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## An Inventory Of Arthropod Fauna At Great Sand Dunes National Monument, Colorado

By

MICHAEL J. WEISSMANN<sup>1</sup> AND BORIS C. KONDRATIEFF<sup>1</sup>

**ABSTRACT** Over 900 species of arthropods are listed from Great Sand Dunes National Monument, Alamosa and Saguache counties, Colorado. The list is compiled from specimens collected by more than 30 researchers over a period of six decades. The inventory includes four species that are apparently endemic to the Monument and surrounding habitat.

**Keywords:** Arthropod; Biodiversity; Colorado; Great Sand Dunes National Monument.

### INTRODUCTION

Byron A. Alexander was a seasonal park naturalist at Great Sand Dunes National Monument in the late 1970's. It was here that his interest in entomology was inspired through his contact with Howard Evans and his students who were studying the behavior of wasps in and around the dunes. The illustrations of plant and insect life accompanying this inventory were created by Byron Alexander while he was working at the Monument, and are reproduced here with permission from Great Sand Dunes National Monument.

Great Sand Dunes National Monument is located in Alamosa and Saguache Counties in south central Colorado. The dunes, which cover 101 km<sup>2</sup> on the east side of the San Luis Valley, are pushed up against the Sangre de Cristo Mountains. Prevailing winds cross over the mountains to the northeast by way of two passes (Mosca Pass and Medano Pass) and deposit the sand load in dunes towering to more than 200 m above the valley floor. Less than 35 cm of precipitation fall on the dunes each year, and the water quickly percolates down from the surface. Daytime summer surface temperatures have been recorded in excess of 55 °C. At elevations above 2400 m, the Great Sand Dunes are also subject to cold winter temperatures and cool evening summer temperatures. Strong winds push sand across the surface and obscure most foot prints daily. The geology and hydrology of the dune mass is not fully understood and has been the subject of extensive research in recent years (for a review of the current knowledge of the geology, hydrology, biology, and anthropology of Great Sand Dunes National Monument, see Schenk, in press). Understanding the hydrology of the dunes has been crucial because of the recent threat of intense withdrawal of surface and ground water for agriculture and other consumptive uses (U.S. Bureau of Reclamation, 1987).

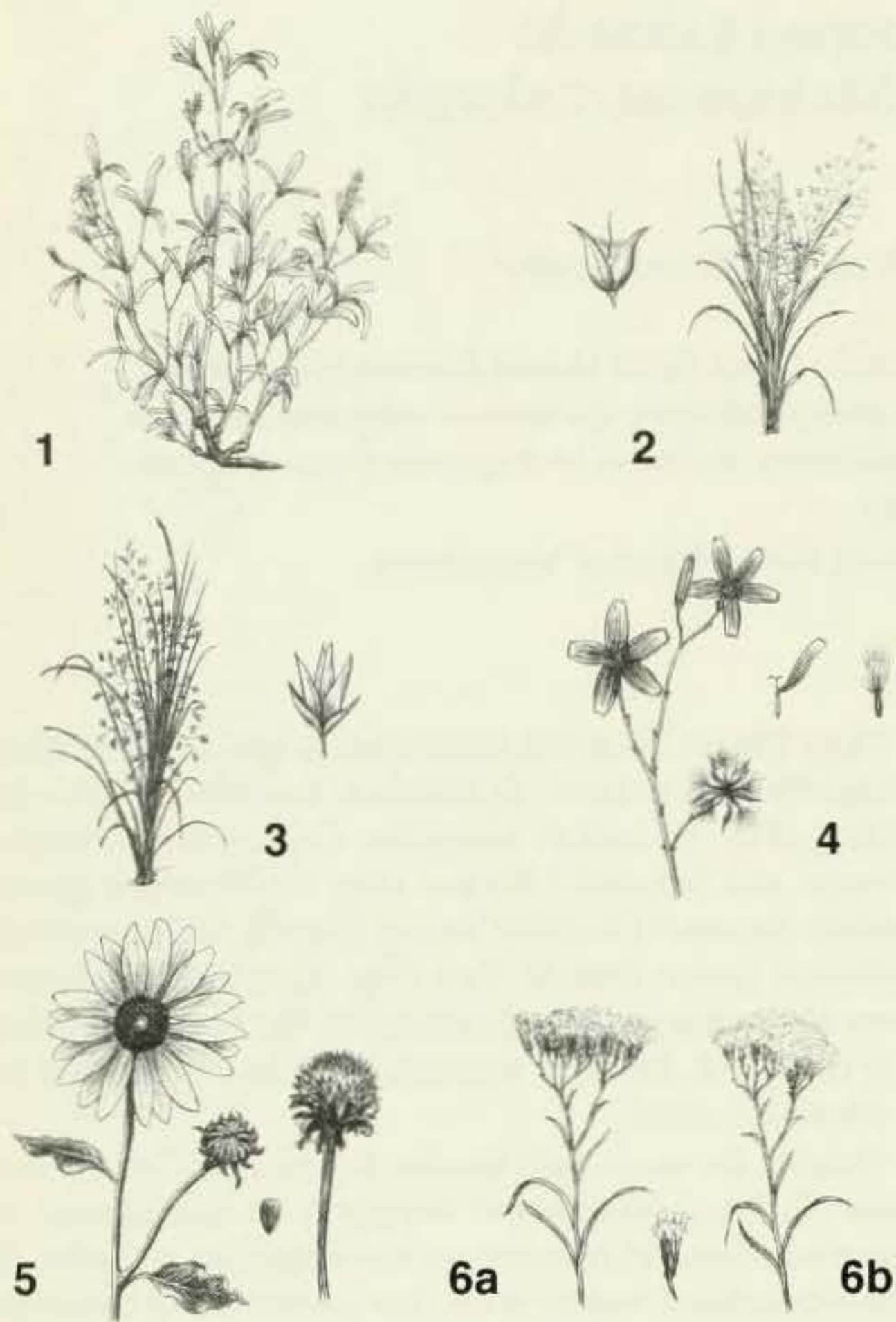
Plant life on the main dune mass is sparse, consisting principally of scurfpea, *Psoralidium lanceolatum* (Pursh) Rydberg (Fig. 1), Indian ricegrass, *Oryzopsis hymenoides* (Roemer and Schultes) Ricker (Fig. 2), blowout grass, *Redfieldia flexuosa* (Thurber) Vassey (Fig. 3), skeletonweed, *Lygodesmia juncea* (Pursh) Don (Fig. 4), and prairie sunflower, *Helianthus petiolaris* Nuttall (Fig. 5). Most of the plant life is clustered, forming vegetation "islands," mainly in the interdune areas.

Despite its seemingly barren landscape, Great Sand Dunes National Monument supports an abundance of arthropods. Several researchers have studied arthropods at the Monument, but no work has been done to combine the efforts of these endeavors into one comprehensive species list. We initiated this study in August 1990 to create an inventory of the arthropods known from the Great Sand Dunes.

