Biodiversity

Use this section to find out more about the biodiversity of our district. Learn about the ecological communities, vegetation, fauna and the threatened species of our district.

What is in this section?

This section contains general information about the biodiversity of the Central Tablelands Land care district. It includes lists of native and introduced species, the main ecological communities and lists of the threatened species and communities in our area.

Biodiversity Snapshot – Central Tablelands

Our landscapes

- ***The braod range of landscapes in our district has resulted in a rich diversity of plants and animal species.***
- ***Environmental services are provided by many animals and plants in our district.***
- ***Our landscape has been altered significantly for urban and agricultural development.***

Our flora

- ***Ecological communities are classified according to the major plant types and structure (ie height and canopy cover).***
- ***Ecological communities provide habitat niches for many animals, as well as other plants.***
- ***Ecological communities include grasslands, woodlands, forests and riparian and aquatic communities.***
- ***Many of our plants have evolved to suit particular conditions and cannot surive in the environments altered for agricultural and urban development.***
- ***Weeds are plants that grow in places where we don't want them to grow.***

Our fauna

- ***Many Australian animal species have evolved to surive only in particular habitats.***
- ***Many animal species that were once widespread in our landscape are now threatened with extinction as a result of human activities.***

Contents

7-1 Our Bioregion

The diversity of our landscapes

The Central Tablelands Landcare district stretches over two distinct ecological zones or Australian **bioregions**: it covers parts of the **South Eastern Highlands (**what we call the Tablelands) and parts of the **South Western Slopes** (what we know as the Central West Slopes).

The topography of the Central Tablelands Landcare district is diverse, and includes the high ranges of the Great Divide east of Bathurst, Mount Canobolas, the undulating hills and tablelands of the Blayney-Carcoar-Milthorpe area, and the steep hills of the Hill End-Mullion Range area. In the west it covers the lower slopes and hills of Manildra and Cudal. The altitude varies from less than 500 metres to over 1 300 metres above sea level (ASL).

Generally the climate of our area is **temperate** with **no distinct dry season**. Being in the mid latitudes, between the equator and the poles, it has relatively mild temperature conditions. In the higher parts we experience **warm or mild summers**, while on the western slopes the summers can be hot.

At a local level, temperatures and rainfall are strongly influenced by aspects such as height above sea level, topography and local winds. Rainfall varies from less than 600mm/year in the west to over 900mm/year around Orange and on the Great Dividing Range. Generally the district receives a **uniform distribution of rain** throughout the year.

The district is also geologically diverse, with ancient **sedimentary** rocks, **granites** and the relatively young **basalts** that were formed by volcanoes. The soils of our district have been formed by a combination of the geological, topographical and climatic conditions and due to the wide diversity in these factors there are a large number of **different soil landscapes.** In our district there are more than 70 soil landscapes.

This wide range in environments across our district has resulted in **a broad diversity of landscapes and ecological communities** as different animals and plants have adapted to the different conditions. From the snow gums in the sub-alpine environment on Mount Canobolas, to the native grasslands of the floodplains of the Macquarie River and to the tall, open forests south of Oberon, we live in an ecologically diverse district. The factors that influence this diversity will be explained in further detail later in this section.

Modern farming, forestry, mining and our urban centres have changed the pre-European landscapes of the district, resulting in new landscapes. In some cases native species and communities are, or have been, threatened with extinction. At the same time, new plants and animals have entered the district, sometimes as weeds and pests.

The value of our biodiversity

Biodiversity is the vast array of life that makes up our natural world and it has three levels:

- **Genetic diversity** is the diversity in DNA (our biological codes for life) that exists within biological populations and species,
- **Species diversity** is the wide range of plant, animal and insect species that inhabit our environment, and;
- **Ecosystem diversity** is the wide variety of habitats and communities that are found across the landscape.

Biodiversity is important because it provides the material to ensure our natural world continues functioning in a healthy way. We need trees to help balance carbon and oxygen in our atmosphere for example. A healthy biodiversity of micro-organisms in the soil ensures that the soil effectively carries out a wide range of functions such as water regulation, nutrient cycling and providing a good environment for plant growth.

These functions that our biodiversity performs are called **ecosystem services** and are services carried out by nature to ensure the environment operates in a balanced, stable way. In the case of soils, when biodiversity is lost then it's important ecological functions be lost or reduced, contributing to problems such as weed invasion, nutrient imbalance and salinity.

Biodiversity also provides us with a link to nature and it is important for our cultural and social well-being. National Parks, State Forests and our gardens and parks provide us with inspiration and allow us to interact with nature.

To maintain our biodiversity it is important to manage our environment in a sustainable way, which involves keeping the wide range of ecological communities in our district healthy. In the Central Tablelands Landcare district we have a range of natural, agricultural and urban ecological communities. All of them are important for our economy, society and environment in the long term.

Our natural and agricultural landscapes

The wide number of ecological communities across our district is the result of a range of factors that combine to make **each local area a unique blend of animals, plants, people and landscape.** This is what gives us the rich and varied natural heritage of the district.

Table 7.1.1
Factors that influence our local landscapes and ecological communities.

Climate	Rainfall, wind, solar radiation and temperature all influence plant growth and determine what types of plants will grow in an area. Generally, the higher rainfall areas support forests and woodland communities dominate the west where the rainfall is lower. Some species of trees can tolerate colder conditions than others and will be found in the higher country.
Geology	The underlying rocks of an area have a strong influence on the fertility and nature of the soils in an area. Different geological environments weather in different ways and form different landscapes such as steep, sharp hilly country or the rounded shapes typical of granite country. The geology also has an influence on properties of soils, which further influences ecological communities. The geological characteristics of our district are explained in more detail in the Land section of this Toolkit.
Topography	The slope and aspect of the landscape influences what type of soils and the local climate that an area will have. Shallow, rocky soils at the top of steep hills favour certain hardier plant species than the richer soils lower down the slope. This is explained in more detail in the Land section of this Toolkit.
Soils	Soil pH, structure, salinity and soil chemistry can influence the type of plant communities in an area. Woodlands on granite soils are made up of different species than those found on basalt soils for example. Local saline areas will be dominated by salt tolerant plant species. This is explained in more detail in the Land section of this Toolkit.
Fire	Some landscapes, such as grasslands and dry, open forests, are more fire tolerant than others such as high rainfall, tall forests which experience fewer fires. Different species are adapted to these diverse landscapes.
Human activity	The level and type of human activity will also impact on the type of ecological communities in an area. Intensive grazing of sheep and cattle will encourage grasslands which are adapted to being grazed by these animals. Agriculture and forestry have changed many of our landscapes since European settlement.

There are two main types of landscapes in our district:

Natural (native) landscapes

These communities have been **relatively undisturbed** since European settlement, but most of the natural landscapes in our district have been modified to some extent by human activities such as farming, grazing, mining or forestry.

Native vegetation is the most obvious aspect of our natural landscapes but the native birds, reptiles and insects that live with our native vegetation are also very important aspects of our biodiversity. The biodiversity of our natural communities is increasingly under threat as animal species lose habitats and native vegetation becomes increasingly fragmented by urban and agricultural development. **Remnant native vegetation management is a critical issue for everyone in our district**.

Figure 7.1.1
Roadside woodland north of Manildra in the western part of the district. Roadsides often contain important remnants of local biodiversity. (D.Hardwick)

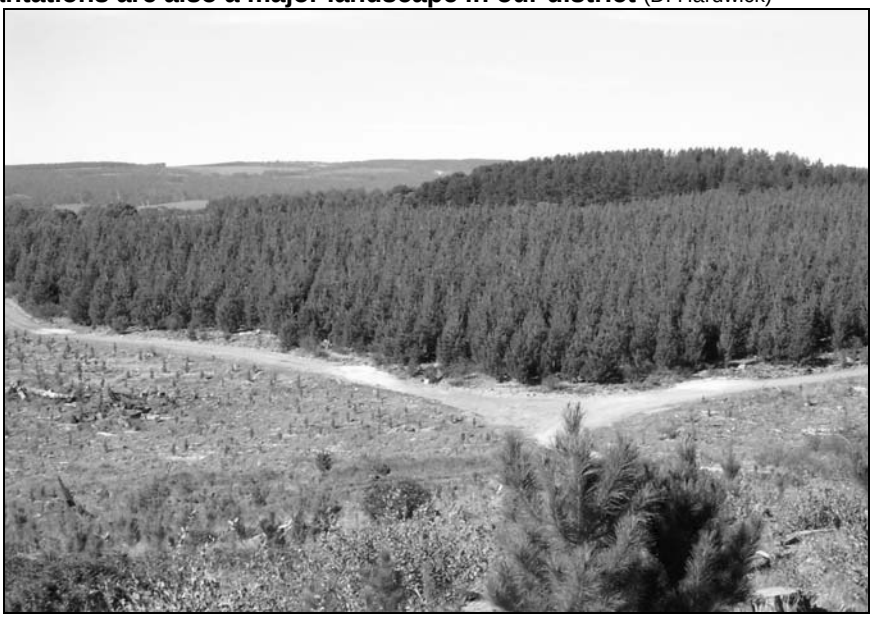
The forests, woodlands and grasslands combine to form a mosaic of **landscapes** across our district. Over time, and with the influences of climate, fire and humans, the patterns of these ecological communities also undergo **constant change**.

Agricultural landscapes

The majority of our land is now used for primary production - mainly agriculture and forestry. In our district this has often meant natural forests, woodlands and grasslands have been cleared or modified for these purposes. Agricultural landscapes are often **highly disturbed** and tend to be less biologically diverse than natural landscapes. Because they are highly disturbed they may also result in environmental problems such as soil erosion and weed invasion.

Figure 7.1.2
Mosaics of grazing pastures and woodlands are common landscapes in our district.
(D. Hardwick)

Figure 7.1.3
Forestry plantations are also a major landscape in our district (D. Hardwick)



7-2 Our Ecological Communities

Classifying our ecological communities

Ecological communities are made up of the plants and animals (the **flora and fauna**) that live and interact with one another in a specific region under relatively similar environmental conditions. One way to classify communities is according to the type of vegetation that is present so, for example, an area could be a forest, woodland or grassland.

In these vegetation communities live a wide range of animals, insects and micro-organisms. Some of these are native species and some are introduced. Together these plants, animals and landscapes make up the various ecological communities of our district.

A national system for classifying Australia's vegetation communities is the National Vegetation Information System (NVIS). Based on this system there are a number of broad **ecological community types** in the Central Tablelands Landcare district. In addition, there are the **aquatic ecological communities** of waterways, wetlands and dams and the **riparian communities** along our creeks and rivers.

Table 7.2.1
Major ecological communities of the Central Tablelands Landcare district.

Forests	Forests are communities with more than 30% foliage cover by trees. Open forests are moderately dense with 30-70% foliage cover while closed forests are dense with more than 70% cover. Many animals are adapted to living in forests and in our area these include possums, gliders and many forest birds.
Woodlands	Woodlands are communities with scattered trees. They have tree foliage cover of 10-30%, and the understorey is usually grassy. Open woodlands have less than 10% tree foliage cover. Yellow Box and White Box woodlands are the main woodland community types in our district.
Grasslands	Grasslands are dominated by grasses and may have occasional, scattered trees. In our district most grassland communities are agricultural and have come about as settlers cleared the woodlands and forests for grazing.
Aquatic and Riparian Communities	Wetlands, dams, creeks and rivers are important aquatic ecological communities. Riparian communities are the woodlands and forests that fringe our watercourses. Although they are only a small part of the total landscape they are vital for biodiversity with unique plants and animals.

Forests

Open forests dominated by eucalypt species, with foliage cover of between 30 and 70%, once covered significant areas of our district. There are two types of native forests in our district:

Tall open forests

In the higher rainfall, high elevation areas tall, open forests generally occurred in the eastern parts such as around Oberon and in the foothills of Mt Canobolas. These forests have trees of around 30m or more in height. The understorey is fairly open and may include small trees, shrubs and grasses.

Open forests

These forests were more widespread across the rest of our district. Open forests usually have trees between 10 and 30m in height with an open understorey of tussock grasses and shrubs. Open forests of Snowgums and Black Sallies also occur at high elevations and in cold frost hollows.

Across our district forest communities intermingle with woodlands, grasslands and agricultural areas forming a mosaic in the landscape.

Forest alliances and associations of the district

A forest in a particular area usually contains a few dominant tree species. These species are characteristic of that forest community and these dominant species together are known as an **association.** An example of an association is the **Brown Barrel-Ribbon Gum tall forest** that occurs in the high, moist areas south of Oberon on fertile soils.

Across broad regions there is a mosaic of associations. A broad area of forest is called an **alliance**, and is named after the most common association across a broad region. An example of an alliance in our district is the **Brown Barrel-Ribbon Gum** (*Eucalyptus fastigata – E. viminalis*), occurring in the higher altitude tablelands and mountains.

Within an alliance there are many associations of species occurring on particular sites so, in different parts of the landscape and on different soils, different associations of species will occur within a broad alliance. In the foothills of Mt Canobolas Broad-leafed Peppermints, Ribbon Gums and Candlebarks grow together in a forest association within the Brown Barrel-Ribbon Gum alliance.

Under the trees of a forest there is sometimes a **midstorey** of shrubs and small trees. The midstorey often includes wattles but it may also contain other species such as grevilleas. The midstoreys of forests in our district are usually open, meaning that there is little overlap in the foliage of the midstorey plants.

On the floor of a forest is an **understorey** of small shrubs, grasses, ferns and groundlayer herbs and forbs. Some forests have an understorey dominated by tussock grasses whilst others have a mixture of various species including bracken, ferns, grasses, herbs and small flowering plants such as native orchids.

