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A Comprehensive Catalog of the
**Common Grasshoppers in the
Treasure Valley**





BUL 1137

A Comprehensive Catalog of the Common Grasshoppers in the Treasure Valley

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Introduction

ALMOST FOUR HUNDRED GRASSHOPPER SPECIES are known to occur in the western United States; Idaho is home to approximately forty of them. The Treasure Valley, located in southwestern Idaho, is a good draw, given its significant agricultural output, particularly in seed and specialty crops, vegetables, and cereals. Indeed, grasshoppers have been recognized as pests in southern Idaho since the 1920s (Fluharty 1921; Whitehead 1925) and likely will continue to be an issue across the northwestern United States (Willmore et al. 2020), where cereal and other agricultural production is strong.

Grasshoppers are members of the taxonomic order Orthoptera, which is further divided into two suborders: Caelifera and Ensifera. Those in the suborder Ensifera are known as long-horned grasshoppers or, more commonly, camel crickets, true crickets, and katydids. Caelifera, however, contains the common grasshoppers, bush crickets, and pygmy mole crickets. The family Acrididae (short-horned grasshoppers) is by far the most common among Caelifera, comprising ten thousand of the eleven thousand known species worldwide (Pfadt 2002). This family contains six subfamilies in North America, four of which occur across southern Idaho: 1) Cyrtacanthacridinae—bird grasshoppers, 2) Gomphocerinae—slant-faced grasshoppers, 3) Melanoplinae—spur-throated grasshoppers, and 4) Oedipodinae—band-winged grasshoppers. Although most Treasure Valley species do not have noticeable economic import, some species, namely the two-striped grasshopper (*Melanoplus bivittatus*), the red-legged grasshopper (*M. femurrubrum*), the clear-winged grasshopper (*Camnula pellucida*), and the migratory grasshopper (*M. sanguinipes*), can devastate crops and grasslands (Willmore et al. 2020).



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Acridid grasshopper species (hereafter treated as grasshoppers) share a similar life history, beginning with eggs and progressing through nymphal stages to adulthood. Unlike holometabolous insects, they lack a larval or pupal stage. In most species, eggs buried in pods (containing a few to over one hundred eggs) in the soil hatch in the spring. The **nymphs** (juveniles), which look like miniature adults without wings, feed on grasses and other plants. Nymphs generally undergo five development stages (instars) before becoming adults. Depending on the species, it takes about forty-five days for the nymphs to develop into adults, which appear mostly in the summer. The adults then breed and lay eggs throughout the summer until the first frost kills those remaining in the fall (Otte 1981, 1984).

In Idaho, there is a knowledge gap regarding how to distinguish grasshopper species. Although some resources for species identification in this region exist (e.g., Hewitt and Barr 1967; Pfadt 2002), most of the literature is outdated and lacks pictures. This catalog addresses these limitations. Organized alphabetically by subfamily and genus, it provides information about the morphology, distribution, feeding habits, and habitat preferences of twenty-four species of grasshoppers in the state, including photographs of each one's sex.

General Grasshopper Anatomy

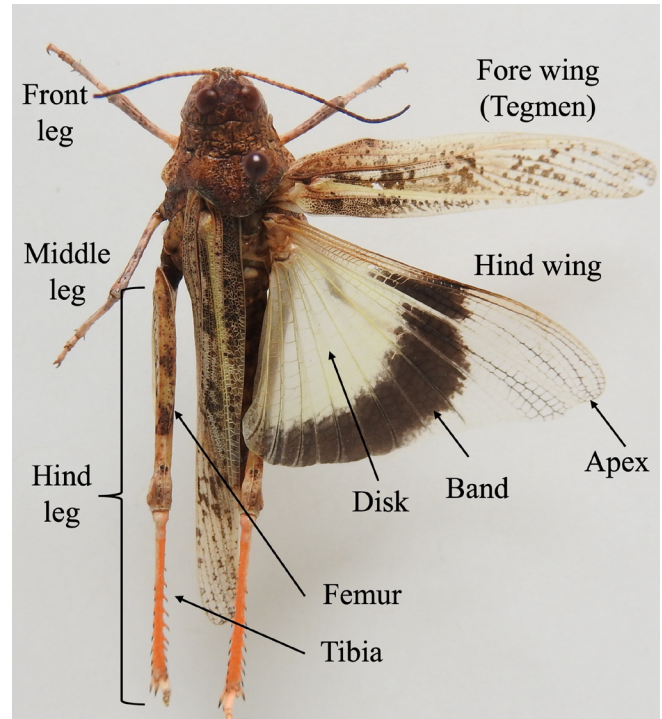


Figure 1. Grasshopper anatomy—dorsal view.

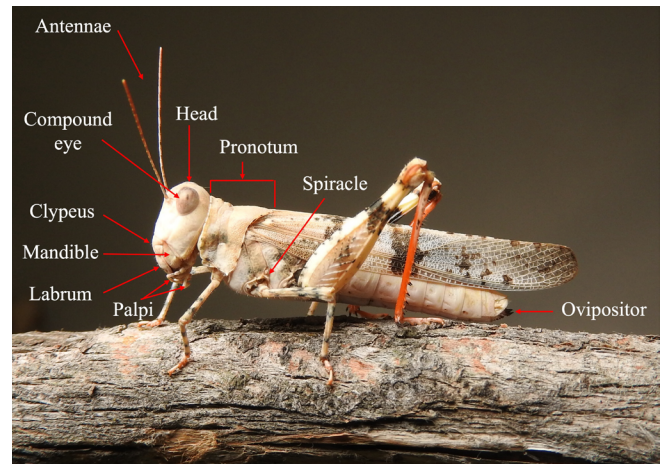


Figure 2. Grasshopper anatomy—lateral view.

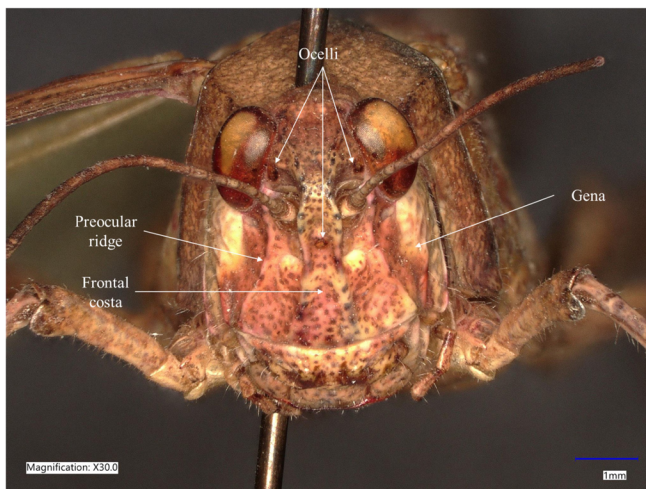


Figure 4. Grasshopper anatomy—head details.

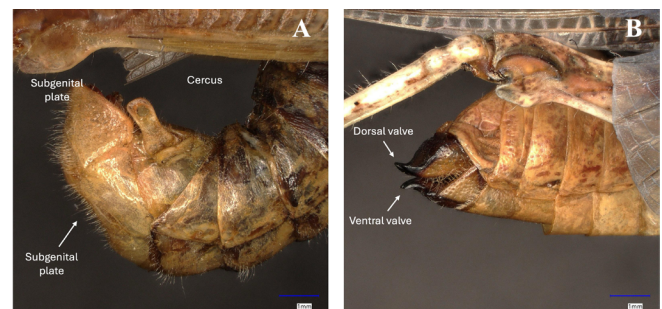


Figure 3. Grasshopper anatomy—male (A) and female (B) genitalia.

