

We hope you find “Grasshoppers of Nebraska” to be a helpful resource in learning more about Nebraska grasshoppers. This PDF provides you with not only links to each grasshopper by common name, but clicking on each species description’s map or plate will take you to the appropriate map (to see the species distribution pattern) or plate (to see a four-color graphic of the grasshopper).

At any time, use the square button box to return to the grasshopper you’ve chosen to view. If you need to navigate elsewhere in the site, such as to the glossary or index, use the bookmarks on the left side of the site.

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The Grasshoppers (Orthoptera: Acrididae and Romaleidae) of Nebraska



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Introduction

As of 2008, 108 species of short-horned grasshoppers (*Acrididae* and *Romaleidae*) were known to occur in Nebraska. While grasshoppers are, in general, considered damaging to rangeland and crops, only a handful of Nebraska's species have been known to cause damage, and several species might be considered beneficial as they consume weedy plants, some of which may be toxic to livestock.

The diet of Nebraska's grasshoppers encompasses a large number of plant species. Within the *Acrididae*, a large group of species, particularly the subfamily Gomphocerinae, feed exclusively on grasses and sedges, and these are the species that are most likely to damage rangeland.

The bandwings (subfamily Oedipodinae) are known for having colorful hind wings, and as a whole, feed on both grasses and forbs. Some bandwings are more preferential to grasses and others to forbs. Among Nebraska's bandwings, only one species, *Pardalophora haldemani*, has been shown to cause considerable damage to rangeland in the state. While *Pardalophora apiculata* was also present in the same areas during the *P. haldemani* outbreak, it occurred at much lower densities.

The subfamily Melanoplinae consists of the spur-throated grasshoppers. These are named for spur-like extensions on the prosternum, which is located on the ventral side between the front pair of legs. The spurthroats tend to feed more often on forbs than grasses, but some species will consume grasses readily if forbs are unavailable. At least one species in this group, *Melanoplus sanguinipes*, is known to cause damage to rangeland in Nebraska. Several other species, including *Melanoplus bivittatus*, *M. differentialis*, *M. femurrubrum* and *Melanoplus sanguinipes*, are known to damage crops. A few species in this group may also feed on shrubs and trees.

The bird grasshoppers (subfamily Cyrtacanthacridinae) are represented in Nebraska by only three species, and only two appear to breed in the state. These species feed on a variety of forbs, shrubs, and trees. The family Romaleidae (lubber grasshoppers) is represented in Nebraska by a single large species. This species prefers to feed on sunflower and sagebrush and is unlikely to damage rangeland.

The large number of grasshopper species occurring in Nebraska is likely the result of several ecological zones converging within the state. Annual precipitation ranges from over 86 cm in the southeastern corner of the state to less than 40 cm in the westernmost areas. This results in a number of ecological zones in the state, including deciduous forest, and large expanses of tallgrass, mixed-grass, and shortgrass prairie (Omernik 1987; Omernik 1995; Bailey 1995). In high elevation areas such as in the Pine Ridge (over 1500 m) a few western mountain-dwelling species occur. As a result of these various habitats, Nebraska is home to species typical of eastern woodlands as well as semi-arid western habitats.

The number of species known to occur in Nebraska is likely to change in the future. Many species may have limited distributions and/or preferred habitats and may be difficult to detect. In the span of four years (2005 through 2008), seven species not previously recorded from Nebraska in the last 100 years were found to occur here. These include *Boopedon gracile* Rehn, *Encoptolophus subgracilis* Caudell, *Melanoplus bispinosus* Scudder, *Melanoplus borealis* (Fieber), *Melanoplus punctulatus* Scudder, *Paratylotropidia brunneri* Scudder, *Psinidia fenestralis* (Serville). While *Boopedon gracile* was newly recorded for the state in 2007, two specimens had been collected over 50 years ago but were misidentified. This species has since been found at several additional locations. The reason that species such as these may have been overlooked in the past appears to be related to early or late seasonal adult activity, habitat specialization, a preference for habitats other than rangeland, or difficulty of identification.

At least one member of Nebraska's grasshopper fauna disappeared long ago. The Rocky Mountain locust (*Melanoplus spretus* (Walsh)), which once ravaged the central United States in enormous swarms, went extinct (but see Lockwood, 2004) around 1900, and specimens are extremely rare in collections. The reasons for its disappearance have been controversial, but it is thought that human activities were involved. We picture the species in this book.

In order to make this field guide easier to use for the amateur, we have included common names wherever possible. The common names were derived from several sources, but most were taken from Helfer (1987) and Pfadt (2002). While many of these common names are not officially accepted by the Entomological Society of America, it is hoped they will be useful for reference.

This field guide includes text covering all grasshopper species (*Acrididae* and *Romaleidae*) which have been recorded in Nebraska over the past 110 years. Unfortunately, it does not include some species reported from Nebraska prior to 1900. Bruner (1897) lists several grasshopper species from Nebraska which are not included in this guide. In Bruner's manuscript, distribution data were not given, and we did not have access to the specimens to determine the location of the collection. In some cases, it is thought that some species were misidentified, and in other, the species name is no longer valid. The following lists three of those species named by Bruner which might occur in Nebraska. It includes quotes from Bruner's manuscript (Bruner 1897).

***Metaleptea brevicornis* (Johannson)**

"...found on low grounds along streams in the eastern part of Nebraska where it is quite rare (Bruner 1897)".

***Dendrotettix quercus* Packard**

"...occurs only in oak groves in the extreme southeastern part of the state. (Bruner 1897)".

***Melanoplus viridipes* Scudder**

"Found only occasionally in woods along the Missouri River (Bruner 1897)".

In this guide, the text for each species covers adult appearance, body length, habitat, seasonality, Nebraska distribution, diet, economic importance, and general notes. It also includes references to images and maps presented elsewhere in the guide. The images provided should be suitable for the identification of nearly all species known to occur in Nebraska.

For species that are difficult to identify, additional images showing various morphological structures are also included. The maps display the known Nebraska distribution of each species at two levels of resolution.

On each map, county records are represented by counties shaded in gray. Light-gray shading indicates a record from before 2005 while dark gray indicates a more recent record, from 2005 to 2008. Black dots indicate the specific location of collection for which accurate collection data could be obtained.

These specific location records should be useful to determine where in a county a species might be expected, based on records from nearby. It is also

important to note that many of the counties in Nebraska, especially those in the western half of the state, cover extensive areas, and while there might be a record for a given county for a species, that species might be limited to a small part of that county.

Having a point of reference would then be useful in determining whether a given species is more likely to occur based on its occurrence in the general area.

Grasshopper Anatomy

Figures are presented here for use in the identification of adult grasshopper specimens. *Figure 2* presents a bandwing species, but the basic anatomy is representative of all Nebraska grasshoppers.

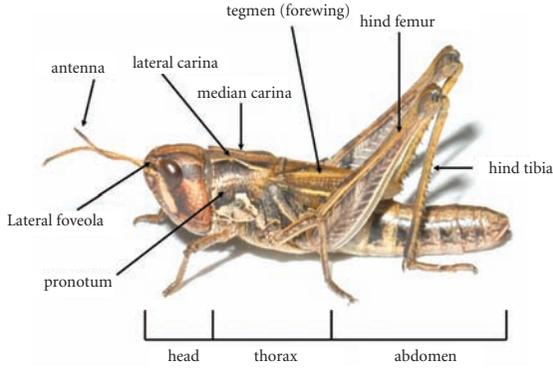


Figure 1. Generalized external anatomy of a grasshopper. Lateral view of an adult female *Aeropedellus clavatus*.

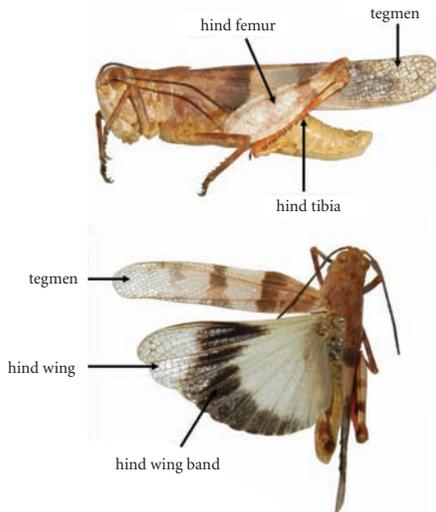


Figure 2. Basic structures of a bandwing grasshopper. Top: lateral view of *Trimerotropis pistrinaria*, bottom: dorsal view of *Trimerotropis pistrinaria*.

Grasshopper Anatomy

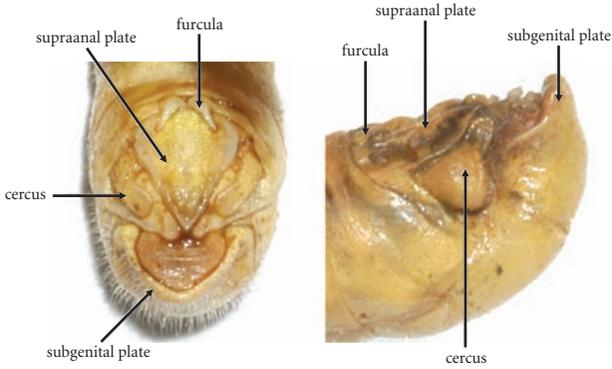


Figure 3. Structures of external male genitalia. Left: dorsal view of *Melanoplus foedus*, right: lateral view of *Melanoplus lakinus*.

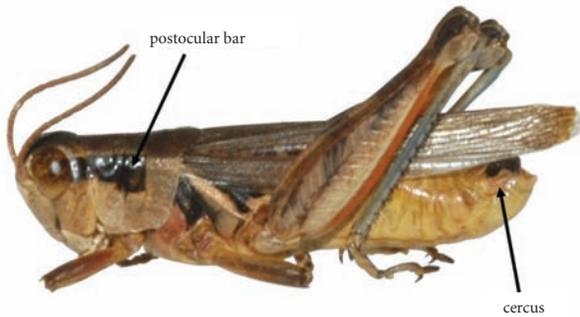


Figure 4. Features on *Melanoplus* species useful for identification. Lateral view of *Melanoplus confusus*.

Species Accounts

Green fool grasshopper

Acrolophitus hirtipes (Say)

Plate 1 (#1, #2); Map 1

Adult appearance: Green with distinct arch on dorsal pronotum and no teeth on arch. Hind wing pale yellowish with broad black band (Plate 1, #2). Hind tibia greenish.

Body length: Male: 24 to 30 mm, Female: 29 to 39 mm.

Habitat: Dry grasslands, often with sparse vegetation. Usually in localized populations.

Seasonality: Nymphs in spring and early summer. Adults most common from late June to mid-August.

Nebraska distribution: Recorded nearly statewide but rare in the east.

Diet: Mostly plants in the Borage family (Boraginaceae), as well as growmwell (*Blugossoides* sp.) stickseed (*Hackelia* sp.), and *Lithospermum*.

Economic importance: None.

Notes: An unmistakable species which usually does not fly long distances when alarmed.

Russianthistle grasshopper

Aeoloplides turnbulli (Caudell)

Plate 1 (#3); Map 2

Adult appearance: Primarily greenish with orange antennae. Outer hind femur with prominent greenish cross bars, hind tibia blue. Hind wing clear.

Body length: Male: 18 to 20 mm, Female: 19 to 25 mm.

Habitat: Dry grasslands and roadsides. Locally abundant among preferred host plants.

Seasonality: Nymphs in spring and early summer. Adults most common from early and mid-July until September.

Nebraska distribution: While there is an old record for Lancaster County, it generally appears limited to the western third of the state.

Diet: Exclusively plants in the Chenopodiaceae, particularly saltbush (*Atriplex* sp.), winterfat (*Krascheninnikovia lanтана*), greasewood (*Sarcobatus vermiculatus*), kochia (*Kochia scoparia*), Russianthistle (*Salsola kali*), and lambsquarters (*Chenopodium album*).

Economic importance: None; might be considered beneficial based on diet.

Notes: Similar in appearance to *Melanoplus* species. Often very numerous on preferred host plant.

Club-horned grasshopper

Aeropedellus clavatus (Thomas)

Plate 1 (#4); Map 3

Adult appearance: Light brown to gray-brown or greenish with some darker markings. Hind tibia light brown. Hind wing clear. The clubbed antennae of the adults are a distinctive character.

Body length: Male: 16 to 18 mm, Female: 19 to 22 mm.

Habitat: Low swales in central Nebraska. Dry grasslands at higher elevations.

Seasonality: Nymphs in spring. Adults most common from middle to late June until early August.

Nebraska distribution: Mostly limited to the northern half of the state, south as far as North Platte.

Diet: Feeds on a variety of grasses and sedges, including western wheatgrass (*Pascopyrum smithii*), prairie junegrass (*Koeleria macrantha*), Sandberg bluegrass (*Poa secunda*), needleandthread (*Stipa comata*), threadleaf sedge (*Carex filifolia*), and needleleaf sedge (*Carex duriuscula*).

Economic importance: Unlikely, but can be locally abundant.

Notes: Common fairly early in summer. Appears to use drier habitats in the most northern parts of the state.

Whitewhiskers grasshopper

Ageneotettix deorum (Scudder)

Plate 1 (#5); Map 4; Whitewhiskers Density Map 2005-2007

Adult appearance: Brown with whitish antennae and orange hind tibia. Hind wing clear.

Body length: Male: 15 to 17 mm, Female: 20 to 24 mm.

Habitat: Grasslands with at least some bare patches. Most abundant on sandy soils.

Seasonality: Nymphs from mid-spring to mid-summer. Adults most common from early July to late August.

Nebraska distribution: Statewide in suitable grassland areas. Extremely abundant in the Sandhills.

Diet: A variety of grasses and sedges including blue grama (*Bouteloua gracilis*), western wheatgrass (*Pascopyrum smithii*), needleandthread (*Stipa comata*), Kentucky bluegrass (*Poa pratensis*), threadleaf sedge (*Carex filifolia*), and needleleaf sedge (*Carex duriuscula*).

Economic importance: The most important rangeland grasshopper pest in Nebraska. Adult densities in the Sandhills may often exceed 20 per square yard in some areas (Whitewhiskers Density Map 2005-2007).

Notes: This is, without question, the most abundant grasshopper across Nebraska as a whole.

Striped grasshopper

Amphitornus coloradus (Thomas)

Plate 1 (#6); Map 5

Adult appearance: Boldly striped with light and dark brown, hind tibia blue. Body almost bullet-shaped. Hind wing clear.

Body length: Male: 17 to 21 mm, Female: 21 to 26 mm.

Habitat: Shortgrass and mixed-grass habitats.

Seasonality: Nymphs in spring and early summer. Adults most common from early July to late August.

Nebraska distribution: Recorded from the western two-thirds of the state but most common in the western half.

Diet: A limited number of grasses and sedges including blue grama (*Bouteloua gracilis*), threadleaf sedge (*Carex filifolia*), and needleleaf sedge (*Carex duriuscula*).

Economic importance: Debatable. Can occur at moderate densities among other more range-destructive species.

Notes: The striped appearance, blue hind tibiae, and bullet-shaped body make this species easy to distinguish.

Speckle-winged grasshopper

Arphia conspersa Scudder

Plate 2 (#7, #8, #9); Map 6

Adult appearance: Dark to light brown or gray-brown. Hind tibia light yellowish to pale blue, often dark brown in eastern Nebraska. Pronotal crest poorly developed. Hind wing pinkish red with broad dark band in most Nebraska populations (Plate 2, #9). Populations in high elevations in the panhandle have a large number of orange to yellow-winged individuals.

Body length: Male: 19 to 22 mm, Female: 28 to 37 mm.

Habitat: Grasslands, from tallgrass to shortgrass. Prefers areas with bare soil exposed and most common on heavier soils such as clay or loess.

Seasonality: Nymphs from late summer to early spring. Adults most common from mid-April to mid-June.

Nebraska distribution: Occurs statewide in suitable habitats.

Diet: A variety of grasses and sedges including Kentucky bluegrass (*Poa pratensis*), prairie junegrass (*Koeleria macrantha*), western wheatgrass (*Pascopyrum smithii*), needleandthread (*Stipa comata*), blue grama (*Bouteloua gracilis*), sixweeks fescue (*Vulpia octoflora*), threadleaf sedge (*Carex filifolia*), needleleaf sedge (*Carex duriuscula*). Also eats small amounts of forbs.

Economic importance: None.

Notes: This is a colorful early season bandwing. Adults are often common by the middle of April and may appear as early as late March in years with unusually warm spring weather.

Red-winged grasshopper

Arphia pseudonietana (Thomas)

Plate 2 (#10, #11); Map 7

Adult appearance: Dark to light brown to gray-brown with darker speckles. Some individuals nearly blackish. Hind tibia dark brown to nearly black with pale ring basally. Pronotal crest poorly to moderately developed. Hind wing scarlet red to (rarely) orange with broad black band (Plate 2, #11).

Body length: Male: 17 to 24 mm, Female: 25 to 35 mm.

Habitat: A wide variety of habitats from grasslands to woodland openings.

Seasonality: Nymphs occur from mid-spring to mid-summer. Adults most common from middle and late July to September.

Nebraska distribution: Occurs statewide but apparently most common in the northern half of the state.

Diet: A wide variety of grasses and sedges as well as some forbs. Preferred hosts include western wheatgrass (*Pascopyrum smithii*), buffalograss (*Buchloe dactyloides*), blue grama (*Bouteloua gracilis*), and needleleaf sedge (*Carex duriuscula*).

Economic importance: None.

Notes: The scarlet red wings are normally distinctive. It can be confused with *Arphia xanthoptera* but differs in the development of the pronotal crest.

Arphia simplex Scudder

Plate 2 (#12), Plate 3 (#13, #14, #15); Map 8

Adult appearance: Brown to gray-brown. Hind tibia blue with a pale band basally. Pronotal crest poorly to moderately developed and nearly always with dark speckles near

midline. Hind wing yellow to (rarely) orange with a thin blackish band (Plate 3, #13).

Body length: Male: 23 to 29 mm, Female: 32 to 40 mm.

Habitat: Mostly tallgrass habitats, ranges westward in stream valleys.

Seasonality: Nymphs from late summer and fall to early and mid-spring. Adults most common from early and mid-June to late July.

Nebraska distribution: Eastern two-thirds of the state and mostly in southern two-thirds. Ranges west to at least Lincoln County in the Platte River Valley and should occur into Keith County.

Diet: Diet poorly known but likely feeds mostly on various grasses and sedges.

Economic importance: None.

Notes: This bandwing can be very common in suitable habitats, especially in June.

Autumn yellow-winged grasshopper

Arphia xanthoptera (Burmeister)

Plate 3 (#16, #17, #18, #19); Map 9

Adult appearance: Light to very dark brown. Hind tibia dark brown with pale ring basally. Pronotal crest strongly developed. Hind wing variable, yellow, orange, or red wide broad black band (Plate 3, #17).

Body length: Male: 23 to 29 mm, Female: 32 to 40 mm.

Habitat: Grasslands, mostly tallgrass and mixed-grass.

Seasonality: Nymphs from middle and late spring to summer. Adults most common from early August to October.

Nebraska distribution: Occurs across most of the state but rare west of Ogallala and not recorded west of Garden County.

Diet: Poorly known. Studies by Sean Whipple (University of Nebraska at Kearney) showed that if presented with smooth brome (*Bromus inermis*), big bluestem (*Andropogon gerardii*), Kentucky bluegrass (*Poa pratensis*), and sideoats grama (*Bouteloua curtipendula*), smooth brome and big bluestem were consumed in statistically larger amounts than the other two grasses.

Economic importance: None.

Notes: This bandwing can be locally abundant and occurs late in the summer. It has been collected in the Lincoln area as late as mid-November.

Big-headed grasshopper

Aulocara elliotti (Thomas)

Plate 3 (#20); Map 10

Adult appearance: Gray-brown. Abdomen largely yellowish and hind tibia blue. Outer hind femur with dark cross bands usually lacking. Hind wing clear. Both sexes usually have forewings extending to end of abdomen.

Body length: Male: 16 to 20 mm, Female: 20 to 26 mm.

Habitat: Shortgrass prairie.

Seasonality: Nymphs from spring to summer. Adults most common from early July to mid-August.

Nebraska distribution: Older records known from eastern Nebraska but it has only been found in the western half of the state in recent years.

Diet: Feeds on a variety of grasses and sedges, and preferred species include blue grama (*Bouteloua gracilis*), western wheatgrass (*Pascopyrum smithii*), needleandthread (*Stipa comata*), crested wheatgrass (*Agropyron desertorum*), threadleaf sedge (*Carex filifolia*),

needleleaf sedge (*Carex duriuscula*).

Economic importance: Known to be range-destructive in state to the west and north, but high densities in Nebraska appear to be localized.

Notes: While this is considered an important rangeland pest in some other western states, it does not appear to be especially common in Nebraska. It can be found at moderate densities in local areas in the panhandle. While males are distinctive in appearance, the females can be difficult to separate from those of *Aulocara femoratum*.

White-crossed grasshopper

Aulocara femoratum Scudder

Plate 4 (#21); Map 11

Adult appearance: Gray-brown, usually with prominent blackish patch on side of pronotum. Abdomen largely yellowish and hind tibia blue. Outer hind femur with distinct blackish cross bands. Hind wing clear. Males always have forewings shorter than abdomen, females are variable in this character.

Body length: Male: 13 to 17 mm, Female: 20 to 26 mm.

Habitat: Shortgrass prairie.

Seasonality: Nymphs from spring to summer. Adults most common from early July to mid-August.

Nebraska distribution: Occurs across the panhandle and in the southwestern corner of the state.

Diet: Consumes a wide variety of grasses and sedges, but appears to prefer western wheatgrass (*Pascopyrum smithii*) and needleleaf sedge (*Carex duriuscula*).

Economic importance: Known to be range-destructive in state to the west and north, but high densities in Nebraska appear to be localized.

Notes: See *Aulocara elliotti*.

Boopedon auriventris McNeill

Plate 4 (#22); Map 12

Adult appearance: Sexually dimorphic. Male: Brown with light margins on pronotum and blackish patches on sides of pronotum. Hind tibia orange to reddish, outer hind femur with little or no visible banding. Forewings extend about half the length of abdomen, rarely longer. Abdomen usually orange. Female: Marking pattern similar to that of male but with dark patch on sides of pronotum often more poorly developed. Spotting on forewing minimal or lacking and forewings very short.

Body length: Male: 18 to 23 mm, Female: 29 to 36 mm.

Habitat: Poorly known in Nebraska. Apparently occurs in grasslands and grassy clearings in open woods elsewhere in its range. Thought to prefer oak savanna habitat in Nebraska.

Seasonality: Poorly known. Adults known to occur in July and August.

Nebraska distribution: Only known from Sarpy and Cuming counties. The Sarpy County specimen (2006) is the only known collection of this species in Nebraska in over 50 years.

Diet: Unknown, likely a grass feeder.

Economic importance: None.

Notes: Bruner (1904) stated that this species occurred on the sand hills and prairies of eastern Nebraska but gave no indication of its abundance. It has likely declined in Nebraska during the last century as a result of habitat loss.

Boopedon gracile Rehn

Plate 4 (#23); Map 13

Adult appearance: Sexually dimorphic. Male: Largely dark brown to nearly blackish. Cream-colored areas present on the head and pronotum. Outer hind femur with distinct blackish cross bands. Hind tibia purple to purple-red with a pale ring basally. Forewings extend to nearly the end of abdomen or beyond. Female: Color pattern similar to that of males but much paler in appearance. Blackish areas on pronotum and dark cross bars on outer hind femur may be poorly developed. Hind tibia purple to dark pink. Forewings about half the length of abdomen. Spots on forewing small. Hind wing dark blue in both sexes.

Body length: Male: 21 to 27 mm, Female: 29 to 38 mm.

Habitat: Tallgrass prairie and grassy woodland openings.

Seasonality: Nymphs in spring and summer. Adult most common from middle and late July to late August.

Nebraska distribution: Only known from five counties along the southern edge of the state in the eastern half. Ranges at least as far west as Franklin County. All collections have occurred within 35 km of the Kansas border.

Diet: Poorly known, presumably a grass feeder.

Economic importance: None.

Notes: Although it appeared new to the state when collected in 2005, it had been collected in Nebraska as early as 1932. Both of the two older specimens (Thayer and Nuckolls Counties) were previously misidentified.

Ebony grasshopper

Boopedon nubilum (Say)

Plate 4 (#24, #25, #26); Map 14

Adult appearance: Sexually dimorphic. Male: Solid black, rarely some individuals may have limited lighter markings. Hind tibia red to black. Outer hind femur usually with a pale ring distally. Forewings nearly to end of abdomen. Female: Light brown with various light and dark markings. Hind tibia pallid to pinkish, red, or purple. Outer hind femur with cross bands poorly developed. Forewings usually half the length of abdomen but occasionally as long as abdomen. Spots on forewing crenulate in appearance. Female rarely melanistic and almost entirely black (Plate 4, #26). Hind wing of both sexes clear; blackish on outer half.

Body length: Male: 20 to 23 mm, Female: 34 to 38 mm.

Habitat: Shortgrass prairie.

Seasonality: Nymphs from spring to summer. Adults most common from late July to September.

Nebraska distribution: Limited to southwestern parts of Nebraska and the panhandle.

Diet: Consumes a wide variety of grasses, apparently prefers western wheatgrass (*Pascopyrum smithii*), needleandthread (*Stipa comata*), and blue grama (*Bouteloua gracilis*).

Economic importance: Unlikely to be a pest in Nebraska, but it is a significant pest in Arizona.

Notes: Males of this species are unlikely to be mistaken for any other grasshopper species but are more likely to be mistaken for a cricket. The females are similar to those of *Boopedon gracile*, but the spots on the forewing distinguish them.

Plains lubber grasshopper

Brachystola magna (Girard)

Plate 5 (#27); Map 15

Adult appearance: The largest Nebraska grasshopper and the only member of the Romaleidae (lubber grasshoppers) in the state. Variously marked with green and light brown or pink. Hind tibia pallid. Hind femur of male more developed than that of female. Forewings very short and rounded.

Body length: Male: 43 to 58 mm, Female: 44 to 56 mm.

Habitat: Shortgrass and mixed-grass prairie.

Seasonality: Nymphs from spring to summer. Adults most common from mid-July to September.

Nebraska distribution: Although there are old records from Lancaster County (1937 most recent), it otherwise occurs across the western two-thirds of the state.

Diet: Mostly forbs with a preference for common sunflower (*Helianthus annuus*) and hoary vervain (*Verbena stricta*), kochia (*Kochia scoparia*) and prickly lettuce (*Lactuca serriola*). Also consumes some grasses such as western wheatgrass (*Pascopyrum smithii*).

Economic importance: Not a pest of rangeland but rarely damages crops on rare occasions. Can become driving hazard during outbreak years as dead grasshoppers can make roads slick.

Notes: This large grasshopper is larger and weighs more than some species of frogs. It is the grasshopper referred to as the “homesteader” by local ranchers. This is the only member of the family Romaleidae in Nebraska. All other Nebraska grasshoppers are members of the family Acrididae.

Bruner slant-faced grasshopper

Bruneria brunnea (Thomas)

Plate 5 (#28); Map 16

Adult appearance: Gray-brown with bold pattern of light and dark areas. Abdomen yellow, hind tibia orange. Hind wing clear.

Body length: Male: 14 to 17 mm, Female: 18 to 23 mm.

Habitat: Shortgrass prairie, especially along the edges of Ponderosa pine (*Pinus ponderosa*) forest in Nebraska.

Seasonality: Nymphs in spring. Adults most common from mid-July through August.

Nebraska distribution: The only recent Nebraska collection consists of a series of seven species from Monroe Canyon in northern Sioux County.

Diet: A variety of grasses and sedges including species of *Carex*, *Agropyron*, *Bouteloua*, *Koeleria*, *Stipa*, and *Elymus*.

Economic importance: None.

Notes: Bruner (1897) reported this species as occurring in middle and western Nebraska, but it has only been found in the far northwestern corner of the state in the last 100 years. It might occur elsewhere in the panhandle at high elevations.

Clear-winged grasshopper

Camnula pellucida (Scudder)

Plate 5 (#29, #30); Map 17

Adult appearance: Overall light brown with variable markings and spots of dark brown to blackish. Hind tibia light brown to nearly orange. Forewings extend beyond end of abdomen and hind wing clear. Hind wing clear (Plate 5, #30).

Body length: Male: 19 to 22 mm, Female: 22 to 26 mm.

Habitat: Occurs in a variety of grassy habitats in areas to the north and in higher elevations. It appears limited to low moist areas in grasslands in Nebraska.

Seasonality: Nymphs occur from spring to early summer. Adults most common from early July to September.

Nebraska distribution: Only recorded from four counties, all in the northern half of the state.

Diet: Feeds on a broad range of grasses, including fescues (*Festuca* sp.), bluegrasses (*Poa* sp.), western wheatgrass (*Pascopyrum smithii*), crested wheatgrass (*Agropyron desertorum*), and bromes (*Bromus* sp.).

Economic importance: Can be highly destructive to rangeland at higher latitudes and altitudes, also somewhat migratory. Does not appear to be economically important in Nebraska.

Notes: While this is a common and economically important species across much of its range, it appears to be comparatively rare in Nebraska.

Fuzzy olive-green grasshopper

Campylacantha olivacea (Scudder)

Plate 5 (#31); Map 18

Adult appearance: Olive-green with numerous small and indistinct whitish markings and with a somewhat fuzzy appearance. Very rarely almost entirely gray to gray-brown. Hind tibia greenish. Forewings extend about half the length of the abdomen.

Body length: Male: 16 to 21 mm, Female: 22 to 28 mm.

Habitat: Tallgrass and mixed-grass prairie, fields, and roadsides (rarely shortgrass). Prefers areas with abundant ragweed.

Seasonality: Nymphs from spring to middle and late summer. Adults most common from late July to September.

Nebraska distribution: Probably occurs nearly statewide but generally lacking from much of the panhandle. It has likely been extirpated from much of the eastern third of the state as a result of habitat loss. It usually occurs at low densities.

Diet: Feeds on various weedy forbs but especially prefers western ragweed (*Ambrosia psilostachya*) and tar bush (*Flourensia cernua*).

Economic importance: Based on its diet it should be considered beneficial.

Notes: The adults of this species might easily be mistaken for nymphs of *Schistocerca lineata* (early instars) or those over several *Melanoplus* species; however, their hairy appearance distinguishes them.

Thomas' grasshopper

Chloealtis abdominalis (Thomas)

Plate 5(#32); Map 19

Adult appearance: Brown to gray-brown with yellowish abdomen. Black patch on pronotum poorly developed or lacking in both sexes. Hind tibia light brown to orange. Forewing of male about as long as abdomen, shorter in female. Outer hind femur entirely brownish. Hind wing clear.

Body length: Male: 17 to 24 mm, Female: 20 to 30 mm.

Habitat: Woodland glades, steep north-facing slopes, and canyon walls.

Seasonality: Poorly known. Presumably similar to that of *Chloealtis conspersa*.

Nebraska distribution: Bruner (1897) mentions it from steep canyons in western

Nebraska. The only specimen in the University of Nebraska State Museum collection was collected from Knox County in 1902, and it is the female specimen pictured. This record appears possibly erroneous, but the specimen certainly matches this species. It should be looked for elsewhere in the northern part of the state on north-facing slopes.

Diet: Presumably a grass feeder.

Economic importance: None.

Notes: See “Nebraska Distribution”.

Sprinkled grasshopper

Chloea conspersa (Harris)

Plate 6 (#33); Map 20

Adult appearance: Brown with a large black patch on the sides of the pronotum. Black patch may be poorly developed or completely lacking in females. Abdomen orange to orange and yellow, especially ventrally. Hind tibia dark orange to red. Outer hind femur with a whitish band near middle. Forewings extending nearly to the end of abdomen in male, about half the length of the abdomen in female.

Body length: Male: 18 to 24 mm, Female: 21 to 29 mm.

Habitat: Occurs in and near dry woodlands, often in the general vicinity of streams or rivers.

