

# The birds of *Wirrumbirra*, Laguna

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*Wirrumbirra* is a 75 ha property located near Yango Creek Road, Laguna, 8 km south-west of Wollombi, NSW. It is situated in the Yango Creek catchment, 2 km east of Yengo National Park. The property supports Hawkesbury Sandstone open forest associations largely unmodified by clearance, grazing or frequent fires. A small number of cattle grazed the area prior to 1979, but since their removal some areas have regenerated. The property, which has been regularly monitored over a period of more than 33 years, has supported a diverse range of birds, including 12 species listed as threatened in New South Wales. A Voluntary Conservation Agreement with NSW National Parks and Wildlife Service has been in place over the property since 2002.

## INTRODUCTION

*Wirrumbirra* is a 75 ha property located in an isolated valley accessible by a private road from Yango Creek Road near Laguna, 8 km south-west of Wollombi (32°59'04"S 151°06'06"E). Elevation ranges from 200 to 300 m above sea level. Average rainfall for the area is 744 mm.

A few non-perennial streams traverse the property. These support isolated pools, which are used by birds for drinking, however they may dry for extended periods during drought. Permanent water is therefore very scarce and is provided by the author at one location on the property, allowing observation of birds, particularly during drought.

Since cattle were removed from the property, and previously cleared areas have been allowed to regenerate, there has been a change in the vegetation, and hence the species of birds recorded. The study highlights trends that have resulted due to this change.

Observations were collected as a personal record of the natural history of the property. Their publication gives an historical indication of the various bird species present, changes that have occurred in the bird population of the property and a baseline for comparing changes that may occur in the future.

The area is preserved in perpetuity under a Voluntary Conservation Agreement with the NSW National Parks and Wildlife Service.

## METHODS

Records were gathered on visits to the property between 1979 and 2012. During the first five years records were made weekly, but less consistently in subsequent years. In total, visits were made in 296 months, which for analysis purposes were split into three periods of approximately 11 years duration (116 months 1979-1989, 107 months 1990-2000 and 73 months 2001-2012). A summary was compiled for each month based on the highest number of each species recorded during a single visit.

Birds were sighted opportunistically around the property and the area covered was variable, sometimes only along the four-wheel-drive access tracks. The less frequently surveyed sandstone escarpments are quite steep in places, and difficult for walking, but provide different habitat and bird species.

## HABITAT

Open forest occupies the majority of the property with dominant species: Narrow-leaved Ironbark *Eucalyptus crebra*, Narrow-leaved Stringybark *E. sparsifolia*, Grey Gum *E. punctata*, Rough-barked Apple *Angophora floribunda*, Forest Oak *Allocasuarina torulosa*, Blunt Beard-heath *Leucopogon muticus*, Narrow-leaved Geebung *Persoonia linearis* and Silver-stemmed Wattle *Acacia parvipinnula*; and a native herb and grass understorey. *Angophora euryphylla* occurs in the open forest below the ridge crests and is considered locally endemic between Putty and the Wollombi area. There is a well-developed shrub understorey.

The rocky ridge line consists of open forest dominated by Narrow-leaved Ironbark, Yellow Bloodwood *E. eximia*, Narrow-leaved Stringybark, Grey Gum, Flannel Flower *Actinotus helianthi*, Woody Pear *Xylomelum pyriforme*, Green Grevillea *Grevillea mucronulata*, Grey Spider Flower *Grevillea buxifolia*, Grass Tree *Xanthorrhoea spp.*, Blunt Beard-heath, Egg and Bacon Pea *Dillwynia floribunda var. teretifolia* and native grasses (**Figure 1**). Scaly Bark *E. squamosa* is also found on the ridge tops in their southern and northern limits. The western slopes feature *Banksia spinulosa*, Grass Tree and Slender Tea-tree *Leptospermum trinervium*. The ridge line understorey layer contains a diversity of pea flowers, boronias, grevilleas and native grasses.

Moist slopes and gullies are dominated by Ironwood *Backhousia myrtifolia* and also include Round-leaf Gum *Eucalyptus deanei*, Turpentine *Syncarpia glomulifera*, Scrub Turpentine *Rhodamnia rubescens*, Hairy Doughwood *Melicope micrococca* and various fern species. The moist slopes and gullies also support dry rainforest species, including Bird's Nest Ferns

*Asplenium australasicum*, Elkhorns *Platynerium bifurcatum* and Hare's Foot Fern *Davallia pyxidata*.

A diverse range of native terrestrial, lithophytic and epiphytic orchids also occurs.

## RESULTS

A total of 124 bird species is recorded for the property.

**Tables 1, 2 and 3** summarise observations for the most frequently observed bird species (reporting rate >20%; i.e. a species recorded during over 20% of the months in which the property was visited) over three approximately 11-year periods. The tables also show the maximum and median numbers of individuals of each species.

