



WHY WE NEED GRASSLAND INVERTEBRATES

Grasslands are important to insects, and insects are important to grasslands

Grasslands offer sweeping vistas that capture people's hearts and are celebrated in movies and literature. They are also home to important invertebrates that support wildlife and livestock by pollinating plants, recycling nutrients, decomposing plant and animal waste, controlling pests, improving soil health, and more.

Why are grasslands important?

Grasslands—including rangelands, other prairies, and savannas—are diverse ecosystems vital for sustaining rural economies by providing livestock forage. Dominated by native grasses and wildflowers and often expansive and connected, grasslands provide resources and protection for wildlife, large and small. The deep plant roots maximize soil health, sequester carbon, and increase groundwater recharge to benefit water supplies—supporting our communities, our health, and wildlife.

Native grasslands are imperiled: just 38% remain in North America. In the Great Plains, nearly 2 million acres—and the influential services they provide—are lost annually to crop conversion and development.

Why are grasslands important to invertebrates?

Many invertebrates call grasslands home. Diverse communities of grasses, wildflowers, shrubs, sedges, and occasional trees provide:

- **Food:** Flowers provide nectar and pollen for pollinators. Vegetation and roots are food sources for herbivorous insects, which then become food for predatory insects.
- **Places to nest and overwinter:** Leaves and stems provide habitat for invertebrates to rest and raise their young. Complex root systems create rich soil that houses entire life cycles of some species and partial life cycles of others; all thrive in untilled soils.
- **Protection from pesticides:** Grasslands receive fewer pesticide inputs than other working lands (e.g., croplands), and so provide a safer habitat for invertebrates.

Why are invertebrates important to grasslands?

Invertebrates provide essential services that support grassland health and livestock production. Their

work ensures that flowering plants reproduce, nutrients cycle through the system, soils are aerated and mixed, and wildlife stay healthy.

- **Decomposers and nutrient cyclers** break down dead plants and animal waste and remains, returning nutrients to the soil.
- **Soil health engineers** tunnel and move soil, mixing nutrients, aerating the soil, and helping water and plant roots to move deeper.
- **Predators and parasitoids** help keep pests and other invertebrates in check; predators capture prey, while parasitoid larvae kill their host by developing on or in them.
- **Pollinators** are essential for the reproduction of most flowering plants. Those plants support a diversity of wildlife and are highly nutritious livestock forage.
- **Food for wildlife** includes many invertebrates, such as herbivorous insects that eat a diversity of plants.

How can agricultural producers and land managers support beneficial invertebrates?

Know the habitat. Grazed or hayed grasslands are compatible with invertebrate conservation. Using the illustration in this brochure as a guide, look for areas on and around your land that are already habitat for these important animals.

Consider invertebrates in management decisions. Managed disturbance is key to healthy grasslands and can also have impacts on beneficial insects. Strategies that can benefit grassland health and invertebrate populations include:

- Rotate management (e.g., grazing) by unit, providing adequate recovery time for plants, and leaving temporary refuges from management.
- Use the most appropriate tools for management goals (e.g., prescribed fire timed to reduce target weeds). *(cont. on back panel)*

- Use targeted noxious and invasive weed control (e.g., avoid broad-scale, broad-spectrum herbicide applications).
- Use integrated pest management (multiple tools to reduce harm to non-pests) when making pest-control decisions.

Evaluate and adapt management to support beneficial invertebrates where feasible.

Adjusting management in small ways can enhance grassland plant diversity, which in turn increases populations of grassland invertebrates. Enhancing plant diversity also supports livestock production and increases drought resilience.

Invertebrates keep grasslands functioning for people, livestock, wildlife, soils, and water.

Xerces Society Resources

Visit xerces.org for conservation guides, fact sheets, and more.

- Supporting Pollinators on Rangeland, xerces.org/pollinator-conservation/rangeland
- *Rangeland Wildflowers: Their Value to Livestock and Pollinators*, xerces.org/publications/guidelines/rangeland-wildflowers-their-value-to-livestock-and-pollinators

NRCS Programs

- Producers may be eligible for technical and financial assistance. For more information, visit nrcs.usda.gov.



Protecting the Life that Sustains Us

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Habitat Features

1. **Diverse plant communities** provide food and shelter to invertebrates that are critical components of food webs.
2. **Vegetation of different heights and ages**, including lightly grazed areas, woody debris, and fallen leaves, provides overwintering and nesting habitat.

3. **Blooming flowers**, spring through fall, provide pollen and nectar.
4. **Grazing animals** (cattle, bison, and others) provide disturbances that grasslands require to maintain plant diversity and varying structure.
5. **Healthy soil** shelters the many invertebrates that spend a portion or all of their life cycle underground.
6. **Dung pats** provide food and shelter for invertebrates that recycle nutrients.
7. **Small patches of bare ground** support ground-nesting bees and wasps.

Invertebrate Contributions

- A. **Decomposition and nutrient cycling** are provided by dung beetles, carrion and burying beetles, millipedes, springtails, mites, and more.
- B. **Soil health engineering** is provided by ants, millipedes, ground-nesting wasps and bees, spiders, and more.
- C. **Pest control** is provided by predators such as wasps, spiders, centipedes, beetles, flies, true bugs, and more. Parasitoids, such as wasps, flies, and beetles, also help with pest control.

- D. **Pollination** is provided by bees, butterflies, and flowering-visiting flies, wasps, beetles, and moths.
- E. **Food for wildlife**, including cicadas, leafhoppers, grasshoppers, spiders, caterpillars, planthoppers, spittle bugs, and more.