The entomological collections of Great Sand Dunes National Monument (GRSA), the University of Colorado Museum in Boulder (UCM), and the C.P. Gillette Entomological Museum at Colorado State University in Fort Collins (CSU) contain numerous specimens previously collected within and around the Monument. These specimens were located, recorded, and identified as specifically as possible by taxonomic specialists. This cumulative collection exists thanks to the efforts of a number of researchers, including (specimen locations in parentheses): B. Rotger, 1942–1977 (UCM and published records in Rotger, 1944); T.P. Maslin, 1949 (UCM); R.E. Gregg, 1949–1954 (UCM, published records in Gregg, 1963); H.G. Rodeck, 1954–1955 (UCM); F.M. Brown, 1954–1981 (GRSA, UCM); H.E. and M.A. Evans, 1954–1983 (GRSA, CSU, and published records in Evans, 1966, and in Evans and O'Neill, 1988); J.C. Daniel et al., 1959 (GRSA); E.R. Tinkham, 1960 (published records in Tinkham, 1962); J. Brookhart, 1965 (UCM, published records in Brookhart, 1972); J. Stanatov,

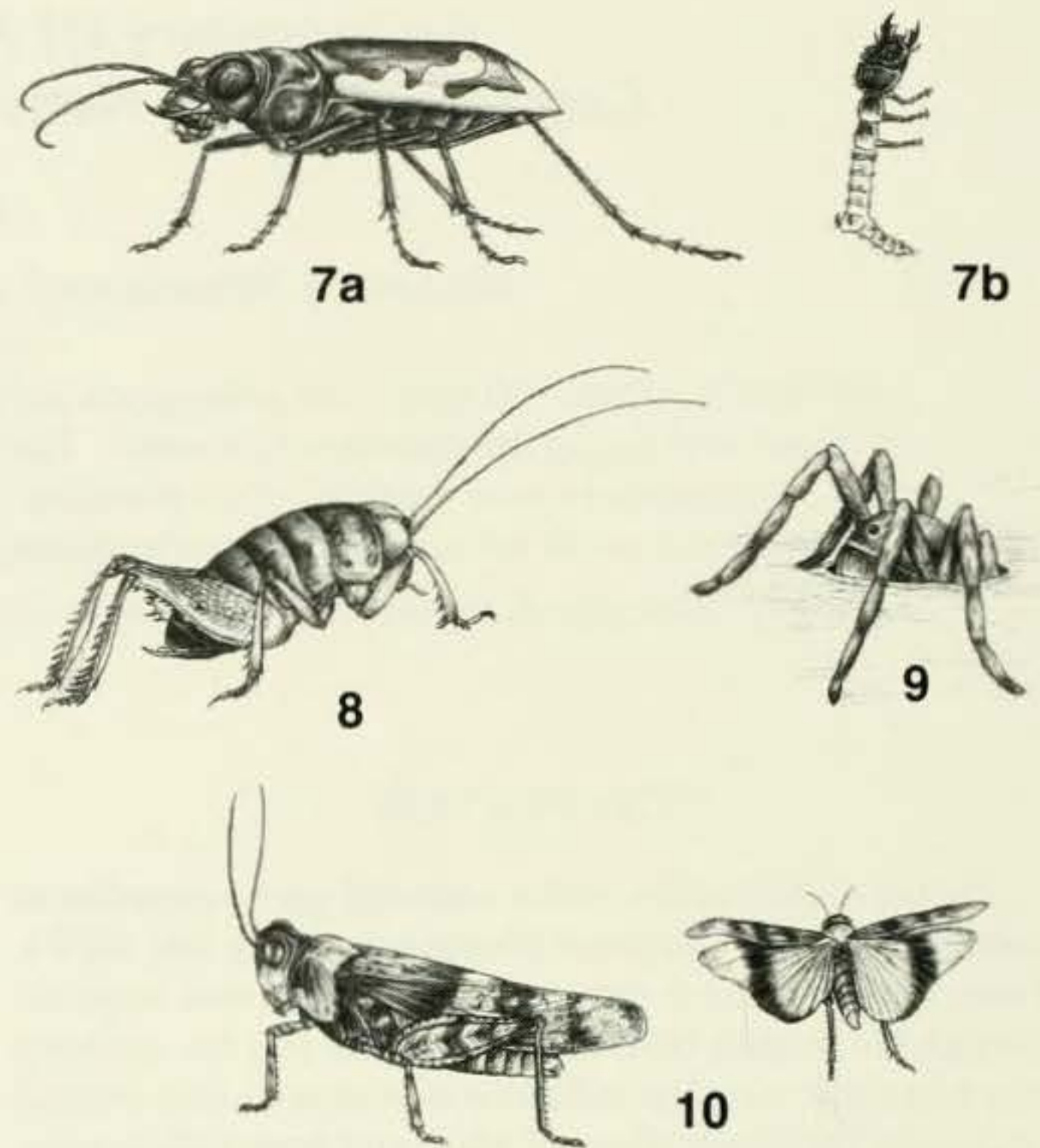
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Figs. 1-6. 1-Scurfpea, *Psoralidium lanceolatum* (Pursh) Rydberg. 2-Indian ricegrass, *Oryzopsis hymenoides* (Roemer and Schultes) Ricker. Inset: Indian ricegrass flower. 3-Blowout grass, *Redfieldia flexuosa* (Thurber)Vassey. Inset: Blowout grass flower. 4-Skeletonweed, *Lygodesmia juncea* (Pursh) Don. Inset: Skeletonweed petal and fruit. 5-Prairie sunflower, *Helianthus petiolaris* Nuttall. Inset: Prairie sunflower seedhead and seed. 6-Rabbitbrush, *Chrysothamnus nauseosus* (Pallas) Britton. a: Rabbitbrush in bloom. b: Rabbitbrush in fruit. Inset: Rabbitbrush flower.

1971 (GRSA); P. Eades, 1974 (GRSA, CSU); C.A. Triplehorn, 1974 (published records in Triplehorn, 1964); K.M. O'Neill, 1974-1980 (GRSA, CSU, and published records in O'Neill, 1983a and 1983b, and O'Neill and Evans, 1981); W. Rubink, 1975 (GRSA, CSU); D. Gwynne, 1976-1979 (GRSA, CSU, and published records in Gwynne, 1978, 1980, and 1981; Gwynne and Evans, 1975; Gwynne and Hostetler, 1978; Gwynne and O'Neill, 1980; and Ahlbrandt et al., 1978); S. Condie, 1977 (GRSA, CSU); G.H. Kemper, 1977-1980 (GRSA, UCM); D. Huffman, 1978 (GRSA); S. Vertrees, 1978 (GRSA); W. Soenger, 1978-1980 (GRSA, CSU); B.A. Alexander, 1978-1995 (GRSA, CSU); S. Wingate, 1980 (GRSA); J. Crock, 1981 (CSU); L.D. Zuckerman, 1981-1982 (GRSA), T.P. Sluss, 1983 (GRSA and records in Sluss, 1986a and 1986b); M. Kippenhan, 1990 (CSU); W. Cranshaw, 1991 (CSU); D. & M. Leatherman, 1991 (CSU).



Figs. 7-10. 7-Great Sand Dunes tiger beetle, *Cicindela theatina* Rotger. a: Adult. b: Larva. 8-Giant sand treader cricket, *Daihinibaenetes giganteus* Tinkham. 9-Wolf spider, *Geolycosa rafaellana* Chamberlain. 10-Grasshopper, *Trimerotropis* sp. Inset: in flight.

Several species have been added to the inventory list based on collections from August 1990 through September 1995. Insects were sampled from several habitats in Great Sand Dunes National Monument. These included the open dune mass in several different areas, at different times of year, and during different times of the day and night. Many interdune areas, dominated by grass and scurfpea plants, were also sampled. Off the dunes, rabbitbrush, *Chrysothamnus nauseosus* (Pallas) Britton (Fig. 6), and other scrub zones were sampled, as was the area around the campground and in the piñon/juniper zones to the east (*Pinus edulis* Engelman and *Juniperus communis* Linnaeus). Some sampling was also done at Denton Spring southeast of the dune mass and at Sand Creek on the west side of the Monument.

Collection techniques included sweep netting, black-light traps, and mercury-vapor lamps. All specimens collected or examined were recorded in two notebooks of data sheets, copies of which have been deposited at the museum at GRSA. All specimens collected during 1990-1995 have been catalogued into the National Park Service Automated National Catalog System (ANCS) and deposited at GRSA, CSU, or UCM.