Species recorded less frequently (i.e. reporting rate < 20%) are shown in **Table 4**.



**Figure 1.** Flannel flowers on rocky ridge in open forest dominated by Narrow-leaved Ironbark, Yellow Bloodwood, Narrow-leaved Stringybark and Grey Gum.

**Table 1.** Species recorded regularly 1979-1989

| Common Name                   | Scientific Name                  | Reporting Rate (%) | Number months recorded | Maximum Count | Median Count |
|-------------------------------|----------------------------------|--------------------|------------------------|---------------|--------------|
| Glossy Black-Cockatoo *       | <i>Calyptorhynchus lathami</i>   | 39.7               | 46                     | 8             | 4            |
| Yellow-tailed Black-Cockatoo* | <i>Calyptorhynchus funereus</i>  | 36.2               | 42                     | 30            | 5            |
| Gang-gang Cockatoo *          | <i>Callocephalon fimbriatum</i>  | 37.9               | 44                     | 50            | 7            |
| Australian King-Parrot *      | <i>Alisterus scapularis</i>      | 38.8               | 45                     | 30            | 4            |
| Crimson Rosella               | <i>Platycercus elegans</i>       | 25.0               | 29                     | 15            | 4            |
| Eastern Rosella *             | <i>Platycercus eximius</i>       | 23.3               | 27                     | 9             | 4            |
| Superb Lyrebird *             | <i>Menura novaehollandiae</i>    | 54.3               | 63                     | 6             | 2            |
| White-throated Treecreeper    | <i>Cormobates leucophaea</i>     | 53.4               | 62                     | 4             | 1            |
| Satin Bowerbird *             | <i>Ptilonorhynchus violaceus</i> | 47.4               | 55                     | 7             | 3            |
| Noisy Miner *                 | <i>Manorina melanocephala</i>    | 26.7               | 31                     | 12            | 4            |
| Blue-faced Honeyeater *       | <i>Entomyzon cyanotis</i>        | 37.9               | 44                     | 8             | 4            |

Note: \*Indicates breeding

**Table 2.** Species recorded regularly 1990-2000

| Common Name                   | Scientific Name                     | Reporting Rate (%) | Number months recorded | Maximum Count | Median Count |
|-------------------------------|-------------------------------------|--------------------|------------------------|---------------|--------------|
| Wonga Pigeon *                | <i>Leucosarcia melanoleuca</i>      | 27.1               | 29                     | 5             | 2            |
| Glossy Black-Cockatoo *       | <i>Calyptorhynchus lathami</i>      | 26.2               | 28                     | 9             | 3            |
| Yellow-tailed Black-Cockatoo* | <i>Calyptorhynchus funereus</i>     | 29.9               | 32                     | 24            | 5            |
| Gang-gang Cockatoo *          | <i>Callocephalon fimbriatum</i>     | 29.9               | 32                     | 50            | 4            |
| Australian King-Parrot        | <i>Alisterus scapularis</i>         | 29.0               | 31                     | 15            | 2            |
| Crimson Rosella               | <i>Platycercus elegans</i>          | 20.6               | 22                     | 10            | 4            |
| Laughing Kookaburra *         | <i>Dacelo novaeguineae</i>          | 27.1               | 29                     | 6             | 5            |
| Superb Lyrebird *             | <i>Menura novaehollandiae</i>       | 62.6               | 67                     | 5             | 1            |
| White-throated Treecreeper    | <i>Cormobates leucophaea</i>        | 34.6               | 37                     | 5             | 2            |
