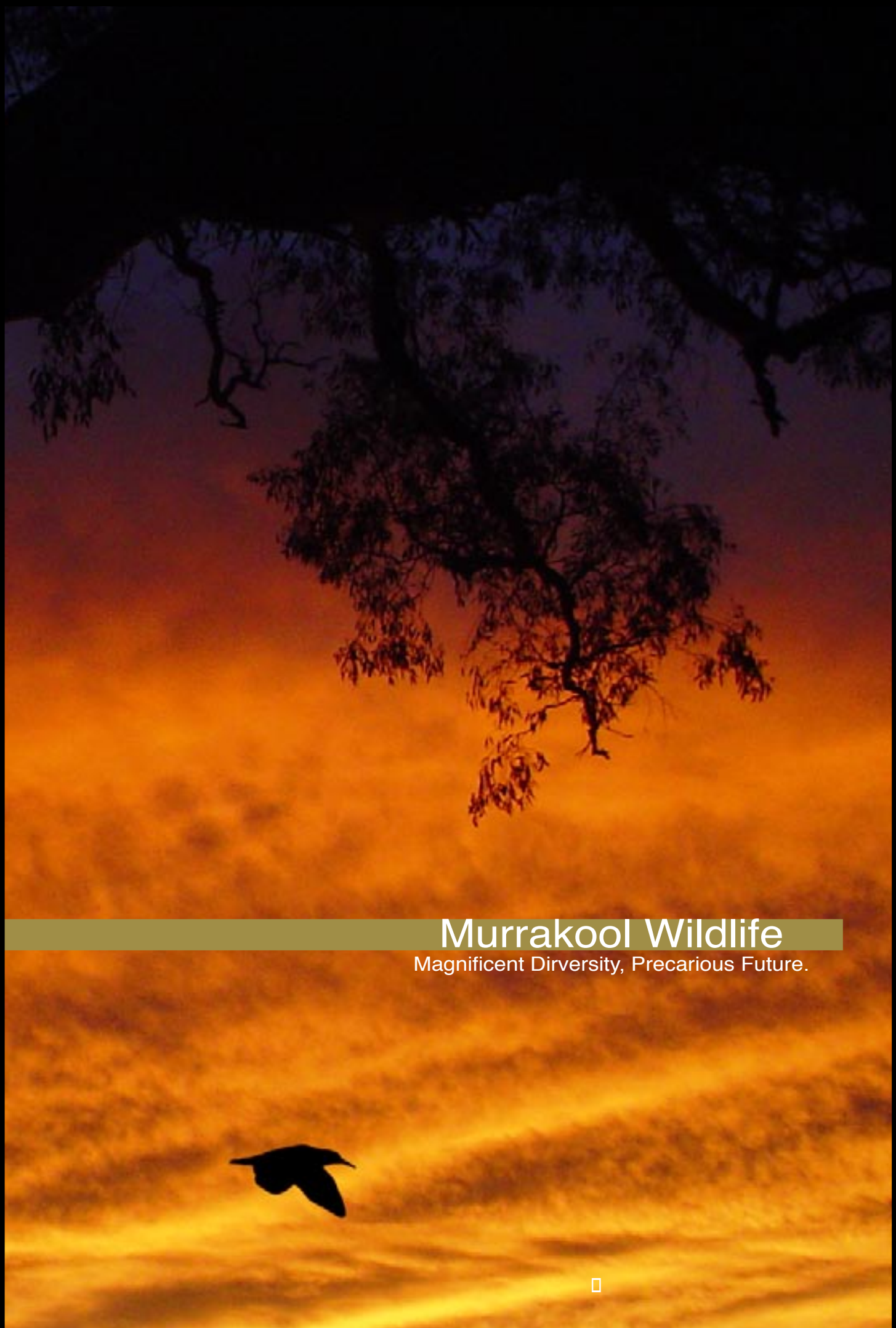
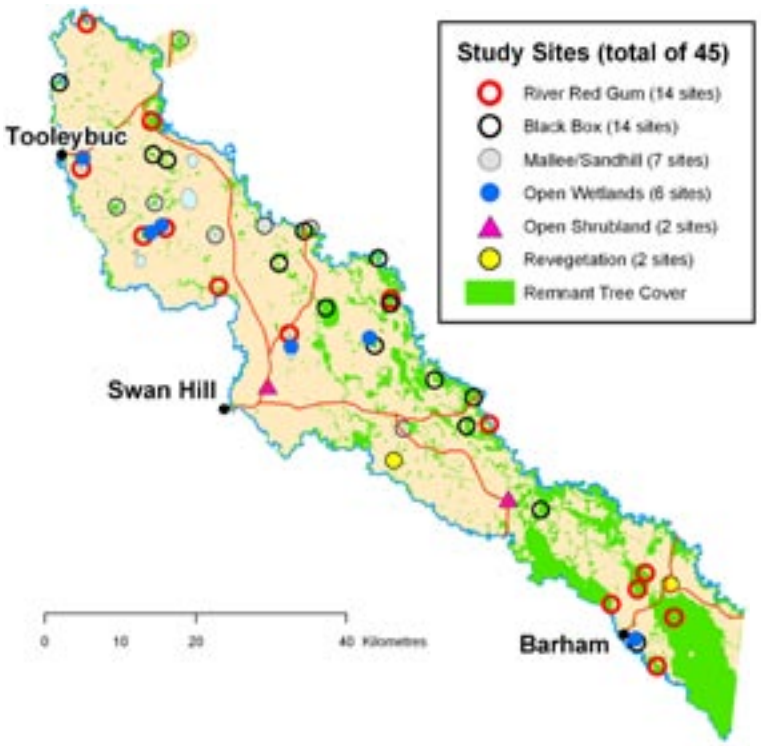


Murrakool Wildlife

Magnificent Dirversity, Precarious Future.



Reversing the decline in biodiversity – the genetic variety within species, the number of species and the range of habitats and ecosystems in which they occur – is one of the biggest challenges facing our current Australian generations. Fortunately, farmers, other land managers and local communities as a whole are increasingly interested in which plants and animals are persisting in their local areas and what they can do to help them survive.

It was decided by local people living in the Murrakool area that a wildlife survey and community engagement focused project would be useful. This project was funded by the Australian Government's *Envirofund* and was based on the *Heartlands* Eastern Billabong Wildlife study[9], which was conducted in 2001 and 2002, north of Albury, New South Wales in the Holbrook, Culcairn and Walbundrie area. The (Murrakool) project aimed to:

- Determine local distribution patterns in wildlife species (frogs, reptiles, birds and mammals).
- Determine the local status of wildlife, especially threatened species.
- Raise awareness amongst local people.
- Encourage people to take greater actions to conserve biodiversity across the landscape.

M. Herring

Students from MacKillop College, Swan Hill helping to make pitfall traps at a mallee/sandhill study site near Koraleigh.

This was the most comprehensive wildlife survey ever undertaken in the area. A great deal of information on the local wildlife was generated from this study and this booklet presents a summary of the findings.

As part of the project, a series of wildlife slide presentations and tours were conducted (attended by over 300 people), together with email, postal and media updates, to detail the progressive findings.

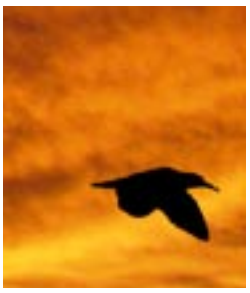
The Murrakool is the area between the Murray and Wakool Rivers where they run roughly parallel to each other, from east of Barham westwards to their junction north of Tooleybuc and Goodnight (see map). This study consisted of 45 study sites, involving over 60 days field work across the region. The sites were selected to provide coverage throughout the study area and of the broad vegetation types present, targeting the largest areas of remnant habitat (see map). Each site received a 20-minute bird survey at three different times of year (Jan-Apr, May-Aug, Sept-Dec). At 14 of the 45 sites, additional surveying was conducted for birds, as well as mammals, reptiles and frogs. Surveying took place from January 2003 – February 2004. The range of methods used included:

- Elliot trapping for small mammals
- Pitfall trapping for reptiles
- Harp trapping for bats
- Spotlighting for gliders and possums
- Anabat call recording for bats
- Active searches for reptiles and frogs
- Call playback for nocturnal birds
- Intensive surveying for birds (e.g. targeted swamp walks for cryptic waterbirds)
- Any observations whilst travelling between sites

M. Herring

M. Herring

Left: Elliot trap, one of the many methods used during the wildlife survey. Above: Barham locals helping to make pitfall traps at a red gum study site.