The updated species list which follows is intended to provide baseline information on species diversity of the region. More than 900 species of arthropods have been recorded to date from the Monument. Among the new findings are four undescribed species. Two of these are anthicid beetles (*Amblyderus* n.spp.), which were found walking on the dunes at mid-day, with surface temperatures in excess of 40 °C. There is also a new robber fly (*Proctacanthus* n.sp.), among the largest insects in the Monument and distinctly different from two closely related species also recorded from the area. An undescribed species of geometrid moth (*Prochoerodes* n.sp.) has been found, also recorded from other places in the western U.S. but not yet formally described in the literature.

Unexpected records include a species of noctuid moth, *Schinia avemensis* (Dyar), previously known only from Manitoba, Canada, the caterpillar of which probably feeds on the flowerheads of the prairie sunflower, and a species of curtonotid fly, *Curtonotum helvum* (Loew), previously unknown west of the Mississippi River, collected at lights and on the *Cleome* flowers at Sand Creek.

The current species list represents only a small percentage, perhaps as little as 25%, of the total number of arthropods which occur within the Monument boundaries. Other sampling techniques, such as pit traps, Malaise traps, and Berlese funnels were not employed and would likely yield additional species. Additionally, historically there has been some bias in the collecting at the Monument. The large numbers of sphecid wasps and noctuid moths recorded are partially due to the habitat type, and partially due to collecting bias of previous researchers—Howard E. Evans, an authority on the behavior of sphecid wasps, and the late F. Martin Brown, a lepidopterist with a fondness for light trapping. Many of the smaller insects were likely overlooked, as were those with very short life cycles or that emerge for only a short time during the season.

Other major collections which are known to have specimens from the Monument include the American Museum of Natural History in New York, and the U.S. National Museum of Natural History (Smithsonian) in Washington, D.C. Both collections have moths (Paul A. Opler and F. Martin Brown, personal communications) which were not examined during this study.

Of special interest are the species that are apparently endemic to Great Sand Dunes National Monument and the San Luis Valley. This includes the darkling beetle ("circus beetle"), *Eleodes hirtipennis* Triplehorn; the Great Sand Dunes tiger beetle, *Cicindela theatina* Rotger (Fig. 7); and the two new species of anthicid beetles, *Amblyderus* spp., which are as yet undescribed and have not been found elsewhere to date. The giant sand treader cricket, *Daihinibaenetes giganteus* Tinkham (Fig. 8), once believed

to occur only at the Monument, has since been found in northern New Mexico and southern Utah (Theodore J. Cohn, personal communication).

All of the above species were seen regularly during the study and are therefore not considered locally rare. They are threatened only to the extent that they have a limited distribution. Their survival is probably dependent upon the survival of the dunes habitat itself. These species are good candidates for population monitoring to determine human impact on the dunes, or to monitor overuse of the resource. A drop in their population levels might indicate overuse of the Monument. Additionally, populations of the species in relatively isolated areas should be compared to populations in heavily used areas of the Monument. Further study is necessary to describe the natural history of these species.

The sand dunes at the Monument are a unique habitat. The dunes appear to be barren but actually are the habitat for a large number of resident insects. Almost one-fourth of the species recorded are considered residents of the sand and the grass/pea interdune areas. The others live in the surrounding vegetated areas, and may come to the sand for feeding or are blown onto the sand by the strong winds. With daytime summer surface temperatures surpassing 55 °C, the dunes are very inhospitable to insects that are not adapted to survive such temperatures. Insects blown onto the sand from other places usually die and are eaten by the scavengers. Many of the insects which are resident on the dunes, including the darkling beetles and sand treader crickets, are mainly scavengers and eat the dead and dying insects blown in from outside. There are also many sand mites which feed on the corpses. Predators such as the resident wolf spiders (*Geolycosa rafaiana* Chamberlain) (Fig. 9) and the tiger beetles also take advantage of the weakened insects, the spiders hunting by night and the tiger beetles by day. Primary production (from plants) is limited to the grass/scurfpea interdune areas. Herbivores, such as the plant bugs (*Lygus* spp.) and grasshoppers (*Trimerotropis* spp.) (Fig. 10), are generally restricted to these areas. Some additional information about the arthropods of the Monument is found in Weissmann et al. (1993).

#### ACKNOWLEDGMENTS

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SPECIES LIST<sup>2,3</sup>

## HEXAPODA

## MICROCORYPHIA

Machilidae (unidentified)

## EPHEMEROPTERA

## Baetidae

*Baetis tricaudatus* Dodds

## Heptageniidae

*Cinygmula* sp.*Epeorus longimanus* (Eaton)

## Leptophlebiidae

*Paraleptophlebia debilis* (Walker)

## Ephemerellidae

*Ephemerella infrequens* McDunnough

## ODONATA

## Aeshnidae

*Aeshna constricta* Say*Aeshna palmata* Hagen

## Libellulidae

*Sympetrum corruptum* (Hagen)*Sympetrum occidentale* Bartenev

## Lestidae

*Lestes congener* Hagen*Lestes dryas* Kirby*Lestes unguiculatus* Hagen

## PHASMIDA

## Heteronemiidae

*Parabacillus coloradus* (Scudder)

## ORTHOPTERA

## Acrididae

*Acrolophitus hirtipes* (Say)*Amphitornus coloradus* (Thomas)*Arphia pseudonietana* (Thomas)*Cammula pellucida* Scudder*Circotettix rabula rabula* Rehn and Hebard*Cordillacris occipitalis* (Thomas)*Cratypedes neglectus* (Thomas)*Dissosteira carolina* (Linnaeus)*Hadrotettix trifasciatus* (Say)*Hesperotettix speciosus* (Scudder)*Melanoplus bowditchi* Scudder*Melanoplus bowditchi canus* Hebard*Melanoplus femur-rubrum* (DeGeer)*Melanoplus packardii packardii* Scudder*Melanoplus* spp.*Mestobregma plattei corrugata* (Scudder)*Psoloessa delicatula* (Scudder)*Spharagemon campestris* (McNeill)*Spharagemon collare* (Scudder)*Trimerotropis agrestis* McNeill*Trimerotropis cincta* (Thomas)*Trimerotropis fratercula* McNeill*Trimerotropis maritima* (Harris)*Trimerotropis verruculatus suffusa* Scudder*Xanthippus montanus* (Thomas)

## Gryllidae

*Oecanthus quadripunctatus* Beutenmuller

## Rhaphidophoridae

*Ceuthophilus utahensis* Thomas*Ceuthophilus* spp.*Daihinibaenetes giganteus* Tinkham

## Stenopelmatidae

*Stenopelmatus* sp.

## Tettigoniidae

*Anabrus simplex* Haldeman*Conocephalus fasciatus* (DeGeer)

## MANTODEA

## Mantidae

*Yersiniops solitarium* (Scudder)

## PLECOPTERA

## Pteronarcyidae

*Pteronarcella badia* (Hagen)

## Nemouridae

*Malenka coloradensis* (Banks)

## Perlodidae

*Isoperla quinquepunctata* Banks

## Chloroperlodidae

*Plumiperla diversa* (Frisson)*Sweltsa lamba* (Banks)

## HEMIPTERA

## Pentatomidae

*Banasa sordida* (Uhler)*Chlorochroa granulosa* Uhler*Chlorochroa sayi* (Stål)*Chlorochroa uhleri* (Stål)*Murgantia histrionica* (Hahn)*Perillus exaptus* (Say)

## Scutelleridae

*Amaurochrous cinctipes* (Say)

(unidentified)

## Cydnididae

*Microporus obliquus* Uhler

## Coreidae

*Chelinidea vittiger* Uhler*Leptoglossus clypealis* Heidemann*Leptoglossus occidentalis* Heidemann

## Alydidae

*Alydus pluto* Uhler*Alydus* spp.*Megalotomus quinquespinosus* (Say)

## Rhopalidae

*Harmostes* sp.*Liorhyssus* sp.