| Satin Bowerbird *             | <i>Ptilonorhynchus violaceus</i>    | 37.4               | 40                     | 6             | 2            |
| Superb Fairy-wren             | <i>Malurus cyaneus</i>              | 24.3               | 26                     | 8             | 4            |
| Variiegated Fairy-wren *      | <i>Malurus lamberti</i>             | 29.0               | 31                     | 8             | 5            |
| Rockwarbler *                 | <i>Origma solitaria</i>             | 32.7               | 35                     | 4             | 2            |
| White-browed Scrubwren *      | <i>Sericornis frontalis</i>         | 20.6               | 22                     | 4             | 3            |
| Striated Thornbill            | <i>Acanthiza lineata</i>            | 27.1               | 29                     | 20            | 4            |
| Brown Thornbill               | <i>Acanthiza pusilla</i>            | 35.5               | 38                     | 10            | 5            |
| Spotted Pardalote *           | <i>Pardalotus punctatus</i>         | 22.4               | 24                     | 6             | 2            |
| Eastern Spinebill             | <i>Acanthorhynchus tenuirostris</i> | 21.5               | 23                     | 4             | 2            |
| Lewin's Honeyeater *          | <i>Meliphaga lewinii</i>            | 34.6               | 37                     | 6             | 2            |
| Yellow-faced Honeyeater *     | <i>Lichenostomus chrysops</i>       | 36.4               | 39                     | 60            | 5            |
| White-eared Honeyeater *      | <i>Lichenostomus leucotis</i>       | 28.0               | 30                     | 10            | 3            |
| Yellow-tufted Honeyeater *    | <i>Lichenostomus melanops</i>       | 22.4               | 24                     | 14            | 5            |
| White-naped Honeyeater        | <i>Melithreptus lunatus</i>         | 36.4               | 39                     | 30            | 5            |
| Noisy Friarbird *             | <i>Philemon corniculatus</i>        | 29.0               | 31                     | 12            | 4            |
| Eastern Whipbird              | <i>Psophodes olivaceus</i>          | 22.4               | 24                     | 5             | 2            |
| Golden Whistler *             | <i>Pachycephala pectoralis</i>      | 21.5               | 23                     | 8             | 1            |
| Rufous Whistler               | <i>Pachycephala rufiventris</i>     | 20.6               | 22                     | 5             | 2            |
| Grey Shrike-thrush *          | <i>Colluricincla harmonica</i>      | 31.8               | 34                     | 5             | 2            |
| Grey Butcherbird *            | <i>Cracticus torquatus</i>          | 25.2               | 27                     | 3             | 2            |
| Australian Magpie *           | <i>Cracticus tibicen</i>            | 22.4               | 24                     | 4             | 2            |
| Pied Currawong *              | <i>Strepera graculina</i>           | 31.8               | 34                     | 4             | 2            |
| Grey Fantail *                | <i>Rhipidura fuliginosa</i>         | 31.8               | 34                     | 5             | 2            |
| Australian Raven              | <i>Corvus coronoides</i>            | 24.3               | 26                     | 4             | 2            |
| Leadend Flycatcher            | <i>Myiagra rubecula</i>             | 22.4               | 24                     | 4             | 2            |
| Eastern Yellow Robin          | <i>Eopsaltria australis</i>         | 33.6               | 36                     | 6             | 2            |
| Red-browed Finch              | <i>Neochmia temporalis</i>          | 22.4               | 24                     | 20            | 5            |

