



## Murray Wildlife

*Murray Land & Water Management  
Plan Wildlife Survey 2005-2006*

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# INTRODUCTION

## Why do a wildlife survey?

One of the great things about living in rural Australia is all the wildlife that we share the landscape with. Historically, we have impacted on the survival of many native animals. Fortunately, there is a growing commitment in the country to wildlife conservation on the farm. As we improve our knowledge of the local landscape and the animals and plants that live in it we will be in a much better position to ensure our natural heritage is maintained for future generations.

This wildlife survey was an initiative of the Berriquin, Cadell, Wakool and Denimein Land & Water Management Plan (LWMP) Working Groups and is the largest and most extensive ever undertaken in the area. This project had three aims:

- 1) To determine the distribution, habitat and local status of birds, reptiles, mammals and frogs
- 2) To raise awareness about wildlife ecology
- 3) To promote conservation of remaining species

## What methods did we use?

A total of 150 sites were established in the Murray LWMP area. The sites were spread across 106 farms and were surveyed between June 2005 and March 2006. The sites incorporated the range of broad vegetation types in the region, together with revegetation on previously cleared land and constructed wetlands. Methods used to survey wildlife included:

- 1) 900 20-minute Bird Surveys (Two surveys in each of three seasons at all 150 sites)
- 2) 50 1-hour active searches for reptiles and frogs (e.g. log rolling)
- 3) 50 1-hour spotlighting surveys for mammals, reptiles and nocturnal birds
- 4) 10 000 Elliot trap-nights for small mammals and reptiles
- 5) Pitfall trapping for reptiles and frogs
- 6) 200 harp trap-nights for bats and 25 Anabat-recording sites
- 7) Call broadcasting to attract birds

Surveying over the entire Murray LWMP area involved over 120 days of field work, usually with at least two people.

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*Front; Wedge-tailed Eagle, D. Webb. Niemur River, M. Herring. Aiden Webb with Carpet Python, D. Webb.. Bush Stone-curlew, D. Webb. Squirrel Glider, P. Merritt. Olive Legless Lizard, D. Webb. Southern Bell Frog, D. Webb.*

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## MAMMALS

A total of 28 mammal species were found. These included 10 bats, 10 marsupials, 1 monotreme, 1 native rodent and 6 introduced mammals. The highest abundance and diversity of bats were recorded in wetlands and along major waterways. The only common marsupials were the Eastern Grey

Kangaroo and Brush-tailed Possum. Yellow-footed Antechinus were locally common, occurring in densities up to 24 per hectare where there were numerous, large, old logs. Several species known to occur in the region were not recorded (e.g. Echidna, Feathertail Glider), reflecting their precarious local existence.



Black Wallaby

*D. Webb*

## BIRDS

A total of 203 bird species. these included species associated with semi-arid areas (e.g. Chestnut-crowned Babbler) and species associated with higher rainfall areas (e.g. White-throated Treecreeper). River Red Gum and Black Box sites along major waterways (e.g. Wakool River) had the highest bird diversity but

other vegetation types supported species not found on the floodplain (e.g. Chenopod Shrubland / White-winged Fairy-wren). A total of 141 species were recorded at 10% or fewer sites (<15), in many cases reflecting their locally threatened status. A total of 14 species were recorded at more than half (>75) of the study sites.



Spotted Harrier

*D. Webb*

## FROGS

A total of 9 frog species were found. The Spotted Marsh Frog, Plains Froglet and Common Froglet were the only common species. They are often locally abundant and are challenged only by two common skinks and a bat as the most numerous terrestrial vertebrates across the landscape. The most significant

records were of the threatened Southern Bell Frog. They were found in large numbers at several sites that included a river, storage dam or rice crop. The Southern Bell Frog population in the Murray region, particularly the Wakool LWMP area, is one of very few remaining strongholds for the species.



Common Spadefoot

*M. Herring*

## REPTILES

A total of 33 reptile species were found. These included 2 turtles, 1 legless lizard, 5 geckoes, 14 skinks, 1 dragon, 2 goannas, 3 blind snakes, 1 python and 4 elapid snakes. Only 4 species were considered common: Boulenger's Skink, Carnaby's Wall Skink, Southern Marbled Gecko and Eastern Brown Snake. There

were 16 species found at 3 or fewer sites. Many of these rare reptiles consist of a handful of small, isolated populations. Mallee and Sandhill Woodland sites were easily the richest for reptile diversity. The discovery of Beaked Gecko and Gibber Gecko populations near Moulamein are the first records south of the Murrumbidgee River.



Southern Blind-Snake

*D. Webb*

## COMMUNITY ENGAGEMENT

The combined attendance of 1,293 people at the 24 seminars and field days held across the four LWMP areas is testimony to the strong interest that irrigation farmers in the Murray region have in their local wildlife. Family barbecues, prizes for children and the opportunity to see some of the more unusual local

critters were major draw-cards. Four booklets, based on each LWMP area were produced. The booklet launches attracted a total of 365 people. More than 2,000 booklets and reptile identification posters were distributed to local landholders, with 30 newspaper articles about the survey published in the region, together with radio and television news.



Berriquin Field Day

*MIL*



# MAMMALS

A total of 28 mammal species were found. These included 10 bats, 10 marsupials, 1 monotreme, 1 native rodent and 6 introduced mammals. The most diverse sites for native mammals were high quality River Red Gum forests.

The only common native mammals, apart from bats, were the Eastern Grey Kangaroo and Brush-tailed Possum. Most of the remaining species exhibited a very patchy distribution. For example, close relatives of the two most common species – the Red Kangaroo, Western Grey Kangaroo and Common Ringtail Possum – were uncommon to rare and only recorded in certain parts of the landscape.

