

# HEARTLANDS



## EASTERN BILLABONG W I L D L I F E

A Snapshot in Time





# INTRODUCTION

**Recent wildlife research in the Eastern Billabong has excited local landholders about how many amazing native species remain. People are now more willing than ever to help save their local wildlife from extinction.**

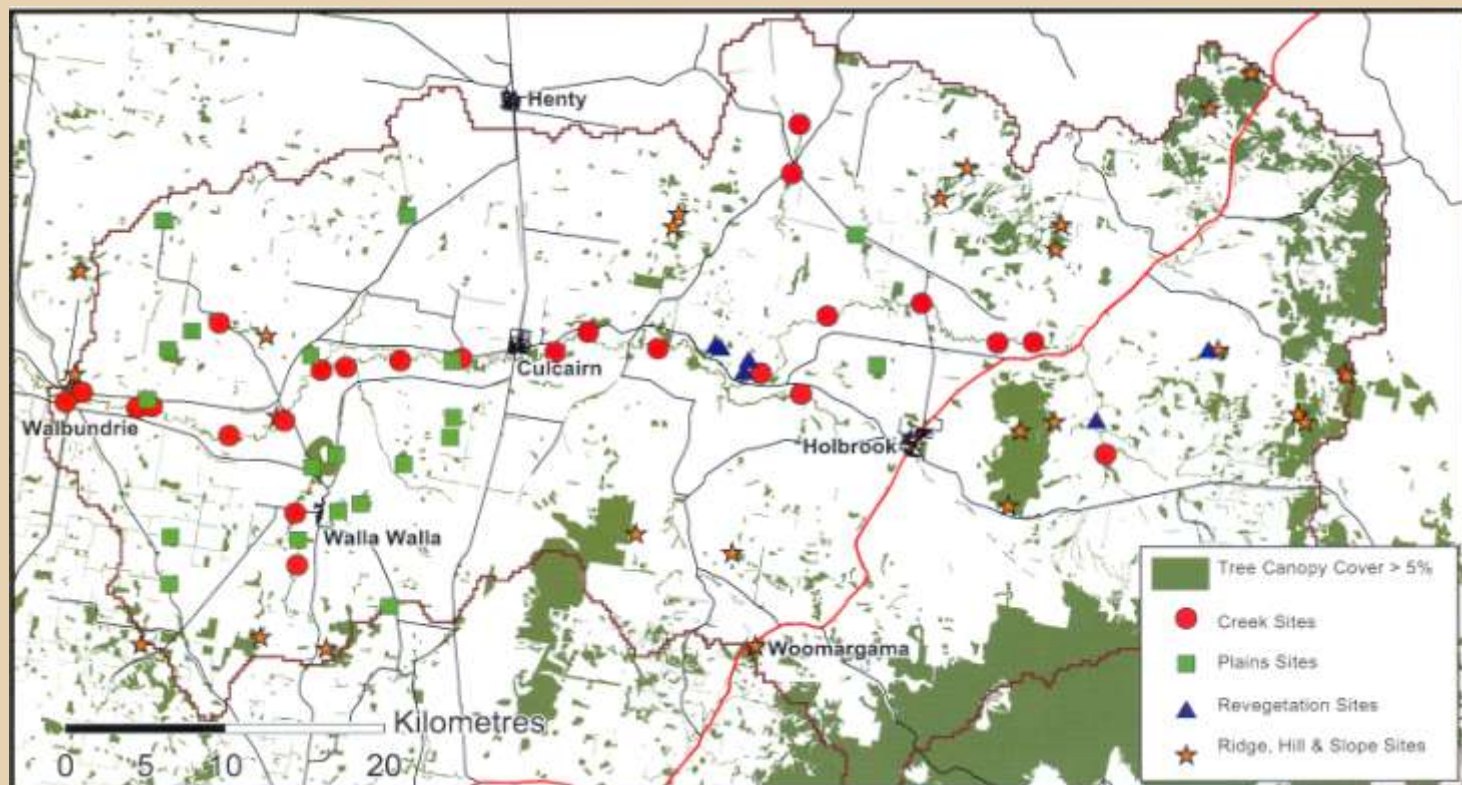
A large scale wildlife survey was conducted throughout the Eastern Billabong Creek catchment from October 2001 to September 2002 as part of the *Heartlands* 'Biodiversity in the Billabong' project<sup>10</sup>. *Heartlands* is a combination of research and on-ground works covering many fields (see partners' logos on back cover) associated with sustainable land use, such as social issues, farm forestry, perennial pastures, salinity and biodiversity.

The primary aim of this study was to help determine and clarify the current distribution, abundance and local status of wildlife species, particularly those considered threatened in New South Wales. Additionally, this project aimed to engage the local community, raise awareness and encourage people to take greater actions to conserve their local wildlife. To help achieve this, over 20 wildlife presentations were held at various halls, pubs, field days and other venues throughout the catchment. This booklet aims to provide a summary of the results of the study and present a detailed inventory of

local wildlife to the Eastern Billabong community, highlighting the current state of affairs for selected species and important conservation issues.

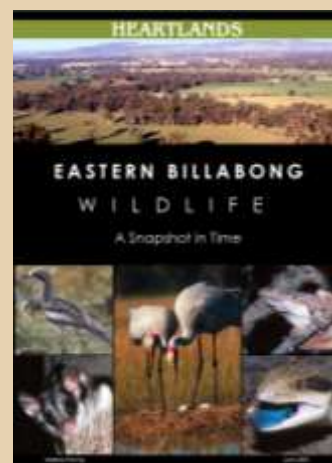
This study looked at four wildlife groups; mammals, birds, frogs and reptiles. Together, these comprise all vertebrate groups present except fish. The focus was on private land and the most significant areas of woodland and forest remaining in the catchment. A total of 78 study sites (see study site map below), included 27 sites on ridges, slopes and hills, 25 sites along the Billabong Creek and its tributaries and 20 sites on the plains. In addition six revegetation sites were surveyed.

This booklet also draws on other research conducted in the area and across Australia (see references and further reading on back cover). The species considered threatened in this booklet refer to species listed as Vulnerable and Endangered under the *Threatened Species Conservation Act (NSW) 1995*. Several species are also considered threatened nationally. Scientific names have been included only for reptiles and frogs because their common names vary so much.



**COVER PHOTOS:** The Billabong Creek from "Wycombe" looking east towards Holbrook and Morgan's Ridge (top). The Brolga has been reduced to critically low numbers in the Eastern Billabong with only two or possibly three breeding pairs remaining (middle). The Bush Stone-Curlew has declined to about six breeding pairs (middle left). A highly significant population of the threatened Squirrel Glider persists in the Eastern Billabong (bottom left). The Peron's Tree Frog is one of very few frog species to remain relatively common (middle right). The Eastern Blue-tongued Lizard appears widespread but uncommon (bottom right).

**LEFT:** Interested people gather to inspect a Yellow-footed Ateuchinus found at "Wybalena" on Morgan's Ridge.





# M A M M A L S

## Eastern Billabong Mammal Species List

### Monotremes

Echidna .

Platypus

### Marsupials

**(t)** Spot-tailed Quoll **P**

**(t)** Brush-tailed Phascogale **P**

Yellow-footed Antechinus .

