Cadell Wildlife

Murray Land & Water Management Plan Wildlife Survey 2005-2006

Matthew Herring
David Webb
Michael Pisasale

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, humans have impacted on the survival of many native plants and animals. Fortunately, there is a growing commitment in the country to wildlife conservation on the farm. As we improve our knowledge and understanding of the local landscape and the animals and plants that live in it we will be in a much better position to conserve and enhance our natural heritage for future generations.

This wildlife survey was an initiative of the Cadell Land & Water Management Plan (LWMP) Working Group and is the largest and most extensive ever undertaken in the area. Cadell was one of four LWMP areas that took part in the project. 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 with 40 of these in Cadell.

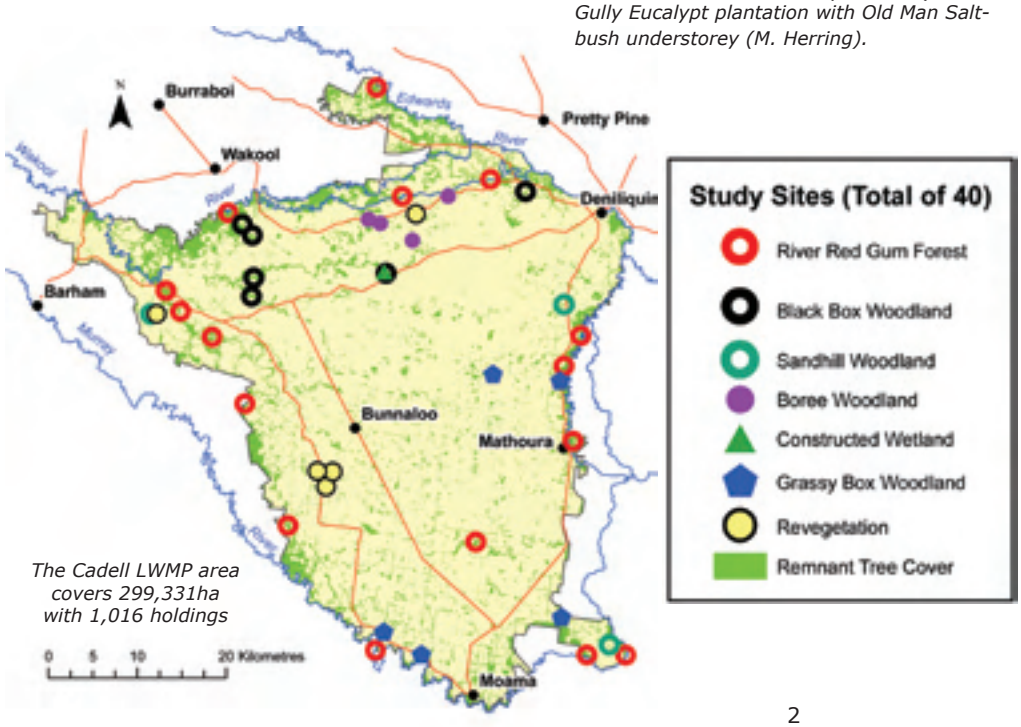
The sites were spread across 106 farms and were surveyed between June 2005 and March 2006. They incorporated a range of vegetation types (e.g. Black Box Woodland) as well as revegetation on previously cleared land and constructed wetlands. Methods used to survey wildlife included:

- Bird surveys
- Log rolling for reptiles and frogs
- Spotlighting for mammals, rep tiles and nocturnal birds
- Elliot traps for small mammals and reptiles
- Pitfall trapping for reptiles and frogs
- Harp traps for bats
- Using the "Anabat" to record bat calls
- Call broadcasting to attract birds

Other targeted methods were used opportunistically and significant species seen incidentally (e.g. when traveling between sites) were also recorded. Surveying over the entire Murray LWMP area involved over 120 days of field work, usually with at least two people.