Note: \*Indicates breeding

**Table 3.** Species recorded regularly 2001-2012

| Common Name                   | Scientific Name                     | Reporting Rate % | Number months recorded | Maximum Count | Median Count |
|-------------------------------|-------------------------------------|------------------|------------------------|---------------|--------------|
| Wonga Pigeon                  | <i>Leucosarcia melanoleuca</i>      | 79.5             | 58                     | 5             | 2            |
| Glossy Black-Cockatoo *       | <i>Calyptorhynchus lathami</i>      | 30.1             | 22                     | 6             | 3            |
| Yellow-tailed Black-Cockatoo* | <i>Calyptorhynchus funereus</i>     | 31.5             | 23                     | 23            | 2            |
| Gang-gang Cockatoo *          | <i>Callocephalon fimbriatum</i>     | 45.2             | 33                     | 9             | 2            |
| Australian King-Parrot        | <i>Alisterus scapularis</i>         | 27.4             | 20                     | 6             | 2            |
| Crimson Rosella               | <i>Platycercus elegans</i>          | 47.9             | 35                     | 8             | 3            |
| Eastern Rosella               | <i>Platycercus eximius</i>          | 23.3             | 17                     | 5             | 2            |
| Fan-tailed Cuckoo             | <i>Cacomantis flabelliformis</i>    | 47.9             | 35                     | 2             | 1            |
| Southern Boobook              | <i>Ninox novaeseelandiae</i>        | 23.3             | 17                     | 2             | 1            |
| Laughing Kookaburra           | <i>Dacelo novaeguineae</i>          | 72.6             | 53                     | 6             | 4            |
| Superb Lyrebird *             | <i>Menura novaehollandiae</i>       | 82.2             | 60                     | 4             | 2            |
| White-throated Treecreeper    | <i>Cormobates leucophaea</i>        | 82.2             | 60                     | 4             | 2            |
| Satin Bowerbird               | <i>Ptilonorhynchus violaceus</i>    | 67.1             | 49                     | 6             | 1            |
| Superb Fairy-wren             | <i>Malurus cyaneus</i>              | 38.4             | 28                     | 5             | 4            |
| Variiegated Fairy-wren        | <i>Malurus lamberti</i>             | 47.9             | 35                     | 5             | 4            |
| Rockwarbler                   | <i>Origma solitaria</i>             | 50.7             | 37                     | 7             | 2            |
| White-browed Scrubwren *      | <i>Sericornis frontalis</i>         | 37.0             | 27                     | 10            | 2            |
| Striated Thornbill *          | <i>Acanthiza lineata</i>            | 57.5             | 42                     | 10            | 4            |
| Brown Thornbill               | <i>Acanthiza pusilla</i>            | 54.8             | 40                     | 12            | 4            |
| Spotted Pardalote *           | <i>Pardalotus punctatus</i>         | 54.8             | 40                     | 6             | 2            |
| Eastern Spinebill             | <i>Acanthorhynchus tenuirostris</i> | 42.5             | 31                     | 3             | 1            |
| Lewin's Honeyeater            | <i>Meliphaga lewinii</i>            | 72.6             | 53                     | 5             | 2            |
| Yellow-faced Honeyeater       | <i>Lichenostomus chrysops</i>       | 80.8             | 59                     | 110           | 5            |
| White-eared Honeyeater        | <i>Lichenostomus leucotis</i>       | 34.2             | 25                     | 5             | 1            |
| Yellow-tufted Honeyeater *    | <i>Lichenostomus melanops</i>       | 74.0             | 54                     | 15            | 4            |
| Bell Miner                    | <i>Manorina melanophrys</i>         | 28.8             | 21                     | 16            | 12           |
| White-naped Honeyeater        | <i>Meliphaga lunata</i>             | 61.6             | 45                     | 50            | 5            |
| Noisy Friarbird *             | <i>Philemon corniculatus</i>        | 57.5             | 42                     | 16            | 4            |
| Spotted Quail-thrush          | <i>Cinlosoma punctatum</i>          | 32.9             | 24                     | 3             | 1            |
| Eastern Whipbird              | <i>Psophodes olivaceus</i>          | 50.7             | 37                     | 4             | 2            |
| Black-faced Cuckoo-shrike     | <i>Coracina novaehollandiae</i>     | 39.7             | 29                     | 2             | 2            |
| Cicadabird                    | <i>Coracina tenuirostris</i>        | 21.9             | 16                     | 3             | 2            |
| Golden Whistler               | <i>Pachycephala pectoralis</i>      | 64.4             | 47                     | 8             | 1            |
| Rufous Whistler               | <i>Pachycephala rufiventris</i>     | 34.2             | 25                     | 3             | 2            |
| Grey Shrike-thrush            | <i>Colluricincla harmonica</i>      | 84.9             | 62                     | 4             | 2            |
| Olive-backed Oriole *         | <i>Oriolus sagittatus</i>           | 32.9             | 24                     | 4             | 2            |
| Grey Butcherbird              | <i>Cracticus torquatus</i>          | 60.3             | 44                     | 2             | 1            |
| Australian Magpie             | <i>Cracticus tibicen</i>            | 43.8             | 32                     | 2             | 2            |
| Pied Currawong                | <i>Strepera graculina</i>           | 64.4             | 47                     | 4             | 2            |
| Grey Fantail                  | <i>Rhipidura albiscapa</i>          | 57.5             | 42                     | 4             | 1            |
| Australian Raven              | <i>Corvus coronoides</i>            | 35.6             | 26                     | 2             | 2            |
| Leaden Flycatcher             | <i>Myiagra rubecula</i>             | 21.9             | 16                     | 3             | 2            |
| Eastern Yellow Robin          | <i>Eopsaltria australis</i>         | 65.8             | 48                     | 6             | 2            |
| Silvereye                     | <i>Zosterops lateralis</i>          | 24.7             | 18                     | 40            | 5            |
| Red-browed Finch              | <i>Neochmia temporalis</i>          | 52.1             | 38                     | 20            | 4            |

