



Healthy Ecosystems and Your Property

Welcome to Land for Wildlife! Your property, large or small, makes a valuable contribution to the survival of native wildlife. To help protect or enhance the habitat values of your property you need to know what wildlife is present and what features are important for wildlife habitat. You also need to be aware of common threats to wildlife and how these can be avoided or minimised. Whether your property is a farm or a bush block you can integrate nature conservation with the other land uses on your property.

This series of Notes aims to share with you essential information on a range of practical topics, including: wildlife habitat needs, bush regeneration, fire ecology, environmental weeds and how to assess the health of your creek. In this Note we introduce some of the key concepts which are explained in detail in subsequent Notes.

We hope that you will find these Notes helpful and interesting, as healthy bushland will always provide *land for wildlife!*

Biodiversity values and healthy ecosystems

Biodiversity is short for biological diversity and can broadly be defined as “*the variety of all life forms - the different plants, animals and micro-organisms, the genes they contain, and the ecosystems they form*”. An ecosystem is a community of living organisms (plants, animals, micro-organisms), and their non-living surroundings (soil, rocks, water and climatic conditions). Ecosystems may vary in size and complexity from a small pond to a large Eucalypt forest. Understanding the way an ecosystem functions will help you to maintain the biodiversity values of your property.

Biodiversity and healthy ecosystems go hand in hand. Altering an ecosystem from its natural state, may result in a series of cascading impacts which lower biodiversity values. For example, the deterioration of water quality in a creek harms aquatic vegetation contributing to a reduction in small insects. These factors impact on habitat and food availability for frogs. In turn, frog abundance declines along with the birds that feed on the frogs.

The health of an ecosystem depends upon its capacity to withstand natural change and human impacts (this is termed resilience). Human activities that decrease ecosystem health include weed and pest animal introductions, soil compaction, vegetation removal, pollution and alterations to natural drainage e.g. damming a creek.

Whilst species diversity and healthy ecosystems go hand in hand, a healthy ecosystem is not always characterised by high species diversity. For example, some ecosystems may be ‘healthy’ whilst supporting only moderate levels of species diversity, such as desert ecosystems, whilst others such as rainforests, have high species diversity.



Fungi are essential to ensure dead plant and animal matter is broken down and recycled within the soil.

Native animals need good quality habitat to survive - a Brushtail Possum in a hollow. Photo by Alan and Stacey Franks.



What is habitat?

Habitat is the environment in which many species (i.e. animals, plants, fungi and micro-organisms) live and use resources necessary for their survival. It includes places for living, nesting and roosting, places to hide from predators, food and water, protection from weather and opportunities to find mates. Habitat is ultimately defined by the organisms that use it and their needs. We often focus on the larger species that we can see such as mammals, birds and reptiles; however, invertebrate species (creatures without a backbone) such as insects, spiders and microorganisms also require suitable habitat. Often, many organisms share the same habitat, using different resources. For example, a healthy dam may provide habitat to countless aquatic insects, frogs, water birds and freshwater fish. The picture below illustrates how a variety of different animals utilise the same habitat and share resources.



Leaf litter and soil for invertebrates, fungi and micro-organisms.

Habitat trees provide important habitat for a diverse range of wildlife species.

Photo by Lyndall Rosevear.

Habitat quality

Different plant and animal species have individual habitat requirements. The more habitat components that are available to wildlife, the greater the potential range of species that will be present. Components that contribute to healthy habitat include:

- A full variety of plant forms including trees, shrubs and groundcovers.
- Vegetation of different ages e.g. juvenile, maturing and mature.
- Tree hollows and fallen logs and branches.
- Leaf litter, mosses and lichen.
- Native grasses, rushes and sedges.
- Watercourses, streams, rivers and damp or swampy areas.
- Plants flowering, fruiting and seeding throughout the year.
- Rocks - small and large.
- Seasonal cracks in the soil.

Even if only one or two of these elements are present, they may still provide important habitat for a range of species.

Important habitat features include:

- **Size** - the bigger and the more habitat types, the better.
- **Shape** - the more compact, the better. Edge effects are also reduced (see diagram opposite).
- **Connectivity** - the more connected patches of vegetation are to each other by corridors or stepping stones, the better it allows individuals or populations to move through the landscape.
- **Sites** - a range of land types and features including watercourses.

Vegetation communities that are in good condition and contain important habitat features will be able to better withstand threatening processes.

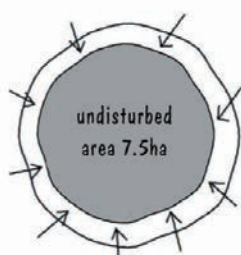


Shape is important as bushland with a small perimeter or edge length relative to its area has greater resilience against threatening processes. For example, an area of bushland that is round or square will be less prone to weed invasion than a long and narrow strip, which has a greater area of bush “accessible” to the invasion of weeds.