Front Cover: *One of many Cadell highlights was the Squirrel Glider, found at two Grassy Box Woodland sites near Moama (P.Merritt). Good quality River Red Gum Forest along the Murray River booms with wildlife (M. Herring). Cadell field day near Womboota (MIL).*

Back Cover: *Flame Robin (P. Merritt). Green Gully Eucalypt plantation with Old Man Saltbush understorey (M. Herring).*



The Cadell LWMP area covers 299,331ha with 1,016 holdings

P.Merritt

The **Yellow-footed Antechinus** was recorded in densities up to 24 per hectare at red gum sites that had numerous large fallen logs.

CONTENTS

Pg. 2	Introduction
Pg. 3	Reptiles & Frogs
Pg. 4	Birds & Mammals
Pg. 5	Birds
Pg. 6	River Red Gum Forest
Pg. 7	Black Box Woodland
Pg. 8-9	Cadell Highlights
Pg. 10	Sandhill Woodland
Pg. 11	Constructed Wetlands
Pg. 12	Boree Woodland
Pg. 13	Grassy Box Woodland
Pg. 14	Revegetation
Pg. 15	What We Can Do To Help

P.Merritt

The **Red-browed Finch** was only found along the Murray River.

Summary of Results
There were 273 species (203 Birds, 33 Reptiles, 28 Mammals and 9 Frogs) found across the entire study area. Of these, 191 species were found in Cadell.

Reptiles
A total of 19 reptiles were found in Cadell, highlighted by a Woodland Blind Snake on the Cummeragunga Sandhill, the only record for the entire study. The Chenopod Morethia, a small skink that loves shrubs but avoids trees, was found in between Deniliquin and Barham and hadn't been recorded in the NSW Murray catchment before. The beautifully patterned Spotted-backed Ctenotus was found at two sites, both with loose soil associated with clumps of Matrush (Lomandra) or along fencelines. Other good finds in Cadell were the Tessellated Gecko in Black Box near Wakool and several Curl Snakes. By far the most common reptiles recorded in Cadell were the Boulenger's Skink and Carnaby's Wall Skink, sometimes occurring in densities over 100 per hectare in good habitat. Sandhill Woodland was the most important vegetation type for reptiles across the four Murray LWMP areas but all sites that were messy with old grass, fallen logs, branches, shrubs, sheets of corrugated iron, old fence posts or other habitat were rich in reptile diversity.

Frogs
By far the most common frogs recorded during the study were Plains Froglet, Common Froglet and Spotted Marsh Frog. They were frequently recorded in large numbers near water, along rivers, creeks and in flooded wetlands including rice. The adults and tadpoles of these common frogs provide a great food source for waterbirds like the Great Egret and reptiles like the Tiger Snake. The most significant of the 8 frog species found in Cadell was the beautiful Southern Bell Frog. They were recorded in a storage dam with dense stands of Cumbungi (see pg. 11), in rice near Caldwell and at numerous sites in the Wakool LWMP area. The Southern Bell Frog population of the Murray Irrigation area is one of very few remaining strongholds for the species.