Agile Antechinus .

Common Dunnart **P**

Fat-tailed Dunnart **P**

Long-nosed Bandicoot **P**

**(t)** Koala

Common Wombat .

Common Brushtail Possum .

**(t)** Eastern Pygmy Possum **P**

Feather-tailed Glider

Sugar Glider .

**(t)** Squirrel Glider .

Greater Glider

Common Ringtail Possum .

Eastern Grey Kangaroo .

Common Wallaroo (Euro)

Black Wallaby .

Red Necked Wallaby

### Bats

Little Red Flying Fox

Grey Headed Flying Fox **P**

**(t)** Yellow-bellied Sheath-tail Bat .

White-striped Freetail Bat .

Eastern Freetail Bat .

Inland Freetail Bat

Southern Freetail Bat .

Gould's Wattled Bat .

Chocolate Wattled Bat .

Large Forest Bat .

Southern Forest Bat .

Little Forest Bat .

**(t)** Common Bent-wing Bat .

**(t)** Southern Myotis .

Eastern False Pipistrelle

Inland Broad-nosed Bat .

Lesser Long-eared Bat .

Gould's Long-eared Bat

**(t)** Greater Long-eared Bat

### Rodents

Water Rat

House Mouse \* .

Black Rat \* .

### Other mammals

Fox \* .

Dingo

Cat \* .

Rabbit \* .

Brown Hare \* .

Goat \* .

Pig \*

Sambar Deer\*

Fallow Deer \* .



The Southern Forest Bat.

Unfortunately, Australia has the worst extinction record for mammals on the planet. The extinction of ten marsupials and nine rodents in Australia since European settlement has primarily been caused by the loss and fragmentation of habitat, introduction of predators like the Fox and Cat, as well as domestic stock and the rabbit. The Eastern Billabong has already lost many species, probably including the Northern Hairy-nosed Wombat, White-footed Rabbit Rat, Rufous Bettong and Eastern Quoll. Furthermore there are several species on the list presented here that are probably either already extinct in the catchment or are destined to be.

A total of 13 bat species were recorded during the surveys, including nine that were found to use the Billabong Creek as a highway. All the bats listed, except the two Flying-foxes are insectivorous and play an important role in controlling insect numbers. By far the most common bat in the Eastern Billabong is the Little Forest Bat (several hundred were caught during the surveys), which weighs only four grams, less than a ten cent coin. The discovery of the Southern Myotis, a threatened 'fishing' bat, at the Walla Walla Swamp was a major highlight of the surveys. This large wetland provides ideal habitat for bats, including numerous hollows and crevices in the ancient River Red Gums. The Common Bent-wing Bat, also a threatened species, was recorded on Morgan's Ridge and is known to favour caves for roosting and maternity sites.



The White-striped Freetail Bat.

## Eastern Billabong Mammal List Key

**P** = Predicted to Occur or possible only no recent records.

**(t)** = listed as threatened in NSW

\* = introduced species

. = Recorded during this study



# SQUIRREL GLIDER

A major highlight of the project was the discovery of Squirrel Gliders, which are listed as a threatened species in NSW- at eight of the study sites, five of which were along the Billabong Creek. The three other sites were also on fertile soils in lowland areas where there were numerous large old trees like River Red Gum, Apple Box, White Box, Grey Box and Yellow Box. Because Squirrel Gliders (and other gliders) glide between trees, they rely on trees that are closely connected to each other, so the Billabong Creek is an ideal area to support significant numbers. Squirrel Gliders feed on insects, gum from wattles, sap from eucalypts, as well as nectar and pollen. They are known to be associated with habitats that have many different plant and tree species that offer a range of feeding opportunities.

The highest densities of Squirrel Gliders were found on the Billabong, near Culcairn and Walla Walla (up to nine on a 250 metre section). These sites had a large number of big old trees, including dead stags, together with thickets of Silver Wattle. Squirrel Gliders can glide up to 90 metres, but generally require large tree canopies with at least some overlap. The one pictured was photographed gliding across the Billabong Creek after being captured and released,

The Squirrel Glider is closely associated with box woodlands, which have been heavily cleared, and are known to have disappeared from up to 50% of their former range<sup>14</sup>. They are one of four glider species found in the Eastern Billabong. The closely related Sugar Glider is by no means common in the catchment but unlike the Squirrel Glider, it is well represented in the large foothill forests of the eastern end (e.g. Woomargama National Park and down the Four Mile Lane). The Greater Glider, which is much larger than the Squirrel or Sugar Glider, is only known from Woomargama National Park and probably provides an important food source for the Powerful Owls that reside there<sup>11</sup>. The tiny (twelve gram), elusive Feathertail Glider was not recorded during the surveys but is known to occur in the catchment. The Common Brushtail and Common Ringtail Possums remain relatively common, whilst two other arboreal marsupials, the Brush-tailed Phascogale (Tuan) and Eastern Pygmy Possum, also may occur. If they do persist in the catchment they must be extremely rare to have gone undetected for this long. Across the border in north-east Victoria the Eastern Pygmy Possum is known from the Mt. Lawson region and the Brush-tailed Phascogale still occurs in the Baranduda, Chiltern and Mt. Pilot areas.

The Billabong Creek, together with other naturally vegetated creek-lines and roadsides, allows Squirrel Glider colonies to mix throughout the catchment, reducing the risk of inbreeding and local extinction. Small isolated colonies, of which very few remain, may not survive for much longer unless habitat connectivity is improved across the landscape. We should strategically plant large wildlife corridors that incorporate numerous farms. The Eastern Billabong probably provides a nationally significant stronghold for the Squirrel Glider, likely supporting at least several hundred individuals. It is our responsibility to ensure they survive for many generations to come.



One of the Squirrel Gliders found at Kings Travelling Stock Reserve, north of Walla Walla. Note the bushy tail and dark markings that help distinguish it from the Sugar Glider.



# YELLOW-FOOTED ANTECHINUS

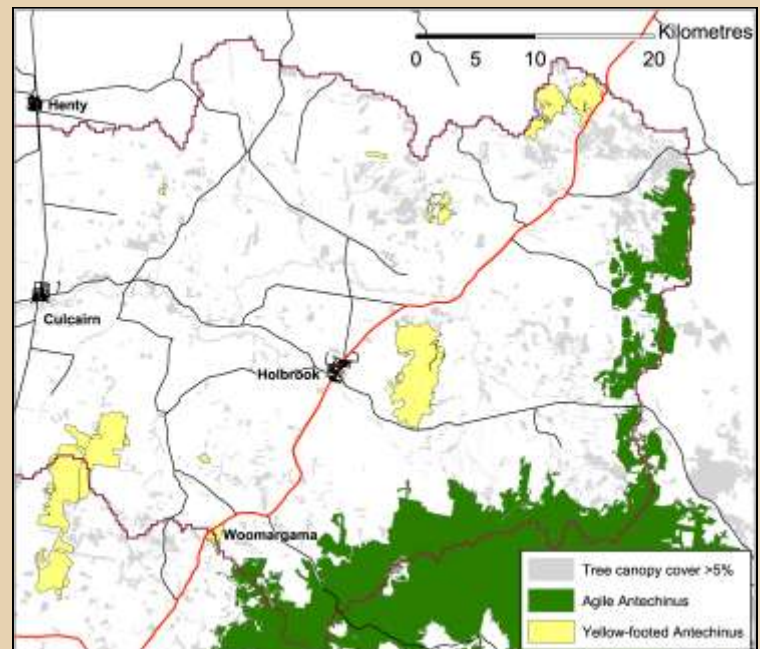
The word Antechinus, pronounced 'anti-kine-us', refers to a group of small carnivorous marsupials, including two that are found in the Eastern Billabong. It is possible that one or two other small, ground-dwelling marsupials- the Fat-tailed and Common Dunnarts-survive in the catchment. Antechinus and dunnarts have pouches like possums, wombats and kangaroos and are very different to rodents (e.g. they lack the two big front teeth). Antechinus mainly feed on insects but will also eat the introduced House Mouse. Every year all of the males die after the breeding season, leaving the females to raise the next generation.