(unidentified)

## Lygaeidae

*Lygaeus reclinatus* Say*Neocoryphus lateralis* (Say)*Nysius* sp.*Peritrechus fraternus* Uhler ?*Xyonysius* c.f. *californicus* Stål<sup>2</sup> Apparently endemic species = \*\*\*<sup>3</sup> Species names in brackets [ ] are questionable records (no specimen available) or recorded from just outside the Monument boundary but not specifically within the Monument.



- Phymatidae  
*Phymata* sp.
- Reduviidae  
*Arilus cristatus* Linnaeus  
*Fitchia aptera* Stål  
*Sinea diadema* (Fabricius)
- Nabidae  
*Nabis* sp.
- Miridae  
*Atractotomus striacolor* (Knight)  
*Hadronema picta* Uhler ?  
*Ilnacora chloris* (Uhler)  
*Litomiris debilis* (Uhler)  
*Lopidea* sp.  
*Lygidea rubecula* (Uhler)  
*Lygus atriflavus* Knight  
*Lygus elisus* VanDuzee  
*Lygus lineolaris* (Palisot)  
*Lygus nubilatus* Knight  
*Lygus shulli* Knight  
*Orthotylus viridis* VanDuzee  
*Phytocoris comulus* Knight  
*Phytocoris consors* VanDuzee  
*Phytocoris heidemanni* Reuter  
*Phytocoris inops* Uhler  
*Phytocoris simulatus* Knight  
*Phytocoris validus* Reuter  
*Polymerus balli* Knight  
*Stenodema pilosipes* Kelton  
*Tupiocoris agilis* (Uhler) ?
- Gerridae (unidentified)
- Corixidae  
*Cenocorixa* sp.  
*Graptocorixa abdominalis* (Say)  
*Sigara alternata* (Say)
- Notonectidae  
*Notonecta kirbyi* Hungerford  
*Notonecta undulata* Say
- HOMOPTERA
- Aphididae (unidentified)
- Delphacidae (unidentified)
- Membracidae  
*Publilia modesta* Uhler  
(unidentified)
- Cicadellidae  
*Aceratogallia arida* Oman  
*Aceratogallia uhleri* (VanDuzee)  
*Aceratogallia* sp.  
*Athysanella occidentalis* Baker  
*Idiocerus snowi* Gillette and Baker  
*Kybos* sp.  
*Laevicephalus parbulus* (Gillette)  
*Oncometopia lateralis* Fabricius  
(unidentified)
- Dictyopharidae  
*Scolops* sp.
- NEUROPTERA
- Myrmeleontidae  
*Brachynemurus nigrilabris* Hagen  
*Brachynemurus peregrinus* (Hagen)  
*Brachynemurus sackeni* (Hagen)  
*Myrmeleon immaculatus* DeGeer
- Chrysopidae  
*Chrysopa coloradensis* Banks  
*Chrysopa oculata* Say  
*Chrysoperla* sp.  
*Eremochrysa* sp.
- Hemerobiidae  
*Hemerobius* sp.  
*Micromus* sp.
- Raphidiidae  
*Raphidia* sp.
- COLEOPTERA
- Carabidae  
*Agonum placidum* (Say)  
*Amara impuncticollis* Say  
*Bembidion graphicum* Casey  
*Calosoma obsoletum* Say  
*Elaphrus lecontei* Crotch  
*Euryderus grossus* (Say)  
*Geopinus incrassatus* (Dejean)  
*Harpalus amputatus* Say  
*Harpalus erraticus* Say  
*Harpalus paratus* Casey  
*Harpalus* spp.  
*Omophron tessellatum* Say
- Cicindelidae  
*Cicindela formosa* Say  
*Cicindela hirticollis shelfordi* Graves  
*Cicindela lengi* Horn  
*Cicindela oregona guttifera* LeConte  
*Cicindela punctulata* Olivier  
*Cicindela repanda* Dejean  
\*\*\**Cicindela theatina* Rotger
- Dytiscidae  
*Agabus lutosus* LeConte  
*Colymbetes exaratus incognitus* LeConte  
*Dytiscus* sp.  
*Graphoderes occidentalis* Horn  
*Hydroporus* sp. (*vilis* complex)  
*Hygrotus impressopunctatus* (Schaller)  
*Hygrotus infuscatus* (Sharp)  
*Hygrotus masculinus* (Crotch)  
*Hygrotus tumidiventris* (Fall)  
*Hygrotus* sp.  
*Ilybius fraterculus* LeConte  
*Laccophilus maculosus decipiens* LeConte  
*Liodessus obscurellus* (LeConte)  
*Stictotarsus striatellus* (LeConte)  
*Rhantus* sp.
- Gyrinidae  
*Gyrinus* sp.
- Hydrophilidae  
*Cercyon* sp.  
*Hydrochus* sp.  
*Sphaeridium scarabaeoides* (Linnaeus)  
*Tropisternus* sp.
- Histeridae  
*Hypocaccus* n.sp.  
*Saprinus lugens* Erichson  
*Spilodiscus* sp.  
(unidentified)
- Staphylinidae  
*Aleochara bimaculata* (Gravenhorst)  
*Creophilus maxillosus* Linnaeus
- Silphidae  
*Heterosilpha ramosa* (Say)  
*Nicrophorus guttula* Motschulsky  
*Nicrophorus marginatus* Fabricius
- Lucanidae  
*Pseudolucanus mazama* LeConte
- Scarabaeidae  
*Aphodius* sp.  
*Diplotaxis belfragei* Fall  
*Eucanthus impressus* Howden  
*Glaresis ecostata* Fall  
*Ligyris gibbosus* (DeGeer)  
*Phyllophaga fimbripes* (LeConte)  
*Phyllophaga* sp.  
*Polyphylla decimlineata* (Say)