Southern Bell Frog *D.Webb*


Tessellated *Gecko* *D.Webb*

REPTILES	
• Eastern Long-necked Turtle R	*Chelodina longicollis*
Murray Turtle R	*Emydura macquarii*
Olive Legless Lizard R	*Delma inornata*
• Southern Marbled Gecko C	*Christinus marmoratus*
Gibber Gecko R	*Diplodactylus byrnei*
• Tessellated Gecko R	*Diplodactylus tessellatus*
Wood Gecko R	*Diplodactylus vitattus*
Beaked Gecko R	*Rynchoedura ornata*
• Carnaby's Wall Skink C	*Cryptoblepharus carnabyii*
Regal Skink R	*Ctenotus regius*
• Robust Ctenotus U	*Ctenotus robustus*
• Spotted-backed Ctenotus U	*Ctenotus orientalis*
• Tree-crevice Skink R	*Egernia striolata*
• Garden Skink R	*Lampropholis guichenoti*
• South-eastern Slider R	*Lerista bougainvillii*
Wood Mulch Slider U	*Lerista muelleri*
Eastern Robust Slider R	*Lerista punctatovittata*
• Dwarf Skink U	*Menetia greyii*
• Chenopod Morethia R	*Morethia adelaidiensis*
• Boulenger's Skink C	*Morethia boulengeri*
Shingleback R	*Tiliqua rugosa*
Common Blue-tongue Lizard U	*Tiliqua scincoides*
• Eastern Bearded Dragon U	*Pogona barbata*
Sand Goanna R	*Varanus gouldii*
• Lace Monitor U	*Varanus varius*
Southern Blind Snake R	*Ramphotyphlops bicolor*
• Prong-snouted Blind Snake R	*Ramphotyphlops bituberculatus*
• Woodland Blind Snake R	*Ramphotyphlops proximus*
Carpet Python R	*Morelia spilota*
Tiger Snake R	*Notechis scutatus*
• Red-bellied Black Snake R	*Psedechis porphyriacus*
• Eastern Brown Snake C	*Pseudonaja textilis*
• Curl Snake U	*Suta suta*

FROGS	
• Peron's Tree Frog U	*Litoria peroni*
• Southern Bell Frog R (t)	*Litoria raniformis*
• Plains Froglet C	*Crinia parinsignifera*
• Common Froglet C	*Crinia signifera*
• Pobblebonk U	*Limnodynastes dumerillii*
• Spotted Marsh Frog C	*Limnodynastes tasmaniensis*
• Barking Marsh Frog U	*Limnodynastes fletchori*
• Common Spadefoot R	*Neobatrachus sudelli*
Wrinkled Toadlet R	*Uperoleia rugosa*

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

BIRDS & MAMMALS

Birds

A total of 144 bird species were found in Cadell. The Cadell area is fortunate in that it supports species typically found well inland like Chestnut-crowned Babbler but also species only found in south-eastern Australia like Flame Robin and White-browed Scrubwren.

Sites along the Murray and Wakool Rivers, together with other major waterways, had the highest bird diversity. They exclusively supported species like the Azure Kingfisher. However, large patches of Boree, Grassy Box and Sandhill Woodland also supported a unique suite of birds, including many that are not found in floodplain vegetation types.

Sites dominated by common species had poor habitat diversity and were typically subject to continuous grazing, removal of fallen timber and a lack of flooding. The 14 most common birds for the entire Murray LWMP study (recorded at 75 or more sites) were the Australian Magpie, Galah, Striated Pardalote, Willie Wagtail, Crested Pigeon, Superb Fairy-wren, 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 occur in open farmland and are 'winners', having benefited from changes to the landscape since European settlement.

The Wood Sandpiper, one of the rarest migratory shorebirds, was found at a flooded Black Box-Nitre Goosefoot wetland in the northern part of Cadell, and wasn't recorded elsewhere during the entire study. The Hooded Robin was recorded in high quality Grey Box woodland near Mathoura and proved to be one of the rarest resident woodland birds across the Murray LWMP area, together with the Gilbert's Whistler, White-browed Babbler and Black-chinned Honeyeater, which were all recorded in Cadell red gum.

Mammals

A total of 20 mammals were found in Cadell. The majority of these were bats and marsupials. The bats included a range of wattled, freetail, long-eared, forest and broad-nosed bats. The greatest number and diversity of bats were recorded in wetlands and along rivers. These fascinating creatures consume up to half their body weight in insects every night! During the day they roost in tree hollows and under bark.

A total of 7 marsupial species were found in Cadell but the only common species were the Eastern Grey Kangaroo and Brush-tailed Possum. The most exciting species were gliders. The Squirrel Glider was found in Grassy Box Woodland sites west of Moama, whilst the Sugar Glider was found in red gum areas associated with major rivers.