David Webb

Front cover: The nationally threatened Australian Painted Snipe (p4 & 12), arguably the highlight of the entire study, epitomises the main theme of this publication – magnificent diversity, precarious future.

Photo Composite by Dylan O'Donnell.

These somewhat heartening figures are undermined by the precarious existence that many species displayed. A total of 49 species were found at only one site. For some, this was because of a lack of targeted surveying or their cryptic nature and naturally low densities, but for most it is indicative of their concerning local status. Indeed, the future survival of at least 40 species in the Murrakool appears – at best – doubtful unless we make dramatic changes across the landscape. Many of these changes are fortunately already underway but we have a very long way to go and an untold extinction debt to pay.


Maree Petrow

The author conducting a bird survey in prime habitat on Campbell's Island

The Murrakool region was found to support a minimum of 244 wildlife species during the period January 2003 - February 2004 (see pages 8 and 9 for species lists):

182	**Birds**
27	**Reptiles**
27	**Mammals**
8	**Frogs**

Of the 244 species recorded, 11 are introduced (non-native) species (4 birds, 7 mammals) and 12 are officially considered threatened species (11 birds, 1 frog) – listed as *Vulnerable* or *Endangered* under the NSW Threatened Species Conservation Act 1995. Many others are locally threatened. There were several largely unexpected species, particularly mallee reptiles, where significant range extensions (>100 km) were discovered.

Common themes emerged, consistent with our general understanding of wildlife ecology. For example, there were distinct groups of species in the different broad vegetation types, many species were associated with particular habitats (e.g. shrubs, cumbungi or logs), and there was an increase in the number of species with the size of the patch of habitat, the level of habitat diversity and the closer proximity to other native vegetation patches.


David Webb

Sacred Kingfisher

Birds

The 182 bird species found during this study is indicative of the magnificent richness of birdlife in the area, with a mix of both western/inland species and southern/eastern species. The most commonly recorded birds (found at 27 or more sites) were Australian Magpie, Galah, Striated Pardalote, Magpie-lark, Australian Raven, Red-rumped Parrot, Eastern Rosella, White-plumed Honeyeater, Willy Wagtail, White-winged Chough, Brown Treecreeper and Superb Fairy-wren. Many of these are known to have increased as a result of European settlement. Most other birds were only found at a small sample of the sites (e.g. only in Black Box, only in wetlands or only where there were shrubs), whilst many others were only found at one or two sites. The most diverse sites for birds were high quality wetlands with adjacent River Red Gum and Black Box (e.g. Tally's Lake and surrounds yielded 93 bird species). The most exciting find of the study was two Australian Painted Snipe, an extremely rare waterbird (p4 & 12). The following two pages detail many of the other major highlights such as Gilbert's Whistler, Regent Parrot and Bush Stone-curlew. We should also be concerned for many of the species that were not found (see the 'Additional species' p8), particularly those that are considered threatened in New South Wales.


Craig Grabham

Sugar Glider

Mammals

The 27 species recorded included 9 marsupials, 9 bats, 1 monotreme, 3 rodents (1 native, 2 introduced) and 5 introduced placental mammals. Note: there is also some local concern that Fallow and Red Deer may become established. The only native mammals that were *Common* were the Eastern Grey Kangaroo and Brush-tailed Possum, although bats were surveyed inadequately to assign local statuses. The most exciting find was a Feathertail Glider on "Allandale", north of Goodnight along the Wakool River (p6). The Yellow-footed Antechinus was found at 4 sites, mostly in the Barham region (p7), whilst the Black Wallaby and Sugar Glider were found at only 2 sites each and also closely associated with River Red Gum. Of all the native mammal species found during the study, there should be most concern in the Murrakool for the Feathertail Glider and the Echidna, which was also found at only one site during the entire study (Koraleigh mallee-sandhill block). Additionally, there are at least five other mammals likely to be in trouble: recent photos from farmers in the Murrakool confirm the local persistence of Fat-tailed Dunnarts; we made a 'probable' sighting of a Narrow-nosed Planigale, a tiny crack-dwelling marsupial carnivore, at Tally's Lake (Wetuppa area); the Little Pied Bat and Large-footed Myotis were found near Barham in 200110; and there are unconfirmed reports of Platypus in recent years. Undoubtedly, the Murrakool historically supported far more native mammals (e.g. Western Quoll, Mitchell's Hopping Mouse, White-footed Rabbit-rat, Eastern Hare-wallaby and Brush-tailed Bettong). Tragically, Australia has the worst modern extinction record for mammals on Earth – 21 species have been lost and countless others are in decline or on the brink.


M. Herring

Shingleback Lizard

Reptiles

The total of 27 reptile species found during the study reflects Australia's magnificent reptilian diversity. More than 800 species have been described so far, making us the number one country in the world for reptiles. As an extreme comparison: England only supports ten species! The 27 species included 12 skinks, 6 geckos, 4 snakes, 2 goannas, 2 dragons and 1 Turtle. Half of these were only found in Sandhill or Mallee Woodland, particularly one site near Koraleigh (p10/11). A total of 16 species (more than half) were assigned to the *Rare* category (p9). The only species found to be common were the Boulenger's Skink, Carnaby's Wall Skink, Eastern Bearded Dragon and Eastern Brown Snake. I found two more species just outside the study area (Mitchell's Short-tailed Snake at Annuello, Curl Snake in between Barham and Moulamein); another within the study area at a later date (Eastern Blue Tongue Lizard); whilst several others are known to occur or it is highly likely they are present (p9). The Carpet Python, although not recorded during the study, was found by locals during the study period at a handful of sites near the Wakool and Murray Rivers. Most people however, haven't seen one for some time and many suggest they have declined markedly in recent years.


Peter Merritt

Peron's Tree Frog

Frogs

The only threatened frog species found (or expected) was the Southern Bell Frog (p4). The most common were the Spotted Marsh Frog, Eastern Sign-bearing Froglet and Common Eastern Froglet. Tally's Lake in the Wetuppa area with its diverse array of wetland habitats, showed up as the most important site, with all 8 of the recorded species.

A total of 12 species officially considered threatened in New South Wales were found during the study, including 11 birds and 1 frog. This section details the findings for each of them. All but three of them (Grey-crowned Babbler, Diamond Firetail, Major Mitchell Cockatoo) were assigned to the *Rare* category for their local status. An additional 14 species considered threatened in New South Wales were found just outside the study area or have been recorded recently by other observers within or adjacent to the Murrakool in the last five years. Some species that are currently not considered threatened in New South Wales (e.g. White-bellied Cuckoo-shrike, Scarlet Robin, Flame Robin, Apostlebird, Short-clawed Ctenotus, Regal Skink and Echidna) are actually more locally threatened in the Murrakool than some of the species listed at the state level. The Brown Treecreeper subspecies (race) that occurs in the Murrakool (and was assigned to the *Common* category) is not the subspecies that is officially considered threatened in NSW.

Ian Montgomery birdway.com.au

Australasian Bittern

Regrettably, the fate of some species is probably already sealed in the Murrakool. For many others however, we are capable of turning their declines into recoveries.