The highest abundance and diversity of bats were recorded in wetlands and along major waterways like the Billabong Creek and Edward River. The three most commonly recorded bats were the Little Forest Bat, Southern Freetail Bat and Gould's Wattled Bat. The rarest was the Little Pied Bat, recorded at one site only.

The most exciting find was the Platypus, recorded in the Edward River east of Moulamein. Observations by local landholders indicate there are at least several of them surviving in that area. There are also unconfirmed anecdotal records from different parts of the Edward River, as well as along other major rivers like the Wakool and Murray. The only likely misidentification is with a Water Rat.

Yellow-footed Antechinus were patchy and only locally common. Extensive Elliot-trapping involved 200 trap-nights at each of 50 sites, for a total of 10 000 trap-nights. It revealed that Yellow-footed Antechinus are largely restricted to the River Red Gum floodplains along the Murray, Wakool, Edward and Niemur Rivers, together with the Tuppall and Gulpa Creeks. They also occasionally occur on adjacent creeks and in box woodlands that are connected to the major rivers.

The trapping grids (5 x 5) covered a quarter of a hectare and allowed us to measure relative

densities. Yellow-footed Antechinus occurred in densities up to 24 per hectare at sites where there were numerous, large, old logs. Maintaining healthy, old red gum trees through intermittent flooding and appropriate grazing regimes will ensure fallen logs are continually produced. Retaining fallen logs and establishing firewood plantations for future supply will also benefit these appealing marsupial carnivores in the long term.

The amazing antechinus is well known for its bizarre breeding habits. The male dies of exhaustion after a frantic two-week mating season. The female raises the young, which are often from multiple fathers, initially in the pouch and later from a nest in a tree hollow or log.

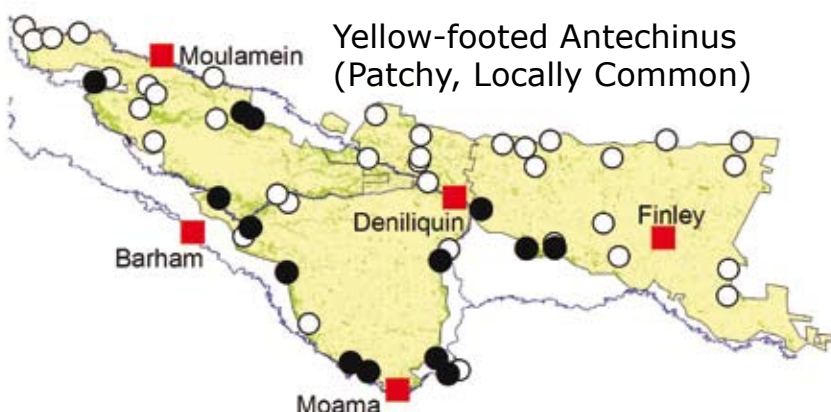
On top of Platypus and Yellow-footed Antechinus, River Red Gum forests were also important for the Black Wallaby and Sugar Glider, particularly areas with numerous hollow-bearing trees, thickets of regenerating trees and shrubs like Dwarf Cherry and

## Leave Logs for Yellow-foots!

In the Murray LWMP area the log-loving Yellow-footed Antechinus is now largely restricted to the River Red Gum forests. Floodplains along the Murray, Wakool, Edward and Niemur Rivers, together with the Tuppall and Gulpa Creeks, are especially important. 'Yellow-foots' were found in densities up to 24 per hectare at sites that had numerous large, old logs.



## Yellow-footed Antechinus (Patchy, Locally Common)



P. Merritt



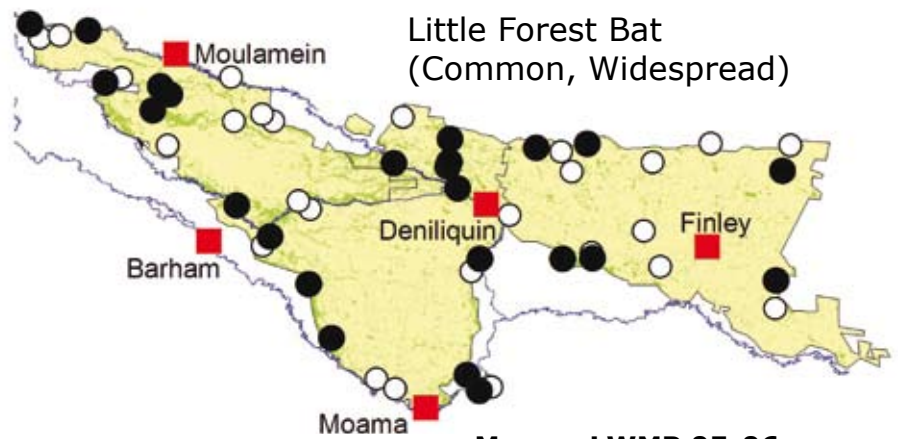
Wildlife Expert Adam Bester with 11 Little Forest Bats. *M. Herring*

Silver Wattle. The threatened Squirrel Glider was only found at two sites, both Grassy Box Woodland west of Moama.

Another major highlight for mammals was the Common Wombat, which was recorded at two sites, one near Conargo and one near Blighty. These are significant, isolated western populations. There is some hope that future surveying may reveal the Northern Hairy-nosed Wombat that is thought to be extinct in NSW and now only known from one small forest reserve in Queensland.