Seasonality: Nymphs from spring to early summer. Adults most common from late June to late August. Only seldom numerous.

Nebraska distribution: Presumably occurs statewide in suitable habitat, but records are widely scattered.

Diet: Poorly known, likely a grass feeder.

Economic importance: None.

Notes: Most recent collections are from near the Platte and Missouri Rivers. It can be locally common at a few sites, but never abundant. While most grasshoppers oviposit in soil, this is one of three Nebraska species that lays eggs in decaying wood.

Meadow grasshopper

Chorthippus curtipennis (Harris)

Plate 6 (#34); Map 21

Adult appearance: Light green to light brown and somewhat slender. Abdomen yellowish ventrally with a distinct blackish patch on the side of each segment. Hind tibia light brown to nearly green. Forewings nearly to end of abdomen in male, about half the length of the abdomen in female. Hind wing clear.

Body length: Male: 12 to 18 mm, Female: 21 to 27 mm.

Habitat: In Nebraska it appears to mostly inhabit low swales and moist meadows.

Seasonality: Nymphs in spring and early summer. Adult most numerous from late June to mid-July.

Nebraska distribution: Recorded from across most of Nebraska, but appears to be rare toward the south. Seldom abundant.

Diet: A broad range of grasses and sedges.

Economic importance: None.

Notes: While this species is easily confused with *Aeropedellus clavatus*, its filiform antennae distinguish it. While very common in the northern United States and Canada, it appears to be relatively scarce and localized in Nebraska.

Green-striped grasshopper

Chortophaga viridifasciata (DeGeer)

Plate 6 (#35, #36, #37, #38), Plate 7 (#39); Map 22

Adult appearance: Variable from gray or gray-brown to almost entirely green, males only rarely green. Green females usually pinkish to purplish ventrally. Hind wing pale greenish with diffuse dark band (Plate 6, #38; Plate 7 #39). Hind tibia pale brownish to dark brown, often blue to almost black in summer adults. Summer adults also often have spotting on forewing and dark marks on outer hind femur (Plate 6, #36, #37). Pronotal crest moderately developed.

Body length: Male: 18 to 22 mm, Female: 24 to 30 mm.

Habitat: Somewhat moist grassy areas, especially in the vicinity of streams.

Seasonality: Poorly defined seasonality in Nebraska. Nymphs most abundant in fall and very early spring. Adults most common from early and mid-April to early June. Nymphs can be found sporadically throughout the summer and adults may be found at low densities from mid-June to November. It is not clear if there are two distinct generations or one prolonged generation.

Nebraska distribution: Occurs statewide, but summer adults appear restricted to the southeastern part of the state.

Diet: Prefers succulent plants and feeds on a variety of grasses and sedges. Shows a preference for Kentucky bluegrass (*Poa pratensis*), but also feeds on foxtail barley (*Hordeum jubatum*), western wheatgrass (*Pascopyrum smithii*), quackgrass (*Elymus repens*), little bluestem (*Schizachyrium scoparium*), prairie junegrass (*Koeleria macrantha*), Johnsongrass (*Sorghum halepense*), various bromes (*Bromus* sp.) and needleleaf sedge (*Carex duriuscula*). It will also feed on forbs occasionally. In the Lincoln area, it is abundant in areas predominated by smooth brome (*Bromus inermis*).

Economic importance: None.

Notes: Based on morphological characters, coloration, and seasonal occurrence, it appears that this species blends into what is currently called *Chortophaga australior*. While *C. australior* is strictly a species of the southeastern United States, this suggests that it may represent a seasonal variant rather than a full species.

Wrangler grasshopper

Circotettix rabula Rehn and Hebard

Plate 7 (#40, #41); Map 23

Adult appearance: Superficially similar to many other bandwings. Light brown with small darker spots. Hind tibia light brown to nearly yellow. Hind wing distinct, yellow with thin scalloped blackish band (Plate 7, #41). Hind wing shape also distinct with apical end somewhat extended.

Body length: Male: 26 to 34 mm, Female: 27 to 36 mm.

Habitat: Dry eroded habitats such as shortgrass prairie, badlands, rocky slopes, and gulleys.

Seasonality: Nymphs in spring. Adults most common from mid-July to September.

Nebraska distribution: Recorded from the panhandle counties but might also occur into Keith, Dundy, Chase, and Perkins Counties.

Diet: Feeds mostly on forbs, with locoweed (*Oxytropis* sp.), vetches (*Vicia* sp.), sandwort (*Arenaria*, *Moehringia* sp.), bladderpod (*Physaria* sp.), wild licorice (*Clyecrrhiza lepidota*), and field bindweed (*Convolvulus arvensis*) recorded as being consumed.

Economic importance: None.

Notes: This is the loudest grasshopper in Nebraska. The loud snapping sounds of displaying males may often be heard among eroded canyons and gulleys in the panhandle. It is seldom common. It often co-occurs with *Hadrotettix trifasciatus*, *Mestobregma plattei*, and *Spharagemon equale*.

Crenulate-winged grasshopper

Cordillacris crenulata (Bruner)

Plate 7 (#42); Map 24

Adult appearance: A small and fragile looking species. Brown to red-brown with whitish markings. Dark markings of forewing creating a scalloped (crenulate) pattern. White area on lower half of lateral pronotum extending dorsally adjacent to rear part of head. Hind wing clear.

Body length: Male: 11 to 14 mm, Female: 14 to 21 mm.

Habitat: Shortgrass prairie.

Seasonality: Nymphs in spring. Adult most common from late June to mid-August.

Nebraska distribution: Has been recorded from six counties in the panhandle and southwestern parts of the state.

Diet: Feeds predominantly on grasses, and especially prefers blue grama. It has also been recorded to feed on hairy grama (*Bouteloua hirsuta*), red threeawn (*Aristida* spp.), prairie junegrass (*Koeleria macrantha*), threadleaf sedge (*Carex duriuscula*), and needleleaf sedge (*Carex filifolia*).

Economic importance: In Montana it has been known to damage threadleaf sedge, but because of its small size and generally low densities, it is seldom a serious pest. It is probably of no economic importance in Nebraska as it appears to be scarce here.

Notes: While it may reach moderate densities in some parts of its range, it appears to be uncommon in Nebraska. While the two *Cordillacris* species in Nebraska are similar, this species can readily be distinguished from *C. occipitalis* by the forewing pattern, the shape of the white marking on the lateral pronotum, and by its smaller size.

Spotted-winged grasshopper

Cordillacris occipitalis (Thomas)

Plate 7 (#43); Map 25

Adult appearance: A small and fragile looking species, but larger than *C. crenulata*. Brown to red-brown with white markings. Dark markings of forewing creating a spotted pattern. White area on lower half of lateral pronotum not extending dorsally adjacent to rear part of head. Hind wing clear.

Body length: Male: 15 to 21 mm, Female: 22 to 27 mm.

Habitat: Shortgrass and mixed-grass prairie. Most common on sandy to loamy soils.

Seasonality: Nymphs in spring. Adult most common from late June to mid-August.

Nebraska distribution: Found across the western two-thirds of the state, locally numerous.

Diet: Feeds on a variety of grasses and sedges. It is known to feed on blue grama (*Bouteloua gracilis*), needleandthread (*Stipa comata*), western wheatgrass (*Pascopyrum smithii*), sand dropseed (*Sporobolus cryptandrus*), downy brome (*Bromus tectorum*), threadleaf sedge (*Carex filifolia*), and needleleaf sedge (*Carex duriuscula*).

Economic importance: Known to be a pest on range grasses, but is only occasionally the dominant species in any grasshopper assemblage. It appears to be most important in the western half of the panhandle where *Ageneotettix deorum* becomes less numerous.

Notes: See *C. crenulata*.

Pronotal range grasshopper

Cratypedes neglectus (Thomas)

Plate 7 (#44), Plate 8 (#45); Map 26

Adult appearance: Easily confused with *Pardalophora* and *Xanthippus* species. Gray-brown to dark gray with darker spots. A pale stripe is present near the posterior edge of the tegmina. Inner hind femur with red and pale areas and one or two gray patches. Hind tibia reddish to pallid. Hind wing yellowish with dark band (Plate 8, #45).

Body length: Male: 24 to 32 mm, Female: 33 to 40 mm.

Habitat: Poorly known in Nebraska, presumably shortgrass prairie.

Seasonality: Nymphs in spring. Adults from June to August.

Nebraska distribution: Known from a single record from Cheyenne County collected in 1901.

Diet: Unknown, probably feeds on grasses and sedges.

Economic importance: None.

Notes: Might be more consistent in Nebraska than the single record suggests.

Painted grasshopper

Dactylotum bicolor (Thomas)

Plate 8 (#46); Map 27

Adult appearance: Unmistakable. Prominently banded with dark blue, orange-red, and white. Forewings short and poorly developed. Hind tibia white to pale blue with blue spines.

Body length: Male: 21 to 26 mm, Female: 27 to 40 mm.

Habitat: Shortgrass and mixed-grass prairie, eroded areas.

Seasonality: Nymphs in spring. Adults most common from early July to early September.

Nebraska distribution: Recorded from across the western two-thirds of the state but appears most consistent in the western half. Often localized.

Diet: Feeds on forbs, and known hosts include false boneset (*Brickellia eupatorioides*), scarlet globemallow (*Sphaeralcea coccinea*), prairie clover (*Petalostemon* sp.), and scurfpea (*Psoralea* sp.). False boneset appears to be preferred in Nebraska.

Economic importance: None.

Notes: This beautiful grasshopper is not likely to be confused with any other.

Hayden grasshopper

Derotmema haydeni (Say)

Plate 8 (#47, #48); Map 28

Adult appearance: Gray-brown to light brown. Hind tibia pallid. Hind wings yellowish or pinkish red with blackish band (Plate 8, #48). Similar to *Psinidia fenestralis* but differs in shape of dark band on hind wing and in having filiform antennae.

Body length: Male: 14 to 20 mm, Female: 21 to 26 mm.

Habitat: Shortgrass prairie. Prefers areas with sparse vegetation. In Nebraska it has been collected most recently on adobe flats and dry gravelly areas adjacent to sandbars.

Seasonality: Nymphs in spring. Adults most common from mid-July to late August.

Nebraska distribution: In Nebraska it has been found throughout the panhandle, but has been collected eastward to Thomas and Hitchcock Counties as well.

Diet: Feeds primarily on forbs, including plains bahia (*Bahia* sp.), scarlet globemallow (*Sphaeralcea coccinea*), finned sagebrush, and others, but also on sedges such as

needleleaf sedge (*Carex duriuscula*).

Economic importance: None.

Notes: Seldom encountered in large numbers

Short-winged green grasshopper

Dichromorpha viridis (Scudder)

Plate 8 (#49, #50); Map 29

Adult appearance: Green to light brown with short wings. Females may resemble those of *Cloaltis conspersa*, but lack markings on outer hind femur. Hind tibia pallid to light green. Hind wing clear.

Body length: Male: 17 to 22 mm, Female: 22 to 30 mm.

Habitat: Woodland edges and openings, moist areas near streams. Occasionally in shaded grassy areas near buildings.

Seasonality: Nymphs in spring. Adults most common from early August to October.

Nebraska distribution: Has been collected from scattered locations across Nebraska with a western record from Scotts Bluff County. Appears to be most consistent in the eastern third of the state.

Diet: The diet of this grasshopper is only poorly known, but it is said to prefer coarse grasses. Recent studies found that when individuals were given the choice between smooth brome (*Bromus inermis*), big bluestem (*Andropogon gerardii*), Kentucky bluegrass (*Poa pratensis*), and sideoats grama (*Bouteloua curtipendula*), smooth brome was consumed in statistically larger amounts than the other three grasses (S. Whipple, unpublished study). It is also thought to feed on crabgrass (*Digitaria* sp.).

Economic importance: None.

Notes: A common grasshopper in the vicinity of Lincoln, Nebraska.

Carolina grasshopper

Dissosteira carolina (Linnaeus)

Plate 9 (#51, 52); Map 30

Adult appearance: Light brown, reddish-brown, or gray brown. Hind tibia pallid to light brown. Hind wing predominantly black with whitish to greenish limited to outer one-third to one-quarter of wing (Plate 9, #52).

Body length: Male: 26 to 33 mm, Female: 33 to 44 mm.

Habitat: Mostly occurs in disturbed areas such as roadsides, edges of parking lots, lawns, agricultural fields, and gardens. Generally uncommon in grasslands.

Seasonality: Nymphs in spring. Adults most common from early and mid-July to September.

Nebraska distribution: It occurs throughout Nebraska, and its current known range surely underrepresents its true distribution.

Diet: It feeds on a variety of grasses and forbs. Known hosts include smooth brome (*Bromus inermis*), western wheatgrass (*Pascopyrum smithii*), kochia (*Kochia scoparia*), and Russianthistle (*Salsola kali*).

Economic importance: Because it is generally limited to disturbed areas, it seldom causes damage to rangeland. However, it can cause minor damage to crops, and disturbed areas seeded with smooth brome appear to foster large numbers.

Notes: It has been speculated that in pre-civilized times, it may have had a much more limited distribution, and may have spread on the heels of human land alterations.

High Plains grasshopper

Dissosteira longipennis (Thomas)

Plate 9 (#53, #54): Map 31

Adult appearance: Light brown with mottling of darker brown. Median carina of pronotum developed into crest and deeply cut once. Hind tibia pallid to nearly yellow. Hind wing blackish with whitish covering at least outer third of wing and with a distinct area of bluish near wing base (Plate 9, #54).

Body length: Male: 38 to 50 mm, Female: 46 to 62 mm.

Habitat: Shortgrass prairie. Migrants in a variety of areas.

Seasonality: Nymphs in spring. Adults most common from mid-July to September. Eggs laid in bare soil areas in sandy loam.

Nebraska distribution: In Nebraska it has only been recorded from 11 counties, with most records from the western half of the state. It can be abundant in Colorado and New Mexico.

Diet: This species is a grass feeder, with a preference for blue grama (*Bouteloua gracilis*) and buffalograss (*Buchloe dactyloides*), but it will also feed on sand dropseed (*Sporobolus cryptandrus*) and needleandthread (*Stipa comata*).

Economic importance: It is a very important rangeland pest in the shortgrass plains of Colorado and New Mexico, but its appearance elsewhere is sporadic. It only breeds in limited areas of these two states and its populations are generally held in check at these sites. Major outbreaks have occurred in the past, and Colorado was most recently documented from 1934 to 1940. In Nebraska, it appears to be uncommon and is found only infrequently and mostly in the panhandle counties.

Notes: While economically important in some parts of its range, it is generally not common in Nebraska.

Encoptolophus costalis (Scudder)

Plate 9 (#55, #56), Plate 10 (#57); Map 32

Adult appearance: Grayish brown to rarely greenish with poorly defined darker banding on tegmina and hind femur. Hind tibia blue with whitish ring basally. Hind wing nearly clear with greenish hue and a diffuse dark area distally near margins (Plate 10, #56). Members of this genus are difficult to differentiate.

Body length: Male: 17 to 22 mm, Female: 23 to 28 mm.

Habitat: Grasslands. Prefers areas of rich grasses with extensive bare patches.

Seasonality: Nymphs in spring. Adults most common from late July to early October.

Nebraska distribution: It has been recorded from throughout Nebraska but appears to be most numerous in the panhandle and in the Central Nebraska Loess Plains ecoregion. It is generally replaced by *Encoptolophus sordidus* in the eastern third of the state.

Diet: Feeds on grasses and sedges. Prefers western wheatgrass (*Pascopyrum smithii*) and needleleaf sedge (*Carex duriuscula*), but will also feed on quackgrass (*Elymus repens*), prairie junegrass (*Koeleria macrantha*), sand dropseed (*Sporobolus cryptandrus*), little bluestem (*Schizachyrium scoparium*), sideoats grama (*Bouteloua curtipendula*), Kentucky bluegrass (*Poa pratensis*), foxtail barley (*Hordeum jubatum*), and timothy (*Alopecurus pratensis*).

Economic importance: None.

Notes: Members of this genus fly with a distinctive buzzing sound.

Dusky grasshopper

Encoptolophus sordidus (Burmeister)

Plate 10 (#58, #59, #60); Map 33

Adult appearance: Dark grayish brown to rarely greenish with poorly defined darker banding on tegmina and hind femur. Hind tibia black to dark brown (rarely purple) with lighter ring basally. Hind wing nearly clear with greenish hue and a diffuse dark area covering nearly outer half of wing (Plate 10, #59).

Body length: Male: 19 to 26 mm, Female: 27 to 33 mm.

Habitat: Prefers weedy fields, overgrown pastures and along woodland margins. Rarely found in rangeland.

Seasonality: Nymphs in spring. Adults most common from early August to early October.

Nebraska distribution: Known from nine counties scattered across Nebraska. The Sheridan County record is questionable. Generally limited to eastern half of state and common in some parts of Lancaster County.

Diet: Poorly known. Likely a grass and sedge feeder.

Economic importance: None.

Notes: See *E. costalis*.

Encoptolophus subgracilis Caudell

Plate 10 (#61, #62), Plate 11 (#63); Map 34

Adult appearance: Dark gray to gray-brown with darker markings largely indistinct. Hind tibia blue with whitish ring basally. Hind wing nearly clear with greenish hue and a diffuse dark area distally near margins (Plate 10, #62). Less robust than other *Encoptolophus* species in Nebraska.

Body length: Male: 15 to 21 mm, Female: 21 to 28 mm.

Habitat: All known Nebraska populations occur on the edges of salt flats in areas dominated by saltwort (*Batis maritima*) and with saltmarsh aster (*Symphyotrichum tenuifolium*). It could potentially occur in saline habitats in the western parts of the state.

Seasonality: Nymphs in spring. Adults most common from late July to early October.

Nebraska distribution: Discovered in Lancaster County from saline habitats in 2006. Collected in 2008 from Dawes and Sioux counties at the bottom of alkaline gullies.

Diet: Mostly a grass feeder, but will also consume forbs.

Economic importance: None in Nebraska. In Arizona it has been known to damage alfalfa and truck crops.

Notes: Newly recorded from Nebraska in 2006. It has long been known to occur in both Kansas and South Dakota but has evaded detection in Nebraska until recently. It is known in Nebraska only from the edges of salt flats in the vicinity of Lincoln.

Velvet-striped grasshopper

Eritettix simplex (Scudder)

Plate 11 (#64, #65); Map 35

Adult appearance: Highly variable. Generally light brown, gray, and/or green. Males brown with darker and lighter markings. Females variable in color. Occurs in two distinct pattern phases; one with dark brown in stripe above whitish lateral carina stripe (Plate 10, #63), and the other with brown or green below lateral carina stripe and covering much of outer face of pronotum (Plate 10, #64). The latter phase lacks dark brown above lateral carina stripe. Hind tibia pallid to light brown. Hind wing clear.

Antennae filiform but appearing nearly clavate. Antennal shape distinguishes it from *Orphulella* species and *Opeia obscura*.

Body length: Male: 14 to 19 mm, Female: 22 to 29 mm.

Habitat: Grasslands.

Seasonality: Nymphs from late summer to early spring. Adults most common from mid-April to mid-June.

Nebraska distribution: Recorded from throughout Nebraska but few records from the eastern third of the state. May have been extirpated from much of eastern Nebraska due to loss of grasslands.

Diet: Preferred hosts shift between nymphs and adults based largely on availability. Nymphs will feed on bluegrasses (*Poa sp.*), downy brome (*Bromus tectorum*), prairie junegrass (*Koeleria cristata*), threadleaf sedge (*Carex filifolia*), and needleleaf sedge (*Carex eleocharis*). Adults feed mostly on young warm-season grasses, preferring blue grama (*Bouteloua gracilis*). They will also consume hairy grama (*Bouteloua hirsuta*), sideoats grama (*Bouteloua curtipendula*), sand dropseed (*Sporobolus cryptandrus*), and needleandthread (*Stipa comata*).

Economic importance: Potentially damaging to rangeland, but seldom occurs at high densities. In recent years it has been numerous in central Nebraska and in the Pine Ridge area.

Notes: Nymphs have been recorded to survive temperatures as low as -15°C, and they may sometimes be noted on warm winter days.

Three-banded grasshopper

Hadrotettix trifasciatus (Say)

Plate 11 (#66, #67); Map 36

Adult appearance: Light brown with three darker brown bands on tegmina and one band on hind femur. Hind tibia red to orange. Inner hind femur blue over basal two-thirds to three-quarters, whitish distally. Hind wing yellowish with black band (Plate 11, #67).

Body length: Male: 24 to 32 mm, Female: 33 to 43 mm.

Habitat: Bare and sparsely vegetated areas, especially gravelly hillsides and eroded shortgrass prairie.

Seasonality: Nymphs in spring. Adults most common from mid-July to early September.

Nebraska distribution: Recorded statewide but more sparsely distributed to the east.

Diet: Feeds on grasses, forbs, plant litter, cattle dung, and dead or weakened insects. Commonly eaten plants include scarlet globemallow (*Sphaeralcea coccinea*), Missouri milkvetch (*Astragalus missouriensis*), Virginia pepperweed (*Lepidium virginicum*), scarlet gaura (*Gaura coccinea*), breadroot scurfpea (*Psoralea esculenta*), blue grama (*Bouteloua gracilis*), and threadleaf sedge (*Carex filifolia*).

Economic importance: None.

Notes: Easily confused with certain *Trimerotropis* species but it is more robust and has a distinctive color pattern on the inner hind femur.

Rufous grasshopper

Heliaula rufa (Scudder)

Plate 11 (#68); Map 37

Adult appearance: Brown to light brown. Males often with paler head and with pinkish on outer hind femur. Hind tibia orange. Hind wing clear.

Body length: Male: 14 to 20 mm, Female: 19 to 27 mm.

Habitat: Rocky and gravelly areas with sparse vegetation.

Seasonality: Nymphs in spring. Adults July to October.

Nebraska distribution: Only recorded from four counties in the panhandle.

Diet: Known to feed on *Grama* species as well as threeawn (*Aristida* spp.).

Economic importance: None.

Notes: This species appears to be rare throughout its range.

Western green grasshopper

Hesperotettix speciosus (Scudder)

Plate 12 (#69); Map 38

Adult appearance: Green with purple in the median area of the dorsal pronotum, along the dorsal edge of the hind femur, and on the antennae. An orange-red area present just below knee of hind femur. Hind tibia light blue to greenish. Wings always distinctly shorter than abdomen. Hind wing clear.

Body length: Male: 18 to 24 mm, Female: 24 to 35 mm.

Habitat: Recorded from nearly throughout Nebraska, but most common in the Sandhills and apparently rare in the eastern parts of the state.

Seasonality: Nymphs in spring. Adults most common from late July to mid-September.

Nebraska distribution:

Diet: Feeds primarily on forbs including western ragweed (*Ambrosia psilostachya*), common sunflower (*Helianthus annuus*), marsh elder (*Iva xanthifolia*), beggar ticks (*Lappula redowski*), breadroot scurfpea (*Psoralea esculenta*), Missouri goldenrod (*Solidago missouriensis*), scarlet globemallow (*Sphaeralcea coccinea*), and curlycup gumweed (*Grindelia squarrosa*). Appears to show a preference for sunflower, western ragweed, and goldenrod.

Economic importance: Because of its preference for weedy forbs, it is unlikely to be a pest of rangeland, and might be considered beneficial in its preference for weedy species.

Notes: A colorful and unmistakable species.

Snakeweed grasshopper

Hesperotettix viridis (Scudder)

Plate 11 (#70, #71); Map 39

Adult appearance: Generally green with white and black areas on the lateral pronotum. Hind femur with orange to red ring just below knee. Hind tibia light blue. Two subspecies recognized in Nebraska, but taxonomic and distributional relationships remain unclear. *Hesperotettix viridis viridis* occurs mostly in the western half of the state and has white lines distinct on our hind femur and white areas on lateral pronotum larger (Plate 11, #71). *Hesperotettix viridis pratensis* most common in the eastern half of the state but does occur in the west in local areas (Plate 11, #70). It has white lines on outer hind femur poorly developed and reduced white on lateral pronotum. Hind wing clear.

Body length: Male: 18 to 24 mm, Female: 20 to 31 mm.

Habitat: Grasslands, especially with snakeweeds present.

Seasonality: Nymphs in spring. Adults most common from mid-July to September.

Nebraska distribution: Recorded from much of Nebraska.

Diet: Feeds on a variety of forbs but prefers snakeweeds (*Gutierrezia* spp.). Sword et al.

(2005) have shown that this grasshopper consists of two distinct host-specific genetic lineages.

Economic importance: Considered a beneficial species as it feeds on weedy forbs and has a preference for snakeweeds, which are toxic to cattle. Feeding by this species has been shown to cause significant mortality among these plants.

Notes: A very colorful species.

Wrinkled grasshopper

Hippiscus ocelote (Saussure)

Plate 12 (#72, #73, #74), Plate 13 (#75); Map 40

Adult appearance: Generally brownish with darker patches. Hind wing yellow or red (most often yellow) with blackish band (Plate 12, #73). Hind tibia orange. Inner hind femur nearly whitish with blue basally and three blackish bands (Plate 13, #75). It is very similar to species in the genera *Pardalophora* and *Xanthippus*, but differs in pronotal sculpturing, the color of the inner hind femur, and in being more robust. The median carina of the pronotum of *H. ocelote* is cut by only one sulcus (Plate 12, #74), while it is cut by two or three in both *Pardalophora* and *Xanthippus* species.

Body length: Male: 23 to 29 mm, Female: 36 to 42 mm.

Habitat: Grasslands and woodland openings. Most numerous in tallgrass prairie. Occasionally attracted to lights.

Seasonality: Nymphs in spring. Adults most common from mid-July to September.

Nebraska distribution: Recorded from grasslands throughout Nebraska.

Diet: Known to feed on western wheatgrass (*Andropogon smithii*), big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), sideoats grama (*Bouteloua curtipendula*), blue grama (*Bouteloua gracilis*), hairy grama (*Bouteloua hirsuta*), Japanese brome (*Bromus japonicus*), buffalograss (*Buchloe dactyloides*), Kentucky bluegrass (*Poa pratensis*), Indian grass (*Sorghastrum nutans*), needleandthread (*Stipa comata*), threadleaf sedge (*Carex filifolia*), and leadplant (*Amorpha canescens*).

Economic importance: Rarely occurs at high densities, so unlikely to cause damage.

Notes: Easily confused with *Pardalophora haldemani* and *Xanthippus corallipes*.

Cudweed grasshopper

Hypochlora alba (Dodge)

Plate 13 (#76, #77); Map 41

Adult appearance: Light green, pale whitish green, to nearly white. Distinct markings only poorly developed. Hind tibia light green. Wings normally about half the length of the abdomen but long-winged forms do occur rarely (Plate 13, #77). Hind wing clear.

Body length: Male: 16 to 20 mm, Female: 20 to 27 mm.

Habitat: Grasslands with patches of cudweed sagewort.

Seasonality: Nymphs in spring. Adults most common from mid-July to September.

Nebraska distribution: Recorded from throughout much of Nebraska.

Diet: Feeds exclusively on sage species and almost exclusively on cudweed sagewort (*Artemisia ludoviciana*). It has also been recorded to feed on *A. frigida*, *A. cana*, and *A. glauca* in smaller amounts. While it has been found to also consume other forbs as well as some grasses, it has been shown that this grasshopper is the only North American species that can feed exclusively on cudweed sagewort.

Economic importance: None.

Notes: This grasshopper's color matches that of its preferred host plants almost perfectly.

Narrow-winged sand grasshopper

Melanoplus angustipennis (Dodge)

Plate 13 (#78, #79); Map 42

Adult appearance: Variable from dull gray to bright yellow and tan. Hind tibia most often pinkish red, but occasionally blue. Blue tibiae appear to occur more commonly near the Wyoming border. Hind wing clear. The male cerci are distinctly spatula-shaped and only resemble those of *M. fluviatilis*, *M. foedus*, and *M. packardii* (Plate 13, #79). Adults of *M. angustipennis* are consistently smaller than these other three species.

Body length: Male: 19 to 25 mm, Female: 21 to 29 mm.

Habitat: Sandy grasslands.

Seasonality: Nymphs in spring. Adults most common from early July to September.

Nebraska distribution: Recorded from much of the state, but mostly in counties across the western two-thirds of the state. It is especially abundant in the Sandhills.

Diet: Feeds on a wide variety of materials including grasses, forbs, shrubs, mosses, and dead insects. Feeds much more commonly on forbs than grasses. Forbs found in crop analyses include western ragweed (*Ambrosia psilostachya*), prairie sunflower (*Helianthus petiolaris*), western sticktight (*Lappula occidentalis*), and cudweed sagewort (*Artemisia ludoviciana*), and grasses include blue grama (*Bouteloua gracilis*), needleandthread (*Stipa comata*), sand dropseed (*Sporobolus cryptandrus*), and western wheatgrass (*Andropogon smithii*).

Economic importance: While this grasshopper can be abundant in sandy rangeland, with adult densities up to 15 per square yard, it appears to prefer to feed on forbs over grasses. Because of this preference for weedy forbs, it might be considered a beneficial species despite its abundance.

Notes: Easily confused with other *Melanoplus* species, but its size and the shape of the male cerci distinguish it.

Two-spined spur-throat grasshopper

Melanoplus bispinosus Scudder

Plate 13 (#80), Plate 14 (#81, #82); Map 43

Adult appearance: Brown to yellowish brown with lighter markings on dorsal pronotum. Outer hind femur with two dark bars and with whitish along lower edge. Hind tibia blue. Hind wing clear. Most easily distinguished by the male genitalia. Male cerci small and narrow (Plate 14, #82), furculae long, pointed, and divergent (Plate 14, #81).

Body length: Male: 18 to 27 mm, Female: 24 to 30 mm.

Habitat: Fields and grasslands, especially adjacent to wooded areas. Appears largely restricted to sandy soils in Nebraska. Adults appear late in the season and are most common from middle and late August to October.

Seasonality: Nymphs in spring and early summer.

Nebraska distribution: Recorded from nine counties in central Nebraska.

Diet: Unrecorded, presumably a forb feeder.

Economic importance: None.

Notes: First recorded in Nebraska in 2005, it is now known from nine counties and occurs north to within 150 km of South Dakota. It might be confused with *Melanoplus confusus* or *M. occidentalis* but males can be easily distinguished by the shapes of the cerci and supraanal plate.

Two-striped grasshopper

Melanoplus bivittatus (Say)

Plate 14 (#83, #84); Map 44

Adult appearance: Dark green with lighter greenish to yellow occurring as two stripes on the dorsal pronotum and tegmina. Hind tibia bluish in Nebraska populations.

Cercus distinct with shape resembling a boot with a spur on the back (Plate 14, #84).

Hind wing clear.

Body length: Male: 24 to 35 mm, Female: 32 to 43 mm.

Habitat: Weedy areas such as roadsides, field edges, and weedy pastures.

Seasonality: Nymphs in spring. Adults most common from early July to September.

Nebraska distribution: Occurs statewide.

Diet: Feeds on a wide variety of plants. Appears to prefer legumes, composites, mustards, flixweed (*Descurainia sophia*), pepperweed (*Lepidium virginicum*), western ragweed (*Ambrosia psilostachya*), kochia (*Kochia scoparia*), and leadplant (*Amorpha canescens*).

Economic importance: Can be a major pest of crops. Known to damage small grains, alfalfa, and corn.

Notes: This is one of the two largest *Melanoplus* species in Nebraska. It is capable of causing damage to crops and unlike many other grasshopper species, it is quick to bite if handled.

Northern grasshopper

(*Melanoplus borealis* (Fieber))

Plate 14 (#85, #86); Map 45

Adult appearance: Generally brownish with green and black. Outer hind femur unmarked orange to reddish. Lateral pronotum largely greenish with prominent blackish postocular bar. Hind tibia reddish to pallid. Hind wing clear. Wings nearly always shorter than abdomen in Nebraska populations. Cerci bluntly rounded and much of male genital region darkened to nearly blackish (Plate 14, #86).

Body length: Male: 18 to 22 mm, Female: 20 to 28 mm.