Glossary of Terms

femora. The third segment of a leg, usually the largest and thickest one.

hemimetabolous. An insect without a pupal stage in its development to adulthood.

holometabolous. An insect with a pupal stage in its development to adulthood.

polyphagous. An animal that feeds on many kinds of foods (plants, in this context).

pronotum. The dorsal plate covering the first segment of a thorax.

subgenital plate. The last sclerite (a hard chitinous or calcareous plate) on the abdomen beneath the genital organs.

tegmen (plural, tegmina). The forewings of a grasshopper or cricket.

tibia. The fourth segment of a leg.

List of Species Commonly Found in the Treasure Valley

Subfamily Cyrtacanthacridinae

Schistocerca lineata:

Spotted Bird Grasshopper

Subfamily Gomphocerinae

Amphitornus coloradus:

Striped Slant-Faced Grasshopper

Aulocara elliotti:

Big-Headed Grasshopper

Cordillacris occipitalis:

Spotted-Winged Grasshopper

Pseudopomala brachyptera:

Bunchgrass Locust

Psoloessa delicatula:

Brown-Spotted Range Grasshopper

Subfamily Melanoplinae

Hesperotettix viridis:

Snakeweed Grasshopper

Melanoplus bivittatus:

Two-Striped Grasshopper

Melanoplus cinereus:

Grayish Sagebrush Grasshopper

Melanoplus femurrubrum:

Red-Legged Grasshopper

Melanoplus packardii:

Packard's Grasshopper

Melanoplus sanguinipes:

Migratory Grasshopper

Oedaleonotus enigma:

Valley Grasshopper

Subfamily Oedipodinae

Arphia pseudonietana:

Red-Winged Grasshopper

Camnula pellucida:

Clear-Winged Grasshopper

Conozoa sulcifrons:

Groove-Headed Grasshopper

Dissosteira carolina:

Carolina Locust

Dissosteira spurcata:

Spurcate Grasshopper

Spharagemon equale:

Say's Grasshopper

Trachyrhachys kiowa:

Kiowa Grasshopper

Trimerotropis agrestis:

Toothed Field Grasshopper

Trimerotropis californica:

Strenuous Grasshopper

Trimerotropis pallidipennis:

Pallid-Winged Grasshopper

Trimerotropis pseudofasciata:

Cerulean-Winged Grasshopper

Subfamily Cyrtacanthacridinae

Members of the subfamily Cyrtacanthacridinae are known as the bird grasshoppers or sometimes simply as birdwings. Like the spur-throated grasshoppers (subfamily Melanoplinae), birdwings also possess a small projection (spur) at the base of their throat in-between the forelegs (Figure 5). They are often the largest grasshoppers in their environment and have large wings that enable them to fly for miles if needed.

Highlights

- Most American birdwings are between 1½ inches and 2½ inches long in total length.
- One native genus exists within the United States: *Schistocerca*.
- The Treasure Valley is home to one species of birdwing: the spotted bird grasshopper.
- Males are significantly smaller than females, often only half their size.
- Most species feed on a vast number of plants.
- This subfamily includes Africa's desert locust, the only Old World member of the genus *Schistocerca*.

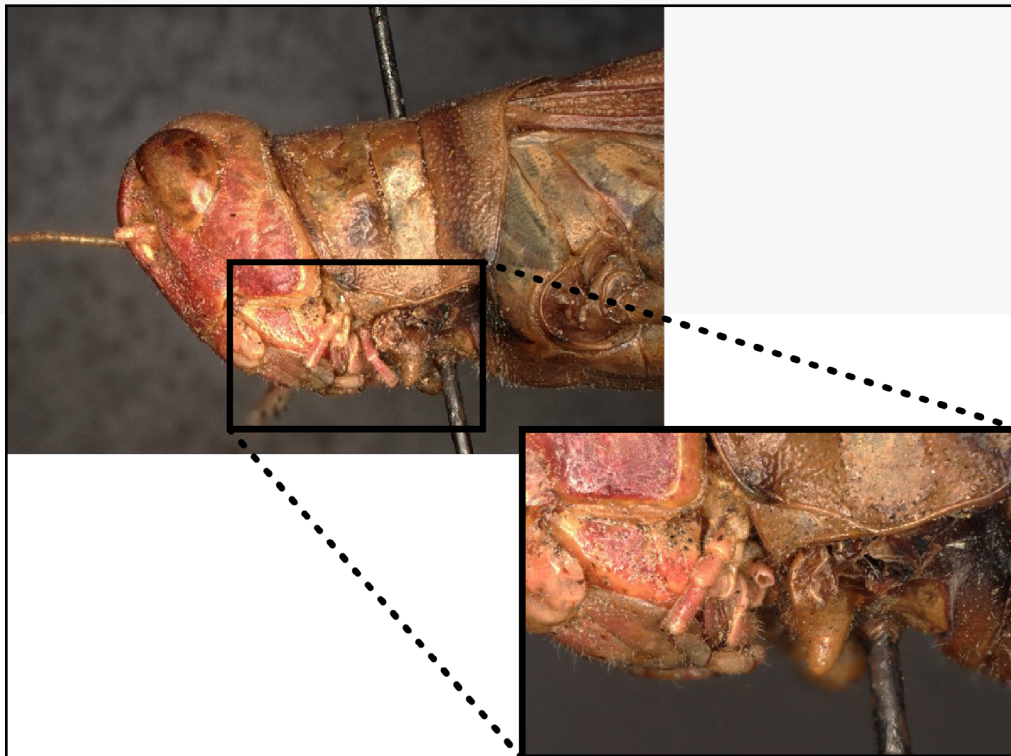


Figure 5. Spur projection.

Common Name:

Spotted Bird Grasshopper

Scientific Name: *Schistocerca lineata* (Scudder 1899)

Description: The spotted bird grasshopper is a large, streamlined grasshopper with long wings that enable long-distance flight. Males are usually 1½–2 inches long, while females typically range between 1¾ inches and 2¼ inches in total length. Males have enlarged femora and antennae. There are several different color morphs of this species, although only one occurs in Idaho. These are known as the “Venusta” morph. Spotted “Venusta” bird grasshoppers in Idaho are green in color, with red hind tibiae, blue-gray or brown eyes, and a yellow dorsal stripe running from the forehead down to the end of the wings. Some individuals are dark green with brown forewings, while others are lighter green or teal blue-green with gray or tan forewings. Some darker individuals have dark crossbands on the top of their hind femora.

Habitat: Spotted bird grasshoppers are not picky about their habitat preferences, but can usually be found resting on shrubs, both native and ornamental. In the wild, these grasshoppers prefer drier, hilled areas with sparsely scattered shrubs.

Host Plants: This is possibly the most polyphagous grasshopper species in the Treasure Valley. In the wild, it feeds on native shrubs such as antelope bitterbrush (*Purshia tridentata*), Woods’ rose (*Rosa woodsii*), and dogwood (*Cornus* spp.), as well as on non-native species such as Russian olive (*Elaeagnus angustifolia*), Siberian elm (*Ulmus pumila*), and blackberry (*Rubus* spp.). Plants within the order Rosales seem to be especially favored. Many ornamental plants and some crops are host plants as well, such as mint (*Mentha* spp.) and sage (*Salvia* spp.).

Life Cycle: One generation develops per year in the Treasure Valley. Nymphs hatch in the spring and mature slowly. The first adults, usually males, mature in July, though some mature as late as August or later. Eggs are laid from August until the frost late in October.



Figure 6. Spotted bird grasshopper.

Distribution in Idaho: This species is the most widely distributed birdwing grasshopper in the United States. Spotted bird grasshoppers are found in the southern half of Idaho, aside from the mountainous areas, and along the river canyons of Idaho’s western border as far north as Lewiston.

Subfamily Gomphocerinae

Subfamily Gomphocerinae or the slant-faced grasshoppers is a unique group of grasshoppers characterized in most cases by long, slim bodies and a projecting forehead, which gives them their name. The males of many species make a scratchy “click” or chirp, often resembling the call of a cricket or katydid, by rubbing a spur on the inside of their hind leg over their wings. They rely primarily on camouflage to evade predators; many species cannot jump or fly far, if at all.