The Yellow-footed Antechinus was found in densities up to 24 per hectare at sites that had numerous large, old logs. A Platypus was found in the Edward River to the west of Cadell in the Wakool LWMP area. No Echidnas or Feathertail Gliders were recorded for the entire study. Historically, early settlers recorded the Eastern Quoll, Rufous Bettong, Bilby and White-footed Rabbit Rat, now all extinct in the Murray region.

There were five introduced mammals recorded in Cadell during the study. In a joint effort with the Rural Lands Protection Board, many landholders in Cadell have been extremely proactive in eradicating feral animals especially the fox and this will have enormous benefits to the local wildlife.

MAMMALS

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)
• - Found in Cadell
- Introduced species
(t) - Listed as threatened in NSW

Gould's Wattled Bat *C.Grabham*

BIRDS
• 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 Kestral 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
Australian Ringneck R
• Blue Bonnet U
• Red-rumped Parrot C
Budgerigar R
• Horsfield'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 Matrin 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)
• - Found in Cadell
- Introduced species
(t) - Listed as threatened in NSW

Spotted Harrier *D.Webb*

RIVER RED GUM FOREST

P.Merritt

D.Webb

M.Herring / P.Merritt (inset)

Emu chicks emerge after being incubated for almost two months exclusively by the male. Good numbers of Emu were recorded in Cadell River Red Gum sites. An enormous 25-foot long Creeping Mistletoe growing along the trunk of a red gum west of Moama. Mistletoe helps increase habitat diversity. The secretive **Spotless Crake** was recorded at this red gum wetland near Barham because of the healthy waterplant community.

There are five main vegetation types in Cadell. These include River Red Gum Forest, Black Box Woodland, Grassy Box Woodland, Sandhill Woodland and Boree Woodland. Together with Revegetation and Constructed Wetlands, these are covered in the following sections.

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 among Australia's greatest ecological assets. Good quality red gum habitat booms with wildlife, particularly birds and mammals. Large, old River Red Gums are the equivalent of 5-star hotels for wildlife because they are filled with a range of hollows and crevices. Bats, possums, gliders, parrots, pardalotes, owls, the Tree-crevice Skink and numerous others all shelter and nest in red gums. Shedding bark is important for treecreepers, the Southern Marbled Gecko and Peron's Tree Frog. Fallen logs and branches are home to an array of reptiles and are a favourite place for the Yellow-footed Antechinus and Bush Stone-curlew. Thickets of young red gums and shrubs like Silver Wattle and Dwarf Cherry also increase habitat diversity in red gum forests and support additional species like the Black Wallaby, Gilbert's Whistler and White-browed Babbler.

More than 110 species were found in red gum across the 16 Cadell sites. Across all four LWMP areas, some of the species most strongly associated with red gum were the Nankeen Night Heron, Yellow Rosella, White-throated Treecreeper, Dollarbird and Carpet Python.

The diminutive **Azure Kingfisher** is restricted to major waterways like the Murray and Wakool Rivers.

The **Gilbert's Whistler** depends on a dense understorey of shrubs like the thickets of Dwarf Cherry you see in red gum.

The **Peron's Tree Frog,** with its distinctive machine gun call, is closely associated with red gum along rivers, creeks and in wetlands.

D.Webb

D.Webb

P. Merritt

D.Webb

The **Lace Monitor** exclusively lays its eggs in termite nests. Termites seal the excavation left by the female and the eggs are safely incubated. Once they hatch, the young look after themselves with no help from their parents.

The **Australian Owlet Nightjar**, a small nocturnal bird that relies on old trees with hollows to shelter and breed in. Like the Tawny Frogmouth, it is not a true owl because it doesn't hunt using its feet.

P.Merritt

C.Grabham

Like all small insectivorous bats, the **Southern Freetail Bat** uses echolocation (high frequency pulses of sound that humans usually can't hear) to navigate and catch flying prey like moths and mosquitoes.