Table 7.2.2

Forest alliances of the Central Tablelands Landcare district (**Adapted from Semple 1990)**

Forest alliance	Description	Tree species	Associations
Brown Barrel-Ribbon Gum Open Forest (*Eucalyptus fastigata - E. vinimalis*)	Occurs in higher altitude areas (above about 900m) around Orange, particularly on Mt Canobolas. Only a few associations of this forest type are found around Orange which is at the western end of its range. It is found in the northern Mullion Range and in the Yetholme to Sunny Corner area, east of Bathurst and is more commonly found in the Sunny corner and Oberon areas.	• *Eucalyptus pauciflora* • *E. dalrympleana* subsp. dalrympleana • *E. robertsonii* subsp. hemisphaerica • *E. viminalis* • *E. dives* • *E. rubida* subsp. rubida • *E. fastigata* • *E. radiata* subsp. radiata	• *Eucalyptus pauciflora, E. dalrympleana* subsp. dalrympleana. Valleys of Mt Canobolas • *E. robertsonii* subsp. hemisphaerica. Isolated stands in northern Mullion Range • *E. viminalis, E. rubida* subsp. rubida*, E. dives*. Foothills of Mt Canobolas • *E. dalrympleana* subsp. dalrympleana, *E. dives.* Sunny Corner • *E. viminalis, E. fastigata*. Sunny Corner • *E. radiata* subsp. radiate, *E. dalrympleana* subsp. dalrympleana*.*
Red Stringybark – Inland Scribbly Gum Open Forest (*Eucalyptus macrorhyncha – E. rossii*)	Dominates dry hills from the western central tablelands to ranges west of Parkes. Because it occurs on poor, rocky, skeletal soils, much of the country covered by this alliance remains uncleared. It is a diverse alliance occurring on sites ranging from dry ridges at about 1000m ASL on Mt Canobolas to low inland hills at about 250m. Some species in the alliance are confined to the higher altitude areas, e.g. *Eucalyptus rubida*, *E. dives*, *E. mannifera* and *E. pauciflora,* but others e.g. *E. macrorhyncha* and *E. goniocalyx*, occur over the whole range. It is a fairly distinct alliance, easily recognisable by the presence of its dominant species, *E. macrorhyncha*, *E. goniocalyx* and *E. rossii.*	• *Eucalyptus rossii* • *E. macrorhyncha* • *E. goniocalyx* • *E. dives* • *E. mannifera* • *E. melliodora* • *E. pauciflora* • *E. canobolensis* • *E. polyanthemos* subsp. polyanthemos • *E. dealbata* • *E. cinerea* • *Callitris endlicheri*	• *Eucalyptus rossii*, *E. macrorhyncha, E. goniocalyx*. Very widespread • *E. rossii, E. goniocalyx.* East of Bathurst • *E. rossii*, *E. mannifera*. • *E. macrorhyncha, E. pauciflora, E. canobolensis, E. dives*. Ridges on Mt Canobolas • *E. rossii*, *E. macrorhyncha, E. mannifera, E. dives.* Mullion Range, Sunny Corner • *E. macrorhyncha, E. goniocalyx, E. polyanthemos* subsp. polyanthemos. Dry Ridges • *E. macrorhyncha, E. polyanthemos* subsp. polyanthemos*.* Dry basalt, flat ridges, dry gullies • *E. macrorhyncha, E. melliodora*. Upper slopes, deeper soil on ridges • *E. macrorhyncha, E. melliodora, E. mannifera.* Mullion Creek • *E. cinerea*. Wattle Flat.

Snow Gum – Black Sally Open Forest (*Eucalyptus pauciflora – E. stellulata*)	Occurs at higher altitudes in the vicinity of Orange and east of Bathurst, above about 800m ASL. It is prominent on the higher peaks of Mt Canobolas and on the plateau east and south of Orange, where it forms mosaics and transitional associations with the *Eucalyptus melliodora, E. blakelyi* alliance. *E. aggregata* occurs in rare isolated stands in remnant areas of suitable habitat, whereas *E. pauciflora* is more widespread. They form a typical sub-alpine association on the summit of Mt Canobolas but elsewhere form transitional or relict associations with the *E. macrorhyncha, E. rossii* alliance (lower slopes of Mt Canobolas) and with the *E. melliodora, E. blakelyi* alliance (Orange plateau).	• *Eucalyptus pauciflora* • *E. canobolensis* • *E. aggregata*	• *Eucalyptus pauciflora, E. canobolensis.* Summit of Mt Canobolas • *E. aggregata*. Swampy creeks (e.g. Gosling Creek on the Cadia Road near Orange) • *E. stellulata*

Fauna of the forests

Forests have a wide diversity of habitats. Habitats are the natural homes of an animal or plant, and in a forest they can include the canopies of the tall trees, hollows in tree trunks, the shrubs and vegetation close to the ground and the rocks and leaf litter on the forest floor.

Many animals are especially adapted to living in forests and struggle to survive elsewhere. Examples are possums, gliders and some bats, which need forest trees for food and habitat.

Wallabies, quolls, marsupial mice, forst birds and a wide range of insects also live in forst communities, along with fungi, and many reptiles. Forest soil is also full of life with worms, spiders, scorpions and lizards a few examples of what can be found there. Introduced species such as foxes, pigs and feral dogs and cats can also be found in these communities.

Woodlands

Woodlands and open woodlands

Woodlands are communities of well-spaced trees with tree foliage cover of between 10% and 30% and open woodland communities have less than 10% foliage cover. Although the understorey of woodlands can consist of shrubs it is often grassy, hence the Grassy Box Woodlands of our district.

Grassy woodlands form a natural transition from the high rainfall, dense forests of the east coast of Australia and the semi arid rangelands of the inland. These communities made up a significant part of the landscape in our Landcare district prior to European settlement. In appearance they are more open than forests and generally the canopies of the trees don't overlap. Yellow Box-Blakely's Red Gum, occurring higher than 700m ASL, and the White Box Woodlands are two common woodland communities in our district.The Grassy Box Woodland is much less common and is known as a Threatened Community.

Figure 7.2.1
Woodlands with a grassy understorey are common in our district.
Looking west from the foothills of Mt Canobolas over the upper western slopes of the district. (D. Hardwick)

Prior to European settlement woodlands **were widespread across the landscapes of our district**, interconnecting with forests and grasslands. Much of the original woodlands of our district have been cleared and altered for grazing and farming and most of our remaining woodlands form part of grazing properties in the district. **In many cases, isolated paddock trees are all that remain of these communities.**

Woodland alliances and associations of the district

The woodland of a particular area usually contains a few dominant tree species. These species are characteristic of that woodland community and these dominant species together are known as an **association**. An example is the **Yellow Box-Ribbon Gum Woodland association** that occurs on higher altitudes of undulating tableland country.

Across broad regions there is often a mosaic of associations, called an **alliance.** Alliances are named after the most common association across a region. An example of an alliance is the **Yellow Box-Blakely's Red Gum Woodland** alliance that occurs across the undulating, well-drained fertile soils of the tablelands.

Within this alliance there are many associations of species occurring on particular types of sites. Ribbon Gums may occur at higher altitudes and Apple boxes are often found along creeks within the Yellow box-Blakely's Red Gum alliance.

The **understorey** (groundlayer) of woodlands in our district may contain small shrubs but predominately they contain a rich variety of grasses, herbs and other non-woody plants (**herbs**) such as lilies, orchids and forbs. Many of the original native perennial tussock grasses have been replaced by introduced species.

Fauna of the woodlands

Woodlands have **significantly different environments than forests**. With more open canopies they are more exposed to temperature and climate influences. There is usually a major difference in the types of animals living in these landscapes and those that live in forests. Some animals such as the eastern grey kangaroo and some birds do move between forests and woodlands but many can't.

Woodlands have a lower density of trees and this means that some aboreal animals that live in forests, such as gliders, aren't present. Many animals that once inhabited the grasses of woodlands are now extinct or rare, including bandicoots, marsupial mice, wombats, grass finches and quolls.

Extensive perennial tussock grasses in the groundlayer, **fallen timber**, **logs** and **rocky outcrops** provide valuable habitats that support diverse communities of fauna including spiders, rodents, frogs, insects, lizards and snakes. In turn these animals are fed upon by birds. Other birds like the grass finch feed on the grass seeds and nest in the trees nearby.

Table 7.2.3
Woodland alliances of the Central Tablelands Landcare district (Adapted from Bower *et al.* 2002)

Woodland	Description	Tree species	Associations and locations
Western Grey Box Woodland *(Eucalyptus microcarpa)*	The western grey box alliance occurs on the lower central western slopes on gently sloping or flat areas. Heavy soils, usually red brown earths, support almost pure stands of *Eucalyptus microcarpa.* It associates extensively with *Callitris glaucophylla* on coarse textured alluvial and sandy soils. This alliance is found mainly in the western half of the area. The *E. melliodora*, *E. blakelyi* and *E. albens* alliances grade into the *E. microcarpa* alliance in the west.	• *Eucalyptus microcarpa* • *E. conica* • *E. melliodora* • *E. blakelyi* • *E. populnea* subsp. bimbil • *Angophora floribunda* • *Callitris glaucophylla*	• *Eucalyptus microcarpa* • *E.microcarpa, E. conica* • *E. microcarpa, Callitris glaucophylla* • *E. microcarpa, E. melliodora, E. blakelyi* • *E. microcarpa, E. blakelyi* • *E. microcarpa, Angophora floribunda* • *E. microcarpa, E. sideroxylon*
Red Stringybark – Inland Scribbly Gum Woodland (*Eucalyptus macrorhyncha – E. rossii*)	This alliance dominates dry hills from the western central tablelands to ranges west of Parkes. Because it occurs on poor, rocky, skeletal soils, much of the country covered by this alliance remains uncleared. It is a diverse alliance occurring on sites ranging from dry ridges at about 1000 m on Mt Canobolas to low inland hills at about 250 m Some species in the alliance are confined to the higher altitude areas, e.g. *Eucalyptus rubida, E. dives, E. mannifera* and *E. pauciflora*, but others e.g. *E. macrorhyncha* and *E. goniocalyx*, occur over the whole range. It is a fairly distinct alliance, easily recognisable by the presence of its dominant species, *E. macrorhyncha*, *E. goniocalyx* and *E. rossii*.	• *Eucalyptus rossii* • *E. macrorhyncha* • *E. goniocalyx* • *E. dives* • *E. mannifera* • *E. melliodora* • *E. pauciflora* • *E. canobolensis* • *E. polyanthemos* subsp. polyanthemos • *E. dealbata* • *E. cinerea* • *Callitris endlicheri*	• *Eucalyptus rossii*, *E. macrorhyncha, E. goniocalyx*. Very widespread • *E. rossii, E. goniocalyx.* East of Bathurst • *E. rossii*, *E. mannifera*. • *E. macrorhyncha, E. pauciflora, E. canobolensis, E. dives*. Ridges on Mt Canobolas • *E. rossii*, *E. macrorhyncha, E. mannifera, E. dives.* Mullion Range, Sunny Corner • *E. macrorhyncha, E. goniocalyx, E. polyanthemos* ssp. Polyanthemos. Dry Ridges • *E. macrorhyncha, E. polyanthemos* subsp. polyanthemos*.* Dry basalt, flat ridges, dry gullies • *E. macrorhyncha, E. melliodora*. Upper slopes, deeper soil on ridges • *E. macrorhyncha, E. melliodora, E. mannifera.* Mullion Creek • *E. cinerea*. Wattle Flat.

Yellow Box – Blakely's Red Gum Woodland (*Eucalyptus melliodora – E. blakelyi)*	This is the main alliance of the agricultural lands on the western slopes. It also occurs in large patches on the basalt soils of the plateau east of Orange (where it grades into the *Eucalyptus pauciflora, E. stellulata* alliance) and in the Bathurst Basin on granite soils. It is usually found on undulating, well drained country with fertile, deep soils. It forms complex mosaics with the *E. albens* alliance on the upper western slopes and grades into the *E. microcarpa* alliance in the west, it also follows drainage lines into steep hilly terrain dominated by drier alliances (*E. macrorhyncha, E. rossii,* and *E. dealbata, E. sideroxylon*).	• *Eucalyptus melliodora* • *E. bridgesiana* • *E. viminalis E. rubida* subsp. rubida • *E. blakelyi* • *E. polyanthemos ssp. Polyanthemos, E. goniocalyx* • *Angophora floribunda*	• *Eucalyptus melliodora.* Widespread • *E. melliodora, E. blakelyi*. Widespread • *E. melliodora, E. blakelyi, E. bridgesiana*. Widespread • *E. viminalis, E. bridgesiana*. Creeks, widespread on the basalt plateau around Orange • *E. viminalis, E. bridgesiana, E. rubida ssp. rubida*. Orange plateau • *E. melliodora, E. viminalis.* Higher altitudes • *E. melliodora, E. bridgesiana, E. goniocalyx*. Transitional • *E. blakelyi, E. rubida ssp. rubida, E. bridgesiana*. Poorly drained sites at high altitudes, e.g. March to Mullion Creek, north of Orange.
White Box Woodland (*Eucalyptus albens)*	*Eucalyptus albens* frequently occurs in almost pure stands over substantial areas on the upper western slopes, e.g. between Cowra and Canowindra. In Central Western NSW, the *E. albens* alliance forms mosaics with the *E. melliodora*, *E. blakelyi* alliance. Tends to occur on undulating country in soils of moderate to high fertility, but is also found at the base of steeper hills, and on skeletal soils. In the west, it is replaced by *E. microcarpa* on red-brown earths, but may blend with it on other soils. *Brachychiton populneus* (kurrajong) is a common associate on rocky sites on upper slopes. *E. albens* generally occurs higher on the slope than the *E. melliodora*, *E. blakelyi* alliance where the two are found together.	• *Eucalyptus albens* • *E. melliodora* • *E. macrorhyncha* • *E. bridgesiana* • *E. blakelyi* • *E. goniocalyx* • *Brachychiton populneus* (kurrajong) • *Callitris endlicheri* • *Callitris glaucophylla*	• *Eucalyptus albens* • *E. albens, E. melliodora* • *E. albens, E. goniocalyx, E.macrorhyncha* • *E. albens, E. blakelyi* • *E. albens, E. blakelyi, E. melliodora* • *E. albens, Callitris glaucophylla* • *E. albens, E. goniocalyx, Callitris endlicheri* • *E. albens, Brachychiton populneus*

Grasslands

Undisturbed **native grasslands** are very rare in our district and were probably not common before European settlement, with woodlands and open forests being more common. But they are important, unique parts of the landscape. Generally, grasslands are areas with less than 5% tree cover with perennial tussock grasses being the dominant plant cover.

Native grassland communities

Native grasslands are **communities dominated by native tussock grasses and other herbs** that have been relatively undisturbed by modern human activity. The majority of native grasslands in our district have been changed by the introduction of exotic grass species such as rye grass and phalaris. Continuous grazing by livestock and the application of fertilizers has also changed these communities.

