

Woodland Bird Habitat Restoration Handbook

A guide for small properties in the Bungendore region





This project has been supported by the New South Wales Government's Saving our Species program through its Department of Planning, Industry and Environment and Environment Trust.

We acknowledge the Traditional Custodians of the lands where we work and the places in which we live. We pay respect to Ancestors and Elders, past, present and emerging. We recognise the unique cultural and spiritual relationship and celebrate the contributions of First Nations peoples to Australia.

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Photo by Jed Pearson

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Introduction

Bungendore's Grassy Woodlands include iconic Endangered Ecological Communities (EECs) that are home to many species of woodland birds. Once widespread throughout Queensland, New South Wales and Victoria, Grassy Woodlands have been extensively cleared for agriculture and modified for livestock grazing. Only small remnants that have escaped these impacts remain in near-original condition. Nationally, a quarter of woodland bird species are now 'threatened', and another quarter of species are described as 'declining species', which means that their numbers have dropped sharply in the last 20 years. These species are at risk of becoming threatened soon without our help.

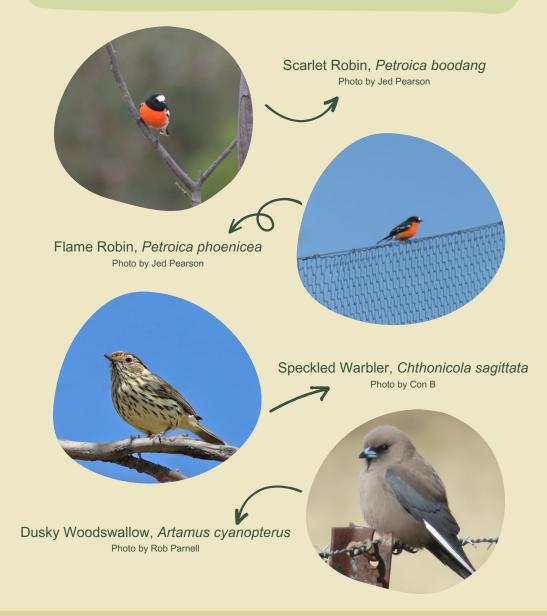


Photo by Janelle Friend





This resource was put together by the Molonglo Conservation Group as part of a landscape-species conservation project pertaining to Scarlet Robin, Flame Robin, Speckled Warbler and Dusky Woodswallow and White Box-Yellow Box-Blakely's Red Gum Grassy Woodlands.



Restoring habitat for woodland bird species can be a long and arduous task and can take many years. Especially in areas with historically high levels of land clearing, the following threats all feature in degraded woodland bird habitat:

- Missing or under-represented habitat structural layers
- Habitat fragmentation
- Removal of woody debris and rocky outcrops (or 'cleaned paddocks')
- Invasive weeds, animal and pest species
- Erosion and riparian degradation



Photo by Elyssa Castles

Although sometimes daunting, great progress can be made restoring woodland bird habitat if the following 'rules of thumb' are followed:



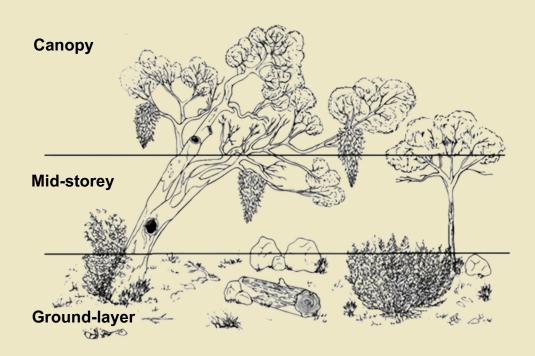
- Have a plan and keep it simple!
- Don't bite off more than you can chew – a slow and steady approach is best
- Observe before you act
- Use what you have, retain your natural assets!
- Restore and maintain your most intact natural areas first
- Prioritise pests and weeds; you can't get them all!