WETLAND SPECIES

Australian Painted Snipe

The Australian Painted Snipe – arguably the best find of the entire study – is Australia's rarest and most threatened resident waterbird (p12). They are known to have declined significantly in recent decades and are now only recorded at around ten sites each year across the country. This striking, unusual and often secretive shorebird relies on a delicate balance of both the cover provided by waterplants and the feeding areas provided by seasonally flooded mudflats (see photos on p12 for suitable habitat examples)[21]. The two birds found during this study (Jan 2004) were associated with recently flooded (but drying) Lignum and mudflat. This poorly known bird should not be confused with the Latham's Snipe (also known as Japanese or Jack Snipe), which does not breed in Australia. To help increase our knowledge of the increasingly mythical Australian Painted Snipe, please promptly report any definite sightings to the author (contact details on p15) or Birds Australia (Threatened Bird Network) on 039882 2622 or tbn@birdsaustralia.com.au.

Australasian Bittern

The booming call of the Australasian Bittern, the most threatened of the world's 12 bittern species, was acclaimed as the call of the Bunyip by some Aboriginal clans and early European settlers. Like the Australian Painted Snipe, this bird is dependent on the cover provided by waterplants and is rarely seen. The only Australasian Bittern recorded during this study was one in rice in January 2004 adjacent to Tally's Lake. Most breeding occurs in dense reedbeds of Cumbungi or Phragmites with water depths usually around 1 metre.

Freckled Duck

In April 2003, three Freckled Ducks (p13) were found on Lake Talpile (often called Talpie), Koraleigh, the only record for the study. This strange duck, although relatively rare, is now considered more secure than once thought. Small numbers are likely to visit the Murrakool on a regular basis and may breed. Freckled Ducks usually feed in wetlands with shallow water. They tend to breed in ephemeral fresh water creeks and swamps vegetated with Lignum or Canegrass.

Southern Bell Frog

The magnificent 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[19]. A breeding population was discovered at Tally's Lake, the only site for this species for the study. 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 and around the Murrakool area are familiar with this distinctive, large, green and brown frog. A widespread decline in the last few decades has been suggested[19].

WOODLAND and FOREST SPECIES

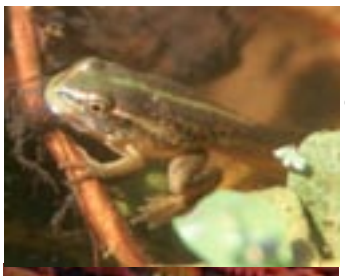
Black-chinned Honeyeater

The Black-chinned Honeyeater was only found at 2 sites, both in the large River Red Gum forests around Barham, namely Little Forest and Campbell's Island State Forest. They generally don't occur any further west in the increasingly arid woodlands. These birds are both nectarvores and insectivores. During this study they were seen feeding in mistletoe.

Bush Stone-curlew

The much-loved Bush Stone-curlew, famed for it's eerie, wailing call at night and excellent camouflage, is in serious

M. Herring



M. Herring

David Webb

David Webb

The Southern Bell Frog, also known as the Growling Grass Frog, pictured here at the tadpole, froglet and adult stages, together with a breeding site found during this study near Tally's Lake.

trouble in south-eastern Australia. This ground-feeding and ground-nesting bird is dependent on logs and fallen branches for cover, and is thought to be particularly vulnerable to foxes. Many farmers themselves have witnessed the dramatic decline of this charismatic species over the last few decades. The Bush Stone-curlew was only recorded at one site, near the Pollacks Swamp, Barham but there are at least five pairs known to occur along the nearby Eagle Creek and surrounds[10], as well as the odd pair elsewhere in the Murrakool. Fortunately, there is a great deal of work being done by landholders in the NSW Murray catchment to help save the curlew from extinction (e.g. predator-proof fencing, increased fox control and retention of fallen timber).

Hooded Robin

In recent years the insectivorous Hooded Robin has become an icon for Australia's small declining woodland birds. There is concern for its persistence across much the wheat-sheep belts of southern Australia. Fortunately, this endearing little bird was found at 3 sites: Koraleigh Sandhill/Mallee block; Wakool River floodplain Black Box/Lignum off the Gonn Road; and Tally's Lake, also in Black Box/Lignum. This bird prefers open woodland without a dense understorey.

Diamond Firetail

The striking Diamond Firetail is also one of our declining woodland birds. Like most finches, this bird feeds on grass seeds. It usually nests in shrubs or in mistletoe clumps. Like all the declining woodland birds, this species will benefit from on-ground works that enlarge existing patches of bush, improve habitat connectivity and increase habitat diversity. Diamond Firetails were found at 6 study sites, spread across the study area but only in Black Box, although incidental observations of them on sandhills adjacent to the floodplain were made.

David Webb

David Webb

David Webb

Top: Bush Stone Curlew Middle: Hooded Robin
Bottom: Diamond Firetail

Grey-crowned Babbler

The well known Grey-crowned Babbler (also known as Happy Families), although considered threatened in NSW, was found at 16 sites, which was more than the White-browed (4 sites) and Chestnut-crowned Babbler (10 sites). The Grey-crowned Babbler has disappeared from large parts of its former range and is thought to still be in decline. Like the other babblers, they do not persist in areas that have very small patches of bush that are not well connected to one another, although they appear to hold on in areas longer than many other declining woodland birds like the robins and thornbills.

Gilbert's Whistler

The Gilbert's Whistler is dependent on a thick understorey of shrubs. Pictured on page 7 is a male at his nest in a Lignum bush near the Wakool River in the early 1970s (Barham region). During the present study this species was found at only two sites, also both near Barham. A family of three was discovered in Campbell's Island State Forest in April and remained in the same area for the remainder of the year, whilst one bird was recorded immediately adjacent to the 'Little Forest' section of Koondrook State Forest. It was just across the Murray River in Victoria on Gunbower Island. Both locations where the Gilbert's Whistler was recorded were in large (at least several thousand hectares) River Red Gum patches where there was a dense Dwarf Cherry understorey (p3 & 14). Let's hope this beaut little bird isn't already part of the Murrakool extinction debt of 'too-far-gone' species.

Regent Parrot

The Regent Parrot relies on both the River Red Gum forests where it breeds and the Mallee and Sandhill Woodland where it prefers to feed. Because these parrots avoid flying across open paddocks, the connectivity between these different habitats is very important. This magnificent species, like most parrots and many other wildlife species, requires tree hollows to breed in. These tend to be in the larger and older River Red Gums. Since European settlement, Regent Parrots have disappeared from a large portion of their range and populations have declined mainly because of the loss of habitat. In New South Wales, Regent Parrots currently have a very limited range and they are now at the edge of their range in the Murrakool, occurring no further east than the Kyalite-Goodnight area. They would have once occurred throughout the Murrakool area but during this study were only found in mallee woodland at a Travelling Stock Reserve near Kyalite and at "Allandale" along the Wakool River, north of Goodnight.

Major Mitchell Cockatoo

The Major Mitchell (or Pink) Cockatoo is one of Australia's most iconic species. It's also a hollow dependent woodland bird that has declined. They were recorded at 6 sites throughout the study period, mainly in Sandhill and Mallee Woodland. Only small numbers were found, typically of one or two birds. Breeding pairs generally space themselves at a minimum of 2 km, so large areas of woodland are required to maintain a viable population.

There are five main Broad Vegetation Types in the Murrakool: Riverine Forest (River Red Gum), Floodplain Woodland (Black Box), Mallee Woodland and Sandhill Woodland, together with wetlands. These are covered in the following sections. There are also very small areas of Grassy Box Woodland (e.g. Grey Box above the floodplain) and Chenopod Shrubland (e.g. treeless areas with saltbushes and Dillonbush).

Rivers and creeks that support healthy native vegetation corridors act as wildlife 'highways', facilitating movement around the landscape and enabling populations to intermix.

Chris & Sandra Pollitt / ANTPhoto.