Highlights

- Most species are small to medium-sized grasshoppers, usually ½–1½ inches in total length.
- Grasses are the primary food for most slant-faced grasshoppers, with many species feeding on nothing else.
- Some species are highly elongated, so much so that they resemble slender sticks.
- The males of some species have flattened, feather-like antennae.
- Many species have short wings and do not readily attempt flight.

Common Name:

Striped Slant-Faced Grasshopper

Scientific Name: *Amphitornus coloradus*
(Thomas 1873)

Description: This is a small, colorful grasshopper, typically $\frac{3}{4}$ –1 inch long in total length. Its wings usually extend to the end of the abdomen or just beyond. It is light brown or tan in color, with two brown stripes running down from the forehead through the pronotum and onto the outside face of the forewings. This leaves a light tan dorsal stripe running down the length of the grasshopper to the ends of the wings. Its hind wings are clear. Two small, white stripes often run from the bottom of the eye to the end of the thorax. Three dark crossbars appear on the top of the hind femora and the hind tibiae are blue or light gray.

Habitat: This grasshopper favors hills and open areas dominated by bunchgrasses. Since it relies on perennial bunchgrasses, this grasshopper is mainly found in dry areas.

Host Plants: Native bunchgrasses are this grasshopper's primary food.

Life Cycle: Striped slant-faced grasshopper nymphs hatch in the spring and feed on grasses. The nymphs mature quickly and adults appear as early as June. Adults breed and lay eggs until they die when the frost comes in the fall.

Distribution in Idaho: This is a grassland species found scattered across most of the western states. Within Idaho, it exists primarily in the Snake River Plain in the southern half of the state.



Figure 7. Striped slant-faced grasshopper.

Gomphocerinae

Common Name:

Big-Headed Grasshopper

Scientific Name: *Aulocara elliotti* (Thomas 1870)

Description: The big-headed grasshopper is a medium-sized grasshopper, typically $\frac{3}{4}$ – $1\frac{1}{4}$ inches in length, with a very large head. Its wings are not very long and sometimes do not reach the end of the abdomen. It is brown or gray in overall color, with either a dark patch behind the eye and side of the pronotum (or a dorsal stripe on the forewings and head) and a white “X” on top of the pronotum. Two dark crossbars appear on the hind femora and the hind tibiae are blue. The hind wings are clear or very lightly tinged blue. Its antennae are very long for its size, sometimes in males almost as long as the total body length.

Habitat: Rangelands dominated by perennial grasses are a favorable habitat for this grasshopper. Within the Treasure Valley, it exists primarily in undisturbed rangeland and desert areas that are dominated by grasses. It is common in the foothills surrounding the valley.

Host Plants: Grasses are the preferred host plants of this species. It feeds on both native and non-native monocots, such as wheat. It is not often a crop pest, but in certain years it can reach populations that cause damage.

Life Cycle: Nymphs hatch in the spring and feed primarily on grasses in open, sandy areas. Adults appear in June, breed, and lay eggs until death or the fall frost.

Distribution in Idaho: Big-Headed grasshoppers have a scattered distribution across the western United States. This is a common species in the southern half of the state, where it exists primarily in the deserts and rangelands of the Snake River Plain.



Figure 8. Big-Headed grasshopper.

Common Name:

Spotted-Winged Grasshopper

Scientific Name: *Cordillacris occipitalis*
(Thomas 1873)

Description: Spotted-winged grasshoppers are small, thin grasshoppers with wings that extend past the tip of the abdomen. This grasshopper is typically ½–1 inch long. It is either green-bodied with tan or yellow legs and forewings or tan-bodied with tan or yellow legs and forewings. Its hind wings are clear. The forehead is slightly pushed out, typical of a slant-faced grasshopper, and the antennae are short. Usually a dark brown stripe appears on the side of the pronotum, bordered by white on top of the pronotum that curves down to the sides of the forewings. Several small, white spots often appear in this brown stripe on the forewings, which give this grasshopper its name.

Habitat: This grasshopper favors habitats with bunchgrasses and other perennial grasses. Open rangeland is a good habitat. Hence, this species is found in dry, open areas dominated by perennial grasses. It does not inhabit urban or suburban areas within the valley, but lives in grassy desert areas.

Host Plants: Like many other slant-faced grasshopper species, this species feeds on grasses in its habitat.

Life Cycle: Nymphs hatch in the spring and feed on grasses. Adults appear in July and August, breed, and lay eggs until the coming of the fall frost.

Distribution in Idaho: This is a grasshopper that exists in sparse populations scattered across bunchgrass communities in almost every western state. It is absent from the mountainous regions of Idaho but is found in many of the lower elevation areas.



Figure 9. Spotted-Winged grasshopper.

Gomphocerinae

Common Name:

Bunchgrass Locust

Scientific Name: *Pseudopomala brachyptera*
(Scudder 1863)

Description: The bunchgrass locust is a very slender grasshopper that typically ranges from 1¼ to 1¾ inches in length. Its overall color is gray or brown; some individuals have a dark patch on the side of the pronotum that extends from behind the eye. It has very short wings that cannot support flight. Males have enlarged forewings that extend almost halfway down the abdomen, but the hind wings underneath are reduced. The forehead pushes out into an exaggerated point, so much so that the face slants down at roughly a 45° angle. The antennae are thick and flattened.

Habitat: This grasshopper is restricted to areas with perennial grasses. It relies on camouflage primarily for survival and remains within the grass, particularly open, grass-dominated areas in the Treasure Valley. It can become common in the lower foothills, where large populations of native bunchgrass grow.

Host Plants: Native perennial bunchgrasses are the favored food of this species.

Life Cycle: Nymphs hatch in the spring and live and feed on grasses. Adults mature in June and breed and lay eggs until death.

Distribution in Idaho: The bunchgrass locust is very widespread in North America. It is found in areas throughout the United States that support populations of perennial grasses. In Idaho, it is found in these areas throughout the state, except for the higher mountainous regions.



Figure 10. Bunchgrass locust.

Common Name:

Brown-Spotted Range Grasshopper

Scientific Name: *Psoloessa delicatula* (Scudder 1876)

Description: The brown-spotted range grasshopper is a medium-sized grasshopper, typically ranging from $\frac{3}{4}$ to $1\frac{1}{4}$ inches in total length. It has long wings that extend past the end of the abdomen, which allows this species to fly quite well. It is highly variable in coloration, but is typically gray or brown in overall color with two dark, triangle-shaped markings on the top of the hind femora and its hind tibiae are red. Some individuals have red coloration on the top of their abdomen, while others have light markings, stripes, or brown spots on the pronotum and forewings. The hind wings are clear. A common mark is a light X-shaped mark on the top of the pronotum. The head only slightly slants downward, making this species closer in shape to the head of most *Melanoplus* spp. than other slant-faced grasshoppers. This species can be distinguished from an early *Melanoplus* individual by the lack of a spur at the base of its throat.

Habitat: Brown-Spotted range grasshoppers prefer areas dominated by grasses. The foothills and rangelands surrounding the urban centers within the valley are good habitat for this species. It is found in the dry, open areas within the Treasure Valley. It is not typically found in urban areas.

Host Plants: This species feeds primarily on native grasses.

Life Cycle: This species is one of the earliest species to mature to adulthood in Idaho. Adults can be observed by the beginning of June and often do not live long after breeding and laying eggs soon thereafter.

Distribution in Idaho: This is a very widespread grasshopper in the western states. In Idaho, brown-spotted range grasshoppers are found in the grass-dominated rangelands of the state.



Figure 11. Brown-Spotted range grasshopper.

Subfamily Melanoplinae

Subfamily Melanoplinae, commonly known as the spur-throated grasshoppers, is a large group of thick-bodied insects often equipped with very large jumping legs. They are named after a short projection or “spur” located in between the first pair of legs at the base of the insects’ throat. Spur-Throated grasshoppers are often the largest and most common grasshoppers in Idaho, aside from the spotted bird grasshopper.