Habitat: Occurs in moist mountain meadows, bogs, and tundra in much of range. In Nebraska it appears limited to cool, spring fed wetlands.

Seasonality: Nymphs in spring. Adults most common from late June to mid-August.

Nebraska distribution: Thus far, only known from three populations in low meadow habitats in the Sandhills. Likely occurs elsewhere in the Loup River drainage.

Diet: Feeds mostly on forbs but will consume some grasses. Known to consume lupine (*Lupinus* spp.), loco (*Oxytropis* spp.), dandelion (*Taraxacum* spp.), thistle (*Cirsium* spp.), red clover (*Trifolium pratense*), western ragweed (*Ambrosia psilostachya*), goldenrod (*Solidago* spp.), leadplant (*Amorpha canescens*), and cinquefoil (*Potentilla* spp.).

Economic importance: None in Nebraska.

Notes: Appears to be very rare and localized in Nebraska. Of the specimens pictured in the plates, the top specimen was collected in Nebraska, the other two in Ontario, Canada.

Sagebrush grasshopper

Melanoplus bowditchi Scudder

Plate 15 (#87, #88, #89, #90, #91); Map 46

Adult appearance: Largely yellowish brown with white and black. Blackish postocular bars on lateral pronotum usually well developed. Outer hind femur orange-brown dorsally, whitish ventrally (Plate 15, #91). Some blue may be present on outer hind femur. Inner hind femur orange (Plate 15, #90). Hind tibia blue. Cerci long and narrow, furculae large and well developed (Plate 15, #89). Similar to *Melanoplus flavidus* but differs in the following characters: tips of male furculae rounded (squared in *M. flavidus*) and inner hind femur orange (yellow to orange-yellow in *M. flavidus*). Hind wing clear.

Body length: Male: 18 to 27 mm, Female: 21 to 30 mm.

Habitat: Shortgrass and mixed-grass prairie with abundant sagebrush. Seldom found far from preferred host plants.

Seasonality: Nymphs in spring. Adults most common from mid-July to September.

Nebraska distribution: Appears limited to the western third of Nebraska. The known eastern limits of its Nebraska distribution are Cherry, Hitchcock, and Keith Counties.

Diet: Feeds almost exclusively on several species of sagebrush. Species consumed include silver sagebrush (*Artemisia cana*), and sand sagebrush (*A. filifolia*). Also known to consume big sagebrush (*Artemisia tridentata*), fringed sagebrush (*A. frigida*), tarragon (*A. dracuncululus*), and cudweed sagewort (*A. ludoviciana*) in smaller amounts.

Economic importance: As it feeds almost exclusively on sagebrush, it is unlikely to damage rangeland.

Notes: Populations in Sioux and Scottsbluff Counties are colored differently from those elsewhere in Nebraska. Adults can be difficult to capture as they tend to hide deep in sagebrush shrubs when alarmed, often moving to the opposite side of a branch when approached.

Bruner's spur-throat grasshopper

Melanoplus bruneri Scudder

Plate 16 (#92, #93, #94, #95); Map 47

Adult appearance: Generally brown to dark brown with markings poorly developed. Hind tibia red, rarely pale greenish. Hind wing clear. Male cerci similar to those of *Melanoplus sanguinipes* (Plate 16, #93). Furculae longer than in *M. sanguinipes*, usually reaching at least halfway to end of supraanal plate and running parallel with each other (Plate 15, #94). Dorsal tip of subgenital plate lacking notch (Plate 15, #95).

Body length: Male: 18 to 23 mm, Female: 22 to 27 mm.

Habitat: Moist mountain meadows and tundra in other parts of range. Has been collected by senior author in moist area along Cache le Poudre River in Colorado. Nebraska habitat unknown.

Seasonality: Nymphs in spring. Adults most common in July and August.

Nebraska distribution: Known from only a single record. The species was first described from specimens collected in Sheridan County, Nebraska (Scudder 1897), but it has not been collected in the state since.

Diet: Feeds on a wide variety of plants but appears to prefer forbs. Forbs commonly ingested include lupines (*Lupinus* spp.) and cinquefoils (*Potentilla* spp.).

Economic importance: None in Nebraska.

Notes: Has not been collected in Nebraska in over 100 years. The specimens pictured were collected along Cache le Poudre River in Colorado.

Pasture grasshopper

Melanoplus confusus Scudder

Plate 16 (#96, #97); Map 48

Adult appearance: Generally gray-brown. Lateral pronotum most often with well developed blackish postocular bar. Outer hind femur with diffuse dark bars, pale on lower half. Ventral edge of outer hind femur orange. Hind tibia blue, rarely red. Hind wing clear. Male cercus with semicircular lobe along lower edge (Plate 16, #97).

Body length: Male 17 to 22 mm, Female: 18 to 28 mm.

Habitat: Found in a wide variety of grassland habitats.

Seasonality: Nymphs in early spring. Adults most common from late May to mid-July.

Nebraska distribution: Occurs statewide.

Diet: Known to consume both grasses and forbs but prefers forbs. Preferred food plants include western ragweed (*Ambrosia psilostachya*), spreading wild buckwheat (*Eriogonum effusum*), cudweed sagewort (*Artemisia ludoviciana*), and western sticktight (*Lappula occidentalis*). Preferred grasses include cool-season species such as downy brome (*Bromus tectorum*), Japanese brome (*Bromus japonicus*), and Kentucky bluegrass (*Poa pratensis*). Also consumes substantial amounts of pollen, fungi, and dead arthropods.

Economic importance: Seldom occurs at densities likely to cause damage to rangeland.

Notes: This is the earliest-occurring *Melanoplus* species in Nebraska. Easily confused with *Melanoplus bispinosus* and *M. occidentalis*, but male genitalia are distinct.

Dawson grasshopper

Melanoplus dawsoni (Scudder)

Plate 16 (#98), Plate 17 (#99); Map 49

Adult appearance: Small, generally brown with yellow ventrally. Wings one-half to one-third the length of the abdomen, rarely full-length. Hind tibia red. Male cercus broad at base but distinctly narrowed toward end (Plate 17, #99).

Body length: Male: 13 to 18 mm, Female: 19 to 23 mm.

Habitat: Grasslands and woodland openings. In Nebraska it appears to prefer areas where there is at least some shrub growth.

Seasonality: Nymphs in spring. Adults most abundant from early July to September.

Nebraska distribution: Has been collected from scattered locations throughout the state, but appears to be most consistent in the northern half.

Diet: Feeds primarily on forbs. Known to consume western ragweed (*Ambrosia psilostachya*), leadplant (*Amorpha canescens*), alfalfa (*Medicago sativa*), white clover (*Trifolium repens*), wild rose (*Rosa* spp.), and milkvetches (*Astragalus* spp.). Also will consume Kentucky bluegrass (*Poa pratensis*).

Economic importance: Rarely occurs at densities likely to cause damage.

Notes: Easily confused with *Melanoplus discolor*, which is generally a rare species in Nebraska.

Differential grasshopper

Melanoplus differentialis (Thomas)

Plate 17 (#100, #101); Map 50

Adult appearance: Generally yellow with blackish chevrons on outer hind femur. Hind wing clear. Some populations may contain melanistic (largely blackish) individuals. Male cercus boot-shaped (Plate 17, #101).

Body length: Male: 25 to 33 mm, Female: 28 to 43 mm.

Habitat: Weedy areas such as roadsides, field edges, and abandoned fields. Commonly invades gardens and flowerbeds.

Seasonality: Nymphs in spring. Adults most common from mid-July to September.

Nebraska distribution: Occurs statewide.

Diet: Feeds on a wide variety of grasses and forbs. Known to feed commonly on composites such as giant ragweed (*Ambrosia trifida*), common sunflower (*Helianthus annuus*), and prickly lettuce (*Lactuca serriola*). Known to damage soybean, wheat, corn, and cotton.

Economic importance: While not economically important in rangeland, it is known to cause serious damage to small grains, corn, alfalfa, soybeans, cotton, and various vegetables and fruit trees. It commonly attacks gardens and flowerbeds.

Notes: This species has been known to do serious damage to cornfields in Nebraska.

Contrasting spur-throat grasshopper

Melanoplus discolor (Scudder)

Plate 17 (#102, #103); Map 51

Adult appearance: Generally brown with well developed blackish postocular bars. Yellow ventrally. Hind tibia red to pinkish red. Wings about half the length of the abdomen. Male cercus broad and not narrowed at end (Plate 17, #103).

Body length: Male: 15 to 19 mm, Female: 18 to 25 mm.

Habitat: Mixed-grass prairie.

Seasonality: Nymphs in spring. Adults most common from mid-July to September.

Nebraska distribution: Thus far only known from seven counties in central Nebraska. All of the recent collections have occurred in the Sandhills.

Diet: Poorly known. Appears to be associated with false boneset (*Brickellia eupatorioides*) in Nebraska.

Economic importance: None.

Notes: Appears to be rare and localized in Nebraska. It is easily confused with *Melanoplus dawsoni*.

Huckleberry spur-throat grasshopper

Melanoplus fasciatus (Walker)

Plate 17 (#104), Plate 18 (#105); Map 52

Adult appearance: Dark brown with well developed postocular bars. Outer hind femur with two blackish bands. Hind tibia red. Tegmina solid colored. Wings about half the length of abdomen, rarely full-length. Male cercus long and oval-shaped at tip and with no distinct bend near middle (Plate 18, #105).

Body length: Male: 17 to 25 mm, Female 26 to 33 mm.

Habitat: Wooded hilltops and woodland openings. Usually in association with shrubs in partially shaded areas.

Seasonality: Nymphs in spring. Adults most common from late June to early August.

Nebraska distribution: Only known from two counties along the eastern edge of the state. At Indian Cave State Park it can be found among woodland openings on hilltops.

Diet: Not well known. Thought to feed on huckleberry and blueberry (*Vaccinium* spp.).

Economic importance: None.

Notes: Easily confused with *Melanoplus walshii* but differs in having solid-colored tegmina. As *M. fasciatus* also occurs in the mountains of the western United States, it should be looked for in the Pine Ridge.

Red-legged grasshopper

Melanoplus femurrubrum (DeGeer)

Plate 18 (#106, #107); Map 53

Adult appearance: Generally grayish brown with green and black. Postocular bars well developed. Yellow ventrally. Hind tibia red. Rarely blue and yellow with blue or purple tibia. Male cercus narrowed at end with angled tip (Plate 18, #107).

Body length: Male 17 to 24 mm, Female: 21 to 29 mm.

Habitat: A wide variety of habitats including rangeland, field edges, woodland openings, yards, and gardens.

Seasonality: Nymphs in spring and early summer. Adults most common from late July to October.

Nebraska distribution: Common throughout the state.

Diet: Feeds on a wide variety of forbs as well as some grasses. Known host plants include various legumes, composites, and several grasses. Although it readily damages alfalfa, it cannot survive exclusively on it.

Economic importance: Generally not a pest in rangeland, but can be a serious pest of crops. It may damage small grains, alfalfa, clover, soybeans, and a wide variety of vegetable crops. It can be a frequent pest in gardens.

Notes: This is the grasshopper that is probably the most commonly seen by the average person.

Yellowish spur-throat grasshopper

Melanoplus flavidus Scudder

Plate 18 (#108, #109, #110), Plate 19 (#111); Map 54

Adult appearance: Generally yellowish with postocular bar most often poorly developed. Outer hind femur largely bluish dorsally, whitish over ventral half (Plate 19, #111). Inner hind femur yellow to orange-yellow (Plate 18, #110). Hind tibia blue. Male cercus long and narrow, furculae broad and well developed. Tips of furculae somewhat squared in appearance (Plate 18, #109). Very similar to *Melanoplus bowditchi* but most easily differentiated by habitat, and the male furculae.

Body length: Male: 20 to 27 mm, Female: 24 to 33 mm.

Habitat: Sandy grasslands, especially in areas with sparse vegetation.

Seasonality: Nymphs in spring. Adults most common from mid-July to September.

Nebraska distribution: Occurs statewide in suitable habitats. Especially common in the Sandhills.

Diet: Feeds mostly on forbs but consumes some grasses. Known hosts include Kentucky bluegrass (*Poa pratensis*), western ragweed (*Ambrosia psilostachya*), leadplant (*Amorpha canescens*), cudweed sagewort (*Artemisia ludoviciana*), prairie sunflower (*Helianthus petiolaris*), narrowleaf gromwell (*Lithospermum incisum*), and Missouri goldenrod (*Solidago missouriensis*).

Economic importance: None.

Notes: Easily confused with *Melanoplus bowditchi*. Common in the Sandhills.

Sandbar spur-throat grasshopper

Melanoplus fluviatilis Bruner

Plate 19 (#112, #113, #114, #115); Map 55

Adult appearance: Gray-brown to woody brown with well developed postocular bars.

Dorsal pronotum lacking stripes. Inner hind femur orange to red, often with dark suffusion (Plate 18, #115). Hind tibia red, purple, blue, or pallid. Hind wing clear. Male cercus spatula-shaped. Male genitalia nearly indistinguishable from those of *Melanoplus foedus* and *M. packardii* (Plate 18, #114). Male furculae shorter than in *M. foedus* and less irregular in shape than in *M. packardii* (Plate 18, #114).

Body length: Male: 23 to 31 mm, Female: 27 to 34 mm.

Habitat: Open riverine woodlands and upper parts of river sandbars.

Seasonality: Nymphs in spring. Adults most common from mid-July to September.

Nebraska distribution: Recorded from scattered locations across Nebraska. Most recent collections have been from the Platte and Republican River Valleys.

Diet: Unknown. Likely prefers forbs such as western ragweed (*Ambrosia psilostachya*).

Economic importance: None.

Notes: The taxonomy of the *Melanoplus packardii* group, which includes this form, *M. foedus*, and *M. packardii*, and *M. stonei* (not in Nebraska), is poorly understood. This form has long been called *Melanoplus floedus fluviatilis*, but recent studies suggest that it is more similar to *M. packardii* and may be the most distinct form in the group.

Striped sand grasshopper

Melanoplus foedus (Scudder)

Plate 19 (#116), Plate 20 (#117, #118); Map 56

Adult appearance: Generally orange-brown to light brown. Dorsal pronotum with two distinct pallid stripes. Postocular bars poorly developed. Inner hind femur light orange-brown to pallid (Plate 20, #118). Hind tibia pinkish red, rarely light blue. Hind wing clear. Male cercus spatula-shaped. Male genitalia nearly indistinguishable from those of *Melanoplus fluviatilis* and *M. packardii*. Male furculae longer than in *M. foedus* and less irregular in shape than in *M. packardii* (Plate 20, #117). Also similar to *Melanoplus angustipennis*, but larger.

Body length: Male: 25 to 33 mm, Female: 27 to 34 mm.

Habitat: Sandy grasslands.

Seasonality: Nymphs in spring. Adults most common from mid-July to September.

Nebraska distribution: Occurs across the western two-thirds of the state. Common in the Sandhills.

Diet: Feeds on a wide variety of forbs, grasses, and sedges, but prefers forbs.

Economic importance: Mostly feeds on weedy forbs and seldom occurs at high densities.

Notes: Part of the *Melanoplus packardii* group (see *Melanoplus fluviatilis*).

Gladston grasshopper

Melanoplus gladstoni Scudder

Plate 20 (#119, #120); Map 57

Adult appearance: Generally brown to light brown. Outer hind femur with dark bars present. Hind tibia red. Hind wing clear. Male cercus nearly rectangular with distinct bend near middle (Plate 20, #120).

Body length: Male: 18 to 23 mm, Female: 19 to 26 mm.

Habitat: Grasslands. Appears to prefer gravelly areas.

Seasonality: Nymphs in spring and early summer. Adults most common from early and mid-August to October.

Nebraska distribution: Recorded from the western and northern parts of the state.

Diet: Feeds on a wide variety of forbs, grasses, and sedges, but prefers forbs.

Economic importance: None.

Notes: Appears to be relatively uncommon in Nebraska but it may be overlooked due to its late-season occurrence.

Graceful spur-throat grasshopper

Melanoplus gracilis (Bruner)

Plate 20 (#121); Map 58

Adult appearance: Generally brown and green with well developed postocular bars. Ventral areas largely green. Hind tibia green. Wings about one-quarter the length of the abdomen. Male cercus long and narrow.

Body length: Male: 14 to 18 mm, Female: 17 to 23 mm.

Habitat: Poorly known. Likely woodland openings.

Seasonality: Nymphs in spring. Adults in July and August.

Nebraska distribution: Occurs especially among huckleberry (*Vaccinium* sp.) in woodland areas near the Missouri River along the eastern edge of the state.

Diet: Unknown. Often associated with iron weed (*Veronia* spp.) and blackberry (*Rubus* spp.).

Economic importance: None.

Notes: Should be looked for in the easternmost parts of the state. A similar species which might also occur there is *Melanoplus viridipes* Scudder as Bruner (1897) mentioned that it occurs near the Missouri River.

Melanoplus huroni Blatchley

Plate 20 (#122); Map 59

Adult appearance: Brown to dark brown with well to moderately developed postocular bars. Outer hind femur with two dark patches. Hind tibia red. Wings about half the length of the abdomen.

Body length: Male: 14 to 19 mm, Female: 17 to 23 mm.

Habitat: Poorly known. Occurs in mountain meadows in the western states.

Seasonality: Nymphs in spring. Adults from July to September.

Nebraska distribution: Known from a single record in Sioux County (no year recorded).

Diet: Poorly known, likely a forb feeder.

Economic importance: None.

Notes: Should be watched for in the Pine Ridge.

Little spur-throat grasshopper

Melanoplus infantilis (Scudder)

Plate 20 (#123, #124); Map 60

Adult appearance: Generally gray to light gray with postocular bars variably developed. Outer hind femur with two dark patches. Hind tibia light blue. Hind wing clear. Male cercus distinct; branched with posterior arm distinctly longer than the other (Plate 20, #124).

Body length: Male: 14 to 19 mm, Female: 16 to 23 mm.

Habitat: Shortgrass prairie.

Seasonality: Nymphs in spring. Adults most common from mid-July to September.

Nebraska distribution: Occurs across the panhandle and other areas in the western third of Nebraska.

Diet: Feeds on forbs and grasses. Diet based largely on plants available within habitat. Recorded forbs consumed include include scarlet globemallow (*Sphaeralcea coccinea*), woolly plantain (*Plantago patagonica*), broom snakeweed (*Gutierrezia sarothrae*), fringed sagewort (*Artemisia frigida*), Fendler sandwort (*Arenaria fendleri*), dandelion (*Taraxacum* spp.), and milkvetches (*Astragalus* spp.). Grasses consumed include blue grama (*Bouteloua gracilis*), western wheatgrass (*Pascopyrum smithii*), needleandthread (*Stipa comata*), sand dropseed (*Sporobolus cryptandrus*), Idaho fescue (*Festuca idahoensis*), Parry oatgrass (*Danthonia parryi*), and bluegrasses (*Poa* spp.).

Economic importance: It has been known to damage shortgrass rangeland in some parts of its range.

Notes: The smallest *Melanoplus* species likely to be found in rangeland in western Nebraska.

Keeler grasshopper

Melanoplus keeleri (Thomas)

Plate 21 (#125, #126); Map 61

Adult appearance: A mix of light and dark brown with black. Postocular bars variable but usually poorly developed. Outer hind femur whitish along ventral third, largely blackish over dorsal half. Hind tibia red. Hind wing clear. Male cercus branched with anterior arm slightly longer and thicker than the other (Plate 21, #126).

Body length: Male: 16 to 25 mm, Female: 21 to 30 mm.

Habitat: Grasslands. Occurs in a wide variety of grassland habitats.

Seasonality: Nymphs in spring and early summer. Adults most common from late July and early August to October.

Nebraska distribution: Occurs statewide but seldom common.

Diet: Feeds on a wide variety of forbs. Known host plants include western ragweed (*Ambrosia psilostachya*), cudweed sagewort (*Artemisia ludoviciana*), Missouri goldenrod (*Solidago missouriensis*), breadroot scurfpea (*Psoralea esculenta*), aromatic aster (*Aster oblongifolius*), common sunflower (*Helianthus annuus*), prickly lettuce (*Lactuca serriola*), green sagewort (*Artemisia glauca*), scarlet globemallow (*Sphaeralcea coccinea*), lespedeza (*Lespedeza* spp.), sweetclover (*Melilotus* spp.), and leadplant (*Amorpha canescens*).

Economic importance: Unlikely to be a pest in rangeland. Feeds heavily on legumes but does not appear to be a pest in crops. May also feed on trees such as apple and plum.

Notes: While this grasshopper occurs in a wide variety of grassland habitats, it is seldom numerous.

Lakin grasshopper

Melanoplus lakinus (Scudder)

Plate 21 (#127, #128); Map 62

Adult appearance: Generally greenish brown to nearly dark green. Outer hind femur with diffuse dark bands. Hind tibia blue. Wings usually about one-third the length of the abdomen but adults with full-length wings occur occasionally. Male cercus broad at base and strongly narrowed in distal third (Plate 21, #128).

Body length: Male: 15 to 23 mm, Female: 18 to 28 mm.

Habitat: Occurs in weedy rangeland as well as roadside areas.

Seasonality: Nymphs in spring. Adults most common from late July to September.

Nebraska distribution: Has been recorded from across the western two-thirds on the state.

Diet: Feeds mostly on plants in the family Chenopodiaceae. Preferred species include kochia (*Kochia scoparia*), Russianthistle (*Salsola iberica*) and lambsquarters (*Chenopodium* spp.). It will also feed on some grasses.

Economic importance: May be considered beneficial as it feeds on weedy forbs.

Notes: May be numerous where found.

Flabellate grasshopper

Melanoplus occidentalis (Thomas)

Plate 21 (#129, #130); Map 63

Adult appearance: Generally light gray to gray-brown. Postocular bars usually only poorly developed. Outer hind femur with two dark patched and pale chevrons visible. Orange along ventral edge of outer hind femur. Hind tibia light blue. Hind wing clear. Male cercus very large and broad throughout (Plate 21, #130).

Body length: Male: 18 to 25 mm, Female: 20 to 27 mm.

Habitat: Shortgrass prairie.

Seasonality: Nymphs in spring. Adults most common from late June to early September.

Nebraska distribution: Has been found in all of the panhandle counties as well as in the southwestern parts of the state.

Diet: Feeds on grasses and forbs but prefers forbs. Also consumes substantial amounts of mosses, roots, seeds, and dead or dying insects. Preferred hosts include scarlet globemallow (*Sphaeralcea coccinea*), wild buckwheat (*Eriogonum* spp.), milkvetches (*Astragalus* spp.), blue grama (*Bouteloua gracilis*), needleandthread (*Stipa comata*), western wheatgrass (*Pascopyrum smithii*), bluegrasses (*Poa* spp.), and needleleaf sedge (*Carex duriuscula*).

Economic importance: It may consume important forage grasses, but it is seldom numerous, and thus, unlikely to damage rangeland.

Notes: Easily confused with *Melanoplus bispinosus* and *M. confusus* but male genitalia are distinct.

Packard grasshopper

Melanoplus packardii Scudder

Plate 22 (#131, #132, #133); Map 64

Adult appearance: Generally yellow-brown and dark olive. Dorsal pronotum with two distinct pallid stripes. Postocular bars moderately developed. Inner hind femur yellowish to olive-yellow, most often with dark suffusion or bars present (Plate 22, #133). Hind tibia blue, rarely purple or red. Hind wing clear. Male cercus spatula-shaped. Male genitalia nearly indistinguishable from those of *Melanoplus fluviatilis* and *M. foedus*. Male furculae more irregular in shape than in than in *Melanoplus fluviatilis* or *M. foedus* (Plate 22, #132).

Body length: Male: 24 to 31 mm, Female: 26 to 37 mm.

Habitat: Grasslands and occasionally weedy roadsides. Prefers heavier soils than *M. fluviatilis* or *M. foedus*.

Seasonality: Nymphs in spring. Adults most common from mid-July to September.

Nebraska distribution: Recorded from across most of the state but appears to be most consistent in the west. Population in Pawnee County in tallgrass prairie.

Diet: Feeds on grasses and forbs but preferential to forbs. Known host plants include scurfpeas, (*Psoralea tenuiflora* and *P. esculenta*), Missouri milkvetch (*Astragalus missouriensis*), woolly loco (*Astragalus mollissimus*), peavine (*Lathyrus polymorphus*), sweetclover (*Melilotus* spp.), prickly lettuce (*Lactuca serriola*), western ragweed (*Ambrosia psilostachya*), sunflower (*Helianthus* spp.), blue grama (*Bouteloua gracilis*), sand dropseed (*Sporobolus cryptandrus*), needleandthread (*Stipa comata*), and smooth brome (*Bromus inermis*).

Economic importance: It seldom occurs at high densities and is unlikely to damage rangeland. It has occasionally caused damage to cotton, vegetables, and small grains elsewhere in its range.

Notes: Part of the *Melanoplus packardii* group (see *Melanoplus fluviatilis*).

Grizzly spur-throat grasshopper

Melanoplus punctulatus Scudder

Plate 22 (#134); Map 65

Adult appearance: Gray-brown mottled with blackish. Often yellowish ventrally. Outer hind femur with three blackish bands. Hind tibia usually red, less often gray. Male cercus broadened at end. General coloration different from other *Melanoplus* species but offers camouflage in its preferred woodland habitats.

Body length: Male: 18 to 24 mm, Female: 22 to 29 mm.

Habitat: Forest.

Seasonality: Nymphs in spring. Adults from July to October.

Nebraska distribution: Only known from two sites in wooded areas in southeastern Nebraska, near the Missouri River.

Diet: Unknown. Most often associated with pines (*Pinus* spp.), tamarack (*Larix* spp.), beech (*Fagus* spp.), and oak (*Quercus* spp.).

Economic importance: None.

Notes: Usually inactive during the day and most often found resting on tree trunks, where they are difficult to detect. Generally rare where found.

Migratory grasshopper

Melanoplus sanguinipes (Fabricius)

Plate 22 (#135, #136), Plate 23 (#137, #138); Map 66

Adult appearance: Generally light brown to brown with markings poorly developed. Tegmina occasionally with dark speckles, resembling those of the now extinct *Melanoplus spretus*. Outer hind femur with light chevrons most often visible. Hind pale greenish to bluish or red. Red tibia more common in eastern parts of Nebraska. Hind wing clear. Male cerci similar to those of *Melanoplus bruneri*. Furculae shorter than in *M. bruneri*, not reaching halfway to end of supraanal plate and largely divergent (Plate 23, #137). Dorsal tip of subgenital plate with distinct notch (Plate 23, #138).

Body length: Male: 18 to 26 mm, Female: 20 to 29 mm.

Habitat: Occurs in a wide variety of habitats. May be found in grasslands, woodland openings, and along roadsides.

Seasonality: Nymphs in spring. Adults most common from early July to September.

Nebraska distribution: Occurs statewide.

Diet: Feeds on a wide variety of forbs and grasses. Preferred hosts include dandelion

(*Taraxacum* spp.), tumble mustard (*Sisymbrium altissimum*), wild mustard (*Brassica* spp.), pepperweed (*Lepidium* spp.), western ragweed (*Ambrosia psilostachya*), downy brome (*Bromus tectorum*), Kentucky bluegrass (*Poa pratensis*), barley (*Hordeum vulgare*), and wheat (*Triticum aestivum*). Also feeds on grasses such as blue grama (*Bouteloua gracilis*), western wheatgrass (*Pascopyrum smithii*), bluegrasses (*Poa* spp.), and sand dropseed (*Sporobolus cryptandrus*).

Economic importance: Can be a serious pest of both rangeland and crops.

Notes: A common species in a wide variety of habitats.

Scudder's spur-throat grasshopper

Melanoplus scudderi (Uhler)

Plate 23 (#139, #140); Map 67

Adult appearance: Generally rich brown. Postocular bar moderately to well developed. Hind tibia pink to red. Wings about one third the length of abdomen. Male cercus nearly triangular in shape and rounded at end (Plate 23, #140).

Body length: Male: 15 to 20 mm, Female: 20 to 26 mm.

Habitat: Woodland edges and gravelly hillsides.

Seasonality: Nymphs in spring and early summer. Adults most common from early August to October.

Nebraska distribution: Known from seven counties, all in the eastern quarter of the state.

Diet: Unknown. Appears to be associated with legumes in some cases.

Economic importance: None.

Notes: Generally rare in Nebraska but it can be common in limited areas.

Rocky Mountain grasshopper

Melanoplus spretus (Walsh)

Plate 23 (#141); No map.

Adult appearance: Very similar to *Melanoplus sanguinipes*. Generally light brown. Postocular bars poorly developed. Tegmina with dark speckles present. Hind tibia reddish to pallid. Hind wing clear.

Body length: Male: 19 to 29 mm, Female: 22 to 34 mm.

Habitat: Bred in river floodplains. Ranged into a wide variety of habitats when swarming.

Seasonality: Nymphs in spring. Adults in summer.

Nebraska distribution: Currently extinct. Once occurred throughout the state during times of high numbers.

Diet: Likely fed on a wide variety of plants.

Economic importance: Highly destructive to cropland.

Notes: During the 1800s this species ravaged cropland in the Great Plains in enormous swarms. The last known collection of this species in North America was in 1902 and it is believed to be extinct.

Melanoplus walshii Scudder

Plate 23 (#142), Plate 24 (#143); Map 68

Adult appearance: Dark brown with well developed postocular bars. Outer hind femur with two blackish bands. Hind tibia red. Tegmina with light colored area dorsally. Wings about half the length of abdomen, rarely full-length. Male cercus long and oval-shaped at tip and with distinct bend near middle (Plate 24, #143).

Body length: Male: 21 to 28 mm, Female: 24 to 33 mm.

Habitat: Oak woodlands. Especially among sparse undergrowth and along slopes.

Seasonality: Nymphs in spring. Adults most common from mid-July to September.

Nebraska distribution: Only known from two counties near the Missouri River.

Diet: Unknown.

Economic importance: None.

Notes: This interesting species is not uncommon at Indian Cave State Park.

Two-striped slant-faced grasshopper

Mermiria bivittata (Serville)

Plate 24 (#144); Map 69

Adult appearance: One of several “toothpick” grasshoppers in Nebraska. Relatively large, long and narrow. Light brown to nearly light green with darker brown tegmina and dark brown stripe on lateral head and pronotum. Whitish stripe present on lower part of tegmen. Hind tibia light brown. Hind wing clear. Antennae ensiform.

Body length: Male: 22 to 36 mm, Female: 33 to 47 mm.

Habitat: Grasslands.

Seasonality: Nymphs in spring. Adults most common from mid-July to early September.

Nebraska distribution: Occurs statewide in suitable habitats.

Diet: Feeds on grasses and sedges such as prairie sandreed (*Calamovilfa longifolia*), western wheatgrass (*Pascopyrum smithii*), big bluestem (*Andropogon gerardii*), silver beardgrass (*Bothriochloa saccharoides*), prairie dropseed (*Sporobolus heterolepis*), little bluestem (*Schizachyrium scoparium*), sand bluestem (*Andropogon hallii*), blue grama (*Bouteloua gracilis*), hairy grama (*Bouteloua hirsuta*), downy brome (*Bromus tectorum*), smooth brome (*Bromus inermis*), sand dropseed (*Sporobolus cryptandrus*), and needleandthread (*Stipa comata*).

Economic importance: May be potentially damaging to rangeland but seldom reaches high densities.

Notes: A common large, slantfaced grasshopper across much of Nebraska.

Lively Mermiria grasshopper

Mermiria picta (Walker)

Plate 24 (#145); Map 70

Adult appearance: One of several “toothpick” grasshoppers in Nebraska. Relatively large, long and narrow. Highly variable ranging from brown to green and pink. Dark stripe on lateral head and pronotum. No whitish stripe present on lower part of tegmen. Hind tibia reddish brown or green. Hind wing clear. Antennae ensiform.

Body length: Male: 26 to 41 mm, Female: 39 to 53 mm.

Habitat: Grasslands, especially hilltops. Poorly known in Nebraska.

Seasonality: Nymphs in spring. Adults from July to September.

