

The Value of Understorey Vegetation

A healthy understorey plays an important role in natural ecosystems as well as being a valuable asset to private landholders. This all important layer provides essential habitat resources of food and shelter to numerous 'beneficial' insects along with many frogs, reptiles, birds and small mammals. This Note discusses various methods of protecting or restoring the understorey and describes some of the problems associated with the decline of understorey vegetation.

What is understorey vegetation?

Understorey vegetation includes small trees, shrubs, herbs, grasses, mosses and lichens that occupy the vegetation layers below the canopy of taller trees. Some habitats have mixtures of these plants, whilst others, such as grassy woodlands, have mostly grasses and a few shrubs. There can be a much greater plant species diversity within the understorey compared with the canopy (except in rainforests). Commonly there are less than ten species of eucalypt and other larger tree species forming the canopy compared with dozens of species in the understorey. In fact, in some Australian ecosystems, understorey plants account for over 90% of the total plant species diversity! This high level of plant species diversity in the understorey is often responsible for an increased diversity of fauna species. The combined presence of understorey vegetation with diverse fauna and fungi, help maintain high biodiversity and healthy ecosystem processes. Maintaining genetic diversity in the understorey also provides a buffer against climate change and allows for adaptation in a rapidly changing environment.

The value of understorey vegetation

Maintaining a healthy understorey is vital for sustaining natural ecosystems and conserving and protecting the essential resources of soil and water. Living plants, together with leaf litter and fallen timber, play a key role in slowing and intercepting surface run-off after rain. In the absence of adequate groundcover and surface protection, rapid run-off of water can occur, taking with it soil and organic matter. This contributes to erosion, siltation of waterways and declines in water quality and soil health.



The understorey in spring, or after rains, is often filled with wildflowers.

Photo by Darryl Larsen.



A healthy understorey layer is vital for sustaining natural ecosystems.

Wildlife in the understorey

The understorey provides important habitat, such as food, nest-building material, breeding sites and shelter for many native animals.

Many species of wildlife prefer to feed in understorey vegetation rather than forage in open areas, where they may be vulnerable to predation. Honeyeaters and some arboreal marsupials, such as Sugar Gliders, feed on nectar from flowers of understorey plants, as do countless insects, such as native bees, butterflies, wasps and ants. These insects in turn, become food for animals such as bandicoots, gliders, insectivorous birds and some lizards.

Small birds such as fairy-wrens build their nests in dense, prickly shrubs for protection and when the young leave the nest, they can hide in understorey vegetation. Frogs often hide in leaf debris or on fern fronds.

An understorey composed of a range of plant species of various ages will allow many wildlife species, including insects, to complete all stages of their lifecycle. If the understorey is removed or degraded, the balance between predators and prey can become unbalanced resulting in reduced ecosystem functions.

Spiders make use of understorey vegetation and help control insect numbers. Photo by Nick Clancy.



Noisy Miners are a native bird that favour areas where the understorey has been cleared or greatly reduced, hence why they are commonly found in urban areas and parklands. Noisy Miners can aggressively exclude other birds from their territory often resulting in a reduced diversity of bird species where Noisy Miners live.

Natural pest control

The understorey provides habitat for predators, such as insectivorous birds, that can assist in natural pest control. Without insectivorous birds to control insect numbers, some insect species can become pests. For example, in a healthy ecosystem thornbills, robins and cuckoos control populations of small beetles, ants and caterpillars.

Invertebrate predators also depend on healthy understorey vegetation. For example, some wasps feed on nectar and protein from native trees and shrubs. A lack of understorey plants decreases this nectar supply and consequently wasp populations can decrease. Certain species of wasp parasitise larvae of leaf-eating beetles such as the Christmas Beetle. When wasp populations decrease, the Christmas Beetle population can explode. Christmas Beetles can voraciously eat eucalypt leaves leading to dieback and even the death of mature eucalypt trees. This scenario is common in cleared areas that lack understorey vegetation.



Christmas Beetle numbers can be kept in check by parasitic wasps that live in understorey vegetation. Photo by Michael Jefferies, Flickr.



Protecting and enriching the soil

Understorey vegetation is vitally important to the stability of the soil surface. The presence of an understorey, along with leaf debris, softens the impact of rainfall, reduces runoff by acting as a physical barrier to surface water and contributes to soil porosity. Understorey plants are a source of organic material that sustains living organisms in the soil and ensures nutrients are returned to the soil. They also act as a thermal insulator and protect the soil from extremes of heat, cold and strong winds. The understorey often includes species such as wattles and casuarinas that contribute to soil fertility. These plants support mycorrhizal fungi on their roots, which fix nitrogen from air into the soil, converting it to a form that can be utilised by other plants (see *Land for Wildlife Note S2 - The Value of Fungi*).



A healthy understorey and leaf litter layer supports an enormous array of life, such as these snails that have been eaten presumably by the colourful ground-dwelling rainforest bird, the Noisy Pitta.



Fungi, decomposing logs and leaf-litter protect and enrich the soil and provide habitat for wildlife.

The disappearing layer

Much of the bushland in Southern Queensland suffers from a cleared or degraded understorey due to a variety of threats, including:

- ‘Tidying-up’ of the understorey to create a park-like setting of mown grass and scattered larger trees.
- Clearing or thinning of larger trees changes the microclimate in the understorey thereby increasing the light availability and favouring opportunistic weed species.
- Weed invasion following disturbance.
- Inappropriate fire regimes (too frequent or too infrequent for the vegetation type) that result in some species being lost from the understorey.
- Grazing by cattle, horses, goats and other animals that trample plants, compress soil, spread weeds and prevent natural regeneration from occurring.



Dense understorey vegetation protects the soil from heat, winds and rainfall runoff.

Managing the understorey

If you are fortunate enough to have understorey present on your property there are a number of management actions that you can adopt to help conserve it.

Identify the different areas of understorey vegetation. For example, areas with native grasses, understorey vegetation in eucalypt forests and understorey vegetation along roadside verges and beside creeks.

Identify threats to understorey vegetation. Threats may include unrestricted livestock access, inappropriate use of fire, weed invasion or feral animals such as pigs.

Address the threats. Where possible, take steps to address them. Fencing may be required to restrict stock access. If weed control is required, investigate what animal species may be relying on the weeds for shelter such as wrens living in lantana. Gradually remove weeds and replace them with suitable native species or allow natural regeneration to occur to ensure that a continuity of habitat is provided for wildlife.

Restore the understorey. The re-establishment of understorey vegetation is an important step in the re-instatement of a healthy ecosystem. Improved management or re-establishment of understorey species may help encourage the return of wildlife by providing food, shelter and breeding sites. If the understorey has recently disappeared from your property, there may be a viable seed bank remaining in the soil so that you can encourage the natural regeneration of an understorey layer.

What you can do

- ✓ Identify areas of understorey remaining on your property.
- ✓ Observe what wildlife utilises the understorey.
- ✓ Identify threats to the understorey.
- ✓ Restrict or prevent stock access.
- ✓ Use natural regeneration where possible to restore a degraded understorey.
- ✓ Remove weeds in stages to ensure that some habitat remains for wildlife.

References and further reading

Seabrook J (1994) *Growing Understorey Seed*. Greening WA.
Greening Australia (pamphlet) *The Understorey*.



Understorey vegetation provides essential habitat for many small birds such as this Superb Fairy-wren.

Land for Wildlife is a voluntary program that encourages and assists landholders to provide habitat for wildlife on their properties. For more information about Land for Wildlife South East Queensland, or to download *Land for Wildlife Notes* free of charge, visit www.lfwseq.com.au

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