Highlights

- Spur-Throats are commonly ½–1½ inches in total length.
- Most are powerful jumpers but cannot fly very far.
- Many species have short wings that are useless for flight.
- Spur-Throats are thick grasshoppers, often with large heads and box-shaped pronota.
- Most spur-throats are highly polyphagous and feed on both grasses and broadleaf plants.
- Some species in Idaho, such as migratory, two-striped, and red-legged grasshoppers, can become crop pests in certain years. Legumes and grasses are among the most favored host plants for these species.
- Others, such as the snakeweed grasshopper, are highly specialized feeders and eat only a small number of native shrubs, such as rabbitbrush and snakeweed.

Common Name:

Snakeweed Grasshopper

Scientific Name: *Hesperotettix viridis* (Thomas 1872)

Description: Snakeweed grasshoppers are small grasshoppers, on average between ½ and 1 inch long, with short wings that usually extend only to the end of the abdomen or just before. It is a very colorful species, usually green, brown, or orange bodied, with red and blue legs and usually five white stripes and four black stripes on the head and thorax. Most individuals in the Treasure Valley have black and white markings around the edges of their body segments. A single white stripe bordered on both sides by black stripes often runs down the center of the head and thorax. The wings are clear or very lightly shaded the same color as the body.

Habitat: Snakeweed grasshoppers are usually found resting on their host plants. Rabbitbrush and snakeweed grow mainly in the foothills and desert surrounding the valley and, as a result, grasshoppers usually restrict themselves to these regions. This grasshopper is found mostly in the foothills and desert canyonlands surrounding the valley. It is not commonly seen in urban or suburban areas within the Pacific Northwest.

Host Plants: This grasshopper feeds mostly on perennial shrubs in the family Asteraceae in this region, especially rabbitbrush (genus *Ericameria*) and snakeweed (genus *Gutierrezia*). It is not a pest of crops or ornamental plants.

Life Cycle: It produces one generation per year in this region. Nymphs hatch in the spring and mature by June and July. Adults breed and lay eggs until the fall frost comes.

Distribution in Idaho: Snakeweed grasshoppers are found in the desert plains and foothills of the southern half of the state.



Figure 12. Snakeweed grasshopper.

Melanoplinae

Common Name:

Two-Striped Grasshopper

Scientific Name: *Melanoplus bivittatus* (Say 1825)

Description: A large, stocky grasshopper, usually between 1 and 2 inches long, with wings that do not usually reach past the tip of the abdomen. It has an overall boxy shape and is rather clumsy in its movements. Its overall color is tan, with brown tegmina and yellowish legs. The top of both the head and thorax is dark brown, with two yellow stripes running from the forehead down the top of the thorax to the tip of the wings. There are usually two yellow cross stripes on the top of the hind femora. This is one of the most common grasshoppers in Idaho.

Habitat: This species is found anywhere in the region, but is especially common where grasses and broadleaf plants grow together. It is found in both urban and rural areas within the Treasure Valley and often on ornamental plants and crops, as well as on native plants in undisturbed areas.

Host Plants: Highly polyphagous, this species feeds on many native and non-native plants, but especially on plants in the mint family (Lamiaceae) and pea family (Fabaceae).

Life Cycle: It produces one generation per year in Idaho. Nymphs hatch in the spring and mature by June and July. Adults lay eggs in pods underground until the frost kills the last remaining ones.

Distribution in Idaho: This is a common grasshopper found throughout the state, except on high mountain peaks.



Figure 13. Two-Striped grasshopper.



Figure 14. Grayish sagebrush grasshopper.

Common Name:

Grayish Sagebrush Grasshopper

Scientific Name: *Melanoplus cinereus* (Scudder 1878)

Description: Grayish sagebrush grasshoppers are averaged-sized grasshoppers, very similar in size and appearance to both *M. sanguinipes* and *M. femurrubrum*. Adults in Idaho are typically $\frac{3}{4}$ – $1\frac{1}{4}$ inches in total length and are slightly slenderer and more streamlined than the latter two species. They have long wings that reach past the end of the abdomen. True to its name, it is light gray in overall color, very similar to the color of sagebrush bark. Its pronotum and legs are tinged brown and a black blotch extends on the side of the pronotum from behind the eye to the forewing. Two or three dark crossbars span the top and outside face of the hind femora and the hind tibiae are light blue or gray. Its hind wings are clear. Males are differentiated from male *M. sanguinipes* by their subgenital plate's lack of a notch and from male *M. femurrubrum* by the plate's shape (it does not round down but instead ends in a dull point).

Habitat: Sagebrush grasshoppers prefer dry, open areas with plenty of sagebrush and related shrubs. This makes the edges of the Treasure Valley, especially the foothills, excellent habitat for them. It is found anywhere in the valley with large populations of these plants; mostly in open, rural areas.

Host Plants: This grasshopper feeds primarily on sagebrush.

Life Cycle: Nymphs hatch in the spring and mature by midsummer. Adults breed and lay eggs until the first frost in October.

Distribution in Idaho: Grayish sagebrush grasshoppers occur primarily in Idaho's southern Snake River Plain.

Melanoplinae

Common Name:

Red-Legged Grasshopper

Scientific Name: *Melanoplus femurrubrum*
(De Geer 1773)

Description: An average-sized grasshopper, usually $\frac{1}{2}$ – $1\frac{1}{4}$ inches long, with wings that extend past the end of the abdomen. The head is fairly large and the body rectangular in shape. Its overall color is brown, with a dark patch that extends on the side of the pronotum behind the eye; three dark bands cross the inside face of the hind femora but do not cross over the top or outside face of the leg. The wings are clear; the hind tibiae are pink or red. The undersides of the thorax and abdomen are often bright yellow. Males are distinguished from *M. sanguinipes* by the subgenital plate's lack of a notch and from *M. cinereus* by the latter's large cerci surrounding a flat subgenital plate.

Habitat: Highly adaptable to many habitats, such as rangelands, pastures, crop fields, or gardens. Within the Treasure Valley, red-legged grasshoppers are found anywhere that has a mix of broadleaf plants and grasses. Often, they are found near sources of water or in crop fields.

Host Plants: Highly polyphagous, red-legged grasshoppers feed on grasses, but also on many species of broadleaf plants, such as those in the pea family (Fabaceae).

Life Cycle: They produce one generation per year in the Pacific Northwest. Nymphs hatch in the spring, following the warming of the soil, and hatch slowly over the next couple of months until the summer. The first adults mature in June and July and breed and lay eggs until the first frost.

Distribution in Idaho: In Idaho, red-legged grasshoppers have a scattered distribution throughout the entire state, except for the mountainous regions.



Figure 15. Red-Legged grasshopper.

Common Name:

Packard's Grasshopper

Scientific Name: *Melanoplus packardii*
(Scudder 1897)

Description: Packard's grasshoppers are large, boxy grasshoppers, roughly 1–1½ inches long, with wings that usually extend to the end of the abdomen. Its overall color is gray, light brown, or yellow, often with two faint lighter stripes on the top edges of the pronotum. The hind tibiae are red or pink colored and the wings clear. There are sometimes two faint, dark-brown crossbars on the tops of the hind femora.

Habitat: Highly adaptable to many habitats, such as rangelands, pastures, crop fields, or gardens. Within Idaho, this species is found in urban, suburban, and rural areas. It is often found in crop fields.

Host Plants: This grasshopper is highly polyphagous and feeds on many grasses and broadleaf plants. Crops are common host plants, such as beans and other legumes.

Life Cycle: It produces one generation per year in Idaho. Nymphs hatch in the spring and most adults mature by the end of June. Adults breed and lay eggs until the first fall frost.

Distribution in Idaho: Packard's grasshoppers are scattered throughout the state, especially in the south, except for the mountainous regions.



Figure 16. Packard's grasshopper.