Figure 7.2.2
A small snow grass community on Mt Canobolas near Orange. Remaining natural grassland communities are often small isolated communities amongst woodlands and forests in the Central Tablelands. (D. Hardwick)

Agricultural grasslands

Most grasslands in our district now form part of agricultural landscapes, being woodlands and open woodlands that were cleared for grazing and farming. These communities are sometimes called **pastures**. They contain introduced grass species and may have only a few species present. Other agricultural pastures are based primarily on native species and when grazed strategically they can have a wide range of native herbs and grasses present.

Figure 7.2.3
Pastures near the Goobang ranges north of Manildra. Note the isolated trees in the paddocks. (D. Hardwick)

Throughout the temperate, south-east highlands of Australia there are still remnants of natural grassland communities with significant native species, however these communities are **highly endangered**.

Flora of the native grasslands

The majority of plant species that are found in the grasses of open woodlands can also be found in grasslands. Over 700 species of native herbs and grasses have been identified in the grasslands of south-eastern Australia.

Perennial tussock grasses are the dominant vegetation in grasslands in our district. Lilies, orchids, and forbs (broad leafed herbs) can also be found. Wallaby grass (*Austrodanthonia spp.*), snow grass, kangaroo grass (*Themeda* spp) and red grass (*Bothriochloa spp.*) are some of the more well known grasses. In damper areas sedges and rushes may occur. Many of the herbs grow between the tussock grasses and may only be seen during a brief growing and flowering season. Some species such as poa tussock, *Phalaris* and snow grass are also found in the understorey of woodlands and forests. Other plants are unique to grasslands as they are adapted to high levels of light and cannot tolerate the shading that occurs in forests.

Fauna of the grasslands

Grasslands contain a range of habitats including the **tussocks of the grasses**, **intertussock spaces**, **fallen timber** from the scattered trees and sometimes **rocky outcrops**. These provide habitats for diverse communities of fauna including spiders, mice, frogs, insects, lizards and snakes.

There is a **wide array of soil life** including spiders, beetles, worms, springtails and micro-organisms. Other animals that once inhabited the grasses of woodlands are now missing or rare, including bandicoots, marsupial mice, wombats and quolls.

Some animals only use the grasslands occasionally, moving between them and the woodlands and forests. Examples include;

- Wallabies and kangaroods that may graze on the open grasses and then move back to the woodlands for shelter and protection;
- Kites and hawks that hover above grasslands hunting rodents; and
- Grass finches that feed on the seeds of tussock grasses and nest in woodland trees.

Grassland communities of the Central Tablelands

Table 7.2.1
Grassland communities of the Central Tablelands Landcare district.

Grasslands	Desription	Species commonly present
Natural temperate grasslands	Native temperate grasslands are communities significantly dominated by native perennial tussock grasses and herbaceous species.	Dominated by a mix of native perennial tussock grasses, forbs and herbs.
Agricultural grasslands	Agricultural grasslands comprise major parts of our grazing country. They have usually been modified from natural landscapes of woodlands and open forests.	They may contain introduced species of grasses such as Phalaris, Rye Grass and Cocksfoot to varying degrees along with native species. They may contain a high proportion of annual grasses and legumes.

Riparian communities

The riparian zone

The riparian zone is the area of the landscape directly associated with the stream or river. It has a number of sections to it

- **Floodplain.** This is the level ground furthest from the watercourse. This area usually gets inundated during flood periods.
- **Banks.** The banks are the sides to any stream or river. Depending upon the velocity of the water flows they may be deep or shallow.
- **Bench.** This is the flat area on the bottom of the riparian zone that is not submerged by the streamflow.
- **Streambed.** This is the active flow channel where the stream or river flows most of the time.

Riparian communities

Riparian communities **are found along the watercourses of our district**. These areas have higher moisture levels than the surrounding landscape and may also experience periodic flooding. In our district these communities are generally **woodlands or fringing forests.**

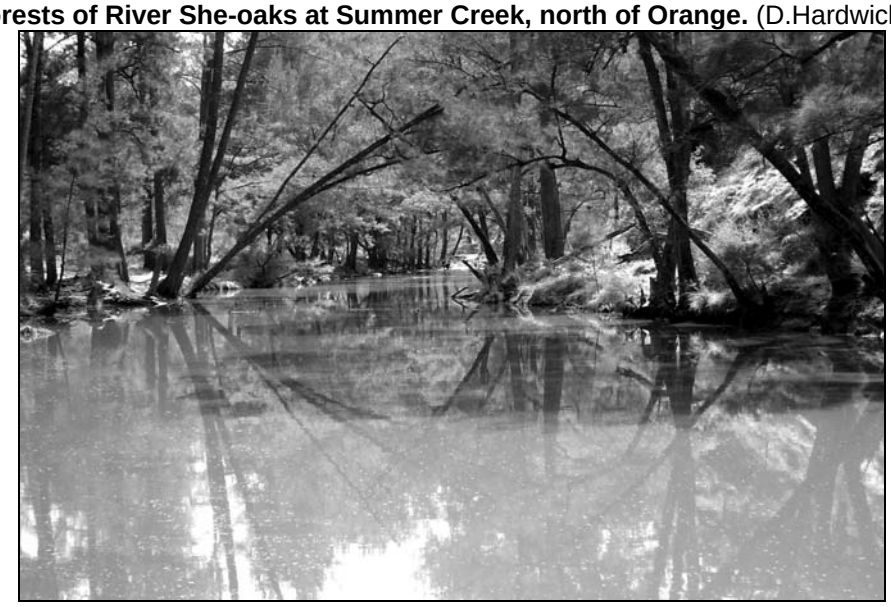
Plants of riparian communities are usually adapted to living in a particular part of the riparian zone. For example, large trees are usually found on the floodplain, shrubs and grasses on the banks, and rushes and sedges are often found close to or even in, the water.

Riparian communities are important as **biodiversity corridors** allowing wildlife and birds to move across the landscape. They are also important in maintaining stable stream banks and in keeping the aquatic ecological communities in our waterways healthy.

Riparian forest communities

These are relative relatively dense forests of trees along creeks and rivers. **River she-oaks** often make up these communities along the rocky streams and creeks of our district. They may also contain a variety of shrubs, sedges, rushes and grasses.

Figure 7.2.4
Fringing forests of River She-oaks at Summer Creek, north of Orange. (D.Hardwick)



Riparian woodland communities

Many of our riparian areas consist of open woodland communities of a few species. **Ribbon Gum and Apple Box communities** are commonly found above about 700m in the Tablelands. Further west, on the slopes, River Red Gum is a dominant species in riparian woodland communities.

Changes to the riparian zones and communities

In the Central Tablelands Landcare district many riparian communities have been cleared for agriculture whilst intensive grazing and disturbance by livestock has prevented native plant species from regenerating. Weeds such as willows, phalaris and blackberries have invaded many of our riparian communities and there has been significant modifications to the riparian zone.

Figure 7.2.5
A highly modified riparian community south of Bathurst. All parts of the riparian zone have been changed due to agricultural activities. (D.Hardwick)

Table 7.2.2
Riparian communities of the Central Tablelands Landcare district

Community Type	Description	Common Species
River She-Oak riparian forests and woodlands	Dominate the watercourses of our district below about 700m on the tablelands and upper slopes of our district.	**She Oak** *Casuarina cunninghamiana*
Ribbon Gum-Apple Box riparian woodlands	These occur along the watercourses and drainage lines above 700m in the district.	**Apple Box** *E. bridgesiana* **Ribbon Gum** *E. viminalis*
River Red Gum riparian woodlands	Occur along the watercourses of the lower slopes in the west of the district.	**River Red Gum** *E. camaldulensis*

Flora species of the riparian communities

Table 7.2.3
Floodplain species in the Central Tablelands Landcare district. (Tomkins)

Species	Common name	Distribution	Location in the Riparian zone
Trees			
Casuarina cunninghamiana	River She-oak	Lower tablelands and slopes	Floodplain, banks, water edge
Eucalyptus aggregata	Black gum	Tablelands above around 800m ASL locally in the Orange area and at Meadow Flat	Moist swampy soils and frost hollows
Eucalyptus blakelyi	Blakely's Red Gum	Tablelands and slopes to 900m ASL	Floodplain
Eucalyptus bridgesiana	Apple Box	Tablelands up to 1000m ASL and slopes	Floodplain
Eucalyptus melliodora	Yellow Box	Tablelands up to 900m ASL and slopes	Floodplain, bank, bench
Eucalyptus pauciflora	Snow Gum	Tablelands and slopes	Floodplain
Eucalyptus rubida	Candlebark	Tablelands to 1400m and slopes	Floodplain
Eucalyptus stellulata	Black Sallee	Tablelands 800-1700m ASL	Floodplain on poorly drained flats and frost hollows
Eucalyptus viminalis	Ribbon Gum	Tablelands	Floodplain
Shrubs			
Pomaderris angustifolia	Pomaderris	Slopes	Floodplain, bank
Pomaderris eriocephala	Pomaderris	Tablelands	Floodplain, bank
Grasses			
Microlaena stipoides	Microlaena	Tablelands & slopes	Floodplain, bank
Austrodanthonia spp.	Wallaby Grass	Tablelands & slopes	Floodplain, bank
Themeda australis	Kangaroo Grass	Tablelands & slopes	Floodplain, bank

Table 7.2.4
Banks and benches species in the Central Tablelands Landcare district. (Tomkins)

Species	Common name	Distribution	Location in the Riparian zone
Trees			
Acacia dealbata	Silver Wattle	Tablelands and slopes	Bank, bench
Acacia implexa	Hickory Wattle	Tablelands and slopes	Bank, bench
Acacia melanoxylon	Blackwood	Tablelands and slopes	Bank
Acacia penninervis	Native Hickory Wattle	Tablelands and slopes	Bank
Eucalyptus dealbata	Tumbledown Red Gum	Tablelands and slopes	Bank, bench
Eucalyptus goniocalyx	Bundy Box	Tablelands to 1000m ASL and slopes	Bank
Eucalyptus macroryhcha	Red Stringybark	Tablelands to 1000m ASL and slopes	Bank
Exocarpos cupressiformis	Native Cherry	Tablelands and slopes	Bank, bench
Shrubs			
Acacia verniciflua	Varnish Wattle	Tablelands and slopes	Bank
Acacia vestita	Weeping Boree	Tablelands and slopes	Bank
Acrotriche rigida		Tablelands	Bank
Callistemon sieberi	River Bottlebrush	Tablelands and slopes	Bank, bench, water's edge
Daviesia genistifolia	Broom Bitter Pea	Tablelands and slopes	Bank
Dodonaea viscosa subsp. angustissima	Narrow-leafed Hopbush	Tablelands and slopes	Bank
Dodonaea viscosa subsp. spatulata	Broad-leafed Hopbush	Tablelands and slopes	Bank, bench, water's edge
Grevillea lanigera	Wooly grevillea	Tablelands	Bank
Hakea decurrens		Tablelands	Bank
Leptospermum continentale		Tablelands	Bank, bed
Lomandra longifolia	Spiny-headed Mat-rush	Tablelands and slopes	Bank, bench
Lomatia myricoides	River Lomatia	Tablelands above 1000m ASL	Bank
Melaleuca erubenscens	Pink Honey-myrtle	Tablelands & slopes	Bank
Melichrus urceolatus	Um Heath	Tablelands	Bank
Monotoca scoparia		Tablelands to 1000m ASL	Bank
Styphelia triflora	Pink Five-Corners	Tablelands and slopes	Bank, bench
Grasses and herbs			
Chionochloa pallida	Red-anthered wallaby Grass	Tablelands	Bank
Elymus scaber	Common Wheatgrass	Tablelands	Bank
Hydrocytle sp.	Pennywort	Tablelands and slopes	Bank, bench
Poa labillardierei	Fine-leafed Tussock	Tablelands and slopes	Bank, bench
Poa sieberiana	Poa Tussock	Tablelands and slopes	Bank, bench
Wahlenbergia spp.	Bluebells	Tablelands and slopes	Bank, bench

Table 7.2.5
Water's edge and streambed species in the Landcare district. (Tomkins)

Species	Common name	Distribution	Location in the Riparian zone
Shrubs			
Callistemon sieberi	River Bottlebrush	Tablelands	Bank, water's edge, bed and swamps
Leptospermum myrtifolium	Swamp tea tree	Tablelands	Water's edge, wetlands
Sedges & rushes			
Carex appressa	Tall sedge	Tablelands and slopes	Water's edge, bank
Carex fascicularis	Sedge	Tablelands and slopes	Bed
Cyperus spp.	Sedges	Tablelands and slopes	Water's edge, bed
Eleocharis acuta	Common Spike Rush	Tablelands and slopes	Water's edge, bed
Juncus holoschoenus	Jointed-leaf Rush	Tablelands	Water's edge, bed
Juncus sp.	Pin Rush	Tablelands and slopes	Water's edge, bed
Juncus usitatus	Common Rush	Tablelands and slopes	Water's edge, bed
Typha spp.	Cumbungi	Tablelands and Slopes	Water's edge, bed
Grasses			
Phragmites australis	Common Reed	Lower tablelands and slopes	Water's edge, bed, bank, bench

Fauna species of the riparian communities

Forest and woodland species of birds and animals live in these riparian communities along with some that use the water nearby as a resource. This includes birds such as kingfishers that feed off the water life. These communities may also provide refuges for animals in times of drought providing food and shelter when the surrounding landscape is unproductive.

Aquatic communities

Aquatic ecological communities are those that are water based. The source of water can be from rain, runoff or groundwater. They are found in the rivers, streams, lakes, dams and wetlands across our district. Although water is the dominant aspect of these communities they often experience periods of little or no water.

Rivers and streams

River and stream communities have running water and fluctuating cycles of high and low flows. The water communities interact with the surrounding riparian vegetation which provides nutrients to the ecosystem as well as providing habitat in the form of logs and snags.

Permanent wetlands and swamps

Permanent wetlands include any ecological community that is dominated by open water and include **storage lakes** and **farm dams**. **Upland swamps** are communities dominated by vegetation rather than open water. They include sedge swamps that are found in wet, low areas of the landscape and the peat bogs of the alpine landscapes.

The **cycle of wet and dry** common to our climate is an important feature of many of our aquatic ecological communities. The plants and animals of these communities are adapted to periods of drought as well as flood and in many cases they need this cycle to keep the ecosystem functioning.

Flora of aquatic communities

Wetlands, rivers and creeks have a wide range of aquatic plants. **Emergent plants** such as sedges, reeds and pin rushes can be found in **vegetation dominated** wetland communities such as swamps, marshes and bogs.

