

CURRACABUNDI NATIONAL PARK

Report on avian surveys conducted for the National Parks and
Wildlife Service, New South Wales

January 2010 to February 2013

An assessment of avian species and numbers in the property comprising
Karamea Homestead and the adjoining Curricabark and Mernot creek valleys
in the eastern section of Currabundi National Park

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Report for the National Parks and Wildlife Service, New South Wales, on three years of field surveys assessing avian species and numbers present on the property Karamea, a newly gazetted section of Curracabundi National Park.

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Summary

Following discussions in 2009 with Terry Evans, then Manager of the Gloucester office of the National Parks and Wildlife Service (NPWS) and Penny Drake-Brockman of the Gloucester Environment Group (GEG), and agreement between NPWS Head Office Sydney and the GEG, a three year project was agreed to assess the presence and number of avian species on the property Karamea, a newly gazetted section of Curracabundi National Park. The area to be surveyed included the Homestead on the Barnard River to the south, and the catchments of Curricabark and Mernot Creeks beyond the steep ridge behind the Homestead to the west and south-west. In addition Mr. Evans requested that all avian migratory observations be recorded. Between January 2010 and February 2013 ten survey campaigns were conducted involving 21 survey sites. A total of 126 bird species were recorded for the area. 112 of these species occurred at the survey sites. Six species listed as Threatened and Endangered under the New South Wales Threatened Species and Conservation Act 1995 and all migratory movements observed were recorded. The range of species recorded demonstrates the importance of Curracabundi National Park as a reserve for eastern Australian woodland birds, many of which are in decline as urbanisation and land clearing continues to eat away at their habitat. The presence of six threatened species further supports the gazettement of the area as Wilderness and National Park. The results of this study highlight its value as a vital link in the Great Eastern Ranges Corridor.

Introduction

The eastern section of Curracabundi National Park, comprising the property Karamea, is 340 km north of Sydney (Figures 1 and 2). It lies in a rain shadow with on average a lower rainfall than the surrounding Gloucester-Nowendoc area, with cold winters and hot summers. The area surveyed is characterized by extremely steep forested slopes and almost impassable pinches created by the Barnard River and its tributary creeks, with sections of pasture land in the valleys and along water courses. Other than cedar extraction and some larger tree felling, much of the original timber remains with only one large section of partially cleared land in the Curricabark valley behind the steep ridge at the rear of the Homestead and cattle yards, small clearings on summits along the trails, and the land surrounding the house and on the flats either side of the Barnard River. The remote areas are currently being allowed to regenerate.

Settled by the Australian Agricultural Company (AA Company) in the 1830s, the area was used to run sheep, although these began to be replaced by cattle in the 1840s with attempts made to reintroduce them a century later. In the late 1840s the AA Company began to reduce its holdings in the northern section of its Gloucester leases and large runs were granted to squatters.

Karamea's 2,640 hectares were gazetted in September 2006 into Curracabundi National Park along with the properties of Rock Glen, Lea Hurst and Watchimbark, and Brett, Camels Hump, Mernot and Monkeycot nature reserves, which connect to Woko National Park to the south-east, and will form a section of the Great Eastern Ranges Corridor. A large section of the park (19,914 hectares) was gazetted Wilderness in 2011. Access is via Giro on the original Gloucester/ Nowendoc dirt road (the present main road being constructed in 1959) through private land and at the time of writing this report, access remained subject to agreement with the Giro landowners. See **Figures 1 and 2** below.

Previous avian studies conducted to the west of Karamea include the following:

E. L. Hyem's work on owls in areas adjoining Mernot and Monkeycot and his publication "Observations on Owls in the Upper Manning River District, NSW" *Corella* Vol. 3, June 1979, No.2, was the culmination of 30 years observing Sooty Owl *Tyto tenebricosa*, Masked Owl *Tyto novaehollandiae*, Eastern Barn Owl *Tyto delicatula*, Powerful Owl *Ninox strenua*, and Southern Boobook *Ninox novaeseelandiae*.

NPWS bird census, 5-9 May 2004 led by Trish Waters, NPWS ranger, and Tod Sonderquist, at Watchimbark Nature Reserve, when 54 species were located.

The National Parks Association three day survey of birds, plants, mammals and spiders, 12-15 April 2007, based at Glen Rock, with Stephen Debus leading a group of bird watchers, when over 70 species were recorded, including Southern Boobook, Masked and Powerful owls.