Nebraska distribution: Currently known from only three specimens. Two in the University of Nebraska State Museum were collected in Cheyenne County and a single specimen was collected in Frontier County in 2007. A single specimen was also collected in Fremont County, Iowa in 2005, less than 15 km from the Nebraska border.

Diet: Poorly known, likely grasses and sedges.

Economic importance: None.

Notes: Despite its broad distribution across the United States, it is seldom common and appears to be rare in Nebraska.

Platt range grasshopper

Mestobregma plattei (Thomas)

Plate 24 (#146, #147); Map 71

Adult appearance: Gray to gray-brown with dark marking on side of pronotum. Hind tibia light blue. Hind wing yellow or red with dark band (Plate 23, #147). Tegmen with two dark bands, largely merging over lower half of tegmen.

Body length: Male: 19 to 32 mm, Female: 26 to 39 mm.

Habitat: Rocky areas in shortgrass prairie, especially along the top edges of eroded hills.

Seasonality: Nymphs in spring. Adults most common from mid-July to September.

Nebraska distribution: Has been collected from all of the panhandle counties.

Diet: Unknown.

Economic importance: None.

Notes: Easily confused with *Derotmema haydeni*, but larger.

Blue-legged grasshopper

Metator pardalinus (Saussure)

Plate 24 (#148), Plate 25 (#149); Map 72

Adult appearance: Gray-brown with darker spots. Abdomen yellow ventrally. Inner hind femur and hind tibia blue. Hind wing yellow, orange, or red with black band (Plate 25, #149). Tegmen with light colored streak dorsally.

Body length: Male: 24 to 37 mm, Female: 30 to 44 mm.

Habitat: Shortgrass and mixed-grass prairie.

Seasonality: Nymphs in spring. Adults most common from early July to September.

Nebraska distribution: Has been collected from all of the panhandle counties as well as two other counties in the central part of the state. Populations appear to be widely scattered but it may be relatively common where found.

Diet: Feeds on grasses and sedges such as western wheatgrass (*Pascopyrum smithii*), bluebunch wheatgrass (*Pseudoroegneria spicata*), needleandthread (*Stipa comata*), green needlegrass (*Stipa viridula*), sand dropseed (*Sporobolus cryptandrus*), prairie junegrass (*Koeleria cristata*), and blue grama (*Bouteloua gracilis*).

Economic importance: None.

Notes: Appears to be a rather localized species in Nebraska.

Obscure grasshopper

Opeia obscura (Thomas)

Plate 25 (#150, #151); Map 73

Adult appearance: Variable in appearance. Males brown and tan. Females brown and tan, green and tan, or combinations thereof. Hind tibia brown to light brown. Hind wing clear. Antennae ensiform.

Body length: Male: 12 to 18 mm, Female: 18 to 24 mm.

Habitat: Grasslands. Prefers areas of short grasses.

Seasonality: Nymphs in spring. Adults most common from late July to September.

Nebraska distribution:

Diet: Feeds on several grass and sedge species including needleandthread (*Stipa comata*), buffalograss (*Buchloe dactyloides*), sand dropseed (*Sporobolus cryptandrus*), little bluestem (*Schizachyrium scoparium*), western wheatgrass (*Pascopyrum smithii*), threadleaf sedge (*Carex filifolia*), and needleleaf sedge (*Carex duriuscula*). Preferential to blue grama.

Economic importance: While a small species, it can occur at moderate to high densities in local areas, and thus, can be potentially dangerous to rangeland.

Notes: Common in areas of short grass and in overgrazed pastures. Easily confused with *Eritettix simplex* but easily distinguished by ensiform antennae.

Marsh slant-faced grasshopper

Orphulella pelidna (Burmeister)

Plate 25 (#152, #153); Map 74

Adult appearance: Largely brown or rarely greenish. Hind tibia light brown. Hind wing clear. Wings always extend beyond end of hind femur. Lateral carinae of pronotum cut by two or three sulci (Plate 25, #153).

Body length: Male: 15 to 21 mm, Female: 19 to 25 mm.

Habitat: Low moist areas such as marshes and swales.

Seasonality: Nymphs in spring. Adults most common from late July to October.

Nebraska distribution: Occurs throughout Nebraska in suitable habitat. Especially common in saltmarshes in the vicinity of Lincoln.

Diet: Poorly known, likely grasses and sedges.

Economic importance: None.

Notes: Easily confused with *Orphulella speciosa* but occurs in wetter habitats.

Slant-faced pasture grasshopper

Orphulella speciosa (Scudder)

Plate 25 (#154), Plate 26 (#155, #156); Map 75

Adult appearance: Largely brown or greenish. Hind tibia light brown to green. Hind wing clear. Wings rarely extend beyond end of hind femur. Lateral carinae of pronotum cut by one sulcus (Plate 26, #156).

Body length: Male: 13 to 19 mm, Female: 17 to 23 mm.

Habitat: Tallgrass and mixed-grass prairie.

Seasonality: Nymphs in spring. Adults most common from late July to October.

Nebraska distribution: Occurs statewide but less commonly in the panhandle.

Diet: Feeds on a wide variety of grasses.

Economic importance: Can be quite numerous in rangeland but has not been known to be damaging.

Notes: Easily confused with *Orphulella pelidna* but prefers drier habitats.

Paratylotropidia brunneri Scudder

Plate 26 (#157); Map 76

Adult appearance: Purple-brown with yellow on abdomen and as two stripes on the dorsal pronotum. Hind tibia purplish. Wings about one-third to one-half the length of the abdomen, but occasionally full length. Of the three Nebraska specimens, one has wings as long as the abdomen.

Body length: Male: 25 to 31 mm, Female: 27 to 35 mm.

Habitat: Woodlands, including openings and edges, especially among oaks.

Seasonality: Nymphs in spring. Adults from July to September.

Nebraska distribution: Known from Nebraska from only three specimens. One was collected in Pawnee County in 2005 and two were collected in Richardson County in 2006.

Diet: Unknown.

Economic importance: None.

Notes: Appears to be a rather clumsy species, most often found low among woody vegetation. The two Richardson County specimens were collected from small elm trees (less than 4 m in height) near an oak woodland. Its life history is poorly known and it is not known to be common anywhere in its range.

Coral-winged grasshopper

Pardalophora apiculata (Harris)

Plate 26 (#158, #159, #160), Plate 27 (#161); Map 77

Adult appearance: Gray-brown with limited spotting on tegmina. Spots on tegmina mostly limited to basal region. Inner hind femur orange with blackish areas (Plate 27, #161). Hind tibia orange to pallid. Dorsal pronotum with only a few small pustules (Plate 27, #160). Hind wing pink with black band (Plate 27, #159).

Body length: Male: 26 to 35 mm, Female: 37 to 47 mm.

Habitat: Grasslands.

Seasonality: Nymphs from midsummer to early spring. Adults most common from March or April to early June.

Nebraska distribution: Occurs statewide.

Diet: Unknown. Likely a grass and sedge feeder.

Economic importance: None.

Notes: Adults of this species occur from early in the spring to late spring. During years with unusually warm springs, adults may be seen on the wing as early as mid-March.

Haldeman's grasshopper

Pardalophora haldemani (Scudder)

Plate 27 (#162, #163, #164, #165); Map 78

Adult appearance: Light brown to gray-brown with extensive darker spotting. Inner hind femur orange to light olive (Plate 27, #165). Hind tibia orange to rarely red. Dorsal pronotum with heavily sculpted appearance. (Plate 27, #164). Median carina of pronotum cut by two sulci. Hind wing yellow or pinkish red with black band (Plate 27, #163).

Body length: Male: 25 to 33 mm, Female: 36 to 45 mm.

Habitat: Grasslands. Most common on heavy soils.

Seasonality: Nymphs from late summer to mid-spring. Adults most common from early and mid-May to early July.

Nebraska distribution: Occurs statewide but appears to be most numerous in the Central Nebraska Loess Plains ecoregion.

Diet: Prefers grasses and sedges. Known to feed on Kentucky bluegrass (*Poa pratensis*), Canada bluegrass (*Poa compressa*), and meadow salsify (*Tragopogon pratensis*).

Economic importance: Not a threat to rangeland in most cases, however, this species caused extensive damage to rangeland in parts of Buffalo, Custer, and Dawson Counties in 2003 and 2004.

Notes: This species can be quite numerous at the bottoms of gulleys in the Central Nebraska Loess Plains.

Wyoming toothpick grasshopper

Paropomala wyomingensis (Thomas)

Plate 27 (#166); Map 79

Adult appearance: One of several “toothpick” grasshoppers in Nebraska. Very slender with the front two pairs of legs reduced. Males are light brown while females may be light brown or light green. Wings about two-thirds the length of the abdomen. Hind wing clear. Male subgenital plate long and pointed.

Body length: Male: 22 to 27 mm, Female: 26 to 36 mm.

Habitat: Shortgrass and mixed-grass areas in rangeland and along roadsides. Can be especially common among little bluestem in sandy areas.

Seasonality: Nymphs in spring. Adults most common from mid-July to September.

Nebraska distribution: Occurs across the western two-thirds of the state.

Diet: Feeds on grasses particularly western wheatgrass (*Pascopyrum smithii*), bluegrasses (*Poa* spp.), needleandthread (*Stipa comata*), blue grama (*Bouteloua gracilis*), sand dropseed (*Sporobolus cryptandrus*), threeawn (*Aristida* spp.), sun sedge (*Carex inops*), Indian ricegrass (*Oryzopsis hymenoides*), big bluestem (*Andropogon gerardii*), and little bluestem (*Schizachyrium scoparium*). Also been reported to feed on milkvetches (*Astragalus* spp.).

Economic importance: None.

Notes: This unique species is often reluctant to jump and will most often freeze if approached.

Four-spotted grasshopper

Philibostroma quadrimaculatum (Thomas)

Plate 28 (#167); Map 80

Adult appearance: Grayish or greenish with bold markings. Tegmina with four large dark spots. Outer hind femur with two to three dark bars. Hind tibia reddish orange. Hind wing clear.

Body length: Male: 14 to 20 mm, Female: 19 to 27 mm.

Habitat: Shortgrass and mixed-grass prairie. Often common in overgrazed areas.

Seasonality: Nymphs in spring and early summer. Adults most common from late July to mid-September.

Nebraska distribution: Occurs across the western two-thirds of the state.

Diet: Feeds on grasses and some sedges. Known hosts include buffalograss (*Buchloe dactyloides*), needleandthread (*Stipa comata*), western wheatgrass (*Pascopyrum smithii*), sand dropseed (*Sporobolus cryptandrus*), sideoats grama (*Bouteloua curtipendula*), prairie sandreed (*Calamovilfa longifolia*), blue grama (*Bouteloua gracilis*), burgrass (*Scleropogon brevifolius*), needleleaf sedge (*Carex eleocharis*), and threadleaf sedge (*Carex filifolia*). It rarely consumes forbs such as prairie onion (*Allium textile*), fringed sagebrush (*Artemisia frigida*), spreading fleabane (*Erigeron divergens*), and scarlet globemallow (*Sphaeralcea coccinea*).

Economic importance: It can cause minor damage to rangeland but seldom reaches high densities.

Notes: Normally only moderately common. Large numbers of this grasshopper may be indicative of overgrazed land.

Large-headed grasshopper

Phoetaliotes nebrascensis (Thomas)

Plate 28 (#168, #169); Map 81

Adult appearance: Generally yellowish brown to greenish brown. Postocular bars moderately developed. Hind tibia blue. Hind wing clear. Wings about one-third the

length of the abdomen but individuals with wings extending beyond abdomen are not uncommon (Plate 28, #169).

Body length: Male: 18 to 24 mm, Female: 23 to 32 mm.

Habitat: Occurs in a wide variety of grassland habitats.

Seasonality: Nymphs in spring and early summer. Adults most common from late July to October.

Nebraska distribution: Occurs statewide.

Diet: Diet is unusual for a melanopline as it feeds mostly on grasses. Preferred hosts include little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardii*), Kentucky bluegrass (*Poa pratensis*), downy brome (*Bromus tectorum*), Scribner panicum (*Dichanthelium oligosanthes*), barnyardgrass (*Echinochloa crusgalli*), witchgrass (*Panicum capillare*), junegrass (*Koeleria* spp.), foxtail barley (*Hordeum jubatum*), bristlegass (*Setaria* spp.), and smooth brome (*Bromus inermis*). Can become excessively numerous in smooth brome.

Economic importance: May cause some damage to rangeland. Can also be extremely numerous along roadsides.

Notes: Unusual among the melanoplins in feeding mostly on grasses. Recent mitochondrial DNA analyses suggest that this grasshopper should be placed in the genus *Melanoplus*.

Short-winged toothpick grasshopper

Pseudopomala brachyptera (Scudder)

Plate 28 (#170); Map 82

Adult appearance: One of several “toothpick” grasshoppers in Nebraska. Male is reddish brown with wings about half the length of the abdomen and hind tibia reddish brown. Female is gray-brown to light gray with wings about one-third the length of the abdomen and hind tibia light brown. Male subgenital plate long and pointed. Antennae ensiform.

Body length: Male: 24 to 35 mm, Female: 28 to 43 mm.

Habitat: Occurs in a variety of areas but appears to prefer areas with tall grasses, often near streams or adjacent to woodlands.

Seasonality: Nymphs in spring. Adults most common from middle and late June to late August.

Nebraska distribution: Recorded from scattered locations across Nebraska.

Diet: Feeds on grasses and sedges. Recorded hosts include quackgrass (*Agropyron repens*), little bluestem (*Schizachyrium scoparium*), blue grama (*Bouteloua gracilis*), foxtail barley (*Hordeum jubatum*), switchgrass (*Panicum virgatum*), prairie cordgrass (*Spartina pectinata*), Kentucky bluegrass (*Poa pratensis*), upright sedge (*Carex stricta*), Canada bluegrass (*Poa compressa*), creeping bentgrass (*Agrostis alba*), and tall dropseed (*Sporobolus asper*).

Economic importance: None.

Notes: Seldom abundant, even in preferred habitats.

Long-horned band-winged grasshopper

Psinidia fenestralis (Serville)

Plate 28 (#171, #172); Map 83

Adult appearance: Gray brown with hind tibia light brown to light blue. Hind wing red

with blackish band (Plate 28, #172). Antennae ensiform.

Body length: Male: 18 to 23 mm, Female: 22 to 30 mm.

Habitat: Nebraska populations occur on sparsely vegetated sand near the Platte River as well as near Cherry Creek in northeastern Buffalo County. It can be locally abundant.

Seasonality: Nymphs in spring. Adults most common from late July to mid-September.

Nebraska distribution: Thus far only known from three counties in central Nebraska.

Diet: Unknown.

Economic importance: None.

Notes: The recent Nebraska records (2005-2007) extend the known range of this species well into the Great Plains. It has also been recorded from several counties in Kansas. It is abundant at several sites near the Platte River. Bruner (1897) stated that this species was collected in northwestern Nebraska, but this seems unlikely.

Brown-spotted grasshopper

Psoloessa delicatula (Scudder)

Plate 29 (#173); Map 84

Adult appearance: Gray to gray-brown with darker markings. Abdomen of male yellow to orange. Hind tibia orange. Lateral carina of dorsal pronotum with distinct pit in region where cut by sulcus. Lateral foveolae square or triangular in shape.

Body length: Male: 12 to 17 mm, Female: 16 to 23 mm.

Habitat: Shortgrass prairie.

Seasonality: Nymphs from midsummer to early spring. Adults most common from April to mid-June.

Nebraska distribution: Has been recorded from across the western two-thirds of the state but appears to be most common in the panhandle.

Diet: Feed on a variety of grasses and sedges. Known hosts include needleleaf sedge (*Carex eleocharis*), threadleaf sedge (*Carex filifolia*), western wheatgrass (*Pascopyrum smithii*), downy brome (*Bromus tectorum*), and sixweeks fescue (*Vulpia octoflora*).

Economic importance: This grasshopper may cause minor damage to rangeland early in the season.

Notes: Often very common in spring in the higher elevations of the western panhandle of the state.

Texas spotted range grasshopper

Psoloessa texana Scudder

Plate 29 (#174); Map 85

Adult appearance: Gray to gray-brown with darker markings. Abdomen of male salmon-red to yellow. Hind tibia pallid. Lateral carina of dorsal pronotum lacking pit in region where cut by sulcus. Lateral foveolae square or triangular in shape.

Body length: Male: 13 to 18 mm, Female: 17 to 24 mm.

Habitat: Sandy areas with sparse vegetation.

Seasonality: Nymphs from midsummer to early spring. Adults most common from April to mid-June.

Nebraska distribution: Occurs across the western three-quarters of Nebraska in areas of suitable habitat.

Diet: Poorly known. Known to feed readily on germinating seeds. Likely also feeds on grasses and sedges.

Economic importance: Might help preserve blowout areas by consuming germinating seeds.

Notes: This is a common spring species in the Sandhills.

American bird grasshopper

Schistocerca americana (Drury)

Plate 29 (#175); Map 86

Adult appearance: Light brown with darker brown spots. Dark line below eye distinctive. Hind wing dark. Hind tibia brownish.

Body length: Male: 28 to 40 mm, Female: 36 to 54 mm.

Habitat: Occurs in a broad range of habitats.

Seasonality: Migrants may enter Nebraska anytime from May to October. The majority of records for the state indicate late summer and fall appearance.

Nebraska distribution: Recorded from six Nebraska counties. Nebraska specimens represent migrants; this species does not breed as far north as Nebraska.

Diet: Feeds on a wide variety of plants including grasses, forbs, shrubs, and trees.

Economic importance: None in Nebraska. Known to damage crops in the southern United States.

Notes: Closely related to two of the most destructive grasshoppers in the world; *Schistocerca gregaria* of Africa and Asia, and *S. paranensis* of South America.

Spotted bird grasshopper

Schistocerca lineata Scudder

Plate 29 (#176); Map 87

Adult appearance: Light purplish brown with areas of darker purplish. Dark stripe below is distinctive for the genus. Most often a yellowish stripe extends from the top of the head down the termina. Hind tibia black to reddish.

Body length: Male: 27 to 37 mm, Female: 33 to 51 mm.

Habitat: Grasslands, especially tallgrass and mixed-grass prairie.

Seasonality: Nymphs in spring. Adults most common from late July to September.

Nebraska distribution: Occurs largely statewide but appears to become rare in the westernmost counties.

Diet: Feeds on a variety of grasses and forbs but prefers legumes. Known hosts include leadplant (*Amorpha canescens*), wild licorice (*Glycyrrhiza lepidota*), milkvetches (*Astragalus* spp.), and peavine (*Lathyrus* spp.).

Economic importance: May occasionally become numerous enough to damage forage legumes and cultivated trees and shrubs.

Notes: Commonly found among leadplant in the sandhills. As with other members of the genus, adults may fly long distances when alarmed.

Obscure bird grasshopper

Schistocerca obscura (Fabricius)

Plate 29 (#177); Map 88

Adult appearance: Dark purplish brown and green. Dark stripe below is distinctive for the genus. A yellowish to greenish stripe extends from the top of the head down the termina. Hind tibia black to green.

Body length: Male: 29 to 41 mm, Female: 47 to 58 mm.

Habitat: Moist grassy areas and among young trees. Has been found commonly on young elm trees in the vicinity of Lincoln.

Seasonality: Nymphs in spring. Adults most common from late July to September.

Nebraska distribution: Appears to be limited to the southern half of the state and primarily in the eastern half.

Diet: Poorly known. Likely feeds on a variety of forbs, shrubs, and trees. Has been observed feeding on stinging nettle (*Urtica dioica*) near Kearney and appears to be associated with elms (*Ulmus* spp.) in and around Lincoln.

Economic importance: None.

Notes: A large and strikingly colored grasshopper.

Boll's grasshopper

Spharagemon bolli Scudder

Plate 29 (#178), Plate 30 (#179); Map 89

Adult appearance: Dark brown with poorly defined dark patches. Pronotal crest poorly developed. Hind tibia red over distal two-thirds, whitish at base, and with a blackish ring between the white and red. Hind wing yellowish with black band (Plate 30, #179).

Body length: Male: 23 to 31 mm, Female: 27 to 38 mm.

Habitat: Woodland openings, especially in oak savanna habitat in the eastern part of Nebraska. Occurs in wooded canyons in western Nebraska.

Seasonality: Nymphs in spring. Adults most common from late July to September.

Nebraska distribution: This species has an unusual distribution in Nebraska. It has been collected in two counties in the eastern quarter of the state as well as in several of the panhandle counties.

Diet: Poorly known. Likely feeds on a mix of grasses, sedges, and forbs.

Economic importance: None.

Notes: This grasshopper is rarely found in eastern Nebraska and might be declining as a result of habitat loss.

Campestral grasshopper

Spharagemon campestris (McNeill)

Plate 30 (#180, #181, #182); Map 90

Adult appearance: Light brown mottled with darker brown patches. Pronotal crest poorly developed. Median carina of pronotum cut by two sulci (Plate 30, #182). Inner hind femur orange with black bands. Hind tibia orange. Hind wing yellowish with black band (Plate 30, #181).

Body length: Male: 24 to 32 mm, Female: 27 to 41 mm.

Habitat: Shortgrass prairie, especially in somewhat barren and eroded areas. Can be common on rocky hillsides.

Seasonality: Nymphs in spring. Adults most common from mid-July to September.

Nebraska distribution: Occurs in all of the panhandle counties.

Diet: Poorly known. Likely feeds on a mix of grasses, sedges, and forbs.

Economic importance: None.

Notes: Easily confused with *Spharagemon equale* but easily differentiated by shape of dorsal pronotum (Plate 29, #179).

Mottled sand grasshopper

Spharagemon collare (Scudder)

Plate 30 (#183, #184), Plate 31 (#185); Map 91

Adult appearance: Light brown with mottled appearance. Pronotal crest moderately developed and median carina cut deeply by one sulcus. Inner hind femur whitish with black bands (Plate 31, #185). Hind tibia orange. Hind wing yellowish with black band (Plate 30, #184).

Body length: Male: 19 to 27 mm, Female: 23 to 32 mm.

Habitat: Sandy grasslands. Especially common in the Sandhills.

Seasonality: Nymphs in spring. Adults most common from mid-July to September.

Nebraska distribution: Occurs throughout the state in suitable habitat.

Diet: Feeds on a wide variety of grasses, sedges, and forbs. Common hosts include blue grama (*Bouteloua gracilis*), needleandthread (*Stipa comata*), western wheatgrass (*Pascopyrum smithii*), sand dropseed (*Sporobolus cryptandrus*), witchgrass (*Panicum capillare*), threadleaf sedge (*Carex filifolia*), sand bluestem (*Andropogon hallii*), little bluestem (*Schizachyrium scoparium*), prairie sandreed (*Calamovilfa longifolia*), buffalograss (*Buchloe dactyloides*), hairy grama (*Bouteloua hirsuta*), junegrass (*Koeleria* spp.), sun sedge (*Carex inops*), baltic rush (*Juncus balticus*), kochia (*Kochia scoparia*), Missouri milkvetch (*Astragalus missouriensis*), sand sagebrush (*Artemisia filifolia*), western sticktight (*Lappula occidentalis*), sunflower (*Helianthus* spp.), redroot pigweed (*Amaranthus retroflexus*), bracted spiderwort (*Tradescantia bracteata*), prairie spiderwort (*Tradescantia occidentalis*), rusty lupine (*Lupinus pusillus*), and western ragweed (*Ambrosia psilostachya*). Has also been observed to feed on dead vegetation on the ground.

Economic importance: Generally occurs at low to moderate densities and is unlikely to damage rangeland.

Notes: This is the common yellow-and-black-winged grasshopper commonly seen in the Sandhills.

Orange-legged grasshopper

Spharagemon equale (Say)

Plate 31 (#186, #187, #188, #189); Map 92

Adult appearance: Light to medium brown mottled with darker brown patches. Pronotal crest poorly developed. Median carina of pronotum cut by one sulcus (Plate 31, #188). Inner hind femur orange with black bands (Plate 31, #189). Hind tibia orange. Hind wing yellowish with black band (Plate 30, #187).

Body length: Male: 23 to 30 mm, Female: 30 to 42 mm.

Habitat: Most common on shortgrass prairie in Nebraska. Also occurs in areas of sparse vegetation on heavy soils in the eastern half of the state.

Seasonality: Nymphs in spring. Adults most common from late July to September.

Nebraska distribution: Occurs primarily in the western half of the state but localized populations have been found in the east as well.

Diet: Feeds on a wide variety of grasses, sedges, and forbs. Appears to prefer blue grama (*Bouteloua gracilis*) over other plants.

Economic importance: Occurs at low to moderate densities and unlikely to damage rangeland.

Notes: Easily confused with *Spharagemon campestris* but easily differentiated by shape of dorsal pronotum (Plate 30, #185).

Otte's sedge grasshopper

Stethophyma celata Otte

Plate 31 (#190); Map 93

Adult appearance: Generally dark green and yellowish. Pronotum and head with dark lateral stripe. Narrow in shape when viewed from above. Wings long and broad. Hind tibia light brown to greenish.

Body length: Male: 26 to 34 mm, Female: 28 to 44 mm.

Habitat: Marshes and wet meadows with tall grass.

Seasonality: Nymphs in spring. Adults in July and August.

Nebraska distribution: Known in Nebraska from only two old records, one from Cuming County and one from Furnas County.

Diet: Unknown. Likely feeds on grasses and sedges.

Economic importance: None.

Notes: This species was only recently described by Dan Otte in 1979. It appears to be rare in Nebraska. The specimen pictured was collected by Glen Salisbury in Kansas.

Admirable grasshopper

Syrbula admirabilis Uhler

Plate 32 (#191); Map 94

Adult appearance: Large and slender. Sexually dimorphic. Males: Mostly dark brown to nearly blackish with lighter stripes. Hind tibia dark brown. Subgenital plate pointed. Females: Green to light brown with lighter and darker stripes. Dorsal field of head and pronotum with broad cream-colored stripe. Tegmen with scalloped spots. Hind tibia light brown. Antennae of both sexes filiform to nearly clavate.

Body length: Male: 20 to 31 mm, Female: 31 to 39 mm.

Habitat: A variety of grassland habitats.

Seasonality: Nymphs in spring. Adults most common from early August to October.

Nebraska distribution: Occurs over the eastern two-thirds of the state but becomes less common to the west and north.

Diet: Feeds on a variety of grasses. Known hosts include big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), blue grama (*Bouteloua gracilis*), hairy grama (*Bouteloua hirsuta*), Japanese brome (*Bromus japonicus*), buffalograss (*Buchloe dactyloides*), junegrass (*Koeleria* spp.), Scribner panicum (*Dichanthelium oligoanthos*), Kentucky bluegrass (*Poa pratensis*), indiagrass (*Sorghastrum nutans*), and tall dropseed (*Sporobolus compositus*).

Economic importance: None.

Notes: Can be very numerous in localized areas.

Finned grasshopper

Trachyrhachys aspersa Scudder

Plate 32 (#192, #193); Map 95

Adult appearance: Dark gray to gray-brown with darker patches. Hind tibia light blue. Hind wing pale yellowish with dark band covering most of outer half of wing (Plate 31, #193).

Body length: Male: 14 to 20 mm, Female: 19 to 26 mm.

Habitat: Shortgrass prairie.

Seasonality: Nymphs in spring and early summer. Adults most common from mid-August to October.

Nebraska distribution: Has been collected from several of the panhandle counties.

Diet: Feeds almost exclusively on blue grama (*Bouteloua gracilis*).

Economic importance: Seldom abundant and unlikely to damage rangeland.

Notes: Because adults occur late in the season, this species may be overlooked and its distribution might be more extensive in Nebraska than is currently known.

Kiowa grasshopper

Trachyrhachys kiowa (Thomas)

Plate 32 (#194, #195); Map 96

Adult appearance: Gray to gray-brown with darker patches. Hind tibia blue. Hind wing nearly clear with remnants of dark band and occasionally some yellowish near base (Plate 32, #195).

Body length: Male: 14 to 21 mm, Female: 20 to 26 mm.

Habitat: Grasslands, especially in areas of short grass.

Seasonality: Nymphs in spring. Adults most common from mid-July to September.

Nebraska distribution: Occurs nearly statewide but appears to become rare in the eastern parts of the state.

Diet: Feeds mostly on grasses and sedges, preferring blue grama (*Bouteloua gracilis*). It is also known to consume western wheatgrass (*Pascopyrum smithii*), needleandthread (*Stipa comata*), Kentucky bluegrass (*Poa pratensis*), threadleaf sedge (*Carex filifolia*), needleleaf sedge (*Carex duriuscula*), and Penn sedge (*Carex pensylvanica*).

Economic importance: Rarely abundant but can potentially damage rangeland.

Notes: Large numbers of this grasshopper may sometimes indicate overgrazed land.

Toothed field grasshopper

Trimerotropis agrestis McNeill

Plate 32 (#196), Plate 33 (#197, #198, #199); Map 97

Adult appearance: Light brown to nearly reddish brown and mottled with darker brown. Ground color closely matches that of dune sand. Small dark mark is present near the middle of the lateral pronotum lacking. Lower rear angle of pronotum extended to a rounded point (Plate 33, #198). Inner hind femur orange-pink to reddish with two black bands (Plate 33, #199). Hind tibia orange to nearly red. Hind wing yellowish with black band (Plate 33, #197).

Body length: Male: 20 to 27 mm, Female: 27 to 35 mm.

Habitat: Sandy areas with sparse or no vegetation such as blowouts and dunes.

Seasonality: Nymphs in spring. Adults most common from late July to September.

Nebraska distribution: Known from all of the panhandle counties as well as Dundy, Keith, and Thomas Counties.

Diet: Unknown. Likely feeds on a variety of grasses, forbs, and dead or dying insects.

Economic importance: None.

Notes: Most often found on bare loose sand, especially in extensive blowouts. Appears to hybridize with *Trimerotropis maritima* at Lake McConaughy.

Trimerotropis cincta (Thomas)

Plate 33 (#200, #201); Map 98

Adult appearance: Dark brown to dark gray-brown with darker patches. Inner hind femur black and white. Hind tibia pallid to light blue. Hind wing yellowish with dark band somewhat diffuse over outer much of outer half of wing (Plate 33, #201).

Body length: Male: 16 to 23 mm, Female: 20 to 31 mm.

Habitat: Bare soil patches, especially in open pine woodlands.

Seasonality: Nymphs in spring. Adults from July to October.

Nebraska distribution: Known in Nebraska from a single Sioux County record.

Diet: Unknown.

Economic importance: None.

Notes: Has not been collected in Nebraska in recent years. If it still occurs here it may likely be found in the Pine Ridge.

Trimerotropis fratercula McNeill

Plate 33 (#202, #203); Map 99

Adult appearance: Light to moderate brown with heavily mottled appearance. Inner hind femur whitish with extensive black areas. Hind tibia pallid. Hind wing yellowish with comparatively thin blackish band (Plate 33, #203).

Body length: Male: 19 to 26 mm, Female: 25 to 34 mm.

Habitat: Rocky slopes and eroded banks.

Seasonality: Nymphs in spring. Adults from July to September.

Nebraska distribution: Has been collected from most of the panhandle counties.

Diet: Unknown.

Economic importance: None.

Notes: Has not been collected in Nebraska in recent years but likely overlooked.

Broad-banded grasshopper

Trimerotropis latifasciata Scudder

Plate 33 (#204), Plate 34 (#205); Map 100

Adult appearance: Light brown with two clearly defined dark bands on the tegmen. Band on outer hind femur poorly developed or lacking entirely. Inner hind femur similar to that of *Trimerotropis pistrinaria*. Hind tibia orange. Hind wing yellowish with black band (Plate 34, #205). Easily confused with *Trimerotropis pistrinaria* but dark band on hind wing broader and usually found in different habitats.

Body length: Male: 22 to 30 mm, Female: 27 to 36 mm.

Habitat: Bare and sparsely vegetated alkaline areas such as salt flats, adobe flats, and badlands.

Seasonality: Nymphs in spring. Adults most common from late July to September.