Several other species known to occur in the broader region

**The Lesser Long-eared Bat, one of 10 bat species found during the study.**



**Murray LWMP 05-06 Mammal List**

were not recorded, reflecting their precarious local existence, in some cases compounded by their cryptic nature. These included the Echidna, Feathertail Glider, Brush-tailed Phascogale, Fat-tailed Dunnart, Large-footed Myotis, Gould's Long-eared Bat, Large Forest Bat, Inland Forest Bat and Yellow-bellied Sheath-tail Bat. Historically, early settlers also recorded the Eastern Quoll, Rufous Bettong, Greater Bilby, Northern Hairy-nosed Wombat and White-footed Rabbit Rat, now all extinct in the Murray region.

There were six introduced mammals recorded across the Murray LWMP area during the study. In a joint effort with the Rural Lands Protection Board, many landholders have been extremely proactive in eradicating feral animals especially the fox. Coordinated campaigns like these that involve large parts of the landscape will have enormous benefits to the local wildlife.

Platypus R  
Yellow-footed Antechinus U  
Common Brushtail Possum C  
Common Ringtail Possum U  
Sugar Glider R  
Squirrel Glider R (t)  
Eastern Grey Kangaroo C  
Western Grey Kangaroo R  
Red Kangaroo R  
Black Wallaby R  
Common Wombat R  
Gould's Wattled Bat C  
Little Pied Bat R (t)  
Chocolate Wattled Bat U  
Lesser Long-eared Bat U  
Southern Forest Bat R  
Little Forest Bat C  
Inland Broad-nosed Bat U  
Inland Freetail Bat U  
Southern Freetail Bat C  
White-striped Freetail Bat U  
Water Rat U  
#House Mouse U  
#Fox C  
#Cat R  
#Rabbit C  
#Hare C  
#Pig R

R - Rare (1 - 10% of sites)  
U - Uncommon (11-25% of sites)  
C - Common (26% sites or more)  
# - Introduced species  
(t) - Listed as threatened in NSW

**Finding Platypus along the Edward River, near Moulamein, was a highlight of the study.**



*D. Webb*



*P. Ryan*



# BIRDS

A total of 203 bird species were found. Sites dominated by common bird species had poor habitat diversity and were typically subject to continuous grazing, removal of fallen timber and a lack of flooding in the case of River Red Gum and Black Box.

The 14 most common birds across the Murray LWMP study (recorded at 75 or more sites) were the Australian Magpie, Galah, Striated Pardalote, Willie Wagtail, Crested Pigeon, Superb Fairywren, Red-rumped Parrot, Noisy Miner, Australian Raven, Eastern Rosella, Yellow Thornbill, White-plumed Honeyeater, Magpie-lark and White-winged Chough.

Many of these bird species are 'winners' and are known to have benefited from changes to the landscape since European settlement like the proliferation of

farm dams, removal of understorey and creation of numerous bushland edges.

The Striated Pardalote is a tiny bird species but an incredibly resilient one. It was typically the only small bird found to be persisting in remnants dominated by large species like the highly aggressive Noisy Miner.

On the other hand, a total of 141 species were recorded at 10% or fewer sites (<15) and assigned to the *Rare* category, in many cases reflecting their locally threatened status.

The Gilbert's Whistler is highly sensitive to fragmentation and loss of understorey. In the Murray LWMP area it is now largely restricted to the Dwarf Cherry thickets (see page 14) that have become increasingly common in the River Red Gum forests along

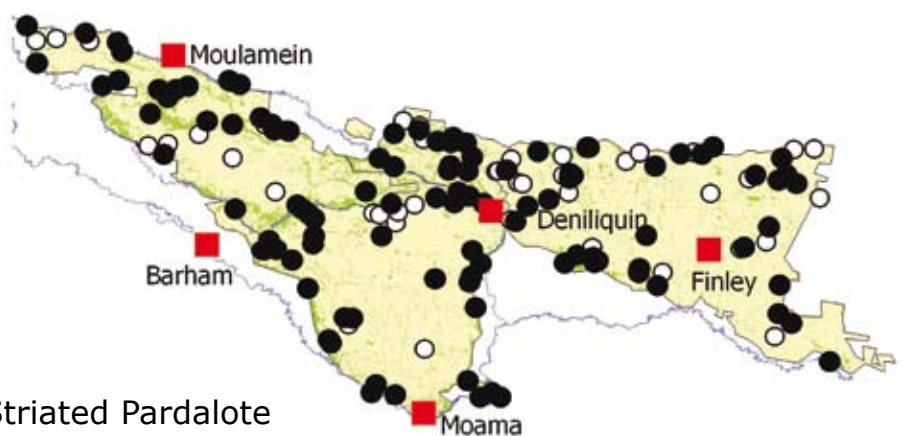
the Murray, Wakool and other major waterways. Without the increase in these shrubs this declining woodland bird may have disappeared from the Murray LWMP area.

Other threatened bush birds that exhibited a precarious distribution and may disappear from private land in the Murray LWMP area in coming decades include the Hooded Robin, Varied Sittella, Bush Stone-curlew, White-browed Babbler, Black-chinned Honeyeater and Painted Honeyeater.

The Bush Stone-curlew in particular is just hanging on. Only three pairs were found. Considerable effort is now being invested by local landholders and government into predator proof fencing for breeding pairs, increased fox control and retention of fallen timber.



