

Measuring farm and garden invertebrate biodiversity

Invertebrates, including insects, spiders and worms, are the hidden workforce of healthy ecosystems and farming systems. They pollinate crops, control pests, break down organic matter, keep the soil healthy, and are an important food source for different mammals, birds, and reptiles. However, they often go unnoticed - until something goes wrong, or pest insects start to become a problem.

WHAT INVERTEBRATES CAN TELL YOU ABOUT YOUR LAND'S HEALTH

A diverse invertebrate community generally means a more resilient system - with natural checks on pest outbreaks, better pollination, and healthier soils. But you can't track change, or spot problems if you don't know what's there to begin with.

Surveying invertebrates doesn't require specialist equipment or expertise, it just needs you to take the time to observe. This fact sheet covers four basic methods that are simple, low-cost, and between them cover a wide range of species and habitats. More systematic surveys can help with developing an integrated pest management (IPM) strategy, and for that approach it may be worth getting expert advice. Either way, it is helpful to become familiar with the invertebrates present on your farm or in your garden and to find out if you notice any patterns.



FOUR EASY SURVEY METHODS



Exoneura, Native reed bee.

1. Flower visitation survey

Best for finding: pollinators

On a warm, sunny day select a flowering plant to study. Spend at least 5–10 minutes observing this plant or patch and record every insect that lands on the flowers. People often think only of honeybees and butterflies, but flowers attract a surprising variety of visitors!

When to survey: Spring, summer and autumn, mid-morning or later. Insects need warmth to become active, so wait until the day has warmed up.

What you might find: Honeybees, native bees, parasitic and predatory wasps, beetles, butterflies, moths, hoverflies.

Bonus: Birds! Especially on high nectar producing native plants

2. Night-time light survey

Best for finding: night-flying insects

You can use any outdoor light and simply observe what's flying around it. You can improve your results by hanging a large white sheet close to the light. Insects will land on the sheet and are much easier to examine. For greater species diversity (sometimes), take a torch and white sheet out into a paddock or bushland area away from the house and shine the light directly onto the sheet.

When to survey: Any time of year after dark, though numbers will be lower in winter.

What you might find: Moths, beetles, wasps, lacewings.

Bonus: You might see some bats diving for flying insects!



Ceremonial Heath Moth (*Dichromodes confluaria*)



Orange Assassin Bug (*Gminatius australis*)

3. Beat sheet survey (also called bush beating)

Best for finding: insects hiding in vegetation

Place a large white sheet or tray beneath a shrub or plant at least 1 m tall. Using a sturdy stick, beat the plant firmly several times, without damaging it. Insects and other invertebrates dislodged from the foliage will fall onto the sheet where you can examine them closely.

When to survey: Daytime, spring through autumn. Wait until vegetation has dried after rain or morning dew, otherwise you'll mostly collect water.

What you might find: Beetles, true bugs (Hemiptera), caterpillars, larvae and grubs, aphids, spiders.

4. Ground litter survey

Best for finding: soil and litter-dwelling invertebrates

Find a spot with leaf litter, woody debris, or decomposing organic matter on the soil surface. Collect a generous handful of material and spread it in a large flat tray or container, then sort through it slowly to see what emerges. You can also carefully lift rocks and logs to check what's sheltering underneath. Take care that snakes and scorpions may also shelter in these spots.

When to survey: Any time of year during daylight hours, though you'll find fewer invertebrates in winter.

What you might find: Slaters (woodlice), slugs, spiders, ground beetles, ants, beetle larvae, flatworms, scorpions, millipedes, centipedes, earwigs, cockroaches.

Bonus: You might find a frog looking for shade.



Ground beetle (*Scaraphites rotundipennis*)

HOW TO IDENTIFY WHAT YOU'VE FOUND

- iNaturalist - photograph and upload; the community and AI will help identify your find (free app and great fun)
- Field guide to the insects of Tasmania - online identification resource for Tasmanian species. <https://tasmanianinsectfieldguide.com/>
- **Citizen science groups on Facebook** – There is a group called 'Citizen scientists of Tasmania', but there might also be other groups so you can also search for Tasmanian invertebrate or insect ID groups
- **Your local entomologist** - university departments and the Tasmanian Institute of Agriculture (TIA) often welcome questions.

Image credits: Reed bee, ceremonial heath moth, orange assassin bug, ground beetle, blue-spotted hawkler and common brown crane fly all taken by Cowirrie (CC0 - from Inaturalist).



Meadow Argus (Junonia villida)



Blue-spotted Hawker (Adversaeschna brevistyla)



Common Brown Crane Fly (Leptotarsus costalis)