The Agile Antechinus is found throughout the foothill forests of the far eastern and south-eastern end of the catchment (e.g. Woomargama National Park and down Four Mile Lane) where much of the native vegetation remains intact. Woomargama National Park alone probably supports at least several thousand individuals. In contrast, the Yellow-footed Antechinus is more closely associated with woodlands and is mainly found west of the Hume Highway where there is much less native vegetation cover due to more intensive clearing for agriculture (see map, which shows current known distribution).

Despite a considerable amount of trapping effort, no Yellow-foots were found on the flats, such as the Billabong Creek, Walla Walla Swamp or Comer Travelling Stock Reserve, near Henty. Unfortunately it also appears the surveys were a few decades too late for many of the smaller or more isolated remnants on hills, despite suitable habitat. This was particularly the case for those in the western end of the catchment where it is likely that local extinction has already occurred. Populations of the Yellow-footed Antechinus are now highly fragmented (see distribution map below) and many may be too small to be viable in the long-term. This species now appears to be restricted to large remnants in the timbered hilly country between 330 and 500 metres altitude (e.g. Red Stringybark, Red Box and Scribbly Gum, see back cover). Similarly, the Black wallaby appears largely restricted to ridges, hills and slopes, as they were only recorded once on the Billabong Creek.

Yellow-footed Antechinus were only found on timbered slopes and ridges that contained large amounts of fallen timber and a healthy layer of leaf litter. Densities of up to twelve per hectare were recorded and appear dependent on the amount of fallen logs. Indeed, fallen timber especially large logs, appears to provide critical habitat for this once plentiful species that is now locally threatened. Hollows in standing trees also provide important habitat, particularly older trees that contain numerous small crevices and cavities.

The Yellow-footed Antechinus, although not considered threatened in NSW, may be as seriously threatened in the Eastern Billabong as the Squirrel Glider. By enhancing the quality of habitat over time (e.g. number of old trees and fallen logs) and increasing the size of remnant patches with adjacent revegetation, we can develop opportunities for each population to increase in numbers, thus giving them a better chance of long-term survival. To help conserve populations of both Antechinus species, one should avoid removing firewood from remnants and plant woodlots for future supply.







The **Swift Parrot** (above, feeding in Golden Wattle), is a nationally threatened migratory species that breeds only in Tasmania. Each year they cross the Bass Strait and spend the winter months on the mainland. Swift Parrots have been recorded at a minimum of nine locations across the Eastern Billabong in the last three years, including about 30 birds at six sites during 2002. This nectar-loving and lerp-eating species favours older remnant trees in fertile lowland areas. It is estimated that only about 1000 Swift Parrots remain in the world<sup>8</sup>.



The **Turquoise Parrot** (left, nesting in a tree stump) is a resident species that moves locally, feeding on grass seeds and nesting in hollows. It was recorded only at "Wybalena" on Morgan's Ridge and "Jillamatong" adjacent to Benambra National Park. This species has only been recorded from a handful of other very large remnants in the Eastern Billabong and is clearly under serious threat.



The **Diamond Firetail** (above), also feeds on grass seeds and although listed as a threatened species in NSW, is not yet rare in the catchment. However, they appear to be mostly restricted to large remnants on ridges and hills. Several nests were found in clumps of mistletoe in healthy remnants. The Painted Honey-eater (not pictured), also a threatened species, is almost entirely dependent on mistletoe as a food supply. The presence of mistletoes in a patch of bush increases habitat diversity. The resources provided by mistletoes (e.g. fruits, nectar, nest sites) are widely used by many wildlife species. In degraded farmland, the abundance of mistletoe is often simply an indication that nature is out of balance<sup>24</sup>.



The **Dusky Woodswallow** (left), like the other five woodswallow species found in the catchment, is highly mobile and selects the better quality habitats in the landscape.

A total of 171 bird species were found in the study, including 10 that are listed as threatened in NSW (see list over page), whilst several others are known to occur. The Eastern Billabong is fortunate in that it supports birds typical of inland Australia (e.g. Chestnut-rumped Thornbill), as well as eastern Australia (e.g. Satin Bowerbird). Many of our birds are migrants and are only present in the catchment at certain times of the year (e.g. Sacred Kingfisher in summer, Flame Robin in winter). Other species like the Budgerigar, which irrupted in the Eastern

Billabong in April 2002 and stayed on for several months, rely on areas like this catchment as a drought refuge. Much of the Eastern Billabong landscape, especially on the flats, is now almost devoid of smaller insect-eating birds. These are typified by the uniquely Australian thornbills, honeyeaters and robins, and apart from a few common species like the Yellow-rumped Thornbill, White-plumed Honeyeater and Flame Robin, they are now largely restricted to high quality remnants on hills. However, there are some exceptions to this, such as the better quality vegetation of Billabong and other creeks (101 bird species were recorded at creek sites). These small birds play an important role in insect control and help prevent eucalypt dieback. Most farms that lack good habitat have very few small insectivorous birds. In contrast, many of the larger birds remain common in degraded farmland some having benefited from European settlement (e.g. Galah, Eastern Rosella, Red-rumped Parrot, Noisy Miner and Australian Magpie).

The **Brown Treecreeper**, (right), one of three treecreeper species found in the catchment, is now considered threatened in NSW and is known to still be declining. Like many of the declining woodland birds it does not survive in farmland with only scattered trees. In contrast to studies in nearby landscapes (e.g. CSIRO research in the Saverneke/ Native Dog area), the study found that the Brown Treecreeper is still relatively common in the Eastern Billabong (recorded at 63% of sites). This is principally because of the extent of vegetated creek-lines, as well as larger patches elsewhere in the catchment. The Brown Treecreeper is a co-operative breeder, whereby offspring from previous breeding seasons help out their parents to raise the young. This bark and ground-foraging bird persists along most of the eastern section of the Billabong Creek. Higher densities of Brown Treecreepers occur where the riparian vegetation strip is widest and habitat diversity is highest, indicated notably by the number of old trees, and amount of fallen timber. A recent study<sup>23</sup> in north-east NSW<sup>7</sup> found female Brown Treecreepers typically disperse from breeding groups. In highly fragmented landscapes the females were found to have difficulty in successfully reaching other patches of bush and consequently are not replaced in isolated breeding groups. In other words, despite the ability of males to in smaller of bush, the inability of young females to colonise these areas eventually leads to local extinction.