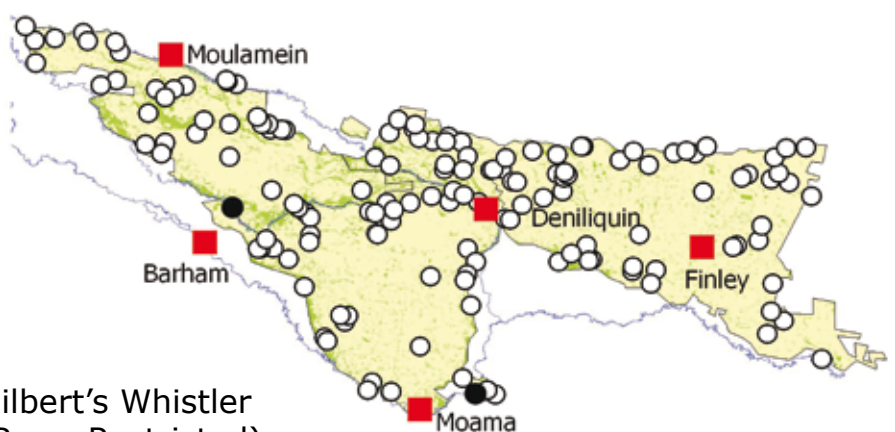
M. Herring



Striated Pardalote  
(Common, Widespread)



D. Webb



Gilbert's Whistler  
(Rare, Restricted)

## Murray LWMP 05-06 Bird List

Emu R  
Brown Quail R  
Stubble Quail R  
Plumed Whistling-duck R  
Australian Wood Duck U  
Freckled Duck R (t)  
Blue-billed Duck R (t)  
Musk Duck R  
Black Swan R  
Australian Shelduck R  
Hardhead R  
Pacific Black Duck U  
Australasian Shoveler R  
Pink-eared Duck R  
Grey Teal U  
Chestnut Teal R  
Magpie Goose R (t)  
Great Crested Grebe R  
Hoary-headed Grebe R  
Australasian Grebe R  
Darter R  
Great Cormorant R  
Little Pied Cormorant R  
Little Black Cormorant R  
Australian Pelican R  
White-necked Heron R  
White-faced Heron U  
Cattle Egret R  
Little Egret R  
Great Egret R  
Intermediate Egret R  
Nankeen Night Heron U  
Glossy Ibis R  
Straw-necked Ibis R  
Australian White Ibis R  
Royal Spoonbill R  
Yellow-billed Spoonbill R  
Black-shouldered Kite R  
Black Kite R  
Whistling Kite U  
Collared Sparrowhawk R  
Brown Goshawk R  
White-bellied Sea-eagle R  
Little Eagle R  
Wedge-tailed Eagle U  
Swamp Harrier R  
Spotted Harrier R  
Black Falcon R  
Brown Falcon U  
Nankeen Kestrel U  
Peregrine Falcon R  
Australian Hobby R  
Brolga R (t)  
Buff-banded Rail R  
Australian Spotted Crake R  
Spotless Crake R  
Dusky Moorhen R  
Purple Swamphen R  
Eurasian Coot R  
Black-tailed Native-hen R  
Bush Stone-curlew R (t)  
Painted Button-quail R  
Little Button-quail R  
Latham's Snipe R  
Black-tailed Godwit R (t)  
Common Greenshank R  
Marsh Sandpiper R  
Wood Sandpiper R  
Red-necked Stint R  
Curlew Sandpiper R  
Sharp-tailed Sandpiper R  
Black-winged Stilt R  
Banded Stilt R  
Red-necked Avocet R

Red-capped Plover R  
Red-kneed Dotterel R  
Black-fronted Dotterel R  
Masked Lapwing R  
Banded Lapwing R  
Inland Dotterel R  
Silver Gull R  
Whiskered Tern R  
White-winged Black Tern R  
Caspian Tern R  
Gull-billed Tern R  
•#Spotted Turtle-dove R  
•#Feral Pigeon R  
Diamond Dove R  
Peaceful Dove U  
Common Bronzewing C  
Crested Pigeon C  
Galah C  
Long-billed Corella U  
Little Corella R  
Sulphur-crested Cockatoo C  
Rainbow Lorikeet R  
Musk Lorikeet R  
Superb Parrot R (t)  
Cockatiel U  
Eastern Rosella C  
Yellow Rosella C



Great Egret

P. Merritt

Australian Ringneck R  
Blue Bonnet U  
Red-rumped Parrot C  
Budgerigar C  
Horsefield's Bronze-Cuckoo R  
Fan-tailed Cuckoo R  
Australian Owlet Nightjar R  
Tawny Frogmouth R  
Southern Boobook R  
Barn Owl R  
Azure Kingfisher R  
Laughing Kookaburra C  
Sacred Kingfisher C  
Red-backed Kingfisher R  
Rainbow Bee-eater R  
Dollarbird R  
White-throated Treecreeper U  
Brown Treecreeper C  
Superb Fairy-wren C  
Variegated Fairy-wren R  
White-winged Fairy-wren R  
Spotted Pardalote U  
Striated Pardalote C  
White-browed Scrubwren R  
Western Gerygone C  
Chestnut-rumped Thornbill C  
Buff-rumped Thornbill U  
Yellow-rumped Thornbill C  
Yellow Thornbill C  
Striated Thornbill U  
Weebill C  
Southern Whiteface U