Note: \*Indicates breeding

**Table 4.** Species seen infrequently between 1979 and 2012 (Reporting Rate < 20%).

| Common Name                 | Scientific Name                      | Reporting Rate % | Number months recorded | Maximum Count |
|-----------------------------|--------------------------------------|------------------|------------------------|---------------|
| Australian Brush-turkey *   | <i>Alectura lathamii</i>             | 1.1              | 3                      | 1             |
| Stubble Quail               | <i>Coturnix pectoralis</i>           | 0.4              | 2                      | 5             |
| Brown Quail                 | <i>Coturnix ypsilophora</i>          | 1.1              | 4                      | 3             |
| Australian Wood Duck        | <i>Chenonetta jubata</i>             | 0.7              | 2                      | 4             |
| Pacific Black Duck          | <i>Anas superciliosa</i>             | 1.1              | 3                      | 3             |
| Brown Cuckoo-Dove           | <i>Macropygia amboinensis</i>        | 9.8              | 28                     | 2             |
| Common Bronzewing *         | <i>Phaps chalcoptera</i>             | 9.1              | 26                     | 5             |
| Crested Pigeon              | <i>Ocyphaps lophotes</i>             | 1.1              | 2                      | 2             |
| Tawny Frogmouth *           | <i>Podargus strigoides</i>           | 3.5              | 10                     | 2             |
| White-throated Nightjar     | <i>Eurostopodus mystacalis</i>       | 6.3              | 18                     | 2             |
| Australian Owlet-nightjar   | <i>Aegotheles cristatus</i>          | 9.8              | 28                     | 4             |
| White-throated Needle-tail  | <i>Hirundapus caudacutus</i>         | 4.9              | 14                     | 40            |
| White-necked Heron          | <i>Ardea pacifica</i>                | 0.7              | 2                      | 1             |
| White-faced Heron           | <i>Egretta novaehollandiae</i>       | 0.4              | 1                      | 1             |
| Pacific Baza                | <i>Aviceda subcristata</i>           | 3.9              | 11                     | 2             |
| Brown Goshawk               | <i>Accipiter fasciatus</i>           | 3.2              | 9                      | 2             |
| Collared Sparrowhawk *      | <i>Accipiter cirrocephalus</i>       | 7.4              | 21                     | 2             |
| Grey Goshawk                | <i>Accipiter novaehollandiae</i>     | 2.5              | 7                      | 2             |
| Wedge-tailed Eagle          | <i>Aquila audax</i>                  | 10.2             | 29                     | 3             |
| Little Eagle *              | <i>Hieraaetus morphnoides</i>        | 5.6              | 16                     | 3             |
| Nankeen Kestrel             | <i>Falco cenchroides</i>             | 0.4              | 1                      | 1             |
| Brown Falcon                | <i>Falco berigora</i>                | 1.4              | 4                      | 3             |
| Australian Hobby            | <i>Falco longipennis</i>             | 1.4              | 4                      | 1             |
| Peregrine Falcon            | <i>Falco peregrinus</i>              | 1.8              | 5                      | 1             |
| Masked Lapwing              | <i>Vanellus miles</i>                | 1.4              | 4                      | 3             |
| Painted Button-quail *      | <i>Turnix varius</i>                 | 2.8              | 8                      | 4             |
| Galah                       | <i>Eolophus roseicapillus</i>        | 1.4              | 4                      | 8             |
| Sulphur-crested Cockatoo    | <i>Cacatua galerita</i>              | 11.2             | 32                     | 30            |
| Scaly-breasted Lorikeet     | <i>Trichoglossus chlorolepidotus</i> | 0.4              | 1                      | 5             |
| Musk Lorikeet               | <i>Glossopsitta concinna</i>         | 0.7              | 2                      | 5             |
| Little Lorikeet             | <i>Glossopsitta pusilla</i>          | 7.0              | 20                     | 14            |
| Eastern Koel                | <i>Eudynamis orientalis</i>          | 2.1              | 6                      | 1             |
| Channel-billed Cuckoo       | <i>Scythrops novaehollandiae</i>     | 9.5              | 27                     | 4             |
| Horsfield's Bronze-Cuckoo   | <i>Chalcites basalis</i>             | 6.3              | 18                     | 3             |
| Shining Bronze-Cuckoo       | <i>Chalcites lucidus</i>             | 4.2              | 12                     | 2             |
| Pallid Cuckoo               | <i>Cacomantis pallidus</i>           | 1.4              | 4                      | 1             |
| Brush Cuckoo                | <i>Cacomantis variolosus</i>         | 7.4              | 21                     | 3             |
| Powerful Owl                | <i>Ninox strenua</i>                 | 9.1              | 26                     | 2             |
| Azure Kingfisher *          | <i>Ceyx azureus</i>                  | 1.8              | 5                      | 1             |
| Sacred Kingfisher *         | <i>Todiramphus sanctus</i>           | 11.9             | 34                     | 4             |
| Rainbow Bee-eater           | <i>Merops ornatus</i>                | 10.9             | 31                     | 20            |
| Dollarbird *                | <i>Eurystomus orientalis</i>         | 6.3              | 18                     | 2             |
| Red-browed Treecreeper      | <i>Climacteris erythrops</i>         | 0.7              | 2                      | 1             |
| Brown Treecreeper           | <i>Climacteris picumnus</i>          | 0.7              | 2                      | 1             |
| Chestnut-rumped Heathwren * | <i>Hylacola pyrrhopygia</i>          | 1.4              | 4                      | 1             |
| Speckled Warbler *          | <i>Chthonicola sagittata</i>         | 2.1              | 6                      | 3             |
| Brown Gerygone              | <i>Gerygone mouki</i>                | 1.4              | 4                      | 4             |
| White-throated Gerygone *   | <i>Gerygone olivacea</i>             | 1.4              | 14                     | 6             |
| Yellow Thornbill            | <i>Acanthiza nana</i>                | 0.7              | 2                      | 6             |
| Buff-rumped Thornbill *     | <i>Acanthiza reguloides</i>          | 6.3              | 18                     | 8             |
| Fuscous Honeyeater          | <i>Lichenostomus fuscus</i>          | 0.7              | 2                      | 6             |
| Little Wattlebird           | <i>Anthochaera chrysoptera</i>       | 1.4              | 4                      | 2             |
| Regent Honeyeater           | <i>Anthochaera phrygia</i>           | 1.4              | 4                      | 20            |
| Scarlet Honeyeater          | <i>Myzomela sanguinolenta</i>        | 4.6              | 13                     | 4             |
| Crescent Honeyeater         | <i>Phylidonyris pyrrhopterus</i>     | 0.4              | 1                      | 1             |