The **Bush Stone-Curlew**, (below), well known for its eerie, wailing call at night, is a ground-feeding and ground-nesting species that is highly susceptible to introduced predators like the Fox. Bush Stone Curlews are dependent on fallen logs and branches for camouflage. They remain common in parts of northern Australia and on large predator-free islands that still have suitable habitat. Many Eastern Billabong farmers remember this species when it was still common but most haven't heard or seen one for decades. Bush Stone Curlews were recorded at four of the study sites and known to occur at a handful of others. The core area is in the Walla Walla region where curlews reside in stands of River Red Gum, Grey Box or Yellow Box that have numerous fallen logs and branches. It is estimated that only about six breeding pairs, together with a few unpartnered young birds remain in the Eastern Billabong. Such critically low numbers, consistent with other parts of south-eastern Australia, means that intensive actions are urgently required. For example, predator-proof fences might be necessary to adequately increase breeding success.

A recent increase in local fox control efforts and a greater awareness of the value of fallen timber to wildlife is hopefully already playing a part in saving curlews from local extinction in the Eastern Billabong and adjacent regions. This highly charismatic species is undoubtedly one of our most intriguing, yet most threatened species.





# EASTERN BILLABONG BIRD LIST

Emu P  
Stubble Quail M .  
Brown Quail R  
King Quail P  
Plumed Whistling Duck R  
Australian Wood Duck A .  
(t) Freckled Duck P  
(t) Blue-billed Duck R (t)  
Musk Duck R  
Black swan M .  
Australian Shelduck C .  
Hardhead M .  
Mallard R \*  
Pacific Black Duck A .  
Australasian Shoveler U .  
Pink-eared Duck R .  
Grey Teal A .  
Chestnut Teal R .  
Great Crested Grebe R  
Hoary-headed Grebe M .  
Australasian Grebe C .  
Darter R .  
Great Cormorant U .  
Little Black Cormorant U .  
Pied Cormorant R  
Little Pied Cormorant M .  
Australian Pelican M .  
White-necked Heron M .  
White-faced Heron C .  
Great Egret U .  
Intermediate Egret R .  
Little Egret R  
Cattle Egret U .  
Nankeen Night Heron R  
Little Bittern P  
(t) Australasian Bittern P  
Glossy Ibis R  
Straw-necked Ibis M .  
Australian White Ibis C .  
Royal Spoonbill R  
Yellow-billed Spoonbill M .  
Black-shouldered Kite M .  
Letter-winged Kite P  
Black Kite R  
Whistling Kite R .  
(t) Square-tailed Kite P  
Collared Sparrowhawk U .  
Brown Goshawk U .  
Grey Goshawk P  
White-bellied Sea-Eagle R  
Little Eagle U  
Wedge-tailed Eagle M .  
Spotted Harrier R .  
Swamp Harrier R  
Black Falcon R .  
Brown Falcon C .  
Nankeen Kestrel C .  
Australian Hobby U .  
Peregrine Falcon U .  
(t) Grey Falcon P  
(t) Brolga R .  
Buff-banded Rail R  
Lewin's Rail P  
Spotless Crake R  
Australian Spotted Crake R  
Baillon's Crake R  
Dusky Moorhen U .  
Purple Swampphen M .  
Eurasian Coot M .  
Black-tailed Native Hen P  
(t) Bush Stone Curlew R .  
Painted Button Quail R .  
Little Button-Quail P  
Red-chested Button-Quail P  
(t) Plains Wanderer P  
Latham's Snipe R  
Black-tailed Godwit P (t)  
Bar-tailed Godwit P  
Common Greenshank P  
Marsh Sandpiper P  
Wood Sandpiper P  
Common Sandpiper P  
Red-necked Stint P  
Long-toed Stint P  
Sharp-tailed Sandpiper P

Curlew Sandpiper P  
Ruff P  
Red-necked Phalarope P  
Pectoral Sandpiper P  
(t) Painted Snipe P  
Red-necked Avocet P  
Black-winged Stilt U .  
Banded Stilt P  
Pacific Golden Plover P  
Red-capped Plover P  
Double-banded Plover P  
Red-kneed Dotterel R  
Black-fronted Dotterel M .  
Masked Lapwing M .  
Banded Lapwing R  
Australian Pratincole P  
Silver Gull R  
Whiskered Tern R  
White-winged Black Tern P  
Caspian Tern P  
Gull-billed Tern P  
Spotted Turtle Dove U \*  
Feral Pigeon U \* .  
Diamond Dove R  
Peaceful Dove M .  
Common Bronzewing M .  
Wonga Pigeon P  
Crested Pigeon C .  
Yellow-tailed Black-Cockatoo P  
Gang gang Cockatoo R .  
Galah A .  
Long-billed Corella R .  
Little Corella U .  
Sulphur-crested Cockatoo C .  
Rainbow Lorikeet P  
Little Lorikeet R .  
(t) Purple-crowned Lorikeet P  
Musk Lorikeet R  
(t) Swift Parrot R .  
King Parrot U .  
(t) Superb Parrot R .  
Cockatiel R .  
Crimson Rosella M .  
Eastern Rosella A .  
Australian Ringneck R .  
Blue Bonnet R .  
Red-rumped Parrot A .  
Blue-winged Parrot P  
(t) Turquoise Parrot R .  
Budgerigar R .  
Pallid Cuckoo U .  
Fan-tailed Cuckoo U .  
Brush Cuckoo P  
Horsfields Bronze-Cuckoo U .  
Shining Bronze-Cuckoo U .  
Black-eared Cuckoo R  
Common Koel P  
(t) Powerful Owl R  
(t) Barking Owl R  
Southern Boobook U .  
Barn Owl U .  
(t) Masked Owl P  
Tawny Frogmouth U .  
Australian Owlet Nightjar R .  
White-throated Nightjar R  
Spotted Nightjar P  
Fork-tailed Swift P  
White-throated Needletail R  
Azure Kingfisher P  
Laughing Kookaburra A .  
Sacred Kingfisher M .  
Red-backed Kingfisher P  
Rainbow Bee-eater M .  
Dollarbird U .  
Superb Lyrebird P  
White-throated Treecreeper M .  
Red-browed Treecreeper R  
(t) Brown Treecreeper C .  
Superb Fairy-Wren M .  
Spotted Pardalote M .  
Striated Pardalote A .  
Red browed Pardalote R  
White-browed Scrubwren M .  
Chestnut-rumped Heathwren P  
(t) Speckled Warbler U .