Feathertail Glider

Fortunately, across the NSW Murray Catchment the River Red Gum Broad Vegetation Type (Riverine Forest/Woodland) is well represented with an estimated 60% of it's original extent remaining[15], largely explained by the enormous forest blocks of Millewa, Werai, Koondrook and Perricoota. Some species are strongly associated with the River Red Gum forests, like the Peaceful Dove, Little Friarbird and Dollarbird. At least two species - the Red-browed Finch and Garden Skink - are expanding their ranges westwards through the River Red Gum forests of the Murray.

Other species, like the Tessellated Gecko, Chestnut-rumped Thornbill, Chestnut-crowned Babbler and Red-capped Robin, are strongly associated with the Black Box woodlands, which are relatively poorly represented in the Murrakool. Areas adjacent to the Wakool River are some of the most significant areas of Floodplain Woodland (Black Box) in the entire New South Wales Murray Catchment

Dick Whitford / ANTPhoto.comcom

Feathertail Glider

Feathertail Glider discovery

The Feathertail Glider found at "Allandale", north of Goodnight near the Wakool/Murray junction was a major highlight of the study and brought me much excitement. It was found whilst we were spotlighting in an area with patches of young red gums surrounded by enormous old giants, some with diameters greater than 2 metres. I am confident we could hear others in the area as well. This tiny (12-gram), hollow dependent, highly acrobatic marsupial is rarely found west of the Great Dividing Range. It lives in groups of up to 40, each with a home range of between 0.4 - 2.1 hectares12. The Sugar Glider, which was found at 2 sites, is considerably larger but still much smaller than the two local possums – Brush-tailed and Ringtail.

Birdlife is rich in both River Red Gum Forest and Black Box Woodland, and there is also a suite of native mammals here as well (e.g. Black Wallaby, Sugar Glider, Yellow-footed Antechi-

Peter Merritt

Peter Merritt

M. Herring

Left: Yellow-footed Antechinus with Southern Marbled Gecko.
Top Right: Female Yellow-footed Antechinus showing pouch with young. Enormous old red gum log, Campbell's Island

M. Herring

Large red gum near the Feathertail Glider site, north of Goodnight, Wakool River.

Black Box woodland is one of the most severely depleted Broad Vegetation Types in the NSW Murray Catchment, with an estimated 18% of its original extent remaining[15]

nus). Reptile diversity on the other hand is relatively poor compared to the Mallee and Sandhill Woodlands. The reptiles that do occur in these areas are either highly mobile (e.g. Red-bellied, Tiger and Brown Snakes) or arboreal (e.g. Carpet Python, Carnaby's Wall Skink, Tree crevice Skink, Southern Marbled Gecko), enabling them to live on a floodplain. The fossorial (litter and soil dwelling) species lack these capabilities and are absent because of this and the heavy soils.

Damian Michael

Boulenger's Skink by far the most abundant reptile in the Murrakool.

David Webb

Brown Treecreeper

The Wakool River and surrounding bush is the most important biodiversity asset in the Murrakool. Fortunately, areas along the Wakool River and nearby watercourses still support relatively large stands of Black Box, many with thick patches of Lignum, Nitre Goosefoot, other shrubs and various ground covers.

Yellow-footed Antechinus – a marsupial carnivore and lover of logs

A total of 6000 trap-nights (10 sites x 75 traps x 4 nights x 2 trapping sessions) were used to survey small mammals. 'Yellow-foots', which mainly feed on insects and small vertebrates, were the only natives found. They were mostly recorded in the River Red Gum blocks around Barham (3 of the 4 sites). The other was in Black Box near the Wakool River. The trapping grids (5 x 5 traps) covered a quarter of a hectare and the highest densities recorded were 12 per hectare, even during the drought. These high densities were closely associated with the amount of large fallen logs, which appear to be a critical resource for Yellow-foots. They were not found further west than "Merran Park" on the Wakool River (20 km NW of Barham), although photographs and observations from locals confirm their presence as far west as Cunninyeuk and Coonamit.

Value of parasites – Dwarf Cherry and Mistletoes

Areas of River Red Gum with a shrubby understorey of the much-maligned Dwarf Cherry (p3 & 14) are rich in birdlife. This root parasite is very patchily distributed along the major watercourses but large patches can support the likes of Gilbert's Whistler and White-browed Scrubwren. Mistletoes are also a misunderstood group of native parasitic plants. They increase habitat diversity and provide many species with nectar, fruit and an ideal place to nest, including the mistletoe-dependent Painted Honeyeater, which is one of the 'possible' threatened species that was not found during the study. Unlike most native species, some mistletoes have benefited from European settlement and the high abundances that you see in some areas are an indication that nature is out of balance (e.g. nutrients have increased making host trees more attractive, fire has been suppressed, there are many more bushland edges).

Chestnut-crowned Babbler, a bird of the Wakool Black Box

This study yielded some important local information about the Chestnut-crowned Babbler (see back cover), which is at the south-eastern edge of its range in the Murrakool. They were found at 10 sites, many with more than one family group. All of the sites are within 5 km of the Wakool River, mostly within 3km. They were almost exclusively in Black Box with a thick understorey of Lignum or Nitre Goosefoot and were found no further east than "Merran Park" on the Gonn Road, about 20 km north-west of Barham. The Chestnut-crowned Babbler is but one of a whole suite of woodland birds for which the Wakool River area is extremely important (e.g. Red-capped Robin, Variegated Fairy-wren, Chestnut-rumped Thornbill).

M. Herring

Black Box-Lignum habitat along St. Helanas Creek.

Damian Michael

Evan Thomas

Craig Grabham

Middle: Carnaby's Wall Skink, one of only five reptiles found to be common in the Murrakool. Top Right: Gilbert's Whistler
Bottom Right: Forest Bats