Structural Layers

Habitat is defined as where a plant or animal lives. Grassy Woodland habitat is divided into three structural layers: the canopy (or overstorey), mid-storey (shrub-layer), and the ground-layer (consisting of herbaceous plants). Various animal species have adapted to use large trees, shrubs, grasses and other herbaceous plants, as well as rocks, fallen logs and fallen leaves as shelter and sources of food. Protecting all three vegetation layers is important for biodiversity. Each vegetation layer provides food and habitat for different groups of species.





Canopy

Tree canopies provide shelter for birds and animals by offering protection high up. Dense foliage provides cover for and provides food for insects that, in turn, provide a food source. Most canopy trees also provide pollen, nectar or fruit. Large old eucalypts provide hollows and forks for birds and animals to make their nests. Eucalypts generally start forming hollows when older than fifty years old, and only develop large hollows suitable for large animals (like owls) when they are much older than that (>150 years).



Mid-storey



The mid-storey is made up of shrubs and includes the trunk and bark found in the lower parts of large canopy trees. Shrubs provide a refuge from predators for smaller birds and provide pollen, nectar and fruits that native animals eat. Bark on the trunk of eucalypts provide a home for many insects and spiders, which are also eaten by birds and other animals.

Ground-layer

In Grassy Woodlands, the vast majority of plant diversity is found in the ground-layer. This diversity supports a wealth of insect life. Grasses and other herbaceous plants provide cover for small birds and animals, produce seeds that are eaten by many species and flowers that attract pollinating insects. Fallen logs, fallen leaves and rocks also play a vital role, providing habitat for many birds, mammals, reptiles and insects.







Habitat fragmentation & connectivity



A major threat to woodland birds in the Bungendore region is habitat fragmentation. Clearing of Grassy Woodland to make way for grazing and cropping land has caused the previously intact woodland to become fragmented and isolated, leaving populations smaller and vulnerable to chance events. Smaller woodland birds, such as the Scarlet Robin, need large patches of woodland, as well as connections between patches to survive. Larger birds, such as owls or cockatoos do not need close connection between patches as do smaller species. They do require stepping stones (such as big old paddock trees) to move across the landscape.

Planting for habitat connectivity can be an effective way to improve woodland bird habitat. Fenced wildlife corridors can be planted to connect patches of intact woodland at a shorter distance. For longer distances, larger old growth paddock trees can be fenced off and planted with wattles and mid-layer shrubs. Smaller planted enclosures can be built to provide 'stepping stones' of habitat across the landscape.







Example of planted corridors and steppingstone enclosures.





Planting for Woodland Birds

Knowing what to plant for woodland birds is easy once you identify which vegetation layers are lacking in the landscape. Locally indigenous species should always be sourced for revegetation projects. Small woodland birds need densely bushy, spiny or thorny vegetation to escape predation from the larger native and introduced bird species.



Photo by Jed Pearson





Planting list for the region

Table Key

- 1. Nesting resource- H= hollows, DT= dense and/or thorny
- 2. Woodland- Box-Gum Grassy Woodland
- 3. Communities- R= riparian, SG= Snow Gum Woodland, DF= Dry Forest
- 4. Plants that are easily sourced from local nurseries and are suitable for planting in bushland rehabilitation projects (i.e., these will establish relatively quickly without too much aftercare).

Common Name	Scientific Name	Use for Woodland Birds			
Canopy Trees		Nesting Resource (1)	Woodland (2)	Community (3)	Suitable (4)
Silver Wattle	Acacia dealbata	DT	х	SG	✓
Green Wattle	Acacia meamsii	DT	x	DF	V
Blackwood	Acacia melanoxylon	DT		SG, DF	V
Drooping She-oak	Allocasuarina verticillata	DT		DF	V
Black Gum	Eucalyptus aggregata	Н		SG	V
Apple Box	Eucalyptus bridgesiana	Н	х	DF	V
Broad-leaved Peppermint	Eucalyptus dives	Н		SG, DF	V
Red Stringybark	Eucalyptus macrorrhyncha	Н		DF	
Brittle Gum	Eucalyptus mannifera	Н	х	DF	V
Yellow Box	Eucalyptus melliodora	Н	х	DF	V
Snow Gum	Eucalyptus pauciflora	Н		SG	V
Red Box	Eucalyptus polyanthemos	Н		DF	V
Candlebark	Eucalyptus rubida	Н	х	SG	V
Ribbon Gum	Eucalyptus viminalis	Н		R, SG	✓
Cherry Ballart	Exocarpos cupressiformis	DT	х	SG, DF	