Western Gerygone U .  
White-throated Gerygone U .  
Brown Thornbill U .  
Inland Thornbill R .  
Buff-rumped Thornbill U .  
Chestnut-rumped Thornbill R .  
Yellow-rumped Thornbill M .  
Striated Thornbill U .  
Yellow Thornbill U .  
Weebill U .  
Southern Whiteface U .  
Red Wattlebird U .  
Little Friarbird M .  
Noisy Friarbird U .  
Spiny-cheeked Honeyeater R  
Striped Honeyeater R  
(t) Regent Honeyeater P  
Blue-faced Honeyeater R .  
Noisy Miner A .  
Yellow-faced Honeyeater U .  
Singing Honeyeater R  
White-eared Honeyeater R .  
Yellow-tufted Honeyeater R .  
Yellow-plumed Honeyeater R .  
Fuscous Honeyeater U .  
White-plumed Honeyeater A .  
(t) Black-chinned Honeyeater U .  
Brown-headed Honeyeater U .  
White-naped Honeyeater M .  
New Holland Honeyeater R  
White-fronted Honeyeater P  
Crescent Honeyeater R  
Eastern Spinebill R .  
Black Honeyeater R  
(t) Painted Honeyeater R  
Scarlet Honeyeater P  
White-fronted Chat R .  
Jacky Winter U .  
Flame Robin C .  
Scarlet Robin M .  
Red-capped Robin R .  
Rose Robin R .  
(t) Pink Robin P  
Eastern Yellow Robin U .  
(t) Hooded Robin R .  
(t) Grey-crowned Babbler U  
White-browed Babbler R .  
Eastern Whipbird P  
Spotted Quail Thrush R .  
Varied Sitella U .  
Crested Shrike-Tit M .  
(t) Olive Whistler P  
(t) Gilberts Whistler P  
Golden Whistler U .  
Rufous Whistler M .  
Grey Shrike-Thrush C .  
Grey Fantail M .  
Rufous Fantail P  
Leaden Flycatcher R .  
Satin Flycatcher R  
Willie Wagtail A .  
Restless Flycatcher C  
Magpie-Lark A .  
White-bellied Cuckoo-Shrike R .  
Black-faced Cuckoo-Shrike C .  
Ground Cuckoo-Shrike P  
Cicadabird P  
White-winged Triller U .  
Olive-backed Oriole U .  
White-breasted Woodswallow R  
Black-faced Woodswallow R .  
White-browed Woodswallow R  
Masked Woodswallow R .  
Dusky Woodswallow M .  
Grey Butcherbird U .  
Pied Butcherbird R .  
Australian Magpie A .  
Pied Currawong M .  
Grey Currawong R .  
Australian Raven A .  
Little Raven U .  
Apostlebird R .  
White-winged Chough C .  
Satin Bowerbird R .  
Australian Pipit U .

Singing Bushlark R .  
Eurasian Skylark P \*  
Double-barred Finch R .  
Red-browed Finch M .  
Zebra Finch P  
(t) Diamond Firetail U .  
European Goldfinch R \* .  
European Greenfinch P \* .  
House Sparrow C \* .  
Eurasian Tree Sparrow U \* .  
Mistletoebird M .  
Welcome Swallow C .  
White-backed Swallow R .  
Tree Martin M .  
Fairy Martin U .  
Australian Reed-Warbler U .  
Brown Songlark U .  
Rufous Songlark M .  
Little Grassbird R  
Golden-headed Cisticola R  
Silvereye M .  
Eurasian Blackbird M \* .  
Bassian Thrush P  
Common Starling A \* .  
\*Common Myna P \*



The threatened Speckled Warbler, a ground-nesting and ground-feeding species, is now largely restricted to hills in the eastern end of the catchment.

## Eastern Billabong Birds List Key

**P** = Predicted to occur or possible only – no recent records  
**R** = Rare (1 – 10% of sites)  
**U** = Uncommon (11 – 25% of sites)  
**M** = Moderately Common (26 – 50% of sites)  
**C** = Common (51 – 75% of sites)  
**A** = Abundant (76 – 100% of sites)  
**(t)** = Listed as threatened in NSW  
\* = Introduced species  
. = recorded during this study

Some adjustments were made due to a lack of surveys in grasslands/paddocks, wetlands, the far east of the catchment, urban areas and highly degraded remnants.





*Above: Eastern Yellow Robin nesting in a thick understorey of Bracken.*

*Left: Female (incubating) and male Red-capped Robin nesting in a tree close to the ground.*

*Right: Male Scarlet Robin.*

*Below Right: Male Flame Robin.*

*Below: Hooded Robin (male) photographed during the surveys at "Jillamatong", Mountain Creek Road, north-west of Woomargama.*



Robins are an ideal group to monitor because they are conspicuous, relatively easy to identify and are good indicators of the overall health of wildlife populations in forests and woodlands. Virtually all of the robins are declining across their ranges in south-eastern Australia. Several of them are now well recognised amongst wildlife researchers for their use as focal species, being highly sensitive and generally only found in the largest, most connected remnants that have high habitat diversity. Seven different species of robin regularly occur in the Eastern Billabong. Future surveys may detect an eighth species, the Pink Robin. The Flame Robin is by far the most common species. Prior to winter they leave the high country and during the colder months of the year can be found in paddocks on most farms across the catchment. The Scarlet Robin, which is also an altitudinal migrant, is only moderately common in the Eastern Billabong and much more dependent on remnants of bush with good quality habitat. The Jacky Winter (not pictured), now uncommon in the Eastern Billabong, is a grey species of robin and like the other robins is often seen pouncing on insects from fence-lines or other low perches in or adjacent to remnant bush. Eastern Yellow Robins were not found west of

Culcairn and this study supports previous local research<sup>6</sup> that identified them as a highly sensitive species. The Rose Robin (not pictured) was only recorded at two sites, both on Morgan's Ridge, near Holbrook. This species, like the Pink Robin, is more typically found in taller, wetter eucalypt forests and rainforests closer to the coast. Red-capped Robins are now rare in the catchment although in the Walbundrie Hills still support numerous breeding pairs at high densities, thus acting as a source supply for other remnants and restored areas. Of all the robins though, the survival of the Hooded is of most concern. A total of only 23 individuals, including six juveniles, were recorded from seven sites. Based on the coverage of the survey it is estimated that as few as only 25 breeding pairs may remain in the entire Eastern Billabong. Indeed, they are one of the most threatened species in the catchment, occurring at very low densities and probably resident in less than 15 different patches. Fortunately though, this species, together with others like the Red-capped, Scarlet and Eastern Yellow Robin, were found to colonise large, structurally diverse revegetation patches within a decade of being planted.



# WATERBIRDS



A large proportion of the birds found in the Eastern Billabong are entirely dependent on wetlands and countless others make use of these habitats to varying degrees. Very few natural, relatively intact wetlands remain in the catchment, yet there are numerous small, artificial wetlands (farm dams). Most waterbirds, such as Yellow-billed Spoonbill (above left), favour wetlands with shallows. The declining Red-kneed Dotterel (below right), together with a suite of other small waders from the plover and sandpiper families rely on shallow mudflats for foraging. Such habitats are lacking in most farm dams.

In southern New South Wales, Brolgas (left middle, adult with chick) rely on large (~100 hectares), relatively healthy swamps for breeding habitat. Only three such sites remain in the Eastern Billabong, so it is no real surprise that there are only two or three Brolga breeding pairs left. The Purple Swamphen (below left) is a large, conspicuous waterbird that is a good indicator for waterbirds that are dependent on wetland vegetation cover, such as the secretive Spotted Crake (below middle). The Painted Snipe and Australasian Bittern, two of Australia's most threatened waterbirds, are also dependent on the cover provided by waterplants like rushes, reeds and canegrass for breeding, feeding and roosting. Other species, like the spoonbills, herons and ibises, rely on trees in flooded areas for nesting, whilst many duck species breed in hollows. The Australian Wood Duck is an example of a waterbird that has actually benefited from the proliferation of farm dams.