Figure 1: Karamea Homestead Site 17

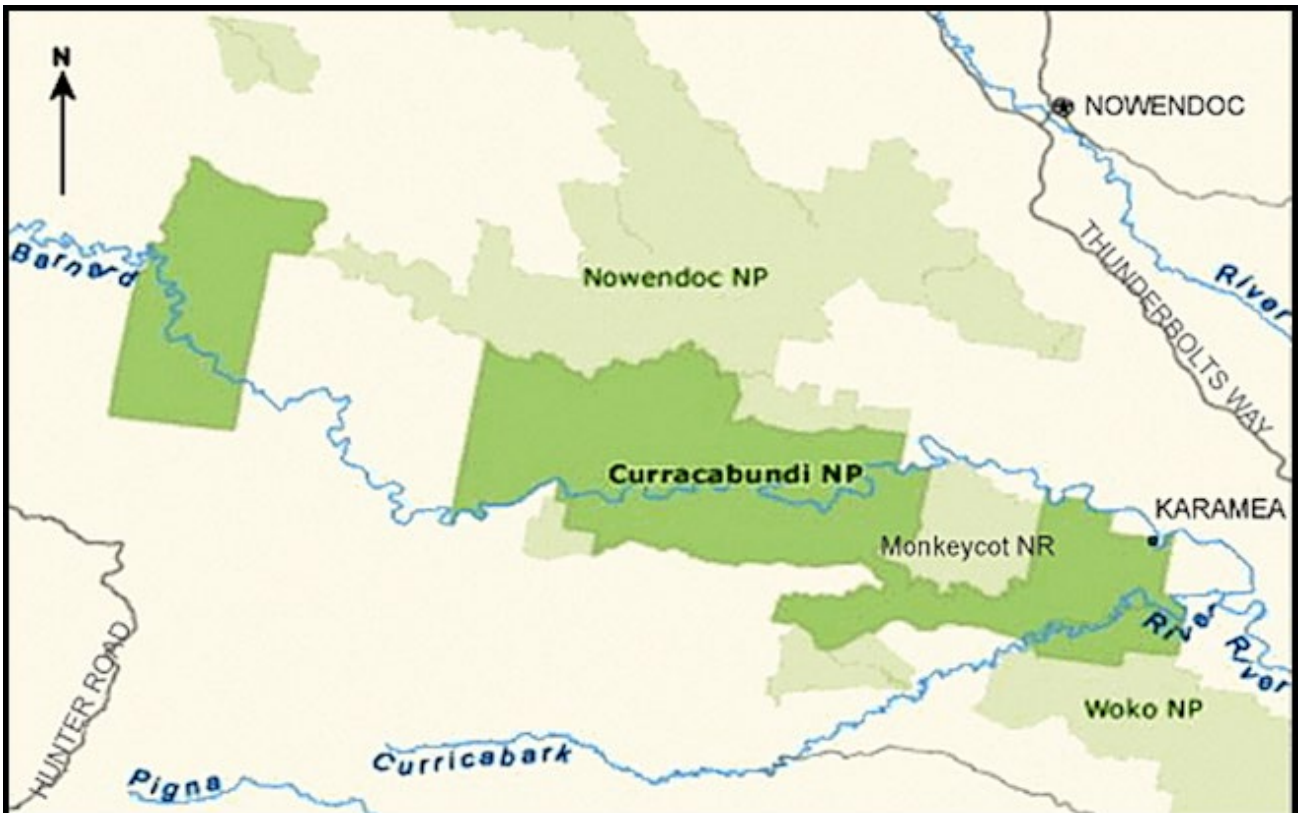


Figure 2: Map showing Karamea Station in relation to Curracabundi National Park

Methods

Owing to the extreme steepness of access tracks, thickly vegetated slopes and creek crossings at the back of the Homestead, 15 transects were initially selected along the vehicle tracks bordering Mernot and Curricabark Creeks, with a further two at the Homestead and Barnard River, covering as wide a variety of habitat/vegetation types as possible. An additional three sites were selected following NPWS track clearance at the far end of the Mernot track and one site on Curricabark when flooding prevented access to the three far sites, making a total of 21 sites. Sites were to be surveyed four times a year starting from January 2010, and star pickets were set up with GPS WGS40 co-ordinates taken. Sites were registered with Birds Australia, now BirdLife Australia (BLA), and Atlas forms submitted to the BLA Birddata archive following each survey event. Sites could only be accessed in robust 4WD vehicles due to the ford crossings and steep, stony and often slippery trails.