Common Name	Scientific Name	Use for Woodland Birds			
Mid-storey shrubs and climbers		Nesting Resource (1)	Woodland (2)	Community (3)	Suitable (4)
Early Wattle	Acacia genistifolia	DT	х	DF	
Red-stemmed Wattle	Acacia rubida	DT	х	DF	✓
Silver Banksia	Banksia marginata	DT		SG, DF	✓
Daphne Heath	Brachyloma daphnoides		х	DF	
Australia Blackthorn	Bursaria spinosa	DT	х	SG, DF	V
River Bottlebrush	Callistemon sieberi	DT		R	✓
Cauliflower-bush	Cassinia longifolia	DT	х	SG, DF	✓
Small-leaved Clematis	Clematis leptophylla	DT	х	DF	✓
Leafy Bitterpea	Daviesia mimosoides			DF	✓
Narrow-leaved Hopbush	Dodonaea viscosa	DT	х	DF	✓
Nodding Saltbush	Einadia nutans	DT	х	DF	✓
Twining Glycine	Glycine clandestina		х	DF	
False Sarsaparilla	Hardenbergia violacea			DF	✓
Grey Guinea-flower	Hibbertia obtusifolia		х	DF	✓
Austral Indigo	Indigofera australis			DF	✓
Burgan	Kunzea ericoides	DT	х	R, SG, DF	✓
Violet Kunzea	Kunzea parvifolia	DT		DF	✓
Woolly Teatree	Leptospermum lanigerum	DT		SG	✓
Swamp Paperbark	Melaleuca parvistaminea	DT		R, SG, DF	✓
Urn Heath	Melichrus urceolatus		х	SG, DF	
Native Raspberry	Rubus parviflora	DT	х	SG, DF	✓
Mountain Kangaroo-apple	Solanum linearifolium	DT		DF	✓





Common Name	Scientific Name	Use for Woodland Birds			
Ground-layer grasses, rushes and sedges		Nesting Resource (1)	Woodland (2)	Community (3)	Suitable (4)
Swamp Wallaby-grass	Amphibromus nervosus			R	
Common Wheatgrass	Anthosachne scabra		х	SG, DF	
Purple Wire-grass	Aristida ramosa		х	DF	
Tall Speargrass	Austrostipa bigeniculata		х	SG, DF	V
Brushtail Speargrass	Austrostipa densiflora		х	DF	
Corkscrew Grass	Austrostipa scabra		х	SG, DF	
Redleg Grass	Bothriochloa macra		х	SG, DF	
Tussock Sedge	Carex appressa	DT		R	✓
Short-haired Plume-grass	Dichelacne micrantha		х	SG, DF	
Common Spikerush	Eleocharis acuta			R	
Rush species	Juncus spp.		х	R, SG DF	✓
Wattle Matrush	Lomandra filiformis		х	SG, DF	
Spiny-headed Matrush	Lomandra longifolia	DT		R, SG, DF	V
Weeping Grass	Microlaena stipoides		х	SG, DF	
Common Reed	Phragmites australis	DT		R	
River Tussock	Poa labillardierei	DT	х	R, SG, DF	V
Snow Grass	Poa sieberiana		х	SG, DF	
Red-anthered Wallaby-grass	Rytidosperma pallidum	DT		DF	
Wallaby-grass species	Rytidosperma spp.		х	SG, DF	
Wild Sorghum	Sorghum leiocladum		х	SG, DF	
Kangaroo Grass	Themeda triandra		х	SG, DF	V
Cumbungi	Typha domingensis	DT		R	