Waterbirds are typically highly mobile (some species migrate from Siberia to the Eastern Billabong) and respond rapidly to wetland restoration. Simple changes to farm dams can dramatically increase their value to waterbirds. Increasing the extent of shallow areas (less than 30 cm deep) and the amount of cover provided by native water plants will result in a greater diversity of habitats, which will lead to a greater variety of waterbirds. Earthworks to create shallow areas that are intermittently flooded, together with better grazing management, are among the techniques used to improve farm dams for wildlife.





Only seven species of frog were recorded during the study. Although they were not heavily targeted, in total, up to 18 different frog species could occur in the catchment. Future surveys are required to better ascertain the local status of frogs. Many of Australia's frog species are known to have declined dramatically in recent decades.

The Spotted grass Frog (below right) remains relatively common in the Eastern Billabong. The tiny Eastern Sign-bearing Froglet is also one of very few species to remain relatively common and was frequently recorded along the Billabong and other creeks. When Walla Walla Swamp was flooded in the year 2000, more than 60 individual Peron's Tree Frogs were found in the loose bark of the lower trunk on just one River Red Gum, indicating the importance of this wetland for at least this species. Of Australia's threatened frog species, only the Southern Bell Frog, could possibly occur in the catchment. It is known to colonise artificial wetlands. Frogs will benefit from similar changes to the habitat and management of farm dams as waterbirds.

The Giant Banjo Frog (above right) and the Wrinkled Toadlet were found at sites near Walbundrie although they are near the southern edge of their geographic ranges. Many of the species listed as P would be at the western edge of their range (e.g. Lesueur's Frog), so if they do occur they are likely to be restricted to areas like Woomargama National Park. The Plains Brown Tree Frog (below left) is almost restricted to Victoria but may be found in the catchment with future surveys.



## Eastern Billabong Frog Species List

Brown Tree Frog	<i>Litoria ewingii</i> P
Lesueur's Frog	<i>Litoria lesueuri</i> P
Plains Brown Tree Frog	<i>Litoria parewingii</i>
Peron's Tree Frog	<i>Litoria peronii</i> .
(t) Southern Bell Frog	<i>Litoria raniformis</i> P
Eastern Sign-bearing Frog	<i>Crinia parinsignifera</i> .
Common Eastern Froglet	<i>Crinia signifera</i> .
Sloane's Froglet	<i>Crinia sloanei</i> P
Eastern Banjo Frog	<i>Limnodynastes dumerilii</i> .
Marsh Frog	<i>Limnodynastes fletcheri</i> P
Giant Banjo Frog	<i>Limnodynastes interioris</i> .
Ornate Burrowing Frog	<i>Limnodynastes ornatus</i> P
Brown-striped Frog	<i>Limnodynastes peronii</i> P
Spotted Grass Frog	<i>Limnodynastes tasmaniensis</i> .
Sudell's Frog	<i>Neobatrachus sudelli</i>
Bibron's Toadlet	<i>Pseudophryne bibroni</i>
Smooth Toadlet	<i>Uperoleia laevis</i>
Wrinkled Toadlet	<i>Uperoleia rugosa</i> .

## Eastern Billabong Frog Species List Key

- P** = Predicted to occur or possible only no recent records.  
**(t)** = Listed as threatened in NSW.  
**.** = Recorded during this study.





## Eastern Billagong Reptile Species List

Yellow-faced Whip Snake	<i>Demansia psammophis</i>
Red-naped Snake	<i>Furina diadema</i> <b>P</b>
Eastern Brown Snake	<i>Pseudonaja textilis</i> .
Red-bellied Black Snake	<i>Pseudechis porphyriacus</i> .
Eastern Tiger Snake	<i>Notechis scutatus</i> <b>P</b>
Small-eyed Snake	<i>Rhinoplocephalus nigrescens</i>
Dwyer's Black-headed Snake	<i>Suta dwyeri</i> <b>P</b>
(t) Little Whip Snake	<i>Suta flagellum</i> <b>P</b>
Bandy Bandy	<i>Vermicella annulata</i> <b>P</b>
Carpet Python (Murray-Darling form)	<i>Morelia spilota</i> .
Blackish (Grey's) Blind Snake	<i>Ramphotyphlops nigrescens</i> <b>P</b>
Woodland Blind Snake	<i>Ramphotyphlops proximus</i> <b>P</b>
Three-lobed (Peter's) Blind Snake	<i>Ramphotyphlops bituberculatus</i> <b>P</b>
(t) Pink-tailed Worm Lizard	<i>Aprasia parapulchella</i> <b>P</b>
(t) Striped Legless Lizard	<i>Delma impar</i> <b>P</b>
Olive Legless Lizard	<i>Delma inornata</i>
Burton's Legless Lizard	<i>Lialis burtonis</i> <b>P</b>
Common Scaly-foot	<i>Pygopus lepidopodus</i> <b>P</b>
Hooded Scaly-Foot	<i>Pygopus schraderi</i> <b>P</b>
Earless Three-lined Skink	<i>Bassiana dupperreyi</i> <b>P</b>
Red-throated Skink	<i>Bassiana platynota</i>
Southern Rainbow Skink	<i>Carlia tetradactyla</i> .
Carnaby's Wall Skink	<i>Cryptoblepharus carnabyi</i> .
Copper-tailed Skink	<i>Ctenotus taeniolatus</i> .
Large-striped Skink	<i>Ctenotus robustus</i>
Cunningham's Skink	<i>Egernia cunninghami</i>
Black Rock Skink	<i>Egernia saxatilis</i>
Tree-crevice Skink	<i>Egernia striolata</i> .
White's Skink	<i>Egernia whitii</i> <b>P</b>
Southern Water Skink	<i>Eulamprus heatwolei</i>
Three-toed Skink	<i>Hemiergis decresiensis</i> .
Grass Skink	<i>Lampropholis delicata</i> <b>P</b>
Garden Skink	<i>Lampropholis guichenoti</i> .
South-eastern Slider	<i>Lerista bougainvillii</i> .
Wood Mulch Slider	<i>Lerista muelleri</i> <b>P</b>
Grey's Skink	<i>Menetia greyii</i> .
Boulenger's Skink	<i>Morethia boulengeri</i> .
Highlands Forest Skink	<i>Nannoscincus maccoyi</i> <b>P</b>
Coventry's Skink	<i>Niveoscincus coventryi</i> <b>P</b>
Eastern Blue-tongued Lizard	<i>Tiliqua scincoids</i> .
Eastern Bearded Dragon	<i>Pogona barbata</i> .
Jacky Lizard	<i>Amphibolurus muricatus</i>
Nobbi	<i>Amphibolurus nobbi</i>
Southern Marbled Gecko	<i>Christinus marmoratus</i> .
Wood Gecko	<i>Diplodactylus vittatus</i>
Eastern Spiny-tailed Gecko	<i>Diplodactylus intermedius</i> <b>P</b>
Lace Monitor (Tree Goanna)	<i>Varanus varius</i> .
Broad-shelled Tortoise	<i>Chelodina expansa</i> <b>P</b>
Eastern Long-necked Tortoise	<i>Chelodina longicollis</i> .
Murray Turtle	<i>Emydura macquarii</i>