Nebraska distribution: Known from all of the panhandle counties as well as McPherson County.

Diet: Unknown. Likely feeds on a variety of grasses and forbs.

Economic importance: None.

Notes: Seldom common and can occur alongside *Trimerotropis sparsa* and *T. salina*. Generally more skittish and difficult to capture than most other *Trimerotropis* species.

Seaside grasshopper

Trimerotropis maritima (Harris)

Plate 34 (#206, #207, #208, #209); Map 101

Adult appearance: Light brown to nearly reddish brown and mottled with darker brown and reddish tints. Ground color closely matches that of beach sand. Lower rear angle of pronotum not extended to a point, instead generally rounded (Plate 34, #208). A small dark mark is present near the middle of the lateral pronotum. Inner hind femur

whitish with two black bands (Plate 34, #209). Hind tibia orange, rarely pallid. Hind wing yellowish with black band (Plate 34, #207).

Body length: Male: 20 to 26 mm, Female: 26 to 33 mm.

Habitat: Beaches and sandbars. Often attracted to lights.

Seasonality: Nymphs in spring. Adults most common from late June to October.

Nebraska distribution: Occurs across much of the state in suitable habitats.

Diet: Poorly known. Joern (1983) found that the diet of this grasshopper consisted of about 60% forbs. It also consumes a substantial amount of insect matter, such as dead or dying insects.

Economic importance: None.

Notes: This grasshopper can be abundant where found.

Pallid-winged grasshopper

Trimerotropis pallidipennis (Burmeister)

Plate 34 (#210), Plate 35 (#211); Map 102

Adult appearance: Light brown to light gray with bands on tegmen clearly defined to patchy. Hind tibia pallid to yellow. Hind wing yellowish with thin black band (Plate 35, #211).

Body length: Male: 19 to 27 mm, Female: 27 to 38 mm.

Habitat: Dry areas with sparse vegetation and abundant areas of bare soil.

Seasonality: Nymphs in spring. Adults most common from July to October in resident populations. Migrants from the southwestern United States can be found from April to November.

Nebraska distribution: Most commonly found in the western third of the state but single specimens have been collected as far east as Kearney.

Diet: Feeds on a wide variety of grasses and forbs.

Economic importance: None in Nebraska. Has been known to cause serious damage to crops and small grains in Arizona, often travelling in large swarms. Large numbers attracted to lights and killed by traffic on streets in Arizona have caused road hazards.

Notes: While this is a major economic pest in Arizona, it is not abundant in Nebraska.

Trimerotropis pistrinaria Saussure

Plate 35 (#212, #213, #214); Map 103

Adult appearance: Light brown with two clearly defined dark bands on the tegmen and one on the outer hind femur. Inner hind femur largely whitish, orange, or pink with blackish band distally and black covering most of the basal half. (Plate 35, #214) Hind tibia orange. Hind wing yellowish with black band (Plate 35, #213).

Body length: Male: 18 to 27 mm, Female: 26 to 34 mm.

Habitat: Bare to sparsely vegetated rocky hillsides.

Seasonality: Nymphs in spring. Adults most common from late July to September.

Nebraska distribution: Occurs in the Panhandle counties and has also been recorded in Dundy County. Suspected to also occur in Keith County.

Diet: Apparently a mixed feeder with a preference for milkvetches (*Astragalus* spp.).

Economic importance: None.

Notes: Can be locally common on gravelly and rocky hillsides, often alongside *Spharagemon campestris* in the panhandle. *Spharagemon equale* normally occurs in adjacent grassland areas.

Salt Creek grasshopper

Trimerotropis salina McNeill

Plate 35 (#215, #216), Plate 36 (#217); Map 104

Adult appearance: Light brown to gray-brown with moderately developed bands on tegmina. Inner hind femur whitish with black markings (Plate 36, #217). Hind tibia pallid to yellowish or rarely orange. Hind wing yellow with black band (Plate 35, #216).

Body length: Male: 19 to 26 mm, Female: 27 to 33 mm.

Habitat: Salt flats, especially along edges. Most often found among sparse to moderate growth of saltgrass (*Distichlis stricta*).

Seasonality: Nymphs in spring. Adults most common from late July to September.

Nebraska distribution: Occurs in two distinct areas within Nebraska. One remnant population occurs in saline areas in the vicinity of Lincoln, and other populations occur around saline ponds and lakes in the Alkaline Lakes Region in the western part of the state.

Diet: Poorly known. Thought to feed on saltgrass (*Distichlis stricta*) and alkali sacaton (*Sporobolus airoides*)

Economic importance: None.

Notes: Based on the distance between populations near Lincoln and those in the western part of the state, morphological comparisons indicate the Lincoln population appears to be distinct. Unfortunately, populations in the Lincoln area appear to be severely reduced. Unlike populations in Nebraska, those in many parts of Wyoming have the black band on the hind wing much reduced.

Great Basin grasshopper

Trimerotropis sparsa (Thomas)

Plate 36 (#218, #219, #220); Map 105

Adult appearance: Pale gray to gray-brown with slightly mottled appearance. Abdomen yellowish. Inner hind femur whitish with black markings (Plate 36, #220). Hind tibia pallid to yellowish. Hind wing pale blue to greenish (Plate 36, #219).

Body length: Male: 19 to 27 mm, Female: 26 to 33 mm.

Habitat: Adobe flats and badlands.

Seasonality: Nymphs in spring. Adults most common from late July to September.

Nebraska distribution: Locally common in the lower parts of badlands and adobe flats in Dawes and Sioux Counties.

Diet: Unknown.

Economic importance: None.

Notes: *Trimerotropis* species are very difficult to identify to species and are often best differentiated by the habitat from which they were collected.

Great crested grasshopper

Tropidolophus formosus (Say)

Plate 36 (#221, #222) Map 106

Adult appearance: Green with markings of blue and reddish shades. Pronotum with very well developed crest, edge of crest distinctly toothed. Hind wing orange with darker band (Plate 36, #222).

Body length: Male: 26 to 39 mm, Female: 31 to 45 mm.

Habitat: Dry grasslands with weeds or shrubs.

Seasonality: Nymphs in spring. Adults from July to October.

Nebraska distribution: Known only from two old records, one from Dundy County and another from Red Willow County.

Diet: Feeds primarily on plants in the family Malvaceae.

Economic importance: None.

Notes: An unmistakable grasshopper, unlikely to be confused with any other species. This specimen pictured was collected by Jim Thurman in Colorado.

Red-shanked grasshopper

Xanthippus corallipes (Haldeman)

Plate 36 (#223, #224), Plate 37 (#225, #226); Map 107

Adult appearance: Gray-brown with heavy spotting on tegmina. Inner hind femur red with no blackish present (Plate 37, #226). Hind tibia red to pallid. Pronotal sculpturing distinct (Plate 37, #225). Hind wing yellow with black band (Plate 36, #224).

Body length: Male: 25 to 33 mm, Female: 35 to 44 mm.

Habitat: Shortgrass prairie.

Seasonality: Nymphs from midsummer to early spring. Adults most common from April to June.

Nebraska distribution: Has been recorded from across the western half of the state but is most common in the higher elevations of the Panhandle.

Diet: Feeds primarily on grasses and sedges and consumes a wide variety of species.

Economic importance: Has been known to damage rangeland in some parts of its range.

Notes: This species is easily confused with *Pardalophora haldemani* and *Xanthippus montanus*. It is most easily differentiated by the pronotal sculpturing. The color of the inner hind femur distinguish them most of the time, but not in all cases.

Xanthippus montanus (Thomas)

Plate 37 (#227, #228, #229, #230); Map 108

Adult appearance: Light brown with limited spotting on tegmina. Spots on tegmina larger and more numerous in basal region. Inner hind femur red with at least some blackish present (Plate 37, #230). Hind tibia red to pallid. Pronotal sculpturing distinct (Plate 37, #229). Hind wing yellow with black band (Plate 37, #228).

Body length: Male: 24 to 31 mm, Female: 31 to 43 mm.

Habitat: Sandy areas with sparse vegetation including blowouts and dunes.

Seasonality: Nymphs from midsummer to early spring. Adults most common from April to early July.

Nebraska distribution: It has been recorded from several counties scattered across the western half of the state.

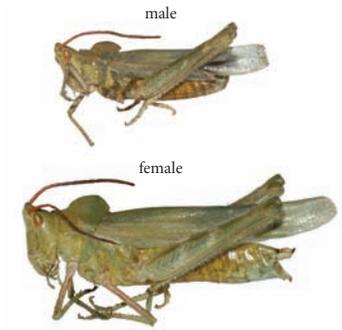
Diet: Unknown. Likely feeds mostly on grasses and sedges.

Economic importance: None.

Notes: This appears to be a relatively rare species in Nebraska and should be watched for in sandy grasslands.

Plate 1

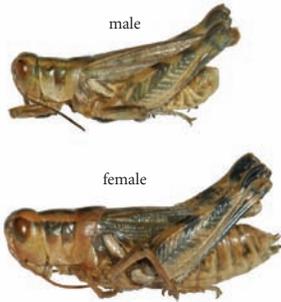
1 *Acrolophitus hirtipes* (Say)



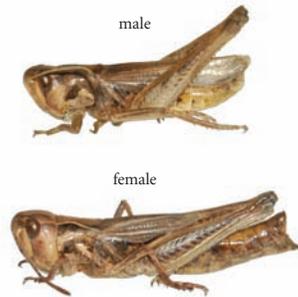
2 *Acrolophitus hirtipes* (Say)



3 *Aeoloplides turnbulli* (Caudell)



4 *Aeoloplides clavatus* (Thomas)



5 *Ageneotettix deorum* (Scudder)



6 *Amphitornus coloradus* (Thomas)

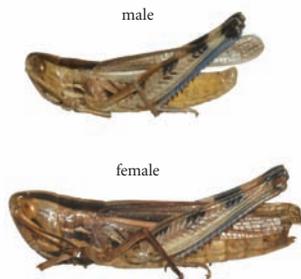


Plate 2

7 *Arphia conspersa* Scudder

Eastern Nebraska
male



female



8 *Arphia conspersa* Scudder

Western Nebraska
male



female



9 *Arphia conspersa* Scudder

male



male



male



female



10 *Arphia pseudonietana* (Thomas)

male



female



11 *Arphia pseudonietana* (Thomas)

male



female



12 *Arphia simplex* Scudder

male



female



Plate 3

13 *Arphia simplex* Scudder

male



female



14 *Arphia simplex* Scudder

inner hind femur



15 *Arphia simplex* Scudder

outer hind femur



16 *Arphia xanthoptera* (Burmeister)

male



female



17 *Arphia xanthoptera* (Burmeister)

male



female



18 *Arphia xanthoptera* (Burmeister)

inner hind femur



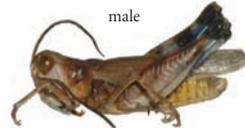
19 *Arphia xanthoptera* (Burmeister)

outer hind femur



20 *Aulocara elliotti* (Thomas)

male



female



Plate 4

21 *Aulocara femoratum* Scudder

male



female



22 *Boopedon auriventris* McNeill

male



23 *Boopedon gracile* Rehn

male



female



24 *Boopedon nubilum* (Say)

male



female

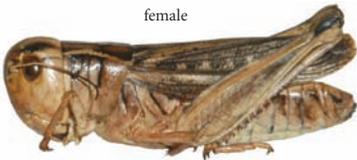


25 *Boopedon nubilum* (Say)

male



female



26 *Boopedon nubilum* (Say)

female



Plate 5

27 *Brachystola magna* (Girard)

male



female



28 *Bruneria brunnea* (Thomas)

male



female



29 *Camnula pellucida* (Scudder)

male



female



30 *Camnula pellucida* (Scudder)

male



female

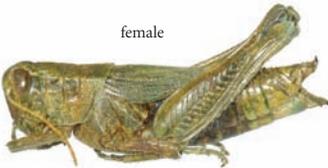


31 *Campylacantha olivacea* (Scudder)

male



female



32 *Chloaltis abdominalis* (Thomas)

male



female



Plate 6

33 *Chloealtis conspersa* (Harris)

male



female



34 *Chorthippus curtipennis* (Harris)

male



female

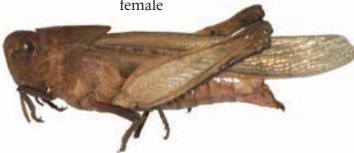


35 *Chortophaga viridifasciata* (DeGeer)

male



female



female



36 *Chortophaga viridifasciata* (DeGeer)

male



female



37 *Chortophaga viridifasciata* (DeGeer)

male



female



38 *Chortophaga viridifasciata* (DeGeer)

male



female

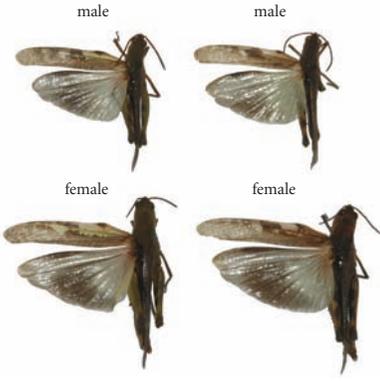


female

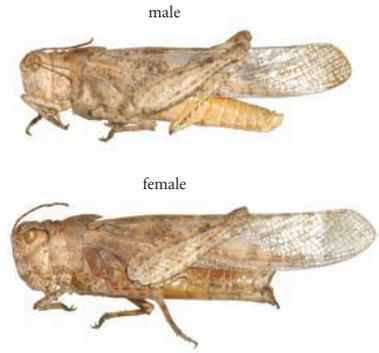


Plate 7

39 *Chortophaga viridifasciata* (DeGeer)



40 *Circotettix rabula* Rehn and Hebard



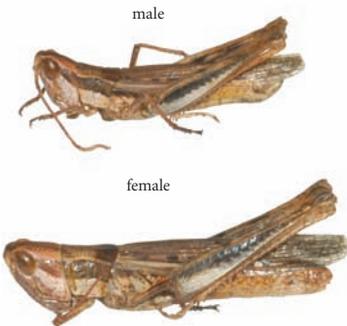
41 *Circotettix rabula* Rehn and Hebard



42 *Cordillacris crenulata* (Bruner)



43 *Cordillacris occipitalis* (Thomas)



44 *Cratypedes neglectus* (Thomas)



Plate 8

45 *Cratypedes neglectus* (Thomas)



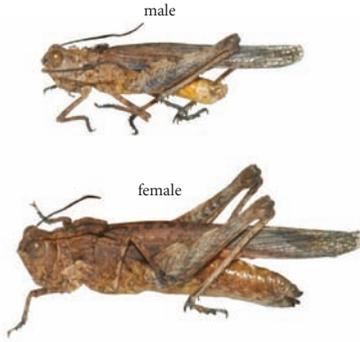
46 *Dactylotum bicolor* (Thomas)



female



47 *Derotmema haydeni* (Say)



female



48 *Derotmema haydeni* (Say)



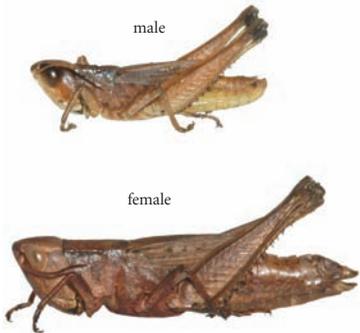
male



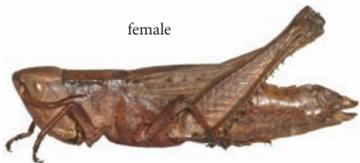
female



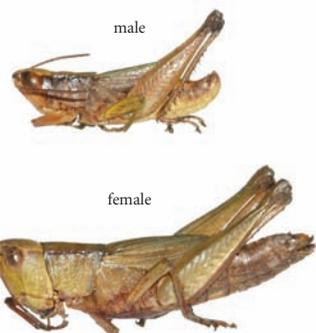
49 *Dichromorpha viridis* (Scudder)



female



50 *Dichromorpha viridis* (Scudder)



female

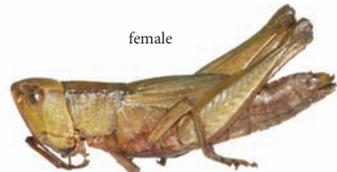
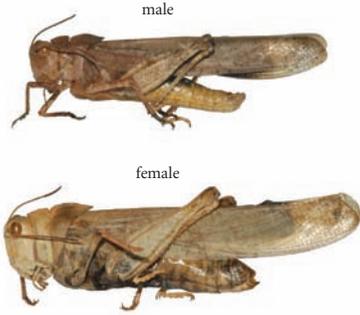


Plate 9

51 *Dissosteira carolina* (Linnaeus)



52 *Dissosteira carolina* (Linnaeus)



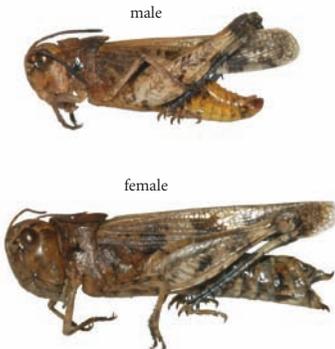
53 *Dissosteira longipennis* (Thomas)



54 *Dissosteira longipennis* (Thomas)



55 *Encoptolophus costalis* (Scudder)



56 *Encoptolophus costalis* (Scudder)



Plate 10

57 *Encoptolophus costalis* (Scudder)

inner hind femur



58 *Encoptolophus sordidus* (Burmeister)

male



female



59 *Encoptolophus sordidus* (Burmeister)

male



female



60 *Encoptolophus sordidus* (Burmeister)

inner hind femur



61 *Encoptolophus subgracilis* Caudell

male



female



62 *Encoptolophus subgracilis* Caudell

male



female



Plate 11

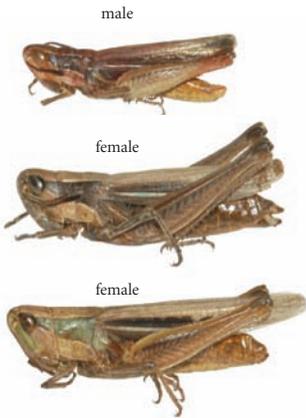
63 *Encoptolophus subgracilis* Caudell



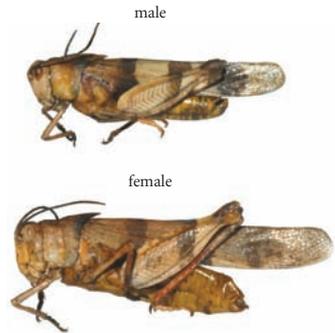
64 *Eritettix simplex* (Scudder)



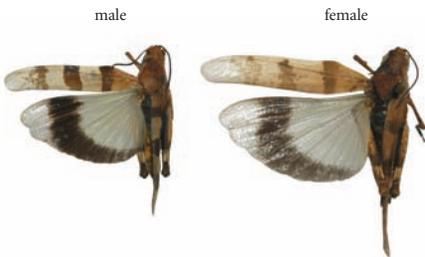
65 *Eritettix simplex* (Scudder)



66 *Hadrotettix trifasciatus* (Say)



67 *Hadrotettix trifasciatus* (Say)

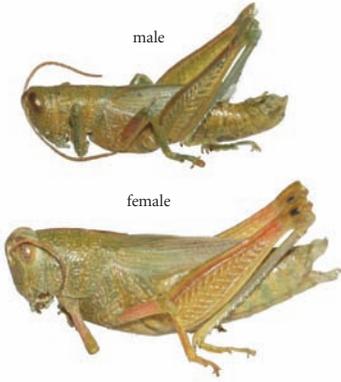


68 *Heliaula rufa* (Scudder)

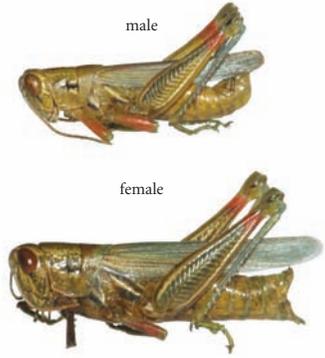


Plate 12

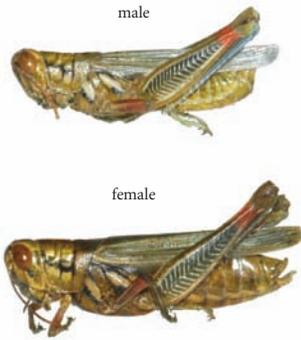
69 *Hesperotettix speciosus* (Scudder)



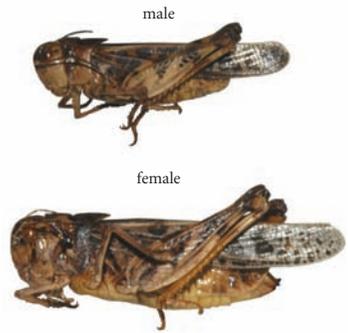
70 *Hesperotettix viridis* (Scudder)



71 *Hesperotettix viridis* (Scudder)



72 *Hippiscus ocelote* (Saussure)



73 *Hippiscus ocelote* (Saussure)

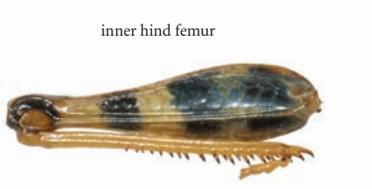


74 *Hippiscus ocelote* (Saussure)

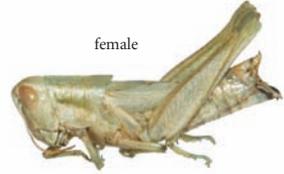
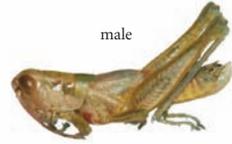


Plate 13

75 *Hippiscus ocelote* (Saussure)



76 *Hypochlora alba* (Dodge)



77 *Hypochlora alba* (Dodge)



78 *Melanoplus angustipennis* (Dodge)



79 *Melanoplus angustipennis* (Dodge)



80 *Melanoplus bispinosus* Scudder



Plate 14

81 *Melanoplus bispinosus* Scudder

male genitalia, dorsal view



82 *Melanoplus bispinosus* Scudder

male genitalia, lateral view

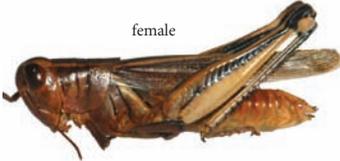


83 *Melanoplus bivittatus* (Say)

male



female



84 *Melanoplus bivittatus* (Say)

male genitalia, lateral view



85 *Melanoplus borealis* (Fieber)

male (Nebraska)



male (Canada)



female (Canada)



86 *Melanoplus borealis* (Fieber)

male genitalia, lateral view



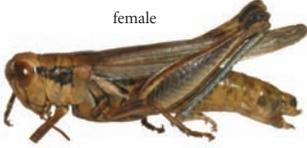
Plate 15

87 *Melanoplus bowditchi* Scudder

male



female



88 *Melanoplus bowditchi* Scudder

male



female



89 *Melanoplus bowditchi* Scudder

male genitalia, lateral view



90 *Melanoplus bowditchi* Scudder

inner hind femur



91 *Melanoplus bowditchi* Scudder

outer hind femur



92 *Melanoplus bruneri* Scudder

male



female



Plate 16

93 *Melanoplus bruneri* Scudder

male genitalia, lateral view



94 *Melanoplus bruneri* Scudder

male genitalia, dorsal view



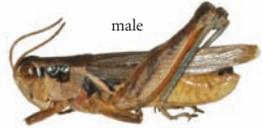
95 *Melanoplus bruneri* Scudder

male genitalia, posterior view



96 *Melanoplus confusus* Scudder

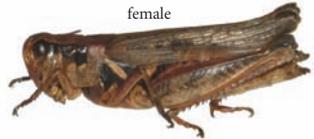
male



female



female



97 *Melanoplus confusus* Scudder

male genitalia, lateral view



98 *Melanoplus dawsoni* (Scudder)

male



female



Plate 17

99 *Melanoplus dawsoni* (Scudder)

male genitalia, lateral view



100 *Melanoplus differentialis* (Thomas)

male



female



male



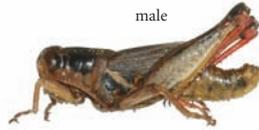
101 *Melanoplus differentialis* (Thomas)

male genitalia, lateral view



102 *Melanoplus discolor* (Scudder)

male



female



103 *Melanoplus discolor* (Scudder)

male genitalia, lateral view



104 *Melanoplus fasciatus* (Walker)

male



female



Plate 18

105 *Melanoplus fasciatus* (Walker)

male genitalia, lateral view



106 *Melanoplus femurrubrum* (DeGeer)

male



female



107 *Melanoplus femurrubrum* (DeGeer)

male genitalia, lateral view

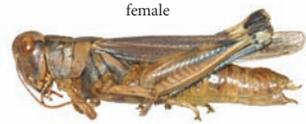


108 *Melanoplus flavidus* Scudder

male



female



109 *Melanoplus flavidus* Scudder

male genitalia, lateral view



110 *Melanoplus flavidus* Scudder

inner hind femur



Plate 19

111 *Melanoplus flavidus* Scudder

outer hind femur



112 *Melanoplus fluviatilis* Bruner

male



male

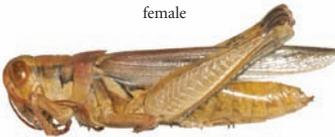


female



113 *Melanoplus fluviatilis* Bruner

female



114 *Melanoplus fluviatilis* Bruner

male genitalia, dorsal view



115 *Melanoplus fluviatilis* Bruner

inner hind femur



116 *Melanoplus foedus* (Scudder)

male



female



Plate 20

117 *Melanoplus foedus* (Scudder)

male genitalia, dorsal view



118 *Melanoplus foedus* (Scudder)

inner hind femur



119 *Melanoplus gladstoni* Scudder

male



female



120 *Melanoplus gladstoni* Scudder

male genitalia, lateral view



121 *Melanoplus gracilis* (Bruner)

male



female



122 *Melanoplus huroni* Blatchley

female



123 *Melanoplus infantilis* (Scudder)

male



female



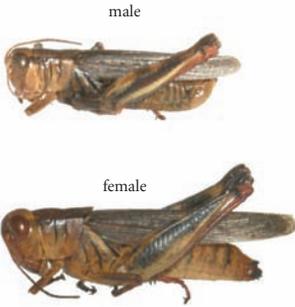
124 *Melanoplus infantilis* (Scudder)

male genitalia, lateral view



Plate 21

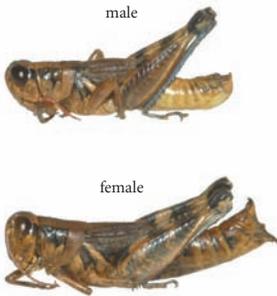
125 *Melanoplus keeleri* (Thomas)



126 *Melanoplus keeleri* (Thomas)



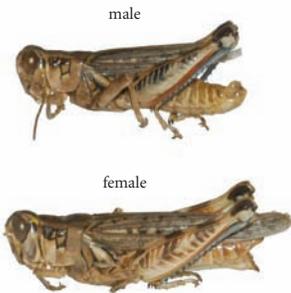
127 *Melanoplus lakinus* (Scudder)



128 *Melanoplus lakinus* (Scudder)



129 *Melanoplus occidentalis* (Thomas)

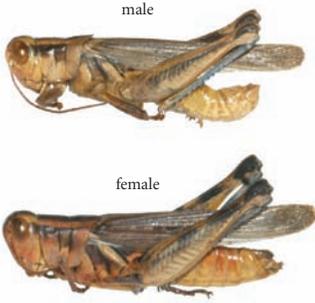


130 *Melanoplus occidentalis* (Thomas)



Plate 22

131 *Melanoplus packardii* Scudder



132 *Melanoplus packardii* Scudder

male genitalia, dorsal view



133 *Melanoplus packardii* Scudder

inner hind femur

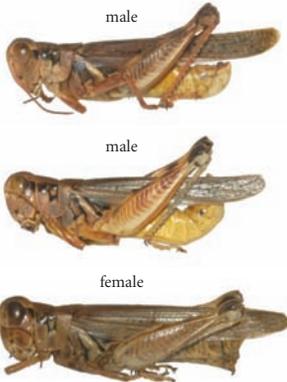


134 *Melanoplus punctulatus* Scudder

female



135 *Melanoplus sanguinipes* (Fabricius)



136 *Melanoplus sanguinipes* (Fabricius)

male genitalia, lateral view



Plate 23

137 *Melanoplus sanguinipes* (Fabricius)

male genitalia, dorsal view



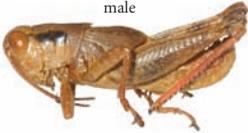
138 *Melanoplus sanguinipes* (Fabricius)

male genitalia, posterior view

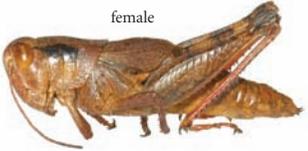


139 *Melanoplus scudderi* (Uhler)

male



female



140 *Melanoplus scudderi* (Uhler)

male genitalia, lateral view



141 *Melanoplus spretus* (Walsh)

male



female



142 *Melanoplus walshii* Scudder

male



female



Plate 24

143 *Melanoplus walshii* Scudder

male genitalia, lateral view

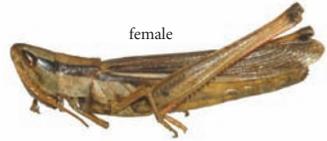


144 *Mermiria bivittata* (Serville)

male



female



145 *Mermiria picta* (Walker)

male



female



146 *Mestobregma plattei* (Thomas)

male



female



147 *Mestobregma plattei* (Thomas)

male



female



148 *Metator pardalinus* (Saussure)

male



female



Plate 25

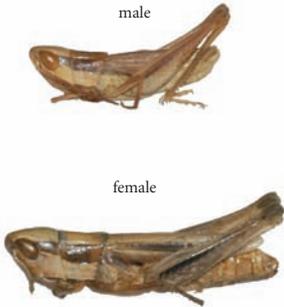
149 *Metator pardalinus* (Saussure)



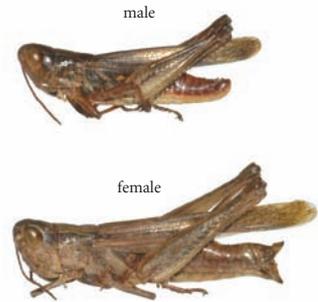
150 *Opeia obscura* (Thomas)



151 *Opeia obscura* (Thomas)



152 *Orphulella pelidna* (Burmeister)



153 *Orphulella pelidna* (Burmeister)



154 *Orphulella speciosa* (Scudder)

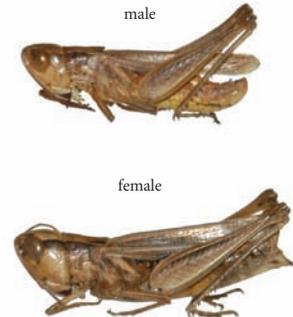


Plate 26

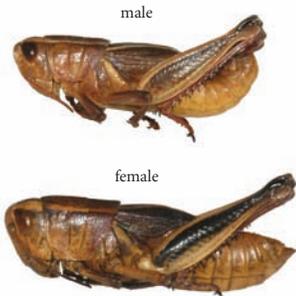
155 *Orphulella speciosa* (Scudder)



156 *Orphulella speciosa* (Scudder)



157 *Paratylotropidia brunneri* Scudder



158 *Pardalophora apiculata* (Harris)



159 *Pardalophora apiculata* (Harris)



160 *Pardalophora apiculata* (Harris)

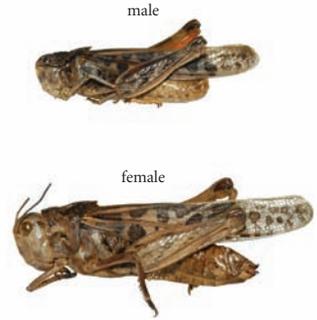


Plate 27

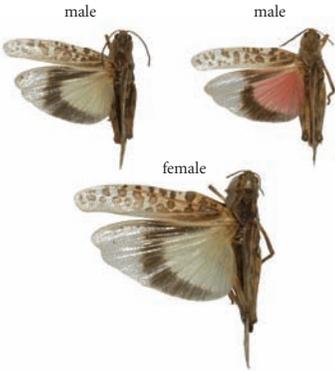
161 *Pardalophora apiculata* (Harris)



