counties, California. Specific records are given for each county and the author's notes on the taxonomic status of many populations is included. This work is of particular interest as this region of California is one of the most diverse and there are many unsolved taxonomic issues. A listing of the butterflies of Sequoia-Kings Canyon National Park is presented and is followed by notes on the effects on a large fire on the region's butterfly populations.

4. Scientific Names List for Butterfly Species of North America north of Mexico. P.A. Opler and A.D. Warren. 2004 (updated). (\$18.00).

This is the first list of scientific names of North American butterfly species prepared and reviewed by systematists since that of C.D. Ferris (1989). This list contains the most current scientific names for more than 780 butterfly species (Papilionoidea and Hesperioidea). Authorship and date of publication (many corrected) are included. The original spelling of species names is given in accord with recent practices. Annotations with literature citations are given for many of the names as explanation for their current usage. Species are numbered for curatorial purposes. No subspecies are included in the current list. A list of species erroneously reported for North America is included and is followed by a list of Hawaiian butterflies. There are more than 480 references to help substantiate the names provided.

5. Contributions to the knowledge of southern West Virginia Lepidoptera. 2004. Valeriu Albu and Eric Metzler (\$14.00).

This is the report of a survey of all families of Lepidoptera found in southern West Virginia. It is notable as one of the few areas in eastern North America where species of all families are reported. A valuable list of references employed in the survey is included.

6. Butterflies of Oregon: Their Taxonomy, Distribution, and Biology. 2005. Andrew D. Warren. (price not set, in production).

Insects of Western North America

1. A survey of the Cerambycidae (Coleoptera), or longhorn beetles of Colorado. 1998. D.J. Heffern (\$10.00)
An annotated listing of the Cerambycidae known from Colorado with taxonomic notes. One color plate of examples is included.

2. The Cicadas of Colorado (Homoptera: Cicadidae, Tibicinidae). 2002. B.C. Kondratieff, A. R. Ellingson, and D. Leatherman. (\$18.00)

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3. Survey of Selected Insect Taxa of Fort Sill, Comanche County, Oklahoma. Part 2. Dragonflies (Odonata), Stoneflies (Plecoptera) and selected Moths (Lepidoptera). 2004. Kondratieff, Opler, Garhart, and Schmidt. (\$27.00)

The results of an intensive survey of the species of these groups on Fort Sill. Included Lepidoptera include Saturniidae, Sphingidae, Arctiidae, Notodontidae, *Schinia*, and *Catocala*. Nine color plates of typical species are included. Many range extensions and new Oklahoma county records are reported for the first time.

4. Survey of Selected Arthropod Taxa of Fort Sill, Comanche County, Oklahoma. Part 3. Chapter 1
Survey of Spiders (Arachnida, Araneae) of Fort Sill, Comanche Co., Oklahoma. Paula E. Cushing & Maren Francis. Chapter 2. Survey of Selected Arthropod Taxa of Fort Sill, Comanche County, Oklahoma. III. Arachnida: Ixodida, Scorpiones, Hexapoda: Ephemeroptera, Hemiptera, Homoptera, Coleoptera, Neuroptera, Trichoptera, Lepidoptera, and Diptera. Price not set.

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