Melanoplinae

Common Name:

Migratory Grasshopper

Scientific Name: *Melanoplus sanguinipes*
(Fabricius 1798)

Description: An average-sized grasshopper, usually $\frac{1}{2}$ – $1\frac{1}{4}$ inches long, with wings that extend past the end of the abdomen. The head is fairly large and the body rectangular in shape. Its overall color is brown, tan, or gray, with a dark patch that extends on the side of the pronotum behind the eye, with three dark bands that cross the inside face of the hind femora and over the top and outside face of the leg. The wings are clear; the hind tibiae are pink, red, or blue. The undersides of the thorax and abdomen are usually cream or gray in color. Males are distinguished from male *M. cinereus* and *M. femurrubrum* by a notch in the subgenital plate.

Habitat: Highly adaptable to many habitats, such as rangelands, pastures, crop fields, or gardens, these are one of the most common grasshoppers in the Treasure Valley. They are found in urban, suburban, and rural areas and often in crop fields.

Host Plants: Highly polyphagous, they feed on many grasses and broadleaf plants. Crops are common host plants, such as hops, beans, and wheat.

Life Cycle: They produce one generation per year in the Treasure Valley. Nymphs hatch in the spring following the warming of the soil and hatch slowly over the next couple of months until the summer. The first adults mature in June and July and breed and lay eggs until the first frost.

Distribution in Idaho: This is a common grasshopper found throughout the state.



Figure 17. Migratory grasshopper.

Common Name:
Valley Grasshopper

Scientific Name: *Oedaleonotus enigma*
(Scudder 1876)

Description: A unique species in Idaho, valley grasshoppers are averaged-sized, usually between ½ and 1 inch long. Although short in length, they are very thick, with massive heads and jumping legs. Wings are clear and vary in length, although most individuals have very short wings that do not extend halfway down the length of the abdomen. Some individuals have wings that extend the length of their abdomen and can fly short distances. Their overall color is tan or light brown, with a dark brown patch on the top of the pronotum, often bordered faintly by white, with three dark crossbars on the top and outside face of the jumping legs. The hind tibiae are blue and the underside and inside face of the hind jumping legs is usually vivid orange or red.

Habitat: Shrublands are the favored habitat of the valley grasshopper. Occasionally, they eat broadleaf plants, but grasses are their preferred host plant in the valley. This species is found typically in the foothills and desert areas within the valley. It is uncommon in suburban and urban areas.

Host Plants: Predominantly grasses.

Life Cycle: It produces one generation per year in Idaho. One of the earliest species to emerge in spring, its nymphs hatch in the spring following the warming of the soil. The first adults mature in June and breed and lay eggs until the first frost.

Distribution in Idaho: Valley grasshoppers are found in the desert plains and foothills of the southern half of the state, occasionally farther north.



Figure 18. Valley grasshopper.

Subfamily Oedipodinae

Subfamily Oedipodinae, known as the band-winged grasshoppers, is a large group of very common grasshoppers. Most are very well camouflaged and are not usually noticed until they take flight and reveal their hind wings. These are wedge-shaped grasshoppers that have very large wings, usually with a black band surrounding a colored interior patch on the hind wing. Most band-winged grasshoppers in Idaho are average-sized, usually 1–1½ inches in total length, and feed primarily on native grasses. Some species, such as the clear-winged grasshopper (*Camnula pellucida*), become incredibly common in favorable years and cause damage to crops, although most are never pests.

Highlights

- Ground-dwelling, often resting on bare patches of ground, especially near tufts of grass.
- Very well camouflaged, often the color of the ground on which they rest.
- Usually have vividly colored wings, contrasting with a fairly plain overall body color.
- Some produce loud clicks during flight, known as **stridulation**.
- Most common in hot, dry, rangeland environments with both grasses and bare ground.
- Each genus has a uniquely shaped pronotum that can often be used to quickly identify a grasshopper to each genus.

Common Name:

Red-Winged Grasshopper

Scientific Name: *Arphia pseudonietana*
(Thomas 1870)

Description: This species is usually the only grasshopper with red wings in the Treasure Valley. Overall, it is dark gray or black in color, sometimes brown, with bright red wings. Some individuals have lighter gray or brown patches on the pronotum, head, or legs, but most are uniformly colored. A very typically sized *Oedipodinae* species, most are 1–1½ inches in total length, with wings that reach past the end of the abdomen. The band on the hind wings reaches the edge of a wing, creating a border instead of a band so that the entire wing is colored. In some individuals, the black fades to transparent gray at the wing tips. The hind wing has a large “spur” of black that cuts into the inner red portion of the wing. The hind femora and tibiae both have a white or light gray band just below the knee. The pronotum is not notched like most other *Oedipodinae* spp. in Idaho.

Habitat: This grasshopper has a very wide distribution across western North America and is found in a variety of habitats. However, in Idaho, it usually prefers open, grassy areas near sources of water. Fairly common in most of the state, although not particularly in the Treasure Valley. Usually found in small groups with several male and female pairs in flat, grassy areas. Indeed, it is unusual to find only one red-winged grasshopper at a time.

Host Plants: This grasshopper feeds primarily on the grasses that grow in its environment.

Life Cycle: In this region, nymphs hatch in the spring and mature by midsummer. Eggs are deposited until the frost in October.

Distribution in Idaho: Red-Winged grasshoppers are found in any part of the state, aside from high mountain peaks.



Figure 19. Red-Winged grasshopper.

Oedipodinae

Common Name:

Clear-Winged Grasshopper

Scientific Name: *Camnula pellucida* (Scudder 1863)

Description: The clear-winged grasshopper is a fairly small grasshopper for its subfamily. In Idaho, most range from $\frac{3}{4}$ to $1\frac{1}{4}$ inches in length, with males being substantially smaller than females. Overall brown or gray in color on the wings and the top of the pronotum and head, with a light yellow or tan border on both sides of the top of the pronotum and forewings, creating a “V.” The sides of the wings, thorax, and hind legs are blotched with dark brown or gray. Two or three dark bars cross the top of the hind legs. The abdomen, ventral surface, and legs are yellow or tan. The hind wings are clear or very lightly colored yellow. This grasshopper is unique in that it has no band on its hind wing.

Habitat: This is a very widespread grasshopper in North America and is found in a variety of habitats. In Idaho, it is usually found in dry, open areas with plenty of grass. It is not a very common grasshopper in the Treasure Valley. It is found anywhere in the valley outside urban centers, but it favors flat, open fields with plenty of grass.

Host Plants: Grasses are the clear-winged grasshopper’s preferred food. It feeds readily on commercial grains, such as wheat, and can become a pest in years with high hatch rates.

Life Cycle: In the Treasure Valley, nymphs hatch in spring and mature into adults by midsummer. Adults breed and lay eggs until the frost.

Distribution in Idaho: Clear-winged grasshoppers are found throughout the state, although they are absent from the highest mountain peaks.



Figure 20. Clear-Winged grasshopper.

Common Name:**Groove-Headed Grasshopper****Scientific Name:** *Conozoa sulcifrons* (Scudder 1876)

Description: This grasshopper is typical of its subfamily. It is on average $\frac{3}{4}$ – $1\frac{1}{4}$ inches long in total length and is brown or gray overall with two dark crossbands on the forewings and hind femora. It has hind wings with a black band surrounding a yellow center. The crossbands on the wings are unusual in this species in that they do not cross over the top of the forewings, which leaves the top of the forewings one solid color. The hind tibiae are red or orange. Its pronotum is divided by two notches, similar to the genus *Trimerotropis*; however, groove-headed grasshoppers' notches are smaller than those of the latter genus. Two raised ridges run down the face, starting at the forehead, which gives this grasshopper its name. Males are unique in this species in that they are small: males are often only half the size of their female counterparts. They have a "saddled" color morph, where the latter half of the pronotum is colored a lighter brown than the rest of the body.

Habitat: Groove-Headed grasshoppers are found in a variety of habitats across most of the western states. In the Treasure Valley, they are commonly discovered in open, sunny fields, which makes farm fields an ideal habitat for them, although they do not usually cause any noticeable damage.