Reeds, rushes and sedges also live on the shallow edges of **open water dominated** communities such as dams and reservoirs. The common reed, a tall grass-like reed, is often found here. Other plants grow on the bottom of shallow streams and wetlands. These plants such as watermilfoils are **submerged** under the water and are a food source for ducks.

Free floating plants, such as the various duckweeds, sit on the surface of open water. Also found in these aquatic environments are various species of algae and diatoms.

Fauna of aquatic communities

Wetlands, swamps and streams are vital for fauna diversity, providing habitat for many unique animals and plants. These aquatic zones are also important on a much larger scale. Wetlands in particular offer a **wildlife refuge** for animals, especially birds, during droughts as they are often the last places to dry out during dry periods. They also provide habitat for migratory birds coming from far distances including China and Siberia.

The rushes, reeds and sedges found in the shallows on the edges of aquatic communities provide important habitat for many aquatic fauna species. Ducks and other waterbirds, frogs, water rats and a whole host of insects are some of the animals that live here. Tiger and red bellied black snakes hunt frogs and rats while the water monitor (a relative of the goanna) also lives in this community.

In the streams and rivers fish, water snails, crustaceans such as yabbies and many insects live amongst the water plants and fallen timber from the riparian trees. The floating duckweeds and watermilfoils provide feed for ducks and other water fowl.

There are only two true aquatic mammals in Australia, the water rat and the platypus. Both are distributed in our area although the platypus is rare.

7-3 Fauna species

Fauna in the district

A wide range of native mammals, birds and reptiles inhabit the ecological communities of our district. Fungi, insects, bugs and a myriad of micro-organisms also live in these communities. Since European settlement introduced species such as pigs, foxes and rabbits have also entered our landscapes.

Some fauna species move throughout the area between different landscapes and these animals have a **varied habitat**. Others are adapted to living in one particular habitat such as **grassland** or in **woodland**s. Many **aboreal** (tree living) animals such as gliders can only live in **forests** as need a particular density of trees for food and habitat. Other animals, especially some birds, migrate in and out of the district each year.

The streams and rivers contain **aquatic** species, including fish, frogs, insects and micro-organisms. These, in turn, depend upon healthy riparian communities of trees and shrubs to ensure aquatic habitats remain healthy.

It is **important to have a network of natural landscapes** (known as wildlife corridors) to allow wildlife and birds to move across the landscape to eat and breed. It is also **important to have a wide diversity of habitats** in our landscapes to support as wide a range of wildlife as possible.

Keys to using the species lists

Included in this toolkit section are lists of animal species likely to be found in the Central Tablelands Landcare district. Included in these lists are other usual pieces of information about habitats, abundance, and food sources for each species.

Fauna habitats

The habitat that each species uses is listed in the species lists. **The habitat key provides the codes for each type of habitat used in the lists.** Use this key to determine the habitat a species lives in for the species lists.

Table 7.3.1
Key to the habitat types in our district. (Goldney and Bowie 1987)

Code	Habitat	Code	Habitat	Code	Habitat
Ae	Aerial	**Fp**	Floodplains	**Rb**	Reed bed
Ar	Arboreal	**Gr**	Grassland	**Rg**	Rocky gully
Bu	Burrowing	**He**	Heathland	**Ri**	Rivers and streams
Cc	Cracking clay	**Ma**	Mallee	**Rk**	Rockfaces
Cl	Cliffs	**Ms**	Mountain stream	**Sa**	Salt or brackish waters
Co	Coastal	**Op**	Open country	**Sh**	Shrubland
Cr	Cryptic	**Pa**	Pastures	**Th**	Thick undergrowth
De	Arid zone	**Pe**	Permanent water	**Up**	Uplands
Ds	Dry sandy	**Pi**	Cypress pine	**Ur**	Urban
Dsh	Dry scrub	**Pl**	Plains	**Va**	Varied
Fa	Farmland	**Pp**	Radiata pine	**We**	Wetlands
Fo	Forest	**Ra**	Rainforest	**Wo**	Woodland

Fauna status

The status (the **relative abundance** of an animal) is listed for each species. The **status key below provides the codes for each level of abundance**. Use this key to determine the habitat required by each species in the following lists.

Table 7.3.2
Key to the abundance status of fauna in our district. (Goldney and Bowie 1987)

Code	Status	Code	Status	Code	Status
A	Abundant	**R**	Rare	**?**	Not known
C	Common	**E**	Endangered	**ER**	Endangered in the region
MC	Moderately common	**Ex**	Extinct	**ExR**	Extinct in the region
U	Uncommon	**RV**	Rare visitor	**ExM**	Extinct on the mainland
S	Scarce	**I**	Introduced	**P**	Predicted in our area

Food eaten

The type of food eaten by each species is also listed in the species lists. The **food key** below provides codes for each type of food as used in the species lists.
Use this key to determine the type of food your species eats from the lists.

Table 7.3.3
Key to the food types for fauna in our district. (Goldney and Bowie 1987)

Code	Food
AQ	Aquatic life (animals and plants that live in water, e.g. tadpoles, water insects, aquatic plants)
O	Omnivore (eats live and dead animals as well as plant material)
I	Insectivore (insects)
C	Carrion (dead animal material)
P	Predator (eats other living animals and sometimes very recently killed / dead animals)
HG	Herbivore (mainly grasses and crops)
HB	Herbivore browser (mainly shrubs and native grasses)
HT	Herbivore (leaves, buds, nectar or fruits from trees)
S	Seeds

Native fauna

Table 7.3.4
Native mammals (51 species)

Common Name	Habitat	Status	Food
Platypus	Ri	C	AQ
Short beaked Echidna	Va	C	I
Spotted-tailed Quoll	Fo/Ra	U	P, C
Tiger Quoll	Fo	U	P, C
Eastern Quoll	Va	ExM	P, I
Western Quoll	Va	ExR	P
Brush-tailed Phascogale	Fo	ExR	I, P
Yellow-footed Antichinus	Va	C / A	I, P
Brown Antichinus	Fo	C	I
Dusky Antichinus	Fo	C	I
Common Dunnart	Wo / Fo / He	C	I
Fat-tailed Dunnat	Wo/Sh/Va	P	I
Southern Brown Bandicoot	Sh	R	I
Long-nosed Bandicoot	Fo / Wo	R	I
Bilby	De	ExR	I
Common Brushtail Possum	Wo / Fo	C	HT
Common Ringtail Possum	Va	C	HT
Greater Glider	Fo/ Wo	U / MC	HT
Yellow-bellied Glider	Fo	R	HT
Sugar Glider	Fo / Wo	C / A	I, HT
Squirrel Glider	Fo / Wo	P	I, HT
Feathertail Glider	Fo / Wo	MC	I, HT
Koala	Fo / Wo	MC	HT
Common Wombat	Fo	C / A	HB
Tasmanian Bettong	Pl / Gr	ExR	HB
Rufous Bettong	Fo / Wo	ExR	H
Bridled Nail-tail Wallaby	Sh/Wo	ExR	H
Brush-tailed Rock-Wallaby	Fo / Rk	S	HB
Red-necked Pademelon	Ra / Fo	P	HB
Swamp Wallaby	Fo / Wo / He	C	HB
Red-necked Wallaby	Fo / Wo	C / A	H
Eastern Grey Kangaroo	Fo / Wo / Va	C / A	H
Common Wallaroo	Va / Rk	C / A	H
Grey-headed Flying-fox	Fo	MC	HT
Little Red Flying-fox	Fo	MC	HT
Eastern Horseshoe Bat	Ra / Fo	P	I
Yellow-bellied Sheathtailed Bat	Va	P	I
White-striped Mastiff Bat	Va	P	I
Little Mastiff-bat	Va	?	I
Greater Long-eared Bat	Wo / Va	P	I
Gould's Long-eared Bat	Fo / Wo	P	I
Lesser Long-eared Bat	Va / Ur	MC	I

Common Name	Habitat	Status	Food
Common Bent-wing Bat	Va / Fo	P	I
Gould's Wattled Bat	Va	MC	I
Chocolate Wattled Bat	Va	P	I
Large Pied Bat	Fo / Wo	P	I
Large-footed Mouse-eared Bat	Va	P	I
Eastern Broad-nosed Bat	?	P	I
Little Cave Eptesicus	Va	MC	I
Little Forest Eptesicus	Fo / Wo / De	P	I
Bush Rat	Fo	C / A	I, HB

Table 7.3.5
Native birds (204 species)

Common Name	Habitat	Status	Food
Stubble Quail	Gr	MC	I, S
Brown Quail	Gr	MC	I, S
Painted Button-quail	Va / Fo	U / C	I, S
Little Button-quail	Gr / Wo	U / C	I, S
Plains Wanderer	Gr / Op	ExR	I, S
Peaceful Dove	Op	C / A	I, S
Diamond Dove	Wo / Ri	S	S
Common Bronzewing	Va	C	S
Crested Pigeon	Gr	C / A	S
Australian Crake	We	R	AQ
Baillon's Crake	We	U	AQ
Black-tailed Native-hen	We / Gr	MC	AQ, I
Dusky Moorhen	We	C / A	AQ
Purple Swamphen	We	C	AQ
Eurasian Coot	We	C / A	AQ
Great Crested Grebe	We	U	AQ
Australasian Grebe	We	C / A	AQ
Hoary-headed Grebe	We	MC	AQ
Great Cormorant	We	C / A	AQ
Little Black Cormorant	We	C / A	AQ
Pied Cormorant	We	U	AQ
Little Pied Cormorant	We	C / A	AQ
Darter	We	U	AQ
Australian Pelican	We	MC	AQ
Whiskered Tern	We	MC	AQ
Gull-billed Tern	We	R	P, I
Silver Gull	Co	C / A	O
Red-kneed Dotterel	We	MC	AQ, S
Masked Lapwing	Gr	A	I
Banded Lapwing	Gr	MC	I, H
Black-fronted Plover	We	C / A	AQ, I
Black-winged Stilt	We	C	AQ
Greenshank	We	S	AQ, I
Marsh Sandpiper	We	S	AQ, I

Curlew Sandpiper	We	S	AQ
Red-necked Stint	We	R	AQ
Sharp-tailed Sandpiper	We	U	AQ
Latham's Snipe	We	MC	AQ, I
Glossy Ibis	Pa / We	U	AQ
Sacred Ibis	Pa / We	C / A	AQ, I
Straw-necked Ibis	Pa / We	C / A	I
Royal Spoonbill	We	MC	AQ
Yellow-billed Spoonbill	We / Pa	MC	AQ
Little Egret	We	U / S	AQ
Intermediate Egret	We	MC	AQ
Great Egret	We	C/ A	AQ
White-faced Heron	Va	C / A	AQ, I
Pacific Heron	We	C / A	AQ, I
Rufous Night Heron	We	MC	AQ
Maned Duck	We	C / A	H
Black Swan	We	C	H
Australian Bittern	We /Va	R	AQ
Australian Shelduck	We	U	AQ
Pacific Black Duck	We	C / A	H
Chestnut Teal	We	MC	AQ, H
Grey Teal	We	C / A	AQ, H
Australasian Shoveler	We	MC	AQ
Pink-eared Duck	We	U	AQ
Freckled Duck	We	ER	AQ
White-eyed Duck	We	C	AQ
Blue-billed Duck	We	ER	AQ, H
Musk Duck	We	U	AQ
Brown Goshawk	Wo / Fo	U	P
Collared Sparrowhawk	Va	U	P
Wedge-tailed Eagle	Va	MC	P, C
Little Eagle	Va	MC	P
Whistling Kite	Va	MC	P, C
Square-tailed Kite	Va	R	P, C
Black-shouldered Kite	Wo / Pa	MC	P, I
Pacific Baza	Ra/ Fo	R	P, I
Australian Hobby	Va	MC	P, I
Peregrine Falcon	Cl	E	P
Black Falcon	Va	U	P, C
Brown Falcon	Va	MC	P, I
Australian Kestrel	Va	MC	P, I
Southern Boobook	Fo / Wo	MC	P, I
Barn Owl	Gr / Fa / Wo	C	P
Yellow-Tailed Black Cockatoo	Fo / Wo / Pp	MC	HT, I
Rainbow Lorikeet	Va / Wo / Fo	S	HT
Scaly-breasted Lorikeet	Fo / Ra	U	HT
Musk Lorikeet	Fo / Wo / Ur	U	HT

Little Lorikeet	Va	MC	HT
Sulphur-crested Cockatoo	Va	C	HT, I, S
Galah	Wo / Gr	A / C	S
Cockatiel	De / Wo	C	S
Superb Parrot	Fp / Fo / Fa	U	HT, S
Australian King-parrot	Fo / Fa	MC	HT
Crimson Rosella	Fo / Fa	MC	HT, I
Yellow Rosella	Fo / Fa	R	HT, I
Eastern Rosella	Fo / Wo	C	HT, S
Red-rumped Parrot	Wo	C / A	S
Turquoise Parrot	Fo / Wo	ER	S
Budgerigar	Wo / Sh / Gr	MC	S
Tawny Frogmouth	Wo / Fo	C	P, I
Australian Owlet-nightjar	Wo / Fo	MC	I
Dollarbird	Wo	C	I
Azure Kingfisher	We	C / A	AQ
Laughing Kookaburra	Wo	C / A	P, I
Red-backed Kingfisher	Wo	MC	P, I
Sacred Kingfisher	Fo / Wo	C	P, I
Rainbow Bee-eater	Op	C	I
White-throated Nightjar	Fo / Wo	U	I
Spotted Nightjar	Fo / Wo	U	I
White-throated Needletail	Ae	MC	I
Pallid Cuckoo	Fo / Wo	C / A	I
Fan-tailed Cuckoo	Fo / Wo	C	I
Brush Cuckoo	Fo	U	I
Black-eared Cuckoo	Sh / Op / Wo / Fo	U	I
Horsfield's Bronze-Cuckoo	Op	C	I
Shining Bronze-Cuckoo	Fo / Wo	U	I
Pheasant Coucal	Th	R	P, I
Superb Lyrebird	Ra / Fo	MC	I
Welcome Swallow	Va	C / A	I
White-backed Swallow	Va	MC	I
Tree Martin	Wo	C / A	I
Fairy Martin	Op	C / A	I
Grey Fantail	Fo / Va	C / A	I
Rufous Fantail	Fo	MC	I
Willie Wagtail	Va / Fa	C / A	I
Leaden Flycatcher	Fo	MC	I
Satin Flycatcher	Fo	U	I
Restless Flycatcher	Fo / Wo	C / A	I
Jacky Winter	Va	C / A	I
Scarlet Robin	Ra / Fo	C / A	I
Red-capped Robin	Wo	C / A	I
Flame Robin	Wo / Fa	MC	I
Rose Robin	Fo	MC	I
Hooded Robin	Va	MC	I