Red Wattlebird R  
Little Friarbird U  
Noisy Friarbird R  
Noisy Miner C  
Yellow-throated Miner R  
Blue-faced Honeyeater R  
Spiny-cheeked Honeyeater R  
Striped Honeyeater R  
Painted Honeyeater R (t)  
Singing Honeyeater R  
White-plumed Honeyeater C  
Black-chinned Honeyeater R (t)  
Brown-headed Honeyeater U  
Black Honeyeater R  
Crimson Chat R  
Orange Chat R  
White-fronted Chat R  
Jacky Winter U  
Flame Robin R  
Red-capped Robin U  
Hooded Robin R (t)  
Grey-crowned Babbler U (t)  
White-browed babbler R  
Chestnut-crowned Babbler R  
Varied Sittella R  
Eastern Shrike Tit R  
Gilbert's Whistler R (t)  
Golden Whistler R  
Rufous Whistler C  
Grey Shrike-thrush C  
Restless Flycatcher U  
Willie Wagtail C  
Grey Fantail C  
Black-faced Cuckoo-shrike C  
Ground Cuckoo-shrike R  
White-winged Triller U  
Olive-backed Oriole R  
White-breasted Woodswallow R  
White-browed Woodswallow R  
Masked Woodswallow R  
Black-faced Woodswallow R  
Dusky Woodswallow R  
Grey Butcherbird C  
Pied Butcherbird C  
Magpie-lark C  
Australian Magpie C  
Pied Currawong R  
Australian Raven C  
Little Raven C  
Apostlebird R  
White-winged Chough C  
Richards Pipit R  
Singing Bushlark R  
Zebra Finch U  
Red-browed Finch R  
Diamond Firetail R (t)  
•# House Sparrow R  
Mistletoebird U  
Welcome Swallow C  
White-backed Swallow R  
Tree Martin U  
Fairy Martin R  
Clamorous Reed Warbler R  
Little Grassbird R  
Golden-headed Cisticola R  
Brown Songlark R  
Rufous Songlark C  
Silvereye R  
# Common Blackbird R  
# Common Starling U

R - Rare (1 - 10% of sites)  
U - Uncommon (11-25% of sites)  
C - Common (26% sites or more)  
# - Introduced species  
(t) - Listed as threatened in NSW



# BIRDS



Chestnut-crowned Babbler



Variegated Fairy-wren

*D. Webb*

**RESTRICTED TO THE WEST** - The Chestnut-crowned Babbler and Variegated Fairy-wren, both strongly associated with Black Box-Lignum habitat, rely on the west.

**RESTRICTED TO THE EAST** - The Superb Parrot and Apostlebird, both strongly associated with Grassy Box and Sandhill Woodland but known to breed in red gum, rely on the east

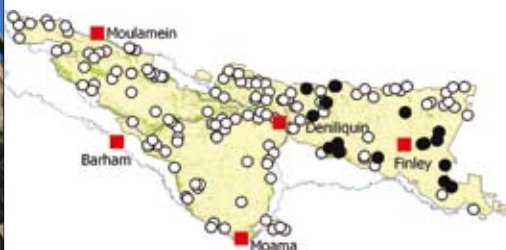
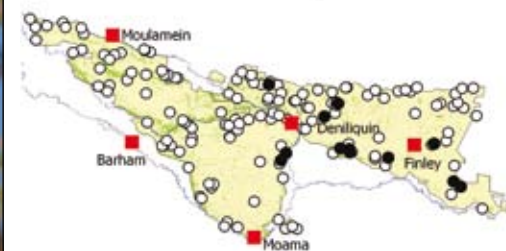
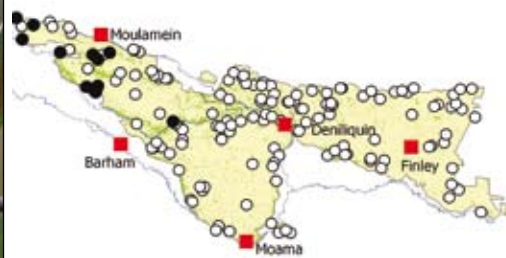


Superb Parrot



Apostlebird

*D. Webb*



The Murray LWP area is fortunate in that it supports species typically found well inland (e.g. Inland Dotterel, Red-backed Kingfisher, Black Honeyeater), as well as species associated with high rainfall areas that primarily occur in the Great Dividing Range and on the coast (e.g. White-throated Treecreeper, Flame Robin, White-browed Scrubwren).

The diversity of habitats – from semi-arid Chenopod Shrubland to the tall, highly productive River Red Gum forests – allow these two geographically different bird groups to come together in one region.

River Red Gum and Black Box sites along major waterways that contained high habitat diversity had the highest bird diversity. They exclusively supported some species (e.g. Azure Kingfisher) and were also the most important vegetation type for many additional species (e.g. Yellow Rosella, Sacred Kingfisher).

Large, healthy patches (>2 ha with shrubs, regenerating trees, fallen timber, native grasses) of Boree, Mallee, Grassy Box and Sandhill Woodland, as well as Chenopod Shrubland also supported a unique suite of birds. Many of the species found in these non-floodplain vegetation types were not recorded in the River Red Gum or Black Box, or only very infrequently. For example, White-winged Fairy-wrens were almost exclusively found in Chenopod Shrubland and the majority of Blue Bonnet and Singing Honeyeater records came from Boree Woodland.

Approximately one quarter of the birds found in the Murray LWP area are dependent on wetlands. Many remnant wetlands now disconnected from the floodplain are dying of thirst. Flooding these remnant wetlands and improved management of constructed wetlands, particularly the Wakool-Tullakool Evaporation Ponds will benefit a plethora of wildlife.



A total of 9 frog species were found. The Spotted Marsh Frog, Plains Froglet and Common Froglet were the only common species. They were found at a wide range of sites, wherever there was sufficient moisture. These three frog species are often locally abundant and are challenged only by two common skinks and a bat as the most numerous terrestrial vertebrates across the landscape.