- Serica alternata* LeConte  
*Serica bruneri* Dawson  
*Serica procula* Casey  
*Serica* sp. (prob. *anthracina* LeConte)  
*Trichiotinus assimilis* (Kirby)  
*Trox sonora* LeConte
- Dryopidae  
*Helichus striatus* LeConte
- Elmidae  
*Heterlimnius corpulenta* (LeConte)  
*Optioservus divergens* (LeConte)
- Buprestidae  
*Dicerca tenebrica* (Kirby)  
*Melanophila gentilis* LeConte
- Lampyridae (unidentified)
- Cantharidae  
*Chauliognathus scutellaris* LeConte
- Dermestidae  
*Trogoderma* sp. (prob. *angustum* (Solier))  
(unidentified)
- Cleridae  
*Enoclerus moestus* (Klug)  
*Phyllobaenus* sp.  
*Trichodes ornatus ornatus* Say
- Melyridae  
*Collops bipunctatus* Say  
(unidentified)
- Nitidulidae  
*Carpophilus* sp.
- Phalacridae  
*Phalacrus* sp.
- Coccinellidae  
*Anatis lecontei* Casey  
*Coccinella monticola* Mulsant  
*Coccinella septempunctata* Linnaeus  
*Coccinella transversoguttata richardsoni* Brown  
*Hippodamia caseyi* Johnson  
*Hippodamia convergens* Guerin-Meneville  
*Hippodamia quinquesignata* (Kirby)  
*Hippodamia tredecimpunctata tribalis* (Say)  
*Myzia interrupta* (Casey)
- Tenebrionidae  
*Bothrotes plumbeus* (LeConte)  
*Coniontis obesa* LeConte  
*Eleodes acuticaudus* LeConte  
*Eleodes brunnipes* Casey  
*Eleodes caudiferus* LeConte  
*Eleodes extricatus* (Say)  
\*\*\**Eleodes hirtipennis* Triplehorn  
*Eleodes longicollis* LeConte  
*Eleodes obscurus dispersus* LeConte  
*Eleodes pimelioides* Mannerheim  
*Eleodes snowi* Blaisdell  
*Eleodes sponsus* LeConte  
*Eleodes tricostatus* (Say)  
*Embaphion contusum* LeConte  
*Embaphion glabrum* Blaisdell  
*Eusattus reticulatus* Say  
*Helops* sp.  
*Telabis aspera* Casey
- Mordellidae (unidentified)
- Meloidae  
*Epicauta* sp.  
*Lytta nuttalli* (Say)  
*Nemognatha* sp.  
*Pyrota bilineata* Horn  
*Tricrania stansburyi* Haldeman  
(unidentified)
- Anthicidae  
\*\*\**Amblyderus* n.sp.1  
\*\*\**Amblyderus* n.sp.2
- Anthicus lutulentus* Casey  
*Anthicus* sp.  
*Notoxus* sp.
- Cerambycidae  
*Anoplodera canadensis* (Olivier)  
*Arhopalus rusticus montanus* (LeConte)  
*Batyle ignicollis* (Say)  
*Batyle suturalis pearsalli* (Bland)  
*Cortodera longicornis* (Kirby)  
*Crossidius coralinus jocosus* (Horn)  
*Crossidius hirtipes wickhami* Casey  
*Crossidius pulchellus* (LeConte)  
*Grammoptera subargentata* (Kirby)  
*Moneilema appressum* LeConte  
*Monochamus clamator* (LeConte)  
*Monochamus scutellatus* (Say)  
*Pachyta lamed liturata* Kirby  
*Prionus californicus* Motschulsky  
*Prionus emarginatus* Say  
*Prionus integer* LeConte  
*Typocerus balteatus* Horn  
*Xylotrechus undulatus* (Say)
- Chrysomelidae  
*Altica bimarginata* Say  
*Altica* sp.  
*Cryptocephalus* spp.  
*Disonycha alternata* (Illiger)  
*Disonycha latifrons* Schaeffer  
*Disonycha* sp.  
*Galeruca costatissima* Blake ?  
*Macrohaltica* sp.  
*Microhopala excavata cyanea* (Say)  
*Pachybrachis* sp.  
*Phyllotreta* spp.  
*Saxinis saucia* LeConte  
*Tricholochamaea* sp. ?  
*Trirhabda lewisii* Crotch  
*Trirhabda nitidicollis* LeConte  
*Zygogramma conjuncta* Rogers
- Curculionidae  
*Epimechus* sp.  
(unidentified)
- TRICHOPTERA
- Hydropsychidae  
*Arctopsyche grandis* Banks  
*Cheumatopsyche* sp.
- Glossosomatidae  
*Agapetus boulderensis* Milne  
*Glossosoma* sp.
- Hydroptilidae  
*Hydroptila* sp.
- Rhyacophilidae  
*Rhyacophila coloradensis* Banks
- Brachycentridae  
*Brachycentrus americanus* (Banks)
- Limnephilidae  
*Limnephilus* sp.
- LEPIDOPTERA
- Oecophoridae  
*Agonopterix* sp. ?
- Gelechiidae (unidentified)
- Tortricidae  
*Acleris* sp. ?  
*Argyrotaenia coloradana* (Fernald)  
*Dorithia semicircularana* (Fernald)  
*Eucosma crambitana* Walsingham  
*Eucosma fernaldana* (Grote)  
*Eucosma* nr. *ridingsana* (Robinson)  
*Eucosma* sp.  
*Syndemis* sp. [or *Pandemis* sp.]  
*Xenotemna pallorana* (Robinson)



- Hesperiidae  
*Erynnis icelus* (Scudder and Burgess)  
*Hesperia comma colorado* (Scudder) ?  
*Hesperia comma ochracea* Lindsey  
*Hesperia nevada* (Scudder)  
*Hesperia uncas* Edwards  
*Oarisma garita* (Reakirt)  
*Pyrgus communis* (Grote)  
*Pyrgus xanthus* Edwards  
*Yvretta rhesus* (Edwards)
- Papilionidae  
*Papilio rutulus* (Linnaeus)  
*Parnassius phoebus pseudorotgeri* Edwards
- Pieridae  
*Artogeia rapae* (Linnaeus)  
*Colias eurytheme* Boisduval  
*Eurema nicippe* (Cramer)  
*Neophasia menapia* (Felder and Felder)  
*Pontia beckerii* (Edwards)  
*Pontia protodice* (Boisduval and LeConte)
- Lycaenidae  
*Agriades franklinii rusticus* (Edwards)  
*Callophrys apama homoperplexa* Barnes and Benjamin  
*Celestrina ladon cinerea* (Edwards)  
*Chalceria rubida sirius* (Edwards)  
*Euphilotes rita coloradensis* (Mattoni)  
*Hemiargus isola alce* (Edwards)  
*Icaricia acmon lutzii* dos Passos  
*Icaricia icarioides lycea* (Edwards)  
*Incisalia niphon niphon* (Hübner)  
*Leptotes marina* (Reakirt)  
*Lycaeides melissa melissa* (Edwards)  
*Mitoura siva siva* (Edwards)  
*Satyrium behrii crossi* (Field)  
*Strymon melinus franki* Field  
*Tharsalea arota schellbachi* Tilden
- Riodinidae  
*Apodemia mormo mormo* Felder and Felder
- Nymphalidae  
*Basilarchia weidemeyeri weidemeyeri* (Edwards)  
*Charidryas acastus* (Edwards)  
*Euptoieta claudia* (Cramer)  
*Nymphalis antiopa* (Linnaeus)  
*Phyciodes campestris camillus* Edwards  
*Poladryas arachne arachne* (Edwards)  
*Polygonia hylas* (Edwards)  
*Speyeria aphrodite ethne* (Hemming)  
*[Vanessa atalanta atalanta* (Linnaeus)]  
*Vanessa cardui* (Linnaeus)
- Satyridae  
*Cercyonis meadii alamosa* Emmel and Emmel  
*Cercyonis oetus charon* (Edwards)  
*Coenonympha ochracea* Edwards  
*Cyllopsis pertepida dorothea* (Nabokov)  
*Neominois ridingsii ridingsii* (Edwards)  
*Oeneis chryxus chryxus* (Doubleday and Hewitson)
- Danaidae  
*Danaus gilippus* Cramer  
*Danaus plexippus* (Linnaeus)
- Pyralidae (unidentified)
- Geometridae  
*Caripeta aequaliaria* Grote  
*Caripeta interalbicans* Warren  
*Cheteoscelis bistrifaria* (Packard)  
*Chlorosea nevadaria* Packard  
*Enypia griseata* Grossbeck  
*Eriplatymetra coloradaria* (Grote and Robinson)  
*Eupithecia anticaria* Walker  
*Hydriomena morosata* Barnes and McDunnough  
*Hydriomena perfracta centralis* McDunnough
- Hydriomena similaris* Hulst  
*Iridopsis emasculata* (Dyar)  
*Itame bitactata* (Walker)  
*Itame decorata* (Hulst)  
*Itame flavicaria* (Packard)  
*Metanema inatomaria* Guenee  
*Perizoma custodiata* (Guenee)  
*Pero behrensaria* (Packard)  
*Plataea trilinearia* (Packard)  
*Prionomelia spododea* (Hulst)  
*Prochoerodes forficaria* (Guenee)  
*Prochoerodes truxaliata* (Guenee)  
*Prochoerodes n.sp.* [nr. *amplicineraria* (Pearsall)]  
*Scelidacantha triseriata* (Packard)  
*Semiothisa nubiculata* (Packard)  
*Semiothisa subminiata* (Packard)  
*Semiothisa sp.*  
*Stannoctenis morrisata* (Hulst)  
*Stannodes formosata* (Strecker)  
*Synchlora aerata liquoraria* Guenee
- Lasiocampidae  
*Epicnaptera americana* (Harris)  
*Gloveria arizonensis* Packard  
*Malacosoma californica* Packard
- Saturniidae  
*Antheraea polyphemus* (Cramer)  
*Coloradia doris* Barnes  
*Hemileuca nuttalli* (Strecker)  
*Hyalophora gloveri* (Strecker)
- Sphingidae  
*Hemaris senta* (Strecker)  
*Hyles lineata* (Fabricius)  
*Smerinthus cerisyi* Kirby  
*Sphinx dollii* Neumoegen
- Arctiidae  
*Eilema bicolor* Grote  
*Lophocampa ingens* (Edwards)  
*Lophocampa maculata* Harris  
*Turuptiana permaculata* (Packard)
- Lymantriidae  
*Dasychira sp. ?*
- Noctuidae  
*Abagrotis discoidalis* (Grote)  
*Abagrotis reedi* Buckett  
*Agroperina conradi* (Grote)  
*Agrotis ipsilon* (Hufnagel)  
*Anathix aggressa* (Smith)  
*Andropolia diversilineata* (Grote)  
*Apamea occidens* (Grote)  
*Aseptis fumosa* (Grote)  
*Brachylomia populi* (Strecker)  
*Catocala grotiana* Bailey  
*Catocala hermia* Edwards  
*Copablepharon absidum* (Harvey)  
*Copablepharon grande* (Strecker)  
*Copablepharon sp.*  
*Crassivesica bocha* (Morrison)  
*Crymodes devastator* (Brace)  
*Cucullia sp.*  
*Drasteria mirifica klotsi* Richards  
*[Enargia decolor* (Walker)]  
*Enargia infumata* (Grote)  
*Eurois praefixa* (Morrison)  
*Euxoa albipennis* (Grote)  
*Euxoa aurulenta* (Smith)  
*Euxoa auxiliaris* (Grote)  
*Euxoa brevipennis* Smith  
*Euxoa cicatricosa* (Grote and Robinson)  
*Euxoa divergens* (Walker)  
*Euxoa messoria* (Harris)  
*Euxoa mimallonis* (Grote)