## REPTILES

Australia is rich in reptile diversity, supporting more species than any other country on the planet. A total of 17 reptile species were found during the study. Several other species are known to occur and numerous others may be detected in future surveys. A handful of species appear to be quite common and widespread in the Eastern Billabong, such as the Eastern Brown Snake (opposite page, bottom left), Southern Rainbow Skink, Boulenger's Skink and Southern Marbled Gecko. However, most species, such as the Copper-tailed Skink (opposite page, top right) and South-eastern Slider (below) appear to be more restricted to good quality remnants, which are mostly on hills and ridges. Populations of such species are largely isolated (e.g. Morgan's Ridge, Gerogery Range, Benambra National Park) and may not be viable in the long term. Most reptile species are relatively immobile and are consequently highly sensitive to the fragmentation of habitat. It is likely that many smaller reptiles will have difficulty in successfully colonising revegetation patches of restored remnants that are too isolated. Indeed, we may have to start considering reintroduction programs to sites that have the ability to support viable populations of certain species again. The distribution of some species (e.g. Murray Turtle, opposite page bottom right) remains largely unknown in the Eastern Billabong.

Almost all reptiles are dependant on cover, usually in the form of rocks, logs, leaf litter, branches, shrubs or grass tussocks. Consequently, they are highly sensitive to changes in habitat diversity. Firewood collection, grazing, the practice of keeping a 'tidy' farm and other impacts reduce the amount of available habitat for reptiles and numerous other wildlife. Indeed 'messy' areas provide ideal habitat for most species because they have more habitat diversity.

### Eastern Billagong Reptile List Key

- P** = Predicted to occur or possible only no - recent records.  
**(t)** = Listed as threatened in NSW.  
 . = Recorded during this study.







The intriguing Pink-tailed Worm Lizard (above) lives under rocks and feeds on small black ants. This threatened species favours open woodlands and grasslands that have a thick cover of Kangaroo Grass (*Themeda triandra*). In Victoria they are only known from the Bendigo region and most NSW records are from around the Tarcutta and Canberra regions. Pictured here are individuals from a population discovered in August 2002 on the Nail Can Hill range, near Albury. This rare legless lizard was also found on Goombargana Hill, west of Walbundrie in September 2000 during a community biodiversity survey organised by the NSW National Parks Association. These records highlight the real possibilities for the future discovery of the species in the Eastern Billabong, as well as other parts of the NSW south-west slopes and northern Victoria. The Olive Legless lizard (right) is much more common, but also rarely seen.

The Carpet Python was recorded at only one site ("Brae Springs", Gerogery Range). Interestingly, we can not be certain that the individuals at this site are from the local population, rather they could be the progeny of those bought down from Queensland many decades ago to control rodents. Carpet Pythons in the Eastern Billabong appear to have declined significantly and are locally threatened, as there are very few recent sightings in the catchment and no recent records for the far eastern section of the Billabong Creek.

The Lace Monitor, which recorded at only three sites, relies on hollow-bearing trees for shelter. They are reluctant to cross open paddocks and mobile individuals (e.g. dispersing young) probably rely on roadside corridors and other native vegetation strips to move through the landscape. Among other things, Lace Monitors feed on the nestlings of many bird species that breed in hollows, such as Galah and Sulphur-crested Cockatoo.





# Conservation Priorities

## Biodiversity Hotspots

Biodiversity hotspots are important reservoirs of life and their conservation should be a priority. The list of biodiversity hotspots in the Eastern Billabong presented below is based on the number of species recorded during the surveys (or otherwise known to occur), the size of the remnant, habitat quality, position in the landscape and the presence of significant wildlife (e.g. threatened and locally threatened species). Examples of significant species are given in brackets.

- **Billabong Creek and its tributaries** (e.g. Yarra Yarra, Jerra Jerra, Back and Ten Mile Creeks) (numerous Squirrel Gliders and Brown Treecreepers, Black-chinned Honeyeater).
- **Morgan's Ridge**, east of Holbrook (Common Bent-wing Bat, Sugar Glider, Yellow-footed Antechinus, seven robins, Turquoise Parrot).
- **Walla Walla Swamp**, including adjacent box woodland, Petries Creek and nearby River Red Gum remnants (Southern Myotis, Squirrel Glider, Brown Treecreeper, Bush Stone-curlew, Brolga).
- **Woomargama National Park/National Reserve** and adjacent remnants (Powerful Owl, Koala, Greater Gliders, several

reptiles and frog species not found elsewhere in the catchment).

- **Benambra National Park** and adjacent remnants, south of Culcairn (Turquoise Parrot, Carpet Python, Yellow-footed Antechinus)
- **Gerogery Range** (Stringybark Hill) (Carpet Python, Speckled Warbler, Swift Parrot)
- **Walbundrie Hills** (Chestnut-rumped Thornbill, Hooded Robin, Swift Parrot).

Other noteworthy remnants, including No Mans Lands (Mountain Creek), "Rossmoor", "Goolahbah", Blue Metal, Brittas, Comer and Kings Travelling Stock Reserves, "Mullemblah", "Stonehaven", remnants down Four Mile Lane, Jingellic Road and Tumbarumba Road.

Increasing the carrying capacity and habitat connection between these hotspots should help prevent many local extinctions. For example, linking creek-line vegetation to nearby remnant patches or Morgan's Ridge to Woomargama National Park will increase the potential for population to expand and intermix.



**The Billabong Creek**—a wildlife super-highway—supports many species and facilitates the movement of countless others throughout the catchment. This photo shows a healthy section of the creek with old River Red Gums, River Bottlebrush and reeds (*Phragmites*). Patches of bush adjacent to the creek (e.g. Kings Travelling Stock Reserve, north of Walla Walla) act as 'hotels', whereby animals moving along the creek can stop for a feed and a rest or perhaps even to stay and breed. The Walbundrie Hills (e.g. Sugarloaf Hill below) are a significant hotspot for threatened and declining woodland birds, acting as a source supply for restored areas in the surrounding landscape.



**PHOTO CREDITS** Front page Landscape: Scott Hartvigsen, all other photographs: Peter Merritt, **Page 2** People shot: Jenny Kane. **Page 3** Background tree: S. Hartvigsen, Southern Forest Bat: David Webb, White-striped Freetail Bat: P. Merritt. **Page 4** Gliding Squirrel Glider: Matthew Herring, Squirrel Glider: A. Bester. **Page 5** both Antechinus shots: Melinda Barlow. **Page 6** Swift Parrot: Chris Tzaros, all other birds: P. Merritt. **Page 7** Brown Treecreeper: Phillip Seely, Bush Stone-curlew: P. Merritt. **Page 8** Speckled Warbler: P. Merritt. **Page 9** All Robins: P. Merritt. **Page 10** Brolga: M. Herring, all other waterbirds: P. Merritt. **Page 11** Spotted Grass Frog & Giant Banjo Frog: Damian Michael, Plains Brown Tree Frog: Jennifer Francis. **Page 12 & 13** Olive Legless Lizard: M. Herring, Murray Turtle and Eastern Brown Snake: P. Merritt, all other reptiles: D. Michael. **Page 14** Creek: M. Herring, hill: S. Hartvigsen. **Page 15** Superb Fairy Wren: P. Merritt, re-vegetation: M. Herring. **Back Page** Bushland: M. Herring.