Common Name	Scientific Name	Use for Woodland Birds			
Ground-layer wildflowers (forbs, lilies and ferns)		Nesting Resource (1)	Woodland (2)	Community (3)	Suitable (4)
Bidgee-widgee	Acaena novae-zelandiae			SG, DF	
Austral Bugle	Ajuga australis		х	SG, DF	
Common Woodruff	Aperula conferta		х	SG, DF	
Chocolate-lily species	Arthropodium spp.		х	SG, DF	
Bulbine Lily	Bulbine bulbosa		х	SG, DF	
Lemon Beautyheads	Calocephalus citreus		х	SG	
Mauve Burr-daisy	Calotis glandulosa			SG, DF	✓
Rock Fern	Cheilanthes sieberi		х	SG, DF	
Common Everlasting	Chrysocephalum apiculatum		х	SG, DF	
Clustered Everlasting	Chrysocephalum semipapposum	DT	х	SG, DF	✓
Pale Everlasting	Coronidium gunnianum		х	SG	
Variable Billy-buttons	Craspedia variabilis		х	SG	
Southern Tick-trefoil	Desmodium varians		х	SG, DF	
Black-anthered Flax-lily	Dianella revoluta	DT		DF	✓
Blue Devil	Eryngium ovinum		х	SG	
Native geranium species	Geranium spp.		х	SG, DF	
Vanilla Glycine	Glycine tabacina		х	SG, DF	
Common Raspwort	Gonocarpus tetragynus			DF	
Ivy Goodenia	Goodenia hederacea			DF	
Swamp Raspwort	Haloragis heterophylla		х	R, SG, DF	
Scaly Buttons	Leptorhynchos squamatus		х	SG	
Hoary Sunray	Leucochrysum albicans		х	SG, DF	





Common Name	Scientific Name	Use for Woodland Birds			
Ground-layer wildflowers (forbs, lilies and ferns)		Nesting Resource (1)	Woodland (2)	Community (3)	Suitable (4)
Variable Plantain	Plantago varia		х	SG, DF	
Bracken Fern	Pteridium esculentum	DT		SG, DF	
Australian Buttercup	Ranunculus lappaceus		x	R, SG, DF	
Swamp Dock	Rumex brownii		x	SG	
Creamy Candles	Stackhousia monogyna		х	SG, DF	
Digger's Speedwell	Veronica perfoliata			DF	✓
Sticky Everlasting	Xerochrysum viscosum		х	DF	✓







Photo by Erna Llenore

Photos by Elyssa Castles





Woody debris

Woody debris, leaf-litter and rocky outcrops are just as important in environmental restoration as they provide a plethora of habitat opportunities for insects, reptiles and small mammals. This habitat increases biodiversity and improves food sources for birds.



Hollows

Old growth tree hollows are important for bird habitat. Naturally formed hollows are essential for roosting and nesting for many bird species. Hollows also provide refuge from predators and weather. Removal of living or dead hollow-bearing trees displaces species that depend on them.



Photo by Jed Pearson



Photo by Ross McConchie





Weeds in the Bungendore region

Weeds are a common management concern when dealing with woodland bird habitat restoration. Tackling weeds can seem daunting, but there are a few simple things to consider when implementing weed management on your property.



Start in the less infested areas and work your way incrementally towards the larger infestations. Prioritise weeds in the most naturally intact areas and work toward more degraded areas.



Some areas are now so degraded with weeds that they are now all that's left to provide shelter for woodland birds. Removing large infestations of weeds too quickly can be detrimental to vulnerable species using these weedy species as refugia.



Removing larger infestations at a gradual rate and replacing the removed weeds as you go will leave habitat to be used while natives have time to recover or plantings grow.



Start upstream and work your way downstream when removing weeds along creeks and waterways.



Prioritise weeds by species – Which weeds are worse or harder to control if let go?