*Euxoa moerens* (Grote) ?  
*Euxoa obeliscoides* (Guenee)  
*Euxoa oblongistigma* (Smith) ? [or *olivalis* (Grote)]  
*Euxoa quadridentata* (Grote and Robinson)  
*Euxoa ridingsiana* (Grote)  
*Euxoa scandens* (Riley)  
*Euxoa stigmatalis* (Smith)  
*Euxoa tessellata* (Harris) ?  
*Euxoa* sp.  
*Helicoverpa zea* (Boddie)  
*Hemieuxoa rudens* (Harvey)  
*Homohadena fifia* Dyar  
*Lacanobia lilacina* (Harvey)  
*Lacinipolia naevia* (Smith)  
*Lacinipolia olivacea megarena* (Smith)  
*Lacinipolia umbrosa* (Smith)  
*Lacinipolia vicina* (Grote)  
*Lacinipolia* sp.  
*Litholomia napaea* (Morrison)  
*Oligia* sp.  
*Oncocnemis balteata* Smith  
*Oncocnemis colorado* Smith  
*Oncocnemis hayesi* Grote  
*Oncocnemis homogena* Grote  
*Oncocnemis iricolor* Smith  
*Peridroma saucia* (Hubner)  
*Platyperigea camina* Smith  
*Platyperigea extima* (Walker)  
*Platyperigea meralis* (Morrison)  
*Ponometia sutrix* (Grote)  
[*Protagrotis niveivenosa* (Grote)]  
*Protogygia* sp.  
*Protorthodes utahensis* (Smith)  
*Protorthodes* sp. (prob. *akalus* Strecker)  
*Pseudanarta caeca* Dod  
*Pseudanarta flavidens* (Grote)  
*Pseudanarta perplexa* Franclemont  
*Pseudanarta* sp.  
*Raphia coloradensis* Putnam-Cramer ?  
*Richia parentalis* (Grote)  
*Schinia avemensis* (Dyar)  
*Schinia balba brucei* Smith  
*Schinia* nr. *citrinella* (Grote and Robinson)  
*Schinia meadi* (Grote)  
*Schinia unimacula* Smith  
*Schinia* sp.  
*Scoliopteryx libatrix* (Linnaeus)  
*Stiria rugifrons* Grote  
*Synedoida inepta* Edwards  
*Trichocerapoda oblita* (Grote)  
*Trichocerapoda strigata* (Smith)  
(unidentified)

## DIPTERA

## Tipulidae

*Dicranota* sp.  
*Hexatoma* sp.  
*Tipula* sp.

## Bibionidae

*Biblio femorata* Wiedeman

## Mycetophilidae (unidentified)

## Sciaridae (unidentified)

## Cecidomyiidae

*Rhabdophaga strobiloides* (Osten Sacken)  
*Rhopalomyia chrysothamni* Felt

## Scatopsidae

*Aspistes* sp.

## Culicidae

*Aedes malanimon* Dyar  
*Aedes* sp.  
*Culex tarsalis* Coquillett  
*Culiseta inornata* (Williston)

## Simuliidae

*Simulium* sp.  
(unidentified)

## Chironomidae (unidentified)

## Tabanidae

*Chrysops* sp.

## Rhagionidae

*Symphoromyia* sp.

## Stratiomyidae

*Nemotelus* sp.

*Saragus cuprarius* (Linnaeus)

## Therevidae

*Acrosathe* sp.

*Ozodiceromyia* sp.

*Pherocera* sp. ?

*Psilocephala* sp. (nr. *lateralis* Adams)

*Thereva* sp.

## Asilidae

*Ablautus rufotibialis* Back

*Asilus formosus* Hine

*Cyrtopogon plausor* Osten Sacken

*Efferia frewingi* Wilcox

*Efferia jubata* (Williston)

*Efferia rapax* (Osten Sacken)

*Efferia staminea* (Williston)

*Efferia varipes* (Williston)

*Efferia* sp. (prob. *subcuprea* (Schaeffer))

*Eucyrtopogon* sp.

*Laphria* sp.

*Lasiopogon quadrivittatus* James

*Lasiopogon* sp.

*Machimus adjustus* Martin

*Machimus occidentalis* (Hine) ?

*Proctacanthella cacopiloga* (Hine)

*Proctacanthus micans* Shiner

*Proctacanthus milberti* Macquart

\*\*\**Proctacanthus* n.sp.

*Promachus nigripes* Hine

*Promachus* sp. (prob. *albifacies* Williston)

*Stenopogon coyote* Bromley

*Stenopogon engelhardti* Bromley

*Stenopogon indistinctus* (Bromley)

*Stenopogon inquinatus* Loew

*Stenopogon martini* Bromley

*Stenopogon* sp.

*Stichopogon argenteus* (Say)

*Stichopogon trifasciatus* (Say)

## Bombyliidae

*Apolysis* sp.

*Dipalta serpentina* Osten Sacken

*Exoprosopa* spp.

*Hemipenthes* sp.

*Oligodranes* sp.

*Paravilla* sp., nr. *fulviana* (Say)

*Phthiria* sp.

*Thevenemyia* sp.

*Villa* sp., nr. *lateralis* (Say)

*Villa* sp.

## Empididae

*Platypalpus* sp.