Peter Merritt

White-bellied Sea Eagle

BIRDS

☐ Emu U
☐ Brown Quail R
☐ (t) Freckled Duck R
☐ Australian Wood Duck C
☐ Black Swan U
☐ Australian Shelduck U
☐ Hardhead U
☐ Pacific Black Duck C
☐ Australian Shoveler R
☐ Pink-eared Duck U
☐ Grey Teal C
☐ Great Crested Grebe R
☐ Hoary-headed Grebe R
☐ Australasian Grebe C
☐ Darter C
☐ Great Cormorant U
☐ Little Black Cormorant U
☐ Little Pied Cormorant C
☐ Australian Pelican U
☐ White-necked Heron U
☐ White-faced Heron U
☐ Great Egret U
☐ Intermediate Egret R
☐ Cattle Egret R
☐ Nankeen Night Heron R
☐ Little Bittern R
☐ (t) Australasian Bittern R
☐ Glossy Ibis R
☐ Straw-necked Ibis U
☐ Australian White Ibis U
☐ Royal Spoonbill U
☐ Yellow-billed Spoonbill U
☐ Black-shouldered Kite R
☐ Black Kite U
☐ Whistling Kite C
☐ Collared Sparrowhawk U
☐ White-bellied Sea-eagle U
☐ Little Eagle R
☐ Wedge-tailed Eagle C
☐ Swamp Harrier R
☐ Spotted Harrier U
☐ Peregrine Falcon R
☐ Black Falcon R
☐ Brown Falcon U
☐ Nankeen Kestrel U
☐ Australian Hobby U
☐ Dusky Moorhen U
☐ Purple Swamphen U
☐ Eurasian Coot U
☐ Black-tailed Native-hen U
☐ (t) Bush Stone-curlew R
☐ Painted Button-quail R
☐ Little Button-quail R
☐ Latham's Snipe R
☐ Red-necked Stint R
☐ Marsh Sandpiper R
☐ Sharp-tailed Sandpiper R
☐ (t) Australian Painted Snipe R
☐ Black-winged Stilt U
☐ Red-necked Avocet R
☐ Red-kneed Dotterel U
☐ Black-fronted Dotterel C
☐ Red-capped Plover R
☐ Masked Lapwing U
☐ Banded Lapwing R
☐ Silver Gull U
☐ Whiskered Tern U
☐ Caspian Tern U
☐ *Feral Pigeon R
☐ Peaceful Dove C
☐ Common Bronzewing C
☐ Crested Pigeon C
☐ Galah C
☐ (t) Major Mitchell's Cockatoo U
☐ Little Corella R
☐ Long-billed Corella U
☐ Sulphur-crested Cockatoo C
☐ Cockatiel R
☐ Eastern Rosella C
☐ Yellow Rosella C
☐ Australian Ringneck U
☐ Blue Bonnet U
☐ Red-rumped Parrot C
☐ Blue-winged Parrot R
☐ Regent Parrot R
☐ Budgerigar R
☐ Horsfield's Bronze Cuckoo R
☐ Fan-tailed Cuckoo R
☐ Pallid Cuckoo R
☐ Australian Owlet Nightjar U
☐ Tawny Frogmouth R
☐ Southern Boobook U
☐ Barn Owl R
☐ Laughing Kookaburra C
☐ Sacred Kingfisher C
☐ Azure Kingfisher R
☐ Dollarbird R
☐ Rainbow Bee-eater U
☐ White-throated Treecreeper C
☐ Brown Treecreeper C
☐ Superb Fairy-Wren C
☐ Variegated Fairy-wren C
☐ White-winged Fairy-wren U
☐ Spotted Pardalote C
☐ Striated Pardalote C
☐ White-browed Scrubwren R
☐ Western Gerygone C
☐ Striated Thornbill R
☐ Chestnut-rumped Thornbill C
☐ Buff-rumped Thornbill C
☐ Yellow-rumped Thornbill C
☐ Yellow Thornbill U
☐ Weebill C
☐ Southern Whiteface U
☐ Red Wattlebird R
☐ Little Friarbird C
☐ Noisy Friarbird R
☐ Spiny-cheeked Honeyeater U
☐ Striped Honeyeater R
☐ Blue-faced Honeyeater U
☐ Yellow-throated Miner R
☐ Noisy Miner C
☐ Singing Honeyeater U
☐ (t) Black-chinned Honeyeater R
☐ Brown-headed Honeyeater C
☐ White-plumed Honeyeater C
☐ Yellow-plumed Honeyeater R
☐ White-fronted Honeyeater R
☐ Black Honeyeater R
☐ White-fronted Chat R
☐ Crimson Chat R
☐ Jacky Winter U
☐ Flame Robin R
☐ Scarlet Robin R
☐ Red-capped Robin C
☐ (t) Hooded Robin R
☐ White-browed Babbler R
☐ (t) Grey-crowned Babbler C
☐ Chestnut-crowned Babbler U
☐ Varied Sitella R
☐ Crested (Eastern) Shrike-Tit U
☐ Golden Whistler U
☐ (t) Gilbert's Whistler R
☐ Rufous Whistler C
☐ Grey Shrike-Thrush C
☐ Grey Fantail C
☐ Restless Flycatcher U
☐ Willie Wagtail C
☐ White-winged Triller U
☐ White-bellied Cuckoo-shrike R
☐ Black-faced Cuckoo-shrike C
☐ Olive-backed Oriole R
☐ White-breasted Woodswallow R
☐ White-browed Woodswallow U
☐ Black-faced Woodswallow R
☐ Dusky Woodswallow R
☐ Grey Butcherbird U
☐ Pied Butcherbird C
☐ Magpie-Lark C
☐ Australian Magpie C
☐ Pied Currawong R
☐ Australian Raven C
☐ Little Raven U
☐ White-winged Chough C
☐ Apostlebird R
☐ Australian Pipit R
☐ Red-browed Finch R
☐ Zebra Finch U
☐ (t) Diamond Firetail U
☐ *House Sparrow R
☐ Mistletoebird C
☐ Welcome Swallow C
☐ White-backed Swallow R
☐ Tree Martin U
☐ Fairy Martin R
☐ Clamorous Reed Warbler U
☐ Brown Songlark R
☐ Rufous Songlark U
☐ Little Grassbird R
☐ Silvereye R
☐ *Common Blackbird R
☐ *Common Starling C

ADDITIONAL SPECIES

☐ Stubble Quail
☐ Plumed Whistling Duck
☐ (t) Blue-billed Duck
☐ Musk Duck
☐ Magpie Goose
☐ *Mallard
☐ Chestnut Teal
☐ Pied Cormorant
☐ Little Egret
☐ Letter-winged Kite
☐ (t) Square-tailed Kite
☐ Brown Goshawk
☐ (t) Grey Falcon
☐ (t) Brolga
☐ Buff-banded Rail
☐ Spottles Crake
☐ Australian Spotted Crake
☐ Baillon's Crake
☐ (t) Australian Bustard
☐ Red-chested Button-quail
☐ (t) Plains Wanderer
☐ Common Greenshank
☐ Wood Sandpiper
☐ Common Sandpiper
☐ Long-toed Stint
☐ Pectoral Sandpiper
☐ Curlew Sandpiper
☐ Ruff (Reeve)
☐ Banded Stilt
☐ Pacific Golden Plover
☐ Double-banded Plover
☐ Australian Pratincole
☐ White-winged Black Tern
☐ Gull-billed Tern
☐ Spotted Turtle-dove
☐ Diamond Dove
☐ Mulga Parrot
☐ Shining Bronze-cuckoo
☐ Black-eared Cuckoo
☐ (t) Barking Owl
☐ Spotted Nightjar
☐ White-throated Needletail
☐ Fork-tailed Swift
☐ Red-backed Kingfisher
☐ Splendid Fairy-wren
☐ White-throated Gerygone
☐ (t) Pied Honeyeater
☐ (t) Painted Honeyeater
☐ Orange Chat
☐ Leaden Flycatcher
☐ Ground Cuckoo-shrike
☐ Masked Woodswallow
☐ Singing Bushlark
☐ * Common Skylark
☐ European Goldfinch
☐ Golden-headed Cisticola

KEY FOR BIRDS
(excluding waterbirds and raptors.)
R = Rare
(1 – 10% of sites)
U = Uncommon
(11 – 25% of sites)
C = Common
(26% or more)

ALL
(t) = Listed as *Endangered* or *Vulnerable* under the NSW Threatened Species Conservation Act 1995

* = Introduced species

MAMMALS

- ☐ Echidna R
- ☐ Yellow-footed Antechinus U
- ☐ Common Brushtail Possum C
- ☐ Common Ringtail Possum R
- ☐ Sugar Glider R
- ☐ Feathertail Glider R
- ☐ Eastern Grey Kangaroo C
- ☐ Western Grey Kangaroo R
- ☐ Red Kangaroo R
- ☐ Black (Swamp) Wallaby R
- ☐ Gould's Wattled Bat
- ☐ Chocolate Wattled Bat
- ☐ Lesser Long-eared Bat
- ☐ Large Forest Bat
- ☐ Southern Forest Bat
- ☐ Little Forest Bat
- ☐ Inland Freetail Bat
- ☐ Southern Freetail Bat
- ☐ White-striped Freetail Bat
- ☐ Water-rat R
- ☐ *Black Rat R
- ☐ *House Mouse U
- ☐ *Fox U
- ☐ *Cat R
- ☐ *Rabbit C
- ☐ *Hare C
- ☐ *Pig R

M. Herring

Echidna

Damian Michael

Southern Marbled Gecko

ADDITIONAL SPECIES

- ☐ Platypus
- ☐ Narrow-nosed Planigale
- ☐ Fat-tailed Dunnart
- ☐ Little Red Flying Fox
- ☐ (t) Yellow-bellied Sheathtail Bat
- ☐ (t) Little Pied Bat
- ☐ (t) Large-footed Myotis
- ☐ Inland Forest Bat
- ☐ Inland Broad-nosed Bat
- ☐ Gould's Long-eared Bat
- ☐ (t) Greater Long-eared Bat
- ☐ Eastern Freetail Bat
- ☐ * Brown Rat