Host Plants: Grasses are the groove-headed grasshoppers' preferred food. Commercial grains can be used as host plants as well as other weedy or native grasses.

Life Cycle: In this region, nymphs hatch in the spring and mature adults appear by midsummer. Adults live and lay eggs until the first frost.

Distribution in Idaho: Groove-Headed grasshoppers are found primarily in the southern half of the state. It is a very common species in and around the Treasure Valley.



Figure 21. Groove-Headed grasshopper.

Oedipodinae

Common Name:

Carolina Locust

Scientific Name: *Dissosteira carolina*
(Linnaeus 1758)

Description: Our largest band-winged grasshopper, Carolina grasshoppers in Idaho typically range from 1½ to 2¼ inches in total length. The species is variable in overall color and ranges from rust orange to tan to charcoal gray (or anywhere in between) and is uniformly colored. Its hind wings are round and very large, shaped almost like butterfly wings. Instead of a black band with a yellow center, as is typical for many species in this suborder, Carolina grasshoppers have hind wings that are black with a yellow border on the wing edges. The top of the abdomen is usually tinged blue or black. Two black crossbars appear on the inside face of the hind femora and a lighter-colored ring below the knee on the hind femora and tibiae. The pronotum is raised with a high dorsal ridge and cut once with a single, deep notch. The grasshopper is “lazy” in flight and can easily be mistaken for a large, black butterfly or moth.

Habitat: This grasshopper is found in every single one of the contiguous forty-eight states and thus thrives in an incredibly wide range of habitats. In the Treasure Valley, it favors dry, sunny fields with a mix of broadleaf plants and grasses. It is found anywhere in the Valley, commonly in open, sunny fields, especially in disturbed areas near water sources.

Host Plants: Because of their wide distribution, Carolina grasshoppers are very polyphagous, especially for a band-winged grasshopper. They favor grasses, including crops such as wheat and rye, but also readily consume broadleaf plants, such as legumes (Fabaceae), mint (Lamiaceae), and members of the sunflower family (Asteraceae).



Figure 22. Carolina locust.

Life Cycle: Because of its large size, this grasshopper has a longer developmental cycle than most others in the Pacific Northwest. Nymphs hatch in the spring and adults mature in mid-to-late summer. Eggs are laid until the coming of the fall frost.

Distribution in Idaho: Carolina grasshoppers are found statewide in Idaho, aside from the highest mountain peaks.

Common Name:**Spurcate Grasshopper**

Scientific Name: *Dissosteira spurcata*
(Saussure 1884)

Description: Spurcate grasshoppers are large grasshoppers, typically 1½–2 inches in total length. Like their close relative, *D. carolina*, these grasshoppers have large, butterfly-like wings, except with a reversed pattern. The wings are clear, with a faint black band that often does not completely encircle the center of the hind wing. Color is overall tan, except the hind tibiae, which are yellow. Most individuals have blotches of brown, black, and/or gray that give this grasshopper a very soiled or dirty appearance. Most spurcate grasshoppers have three dark crossbars on the hind femora that intersect over the forewing. However, some individuals are almost patternless, exhibiting a uniformly tan or brown color. Most individuals have a lightly colored X-shaped marking on top of the pronotum, which is divided by a single notch. It does not have a high dorsal ridge like *D. carolina*.

Habitat: This grasshopper favors flat, open areas with lots of bare ground as well as grass. Open fields are often occupied by groups of them.

Host Plants: Spurcate grasshoppers, just like Carolina grasshoppers, feed on many different plants, both grasses and broadleaf. They favor grasses, but readily consume plants such as legumes (Fabaceae) and members of the mint family (Lamiaceae).

Life Cycle: In the Pacific Northwest, nymphs hatch in the spring and mature rapidly. Spurcate grasshoppers are among the first adult grasshoppers to appear in early summer. Adults breed and lay eggs until the fall frost.

Distribution in Idaho: Spurcate grasshoppers are most common near the western border of Idaho. Within Idaho, they are most common in and around the Treasure Valley, but sometimes they appear farther east in the Snake River Plain.



Figure 23. Spurcate grasshopper.

Oedipodinae

Common Name:

Say's Grasshopper

Scientific Name: *Spharagemon equale* (Say 1825)

Description: These grasshoppers are average-sized for their suborder, typically 1¼–1¾ inches long in total length, with large heads. They are overall brown or gray in color, with three dark, blotchy crossbands crossing the hind femora and forewings. The hind tibiae are bright orange, as well as the underside of the hind femora. Their hind wings are yellow in the center, often fading to green near the body, with a thick black band completely surrounding the yellow center. The pronotum is cut once with a small notch that divides a very small dorsal ridge into two halves. This species has a “saddled” color morph, where the latter half of the pronotum is colored gray or white, and the top of the head is dark gray or sometimes even purple. Saddled Say's grasshoppers are some of the most colorful grasshoppers in Idaho.

Habitat: This grasshopper has a wide distribution across the United States and survives in a wide range of habitats. In Idaho, it prefers the dry, grassy hills and valleys of the Snake River Plain. It is very common in the Treasure Valley and even lives in urban and suburban areas, though they seem to prefer open, grassy fields.

Host Plants: Say's grasshoppers feed primarily on grasses.

Life Cycle: In the Pacific Northwest, nymphs hatch in the spring and mature by early summer to midsummer. Adults breed and lay eggs until the fall frost.

Distribution in Idaho: Say's grasshoppers are almost exclusively a desert species that are found primarily in the southern half of the state.



Figure 24. Say's grasshopper.

Common Name:**Kiowa Grasshopper**

Scientific Name: *Trachyrhachys kiowa*
(Thomas 1872)

Description: Kiowa grasshoppers are small and have large heads, slender bodies, and long, thin legs. In total length, they range somewhere between $\frac{3}{4}$ and $1\frac{1}{4}$ inches. Their hind wings are very slender and roughly twice as long as they are wide. Color varies widely among individuals, but in Idaho, most are some shades of gray or brown with three or four dark blotches on the side of the forewings. Some have crossbars on their hind femora as well. The top of their forewings is uniformly colored, sometimes a lighter one than the rest of the body. Some have light-colored markings on the pronotum and head as well. The hind tibiae are blue. Hind wings vary in color, but most are either clear in the center with a very faint black band halfway down the wing or yellow, with or without the band. The pronotum is cut twice, creating two low ridges with a single tooth in the center.

Habitat: This grasshopper favors grassy fields, dominated by bunchgrasses and other perennial grasses. It is uncommon in the Treasure Valley, although its natural range covers all of Idaho, within favorable habitats. It sometimes is found in dry, open fields with lots of perennial grasses, usually in rural, undisturbed areas.

Host Plants: Kiowa grasshoppers feed primarily on grasses.

Life Cycle: In the Pacific Northwest, Kiowa grasshoppers hatch in the spring and mature by the summer. Adults breed and lay eggs until the first hard frost.

Distribution in Idaho: Kiowa grasshoppers have a wide range across the United States, but in Idaho they are found in areas with perennial grasses, especially in dry, open places.



Figure 25. Kiowa grasshopper.

Oedipodinae

Common Name:

Toothed Field Grasshopper

Scientific Name: *Trimerotropis agrestis*
(Tinkham 1964)

Description: Toothed field grasshoppers are large band-winged grasshoppers for their genus, adapted perfectly for their environment. In the wild, they are scattered sparsely over the Great Plains and Great Basin, with an isolated subspecies (*Trimerotropis agrestis hewitti*) found exclusively near Idaho's southern sand dunes. Hence their distinctive color—speckled exactly the color of the sand on which they live. They are usually 1¼–1½ inches in total length and have a very flattened and wide pronotum, which is unusual for the genus. Two light brown or gray lines run down the top edges of the forewings, creating a V-shaped marking when the wings are folded. The hind wings are colored yellow in the center with a thick black band bordering the entire center and the hind tibiae are orange. The pronotum is cut twice with two very shallow notches, creating a single tooth in the center. One of the most unique characteristics of this species is a small, flared-out fin (“tooth”) on the bottom of the pronotum, in-between the first two pairs of legs, which is what gives this species its name.