Eastern Yellow Robin	Fo / Wo	C / A	I
Golden Whistler	Ra / Fo / Ma / Wo	C / A	I, HT
Rufous Whistler	Fo / Wo / Ma	MC	I
Grey Shrike-thrush	Fo / Wo / Ma	A	I, P
Australian Magpie Lark	Op	A	I
Crested Shrike-tit	Fo / Wo / Ma	MC	I
Black-faced Cuckoo-shrike	Wo / Fo	A	I
White-winged Triller	Op / Wo	A / MC	I
Spotted Quail-thrush	Fo	MC	I,S
White's Thrush	Fo	MC	I
White-fronted Chat	Va	C	I
Crimson Chat	Va	MC	I,S
Orange Chat	Va	ER	I
White-throated Gerygone	Fo / Wo	C	I
Western Gerygone	Wo / Ma	C	I
Weebill	Fo / Wo / Ma	A	I
Southern Whiteface	De / Op / Wo	C	I,S
Striated Thornbill	Fo / Wo	C	I
Yellow Thornbill	Fo / Wo	C	I
Brown Thornbill	Fo	C / A	I
Buff-rumped Thornbill	Fo	A	I
Yellow-rumped Thornbill	Wo	A	I
White-browed Scrubwren	Va	C / A	I
Chestnut-rumped Hylacola	He / Th	U	I
Speckled Warbler	Wo / Cy	C	I
Origma	Rg / Rk	MC	I,S
Brown Songlark	Gr	A	I,S
Rufous Songlark	Wo / Op	A	I,S
Little Grassbird	We / Gr	MC	I
Clamorous Reed Warbler	Wo	C	I
Golded-headed Cisticola	Gr	S / R	I
Superb Fairy-wren	Ra / Fo	A	I
Masked Woodswallow	Fo / De	MC	I
White-browed Woodswallow	Fo / De	A	I
Dusky Woodswallow	Fo / Wo	A	I
Varied Sittella	Fo	C / A	I
Brown Treecreeper	Wo	A	I
White-throated Treecreeper	Ra / Fo / Wo	A	I
Red-browed Treecreeper	Fo	C	I
Mistletoebird	Va / Fo / Wo	A	HT
Spotted Pardalote	Fo	A	I
Striated Pardalote	Fo / Wo	C	I
Silvereye	Va	A	I,HT
White-naped Honeyeater	Fo	C / A	HT
Black-chinned Honeyeater	Wo	MC	I, HT
Brown-headed Honeyeater	Wo / Ma	C / A	I
Striped Honeyeater	Wo / Fo	C	I, HT

Eastern Spinebill	He / Fo	MC	I, HT
Regent Honeyeater	Fo / Wo	R	I, HT
Fuscous Honeyeater	Fo / wo	C	I, HT
Yellow-faced Honeyeater	Fo	C / A	I, HT
White-eared Honeyeater	Fo / Wo / Ma	C / A	I, HT
Yellow-tufted Honeyeater	Fo / Wo	C	I, HT
White-plumed Honeyeater	Fo / Wo	C / A	I, HT
New Holland Honeyeater	He / Wo	MC	I, HT
Noisy Miner	Wo / Ur	A	I, HT
Red Wattlebird	Fo / Wo / Ur	A	I, HT
Blue-faced Honeyeater	Fo / Wo	C	I, HT
Noisy Friarbird	Fo / Wo	C / A	I, HT
Richard's Pipit	Op / Gr	A	I
Singing Bushlark	Gr	C	S, I
Diamond Firetail	Wo	C	S, I
Zebra Finch	Op	C / A	S, I
Double-barred Finch	Fo / Gr	C	S, I
Plum-headed Finch	Wo	MC	S, I
Red-browed Firetail	Va	C / A	S, I
Olive –backed Oriole	Wo	MC	HT
White-winged Chough	Wo	C / A	P, I
Pied Currawong	Fo / Wo / Ur	C	P, I
Grey Currawong	Fo / Wo	MC	P, I
Pied Butcherbird	Wo / Pa	C	P, I
Grey Butcherbird	Fo / Wo / Ma	A	P, I
Australian Magpie	Fo / Wo / Ur	A	I
Australian Raven	Va	A	O
Little Raven	Va	A	I

Table 7.3.6
Native frogs (25 species)

Common Name	Habitat	Status	Food
Booroolong Frog	Ms	C	I
Green Tree Frog	Va	U	I
Blue Mountains Tree Frog	Va	U	I
Brown Tree Frog	Va	U	I
Lesueur's Frog	Va	MC	I
Peron's Tree Frog	Va	MC	I
Green Swamp Frog	Va	U	I
Verreaux's Tree Frog	Fo / Wo / We	U	I
Red-groined Toadlet	De	ER	I
Green and Golden Bell Frog	We	ER	I
Common Eastern Froglet	Va	C	I
Giant Burrowing Frog	Fo / Ri	ER	I
Eastern Banjo Frog	Pe	C	I
Long-thumbed Frog	Va	U	I
Ornate Burrowing Frog	Ra / Fo / Wo	P	I

Common Name	Habitat	Status	Food
Spotted Grass Frog	Va	A	I
Brown-striped Frog	Pe	MC	I
Common Spadefoot Toad	Bu	?	I
Brown Toadlet	Fo	MC	I
Eastern Sign-bearing Froglet	Cr	P	I
Crinia parsinsignifera	Cr	P	I
Uperoleia fimbrianus	?	P	I
Broad-palmed Frog	Va	P	I
Leaf Green Tree Frog	Pe	P	I
Desert Tree Frog	Va	P	I

Table 7.3.7
Native lizards (41 species)

Common name	Habitat	Status	Food
Wood Gecko	Va	C	I
Lesueur's Velvet Gecko	Rk	U	I
Southern Leaf-tailed Gecko	Ur / Rk	P	I
Eastern Thick-tailed Gecko	Va	C	I
Pink-tailed Worm Lizard	P	R	I
Burton's Snake-lizard	Va	U	P
Common Scaly Foot	Va	P	I
Hooded Scaly-foot	Va	P	I
Bearded Dragon	Va	A	I
Mountain Dragon	Up	C	I
Jacky Lizard	Va	C	I, H
Nobbi	Va	A	I
Central Bearded Dragon	Ds	?	I
Eastern Water Dragon	Ar / Ri	C	P
Lined Earless Dragon	Va	ER	I
Gould's Goanna	Va	C	P, C
Lace Monitor	Ar	MC	P, C
Southern Rainbow Skink	?	A	I
Fence Skink	Ar	C	I
Striped Skink	Va	A	I
Copper-tailed Skink	Va / Rk	C	I
Cunningham's Skink	Rk	C	I, H
Black Rock Skink	Rk	P	I
Tree Skink	Ar	U	I
White's Skink	Va	C	I
Three-toed Skink	Bu	C	I
Delicate Skink	Ur	?	I
Garden Skink	Ur	C	I
Weasel Skink	Va	C	I
Leiolopisma coventryi	Up	P	I
Leiolopisma entrecasteauxii	Up	A	I
Red-throated Skink	Va	C	I
Bougainville's Skink	Bu	P	I

Grey's Skink	Va	P	I
Boulenger's Skink	Va	C	I
Eastern Water Skink	Ri / Rk	A	I, AQ, P
Highland Water Skink	Ri	?	I, AQ, P
She-oak Skink	Va	P	I
Blotched Blue-tongue	Fo	C	I, H
Eastern Blue-tongue	Va	C	I, P
Shingleback	Va	C	I, H

Table 7.3.8
Native snakes (25 species)

Common name	Habitat	Status	Food
Small-headed Blind Snake	Va	C	I
Prong-snouted Blind Snake	Va	P	I
Blackish Blind Snake	Va	C	I
Proximus Blind Snake	Va	P	I
Brown-snouted Blind Snake	Va	P	I
Carpet Python	Va	C	P
Diamond Python	Va	R	P
Green Tree Snake	Ar	?	P
Common Death Adder	Va	P	P
Copperhead	We	C	P
Eastern Small-eyed Snake	Va	U	P
Yellow-faced Whip Snake	Va	U	P
De Vis's Banded Snake	Va	P	P
Mustard-bellied Snake	Va	P	P
Red-naped Snake	Va	U	P
Pale-headed Snake	Ra / Fo / Wo	P	P
Broad-headed Snake	Rk	E	P
Eastern Tiger Snake	Va	A	P
King Brown Snake	Va	?	P
Red-bellied Black Snake	We	A	P
Eastern Brown Snake	Va	C	P
Little Whip Snake	Va	?	P
Black-headed Snake	?	C	P
Spectacled Hooded Snake	Va	U	P
Bandy Bandy	Va	U	P

Table 7.3.9
Native fish (10 species)

Common name	Habitat	Status	Food
Australian Grayling	Ri	ExR	AQ
Australian Smelt	Ri	C	AQ, I
Dwarf Flat-headed Gudgeon	Ri	U	AQ, P
Mountain Galaxias	Ri	ER	AQ, I
Murray Cod	Pe	ER	AQ, P
Silver Perch	Pe	C	AQ, O
Yellow Belly	Pe	C/U	AQ, P
Slippery	Ri	E	AQ, I
Trout Cod	Ri	ExR	AQ, P
Southern Pygmy Perch	Ri	ER	AQ, I

Table 7.3.10
Native tortoises (2 species)

Common name	Habitat	Status	Food
Long-necked Tortoise	We / Ri	C	AQ
Broad-shelled River Turtle	Ri	U	AQ

Introduced fauna

Table 7.3.11
Introduced mammals (8 species)

Common name	Habitat	Status	Food
Black Rat	Va	C, I	O
House Mouse	Va	C / A, I	O
Water Rat	Ri	MC	P
White-footed Rabbit Rat	Va	Ex	?
Hastings River Mouse	Fo / Wo	ExR	S
Rabbit	Va	C / A, I	H, HB
Brown Hare	Gr / Wo / Ur	C, I	H
Pig (Feral)	Va	MC, I	O
Goat (Feral)	Va	C / A, I	HB
Fox	Va	C / A, I	P, O
Feral cat	Va	MC, I	P

Table 7.3.12
Introduced fish (8 species)

Common name	Habitat	Status	Food
Brown Trout	Ri	I	AQ, P
Brook Trout	Pe	U, I	AQ, I
Atlantic Salmon	Pe	S, I	AQ, P
European Carp	Ri	I	AQ, O
Goldfish	Ri	I	AQ, O
Mosquito Fish	Ri	I	AQ, O
Rainbow Trout	Ri	I	AQ, P
Redfin	Ri	I	AQ, P

Table 7.3.13
Introduced birds (9 species)

Common name	Habitat	Status	Food
Mallard	We	U, I	AQ
Feral Pigeon	Ur	A, I	O
Blackbird	Ur	C / A, I	I
Common Skylark	Gr	C, I	S, I
House Sparrow	Ur	A, I	S, I
European Goldfinch	Ur / Pa	A, I	S, I
European Greenfinch	Ur	U, I	S
Common Mynah	Ur	MC, I	HT
Common Starling	Ur / Pl	A, I	HT, S

7-4 Flora Species

Flora in the district

Eucalypts, native shrubs, perennial grasses, herbs, mosses and small flowering plants made up the vegetation in our district before European settlement. The area is at the confluence of the dry western floras of inland NSW and the moist eastern floras and, as a result, it has a relatively high degree of floristic diversity.

Originally our region was timbered by eucalyptus forest in the moister east and south east. This merged into woodlands of decreasing height and density to the west as rainfall and elevation decreased. Large areas of the original vegetation have been cleared in the course of settlement, especially the woodlands on more fertile soils.

The introduction of exotic plants for agriculture, forestry and amenity has further changed the nature of our vegetation. Widespread areas of our landscape are now grasslands composed of introduced as well as native species. Other areas have exotic forests and significant exotic weeds such as willows.

Trees

Eucalypts are the dominant tree species in the district. They are found in forests, woodlands and the high, subalpine areas. Of about 240 eucalypts in NSW around 30 occur in the district. Some, such as *Eucalyptus canobolensis* found on Mt Canobolas, are rare. Other native trees include the **wattles** (Acacias). Introduced tree species include the willows (*Salix* spp.) and pine trees (*Pinus* spp.) that make up the extensive softwood forests around Mt Canobolas, Bathurst and Oberon.

Keys to using the flora lists

Table 7.4.1
Key to habitat and distribution of flora

Code	Habitat	Code	Distribution
F	Forest	T	Tablelands
W	Woodland	S	Slopes
G	Grassland		
High			
Ri			
wet			

Native flora species

Table 7.4.2
Tree species, common names, habitat and distribution.

Species	Common name	Habitat	Distribution
Allocasuarina diminuta			
Allocasuarina gymnanthera			T, S
Allocasuarina littoralis	Black Sheoak		T, S
Allocasuarina nana			
Allocasuarina verticillata	Hill Oak		T, S
Brachychiton populneus	Kurrajong		T, S
Callitris endlicheri	Black Cypress Pine		T, S
Callitris glaucophylla	White Cypress Pine		S
Casuarina cunninghamiana	River Oak		T, S
Eucalyptus albens	White Box	W	T, S
Eucalyptus blakelyi	Blakely's Red Gum	W	T, S
Eucalyptus blaxlandii			
Eucalyptus bridgesiana	Apple Box	W	T, S
Eucalyptus cannonii			
Eucalyptus canobolensis		F, W	
Eucalyptus cinerea	Argyle Apple	F, W	
Eucalyptus crebra	Narrow-leaved Ironbark		S
Eucalyptus dalrympleana	Mountain Gum	F	T
Eucalyptus dealbata	Tumbledown Gum	F, W	T, S
Eucalyptus dives	Broad-leaved Peppermint	F, W	T
Eucalyptus fastigata	Brown Barrel	F	
Eucalyptus fibrosa	Red Ironbark		T, S
Eucalyptus goniocalyx	Bundy	F, W	T, S
Eucalyptus macrorhyncha	Red Stringybark	F, W	T, S
Eucalyptus mannifera	Brittle Gum	F, W	T
Eucalyptus melliodora	Yellow Box	F, W	T, S
Eucalyptus microcarpa	Inland Grey Box	W	S
Eucalyptus oblonga	Stringybark		
Eucalyptus pauciflora	Snow Gum	F, W	T
Eucalyptus polyanthemos	Red Box	F, W	T, S
Eucalyptus praecox	Brittle Gum		
Eucalyptus pulverulenta	Silver-leaved Gum		
Eucalyptus punctata	Grey Gum		
Eucalyptus radiata	Narrow-leaved Peppermint	F	
Eucalyptus robertsonii	Robertsons Peppermint	F	T
Eucalyptus rossii	Inland Scribbly Gum	F, W	T, S
Eucalyptus rubida	Candlebark	F, W	T
Eucalyptus saxicola			
Eucalyptus sideroxylon	Mugga Ironbark		S
Eucalyptus sparsifolia	Narrow-leaved Stringybark		T, S
Eucalyptus stellulata	Black Sally		T
Eucalyptus viminalis	Ribbon Gum	F, W	T, S

Table 7.4.3
Wattle species, common names, habitat and distribution.