Black Box Woodland is dominated by Black Box *(Eucalyptus largiflorens)* and is often found on heavier floodplain soils, along creeks and in wetland depressions. Good quality Black Box woodland also has a range of understorey shrubs such as Lignum, Nitre Goosefoot, Miljee, Thorny Saltbush, Leafless Cherry, Native Willow and a variety of grasses. Black Box with an understorey is ideal for many woodland birds like the Red-capped Robin and Chestnut-crowned Babbler, and when flooded it teems with frogs, bats and a spectacular range of waterbirds.

More than 75 species of animals were found in Black Box across the 6 Cadell sites, most notably the Hooded Robin, Tessellated Gecko and Curl Snake. The number of species found at each site varied considerably, depending on how isolated the site was, the size of the site and the quality of habitat. Many Black Box remnants are missing an understorey of shrubs and provide habitat for only a handful of species like the Eastern Rosella, Noisy Miner, Grey Butcherbird, Eastern Grey Kangaroo and Eastern Brown Snake. Increasing the cover of native perennial grasses, retaining fallen timber and reinstating native shrubs will benefit the more sensitive species like Diamond Firetail and Yellow-footed Antechinus. Fencing off remnant stands and controlling grazing to allow young trees, shrubs and various ground covers to regenerate is usually the most practical first step.

Many of the remaining stands of Black Box are disconnected from the floodplain and show signs of thirst. The wetlands watering project that the NSW Murray Wetlands Working Group and Murray Irrigation have implemented since 2001 has been a great success in bringing these systems back to life on many farms. Waterbirds like the Latham's Snipe, which only breeds in Japan, and the Red-kneed Dotterel that breeds locally, together with all local frogs and bats benefit directly from the flooding.

High quality Black Box-Lignum habitat. M.Herring

CADELL HIGHLIGHTS

Involving the community...
The six Cadell field days and seminars were well attended with an average of over 50 people attending each event. We received a great deal of support and positive feedback from the community, with particular appreciation of the family-focused barbecues, novelty prizes, involvement in the surveying and the opportunity to see some of the more unusual local critters like blind snakes, long-eared bats and antechinus. A total of 1293 people attended the 24 field days and seminars held across the four LWMP areas, testimony to the strong interest that irrigation farmers in the Murray region have in their local wildlife.

Photo Captions and Credits
Top Left: Locals at a Cadell field day on "Emu Park" inspect a Carpet Python (*MIL*)
Top Right: Kids participating in wildlife competitions at a field day near Womboota (*MIL*)
Middle Left: Common Ringtail Possum (*P.Merritt*)
Bottom Right: Seminar at the Caldwell Hall (*MIL*)
Next Page, Top Left: Hooded Robin (*D. Webb*)
Top Right: Tree Crevice Skink (*D.Webb*)
Middle Left: Superb Parrot (*D.Webb*)
Middle Right: Children intrigued by a Tree-crevice Skink (*MIL*)
Bottom Left: Kids learning about wildlife in the Murray River red gum forests. (*MIL*)
Bottom Right: White-bellied Sea Eagle (*P.Merritt*)

SANDHILL WOODLAND

Sandhill woodland includes White and Murray Cypress-Pine, Buloke, Yellow Box and Needlewood and often merges with Grassy Box Woodland. 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 sandy soils allow movement of underground animals like blind snakes and excavation of nesting burrows by Rainbow Bee-eaters and Sand Goannas.

Sandhill Woodland has a particularly unique suite of wildlife, very different to what we find in other vegetation types like River Red Gum. A third of the 33 reptiles found across the Murray LWMP area were either exclusively found on sandhills with good quality remnant vegetation or were only rarely found in other vegetation types. A well-managed sandhill remnant with good habitat supports around 10 reptile species, even if the site is only a hectare or two in area. The most significant birds found in sandhill woodland in Cadell were the White-backed Swallow, which builds its nesting burrow into sand banks, and the Black Falcon, a powerful bird eater.