**Table 4.** Species seen infrequently between 1979 and 2012 (Reporting Rate < 20%) (cont.).

| Common Name                 | Scientific Name                  | Reporting Rate % | Number months recorded | Maximum Count |
|-----------------------------|----------------------------------|------------------|------------------------|---------------|
| White-cheeked Honeyeater *  | <i>Phylidonyris niger</i>        | 5.6              | 16                     | 20            |
| Brown-headed Honeyeater     | <i>Melithreptus brevirostris</i> | 0.7              | 2                      | 5             |
| Grey-crowned Babbler *      | <i>Pomatostomus temporalis</i>   | 2.8              | 8                      | 5             |
| Varied Sittella *           | <i>Daphoenositta chrysoptera</i> | 8.1              | 23                     | 12            |
| White-bellied Cuckoo-shrike | <i>Coracina papuensis</i>        | 2.8              | 8                      | 2             |
| Crested Shrike-tit          | <i>Falcunculus frontatus</i>     | 6.0              | 17                     | 2             |
| Pied Butcherbird            | <i>Cracticus nigrogularis</i>    | 4.9              | 14                     | 2             |
| Spangled Drongo             | <i>Dicrurus bracteatus</i>       | 0.4              | 1                      | 1             |
| Rufous Fantail *            | <i>Rhipidura rufifrons</i>       | 3.9              | 11                     | 4             |
| Willie Wagtail *            | <i>Rhipidura leucophrys</i>      | 1.1              | 3                      | 1             |
| Black-faced Monarch         | <i>Monarcha melanopsis</i>       | 1.4              | 4                      | 3             |
| Magpie-lark                 | <i>Grallina cyanoleuca</i>       | 0.4              | 1                      | 1             |
| White-winged Chough *       | <i>Corcorax melanorhamphos</i>   | 13.3             | 38                     | 30            |
| Jacky Winter *              | <i>Microeca fascians</i>         | 1.4              | 4                      | 1             |
| Scarlet Robin               | <i>Petroica multicolor</i>       | 4.2              | 12                     | 2             |
| Flame Robin                 | <i>Petroica phoenicea</i>        | 0.4              | 1                      | 1             |
| Rose Robin                  | <i>Petroica rosea</i>            | 11.6             | 33                     | 4             |
| Welcome Swallow             | <i>Hirundo neoxena</i>           | 4.2              | 12                     | 5             |
| Bassian Thrush *            | <i>Zoothera lunulata</i>         | 10.2             | 29                     | 5             |
| Mistletoebird               | <i>Dicaeum hirundinaceum</i>     | 3.5              | 10                     | 4             |
| Double-barred Finch         | <i>Taeniopygia bichenovii</i>    | 1.8              | 5                      | 10            |
| Chestnut-breasted Mannikin  | <i>Lonchura castaneothorax</i>   | 0.4              | 1                      | 2             |

Note: \*Indicates breeding

**Table 5.** Reporting rates (%) of bird species which showed large changes in status during the 33-year study.

| Common Name                | 1979-1989 (Table 1) | 1990-2000 (Table 2) | 2001-2012 (Table 3) |
|----------------------------|---------------------|---------------------|---------------------|
| Wonga Pigeon               | 12.1                | 27.3                | 79.5                |
| Crimson Rosella            | 25                  | 20.6                | 47.9                |
| Eastern Rosella            | 23.3                | 8.4                 | 23.3                |
| White-throated Treecreeper | 53.4                | 34.6                | 82.2                |
| Satin Bowerbird            | 47.4                | 37.4                | 67.1                |
| Laughing Kookaburra        | 13.8                | 27.1                | 72.6                |
| Spotted Pardalote          | 10.3                | 22.4                | 54.8                |
| Eastern Spinebill          | 1.7                 | 21.5                | 42.5                |
| Lewin's Honeyeater         | 2.6                 | 34.6                | 72.6                |
| Yellow-faced Honeyeater    | 15.5                | 36.4                | 80.8                |
| Yellow-tufted Honeyeater   | 12.1                | 22.4                | 74                  |
| Bell Miner                 |                     |                     | 28.8                |
| Noisy Miner                | 26.7                | 1.9                 |                     |
| Eastern Whipbird           | 5.2                 | 22.4                | 50.7                |
| Golden Whistler            | 2.6                 | 21.5                | 64.4                |
| Grey Butcherbird           | 15.5                | 25.2                | 60.3                |
| Australian Magpie          | 11.2                | 22.4                | 43.8                |
| Pied Currawong             | 3.4                 | 31.8                | 64.4                |
| Eastern Yellow Robin       | 5.2                 | 33.6                | 65.8                |
| Red-browed Finch           | 9.5                 | 22.4                | 52.1                |