Species	Common name	Habitat	Distribution
Acacia acinacea	Gold-dust Wattle		T, S
Acacia amoena	Boomerang Wattle	F, W	T, S
Acacia binervata	Two-veined hickory		T
Acacia brownii	Heath Wattle	F, W	T, S
Acacia buxifolia	Box-leaved Wattle	F, W	T, S
Acacia dawsonii	Poverty Wattle	W	T
Acacia dealbata	Silver Wattle	F	T, S
Acacia deanei ssp. Paucijuga	Deans Wattle		T, S
Acacia decora	Western Golden Wattle	F	T, S
Acacia decurrens	Black Wattle		
Acacia difformis	Drooping Wattle		T, S
Acacia falciformis	Broad-leaved Hickory		T, S
Acacia genistifolia	Early Wattle	F	T, S
Acacia gladiiformis	Sword-leaved Wattle		T, S
Acacia gunnii	Ploughshare Wattle	F	T, S
Acacia hakeoides	Hakea Wattle	W	T, S
Acacia implexa	Hickory Wattle	F, W	T, S
Acacia lanigera	Wooly Wattle		T, S
Acacia leucoclada			
Acacia longifolia	Sydney Golden Wattle		
Acacia mearnsii	Black Wattle		
Acacia meiantha			T
Acacia melanoxylon	Blackwood	F, high	T, S
Acacia paradoxa	Kangaroo Thorn	F, W	T, S
Acacia penninervis	Mountain Hickory	F, W	T, S
Acacia terminalis	Sunshine Wattle	F, W	T
Acacia ulicifolia	Prickly Moses	F, W	T, S
Acacia uncinata	Gold-dust Wattle	F	T, S
Acacia verniciflua	Varnish Wattle	F, Ri	T, S
Acacia vestita	Weeping Boree	F	T, S

Table 7.4.4
Leguminours shrubs and bushes (Fabaceae family), common names, habitat and distribution.

Species	Common name	Habitat	Distribution
Almaleea incurvata		W	
Bossiaea buxifolia	Matted Bossiaea		T, S
Bossiaea foliosa	Leafy Bossiaea		T
Bossiaea obcordata			
Bossiaea rhombifolia subsp. rhombifolia		F	
Daviesia genistifolia	Broom Bitter Pea		T, S
Daviesia latifolia		F, W, G, high	
Daviesia leptophylla	Slender Bitter Pea		T, S
Daviesia ulicifolia	Gorse Bitter Pea	F, W, G	
Desmodium brachypodum	Large Tick-trefoil	F	
Desmodium varians	Slender Tick-trefoil	F, W	
Dillwynia juniperina	Prickly Parrot-pea		T, S
Dillwynia phylicoides	Parrot-pea	F, W	T, S
Dillwynia retorta		F	T
Dillwynia sericea		F, W	T, S
Glycine clandestina		F, W, G, high	T, S
Glycine tabacina		W, G	T, S
Gompholobium huegelii	Pale Wedge Pea	F	T, S

Gompholobium uncinatum	Red Wedge Pea		T, S
Hardenbergia violacea	False Sarsaparilla	F, W, G	T, S
Hovea lanceolata	Lance-leaf Hovea		T, S
Hovea linearis		F	T, S
Indigofera adesmiifolia		W	T, S
Indigofera australis	Hill Indigo	F, W	T, S
Indigofera coronillifolia			S
Mirbelia oxylobioides		F, high	T
Mirbelia platylobioides		W	T, S
Platylobium formosum	Handsome Flat-pea		T
Podolobium ilicifolium	Prickly Shaggy Pea	F	T, S
Pultenaea microphylla	Bush-pea	F, W	T, S
Pultenaea procumbens	Bush-pea	F	T, S
Pultenaea scabra		F	T, S
Pultenaea subternata	Bush-pea		T, S
Swainsona galegifolia	Smooth Darling Pea	F, W, G	T, S
Zornia dyctiocarpa	Zornia	F, G	T

Table 7.4.5
Heaths (Epacridaceae family), common names, habitat and distribution.

Species	Common name	Habitat	Distribution
Acrotriche serrulata	Honeypots	F	T, S
Astroloma humifusum	Native Cranberry		
Brachyloma daphnoides	Daphne Heath	F, W	T, S
Epacris microphylla			T
Leucopogon appressus		F	T, S
Leucopogon attenuatus	Beard heath		T, S
Leucopogon ericoides		F	T, S
Leucopogon lanceolatus		F, W	T
Leucopogon microphyllus var. microphyllus		F	T, S
Leucopogon muticus		F	T, S
Leucopogon virgatus		W	T, S
Lissanthe strigosa	Peach Heath	F	T, S
Melichrus urceolatus	Urn Heath	F, W	T, S
Monotoca scoparia		F, W	T, S
Styphelia triflora	Pink Five-corners	F, W	T, S
Styphelia tubiflora		F	T

Table 7.4.6
Shrubs, bushes and vines, families, common names, habitat and distribution.

Family	Species	Common name	Habitat	Distribution
Chenopodiaceae	*Chenopodium desertorum subsp. microphyllum*		F, W, G	S
	Chenopodium pumilio	Small Crumbweed	F, W, G	
	Einadia hastata	Berry Saltbush	F, W, G	
	Einadia nutans	Climbing Saltbush	F, W, G	
	Maireana microphylla		F, W, G	S
Dilleniaceae	*Hibbertia obtusifolia*	Hoary Guinea Flower	F, W, G	
	Hibbertia riparia			
	Hibbertia sericea.	Silky Guinea Flower		
Euphorbiaceae	*Phyllanthus hirtellus*	Thyme Spurge	F	T, S
	Poranthera corymbosa		F	T, S
	Poranthera microphylla		F, W	
Geraniaceae	*Geranium graniticola*		W, high	T
	Geranium potentilloides		W, G	T
	Geranium retrorsum		W, G	T, S
	Geranium solanderi	Native Geranium	W, G	T, S
	Pelargonium inodorum		F, W, G	T, S
Goodeniaceae	*Goodenia bellidifolia*		F	T, S
	Goodenia decurrens		F	T, S
	Goodenia hederacea		F, W, G	T, S
	Goodenia ovata		F, W	T, S
	Goodenia pinnatifida		F, W, G	T, S
Haloragaceae	*Gonocarpus elatus*		F, W, G	T, S
	Gonocarpus micranthus		F, Wet	T
	Gonocarpus tetragynus		F	T, S
	Gonocarpus teucrioides		F	T
Lauraceae	*Cassytha pubescens*	Strangle-vine		T
Myrtaceae	*Callistemon citrinus*	Crimson Bottlebrush		
	Callistemon linearis	Narrow-leaved Bottlebrush		
	Callistemon pallidus	Lemon Bottlebrush		
	Callistemon sieberi	River Bottlebrush		T, S
	Calytrix tetragona	Common Fringe-myrtle		T, S
	Kunzea ericoides	Burgan	F, Ri, high	T, S
	Kunzea parvifolia	Violet Kunzea	F	T, S
	Leptospermum divaricatum		W	S
	Leptospermum grandifolium	Woolly Teatree	Ri, high	T
	Leptospermum juniperinum		wet	T
	Leptospermum	Woolly Teatree	Ri, F	T

	lanigerum			
	Leptospermum morrisonii		W	T
	Leptospermum multicaule	Silver Tea-tree	W	T, S
	Leptospermum myrtifolium	Swamp Tea-tree	W, Ri, high	T
	Leptospermum obovatum		Ri	T
	Leptospermum parvifolium		F	T, S
	Leptospermum polygalifolium			T
	Leptospermum trinervium		F	T, S
	Melaleuca erubescens	Pink Honey-myrtle		S
	Melaleuca styphelioides	Prickly-leaved Tea Tree	Ri	T
Olacaceae	*Olax stricta*		F, W	T, S
Onagraceae	*Epilobium billardiereanum*		F, W, G, Damp	T, S
	Epilobium pallidiflorum		Ri	T
Pittosporaceae	*Billardiera scandens*	Appleberry		
	Bursaria longisepala			
	Bursaria spinosa	Native Blackthorn		
	Bursaria spinosa subsp. lasiophylla			
	Bursaria spinosa subsp. spinosa			
	Cheiranthera cyanea var. cyanea	Finger Flower		
	Pittosporum phylliraeoides	Weeping Pittosporum		S
	Pittosporum multiflorum	Orange Thorn		
	Rhytidosporum procumbens			
Proteaceae	*Banksia marginata*	Honeysuckle		T, S
	Grevillea arenaria		F	S
	Grevillea floribunda	Seven Dwarfs Grevillea	F, W	T, S
	Grevillea ramosissima	Fan Grevillea	W	T, S
	Grevillea robusta	Silky Oak		
	Grevillea triternata		F	T, S
	Hakea decurrens		F, W	T, S
	Hakea decurrens subsp. decurrens			
	Hakea sericea		F	T
	Isopogon anemonifolius			
	Lomatia myricoides	River Lomatia	Ri	T, S
	Lomatia silaifolia	Crinkle Bush	F, W	T, S
	Persoonia chamaepeuce		F, W	T
	Persoonia linearis	Narrow-leaved	F, W	T, S

		Geebung		
	Persoonia mollis		F	T
	Persoonia rigida	Hairy Geebung	F, W	T, S
Ranunculaceae	*Clematis aristata*		F	T
	Clematis glycinoides	Headache Vine	F	T, S
	Clematis microphylla	Small-leaf Clematis		T, S
	Ranunculus lappaceus	Common Buttercup	F, W, G, high	T, S
Rhamnaceae	*Cryptandra amara*		F, W, G	T, S
	Cryptandra amara		F, W, G	T, S
	Cryptandra spinescens		F	T, S
	Discaria pubescens	Australian Anchor Plant	F, W	T, S
	Pomaderris andromedifolia	Pomaderris		T, S
	Pomaderris angustifolia	Pomaderris	F, Ri	T, S
	Pomaderris aspera	Hazel Pomaderris	F, Ri	T, S
	Pomaderris betulina		F	T
	Pomaderris eriocephala		F, high	T
	Pomaderris ferruginea		F, Ri	T, S
	Pomaderris phylicifolia	Narrow-leaf Pomaderris		T
Rutaceae	*Boronia microphylla*	Small-leaved Boronia	F	T
	Correa reflexa	Native Fuschia	F	T
	Phebalium spp.			T
	Zieria obcordata		W	T
Santalaceae	*Exocarpos cupressiformis*	Native Cherry		T, S
	Exocarpos strictus	Dwarf Cherry		T
	Santalum lanceolatum	Northern Sandalwood	W	S
Sapindaceae	*Dodonaea boroniifolia*	Hairy Hopbush	F, W, G	T, S
	Dodonaea viscosa			
	Dodonaea viscosa subsp. angustifolia	Broad-leaf Hopbush	F, W	T, S
	Dodonaea viscosa subsp. angustissima	Narrow-leaf Hopbush		T, S
	Dodonaea viscosa subsp. cuneata	Wedge-leaf Hopbush	F	T, S
	Dodonaea viscosa subsp. spatulata	Broad-leaf Hopbush	F	T, S
Scrophulariaceae	*Derwentia derwentiana*		W, Ri	S
	Derwentia perfoliata	Digger's Speedwell	F, W, G	T, S
	Veronica calycina	Hairy Speedwell	F	T, S
	Veronica plebeia	Trailing Speedwell	F, G	T, S
Solanaceae	*Solanum cinereum*	Narrawa Burr	F, W	T, S
	Solanum linearifolium	Mountain Kangaroo Apple	W, G	T, S
	Solanum linnaeanum	Apple of Sodom		
Thymelaeaceae	*Pimelea curviflora*		F	T

	var. gracilis			
	Pimelea curviflora var. sericea		F	T, S
Xanthorrhoeaceae	*Xanthorrhoea glauca*	Grass Tree		T, S
Zamiaceae	*Macrozamia secunda*	Burrawang	F	T

Table 7.4.7
Herbs and other ground covers, common names, habitat and distribution.