Habitat: This species requires hot, dry, sandy hills in its habitat. It is often found at the base of the dunes, where vegetation begins to grow.

Host Plants: This species is not picky about its food, considering it does not have much food available in its native habitat. In captivity, it feeds readily on grasses, as well as plants, such as mint (*Mentha* spp.) and pigweed (*Amaranthus* spp.). Although it readily eats crops, the species is not abundant enough to cause any sort of crop damage.



Figure 26. Toothed field grasshopper.

Life Cycle: In southern Idaho, toothed field grasshoppers hatch in the spring and mature into adults in midsummer. Adults breed and lay eggs until the first frost in October.

Presence in Idaho: Within Idaho, this species is only found around southern Idaho's sand dunes.

Common Name:**Strenuous Grasshopper**

Scientific Name: *Trimerotropis californica*
(Bruner 1889)

Description: Strenuous grasshoppers are slender grasshoppers, very typical in size, shape, and physical appearance for their genus. In Idaho, they are typically 1–1½ inches in total length and are typically patterned. Overall, they are usually a light creamy tan in color, with darker brown bands fading to blotches and speckles toward the end of the forewings. The first two bands cross the hind femora as well as the forewings, much in the same way as *T. pallidipennis* and *T. pseudofasciata*. Its hind wings are yellow in the center with a black band surrounding the colored center. The tip of the wing is clear and the hind tibiae are orange. Its head is large and reaches higher than the top of the pronotum, which is cut twice. The first notch in the pronotum is very shallow and does not create a sharp tooth.

Habitat: Strenuous grasshoppers seem to favor open, hilly regions with plenty of grass mixed with bare ground. It is not commonly seen in urban or suburban areas.

Host Plants: This grasshopper feeds primarily on grasses.

Life Cycle: In the Pacific Northwest, nymphs hatch in the spring. Adults mature by midsummer and breed and lay eggs until the fall frost.

Distribution in Idaho: Strenuous grasshoppers are not a particularly common species in Idaho. They are most often seen in the southwestern corner of the state, particularly in and around the Treasure Valley.



Figure 27. Strenuous grasshopper.

Oedipodinae

Common Name:

Pallid-Winged Grasshopper

Scientific Name: *Trimerotropis pallidipennis*
(Burmeister 1838)

Description: Pallid-winged grasshoppers are slender grasshoppers, average in size, shape, and physical appearance for the genus *Trimerotropis*. In the Treasure Valley, they are typically 1–1½ inches in total length and, although coloration can vary somewhat, its overall patterning is generally consistent: usually anywhere between slate gray and light tan or rust. Bands cross over the hind femora and forewings and fade to blotches and speckles toward the end of the forewings. The first two bands cross the hind femora as well as the forewings, much in the same way as *T. californica* and *T. pseudofasciata*. Its hind wings are yellow in the center, sometimes tinged green, with a black band surrounding the colored center. The tip of the wing is clear and the hind tibiae yellow or tan. Its pronotum is cut twice. The first notch in the pronotum is shallow and creates only a small tooth.

Habitat: Pallid-Winged grasshoppers are one of the most widespread band-winged grasshoppers in the West and are found in an enormous number of different habitats. Open, sunny fields are a favorite habitat, but this grasshopper appears anywhere in Idaho.

Host Plants: Due to this species' wide distribution, it is more polyphagous than most other *Oedipodinae* spp. It feeds readily on grasses but also some legumes (Fabaceae) and members of the mint family (Lamiaceae).

Life Cycle: Pallid-Winged grasshoppers have a very fast life cycle and, even in the Pacific Northwest, often produce two generations per year. The first nymphs hatch as soon as the spring sun warms the soil in April; adults mature by early June. A second hatching occurs in July and August, with adults maturing by late August and September. Adults breed and lay eggs until the coming fall frost.



Figure 28. Pallid-Winged grasshopper.

Distribution in Idaho: This grasshopper is found anywhere in Idaho, except for the high mountain peaks.

Common Name:**Cerulean-Winged Grasshopper**

Scientific Name: *Trimerotropis pseudofasciata*
(Scudder 1876)

Description: Cerulean-Winged grasshoppers are slender grasshoppers, average in size, shape, and physical appearance for *Trimerotropis*. When they fold their wings, they are almost visually indistinguishable from *T. pallidipennis*. In the Treasure Valley, they are typically 1–1½ inches in total length and usually range from slate gray to light cream or tan. Bands cross over the hind femora and forewings and fade to blotches and speckles toward the end of the forewings. The first two bands cross the hind femora as well as the forewings, much in the same way as *T. californica* and *T. pallidipennis*. Their hind wings are light blue in the center, sometimes almost completely clear with only a small patch of blue and a very light black band surrounding its colored center. In many individuals, the band does not completely surround the center but fades away toward the bottom of the wing. The tip of the wing is clear and the hind tibiae are blue. Its pronotum is cut twice. The first notch in the pronotum is shallow and creates only a small tooth.

Habitat: Cerulean-Winged grasshoppers favor dry, desert habitats with lots of open, sunny areas. They are often found on the edge of sandy areas where grass or other vegetation grows. They usually stay in or near dry, open areas with plenty of bare ground, with occasional strays into urban or suburban areas.

Host Plants: These grasshoppers feed primarily on grasses.

Life Cycle: In the Pacific Northwest, nymphs hatch in the spring and mature rapidly. The first adults appear by early summer and breed and lay eggs until the fall.



Figure 29. Cerulean-Winged grasshopper.

Distribution in Idaho: Cerulean-Winged grasshoppers are primarily a desert species and are more common south of Idaho. Within our state, they are most often observed in the desert areas of the Snake River Plain.

Species Catalog (Adult Males and Females)