Priority weeds

African Lovegrass, Eragrostis curvula

African Lovegrass is a perennial grass introduced from southern Africa sometime before 1900. It thrives in acidic, sandy soil with a low nutrient content. It is found all across NSW. A Declared Weed of National Significance (WONS).

Description – Grows in tussocks up to 1.2m. Leaves are dark green to blue-green, 3mm wide with rolled edges. Stems are erect, slender, and sometimes bent at the nodes. Flowers are greyish blue to purple when young but mature to a straw colour. Seeds cluster at the end of the stems, are about 1mm long and are present from summer to late autumn.

Mode of dispersal – Each seed head produces between 300 to 100 seeds. It is spread mostly by vehicles, other machinery, and stock, but can also be spread short distances by wind or water.

Lookalikes – Browns Lovegrass (native), River Tussock (native).





Left: African Lovegrass florescent (photo by NSW Weedwise) Right: Full plant (Photo by (NSW Weedwise)





Chilean Needle Grass, Nassella neesiana

Chilean Needle Grass is a perennial grass, introduced to Glen Innes NSW sometime around 1940. Colonises bare ground and poor, disturbed soils. Can survive fire, heavy grazing, or drought. A Weed of National Significance.

Description – Grows in tussocks, up to 40cm high. Leaves are flat, 1 to 5mm wide and coarse. The leaves have characteristic 'railway track' veins on the upper surface. Seeds are pale brown when mature, 8 to 10 mm long. The awn is 6 to 9 cm long, twisted when dry. It is difficult to pull off the seed. The sharp awn is surrounded by a corona of small teeth where it joins the seed.

Mode of dispersal – The seeds are spread by vehicles, other machinery and live-stock. Seeds are attached to wool or fur and can stay on an animal for weeks. They can be spread by heavy rain, but not by wind.

Lookalikes - Very similar to some species of speargrass, *Austrostipa* spp. Can also be confused with other *Nassella* species, such as Serrated Tussock and Mexican Feather Grass.



Top: Chilean Needle Grass (Photos by NSW Weedwise)

Bottom Left: The hairy ligule of Chilean Needlegrass (Photo by Tamanian Gov DNRE)

Bottom Right: The hairy corona of Chilean Needlegrass seed (Photo by NSW Weedwise)





Serrated Tussock, Nassella trichotoma

Serrated Tussock is a perennial tussock grass from South America. It most likely arrived in Australia in the early 1900s and was first recorded in Yass, NSW. Hence it's often referred to as Yass Tussock. A Weed of National Significance.

Description – Serrated Tussock grows in upright tussocks up to 45cm high. Leaves are upright, stiff, very narrow, and tightly rolled. They are serrated, which can be felt when running your fingers up the leaf blade. Its colour changes throughout the seasons, starting as a light green with brown tips in spring, a purple tinge in early summer, dark green in late summer (when other grasses have turned brown), to a pale straw yellow in winter (sometime described as 'bleached-blonde surfies'). A distinctive ligule; rounded, white, membranous and hairless. Seeds are brown, hard and small (1.5mm). Possesses a small awn, less than 25mm long.

Mode of dispersal – Mainly spread by wind, but also by water and vehicles, other machinery and stock. Mature seeds can be spread up to 10km by wind, and have been found to spread up to 60km down the Macquarie River.

Lookalikes – Can be confused with native speargrasses, *Austrostipa* spp, River Tussock, Snow Grass, and sometimes wallaby grasses.



Left: Serrated Tussock seeds (Photo by Molonglo Conservation Group)
Right: Serrated Tussock infestation (Photo by NSW Weedwise)





Blackberry, Rubus spp.

Blackberry is a perennial woody weed and has been in Australia since the 1840s. It was brought by Europeans as a source of fruit and for hedging. It is estimated Blackberry covers over 8.5 million hectares of land and costs over \$100 million annually in control and production loss. A Weed of National Significance.