REPTILES

- ☐ Eastern Long-necked Turtle *Chelodina longicollis* U
- ☐ Southern Marbled Gecko *Christinus marmoratus* C
- ☐ Beaded Gecko *Diplodactylus damaeus* R
- ☐ Tessellated Gecko *Diplodactylus tessellatus* R
- ☐ Wood Gecko (Stone Gecko) *Diplodactylus vittatus* R
- ☐ Tree Dtella *Gehyra variegata* R
- ☐ Southern Spiny-tailed Gecko *Strophurus intermedius* R
- ☐ Carnaby's Wall Skink *Cryptoblepharus carnabyi* C
- ☐ Short-clawed Ctenotus *Ctenotus brachyonyx* R
- ☐ Regal Skink *Ctenotus regius* R
- ☐ Large-striped Skink *Ctenotus robustus* R
- ☐ Tree-crevice Skink *Egernia striolata* R
- ☐ Garden Skink *Lampropholis guichenoti* R
- ☐ Bougainville's Skink *Lerista bougainvillii* R
- ☐ Wood Mulch Slider *Lerista muelleri* R
- ☐ Eastern Robust Slider *Lerista punctatovittata* R
- ☐ Grey's Skink *Menetia greyi* R
- ☐ Boulenger's Skink *Morethia boulengeri* C
- ☐ Shingleback *Tiliqua rugosa* U
- ☐ Nobbi Dragon *Amphibolurus nobbi* R
- ☐ Eastern Beared Dragon *Pogona barbata* C
- ☐ Gould's Monitor (Sand Goanna) *Varanus gouldii* R
- ☐ Lace Monitor (Tree Goanna) *Varanus varius* U
- ☐ Prong-snouted Blind Snake *Ramphotyphlops bituberculatus* R
- ☐ Tiger Snake *Notechis scutatus* U
- ☐ Red-bellied Black Snake *Pseudechis porphyriacus* U
- ☐ Eastern Brown Snake *Pseudonaja textilis* C

ADDITIONAL SPECIES

- ☐ Broad-shelled Turtle *Chelodina expansa*
- ☐ Murray Turtle *Emydura macquarii*
- ☐ Olive Legless Lizard *Delma inornata*
- ☐ Burton's Legless Lizard *Lialis burtonis*
- ☐ Eastern Hooded Scaly-foot *Pygopus schraderi*
- ☐ Spotted-back Ctenotus *Ctenotus orientalis*
- ☐ Yellow-bellied Water Skink *Eulamprus heatwolei*
- ☐ Eastern Blue-tongue Lizard *Tiliqua scincoids*
- ☐ Southern Blind Snake *Ramphotyphlops australis*
- ☐ Carpet Python *Morelia spilota*
- ☐ Mitchell's Short-tailed Snake *Suta nigriceps*
- ☐ Curl Snake *Suta suta*
- ☐ Bandy Bandy *Vermicella annulata*

KEY FOR MAMMALS, REPTILES, FROGS, WATERBIRDS & RAPTORS

R = Rare, one or two sites only
U = Uncommon, three - five sites
C = Common, six or more

Bats were surveyed inadequately to assign local statuses.

ADDITIONAL SPECIES: recorded either within 50 km of the study area (e.g. Barham – Deniliquin Rds, Tullakool saltworks, Hirds Swamp, Annuello) during the study period, or seen by other observers within the study area (and 50 km buffer) in the last five years, or it is highly likely it still occurs.

Scientific names have only been included for reptiles and frogs because their common names vary so much.

FROGS

- ☐ Peron's Tree Frog Litoria peroni U
- ☐ (t) Southern Bell Frog (Growling Grass Frog) *Litoria raniformis* R
- ☐ Eastern Sign-bearing Froglet (Plains Froglet) *Crinia parinsignifera* C
- ☐ Common Eastern Froglet *Crinia signifera* C
- ☐ Eastern Banjo Frog *Limnodynastes dumerilii* U
- ☐ Spotted Marsh Frog *Limnodynastes tasmaniensis* C
- ☐ Barking Marsh Frog *Limnodynastes fletchori* U
- ☐ Wrinkled Toadlet *Uperoleia rugosa R*

ADDITIONAL SPECIES

- ☐ Sloane's Froglet *Crinia sloanei*
- ☐ Giant Bullfrog *Limnodynastes interioris*
- ☐ Common Spadefoot *Neobatrachus sudelli*
- ☐ Holy Cross Toad *Notaden bennetti*
- ☐ Bibron's Toadlet *Pseudophryne bibroni*

Half of the reptile species found in the Murrakool are dependent on Mallee and Sandhill Woodland

Remarkable reptiles

The restoration of Mallee and Sandhill Woodland will be critical for reptile conservation in the Murrakool, not to mention the unique array of plants. Half of the reptiles found in the Murrakool and almost all of those considered rare (recorded at one or two sites only, see p9) are dependent on the Mallee and Sandhill Woodlands. This is not really surprising when you consider the now poor representation of these woodlands in the area, coupled with the immobility and fossorial (soil and litter dwelling) nature of many reptiles, which doesn't allow them to occur on the floodplain. In the Murrakool, many of these rare species (e.g. Regal Skink and Short-clawed Ctenotus) are probably now restricted to a single ~80 hectare block near Koraleigh. Indeed, there were a total of eight reptile species only found here. As a result of this and its significance for birds and plants, the *Koraleigh Landscape Restoration Project* based around this core patch has begun. It aims to determine the relative biodiversity value of connected and unconnected patches (and strips) at various distances surrounding the core block. On-ground works can then be targeted for the best outcomes.

M. Herring

An extremely Isolated mallee patch near Stony Crossing illustrates the process of local extinction, with only two Grey-crowned Bablers remaining.

One of the biggest challenges for biodiversity conservation in the Murrakool is the restoration of Mallee and Sandhill Woodland

Mallee Woodland is one of the most severely depleted broad vegetation types in the NSW Murray Catchment with an estimated 4% of its original extent remaining[15]

Lost mammals and birds

There are several mammals that would have almost certainly once occurred in the Sandhill and Mallee Woodlands of the Murrakool but are now locally extinct. There are three; the Mallee Ningaui, Western Pygmy Possum and Mitchell's Hopping Mouse, that are all still found across the border in Victoria, only about 40 kilometres west of the northern tip of the Murrakool in the Annuello district[14]. Unfortunately, it also appears several bird species have already become locally extinct in the Mallee and Sandhill Woodlands of the Murrakool (e.g. Gilbert's Whistler, Malleefowl), whilst others are clearly on their last legs (e.g. White-browed and Chestnut-crowned Babblers, Hooded Robin, Varied Sittella).

M. Herring

M. Herring

David Webb

Crimson Chat

M. Herring

M. Herring

Wood Gecko

Top Left: Eastern Robust Slider Top Right: Tree Dtella Bottom: Regal Skink

Sandhill Woodland is also one of the most depleted broad vegetation types in the NSW Murray Catchment with an estimated 13% of its original extent remaining[15]

The old giants – prime wildlife real estate - even out in the paddock

Old trees in the landscape are extremely valuable to an array of wildlife species. Almost all owls and parrots for instance nest only in tree hollows, whilst all the small, insectivorous bats found in the Murrakool shelter and breed in the various hollows and crevices provided by large, old trees. Isolated paddock trees, often referred to as the 'living dead', are progressively disappearing from the landscape because of dieback and a lack of recruitment. This is occurring at the expense of local wildlife. Old trees also contribute fallen branches and logs, which are important for many species of reptile, the Bush Stone-curlew, Brown Treecreeper, Yellow-footed Antechinus and many others.