Family	Species	Common name	Habitat	Distribution
Amaramthaceae	*Alternanthera denticulata*	Lesser Joyweed	F, W, G	
Anthericaceae	*Arthropodium milleflorum*	Vanilla Lily		
	Arthropodium minus	Small Vanilla Lily		
	Dichopogon fimbriatus	Nodding Chocolate Lily		
	Thysanotus patersonii	Twining Fringe-Lily		
	Thysanotus tuberosus	Common Fringe-lily		
	Tricoryne elatior	Yellow Autumn-lily		
Apiaceae	*Daucus glochidiatus*	Native Carrot		
Asphodelaceae	*Bulbine bulbosa*	Bulbine Lily		
Asteraceae	*Brachyscome aculeata*	Hill Daisy	F, W, G	T, S
	Brachyscome procumbens		F	T
	Brachyscome ptychocarpa		F	T, S
	Brachyscome scapigera		F	T, S
	Brachyscome spathulata		W, G	T, S
	Calocephalus citreus	Lemon Beauty-heads	W, G	T, S
	Calomeria amaranthoides	Incense Plant	Ri	T
	Calotis glandulosa		F, W, G, high	T
	Calotis lappulacea	Yellow Burr-daisy	W, G	T, S
	Cassinia arcuata	Sifton Bush		
	Cassinia laevis	Cough Bush	F, W, G	T, S
	Cassinia longifolia	Shiny Cassinia	F	T, S
	Cassinia quinquefaria	Cassinia	F, W	T, S
	Cassinia uncata	Sticky Cassinia	F	T, S
	Celmisia longifolia		high	T
	Centipeda minima	Spreading Sneezeweed	G	T, S
	Chrysocephalum apiculatum	Common Everlasting, Yellow But	W, G	T, S
	Chrysocephalum semipapposum	Clustered Everlasting	F, W, G	T, S
	Cymbonotus lawsonianus	Bear's Ear	F, W	T, S

	Helichrysum rutidolepis	Pale Everlasting	F, W	T
	Helichrysum scorpioides	Button Everlasting	F	T, S
	Lagenifera stipitata	Blue Bottle-daisy	F, W, G, high	T
	Leptorhynchos squamatus	Scaly Buttons	W, G, high	T
	Olearia elliptica	Sticky Daisy Bush	F, W	T
	Ozothamnus diosmifolius	White Dogwood	F	T, S
	Pseudognaphalium luteo-album	Jersey Cudweed	F, W, G	T, S
	Senecio hispidulus var. hispidulus		F, W, G	T, S
	Senecio linearifolius		F	T
	Senecio quadridentatus	Cotton Fireweed	F, W, G	T, S
	Sigesbeckia orientalis	Indian Weed	Ri	T, S
	Vittadinia cervicularis		W, G	T, S
	Vittadinia cuneata	Fuzzweed	F, W, G	T, S
	Xerochrysum bracteatum	Golden Everlasting	F, W	T, S
	Xerochrysum viscosum		F, W	T, S
Brassicaceae	*Cardamine paucijuga*		F, W, G	
	Lepidium hyssopifolium			
	Lepidium pseudohyssopifolium	Peppercress		S
Campanulaceae	*Wahlenbergia communis*	Tufted Bluebell	F, W, G	T, S
	Wahlenbergia gracilenta	Annual Bluebell		S
	Wahlenbergia gracilis	Sprawling or Australian Bluebell	F, W, G	T, S
	Wahlenbergia graniticola	Granite Bluebell	W	T, S
	Wahlenbergia luteola		W, G	T, S
	Wahlenbergia stricta	Tall Bluebell	F, W, G	T, S
Caryophyllaceae	*Scleranthus biflorus*		G	
	Stellaria flaccida		F	
	Stellaria media	Common Chickweed	F, W, G	
	Stellaria pungens	Prickly Starwort	F	
Clusiaceae	*Hypericum japonicum*		damp	T
Colchicaceae	*Burchardia umbellata*	Milkmaids		
Crassulaceae	*Crassula sieberiana*	Australian Stonecrop	F, W, G	
Hypoxidaceae	*Hypoxis hygrometrica*	Golden Weather-grass	F, W, G	
Iridaceae	*Patersonia sericea*		F, W	T, S
Orchidaceae	*Acianthus collinus*		F	T
	Caladenia carnea	Pink Fingers	F, W	T

	Caladenia clavigera	Clubbed Spider Orchid	F	T, S
	Caladenia congesta	Black Tongue Caladenia	F, W	T, S
	Caladenia cucullata	Hooded Caladenia	F	T, S
	Caladenia dimorpha		F	T, S
	Caladenia fuscata		W	T, S
	Caladenia gracilis	Musky Caladenia	F, W	T
	Caleana minor	Small Duck Orchid	F	T, S
	Calochilus campestris	Copper Beard Orchid	F	T, S
	Calochilus robertsonii	Purplish Beard Orchid	F	T, S
	Chiloglottis trapeziformis		F	T, S
	Cryptostylis erecta	Tartan Tongue Orchid		
	Cyanicula caerulea	Blue Caladenia		
	Cyrtostylis reniformis	Gnat Orchid	F	T, S
	Dendrobium speciosum	Rock Lily		T, S
	Dendrobium striolatum		F, high	T, S
	Dipodium hamiltonianum		F	T, S
	Dipodium punctatum		F, W	T, S
	Diuris maculata	Spotted Doubletail	F	T
	Diuris pardina	Leopard Orchid	F	T, S
	Diuris punctata	Purple Donkey Orchid	F	T
	Diuris sulphurea	Tiger/Hornet Orchid	F	
	Eriochilus cucullatus	Parson's Bands	F, W, G	
	Genoplesium archeri	Variable Midge Orchid	F	
	Genoplesium rufum	Red Midge Orchid	F	
	Glossodia major	Waxlip Orchid	F, W	
	Lyperanthus suaveolens	Brown Beaks	F	
	Microtis unifolia	Common Onion Orchid		
	Prasophyllum brevilabre	Short-lipped Leek Orchid	F, W	
	Prasophyllum flavum	Yellow Leek Orchid	F	
	Pterostylis aciculiformis		F	
	Pterostylis coccina		F	
	Pterostylis fischii		G, O	
	Pterostylis longifolia	Tall Greenhood	F	
	Pterostylis mutica	Midget Greenhood	F, G	
	Pterostylis obtusa			
	Pterostylis parviflora	Tiny Greenhood	F	
	Pterostylis pusilla	Ruddyhood	F	
	Pterostylis reflexa			

	Pterostylis rufa	Rusty Hood	F	
	Pterostylis truncata	Little Dumplings	F	
	Thelymitra aristata	Great Sun Orchid	F	
	Thelymitra carnea	Tiny Sun Orchid	W	
	Thelymitra ixioides var. ixioides	Dotted Sun Orchid	F	
	Thelymitra pauciflora	Slender Sun Orchid	F, W	
Oxalidaceae	*Oxalis exilis*		Ri	T, S
	Oxalis perennans		F, W, G	T, S
Phormiaceae	*Dianella longifolia*		F	T, S
	Dianella revoluta		F, W, G	T, S
	Stypandra glauca	Nodding Blue Lily	F, W, G	T, S
Plantaginaceae	*Plantago varia*		F, W, G	T, S
Polygalaceae	*Comesperma volubile*		F	T
Polygonaceae	*Persicaria decipiens*	Slender Knotweed		T, S
	Persicaria hydropiper	Water Pepper		T, S
	Persicaria prostrata	Creeping Knotweed	Ri	T, S
	Rumex brownii	Swamp Dock	G	T, S
Portulacaceae	*Calandrinia eremaea*		F, W, G	T, S
Rosaceae	*Acaena agnipila*		F, W, G	T, S
	Acaena novae-zelandiae		F, W, G	T, S
	Acaena ovina		F, W, G	
	Rubus parvifolius	Native Raspberry	F, W, G	T, S
Rubiaceae	*Asperula conferta*	Common Woodruff	F, W, G	T, S
	Asperula scoparia	Prickly Woodruff	F, high	T
	Coprosma hirtella		high	T
	Coprosma quadrifida	Prickly Currant Bush	F, W	T
	Galium propinquum	Maori Bedstraw	F, W, G	T, S
	Opercularia aspera	Coarse Stinkweed	F, Ri	T, S
	Opercularia diphylla		F, W, G	T, S
	Opercularia hispida	Hairy Stinkweed	F, W, G	T, S
	Pomax umbellata		F, W, G	T, S
Violaceae	*Hymenanthera dentata*	Tree Violet	F, W, Ri	T, S
	Viola betonicifolia		F, W	T, S
	Viola hederacea	Ivy-leaved Violet	F	T, S
Zygophyllaceae	*Zygophyllum glaucum*	Pale Twinleaf	W	S

Table 7.4.8
Ferns, by family, common names, habitat and distribution.

Family	Species	Common name	Habitat	Distribution
Adiantaceae	*Adiantum aethiopicum*	Common Maidenhair	Ri, F, W, G	
	Cheilanthes austrotenuifolia	Rock Fern		
	Cheilanthes distans	Bristly Cloak Fern	F, W	
	Cheilanthes sieberi		W	
	Pellaea falcata	Sickle Fern	F, W, G	
Aspleniaceae	*Asplenium flabellifolium*	Necklace Fern	F	
	Pleurosorus rutifolius		F, W, G	
Blenchnaceae	*Blechnum cartilagineum*	Gristle Fern	F, W, G	
	Doodia aspera	Prickly Rasp Fern	F	
Dennstaedtiaceae	*Pteridium esculentum*	Bracken	F, W, G	

Table 7.4.9
Grasses (Poaceae family), by species, common names, habitat and distribution.

Species	Common name	Habitat	Distribution
Agrostis venusta	Graceful Bent	G	T
Amphibromus pithogastrus			T
Aristida behriana	Bunch Wiregrass	G	S
Aristida benthamii		F, W, G	S
Aristida ramosa		W	T, S
Aristida vagans	Three awn Speargrass	F	T, S
Austrodanthonia caespitosa	Ringed Wallaby Grass	F, W, G	
Austrodanthonia duttoniana		W, G	
Austrodanthonia eriantha		W, G	
Austrodanthonia laevis		W, G	
Austrodanthonia monticola		F, W, G	
Austrodanthonia pilosa	Smooth-flowered Wallaby Grass	F, W, G	
Austrodanthonia racemosa var. racemosa		W, G	
Austrodanthonia setacea		F, W, G	
Austrodanthonia tenuior		F, W	
Austrostipa bigeniculata		W	
Austrostipa densiflora		W	
Austrostipa mollis	Speargrass	F, W, G	
Austrostipa nodosa		F, W, G	
Austrostipa rudis subsp. nervosa		W	
Austrostipa scabra	Speargrass	F, W, G	
Austrostipa scabra subsp. falcata		W	T
Austrostipa scabra subsp. scabra		F, W, G	
Austrostipa setacea	Corkscrew Grass	F, W, G	
Austrostipa verticillata		F, W, G	
Bothriochloa decipiens	Red Grass	G	
Bothriochloa macra	Red Grass	G	
Briza maxima	Quaking Grass		
Briza minor	Shivery Grass		
Cenchrus spp.			
Chloris truncata	Windmill Grass	F, W, G	
Cymbopogon refractus	Barbed Wire Grass	F, W, G	T, S

Cynodon dactylon	Common Couch	G	T, S
Dactylis glomerata	Cocksfoot		
Deyeuxia quadriseta		Ri	T
Dichelachne inaequiglumis		W	T
Dichelachne micrantha	Shorthair Plumegrass	F	T, S
Digitaria didactyla	Queensland Blue Couch	F, W, G	S
Digitaria divaricatissima	Umbrella Grass	W	S
Digitaria parviflora	Small-flowered Finger Grass	W	T
Echinopogon caespitosus		F, W, G	T, S
Echinopogon cheelii	Long-flowered Hedgehog Grass	F, W, G	T
Echinopogon ovatus	Forest Hedgehog Grass	W, Ri	T, S
Elymus scaber var. scaber	Common Wheatgrass	F, W, G	
Eragrostis leptostachya	Paddock Lovegrass	W, G	T, S
Eriochloa pseudoacrotricha	Early Spring Grass	G	S
Hemarthria uncinata var. uncinata	Matgrass	Damp	
Microlaena stipoides		F, W	
Panicum effusum	Poison or Hairy Panic	W	T, S
Panicum simile	Two-colour Panic	W	T
Paspalum distichum	Water Couch	Wet, Ri	T, S
Pennisetum alopecuroides	Swamp Foxtail	Ri	T, S
Phragmites australis	Common Reed	Wet, Ri	T, S
Poa labillardierei var. labillardierei	Tussock	F, Ri	T, S
Poa sieberiana var. sieberiana	Snowgrass	W, G, high	T, S
Sorghum leiocladum	Wild Sorghum	W	
Sporobolus caroli	Fairy Grass	W	S
Sporobolus creber	Slender Rat's Tail Grass	W	T, S
Themeda australis	Kangaroo Grass	F, W, G	T, S

Table 7.4.10
Sedges, rushes and reeds, by family, species, common names, habitat and distribution.

Family	Species	Common name	Habitat	Distribution
Cyperaceae	*Baumea articulata*	Jointed Twig-rush		
	Carex appressa			
	Carex breviculmis			
	Carex inversa	Knob Sedge		
	Caustis flexuosa	Curly Wig		
	Cyperus eragrostis	Umbrella Sedge		
	Eleocharis gracilis			
	Eleocharis sphacelata	Tall Spike Rush		
	Gahnia aspera		W	
	Lepidosperma gunnii			
	Lepidosperma laterale		F, W	
	Lepidosperma tortuosum			
	Schoenoplectus validus			
	Schoenus apogon	Fluke Bogrush		
Juncaceae	*Juncus australis*		W, G	T, S
	Juncus firmus		Wet	T, S
	Juncus holoschoenus		F, W, G	T, S
	Juncus homalocaulis		W, G	T, S
	Juncus planifolius		W, Wet	T, S
	Juncus prismatocarpus		W, Wet	T, S
	Juncus remotiflorus			T, S
	Juncus subsecundus			T, S

	Juncus usitatus			T, S
	Luzula densiflora		W, G	T, S
Lomandraceae	*Lomandra confertifolia*			
	Lomandra filiformis	Wattle Matt-rush		
	Lomandra filiformis subsp. coriacea		F	
	Lomandra gracilis		F	
	Lomandra longifolia	Spiny-headed Mat-rush		

Table 7.4.11
Wetland plants, by family, species, common names, habitat and distribution.

Family	Species	Common name	Habitat	Distribution
Azollaceae	*Azolla filiculoides*	Azolla	Wet	
Hydrocharitaceae	*Ottelia ovalifolia*	Swamp Lily	Wet	
Potamogetonaceae	*Potamogeton ochreatus*	Blunt Pondweed	Wet	T, S
Typhaceae	*Typha domingensis*	Narrow-leaved Cumbungi	Wet	T, S
	Typha orientalis		Wet	T, S

Weeds

Weeds are defined as plants growing in a place where we do not want them. They often indicate an imbalance in the natural ecosystem, such as a change in light, moisture or nutrients. Some weeds are more serious than others and can cause severe environmental damage. NSW Agriculture has different categories of weeds depending upon how much they are a threat to our environment.