High Quality Sandhill Woodland *M.Herring*

Parts of Cadell like the Cummeragunga Sandhill west of Moama and sites on the Lower Thule Road have extensive sandhills but when the area was first settled in the 1800s they were heavily cleared for grazing and then later for cropping. Remaining stands of Buloke, Needlewood and Murray Cypress-Pine are examples of remnant sandhill woodland that are excellent starting blocks for future restoration. This can be done by fencing out stock, controlling common weeds and replanting with shrubs. Controlling rabbits, hares, foxes and cats will also make a site more attractive to native wildlife.

D. Webb

D.Webb

The **Prong-snouted Blind Snake**, one of three blind snake species found across the Murray LWMP area, is largely restricted to sandhill woodland. The **Robust Ctenotus**, a beautifully patterned medium to large-sized skink, is also right at home in the loose soil of sandhill woodland.

The **Eastern Bearded Dragon**, often mislabeled a 'frill-neck', can escape predators with its bursts of high speed or deter them when it exposes it's bright yellow mouth.

D.Webb

The rare **Common Spadefoot** has distinctive dark 'spades' on each foot. This burrowing frog is usually only found when it surfaces after rain. Up to 1000 eggs are laid, at or near the surface of the water, often entwined among vegetation.

M.Herring

P.Merritt

D.Webb

P.Merritt

The **Marsh Sandpiper** was one of 8 migratory shorebird species found across the four LWMP areas. They essentially live their lives in an endless summer, migrating between the northern and southern hemispheres. This species relies on mudflats and breeds in Europe, Siberia and China. **The Water Rat** is now the only native rodent found in the region. The increasingly mythical **Australian Painted Snipe** is Australia's most threatened waterbird and despite the Murray region being an important spring/summer breeding area for them, they were not found during the study. These striking yet secretive birds favour shallow wetland areas. Irrigation storage dams and other constructed wetlands on farms have huge potential to support many more waterbirds by incorporating shallows with waterplants that are only flooded intermittently. A site in the Berriquin LWMP area illustrates the potential biodiversity value of a farm dam, with Australian Painted Snipe recorded on a number of occasions, together with more than 60 other waterbird species.

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.

Most constructed wetlands, whether for irrigation storage or stock water, are steep-sided deep dams with insufficient habitat for most waterbirds, frogs and bats. The Australian Wood Duck and Galah are rare examples of species that have actually benefited from the proliferation of farm dams. Simple changes to constructed wetlands can dramatically increase their wildlife carrying capacity. Earthworks to create seasonally flooded shallows that support waterplants and mudflats will attract a wide range of new species like egrets, herons, crakes, sandpipers, spoonbills and stilts. Avoiding constant grazing pressure from stock will also enable mudflats and waterplants to flourish resulting in a greater range of wildlife utilising your farm dam.

M.Herring / D. Webb (inset)

BOREE WOODLAND

Boree Woodland is dominated by Boree *(Acacia pendula)* and originally it covered large areas of Cadell extending over expansive areas beyond the active floodplain. Today, there are just a few scattered stands remaining, representing about 4% of the original area.

More than 40 species were found across the four Cadell sites. The Blue Bonnet and Singing Honeyeater were closely associated with Boree across all four LWMP areas. The most exciting find in Cadell Boree was the Spotted-backed Ctenotus at two sites. These intricately patterned skinks are identifiable by the spots on their back.

Conservation of the remaining stands of Boree is crucially important for the Cadell area. Controlling stock grazing to allow regrowth of young Boree trees and shrubs, retaining fallen timber and encouraging native grasses can make a huge difference.

P.Merritt

D.Webb

The stunning **Red-capped Robin** is a sensitive bird that relies on the best quality patches of bush with an understorey of shrubs.

The well known **Grey-crowned Babbler** is a social species usually found in groups of six or more. It is one of few woodland birds able to persist in bush dominated by Noisy Miners.