Large changes in the occurrence of the regularly recorded species (RR > 20%) are shown in **Table 5**. For inclusion in this table the frequency of occurrence must have either at least doubled or halved between successive 11-year periods. Only one species, Noisy Miner *Manorina melano-*

*cephala*, declined to this extent, whereas 19 species increased.

A number of bird species now listed as threatened under the *Threatened Species Conservation Act 1995* (NSW) have been recorded on *Wirrumbirra*, some of which even now remain as breeding

species (**Table 6**). It is not surprising that two of these, the Little Eagle *Hieraetus morphnoides* and the Brown Treecreeper *Climacteris picumnus* have not been recorded in recent years, since a noticeable state-wide decline has resulted in these species being listed. To judge from recent research,

Speckled Warbler *Chthonicola sagittata* may be among the few species which suffer from the cessation of grazing, which is consistent with their sparse occurrence at *Wirrumbirra* in the later years of this study (Newman 2010, Roderick & Stuart 2010).

**Table 6.** Threatened species recorded at *Wirrumbirra* from 1979 to 2012

| Common Name                                  | 1979       | 1980-1989               | 1990-1999        | 2000-2012                        |
|--|------------|-------------------------|------------------|----------------------------------|
| Little Eagle *                               |            | 1982-84, 1986           | 1993             |                                  |
| Glossy Black-Cockatoo *                      | 1979       | 1980-1986,<br>1988-89   | 1990-1999        | 2000-03, 05, 06,<br>2008-12      |
| Gang-gang Cockatoo *                         | 1979       | 1980-1987               | 1990-1999        | 2000-2012                        |
| Little Lorikeet                              |            | 1980, 82, 83, 85,<br>86 | 1997, 1998       | 2003, 09, 11, 12                 |
| Powerful Owl                                 | 1979       | 1981-1986               | 1990, 92, 94, 99 | 2000, 01, 12                     |
| Brown Treecreeper                            | April 1979 | May 1980                |                  |                                  |
| Speckled Warbler *                           | 1979       | 1980-1983               |                  | 2001                             |
| Regent Honeyeater<br>(Critically Endangered) |            | 1983, 1984              |                  |                                  |
| Grey-crowned Babbler *                       | 1979       | 1982, 1983              |                  | 2010                             |
| Varied Sittella                              | 1979       | 1980-1982               | 1991, 1999       | 2000, 01, 04-5,<br>2008-10, 2012 |
| Scarlet Robin                                | 1979       | 1980, 1983-1986         | 1992             | 2009                             |
| Flame Robin                                  |            |                         | 1991             |                                  |

Note: \* Indicates the existence of breeding records

## DISCUSSION

*Wirrumbirra* with a bird list of 124 species, including 51 which have bred, supports a diverse population of woodland and open-country birds. Eleven of these species (**Table 6**), of which five have bred on the property, are listed as Vulnerable under the *Threatened Species Conservation Act 1995* (NSW). Of these the Glossy Black-Cockatoo and Gang-gang Cockatoo breed on the *Wirrumbirra* property, and have limited distribution in the Hunter Region (Newman *et al.* 2010). Glossy Black-Cockatoos are usually encountered feeding on *Allocasuarina* fruits and the Wollombi/Laguna area is one of the strongholds of the species in the Hunter Region (Roderick & Stuart 2010). They may commonly be seen and heard, sometimes perched all day in these trees, as they delicately extract the seeds.

The Regent Honeyeater *Anthochaera phrygia*, which is listed as Critically Endangered under the

*Threatened Species Conservation Act 1995* (NSW) was recorded in August and September 1983 and again in August 1984. At this time *Eucalyptus sparsifolia* was flowering profusely. It is possible they have been present at other times, but did not coincide with our visits.

The Grey-crowned Babbler *Pomatostomus temporalis* was often present in the first few years, when the vegetation was more open. It nested in April 1982, but has been absent since, possibly due to vegetation changes. Within the Hunter Region it occurs widely, including areas where the habitat has been substantially modified (Roderick & Stuart 2010). Its decline as vegetation increased had similarities to that of the Noisy Miner (see below), but no clear connection can be established, since it was always less frequently observed than that species.