Table 7.4.12
Categories of Noxious Weeds of our District (NSW Agriculture 2003)

Category	Description
W1	The presence of the weed on land must be notified to the local control authority and the weed must be fully and continuously suppressed and destroyed.
W2	The weed must be fully and continuously suppressed and destroyed.
W3	The weed must be prevented from spreading and its numbers and distribution reduced.
W4a	The weed must not be sold, propagated or knowingly distributed and any part of the weed must be prevented from growing within 3 metres of the boundary of a property.
W4b	The weed must not be sold, propagated or knowingly distributed and any existing weed must be prevented from flowering and fruiting.
W4c	The weed must not be sold, propagated or knowingly distributed and the weed must be prevented from spreading to an adjoining property.
W4d	The weed: (a) must not be sold, propagated or knowingly distributed; and (b) must be fully and continuously suppressed and destroyed unless it is: · listed on the state heritage register under the Heritage Act 1977; listed for preservation or protection as a heritage item under an Environmental Planning Instrument under the Environmental Planning and Assessment Act 1979; · listed for preservation or protection in a tree preservation order of the council for the Local Government area; · included for preservation or protection in a Plan of Management for a local government area under section 40 of the Local Government Act 1993; or · included for preservation or protection in a noxious weed policy or a noxious weed control program approved by the local control authority for the area for which it is the local control authority.
W4e	The weed must be fully and continuously suppressed and destroyed. All

	reasonable precautions must be taken to ensure produce, soil, livestock, equipment and vehicles are free of the weed before sale or movement from an infested area of the property.
W4f	The weed must not be sold, propagated or knowingly distributed. Any biological control or other control program directed by the local control authority must be implemented.
W4g	The weed must not be sold, propagated or knowingly distributed.

Table 7.4.13
Listed Noxious weeds of the district (NSW Agriculture 2003)

Common name	Scientific name	Category
African boxthorn	*Lycium ferocissimum*	**W2**
African love grass	*Eragrostis curvula*	**W3**
Alligator weed	*Alternanthera philoxeroides*	**W1**
Bathurst, Noogoora Burr	*Xanthium spp.*	**W2**
Black knapweed	*Centaurea nigra*	**W1**
Blackberry	*Rubus fruticosus (agg. spp.)*	**W3**
Broomrape	*Orobanche spp.*	**W1**
Cabomba	*Cabomba spp.*	**W4g**
Columbus grass	*Sorghum x almum*	**W2**
Dodder	*Cuscuta campestris*	**W2**
Gorse	*Ulex europaeus*	**W2**
Green cestrum	*Cestrum parqui*	**W2**
Harrisia cactus	*Harrisia spp.*	**W4f**
Hawkweed	*Hieracium spp.*	**W1**
Hemlock	*Conium maculatum*	**W2**
Horsetail	*Equisetum spp.*	**W1**
Johnson grass	*Sorghum halepense*	**W2**
Karroo thorn	*Acacia karroo*	**W1**
Kochia	*Kochia scoparia*	**W1**
Lagarosiphon	*Lagarosiphon major*	**W1**
Longstyle feather grass	*Pennisetum villosum*	**W2**
Mexican feather grass	*Nassella tenuissima syn Stipa tenuissima*	**W1**
Miconia	*Miconia spp.*	**W1**
Nodding thistle	*Carduus nutans*	**W3**
Pampas grass	*Cortaderia spp.*	**W2**
Parthenium weed	*Parthenium hysterophorus*	**W1**
Prickly pears	*Opuntia spp.*	**W4f**
Privet - broadleaf	*Ligustrum lucidum*	**W4b**
Privet - narrowleaf	*Ligustrum sinense*	**W4b**
Rhus tree	*Toxicodendron succedaneum*	**W2**
Salvinia	*Salvinia molesta*	**W1**
Scotch English broom	*Cytisus scoparius*	**W2**
Scotch, Illyrian or Stemless Thistle	*Onopordum spp.*	**W3**
Senegal tea plant	*Gymnocoronis spilanthoides*	**W1**
Serrated tussock	*Nassella trichotoma*	**W3**
Siam weed	*Chromolaena odorata*	**W1**
Silverleaf nightshade	*Solanum elaeagnifolium*	**W2**
Spiny burrgrass	*Cenchrus incertus*	**W2**
Spiny burrgrass	*Cenchrus longispinus*	**W2**
Spotted knapweed	*Centaurea maculosa*	**W1**
St John's wort	*Hypericum perforatum*	**W3**
Star thistle	*Centaurea calcitrapa*	**W2**
Sweet briar	*Rosa rubiginosa*	**W3**
Tree of heaven	*Ailanthus altissima*	**W2**
Water hyacinth	*Eichhornia crassipes*	**W1**
Water lettuce	*Pistia stratiotes*	**W1**
Wild radish	*Raphanus raphanistrum*	**W2**

Willows	*Salix spp.*	**W4g**

7-5 Threatened species and communities

What are threatened species and communities?

In NSW over 700 species are threatened with extinction. This includes 520 species of plants that are endangered or vulnerable. There are also about 230 animals that are threatened. It is probable that more many species of both plants and animals are threatened. This is due to our still incomplete knowledge of our flora and fauna.

In addition to the large numbers of species threatened with extinction, there are entire ecological communities that are seen to be at risk of extinction.

Table 7.5.1
Numbers of Threatened Species and Communities in our Landcare district. (NPWS 2004)

Biodiversity group	Number
Flora	**10**
Mammals	**10**
Birds	**21**
Reptiles	**1**
Frogs	**2**
Insects	**1**
Ecological communities	**2**

Types of threats

The main threat to our biodiversity is habitat loss and decline, which has occurred as land use changes due to human activities. Pollution from agricultural and industrial chemicals, land clearing and the introduction of exotic species all contribute to a loss in biodiversity.

Competition and predation by introduced animals along with grazing and vegetation clearing have affected our natural grasslands and woodlands. Most of the small mammals that lived in these communities such as bandicoots, marsupial mice, quolls and bettongs have either disappeared or are extremely rare in these areas.

Levels of threats

Some species and communities are more threatened than others. The threats to some species are critical and unless urgent action is taken we will soon lose these species and communities forever. By preserving as much local biodiversity as possible we can help keep the fabric of our natural heritage healthy for future generations.

The NSW government has classified the different levels of threats to our flora and fauna, as outlined in the following table.

Table 7.5.2
Levels of threat to our flora and fauna (NPWS 2004).

Level	Description
Extinct	The species has not been located in nature during the preceding 50 years, despite searching of known or likely habitats.
Endangered (E)	The species is likely to become extinct in nature if threats continue to it or its habitat is reduced. Species, isolated populations of species or ecological communities can be endangered.
Vulnerable (V)	The species is likely to become endangered if threats continue.

Threatened Flora

Plants that are threatened in our district include trees, shrubs and groundcover species. Endangered eucalypts include the **Canobolas Candlebark** (*Eucalyptus canoolensis*) which is found only on the higher slopes of Mt Canobolas and **Canon's Stringybark** (*E. cannonii*) which is found in the dry forests east of Bathurst.

Also threatened is *Zieria obcordata*, a hairy shrub, found only in isolated patches in the granite country near Bathurst and Wellington. **Peppercress** (*Lepidium hysoppifolium*) is a small herb found only in grasslands near Bathurst.

Table 7.5.3
Listed Threatened Flora of our district. (NPWS 2004)

Plant family	Species	Threat Level
Asteraceae	*Calotis glandulosa*	**V**
Brassicaceae	*Lepidium hyssopifolium*	**E**
Lamiaceae	*Prostanthera stricta*	**V**
Myrtaceae	*Eucalyptus cannonii*	**V**
	Eucalyptus canobolensis	**V**
	Eucalyptus pulverulenta	**V**
	Eucalyptus saxicola	**E**
Proteaceae	*Grevillea obtusiflora subsp. obtusiflora*	**E**
	Persoonia marginata	**V**
Rutaceae	*Zieria obcordata*	**E**

Threatened Fauna

Mammals

Of 131 mammals in NSW 22% are presumed to be extinct and another 40% are threatened. In our district there are 10 mammals that are listed as being threatened. These include the **Squirrel Glider** (*Petaurus norfolcensis*) and the **Spotted-tailed Quoll** (*Dasyurus maculates*) which both live in eucalypt forests.

Other threatened mammals include a number of bats including the **Large-footed Myotis** (*Myotis adversus*) which hibernates during winter in the Central Tablelands area.

Table 7.5.4
Listed Threatened Mammals of our district. (NPWS 2004)

Family	Species	Common Name	Threat Level
Dasyuridae	*Dasyurus maculatus*	Spotted-tailed Quoll	**V**
Emballonuridae	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	**V**
Macropodidae	*Petrogale penicillata*	Brush-tailed Rock-wallaby	**E**
Petauridae	*Petaurus australis*	Yellow-bellied Glider	**V**
	Petaurus norfolcensis	Squirrel Glider	**V**
Phascolarctidae	*Phascolarctos cinereus*	Koala	**V**
Vespertilionidae	*Chalinolobus dwyeri*	Large-eared Pied Bat	**V**
	Falsistrellus tasmaniensis	Eastern False Pipistrelle	**V**
	Miniopterus schreibersii oceanensis	Eastern Bent-wing Bat	**V**
	Myotis adversus	Large-footed Myotis	**V**

Birds

21 birds are listed as threatened in our district. Birds from our woodlands are especially threteaned as their habitats has largely been lost to agricultural landscapes. Endangered small birds include the **Speckled Warbler** (*Pyrrholaemus sagittatus*) and the **Hooded Robin** (*Melanodryas cucullata*).Other birds are two owl species and the **Regent Honeyeater** (*Xanthomyza Phrygia*).

Table 7.5.5
Listed Threatened Birds of our district. (NPWS 2004)

Family	Species	Common Name	Threat Level
Acanthizidae	*Pyrrholaemus sagittatus*	Speckled Warbler	**V**
Accipitridae	*Hamirostra melanosternon*	Black-breasted Buzzard	**V**
	Lophoictinia isura	Square-tailed Kite	**V**
Anatidae	*Oxyura australis*	Blue-billed Duck	**V**
	Stictonetta naevosa	Freckled Duck	**V**
Anseranatidae	*Anseranas semipalmata*	Magpie Goose	**V**
Ardeidae	*Botaurus poiciloptilus*	Australasian Bittern	**V**
	Ixobrychus flavicollis	Black Bittern	**V**
Cacatuidae	*Calyptorhynchus lathami*	Glossy Black-Cockatoo	**V**
Climacteridae	*Climacteris picumnus*	Brown Treecreeper	**V**
Estrildidae	*Stagonopleura guttata*	Diamond Firetail	**V**
Meliphagidae	*Melithreptus gularis gularis*	Black-chinned Honeyeater (eastern subsp.)	**V**
	Xanthomyza phrygia	Regent Honeyeater	**E**
Petroicidae	*Melanodryas cucullata*	Hooded Robin	**V**
Phaethontidae	*Phaethon rubricauda*	Red-tailed Tropicbird	**V**
Psittacidae	*Lathamus discolor*	Swift Parrot	**E**
	Neophema pulchella	Turquoise Parrot	**V**
	Polytelis swainsonii	Superb Parrot	**V**
Strigidae	*Ninox connivens*	Barking Owl	**V**
	Ninox strenua	Powerful Owl	**V**
Tytonidae	*Tyto novaehollandiae*	Masked Owl	**V**

Reptiles, Insects & Frogs

Many smaller animals are also under threat. Included is the **Bathurst Copper Butterfly** (*Paralucia spinifera*) which is found in very restricted sites above 900m in woodlands and open forest. It is found near Yetholme to the east of Bathurst.

Table 7.5.6
Other listed Threatened fauna of our district. (NPWS, NSW)

Family	Species	Common Name	Threat Level
Reptiles			
Varanidae	*Varanus rosenbergi*	Rosenberg's Goanna	**V**
Insects			
Lycaenidae	*Paralucia spinifera*	The Bathurst Copper Butterfly	**E**
Frogs			
Hylidae	*Litoria aurea*	Green and Golden Bell Frog	**E**
	Litoria booroolongensis	Booroolong Frog	**E**

Threatened ecological communities

There are two ecological communities in our district listed as threatened.

Table 7.5.7
Listed Threatened Ecological communities of our district. (NPWS 2004)

Ecological Community	Description	Threat level
White Box – Yellow Box – Blakely's Red Gum Woodlands	This woodland alliance is one of the main ecological communities in our district. It is usually found on fertile, well drained soils in the undulating country of the tablelands and upper- western slopes. It can occur up to about 1200m.	**E**
Mt Canobolas Xanthoparmelia Lichen Community	This community is found on the slopes and summit of Mt Canobolas. Specifically it occurs on rock faces and soils in the Mt Canobolas Tertiary volcanic complex area. Part of the Community occurs within the Mt Canobolas State Conservation Area.	**E**

7-6 Conclusions

Much of the flora and fauna of the Central Tablelands has evolved to survive under particular conditions, and there are a number plants, animals and communities that are under threat of extinction as a result of the alteration of those conditions by human activities. These activities include the introduction of domestic and feral animals and plants, farming and grazing activities, and vegetation clearing for rural and urban development.

It is important to recognise the environmental services provided by many plants and animals in our district, and to understand and work to minimise the threats posed to many species.

7-7 References and further information

Sources used

The following sources were used in the writing of the Biodiversity section of the Central Tablelands Landcare Natural Resources Toolkit.

Atwill, P., and Wilson, B. (eds) (2003). *Ecology: An Australian perspective.* Oxford University Press, South Melbourne.

Brown, I. and Rigby, N. (2001).*Threatened Species: a landholders guide*. NPWS Central West Region, Bathurst, NSW.

Bower C., Semple W. and Harcombe L. (2002). *Eucalypts of the Central West: comprising a key to species groups.* NSW DLWC, Orange.

Dalton, J. (2003). *Vegetation in the Central Tablelands Landcare District*. Unpublished report.

Goldney, D.C. and Bowie, I.J.S. (eds) (1987). *Scenic and scientific survey of the Central Westerns Region: a report to the Australian Heritage Commission – Vertebrate fauna lists for the Orange, Bathurst and Oberon 1:100 000 Map sheets*, Mitchell College of Advanced Education, Bathurst.

Harden, G.J. (ed) (1990-1993). Flora of NSW, Vol. 1-4. UNSW Press, Kensington.

NSW National Parks and Wildlife Service (2004). *Wildlife Atlas*. NSW Government.

Semple, W. (1995). *Native shrubs of the Granite Country around Bathurst.* NSW DLWC.

Semple, W. (1999) *Native trees and shrubs of the Burrendong Country*, Central Western NSW. NSW DLWC.

Tomkins, K. (undated) *Riparian Vegetation Tablelands*. NSW DLWC.