The 'furnished house' on the right is the only option for most prospective wildlife tenants. This comparison between two Boree stands illustrates the role that continuous grazing can have on the loss of this vegetation type from the landscape. The stand on the left is a classic case of the 'living dead' because it isn't rested from grazing for long enough to allow the regeneration of young Boree, various shrubs and ground covers. The stand on the right is only crash-grazed, then rested for months at a time.

M.Herring

D.Webb

Superb Parrots were closely associated with Grassy Box Woodland and although they breed in the red gum forests, they rely on other vegetation types to feed in.

M.Herring

Grassy Box Woodland includes any stands of White Cypress-Pine, Murray Cypress-Pine, Yellow Box, Grey Box, Buloke or Needlewood, that aren't on sandhills. Two hundred years ago this was the most widespread vegetation type in Cadell and originally, these woodlands contained a great variety of understorey shrubs such as wattles, together with open grassy areas. The soils found in Grassy Box Woodland were favoured for agriculture and on most farms more than 95% of the original area has disappeared. Today, the wildlife found in these woodlands usually consists of common species that can persist in landscapes that are mostly cleared. However, sites in Cadell that contained good habitat supported sensitive species like the Hooded Robin, Buff-rumped Thornbill and Yellow-footed Antechinus.

This enormous Grey Box tree near Moama is home to **Squirrel Gliders**, rare tree-dwelling marsupials that rely on tree hollows for breeding and shelter during the day. They are capable of gliding for up to 100 metres between trees, any gaps beyond that usually restrict their movements.

D.Webb

This Grassy Box Woodland site has thickets of regenerating young trees after being rested from grazing, greatly benefiting wildlife. Sites like this can also have shrubs added, further improving wildlife habitat. An increasing number of landholders in Cadell are using fencing incentives to manage grazing and encourage regrowth of native vegetation.

M.Herring

REVEGETATION

This Green Gully Eucalypt plantation is outstanding for small woodland birds because it contains an understorey of Old Man Saltbush and is larger than 5 hectares.

M.Herring

Old Man Saltbush plantings like this one in between Barham and Deniliquin attract wildlife associated with chenopod shrubland like the White-winged Fairy-wren, Orange Chat and White-fronted Chat. These "crops" are a much better option than conventional agriculture because they offer good grazing value, help mitigate salinity and also provide wildlife habitat.

Over the last decade it has become clear that many wildlife species, particularly birds and bats, are readily able to return to suitable revegetation patches that landholders have planted. Other less mobile species, like many reptiles and small mammals will only benefit from revegetation that is situated adjacent to existing remnants. Large plantings greater than five hectares that have a mix of tree and shrub species and are located adjacent to good remnant vegetation are the best and provide habitat for much more wildlife than single-species plantings in thin strips in isolated paddocks.

Eucalypt plantations for timber or firewood and Old Man Saltbush plantings for grazing value and salinity mitigation are a much better 'crop' for most wildlife than conventional agriculture. Some farm forestry sites in Cadell that incorporated an Old Man Saltbush understorey were outstanding for bird diversity with a range of thornbills, honeyeaters, whistlers, robins and other small birds.

Old sheets of corrugated iron, fence posts and roofing tiles can provide homes for a range of skinks, geckos and legless lizards that will otherwise have to wait many decades for fallen logs and branches to accumulate. Similarly, nest boxes designed for bats, possums, gliders, parrots, owls or other hollow-nesting wildlife can provide shelter and nest sites well before hollow formation takes place decades down the track.

For information on the range of incentives available for managing, restoring and establishing native vegetation, please contact your Cadell LWMP officer on 03 5881 9300.

P.Merritt

The **Western Gerygone** and **Superb Fairy-wren** are among a whole suite of small, insectivorous birds that respond to revegetation within a few years of planting.

P.Merritt

How can I attract more wildlife to my farm?

The most important thing that Cadell landholders can do for wildlife conservation is identify the most significant remnant vegetation sites on their properties and manage them in a way that will maintain or improve the quality of habitat. Keeping areas messy by avoiding continuous grazing pressure, not 'cleaning up' fallen timber and ensuring that there is at least some areas that have shrubs and young trees are three simple ways to improve your wildlife habitat.