Schistocerca lineata – Male



Schistocerca lineata – Female



Amphitornus coloradus – Male



Amphitornus coloradus – Female



Aulocara elliotti – Male



Aulocara elliotti – Female



Cordillacris occipitalis – Male



Cordillacris occipitalis – Female



Pseudopomala brachyptera – Male



Pseudopomala brachyptera – Female



Psoloessa delicatula – Male



Psoloessa delicatula – Female



Hesperotettix viridis – Male



Hesperotettix viridis – Female



Melanoplus bivittatus – Male



Melanoplus bivittatus – Female



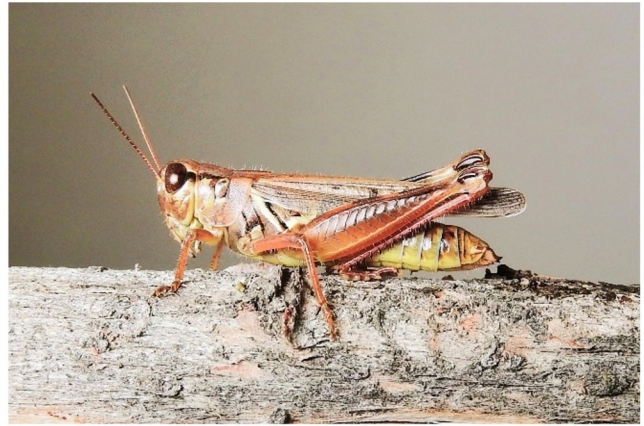
Melanoplus cinereus – Male



Melanoplus cinereus – Female



Melanoplus femurrubrum – Male



Melanoplus femurrubrum – Female



Melanoplus packardii – Male



Melanoplus packardii – Female



Melanoplus sanguinipes – Male



Melanoplus sanguinipes – Female



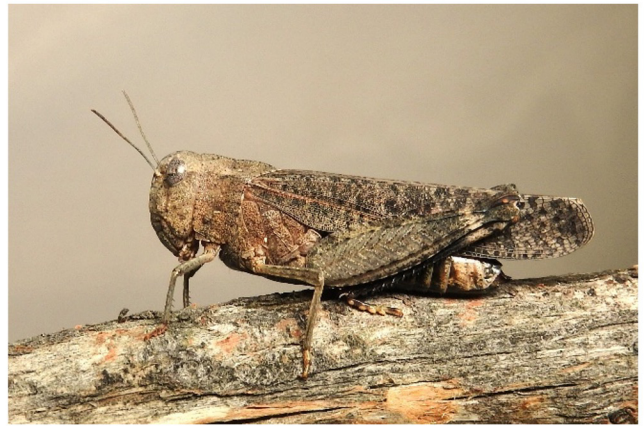
Oedaleonotus enigma – Male



Oedaleonotus enigma – Female



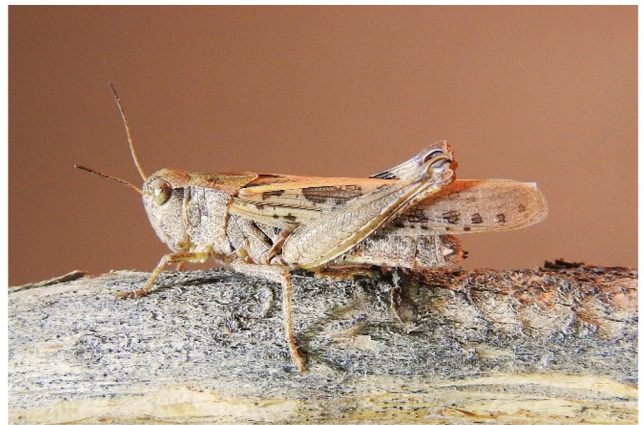
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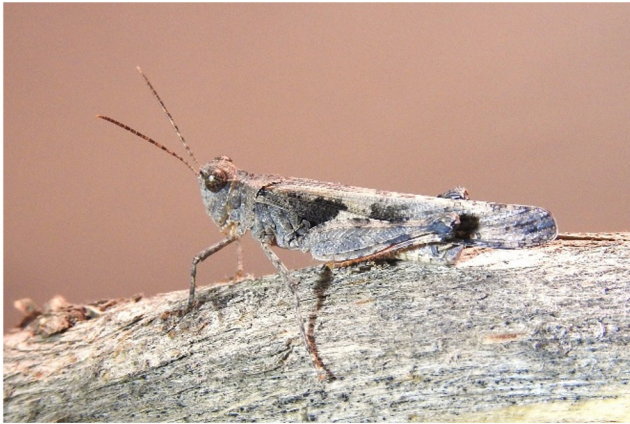
Arphia pseudonietana – Female



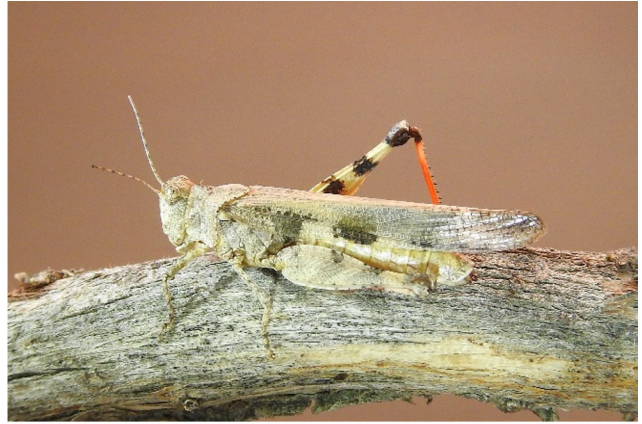
Camnula pellucida – Male



Camnula pellucida – Female



Conozoa sulcifrons – Male



Conozoa sulcifrons – Female



Dissosteira carolina – Male



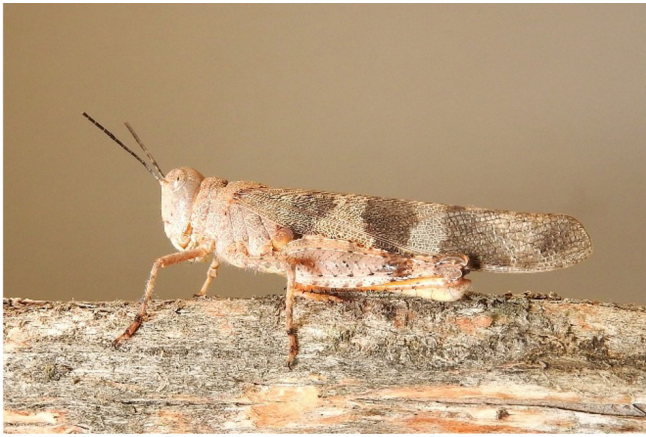
Dissosteira carolina – Female



Dissosteira spurcata – Male



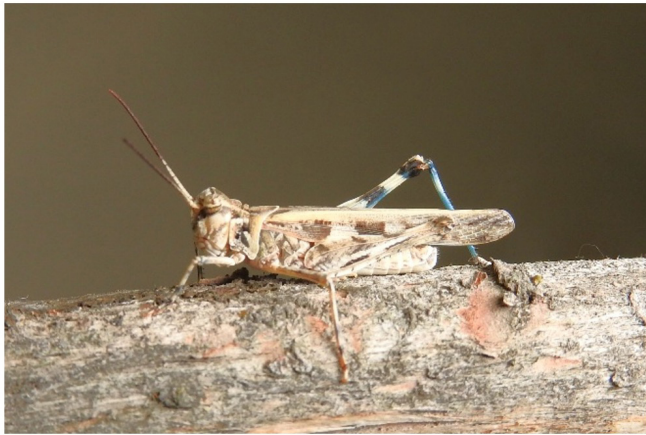
Dissosteira spurcata – Female



Spharagemon equale – Male



Spharagemon equale – Female



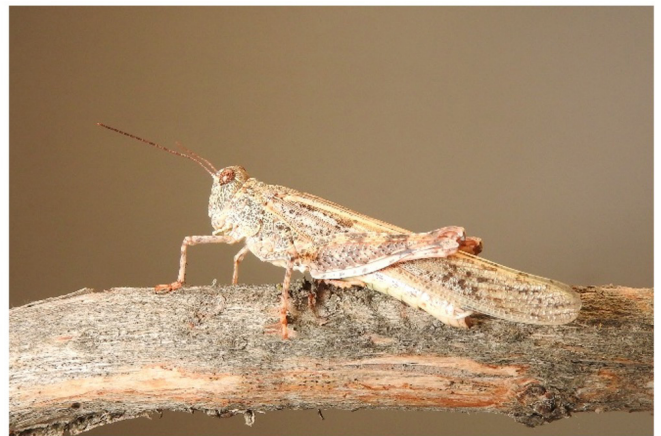
Trachyrhachys kiowa – Male



Trachyrhachys kiowa – Female



Trimerotropis agrestis – Male



Trimerotropis agrestis – Female



Trimerotropis californica – Male



Trimerotropis californica – Female



Trimerotropis pallidipennis – Male



Trimerotropis pallidipennis – Female



Trimerotropis pseudofasciata – Male



Trimerotropis pseudofasciata – Female

Final Thoughts

Idaho hosts a great diversity of grasshoppers (over forty species), with over 50% of the species found along the Snake River Plain. Our focus on twenty-four of them, which includes two species with populations that occur only in southern Idaho and four that are considered agricultural pests, is thus an excellent resource for Extension educators, farmers, ranchers, and enthusiasts seeking to learn more about these insects in the state, especially given the incidence of grasshopper swarms in the Treasure Valley. The high-quality photography and basic details about them as common species in the Treasure Valley consolidate useful information for the first time, providing a template for future catalogs of the other grasshoppers that live in Idaho, species that are restricted to higher elevations, sagebrush steppe, or microhabitats.

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