## Changes in Bird Population

The most striking feature of the 33-year period results was the progressive increase in the richness and diversity of the bird population over the years, with 10 (**Table 1**), 34 (**Table 2**) and 40 (**Table 3**) species being recorded regularly (RR > 20%) in the successive 11-year periods between 1979 and 2012. In the second and third periods of the study 19 species had reporting rates at least double those in the first 11 years, whereas only one species, the Noisy Miner declined (**Table 5**). These increases, (**Table 3**), indicate that removing cattle and allowing the cleared areas to revegetate have had an overall improvement on the quality of bird habitat. At *Wirrumbirra* features of the vegetation regrowth included development of stands of *Allocasuarina littoralis* a species favoured by Glossy Black-Cockatoos. Also, in one former open area, a group of *Sannantha pluriflora* (syn. *Baeckea*) closed the canopy. However, the restoration of vegetation and the dynamic of the change in bird population was a long-term process, requiring over 20 years to approach full effect. The increased recording for some species, such as the Wonga Pigeon, during this period might also be because of vegetation regrowth.

A further factor impacting on the rate of recovery of bird populations is the presence of the Noisy Miner. Under grazed conditions degraded open woodland lacks the variety of vegetation type and

structure to support diverse bird populations. This situation is exacerbated by the presence of Noisy Miners, which were frequently observed only during the initial years of this study (**Table 1**). Noisy Miners are a despotic species, which drives out smaller species from open woodland in the absence of understorey vegetation (Maron *et al.* 2013). Newman (2013) found it took about ten years after cattle were removed before the habitat became unsuitable for Noisy Miners, similar to the duration of their persistence after grazing ceased in this study (**Table 5**).

The Bell Miner *Manorina melanophrys*, another despotic, colonial species, first appeared in February 2008 but was not seen after the end of 2011. On a subsequent visit we found this species further along the creek in a neighbouring property, presumably an instance of the periodic relocations of colonies, for which this species is known (M. Newman pers. comm.).

## Other Species

Some highlights of the other species recorded at *Wirrumbirra* follow.

The Superb Lyrebird was the most recorded species (66.7 %). Nests (**Figure 2**) were found each year and the young birds were observed most years.



**Figure 2.** Superb Lyrebird nest at *Wirrumbirra* 1994



The Rockwarbler *Origma solitaria*, the only bird species endemic to NSW, was regularly recorded. The Rockwarbler is a supporting species in the nomination of the Greater Blue Mountains Important Bird Area based on its restricted range and specialised habitat requirements, namely forested sandstone gorges with caves. *Wirrumbirra*, which is immediately adjacent, also provides this specialised habitat.

In August 2006 the fresh mound of an Australian Brush-turkey *Alectura lathami* was discovered in our rainforest, which we planted in a small gully. We did not record the bird at this time, but in September 2011 and October 2012 it was sighted.

Parrots and cockatoos are particularly well represented at *Wirrumbirra*. Among species regularly recorded, Glossy Black-Cockatoos have already been discussed. Gang-gang Cockatoos have been observed feeding on the fruits of the *Eucalyptus* spp. that dominate the open forest. They also feed on the fruits of *Persoonia linearis*, another dominant species. Yellow-tailed Black-Cockatoos have been noted extracting the wood-boring larvae of insects from the stems of *Acacia parvipinnula*, another common tree. Australian King-Parrot *Alisterus scapularis*, Crimson Rosella *Platycercus elegans* and Eastern Rosella *P. eximius* are also attracted to the property.

A Crescent Honeyeater *Phylidonyris pyrrhopterus* observed feeding in a grevillea species in July 1999 was notable in that most Hunter Region records are restricted to high altitude alpine habitat. This record suggests it may come to lower altitudes in winter.

## CONCLUSIONS

The vegetation is important habitat for the Glossy Black-, Yellow-tailed, and Gang-gang Cockatoos, as well as Australian King-Parrot, Crimson and Eastern Rosellas that have all been recorded regularly at *Wirrumbirra*. For example, large stands of *Allocasuarina torulosa* occur frequently across the property, and provide a regular food supply.

Although the observer effort involved in compiling the monthly lists was variable, nevertheless a pattern emerges of consistent sightings and changes in *Wirrumbirra*'s bird population. Of particular note is that the net increase in bird species is correlated with the extensive regrowth of eucalypts following the removal of cattle, with very few cleared areas now remaining. Other patterns are the regular arrival of some species, coinciding with the mass flowering of *Eucalyptus sparsifolia*.

It is gratifying to know this area is preserved in perpetuity under a Voluntary Conservation Agreement with the NSW National Parks and Wildlife Service.

## ACKNOWLEDGEMENTS

Mike Newman and Alan Stuart of Hunter Bird Observers Club are thanked for their assistance. Allan Raine and Carolyn Raine also gave advice.

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