(unidentified)

## Phoridae (unidentified)

## Syrphidae

*Allograpta obliqua* (Say)

*Baccha lemus* Osten Sacken

*Chrysogaster parva* Shannon

*Crioprora femorata* Williston

*Eristalis hirtus* Loew

*Eristalis latifrons* Loew

*Eristalis tenax* (Linnaeus)

*Eupeodes volucris* Osten Sacken



- Helophilus latifrons* Loew  
*Melanostoma stegnum* Say  
*Paragus bicolor* (Fabricius)  
*Paragus tibialis* (Fall)  
*Paragus variabilis* Vockeroth  
*Scaeva pyrastris* Linnaeus  
*Sphaerophoria cylindrica* (Say)  
*Sphaerophoria philanthus* (Meigen)  
*Spilomyia interrupta* Williston  
*Toxomerus marginatus* (Say)  
*Volucella satura* Osten Sacken  
*Xylota* sp. ?
- Pipunculidae  
*Tomosvaryella* sp.
- Conopidae  
*Physocephala texana* (Williston)  
*Zodion fulvifrons* Say
- Micropezidae  
*Micropeza turcana* Townsend
- Otitidae  
*Ceroxys latisculus* (Loew)  
*Oedopa ascriptiva* Hendel  
*Otites* sp.
- Pyrgotidae  
*Sphecomyiella valida* (Harris)
- Tephritidae  
*Tephritis* sp.
- Agromyzidae  
*Agromyza* sp.  
 (unidentified)
- Sepsidae  
*Sepsis* sp.
- Sciomyzidae  
*Limnia* sp.
- Lauxaniidae  
*Camptoprosopella dolorosa* Williston  
*Homoneura* sp.
- Chamaemyiidae  
*Chamaemyia* sp.  
*Leucopis* sp.
- Curtonotidae  
*Curtonotum helvum* (Loew)
- Ephydriidae (unidentified)
- Chloropidae  
*Chlorops* sp.  
*Meromyza* sp.
- Heleomyzidae  
*Pseudoleria* sp.  
*Suillia* sp.
- Anthomyidae (unidentified)
- Muscidae  
*Fannia* sp.  
 (unidentified)
- Calliphoridae  
*Lucilia sericata* (Meigen)  
*Phormia regina* (Meigen)  
*Protophormia terraenovae* (Robineau-Desvoidy)
- Sarcophagidae  
*Eumacronychia* sp., nr. *elita* Townsend  
*Metoposarcophaga pachyproctosa* (Parker)  
*Phrosinella fulvicornis* (Coquillett)  
*Ravina lherminieri* (Robineau-Desvoidy)  
*Sarcophaga aldrichi* Parker  
*Senotainia* sp., nr. *trilineata* (Wulp)  
*Senotainia* spp.  
*Wohlfahrtia vigil* Walker
- Tachinidae  
*Acroglossa hesperidarum* (Williston)  
*Archytas* sp.  
*Clairvillia* sp. ?  
*Cylindromyia armata* Aldrich  
*Cylindromyia* spp.  
*Deopalpus* sp.  
*Epalpus* sp. (prob. *signifer* (Walker))  
*Frontiniella parancilla* Townsend ?  
*Gonia* spp.  
*Juriniopsis* sp.  
*Leucostoma* sp. ?  
*Linnaemya* sp.  
*Microchaetina* sp.  
*Parachytas* sp.  
*Peleteria aldrichi* Curran  
*Peleteria* spp.  
*Phasia* sp.  
*Ptilodexia agilis* Rein  
*Ptilodexia* sp.  
*Spallanzania* sp.  
*Tachina* sp. ?  
 (unidentified)
- Oestridae  
*Cuterebra approximata* Walker
- HYMENOPTERA
- Braconidae  
*Apanteles* spp.  
*Cremonops* sp.  
*Iphiaulax* sp.  
*Rogas* sp.  
 (unidentified)
- Ichneumonidae  
*Anomalon reticulatum* (Cresson)  
*Enicospilus* sp.  
*Exochus* sp.  
*Glypta* sp.  
*Megarhyssa* sp.  
*Netelia* sp.  
*Ophion* sp.  
 (unidentified)
- Mymaridae (unidentified)
- Eulophidae  
*Entedon* sp.  
 (unidentified)
- Encyrtidae (unidentified)
- Eupelmidae (unidentified)
- Torymidae  
*Torymus koebeli* Hubner  
*Torymus* nr. *tubularis* Hubner
- Pteromalidae  
*Pteromalus* sp.
- Eurytomidae (unidentified)  
 (unidentified family of Proctotrupeoidea)
- Chalcididae  
*Spilochalcis arcana* (Cresson)
- Chrysididae  
*Ceratochrysis kansensis* (Viereck)  
*Chrysis coeruleans* Fabricius  
*Chrysis dorsalis* Aaron  
*Chrysis scitula* Cresson  
*Hedychridium nevadae* Kimsey  
*Hedychridium nigropilosum* Mocsary
- Bethylidae  
*Epyris clarimontis* Kieffer  
*Epyris myrmecophilus* Brues
- Sphecidae  
*Ammophila azteca* Cameron  
*Ammophila harti* Fernald  
*Ammophila juncea* Cresson  
*Ammophila macra* Cresson  
*Ammophila procera* Dahlbom  
*Ammophila strenua* Cresson  
*Ammoplanops* sp.  
*Ancistromma aurantia* (Fox)  
*Ancistromma capax* (Fox)



*Aphilanthops frigidus* (Smith)  
*Bembecinus quiquespinosus* (Say)  
*Bembix americana spinolae* Lepeltier  
*Bembix pruinosa* Fox  
*Bembix sayi* Cresson  
*Bicyrtes ventralis* Say  
*Bothynostethus distinctus* Fox  
*Cerceris bicornuta bicornuta* Guerin  
*Cerceris conifrons* Mickel  
*Cerceris echo* Mickel  
*Cerceris rhois* Rohwer  
*Cerceris sexta* Say  
*Cerceris tepanica* Saussure  
*Cerceris wyomingensis* Scullen  
*Cerceris* sp.  
*Clypeadon laticinctus* Cresson  
*Crabro florissantensis* Rohwer  
*Crabro pallidus* Fox  
*Crossocerus* sp.  
*Diodontus occidentalis* Fox  
*Diodontus rugosus* Fox  
*Dryudella caerulea* (Cresson)  
*Dryudella rhimpa* Parker  
*Ectemnius dilectus* Cresson  
*Ectemnius* sp.  
*Encopognathus wenonah* (Banks)  
*Eucerceris fulvipes* Cresson  
*Eucerceris superba superba* Cresson  
*Eucerceris zonata* (Say)  
*Gorytes canaliculatus* Packard  
*Hoplisoides placidus birkmanni* Baker  
*Hoplisoides spilopterus* (Handlirsh)  
*Hoplisoides* sp.  
*Larropsis uniformis* Bohart and Bohart  
*Larropsis vegeta* (Fox)  
*Larropsis* sp.  
*Mellinus abdominalis* Cresson  
*Microbembex californica* Bohart  
*Microbembex monodonta* Say  
*Mimesa* sp.  
*Miscophus* sp.  
*Oryttus gracilis arapaho* (Pate)  
*Oryttus* sp.  
*Oxybelus emarginatum* Say  
*Oxybelus parvum* Cresson  
*Oxybelus uniglumis quadrinotatus* Say  
*Palmodes carbo* Bohart and Menke  
*Philanthus albopilosus* Cresson  
*Philanthus basilaris* Cresson  
*Philanthus bicinctus* Mickel  
*Philanthus inversus* Patton  
*Philanthus psyche* Dunning  
*Philanthus pulcher* Dalla Torre  
*Philanthus zebratus* Cresson  
*Plenoculus davisii* Fox  
*Plenoculus propinquus* Fox  
*Plenoculus* sp.  
*Podalonia communis* (Cresson)  
*Podalonia luctuosa* (Smith)  
*Podalonia mexicana* (Saussure)  
*Podalonia mickeli* Murray  
*Podalonia occidentalis* Murray  
*Podalonia robusta* Cresson  
*Prionyx canadensis* (Provancher)  
*Prionyx parkeri* Bohart and Menke  
*Prionyx thomae* (Fabricius)  
*Pseudoplisus venustus* (Cresson) ?  
*Pulverro* sp.  
*Steniolia obliqua* (Cresson)  
*Stictiella plana* Fox  
*Tachysphex quebecensis* (Provancher)

*Tachysphex* sp.  
*Tachytes spatulatus* Fox  
*Tachytes* spp.

## Colletidae

*Colletes albescens* Cresson  
*Colletes americanus* Cresson  
*Colletes gypsicolens* Cockerell  
*Colletes lutzi lutzi* Timberlake  
*Colletes phaceliae* Cockerell  
*Colletes simulans* Cresson  
*Colletes* sp.  
*Hylaeus* sp.