The Wrinkled Toadlet and Common Spadefoot were the two rarest frogs, only recorded at one and two sites respectively. The Common Spadefoot was found at two Sandhill Woodland sites. Here, they are able to burrow easily but without cover provided by perennial, native grasses they are vulnerable to predation when they surface after rain.

The most significant records were of the threatened Southern Bell Frog, which is thought to have undergone an overall decline across its range. They were found in large numbers at several sites that included a river, storage dam or rice crop. The Southern Bell Frog population in the Murray region, particularly the Wakool LWMP area, is one of very few remaining strongholds for the species.

The Southern Bell Frog is thought to be most seriously threatened by the loss and modification of suitable habitat,

together with egg and tadpole predation by the introduced Mosquitofish or Plague Minnow (*Gambusia holbrooki*).

Fortunately, Southern Bell Frogs are capable of responding positively to habitat restoration, utilising highly modified or created wetlands, providing there is aquatic emergent vegetation. As such, many rice farmers in the Murray LWMP area are familiar with this distinctive, large, green and brown frog.

All local frogs are capable of benefiting from simple changes to irrigation storage dams that increase the amount of shallows and waterplants. The wetlands watering project run by the Murray Wetlands Working Group and Murray Irrigation Limited is also of great benefit to local frogs, as the health in remnant wetlands is improved.

## Murray LWMP 05-06 Frog List

Peron's Tree Frog U  
Southern Bell Frog R (t)  
Plains Froglet C  
Common Froglet C  
Pobblebonk U  
Spotted Marsh Frog C  
Barking Marsh Frog U  
Common Spadefoot R  
Wrinkled Toadlet R



Spotted Marsh Frog D. O'Donnell



Pobblebonk M. Herring

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U - Uncommon (11-25% of sites)  
C - Common (26% sites or more)  
(t) - Listed as threatened in NSW

*Litoria peroni*  
*Litoria raniformis*  
*Crinia parinsignifera*  
*Crinia signifera*  
*Limnodynastes dumerillii*  
*Limnodynastes tasmaniensis*  
*Limnodynastes fletcheri*  
*Neobatrachus sudelli*  
*Uperoleia rugosa*

The **Southern Bell Frog** was recorded in good numbers in this Cadell irrigation storage dam between Barham and Deniliquin because it supports stands of Cumbungi.



M.Herring / D. Webb (Inset)





Locals inspect bat at Denimein Field Day on the Edward River. A total of 1,293 people attended the 24 field days and seminars held throughout the Murray LWMP area.



Cadell Field Day near Womboota (above)  
Wakool Field Day at "Nyang" (below)



More than 60 locals inspect harp trap at Wetland Field Day near Berrigan.

## WILDLIFE CAPTIV



Local families participate in the activities at a reptile field day near Conargo.





Wakool Field days on the Edward River at "North Dale" (left) and near Jimaringle (right).

## VATES COMMUNITY





# REPTILES

A total of 33 reptile species were found. These included 2 turtles, 1 legless lizard, 5 geckoes, 14 skinks, 1 dragon, 2 goannas, 3 blind snakes, 1 python and 4 elapid snakes.

Only four species were considered common: the Boulenger's Skink, Carnaby's Wall Skink, Southern Marbled Gecko and Eastern Brown Snake. The Boulenger's Skink, Carnaby's Wall Skink and Southern Marbled Gecko can be particularly abundant and widespread, sometimes occurring in densities over 100 per hectare in good habitat.

At the other end of the spectrum there were 16 species found at three or fewer sites. Many of these locally rare reptiles consist of a handful of small, isolated populations. Typically they are much less mobile than most birds, mammals and frogs, and subsequently more susceptible to becoming isolated.

At isolated revegetation sites and restored remnants it may be necessary and desirable to reintroduce some of these species once areas are again capable of supporting viable populations.

The discovery of Beaked Gecko and Gibber Gecko populations near Moulamein are the first records south of the Murrumbidgee River and highlight the paucity of reptile surveys undertaken in the region prior to this study.

The Beaked Gecko was found at a high quality 30-ha sandhill woodland site dominated by Bulokes. This small, isolated population contrasts with the widespread distribution and local abundance of the Boulenger's Skink (see below). This common skink was absent only at sites that lacked big trees like Chenopod Shrubland, Constructed Wetlands and some Boree sites.

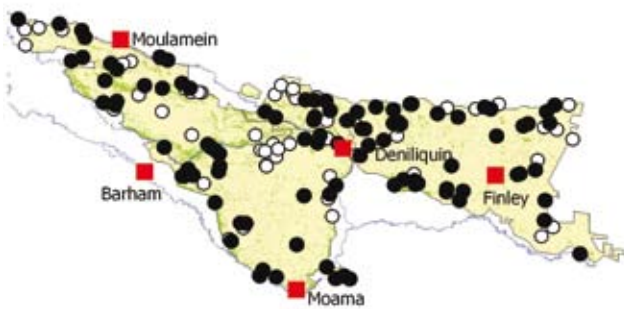
A Carpet Python found on the Niemur River was the only one

for the entire study but based on observations from local landholders the Wakool LWMP area is one of the few remaining strongholds for the Murray-Darling form of this python.

The discovery of two species previously only known from the NSW Murray Catchment near Koraleigh was another major highlight for the study. The Regal Skink and Eastern Robust Slider were recorded in Mallee and Sandhill Woodland west of Moulamein. These vegetation types supported other rare species like Sand Goanna and Prong-snouted Blind Snake.