Peter Merritt

The Feral Cat, one of 11 introduced (non-native) species found during the study. The control of introduced species will be an integral part of wildlife conservation in the Murakool.

Fallen logs, shrubs and tree hollows provide critically important habitat for many wildlife species

It is clear that without massive habitat restoration across the Murrakool, the local area will lose much wildlife

The way forward

Most remaining patches are small, highly degraded and severely isolated. Some of the most useful things we can do to improve their health and increase their value to wildlife are by increasing their size, intermittently excluding stock so the understorey can naturally regenerate, avoid removing logs and branches, and connect surrounding strips and patches. Roadside strips, which are often in the best condition, can be widened into the adjacent property. Shrubs, such as Moonah, Cassias, Hopbushes, Emu-bushes, Hakeas and Acacias, as well as ground covers, that have been lost in many mallee and sandhill remnants can also be re-established by planting or direct seeding. Old fence posts, roof tiles, pieces of corrugated iron and other 'rubbish' can provide important habitat similar to that of logs, which won't re-accumulate for many decades.

David Webb

Right : Nobbi Dragon

David Webb

Beaded Gecko

M. Herring

Short-clawed Ctenotus

M. Herring

High quality Sandhill Woodland near Koraleigh with Murray Cypress Pine, Rosewood and Needlewood, as well as Belah and Buloke out of view.

Wetlands are particularly valuable for birds, frogs and bats. Wetland study sites such as Lake Talpile (Talpie) and Tally's Lake, where the wetland abutted remnant bush, were the richest in wildlife, yielding more than 50 species in an hour. The most impressive wetland species are the migratory shorebirds that come from the northern hemisphere (e.g. Japan, Siberia) each year to spend summer in the Murrakool and other parts Australia. For this study, these species included the Latham's Snipe, Red-necked Stint, Marsh Sandpiper and Sharp-tailed Sandpiper, with Lake Tooim showing up as the most important site. There are several other species that are known to still visit the Murrakool (p4). The extreme mobility of these migratory shorebirds epitomises the ability of waterbirds to respond swiftly to positive changes in wetland management.

David Webb

Sharp-tailed Sandpipers, which breed in Siberia, were one of four migratory shorebirds found during the study. They rely on wetlands that have shallow areas with mudflats.

More than a quarter of the bird species found in the Murrakool are dependent on wetlands.

Simple changes to farm dams can dramatically increase their value to biodiversity.

There are few large, natural wetlands remaining in the Murrakool, notably the Poon Boon Lakes complex, Lake Tooim (Murray Downs), Lake Coomeroop (Tooleybuc) and Tally's Lake. Of course there are also the floodplain forests and woodlands associated with the creeks and rivers, like the Koondrook State Forest and areas along the Wakool River, but most of the original floodplain in the Murrakool is now disengaged from seasonal flooding. The management of flooding regimes at the key remaining wetlands and floodplains is critical.

The dramatic alteration of flooding regimes at all wetlands and across the entire floodplain has resulted in some areas receiving too much water to maintain a healthy ecology, and countless others that are in dire need of a drink. These thirsty wetlands tend to be the shallow, ephemeral areas that are usually only flooded for a few months at a time every 1-4 years. The Murray Wetlands Working Group, together with Murray Irrigation Limited have been providing environmental water to privately owned wetlands like these to improve their health and help restore local biodiversity. The results of this work have shown a significant response of native wetland birds, frogs and plants[16].

Evan Thomas

Evan Thomas

M. Herring

David Webb

Top Left, Top Right & Right: Australian Painted Snipe; nest/eggs, chick and adult. Bottom Left : Tally's Lake where three Australian Painted Snipe were found during this study.

Rice as wildlife habitat

Rice generally lacks the habitat diversity found in many natural wetlands but has much more appeal than the typical farm dam, which is usually devoid of waterplants and too deep for most wildlife species. Many frogs, bats and waterbirds, including threatened species, are able to make good use of rice crops each year. Other wetland species however (e.g. Little Bittern), are not catered for – in terms of habitat – by rice.

Across the Murray and Murrumbidgee catchments, rice crops, together with the associated irrigation channels and storage wetlands, are important habitat for the threatened Southern Bell Frog (p4). Indeed, the breeding population found during this study is known to make wide use of the surrounding rice during summer and early autumn.

Late in the growing season when there is sufficient cover, the threatened Australasian Bittern also widely utilises rice and breeding sometimes occurs, although it is highly likely that draining and harvesting take place before the chicks are capable of flying.

Peter Merritt

Black-winged Stilt

Peter Merritt

Freckled Duck

M. Herring

Created wetland (near Jerilderie, east of the study area) with ideal habitat for Australian Painted Snipe and many other waterbird species. It has supported over 100 species in recent years because it provides a range of habitats for waterbirds and frogs, such as mudflats with *eleocharis* spike-rushes, dense stands of Cumbungi and deep open water.

Transform your barren, lifeless farm dam into an oasis

Small, created wetlands, including all types of farm dams, are relatively common throughout the landscape. Unfortunately, they usually support few wildlife species. The Australian Wood Duck is a rare example of a species that has actually benefited from the proliferation of farm dams. These typically barren wetlands lack sufficient wildlife habitat but provide us with a great opportunity to benefit wetland biodiversity. Excitingly, simple changes to farm dams can dramatically increase their value to wildlife. Earthworks to create seasonally flooded shallows and fencing to manage grazing regimes will enable mudflats and waterplants to flourish. This will increase habitat diversity and result in a greater variety of species that utilise the dam. Next time you're getting your dam re-dug or desilted, think about where you might be able to increase habitat through earthworks to create these ephemeral shallows. You can fence all but a small portion of the dam – so stock still have access – or pump water out to a trough. The sound of various frogs and sightings of egrets, herons, spoonbills, plovers, stilts, dotterels, sandpipers, unusual ducks and many other waterbirds will make the modest effort well worth it.

Evan Thomas

Little Bittern

Peter Merritt

David Webb

Peter Merritt

Middle : Swamp Harrier Top Right : Barking Marsh Frog
Botom Right: Black-tailed Native-hen

The identification of local biodiversity hotspots was one of the most important outcomes of this study. Biodiversity hotspots are a priority for conservation. They are reservoirs of life, acting as wildlife supply sources for conservation works in the surrounding landscape. The best things we can do are to manage these areas to improve the habitat and increase the wildlife carrying capacity, enlarge them where possible and increase habitat connectivity in the surrounding landscape.

With limited funding for on-ground conservation works it makes sense to target areas where we will get the best outcomes and value for money. Biodiversity hotspots are characterised by at least one of the following: relatively large patch, high habitat diversity, high number of species, presence of threatened and unique species, high productivity/fertility or severely depleted vegetation type. Sites on the list opposite were selected based on these attributes. Examples of significant species found during this study are given for each area.

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M. Herring

Black Box-Lignum habitat near the Wakool River.

M. Herring

Lignum, Cumbungi, Rush, Spike-rush, Canegrass and Nardoo habitat at Tally's Lake, Wetuppa area.