## Andrenidae

*Andrena andrenoides* Cresson  
*Andrena barbilabris* Kirby  
*Andrena birtwelli* Cockerell  
*Andrena colletina* Cockerell  
*Andrena cupreotincta* Cockerell  
*Andrena helianthi* Robertson  
*Andrena hitei* Cockerell  
*Andrena illinoensis* Robertson  
*Andrena lupinorum* Cockerell  
*Andrena medionitens* Cockerell  
*Andrena mentzeliae* Cockerell  
*Andrena placida* Smith  
*Andrena prunorum* Cockerell  
*Andrena vulpicolor* Cockerell  
*Perdita fallax* Cockerell  
*Perdita hyalina* Cresson  
*Perdita nigroclypeata* Timberlake  
*Perdita* sp.  
*Pseudopanurgus* sp.

## Halictidae

*Agapostemon angelicus* Cockerell ?  
*Agapostemon femoratus* Crawford  
*Agapostemon splendens* (Lepelletier)  
*Agapostemon texanus* Cresson ?  
*Dialictus albohirtus* (Crawford)  
*Dialictus pictus* (Crawford)  
*Dialictus pruinosiformis* (Crawford)  
*Dialictus pruinosus* (Robertson)  
*Dialictus ruidosensis* Cockerell  
*Dialictus scrophulariae* (Cockerell)  
*Dialictus succinipennis* (Ellis)  
*Evyllaeus cooleyi* (Crawford)  
*Evyllaeus lusorius* (Cresson)  
*Halictus* sp.  
*Lasioglossum cyaneiceps* (Cockerell)  
*Lasioglossum sisymbrii* (Cockerell)  
*Lasioglossum trizonatum* (Cresson)  
*Nomia heteropoda kirbii* Smith  
*Sphecodes* sp.

## Megachilidae

*Anthidium emarginatum* Say ?  
*Anthidium rodecki* Schwarz  
*Anthidium tenuiflorae* Cockerell  
*Anthidium* sp.  
*Ashmeadiella californica* (Ashmead)  
*Ashmeadiella* sp.  
*Dianthidium ulkei* (Cresson)  
*Dianthidium* sp.  
*Heriades gracilior* Cockerell  
*Heriades* sp.  
*Hoplitis albifrons* (Kirby)  
*Lithurge apicalis* (Cresson)  
*Megachile addenda* Cresson  
*Megachile fidelis* Cresson  
*Megachile fortis* Cresson  
*Megachile nevadensis* Cresson  
*Megachile perihirta* Cockerell ?  
*Megachile pugnata* Say



*Osmia atriventris* Cresson ?  
*Osmia lignaria propinqua* Cresson  
*Trachusa occidentale* (Cresson)  
*Trachusa zebratum* (Cresson) ?  
**Anthophoridae**  
*Anthophora curta* Provancher  
*Anthophora montana* Cresson  
*Anthophora* sp.  
*Ceratina neomexicana* Cockerell  
*Ceratina nanula* Cockerell ?  
*Diadasia* sp.  
*Epeolus lutzii* Cockerell ?  
*Epeolus pusillus* Cresson  
*Habropoda cineraria* (Smith)  
*Habropoda morrisoni* (Cresson)  
*Melecta pacifica* Cresson  
*Melissodes* sp.  
*Nomada vincta* Say  
*Xenoglossodes* sp.  
*Xeromelecta californica* Cresson  
**Apidae**  
*Apis mellifera* Linnaeus  
*Bombus appositus* Cresson  
*Bombus bifarius* Cresson  
*Bombus centralis* Cresson  
*Bombus fervidus* (Fabricius)  
*Bombus flavifrons* Cresson  
*Bombus huntii* Greene  
*Bombus mixtus* Cresson  
*Bombus morrisoni* Cresson  
*Bombus nevadensis nevadensis* Cresson  
*Bombus terricola occidentalis* Greene  
*Psithyrus insularis* (Smith)  
**Tiphiidae**  
*Brachycistis glabrella* (Cresson)  
*Neotiphia sulcata* (Roberts)  
*Paratiphia* sp.  
*Tiphia nona* Allen ?  
*Tiphia* sp.  
**Mutillidae**  
*Chyphotes albipes* Cresson  
*Dasymutilla bioculata* (Cresson)  
*Dasymutilla chiron ursula* (Cresson)  
*Dasymutilla medea* (Cresson)  
*Dasymutilla nigripes* (Fabricius)  
*Dasymutilla vesta* (Cresson)  
*Dasymutilla vestita* (Lepeltier)  
*Odontophotopsis obliquus* Viereck  
*Odontophotopsis ocellatus* Baker ?  
*Odontophotopsis* sp.  
*Photopsis clara* Cresson ?  
*Pseudomethoca propinqua* (Cresson)  
**Pompilidae**  
*Anoplius brevihirta* (Banks)  
*Anoplius marginalis* (Banks)  
*Aporinellus completus* Banks  
*Cryptocheilus terminatum terminatum* Say  
*Episyron quinquinotatus hurdi* Evans  
*Evagetes ingenuus* (Cresson)  
*Evagetes padrinus minisculus* (Banks)  
*Pompilus scelestus* Cresson  
**Scoliidae**  
*Campsomeris pilipes* Saussure  
*Campsomeris plumipes confluenta* Say  
**Masaridae**  
*Pseudomasaris vespoidea* (Cresson)  
**Vespidae**  
*Vespula arenaria* Fabricius  
*Vespula atropilosa* Sladen  
*Vespula maculata* Linnaeus  
*Vespula norvegicoides* Sladen  
*Vespula pennsylvanica* Saussure

**Eumenidae**  
*Ancistrocerus adiabatus adiabatus* (Saussure)  
*Ancistrocerus antilope antilope* (Panzer)  
*Ancistrocerus bustemente bustemente* (Saussure)  
*Ancistrocerus catskill* (Saussure)  
*Ancistrocerus catskill albophaleratus* (Saussure)  
*Ancistrocerus durangoensis* Cameron  
*Ancistrocerus lineativentris lineativentris* Cameron  
*Eumenes crucifera crucifera* Provancher  
*Eumenes verticalis coloradensis* Cresson  
*Euodynerus auranus albivestis* Bohart  
*Euodynerus auranus auranus* (Cameron)  
*Euodynerus foraminatus aequalis* (Cameron)  
*Euodynerus nr. tempifera* (Viereck)

**Formicidae**  
*Camponotus pennsylvanicus modoc* Wheeler  
*Camponotus vicinus* Mayr  
*Dorymyrmex pyramicus* (Roger)  
*Formica bradleyi* Wheeler  
*Formica fusca* Linnaeus  
*Formica integroides coloradensis* Wheeler  
*Formica neoclara* Emery  
*Formica obscuripes* Forel  
*Lasius alienus americanus* Emery  
*Manica mutica* (Emery)  
*Monomorium minimum* (Buckley)  
*Myrmica brevispinosa* Wheeler  
*Myrmica brevispinosa discontinua* Weber  
*Pheidole pilifera coloradensis* Emery  
*Pogonomyrmex occidentalis* (Cresson)  
*Tapinoma sessile* (Say)

#### ARACHNIDA ARANEAE

Dictynidae (unidentified)  
 Araneidae (unidentified)  
 Tetragnathidae  
*Tetragnatha* sp.  
 Lycosidae  
*Geolycosa rafaellana* Chamberlain  
*Lycosa* sp.

Thomisidae (unidentified)  
 Salticidae (unidentified)

#### ACARI

Erythraeidae (unidentified)  
 (unidentified)

#### PSEUDOSCORPIONES (unidentified)

#### SOLIFUGAE

Eremobatidae  
*Eremobates mormonus* Muma  
*Eremochelis bilobatus* Muma  
*Hemerotrecha fruitana* Muma

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