For those lucky enough to still have good stands of Boree, Native Pine, Grey Box, Yellow Box, Buloke or Needlewood, these are some of most valuable assets on your farm. For those with River Red Gum or Black Box along major waterways like the Murray River, your sites contribute to major wildlife 'highways' through the landscape. Flooding Black Box, River Red Gum and other wetland sites from time to time will help maintain the health of the floodplain and greatly improve wildlife habitat.

Revegetated sites attract the most species when they are 5 or more hectares in area, incorporate a range of tree and shrub species and are situated adjacent to remnant vegetation. Simple changes to irrigation and stock water storage dams that create shallows with waterplants and mudflats can also dramatically increase wildlife diversity on your farm.

Recommended Reading

Michael, D., Crane, M., MacGregor, C. and Cunningham, R. (2003) *Wildlife on Farms – how to conserve native animals.* CSIRO Publishing, Melbourne.

Kent, K., Earl, G., Mullins,B., Lunt,I & Webster,R. Editors. (2002) *Native Vegetation Guide for the Riverina; notes for land managers on its management and revegetation*. Charles Sturt University, Albury.

Flooding of black box and red gum is vital for the health of the floodplain.

Linking patches of bush within and between properties creates corridors.

Reducing grazing pressure will encourage an understorey of shrubs.

M.Herring

Keeping remnant vegetation messy, like this Black Box patch, will benefit wildlife.

Acknowledgements

The Cadell LWMP Wildlife Survey was funded and supported by Murray Irrigation Limited, the National Action Plan for Salinity and Water Quality, the Natural Heritage Trust and the Murray Catchment Management Authority. This project was based on two previous studies in the NSW Murray Catchment; the Murrakool Wildlife Survey conducted around Barham, Swan Hill and Tooleybuc in 2003/2004 and the Heartlands Eastern Billabong Wildlife Survey conducted around Holbrook, Culcairn and Walbundrie in 2001/2002. Special thanks to all the Cadell farmers for supporting the project so enthusiastically, with access to your properties, help during trapping sessions, strong attendance at the six Cadell field days and seminars, and reporting a multitude of local sightings made over many decades. Hats off to Kirsty Swinton and Clare Fitzpatrick, Cadell LWMP officers, for their significant contribution to the project. Massive thanks to the talented team of wildlife surveyors who helped with the field work: Adam Bester, Peter Irish, Jess Herring, Gary Herring, Hugh McGregor, Terry Korodaj, Daniel Arnold, Cameron Thomas, Jane Herring, Craig Grabham and Alex Knight. Big thanks to Jess Herring and Maree Petrow for tackling the daunting task of data entry. Thanks also to the Riverina and Murray Rural Lands Protection Boards for access to Travelling Stock Reserves, and to Charles Sturt University and the Department of Environment & Conservation for scientific permits, equipment hire and bat call analysis. Thanks to Paul Higgs and Jason Tasker for helping to produce the study site map. Lastly, to Dylan O'Donnell for his outstanding design expertise in helping to prepare these booklets.

For further information contact:
Murray Irrigation Limited
443 Charlotte Street
Deniliquin NSW 2710
Phone (BH) 03 5881 9300

Publication details

Published by Murray Wildlife and Murray Irrigation Limited.

ISBN: 0-9775829-2-2

Date of Publication: August 2006
Author: Herring, Matthew.

Suggested citation:
Herring, M., Webb, D. & Pisasale, M. (2006) Cadell Wildlife – Murray Land & Water Management Plan Wildlife Survey 2005-2006. Murray Wildlife and Murray Irrigation Limited.

CADELL
Land and Water Management Plan

Murray CMA
CATCHMENT MANAGEMENT AUTHORITY

Murray Irrigation Limited

Natural Heritage Trust
Helping Communities
Helping Australia

action
Salinity & Water
AUSTRALIA