Mallee and Sandhill Woodland sites were easily the richest for reptile diversity. A third of the 33 reptiles found across the Murray LWMP area were either exclusively found on sandhills (including mallee) with good quality remnant vegetation or were only rarely found in other vegetation types.

**Boulenger's Skink**  
(Common, Widespread)



**Beaked Gecko**  
(One Known Population)



D. Webb



D. Webb





Sand Goanna

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Carpet Python

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Gibber Gecko

D. Webb

A well-managed sandhill or mallee remnant with good habitat supports around 10 reptile species, even if the site is only a hectare or two in area. All sites, irrespective of vegetation type, that were messy with old grass, fallen logs, branches, shrubs, sheets of corrugated iron, old fence posts or other habitat contained healthy reptile assemblages.

Many of the reptile species restricted to Sandhill and Mallee woodland are fossorial (soil and litter dwelling) and relatively immobile. This doesn't allow them to occur on the floodplain in River Red Gum and Black Box. All reptiles found on the floodplain are either arboreal or highly mobile (e.g. Lace Monitor, Eastern Brown Snake, and Southern Marbled Gecko).



Southern Blind Snake

M. Herring

### Murray LWMP 05-06 Reptile List

Eastern Long-necked Turtle	R
Murray Turtle	R
Olive Legless Lizard	R
Southern Marbled Gecko	C
Gibber Gecko	R
Tessellated Gecko	R
Wood Gecko	R
Beaked Gecko	R
Carnaby's Wall Skink	C
Regal Skink	R
Robust Ctenotus	U
Spotted-backed Ctenotus	U
Tree-crevice Skink	R
Garden Skink	R
South-eastern Slider	R
Wood Mulch Slider	U
Eastern Robust Slider	R
Dwarf Skink	U
Chenopod Morethia	R
Boulenger's Skink	C
Shingleback	R
Common Blue-tongue Lizard	U
Eastern Bearded Dragon	U
Sand Goanna	R
Lace Monitor	U
Southern Blind Snake	R
Prong-snouted Blind Snake	R
Woodland Blind Snake	R
Carpet Python	R
Tiger Snake	R
Red-bellied Black Snake	R
Eastern Brown Snake	C
Curl Snake	U

R - Rare (1 - 10% of sites)  
U - Uncommon (11-25% of sites)  
C - Common (26% sites or more)

*Chelodina longicollis*  
*Emydura macquarii*  
*Delma inornata*  
*Christinus marmoratus*  
*Diplodactylus byrnei*  
*Diplodactylus tessellatus*  
*Diplodactylus vitattus*  
*Rynchoedura ornata*  
*Cryptoblepharus carnabyi*  
*Ctenotus regius*  
*Ctenotus robustus*  
*Ctenotus orientalis*  
*Egernia striolata*  
*Lampropholis guichenoti*  
*Lerista bougainvillii*  
*Lerista muelleri*  
*Lerista punctatovittata*  
*Menetia greyii*  
*Morethia adelaidensis*  
*Morethia boulengeri*  
*Tiliqua rugosa*  
*Tiliqua scincoides*  
*Pogona barbata*  
*Varanus gouldii*  
*Varanus varius*  
*Ramphotyphlops bicolor*  
*Ramphotyphlops bituberculatus*  
*Ramphotyphlops proximus*  
*Morelia spilota*  
*Notechis scutatus*  
*Pseudechis porphyriacus*  
*Pseudonaja textilis*  
*Suta suta*



Wood Gecko

D. Webb



# LOCAL HOTSPOTS



**River Red Gum Forest** - Murray, Wakool, Edward and Neimur Rivers ; Billabong, Tuppall and Gulpa Creeks.



**Black Box Woodland** - Murray, Wakool, Edward and Neimur Rivers ; Billabong, Tuppall and Gulpa Creeks.



**Grassy Box Woodland** - So little remains that any stand is highly valuable.



**Sandhill Woodland** - So little remains that any stand is highly valuable.

Different vegetation types support different suites of wildlife. Conservation of all vegetation types across the region is therefore very important. For example, some reptile species are only found in Mallee Woodland, whereas certain bird species are only found in Chenopod Shrubland.

River Red Gum (*Eucalyptus camaldulensis*) is one of the most intact vegetation types in the NSW Murray Catchment. The red gum forests of the Murray region are one of Australia's greatest ecological assets. Good quality red gum habitat booms with wildlife, particularly birds and mammals. Major waterways like the Murray, Wakool, Edward and Neimur Rivers, together with the Billabong, Tuppall and Gulpa Creeks act as wildlife 'highways' through the landscape, enabling wildlife populations to intermix.

Black Box (*Eucalyptus largiflorens*) woodland is structurally very different to River Red Gum. Good quality Black Box often has a range of understorey shrubs such as Lignum, Nitre Goosefoot and a variety of grasses. Black Box with an understorey is ideal for many woodland birds.

Grassy Box Woodland includes any stands of White Cypress-Pine, Murray Cypress-Pine, Yellow Box, Grey Box, Buloke and Needlewood, that aren't on sandhills. Two hundred years ago this was the most widespread vegetation type across the NSW Murray Catchment with large patches scattered through Denimein, Berriquin and Cadell.

Sandhills originally had the most diverse shrub layers with species such as Moonah, Rosewood, Butterbush, Native Willow, Emu Bush, Hopbush, Quandong and various species of saltbush. Good quality sandhill woodland is a haven for reptiles and woodland birds.