M. Herring

Mallee-Spinifex habitat near Koraleigh

M. Herring

River Red Gum, Silver Wattle and Dwarf Cherry habitat along the Little Murray River, Campbell's Island State Forest, Barham

- **Wakool River and surrounds** – Regent Parrot, Feathertail Glider, Hooded Robin, Apostlebird, numerous Red-capped Robins, Diamond Firetail, three babbler species including significant 'edge-of-range' Chestnut-crowned Babbler population, three fairy-wren species, Yellow-footed Antechinus, Sugar Glider.
- **Murray River region, specifically Campbell's Island and surrounds** – Gilbert's Whistler, Black-chinned Honeyeater, White-bellied Cuckoo-shrike, Azure Kingfisher, Sugar Glider, Yellow-footed Antechinus, Black Wallaby.
- **Koondrook State Forest and surrounds, including Little Forest and Pollack Swamp** – Gilbert's Whistler, Bush Stone-curlew, Scarlet Robin, Yellow-footed Antechinus, Sugar Glider, Black Wallaby.
- **Coobool Black Box and Merran Creek** – Tessellated Gecko, Grey-crowned Babbler, Diamond Firetail.
- **Koraleigh mallee/sandhill block** ("Riverleigh") – Echidna, Hooded Robin, White-browed Babbler, Grey-crowned Babbler, Varied Sittella, 8 of the 16 reptile species considered rare were only found at this site and four of them are probably not found elsewhere in the entire NSW Murray catchment.
- **Tally's Lake and adjacent wetlands**, Wetuppa area – Australian Painted Snipe, Little Bittern, Diamond Firetail, Hooded Robin, Grey-crowned Babbler, ibis/cormorant/darter breeding colonies, Water Rat, Southern Bell Frog breeding population, unconfirmed but probable Narrow-nosed Planigale.
- **Poon Boon Lakes complex (Lakes Talpile (Talpie), Poomah, Poon Boon, Wollare, Goonimut, Genoe and others) and Lake Coomeroop (Tooleybuc)** – Freckled Duck, Latham's Snipe, Marsh Sandpiper, Red-necked Avocet, Red-capped Plover, Grey-crowned Babbler, Water Rat, Black Wallaby.
- **Lake Tooim** (Murray Downs Lake) – Red-necked Stint, Marsh Sandpiper, Sharp-tailed Sandpiper, Red-capped Plover, Red-necked Avocet, Caspian Tern.
- **Kyalite mallee** – Regent Parrot, Major Mitchell's Cockatoo, Grey-crowned Babbler, Tree Dtella, Grey's Skink, Sand Goanna, Prong-snouted Blind Snake.

REFERENCES AND FURTHER READING

1. Anstis, M. (2002) *Tadpoles of south-eastern Australia: a guide with keys*. Reed New Holland, Sydney.
2. Barrett, G. (2000) Birds on farms: ecological management for agricultural sustainability. Supplement to *Wingspan* 10 (4).
3. Barrett, G., Silcocks, A., Barry, S., Cunningham, R. and Poulter, R. (2003) *The New Atlas of Australian Birds*. Royal Australasian Ornithologists Union (Birds Australia), Melbourne.
4. Bennett, A., Brown, G., Lumsden, L. M., Krasna, S. and Silins, J. (1998). *Fragments for the Future- Wildlife in the Victorian Riverina (the Northern Plains)*. Department of Natural Resources and Environment, East Melbourne.
5. Brown, G. (2002) The distribution and conservation status of the reptile fauna of the Murray River region in Victoria. *The Victorian Naturalist* 119 (3): 133-143.
6. Churchill, S. (1998) *Australian Bats*. Reed New Holland, Sydney.
7. Disher, P. (2000) *Birds of the Barham District*. Barham Landcare Group, New South Wales.
8. Ford, H. A., Barrett, G. W., Saunders, D. A. and Recher, H. F. (2001) Why have birds in the woodlands of southern Australia declined? *Biological Conservation* 97: 71-88.
9. Herring, M. (2003) Eastern Billabong Wildlife: A Snapshot in Time. *Heartlands*, CSIRO, Murray-Darling Basin Commission and the Eastern Billabong Landcare groups.
10. Habitat Planning, Frankenberg, R & J, Grabham, G. & Goffey Geosciences (2001) Environmental Impact Statement: De-silting and snag realignment, Eagle Creek, Barham. Unpublished consultancy report.
11. Gibbons, P. and Lindenmayer, D. (2002) *Tree hollows and wildlife conservation in Australia*. CSIRO Publishing, Melbourne.
12. Lindenmayer, D. (2002) *Gliders of Australia: a natural history*. University of New South Wales Press Ltd, Sydney.
13. Lindenmayer, D., Claridge, A., Hazell, D., Michael, D., Crane, M., MacGregor, C. and Cunningham, R. (2003) *Wildlife on Farms - how to conserve native animals*. CSIRO Publishing, Melbourne.
14. Menkhorst, P. & Knight, F. (2001) *A Field Guide to the Mammals of Australia*. Oxford University Press, South Melbourne.
15. MCMB (2002) Murray Catchment Blueprint. NSW Government and Murray Catchment Management Board.
16. Nias, D. J., Alexander, P. and Herring, M. (2003) Watering private property wetlands in the Murray Valley, New South Wales. *Ecological Management & Restoration*. 4: 5-12.
17. Pizzey, G. and Knight, F. (1997) *Field Guide to the birds of Australia*. Harper Collins, Sydney.
18. Platt, S. J. (2002) *How to plan wildlife landscapes: a guide for community organisations*. Department of Natural Resources and Environment, Melbourne.
19. Pyke, G. H. (2002) A review of the biology of the Southern Bell Frog Litoria raniformis (Anura: Hylidae). *Australian Zoologist* 32, 32-48.
20. Robinson, M. (1993) *A field guide to the frogs of Australia from Port Augusta to Fraser Island including Tasmania*. Australian Museum and Reed Publications, Sydney.
21. Rogers, D.I., Hance, I., Paton, S., Tzaros, C., Griffioen, P., Herring, M., Jaensch, R., Oring, L., Silcocks, A and Weston, M. (In Press). The breeding bottleneck: Breeding habitat and population decline in the Australian Painted Snipe. In Straw, P. and Milton, D. (Eds.) In prep. *Status and Conservation of Shorebirds in the East Asian-Australasian Flyway*. International Wader Studies and Wetlands International.
22. Simpson, K. and Day, N. (1999) *Field guide to the birds of Australia*. Penguin Books Australia: Melbourne.
23. Swan, G., Shea, G. & Sadlier, R. (2004). *A Field Guide to Reptiles of New South Wales*. 2nd Edn. Reed New Holland, Sydney.
24. Watson, D. M (2001) Mistletoe – a keystone resource in forests and woodlands worldwide. *Annual Review of Ecology and Systematics* 32: 219-249.
25. Webster, R., Belcher, C. and Leslie, D. (2003) A survey for threatened fauna in south-western New South Wales. *Australian Zoologist* 32: 214-228.
26. Wilson, S. & Swan, G. (2003). *A Complete Guide to Reptiles of Australia*. Reed New Holland, Sydney.

25. Webster, R., Belcher, C. and Leslie, D. (2003) A survey for threatened fauna in south-western New South Wales. *Australian Zoologist* 32: 214-228.
26. Wilson, S. & Swan, G. (2003). *A Complete Guide to Reptiles of Australia*.

Reed New Holland, Sydney.

M. Herring

Since being established in 1995, this 30 hectare Old Man Saltbush planting on "Brechin" (in the Mellool area) has already attracted back many bird species, on top of providing a wonderful resource for stock. The White-winged and Superb Fairy-wrens together with three thornbill species and the Southern Whiteface, were among the birds found during this study to have responded to this planting. It was formerly a bare paddock supporting very few species.

Murrakool's Unique Mix
1.Budgerigar - D. Webb 2. Chestnut-crowned Babbler - P. Merrit 3. Spotted Harrier - P. Merritt 4. Freetail Bat - C. Grabham 5. Red-capped Robin - D. Webb 6. Great Crested Grebe - P. Merritt 7. Australian Owlet Nightjar - P. Merritt 8. Major Mitchell's Cockatoo - P. Merritt 9. Rainbow Bee-eater - D.Webb 10. Sharp-tailed Sandpiper - D. Webb 11. Yellow-footed Antechinus - P. Merritt 12. Lace Monitor - D. Webb 13. Regal Skink - D. Webb 14. Spotted Marsh Frog - P. Merritt 15. Southern Spiny-tailed Gecko - D. Webb 16. Echidna - D. Webb 17. Southern Bell Frog - D. Webb

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