162 *Pardalophora haldemani* (Scudder)



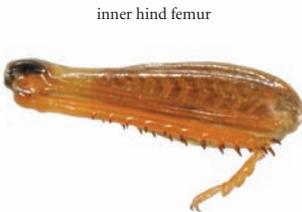
163 *Pardalophora haldemani* (Scudder)



164 *Pardalophora haldemani* (Scudder)



165 *Pardalophora haldemani* (Scudder)



166 *Paropomala wyomingensis* (Thomas)

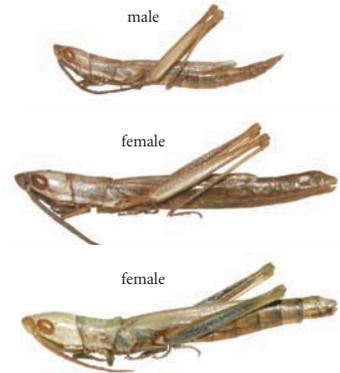
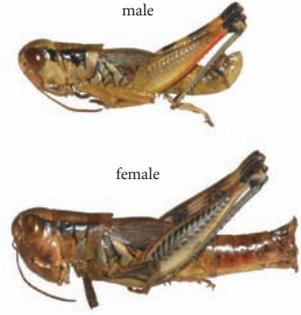


Plate 28

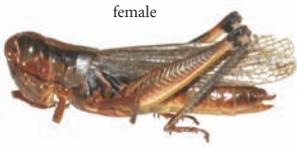
167 *Phlibostroma quadrimaculatum* (Thomas)



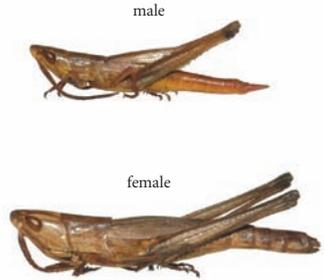
168 *Phoetaliotes nebrascensis* (Thomas)



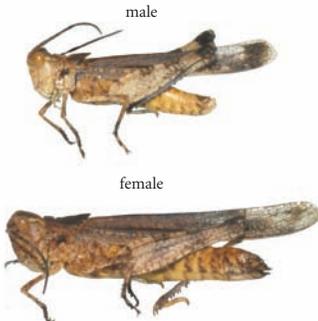
169 *Phoetaliotes nebrascensis* (Thomas)



170 *Pseudopomala brachyptera* (Scudder)



171 *Psinidia fenestralis* (Serville)



172 *Psinidia fenestralis* (Serville)



Plate 29

173 *Psoloessa delicatula* (Scudder)

male



female



174 *Psoloessa texana* Scudder

male



female



175 *Schistocerca americana* (Drury)

female

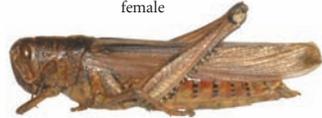


176 *Schistocerca lineata* Scudder

male



female

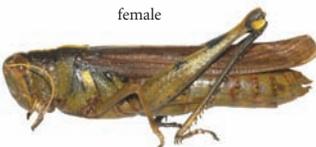


177 *Schistocerca obscura* (Fabricius)

male

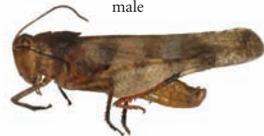


female



178 *Spharagemon bolli* Scudder

male

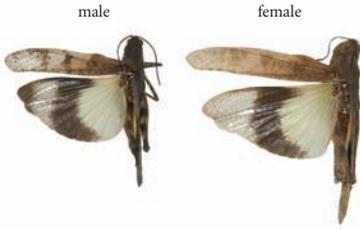


female

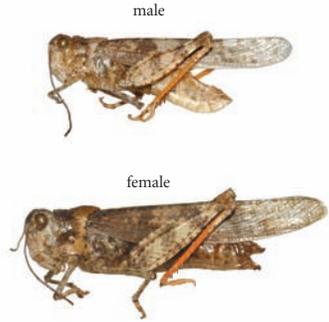


Plate 30

179 *Spharagemon bolli* Scudder



180 *Spharagemon campestris* (McNeill)



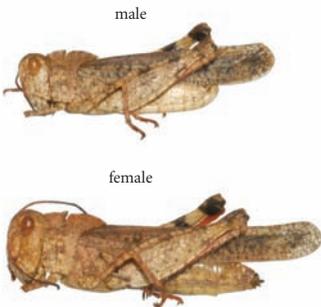
181 *Spharagemon campestris* (McNeill)



182 *Spharagemon campestris* (McNeill)



183 *Spharagemon collare* (Scudder)



184 *Spharagemon collare* (Scudder)

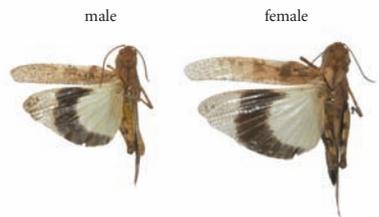
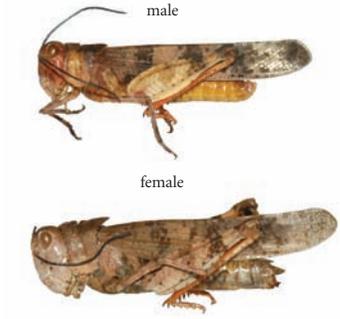


Plate 31

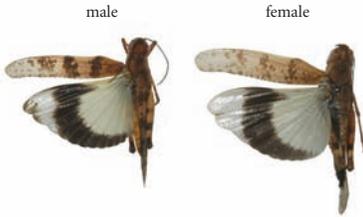
185 *Spharagemon collare* (Scudder)



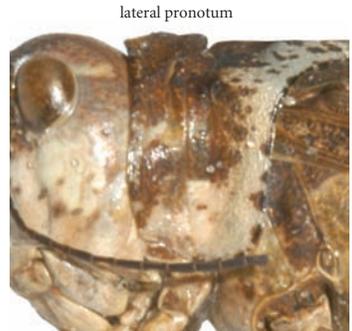
186 *Spharagemon equale* (Say)



187 *Spharagemon equale* (Say)



188 *Spharagemon equale* (Say)



189 *Spharagemon equale* (Say)



190 *Stethophyma celata* Otte

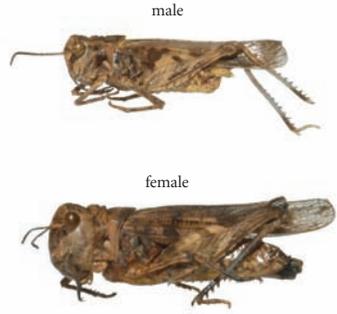


Plate 32

191 *Syrbula admirabilis* Uhler



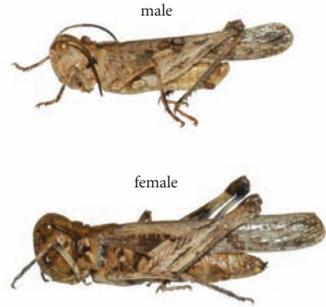
192 *Trachyrhachys aspersa* Scudder



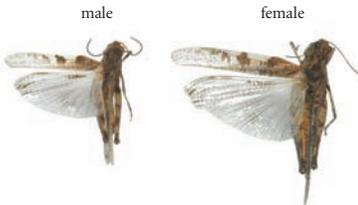
193 *Trachyrhachys aspersa* Scudder



194 *Trachyrhachys kiowa* (Thomas)



195 *Trachyrhachys kiowa* (Thomas)

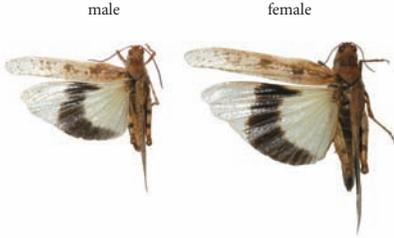


196 *Trimerotropis agrestis* McNeill



Plate 33

197 *Trimerotropis agrestis* McNeill



198 *Trimerotropis agrestis* McNeill

lateral pronotum



199 *Trimerotropis agrestis* McNeill

inner hind femur



200 *Trimerotropis cincta* (Thomas)

male



201 *Trimerotropis cincta* (Thomas)

male



202 *Trimerotropis fratercula* McNeill

male



203 *Trimerotropis fratercula* McNeill

male



204 *Trimerotropis latifasciata* Scudder

male

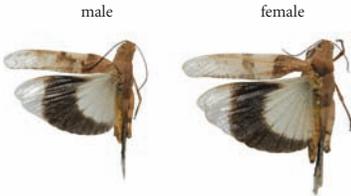


female

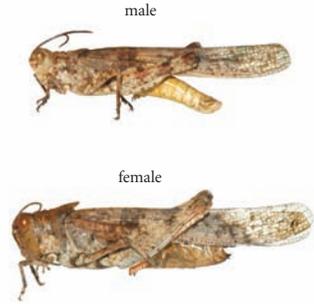


Plate 34

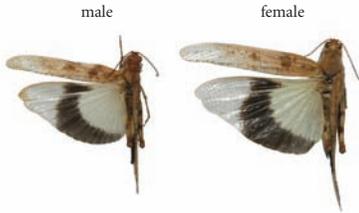
205 *Trimerotropis latifasciata* Scudder



206 *Trimerotropis maritima* (Harris)



207 *Trimerotropis maritima* (Harris)



208 *Trimerotropis maritima* (Harris)



209 *Trimerotropis maritima* (Harris)



210 *Trimerotropis pallidipennis* (Burmeister)

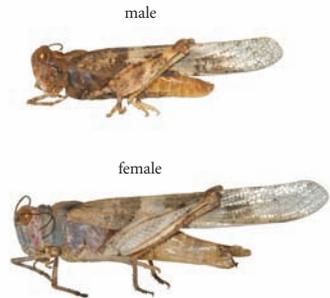
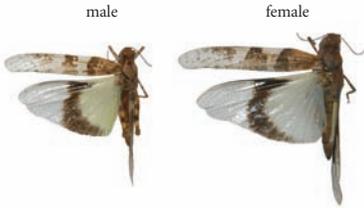
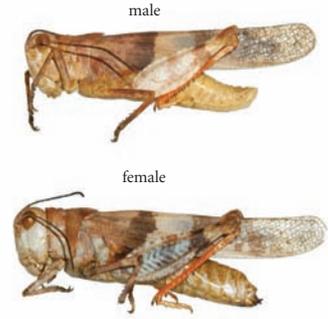


Plate 35

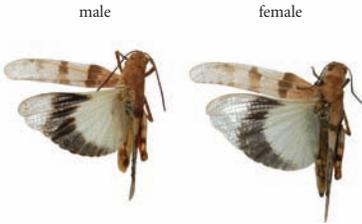
211 *Trimerotropis pallidipennis* (Burmeister)



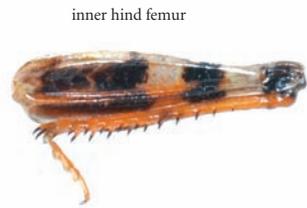
212 *Trimerotropis pistrinaria* Saussure



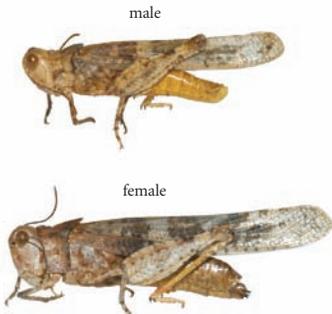
213 *Trimerotropis pistrinaria* Saussure



214 *Trimerotropis pistrinaria* Saussure



215 *Trimerotropis salina* McNeill



216 *Trimerotropis salina* McNeill

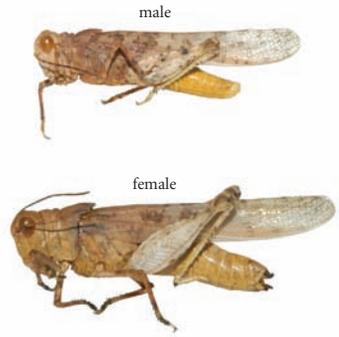


Plate 36

217 *Trimerotropis salina* McNeill



218 *Trimerotropis sparsa* (Thomas)



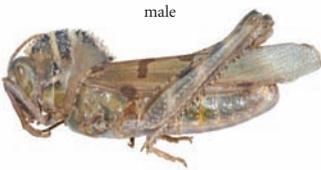
219 *Trimerotropis sparsa* (Thomas)



220 *Trimerotropis sparsa* (Thomas)



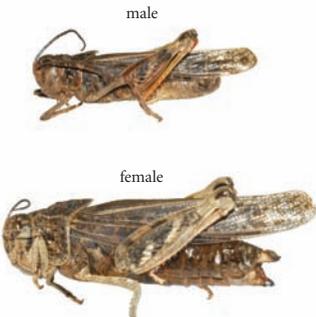
221 *Tropidolophus formosus* (Say)



222 *Tropidolophus formosus* (Say)



223 *Xanthippus corallipes* (Haldeman)



224 *Xanthippus corallipes* (Haldeman)

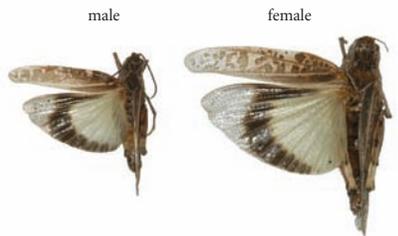


Plate 37

225 *Xanthippus corallipes* (Haldeman)

dorsal pronotum



226 *Xanthippus corallipes* (Haldeman)

inner hind femur



227 *Xanthippus montanus* (Thomas)

male



female



228 *Xanthippus montanus* (Thomas)

male



female



229 *Xanthippus montanus* (Thomas)

dorsal pronotum



230 *Xanthippus montanus* (Thomas)

inner hind femur

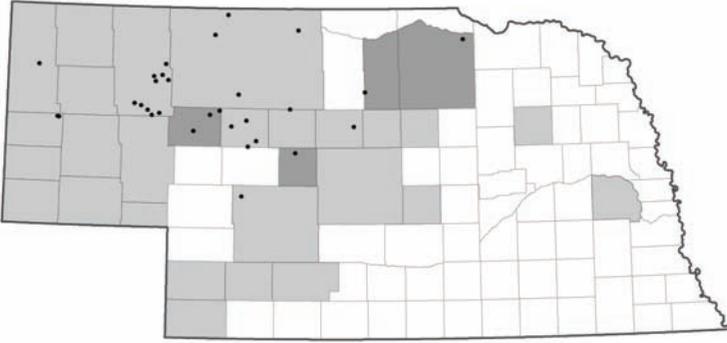


County Map of Nebraska

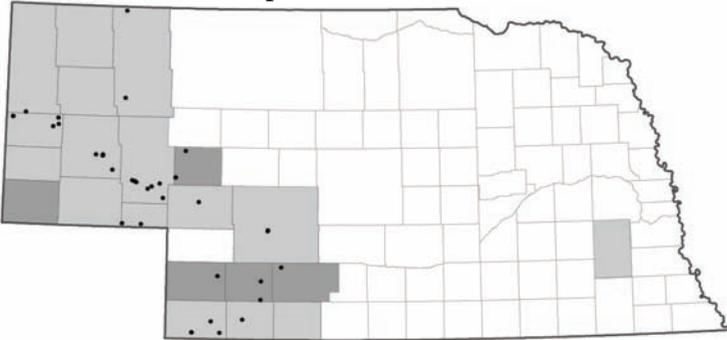


Maps

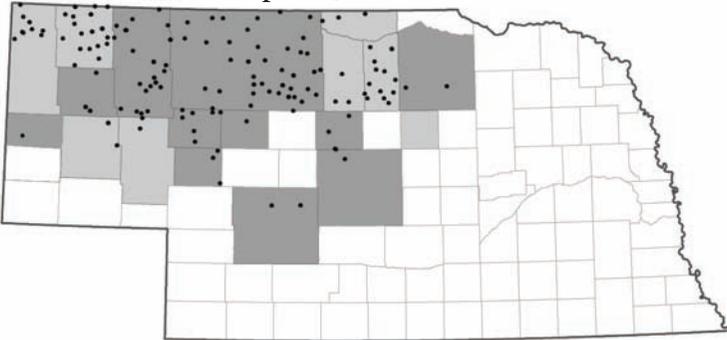
Map 1 *Acrolophitus hirtipes* (Say)



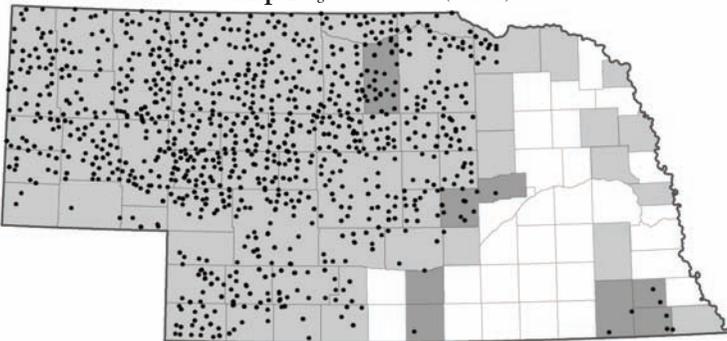
Map 2 *Aeoloplides turnbulli* (Caudell)



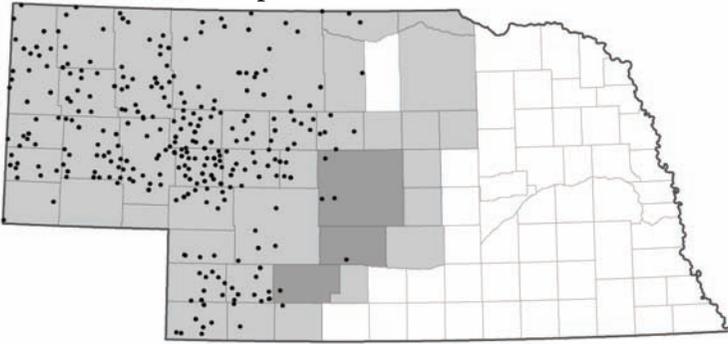
Map 3 *Aeropedellus clavatus* (Thomas)



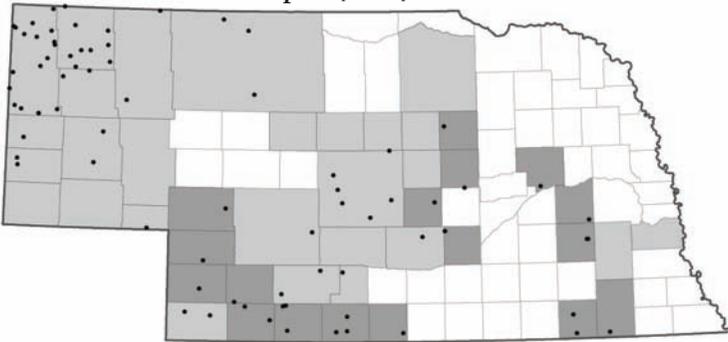
Map 4 *Ageneotettix deorum* (Scudder)



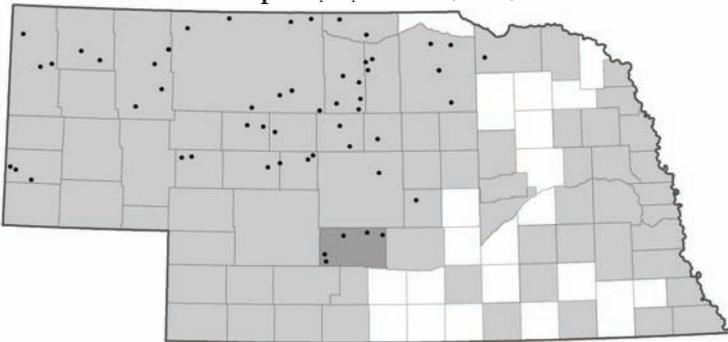
Map 5 *Amphitornus coloradus* (Thomas)



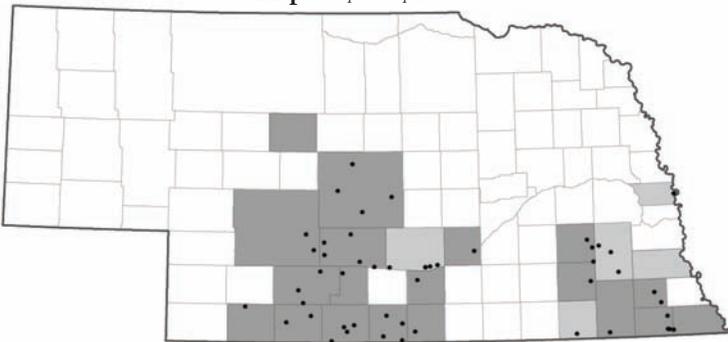
Map 6 *Arphia conspersa* Scudder



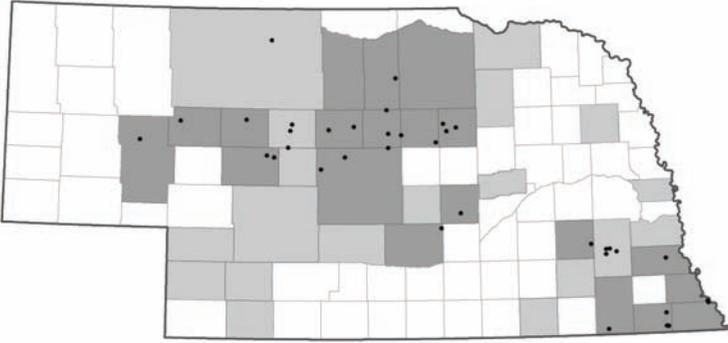
Map 7 *Arphia pseudonietana* (Thomas)



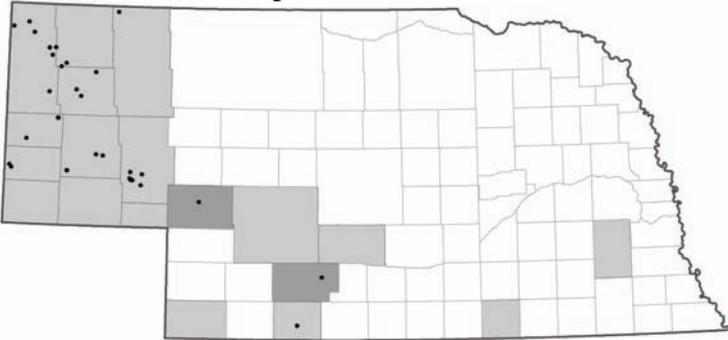
Map 8 *Arphia simplex* Scudder



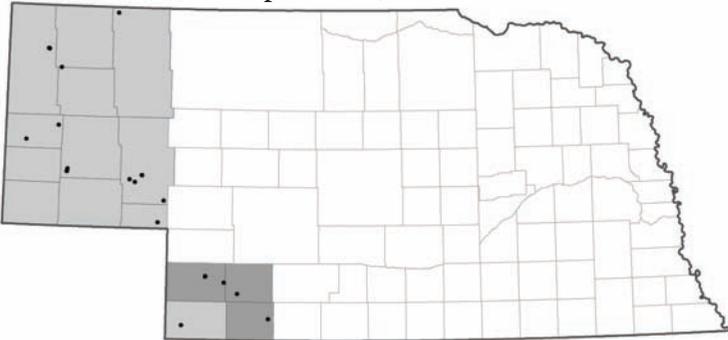
Map 9 *Arphia xanthoptera* (Burmeister)



Map 10 *Aulocara elliotti* (Thomas)



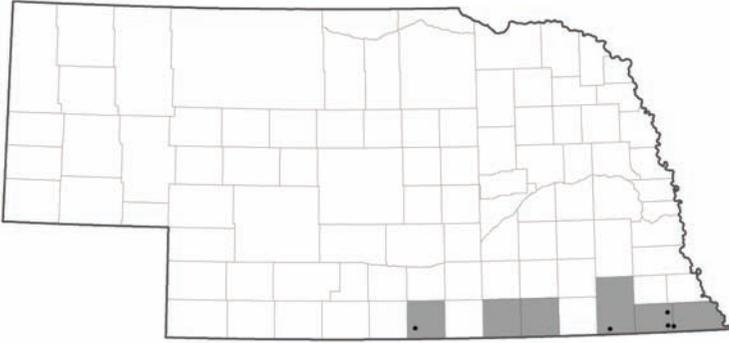
Map 11 *Aulocara femoratum* Scudder



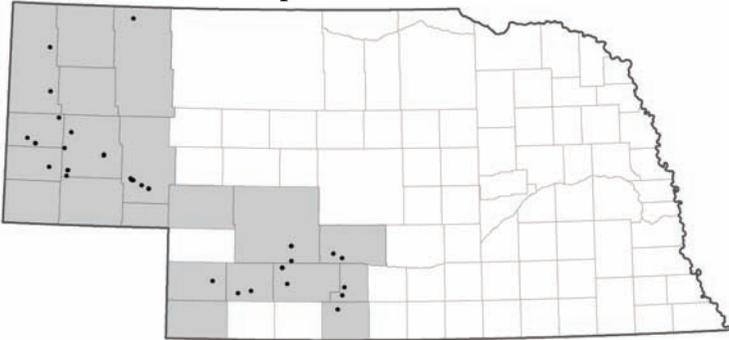
Map 12 *Boopedon auriventris* McNeill



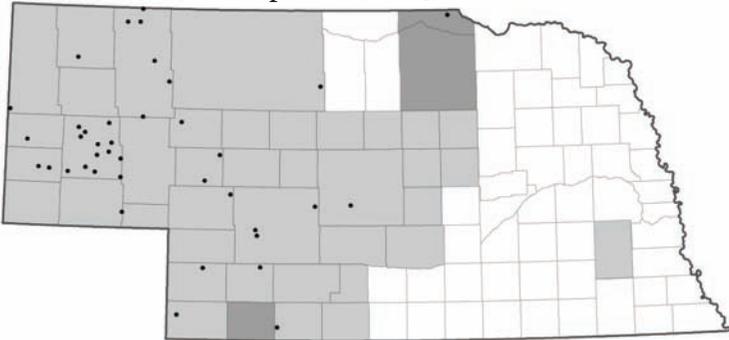
Map 13 *Boopedon gracile* Rehn



Map 14 *Boopedon nubilum* (Say)



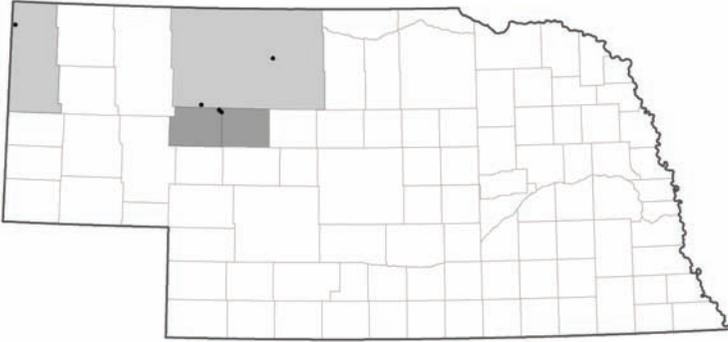
Map 15 *Brachystola magna* (Girard)



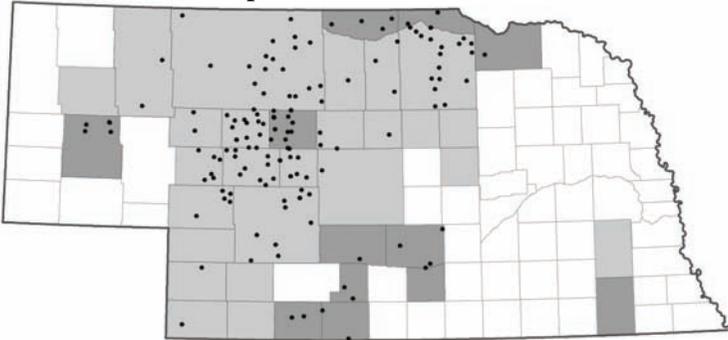
Map 16 *Bruneria brunnea* (Thomas)



Map 17 *Camnula pellucida* (Scudder)



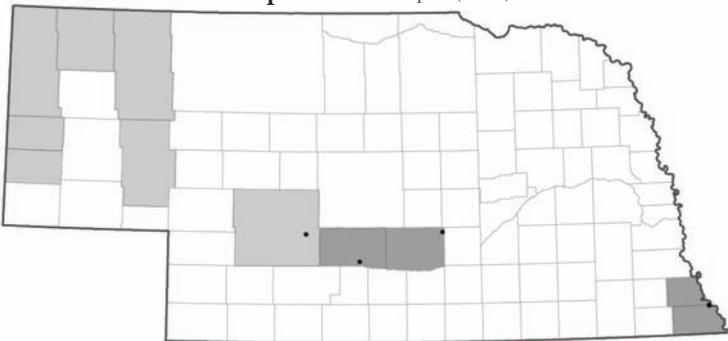
Map 18 *Campylacantha olivacea* (Scudder)



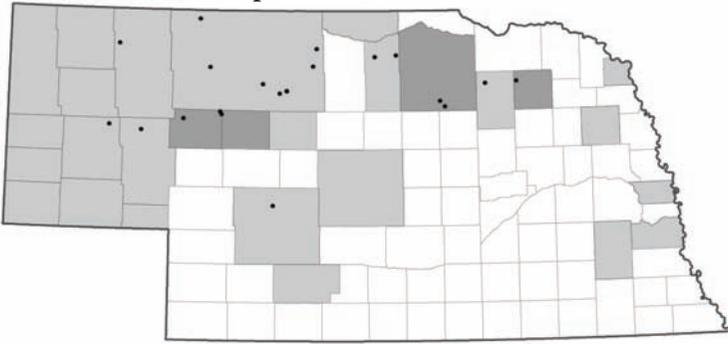
Map 19 *Chloealtis abdominalis* (Thomas)



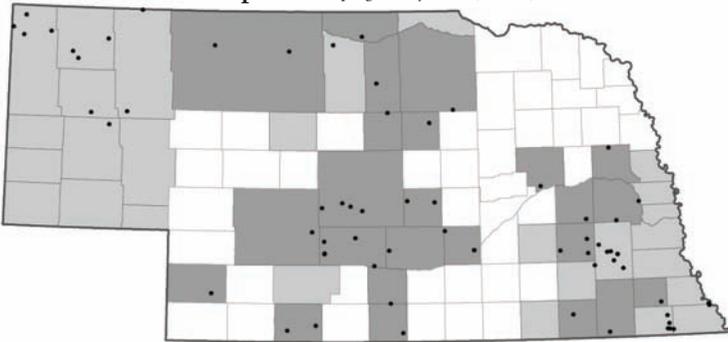
Map 20 *Chloealtis conspersa* (Harris)



Map 21 *Chorthippus curtipennis* (Harris)



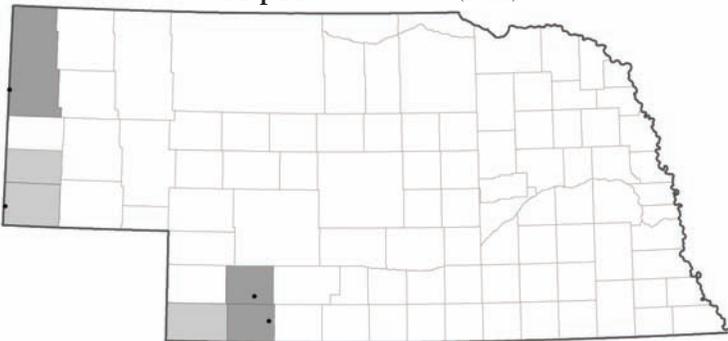
Map 22 *Chortophaga viridifasciata* (DeGeer)