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# Bringing Back The Wildlife

## Habitat Restoration Across the Landscape

There is no doubt about it: without massive habitat restoration across the landscape, local extinctions will continue to occur and we will continue to lose important parts of our natural heritage, which helps to define us Australians. The particular mix of natural heritage in the Eastern Billabong is what characterises the catchment and makes it unique. This area is among a handful of regions in Australia that are leading the way with wildlife conservation in agriculture landscapes (see case study below). It is now clear that the work already undertaken for biodiversity conservation by landholders in the area is working well, but we still have a long way to go. We need to be more strategic about what we plant, where we plant it, how we plant it and what are the other options. For example, allowing natural regeneration to occur, through appropriate grazing of fire management, may be a better option for enlarging existing patches of bush, increasing habitat diversity or improving the health and long-term viability of a remnant patch of trees.

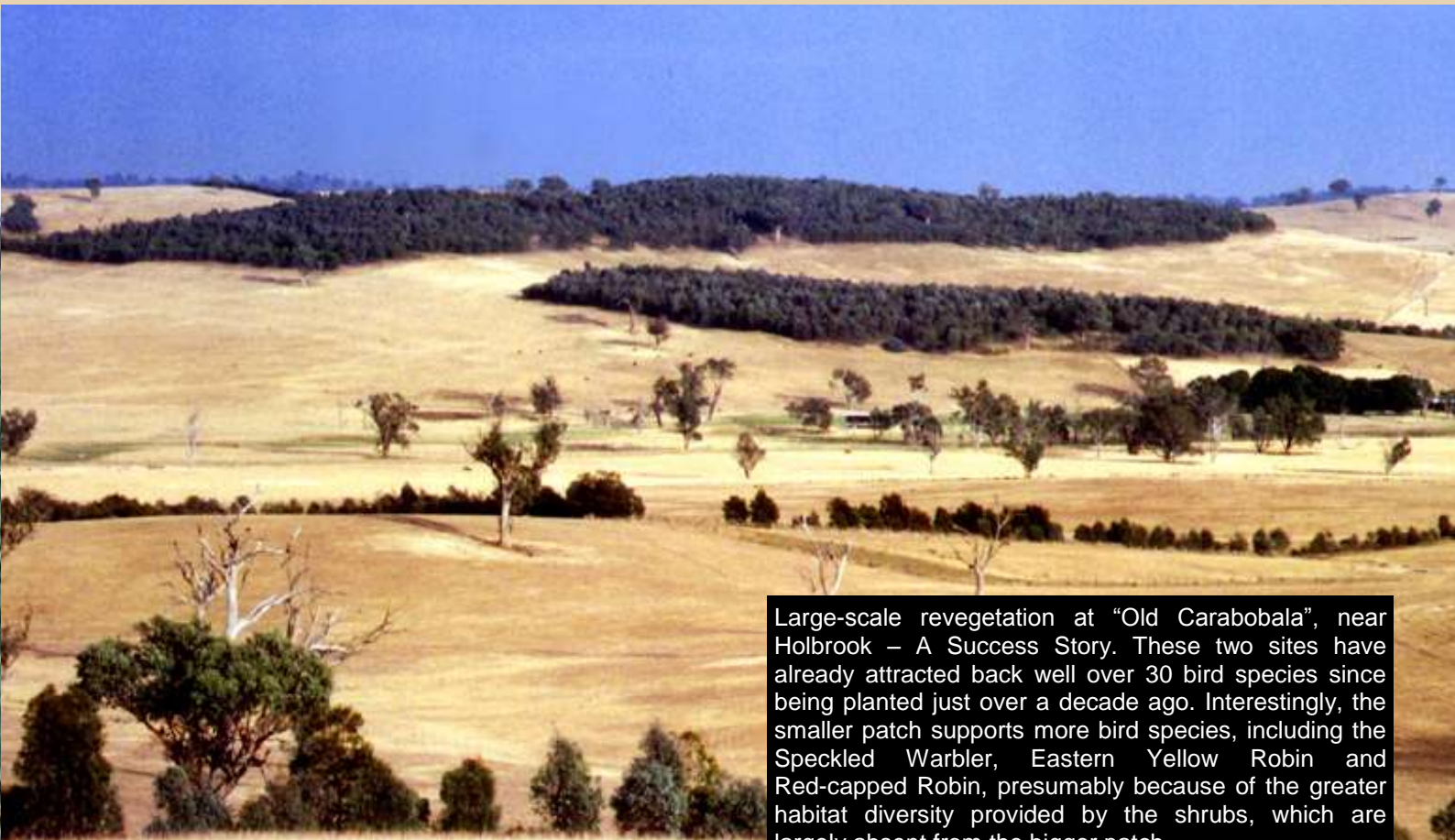
A study on farms across Australia recommended that for birds, corridors should be at least 50 metres wide, native vegetation patches should be at least ten hectares and at least 10% of every farm should be managed for wildlife conservation<sup>2</sup>. There are several factors that strongly influence the response of wildlife to revegetated areas. These most important ones are the diversity of species planted, the size of the area planted and the position of the planting in the landscape (e.g. distance to the nearest remnant patch of bush). The value of remnant trees within a revegetated area should not be underestimated. Old paddock trees, sometimes referred to as 'the living dead', act as stepping stones for mobile wildlife species moving through and about the catchment. Unfortunately these old

giants, which are often important bat roosts, are gradually disappearing from the landscape because of dieback and a lack of recruitment.

Some wildlife species listed in this booklet are undoubtedly at crisis point and unfortunately their fate may already be irreversible. We have dramatically reduced the simplified wildlife habitat across the landscape. As a result of this we have an extinction debt to pay for past practices. However, the majority of threatened species in the Eastern Billabong are not doomed and restoration effects that increase diversity across the landscape should go a long way to halting the loss of biodiversity – the diversity of life. People, particularly farmers, play the most crucial role for wildlife conservation in the Eastern Billabong. Indeed, the future survival of many species literally lies in the hands of the local community. The actions taken by people in the day and years to come will ultimately decide the presence or absence of countless species in our area. It is apparent that the more we learn about the landscape and understand it, the more willing we will be to provide a long-term future for all biodiversity, including ourselves. Let us make the future state of affairs a brighter one for ourselves and all the other species that we share the catchment with.



The Superb Fairy-Wren is one of the first species to respond to revegetation.



Large-scale revegetation at "Old Carabobala", near Holbrook – A Success Story. These two sites have already attracted back well over 30 bird species since being planted just over a decade ago. Interestingly, the smaller patch supports more bird species, including the Speckled Warbler, Eastern Yellow Robin and Red-capped Robin, presumably because of the greater habitat diversity provided by the shrubs, which are largely absent from the bigger patch.





# HEARTLANDS



## Towards Sustainable Land Use in the Murray Darling Basin



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