Description – A woody, semi-deciduous scrambling bramble. It has arching, tangled canes, that form thickets to several metres high. It is thorny and produces the familiar dark coloured fruits. Leaves are dark green on top and lighter on the underside, with shallow fissures. Arranged in a palmate fashion, each leaf has 3 to 5 leaflets.

Mode of dispersal – Seeds are dispersed by mammals and birds through their droppings. It also spreads vegetatively, with canes, either attached or separated from the plant, able to root on contact with the soil.

Lookalikes – Easily confused with Native Raspberry (*Rubus parvifolius*). Native Raspberry has a pinnate leaf arrangement; the leaflets arranged like a feather or fern.





Left: Blackberry palmate leaf arrangement (Left) vs Native Raspberry pinnate leaf arrangement (Right) (Photo by Jed Pearson)

Right: Blackberry bramble (Photo Jed Pearson)

St John's Wort, Hypericum perforatum

St John's Wort is a perennial forb from Eurasia and Africa. It was brought to Australia in 1875 as an ornamental plant. It is toxic to stock and can out compete native plants. It is a Declared Pest Plant.

Description – A herbaceous plant with a woody base, growing up to 1m. Leaves are dark green on top, lighter on the underside, 5 to 20mm long. Leaves are dotted with prominent oil glands that can be seen if a leaf is held up to the light. Flowers are bright yellow, star shaped, with 5 petals and bundles of long stamens up to 20mm long. Fruit is a capsule, brown and sticky, about 8mm long.

Mode of dispersal – Each plant can produce up to 30,000 seeds per year. Sticky seed capsules can stick to wool or fur and seeds can be spread through the digestive tracts of animals. It can also be dispersed short distances by wind. It is spread by vehicles and other machinery.

Lookalikes – Can be confused with Small St John's Wort (*Hypericum gramineum*), a native. As its name suggest, Small St John's Wort only reaches up to 30cm. Its leaves are stem-clasping. Flower possesses far fewer stamens, which are smaller and less pronounced.



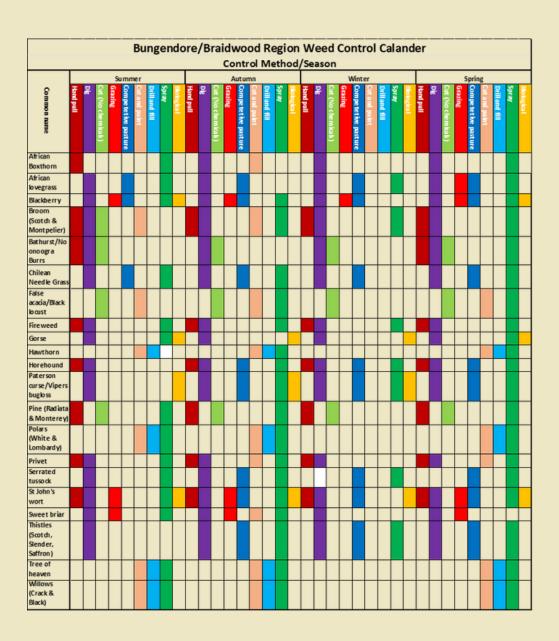


Left: Native St John's Wort (Left) vs invasive St John's Wort (Right) (Photo by Jed Pearson)

Right: St John's Wort infestation (Photo by Jed Pearson)











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Preserving habitat for woodland bird species in South Eastern New South Wales is of paramount importance to ensuring the long-term survival and ecological balance of our natural environment. Woodland birds play a vital role in maintaining biodiversity, pollination, seed dispersal, and pest control, contributing to the overall health of ecosystems. However, rampant urbanization, land clearing, and habitat fragmentation have significantly impacted their populations, leading to declining numbers and even local extinctions. By recognizing the value of these species and taking proactive measures to protect and restore their habitats, we can safeguard the delicate balance of nature, promote biodiversity, and secure a sustainable future for both the avian inhabitants and the broader ecosystem in South Eastern New South Wales.



Photo by Jed Pearson