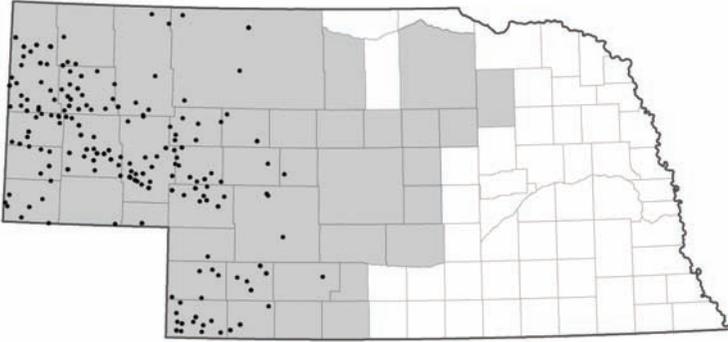
Map 23 *Circotettix rabula* Rehn and Hebard



Map 24 *Cordillacris crenulata* (Bruner)



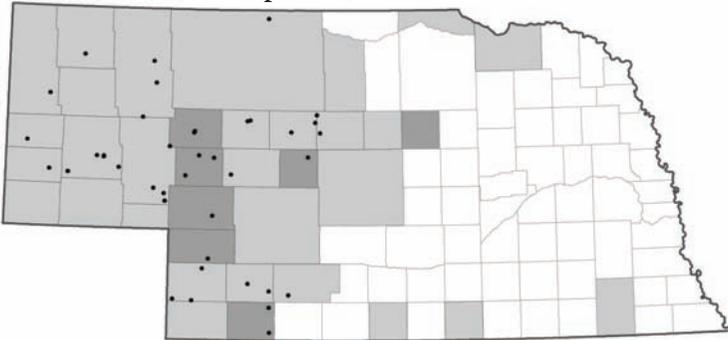
Map 25 *Cordillacris occipitalis* (Thomas)



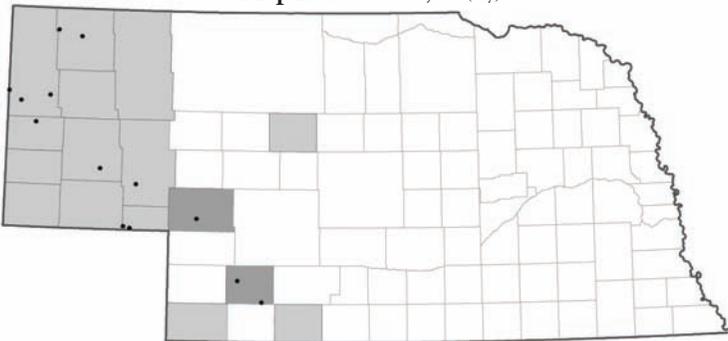
Map 26 *Cratypedes neglectus* (Thomas)



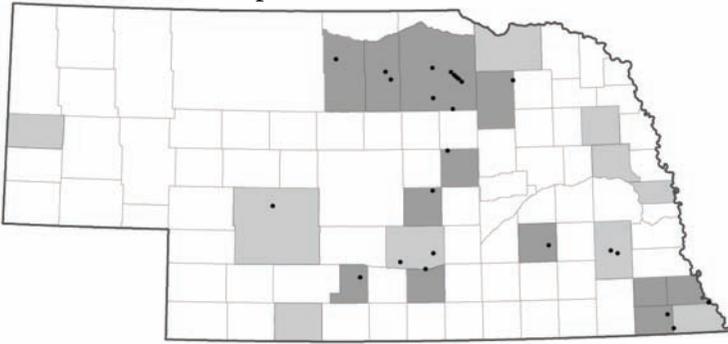
Map 27 *Dactylotum bicolor* (Thomas)



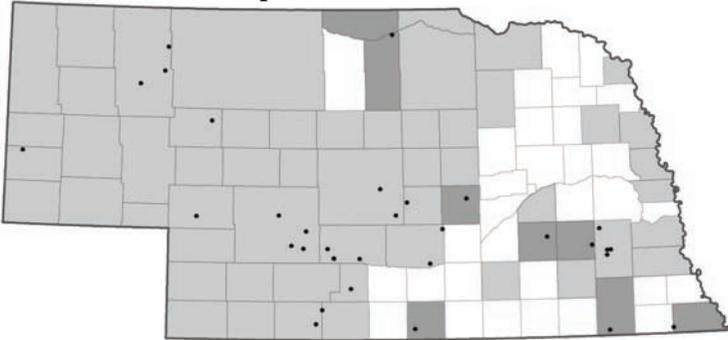
Map 28 *Derotmema haydeni* (Say)



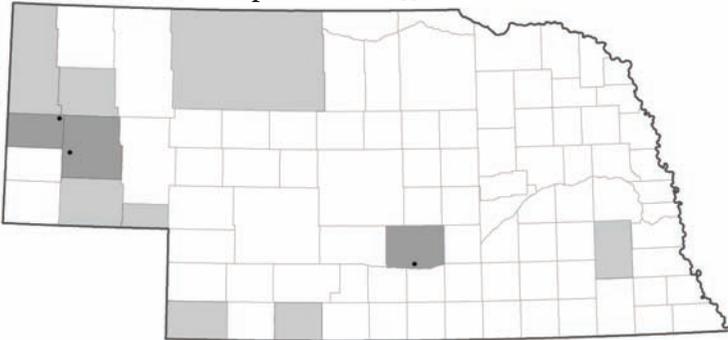
Map 29 *Dichromorpha viridis* (Scudder)



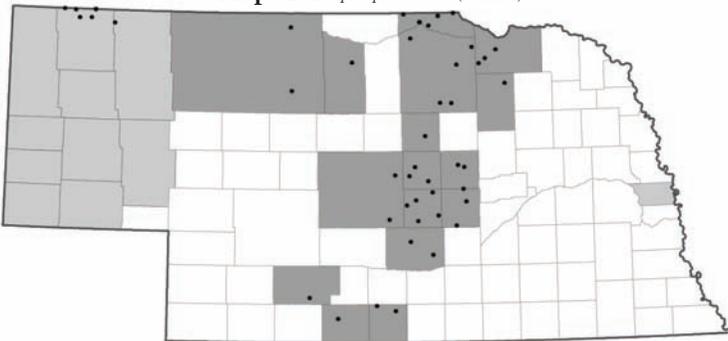
Map 30 *Dissosteira carolina* (Linnaeus)



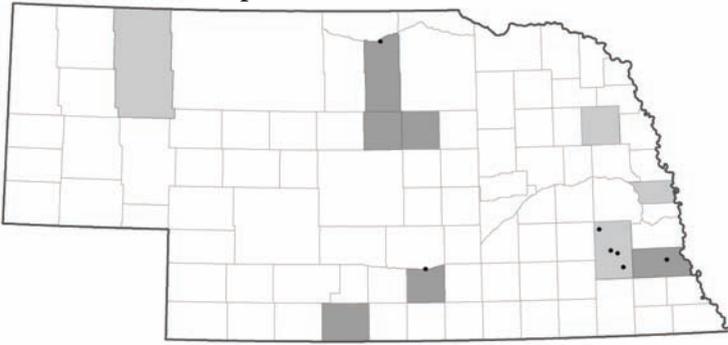
Map 31 *Dissosteira longipennis* (Thomas)



Map 32 *Encoptolophus costalis* (Scudder)



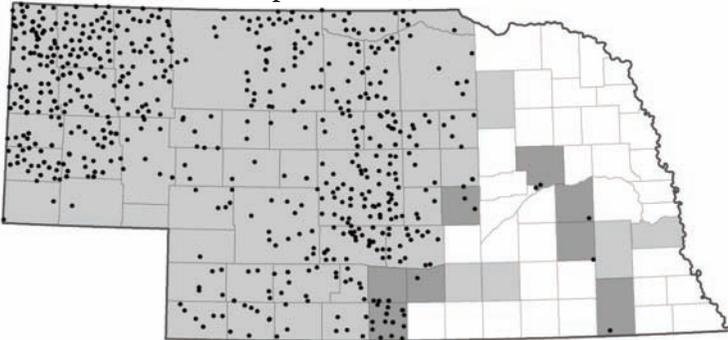
Map 33 *Encoptolophus sordidus* (Burmeister)



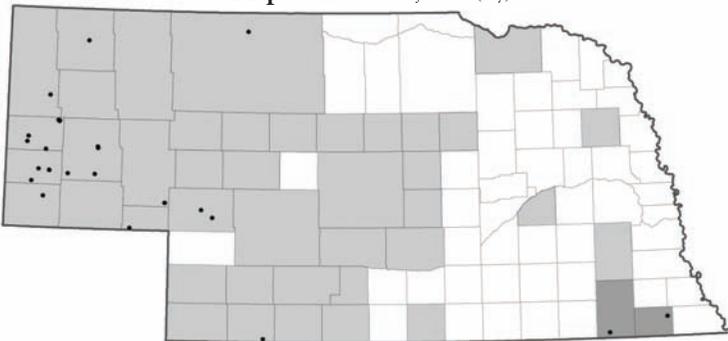
Map 34 *Encoptolophus subgracilis* Caudell



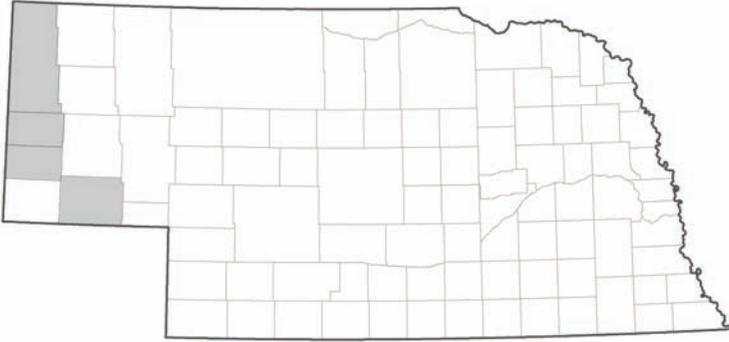
Map 35 *Eritettix simplex* (Scudder)



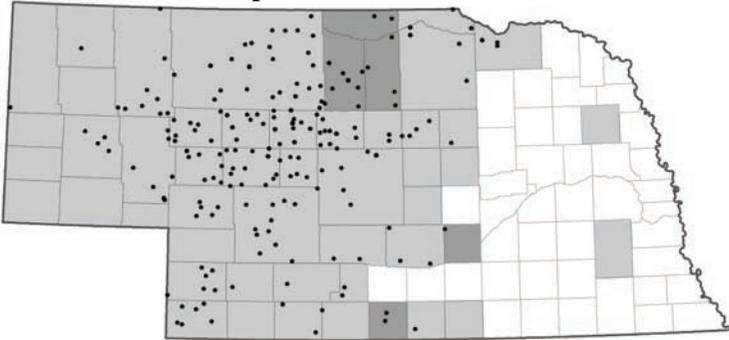
Map 36 *Hadrotettix trifasciatus* (Say)



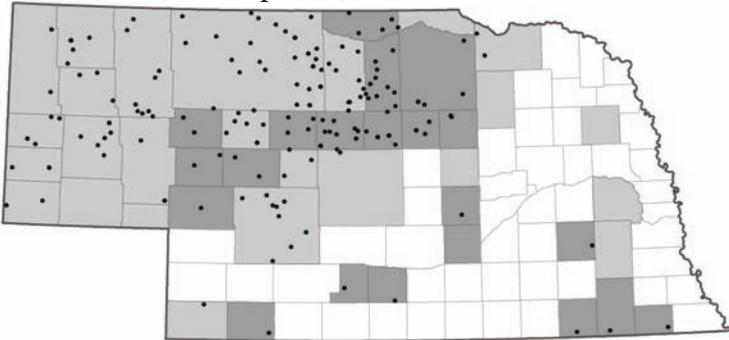
Map 37 *Heliaula rufa* (Scudder)



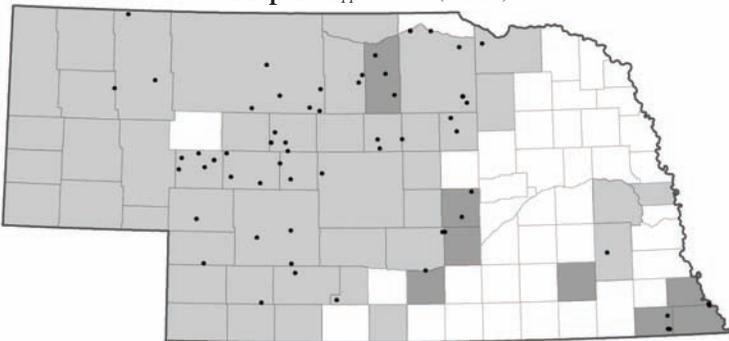
Map 38 *Hesperotettix speciosus* (Scudder)



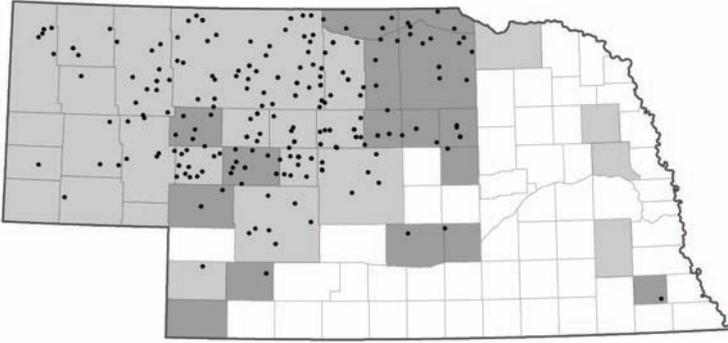
Map 39 *Hesperotettix viridis* (Scudder)



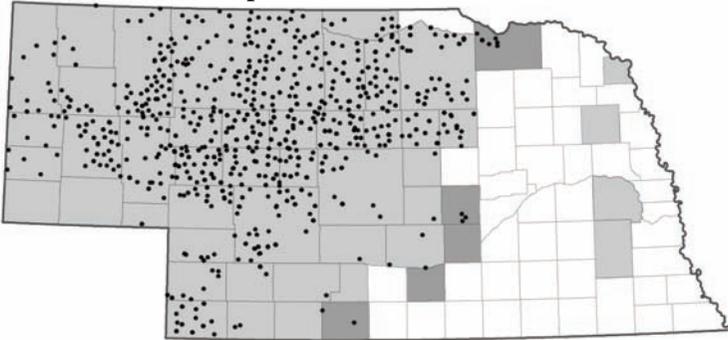
Map 40 *Hippiscus ocelote* (Saussure)



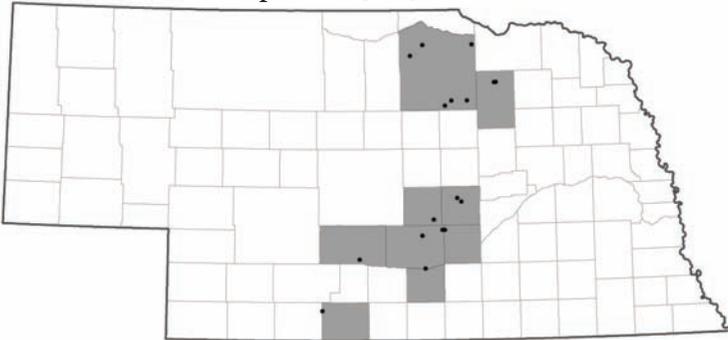
Map 41 *Hypochlora alba* (Dodge)



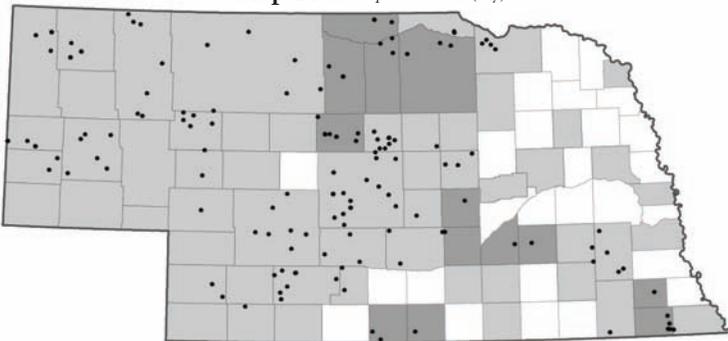
Map 42 *Melanoplus angustipennis* (Dodge)



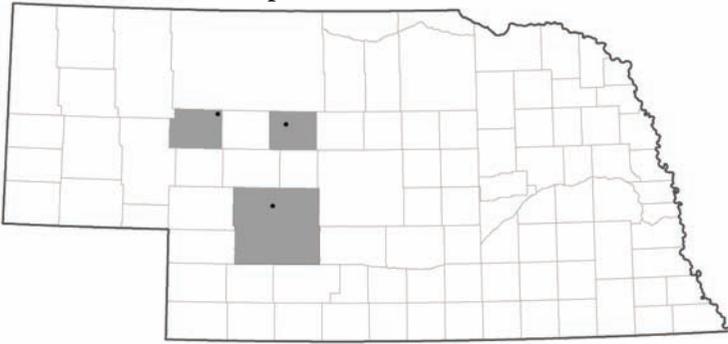
Map 43 *Melanoplus bispinosus* Scudder



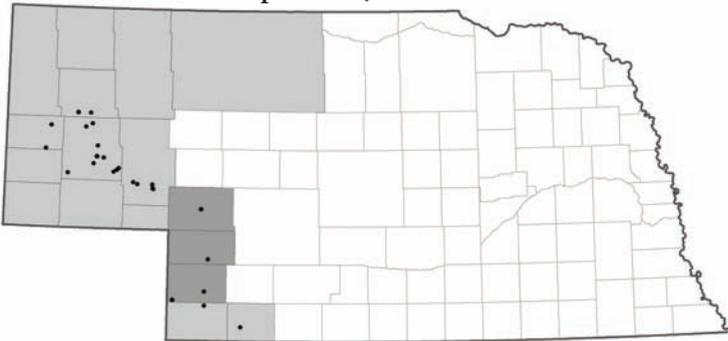
Map 44 *Melanoplus bivittatus* (Say)



Map 45 *Melanoplus borealis* (Fieber)



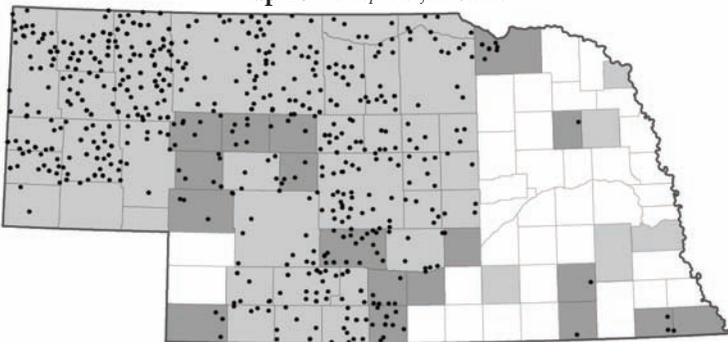
Map 46 *Melanoplus bowditchi* Scudder



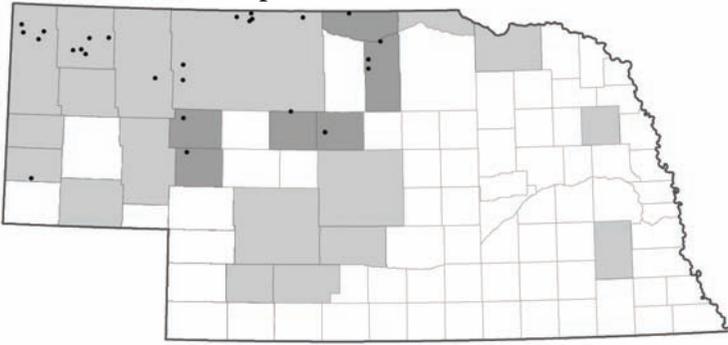
Map 47 *Melanoplus bruneri* Scudder



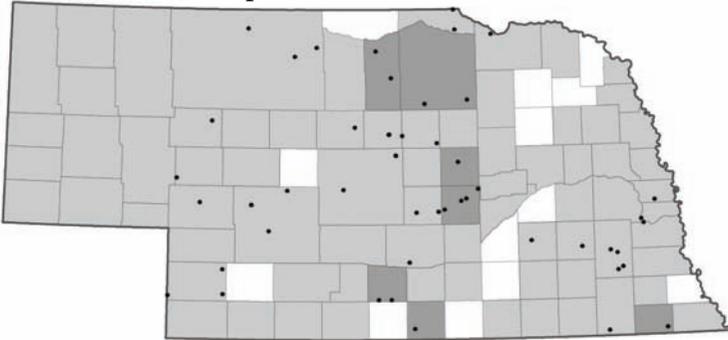
Map 48 *Melanoplus confusus* Scudder



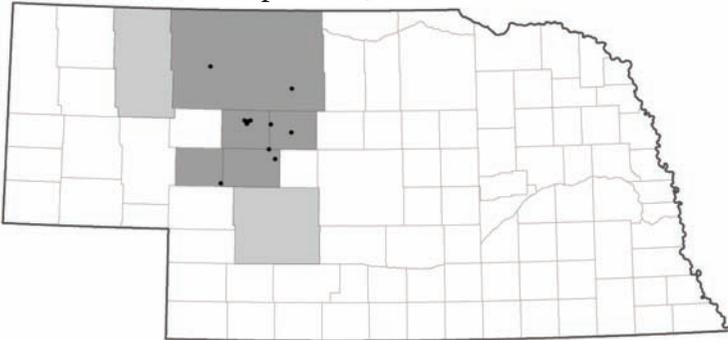
Map 49 *Melanoplus dawsoni* (Scudder)



Map 50 *Melanoplus differentialis* (Thomas)



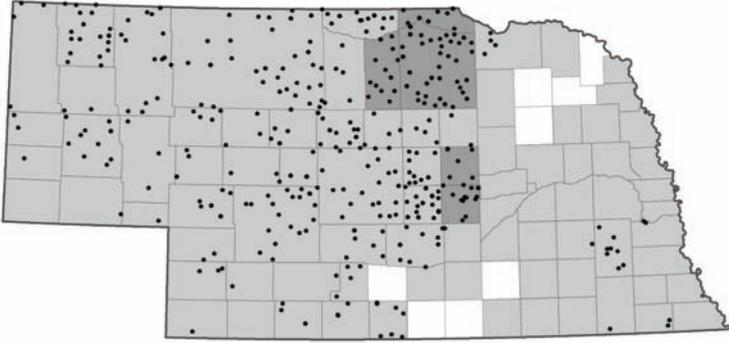
Map 51 *Melanoplus discolor* (Scudder)



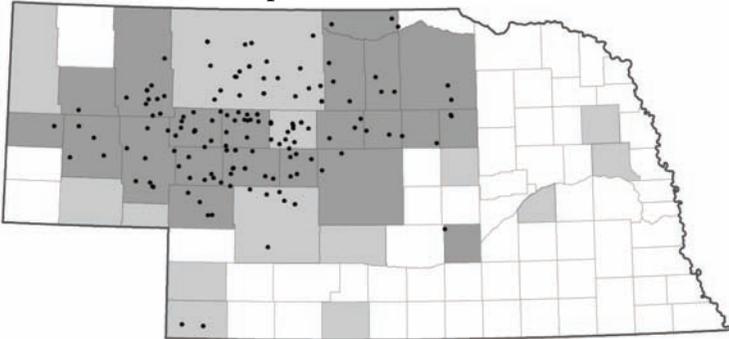
Map 52 *Melanoplus fasciatus* (Walker)



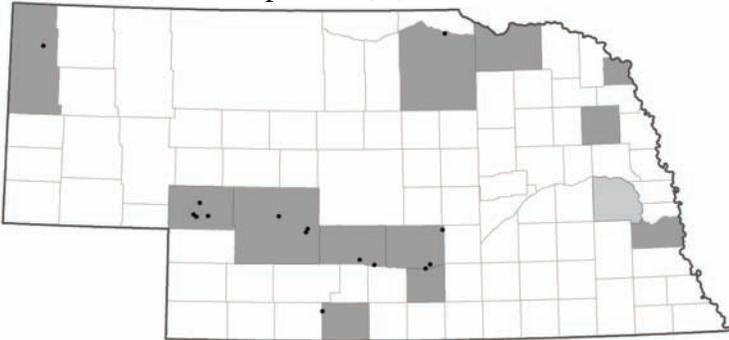
Map 53 *Melanoplus femurrubrum* (DeGeer)



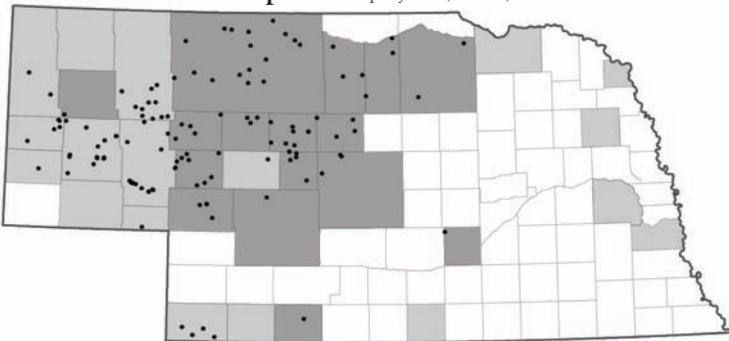
Map 54 *Melanoplus flavidus* Scudder



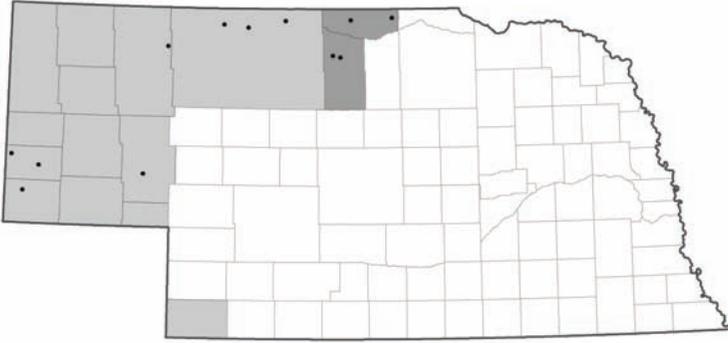
Map 55 *Melanoplus fluviatilis* Bruner



Map 56 *Melanoplus foedus* (Scudder)



Map 57 *Melanoplus gladstoni* Scudder



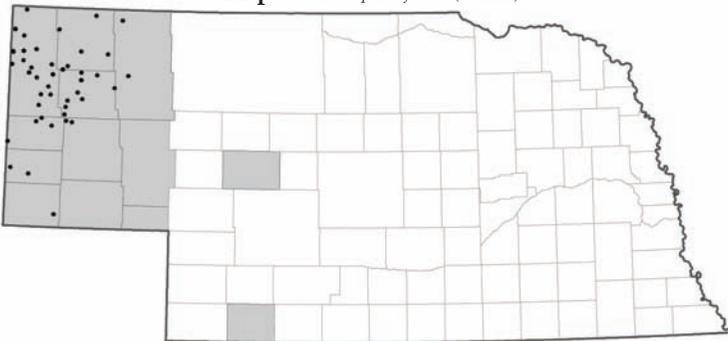
Map 58 *Melanoplus gracilis* (Bruner)



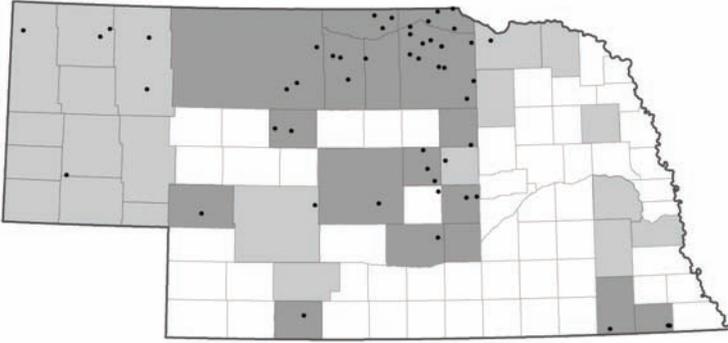
Map 59 *Melanoplus huroni* Blatchley



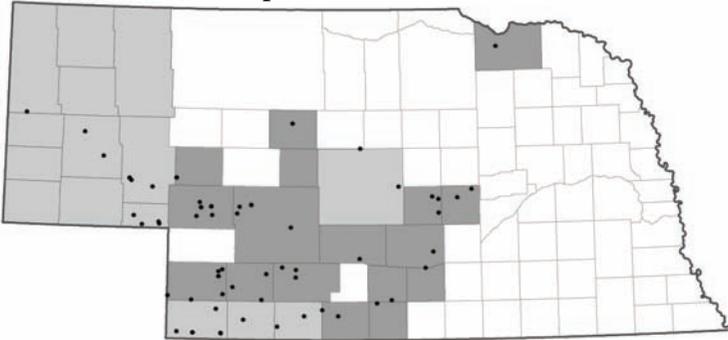
Map 60 *Melanoplus infantilis* (Scudder)



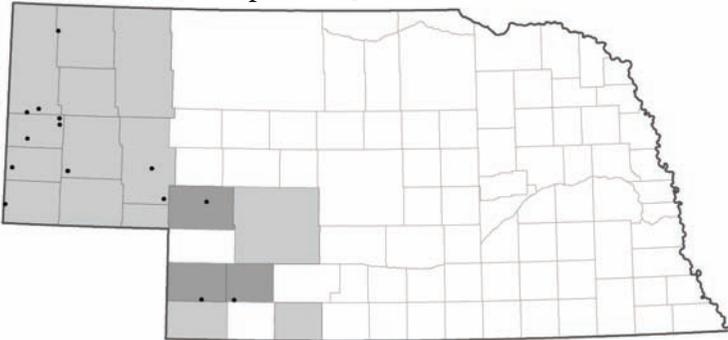
Map 61 *Melanoplus keeleri* (Thomas)



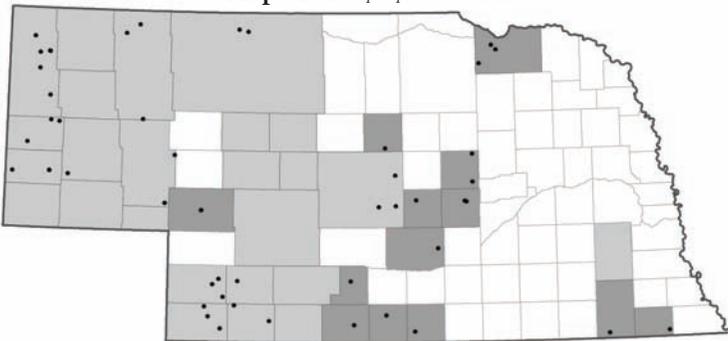
Map 62 *Melanoplus lakinus* (Scudder)



Map 63 *Melanoplus occidentalis* (Thomas)



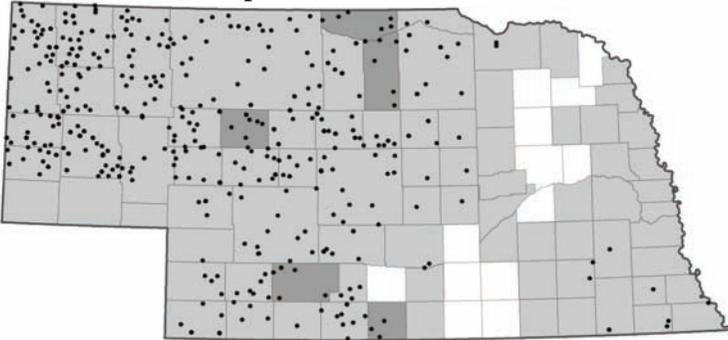
Map 64 *Melanoplus packardii* Scudder



Map 65 *Melanoplus punctulatus* Scudder



Map 66 *Melanoplus sanguinipes* (Fabricius)



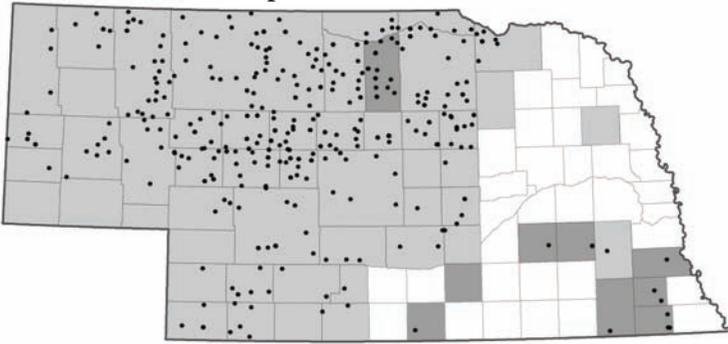
Map 67 *Melanoplus scudderi* (Uhler)