The soils found in Grassy Box and Sandhill Woodland were favoured for agriculture and approximately 95% of the original area has disappeared. Today, the wildlife found in these woodlands usually consists of common species like the Noisy Miner that persist in landscapes that are mostly cleared. There is an urgent need to restore Grassy Box and Sandhill Woodland remnants so that they can once again support their unique suites of wildlife.

Boree Woodland is dominated by Boree (*Acacia pendula*) and originally it was the dominant vegetation type in the northern part of Cadell and Berriquin, and much of Denimein. It extended over expansive areas beyond the active floodplain. Today, there are just a few scattered stands remaining, representing about 4% of the original area. Conservation of the remaining stands of Boree is crucially important for the Murray LWMP area.

Chenopod Shrubland includes Cottonbush, Mat-rush, various saltbushes, bluebushes, Dillonbush and other shrubby plants. Only a handful of birds are closely associated with Chenopod Shrubland like the White-fronted Chat. Many reptiles do well in treeless habitats, providing there is some cover from native shrubs, grass tussocks or cracking soils.

Mallee Woodland once covered large areas west of Moulamein but today less than 5% of this remains. A third of the 33 reptiles found across the Murray LWMP area were either exclusively found on sandhills (including mallee) with good quality remnant vegetation or were only rarely found in other vegetation types.

Wakool-Tullakool Evaporation Ponds and other constructed wetlands are vitally important for waterbirds including migratory shorebird species like the sandpipers and stints.



**Boree Woodland** - Any stands in the northern sections of Berriquin and Cadell, together with much of Denimein.



**Chenopod Shrubland** - High quality sites with a healthy range of shrubs are important.



**Mallee Woodland** - Any patches of Mallee west of Moulamein are vitally important.



**Constructed Wetlands** - Tullakool-Wakool Evaporation Ponds and other high quality constructed wetlands.

*All photos M. Herring*



# REVEGETATION

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Old Man Salt Bush Plantings attract White-winged Fairy-wrens. *M. Herring / D.Webb (inset)*

Red-capped Robins and numerous other small, insectivorous birds benefit from a farm forestry site that has an Old Man Salt Bush understorey.

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Benefit from this



Painted Honeyeater

D. Webb



Numerous native plant species have been reinstated at this site on "Union Plain".

M. Herring

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# MAKING A DIFFERENCE - 8 WAYS TO IMPROVE WILDLIFE

## 1. Map Your Vegetation

The most important thing that landholders in the Murray LWMP can do for wildlife conservation is to identify the significant remnant vegetation sites on their properties and manage them in a way that will maintain or improve the quality of habitat. Linking these patches of bush within and between properties creates valuable corridors.



MIL

## 2. Reduce Grazing Pressure

Avoiding continuous grazing pressure and resting areas from stock dramatically improves wildlife habitat, allowing young trees, shrubs and grasses to regenerate. Fencing incentives for such works are increasingly taken up through the LWMPs.



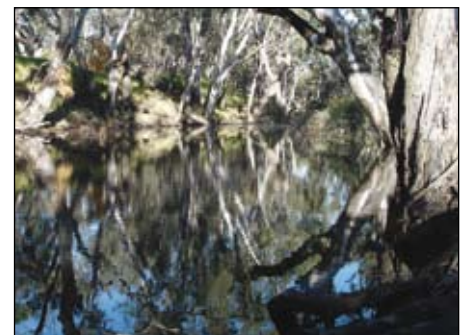
## 3. Retain Fallen Timber

Tidying up the farm by piling up logs and branches and burning them is bad news for wildlife. Retaining fallen timber will benefit many species like the Yellow-footed Antechinus, Bush Stone-curlew and a whole range of reptiles such as geckoes and skinks. Even junk such as old fence posts and sheets of corrugated iron can be valuable habitat.



## 4. Wetlands Watering

Flooding River Red Gum, Black Box and other wetland sites from time to time will help maintain the health of the floodplain and greatly improve wildlife habitat. Intermittent flooding promotes waterplant growth, stimulates regeneration and maintains the health of old trees, all benefiting wildlife.

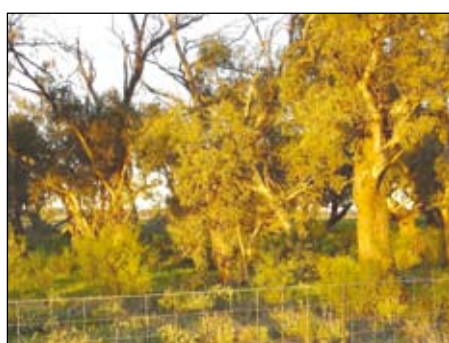






## 5. Revegetation

The response of wildlife to plantings on cleared land is phenomenal, especially for birds. Revegetated sites attract the most species when they are five or more hectares in area, incorporate a range of tree and shrub species and are situated adjacent to remnant vegetation. Commercial plantings like farm forestry and Old Man Saltbush are a great win-win for agriculture and wildlife.



## 6. Replant Understorey

Reinstating an understorey of shrubs into remnants is another easy way to make a big difference to wildlife habitat on your farm. Direct-seeding or planting of a range of appropriate shrub species, depending on the vegetation type, is great news for wildlife.



*All photos M. Herring*

## 7. Modify Storage Dams

Simple changes to farm dams can also increase wildlife diversity on your property. Earthworks that create shallows (50 cm and less) and exclusion of stock to promote waterplant growth can result in a wetland oasis for wildlife. Stock water can be pumped to a nearby trough if needed.



*Southern Riverina Hunting Club*

## 8. Feral Animal Control

On top of improving habitat on your farm, controlling introduced predators like Foxes and Feral Cats will also benefit wildlife.

## Acknowledgements

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