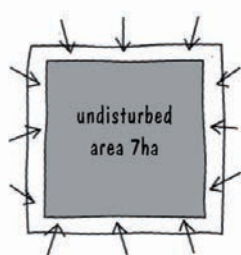
Size, shape and edge effects 10 hectare remnants

Indicates edge effects
for a distance of 25m

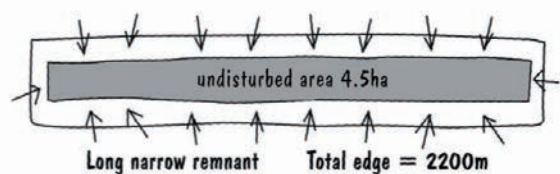
Indicates effective
undisturbed habitat



Circular remnant
Total edge = 1121m



Square remnant
Total edge = 1265m



Long narrow remnant
Total edge = 2200m

Compact, circular or square patches of vegetation will be more resistant to threats like weed invasion than long narrow patches. Redrawn from SEQ Catchments (2009) Living in the Landscape - the Lockyer Valley.

Habitat diversity is important as it ensures there is a variety of food, shelter and breeding resources needed to sustain many different fauna groups (e.g. insects, birds and reptiles). Habitat diversity could include broadscale changes in vegetation type e.g. the transition from open forest to grassland, or smaller changes such as creek running through a rainforest.

Variation in plant species, age and layers is very important because it contributes significantly to food abundance (e.g. flowers, fruit and seed) as well as breeding and shelter resources (e.g. tree hollows, fallen logs and leaf litter). The age and variety of plants in an area of bushland can be directly linked to its size, connectivity to other patches of native vegetation and past management practices.



Large blocks support larger numbers of animals and contain a greater diversity of species and habitat types.



Smaller blocks support limited numbers of animal and plant species.



Very small blocks support only a few animals and typically limited diversity of species.

Habitat potential for varying sizes of vegetation remnants. Reproduced from SEQ Catchments (2009) Living in the Landscape - the Lockyer Valley.

A **threatening process** may be defined as any process that threatens the survival or abundance of a native species or ecological community. Most threatening processes are human-induced and include:

- Vegetation clearing and habitat fragmentation.
- Changes in vegetation community composition and health due to inappropriate fire regimes.
- Weed invasion and pest animal species.
- Climate change and pollution.
- Altered water flows, tables and regimes.
- Increased soil erosion and salinity.

Some natural processes such as floods, lightning strike fires and diseases can also threaten ecosystems and individual species. Being aware of the threatening processes on your property and addressing them through a well thought-out management plan can make a huge difference to the value of your property for wildlife.



Introduced pest animals, such as the Red Fox, are a very serious threat to many native Australian species. An adult female fox is pictured here carrying a Brush-tailed Possum back to her den to feed her young. Photo by M. Dickinson.

What you can do

In liaison with your Land for Wildlife Officer, develop a Bushland Management Plan for your property (Notes G3, EW1).

- ✓ To help make weed management more effective and achievable, develop a weed management plan in conjunction with your Land for Wildlife Officer (Note EW1).
- ✓ Retain and protect native vegetation and encourage natural regrowth, especially in areas of existing native vegetation and corridors (Notes G2, V1 and V2).
- ✓ Only use locally occurring native plants in revegetation activities (Notes V3 and V4).
- ✓ Preserve dead trees, especially those with hollows (Note V7).
- ✓ Learn about the ecological role of fire on your property (Notes G3, F1 and F2).
- ✓ Install nest boxes where natural hollows are lacking (Notes A2 and V7).
- ✓ Allow leaf litter, fallen logs and branches to accumulate (i.e. don't 'tidy-up') and retain rocky areas (Notes V6 and S1).
- ✓ Get to know plants and animals in your local area through observation, using field guides, sending plants to the Qld Herbarium for identification and attending workshops and field days. Also consider learning about the fungi, lichen and other life forms that occur on your property (Notes A1, R1, V8 and S2).
- ✓ Develop an understanding of soil health and micro flora (Notes S1, S2).
- ✓ Maintain and encourage a diverse vegetation structure, including groundcover, understorey, midstorey and canopy vegetation (Notes S1, S2 and V6).
- ✓ Install wildlife-friendly fencing near areas of native vegetation, especially along waterways and around dams (Notes G4 and W2).
- ✓ Fence sensitive areas (such as creekbanks) to restrict livestock access and install off-stream watering points (Notes G3, G4, W1 and W2).
- ✓ Leave standing and fallen timber in and around dams and waterways to provide fish habitat (Notes W1 and W2).
- ✓ Avoid using pesticides and fertilisers in or near habitat areas, especially waterways (Notes W1 and W2).



*Blue-tongued Skinks are common in most habitats except rainforests.
Photo by John Bowden.*



A family of Sugar Gliders in a nest box. Photo by Alan and Stacey Franks, Hollow Log Homes.

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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Information in *Land for Wildlife Notes* is not necessarily endorsed by any of the supporting agencies, nor should it be taken to constitute professional advice or a recommendation of land management.

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