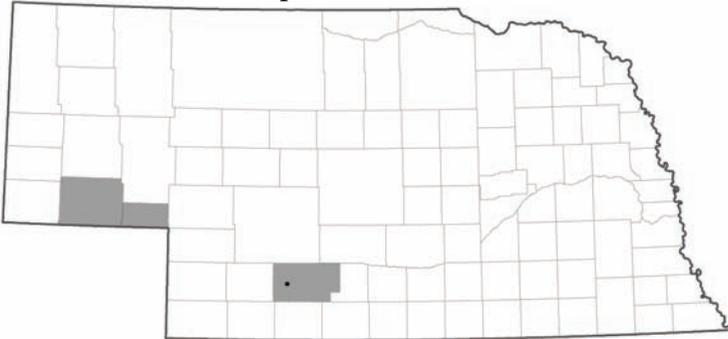
Map 68 *Melanoplus walshii* Scudder



Map 69 *Mermiria bivittata* (Serville)



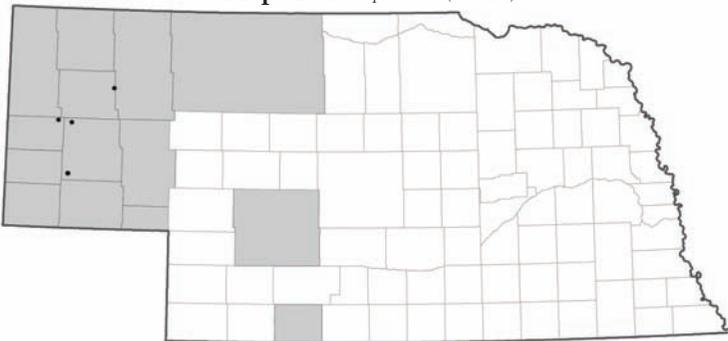
Map 70 *Mermiria picta* (Walker)



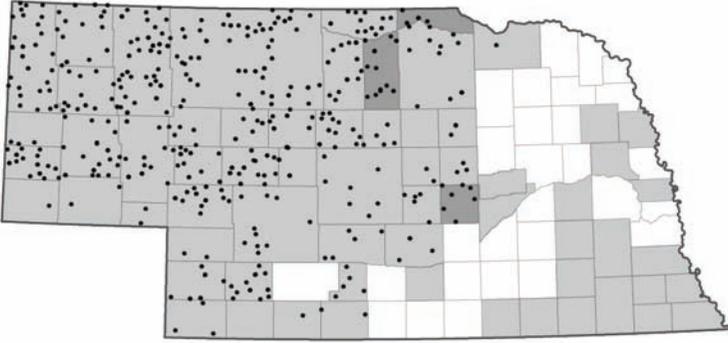
Map 71 *Mestobregma plattei* (Thomas)



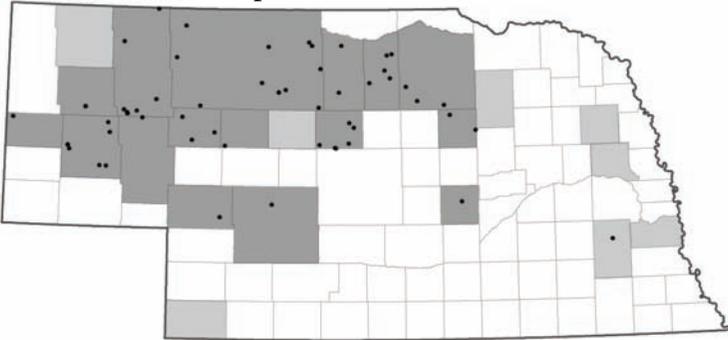
Map 72 *Metator pardalimus* (Saussure)



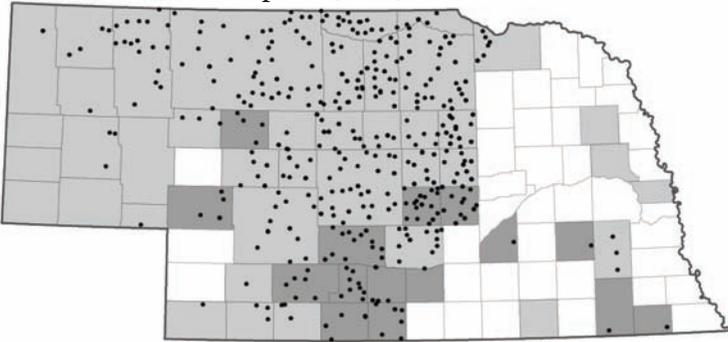
Map 73 *Opeia obscura* (Thomas)



Map 74 *Orphulella pelidna* (Burmeister)



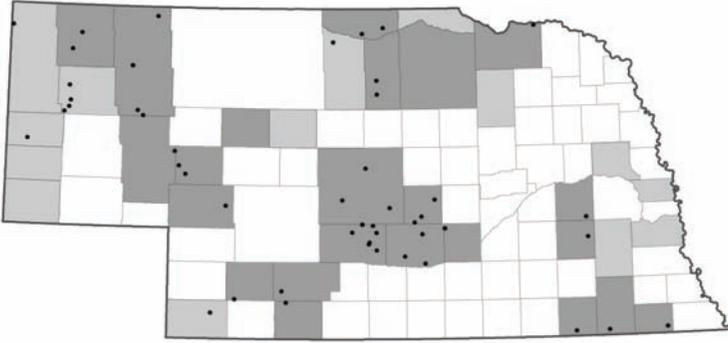
Map 75 *Orphulella speciosa* (Scudder)



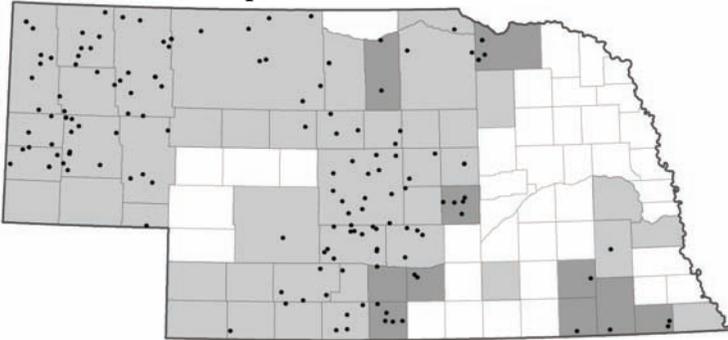
Map 76 *Paratylotropidia brunneri* Scudder



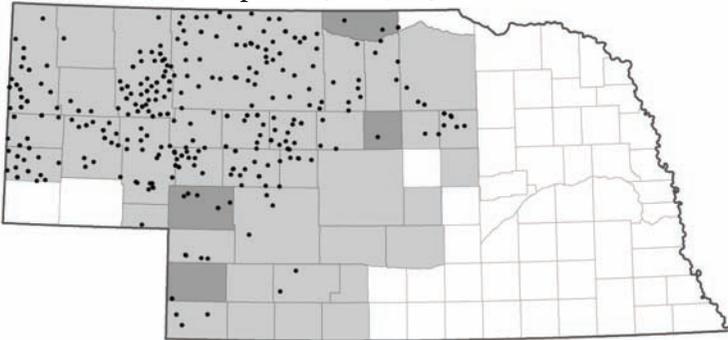
Map 77 *Pardalophora apiculata* (Harris)



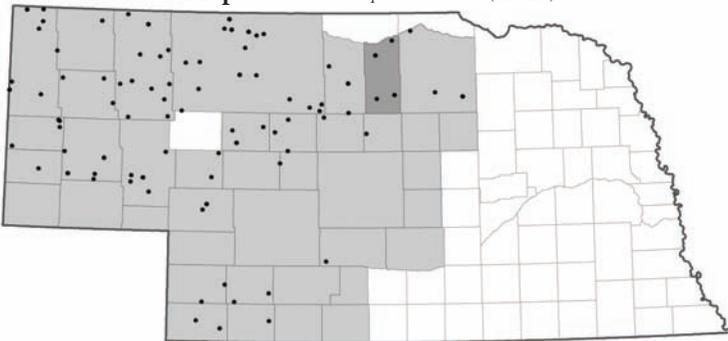
Map 78 *Pardalophora haldemani* (Scudder)



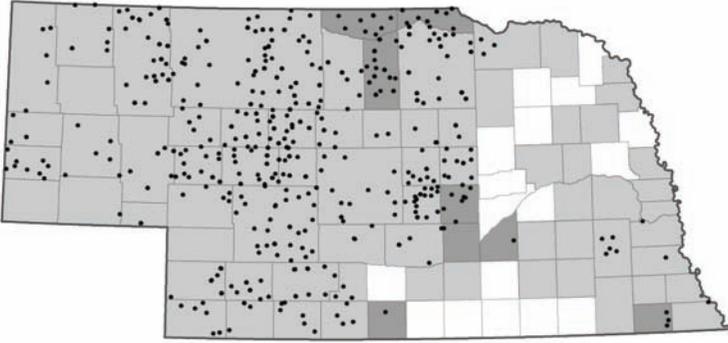
Map 79 *Paropomala wyomingensis* (Thomas)



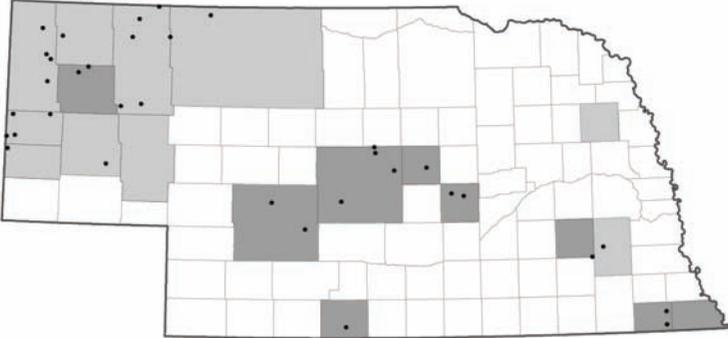
Map 80 *Phlibostroma quadrimaculatum* (Thomas)



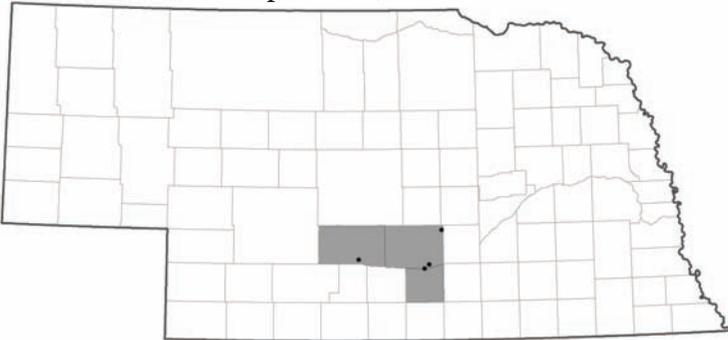
Map 81 *Photaliotes nebrascensis* (Thomas)



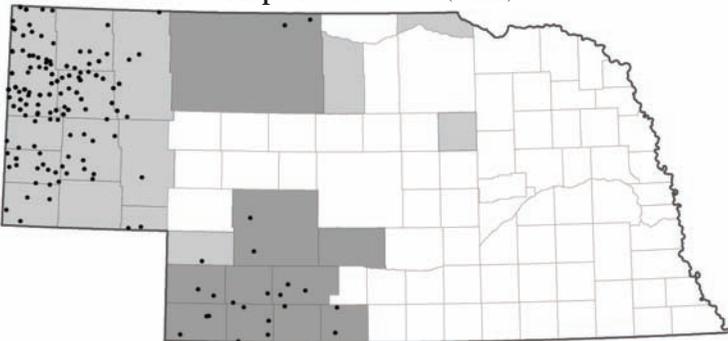
Map 82 *Pseudopomala brachyptera* (Scudder)



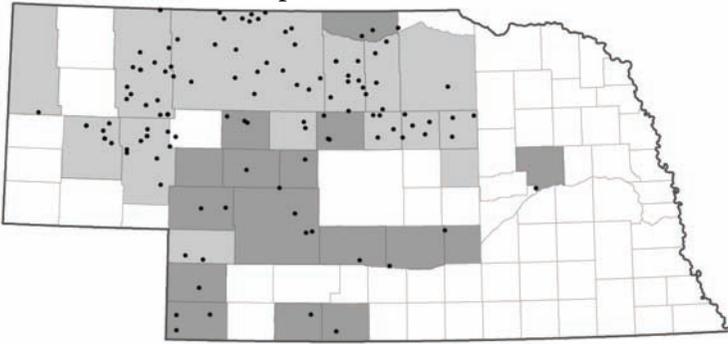
Map 83 *Psinidia fenestralis* (Serville)



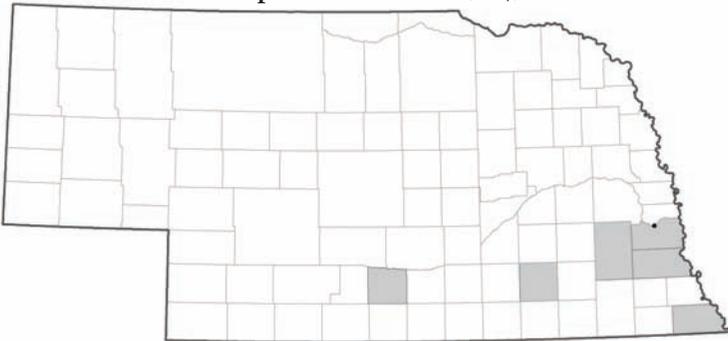
Map 84 *Psoloessa delicatula* (Scudder)



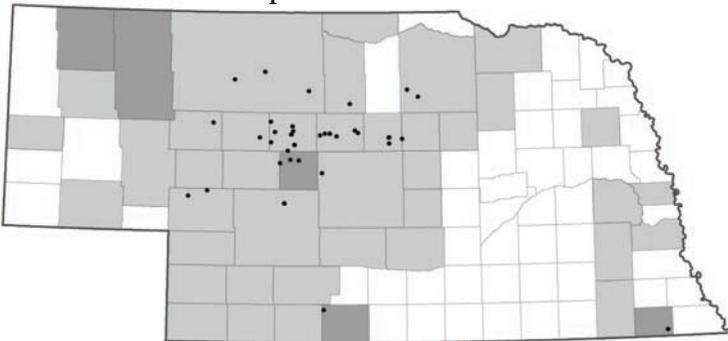
Map 85 *Psoloessa texana* Scudder



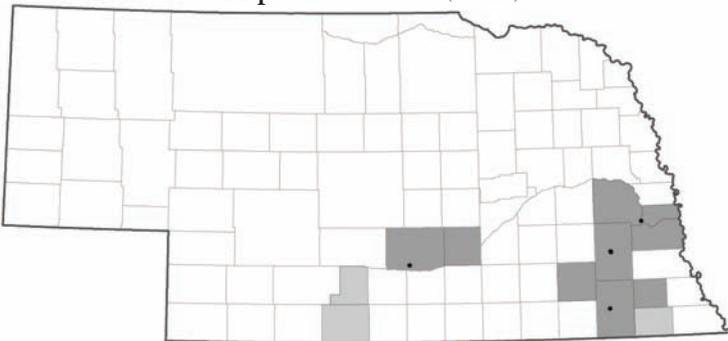
Map 86 *Schistocerca americana* (Drury)



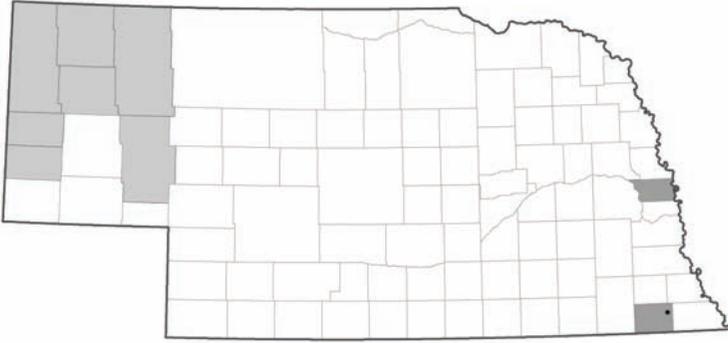
Map 87 *Schistocerca lineata* Scudder



Map 88 *Schistocerca obscura* (Fabricius)



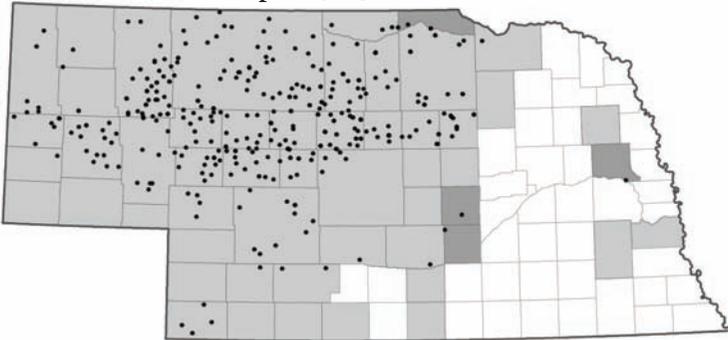
Map 89 *Spharagemon bolli* Scudder



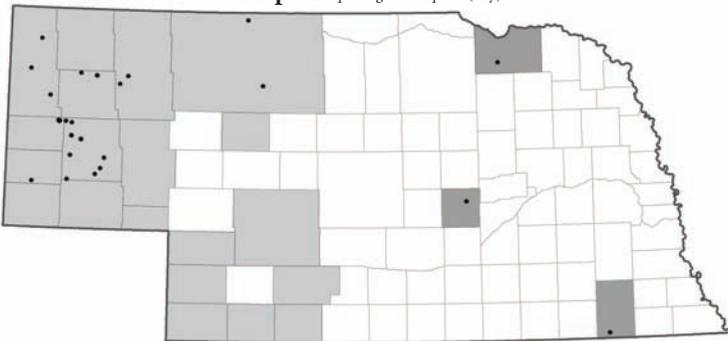
Map 90 *Spharagemon campestris* (McNeill)



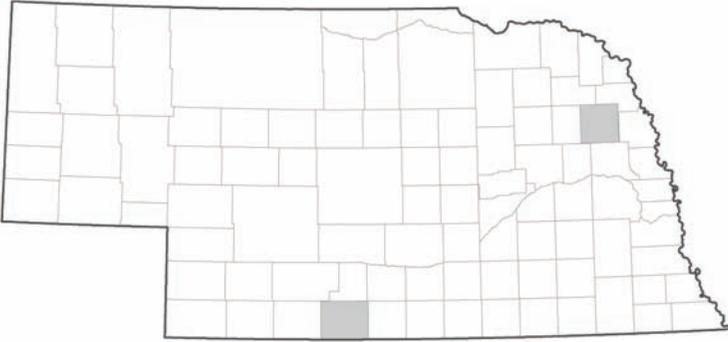
Map 91 *Spharagemon collare* (Scudder)



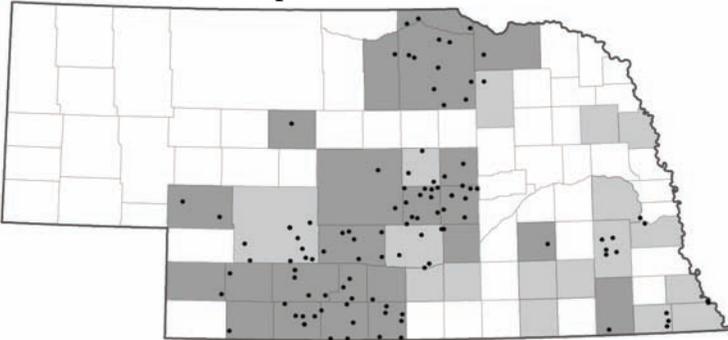
Map 92 *Spharagemon equale* (Say)



Map 93 *Stethophyma celata* Otte



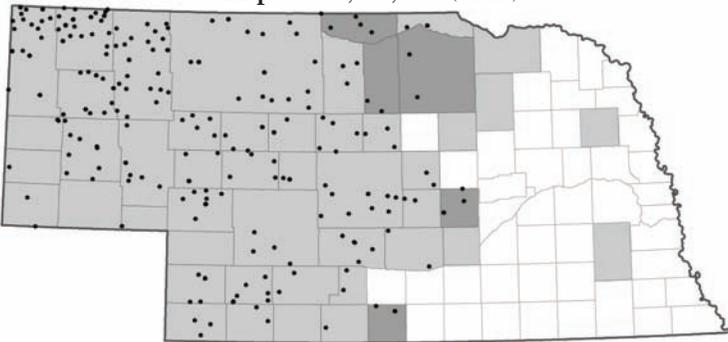
Map 94 *Syrbula admirabilis* Uhler



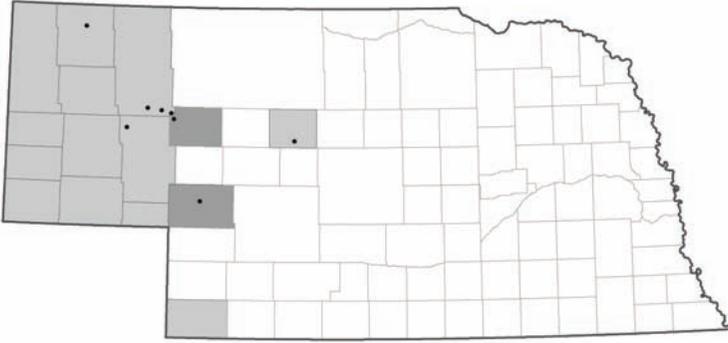
Map 95 *Trachyrhachys aspersa* Scudder



Map 96 *Trachyrhachys kiowa* (Thomas)



Map 97 *Trimerotropis agrestis* McNeill



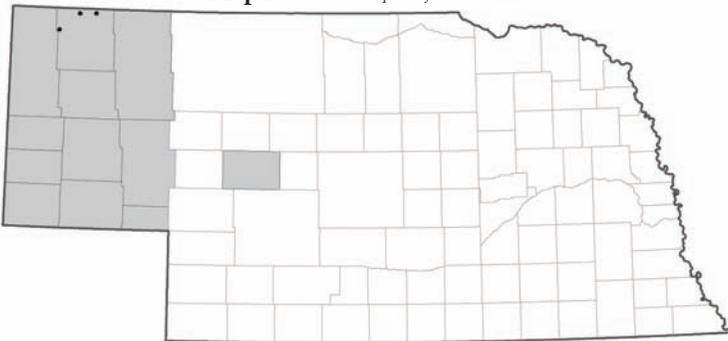
Map 98 *Trimerotropis cincta* (Thomas)



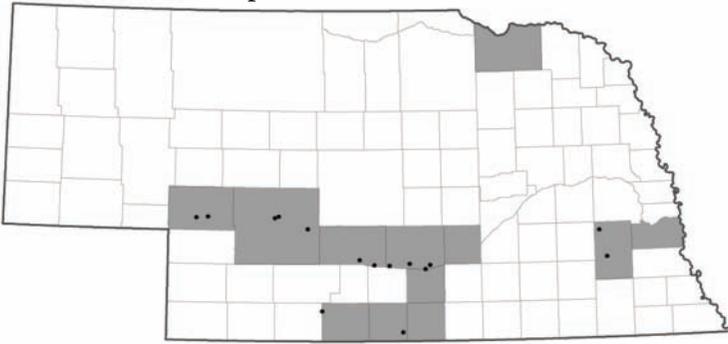
Map 99 *Trimerotropis fratercula* McNeill



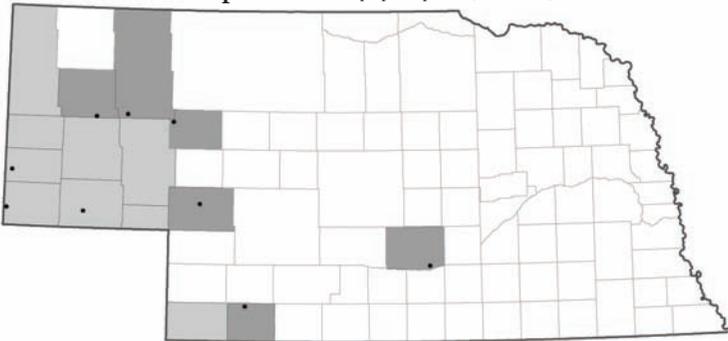
Map 100 *Trimerotropis latifasciata* Scudder



Map 101 *Trimerotropis maritima* (Harris)



Map 102 *Trimerotropis pallidipennis* (Burmeister)



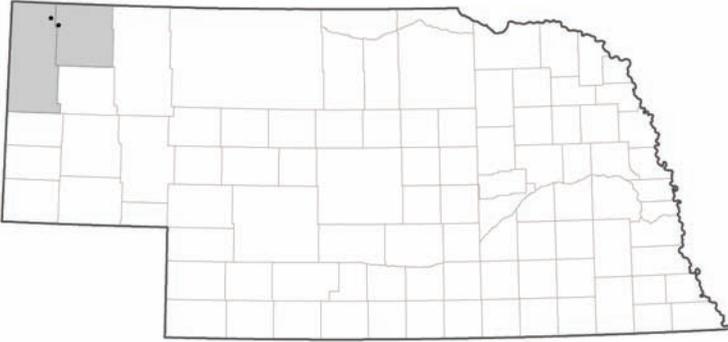
Map 103 *Trimerotropis pistrinaria* Saussure



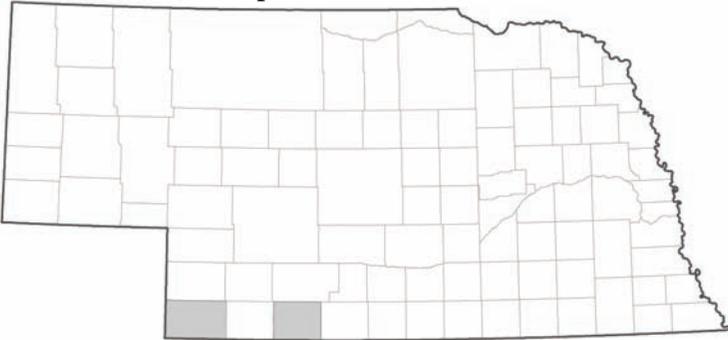
Map 104 *Trimerotropis salina* McNeill



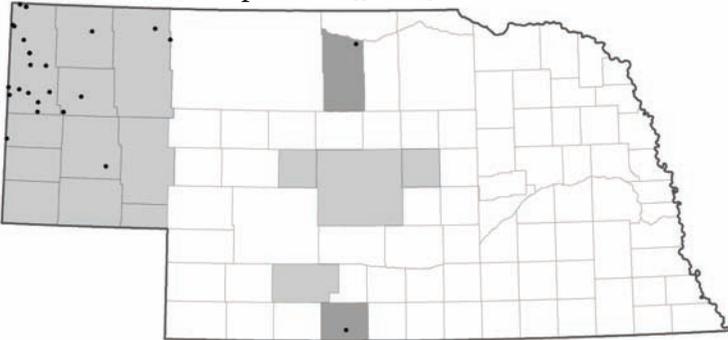
Map 105 *Trimerotropis sparsa* (Thomas)



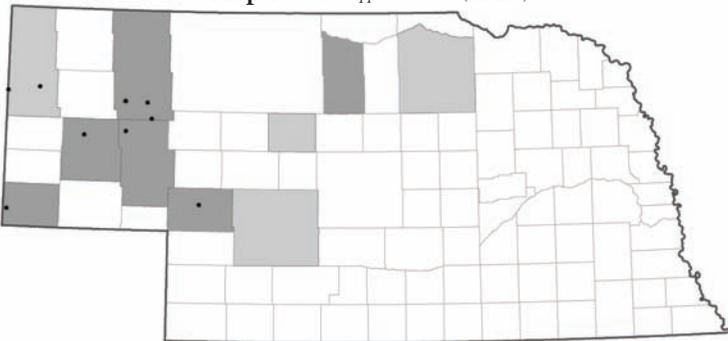
Map 106 *Tropidolophus formosus* (Say)



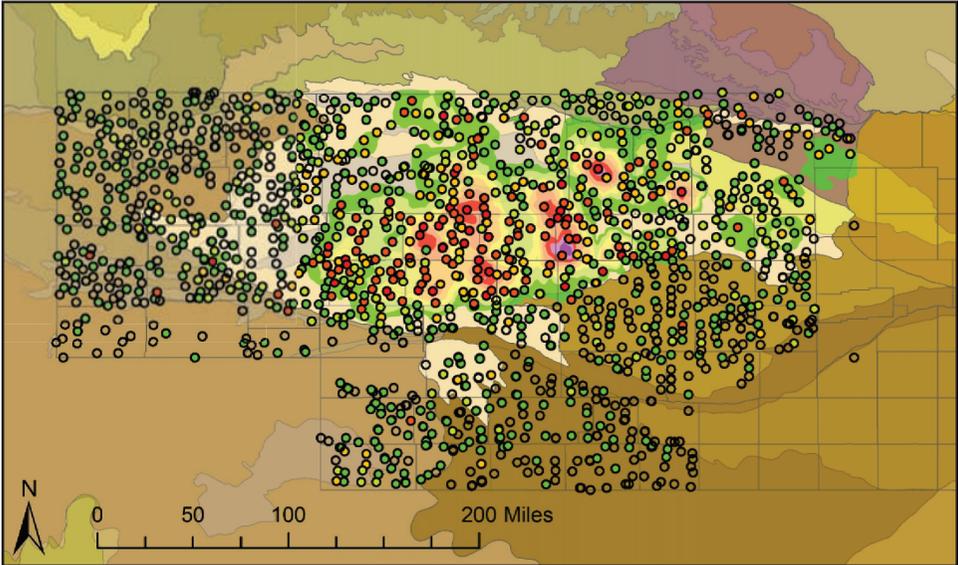
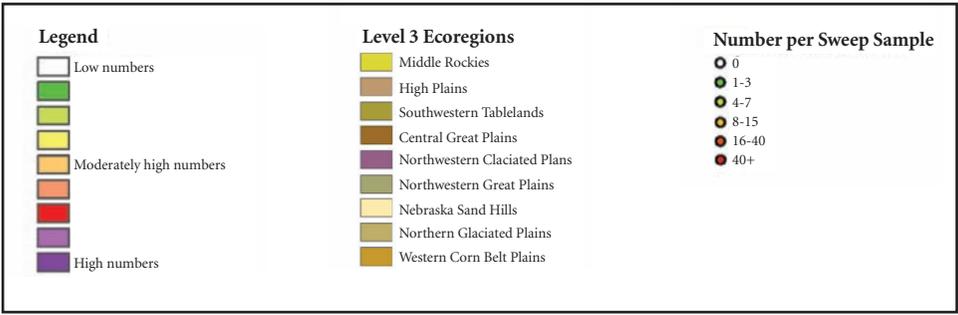
Map 107 *Xanthippus corallipes* (Haldeman)



Map 108 *Xanthippus montanus* (Thomas)



Whitewhiskers Density Map 2005-2007



Glossary

anterior: Referring to the front portion or toward the front.

basal: Toward the base of a structure.

clavate: Club-shaped.

distal: Toward the end or tip of a structure.

dorsal: Referring to the top portion or toward the top.

ensiform: Sword-shaped.

filiform: Filament-shaped.

lateral: Referring to the side.

lateral carina: One of two ridges, each occurring on either side of the dorsal pronotum.

lateral foveolae: A pair of pit-like structures occurring on the inner sides of the eyes and immediately above the antennae.

median carina: A ridge occurring on the midline of the dorsal pronotum.

posterior: Referring to the rear portion or toward the rear.

pronotum: The dorsal part of the thorax made up of the first thoracic segment which largely hides the other thoracic segments.

prosternum: The first ventral thoracic segment, immediately behind the head. This is the location at which a spur occurs in the spur-throated grasshoppers.

sulcus (*pl. sulci*): A narrow groove, most often seen on the pronotum of grasshoppers.

tegmen (*pl. tegmina*): The leathery forewing of Orthoptera (grasshoppers and related insects).

ventral: Referring to the bottom portion or toward the bottom.

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