The data acquisition design used the standard BLA 2ha survey method which involves sampling bird populations at fixed sites of constant area (2ha) for a period of 20 minutes. The principle underlying this design is that competent observers will locate most (>80%) of bird species present in a 2ha area during 20 minute surveys conducted when birds are active. Surveys were conducted as early in the day as possible to ensure high levels of bird activity with species present being recorded as well as an estimate of number of each species. Collecting records in this systematic manner facilitates intra-site comparisons of bird populations as well as variations at sites between seasons and years. At each site 20 minute surveys were conducted on foot by two or more participants, walking 100 meters along the track either side of a centre point, recording species both visually and by call 50 meters either side of the track, including fly-overs together with an estimate of the number of each species present. Significant bird activity was noted, in particular presence of vulnerable or endangered species, breeding, foraging, migration and the presence of mammal, reptile or feral species.

One brief night-time survey for owls was carried out on November 2011 when a Southern Boobook responded to call-back at Mernot Site 3. During all visits night-birds heard from the Homestead area and all species seen or heard outside of survey sites and time limits were recorded, providing a more complete species list for the park. However since these additional records were not acquired in a systematic manner, their use in data analysis is limited.

Out of the projected 12 survey events, only ten were completed due to extreme wet weather conditions outlined below. On some occasions 2ha sites were surveyed more than once at different times of day but only one of these duplicate surveys, held early morning and with the highest number of recorded species, was used for data analysis.

Weather restrictions

Barnard River - heavy rain on several occasions in 2011 and 2012 caused delay or abandonment of surveys when the river flooded the causeway leading to the Homestead. In 2012 flooding dumped tons of gravel on the southern side of the causeway, sweeping the flats at Site 17 clear of weedy vegetation and a large dead tree, thus changing the habitat.

Curricabark Creek - flooding caused the creek ford to Site 12 and beyond to be inaccessible during the first survey visit. Site 12A was added on the second survey visit when it was not possible to cross the second ford, and this new site was surveyed eight times. Sites 13, 14 and 15 beyond the second ford could not be surveyed during the first three visits due to flooding and washout of the track, and were therefore surveyed seven times. Site 9 was missed in May 2010 and surveyed nine times.

Mernot Creek - three new sites were created (MT1, MT2 and MT3) in September 2010 after the track beyond the ford at Site 7 was cleared by NPWS staff, and surveyed eight times.

Results

A total of 126 species was recorded overall as detailed in Tables 1A and 1B. This number included 111 species recorded during surveys at the 21 designated sites (**Table 1A**), and a further 15 species (**Table 1B**) recorded outside of time limits at the sites or in other areas of the park. Six species listed as threatened and endangered under the New South Wales Scientific Committee Threatened Species Conservation Act 1995, were recorded at the 2ha survey sites or elsewhere in the park (**Table 2**).

Table 1A. Recording rates of 111 species at twenty-one two-hectare sites – total of 209 surveys

Common Name	Scientific Name	Number of survey sites recorded ¹	Maximum number in one survey	Total birds all surveys	Reporting rate all surveys ² (%)
Brown Quail	<i>Coturnix ypsilophora</i>	8	13	48	6.7
Pacific Black Duck	<i>Anas superciliosa</i>	4	11	36	6.2
Australasian Grebe	<i>Tachybaptus novaehollandiae</i>	1	1	1	1.4
Little Pied Cormorant	<i>Microbarbo melanoleucos</i>	2	2	7	1.4
Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>	1	23	26	1.9
Great Cormorant	<i>Phalacrocorax carbo</i>	1	1	1	0.5
White-faced Heron	<i>Egretta novaehollandiae</i>	2	1	2	1.0
Black-shouldered Kite	<i>Elanus axillaris</i>	3	1	3	1.4
Brown Goshawk	<i>Accipiter fasciatus</i>	5	1	2	2.4
Grey Goshawk	<i>Accipiter novaehollandiae</i>	2	1	2	1.0
Wedge-tailed Eagle	<i>Aquila audax</i>	13	3	27	10.5
Brown Falcon	<i>Falco berigora</i>	3	1	4	1.9
Black Falcon	<i>Falco subniger</i>	1	1	1	0.5
Nankeen Kestrel	<i>Falco cenchroides</i>	1	1	2	0.5
Dusky Moorhen	<i>Gallinula tenebrosa</i>	2	1	2	1.0
Masked Lapwing	<i>Vanellus miles</i>	4	2	8	3.3
Brown Cuckoo-Dove	<i>Macropygia amboinensis</i>	4	2	5	2.9
Bar-shouldered Dove	<i>Geopelia humeralis</i>	2	6	12	1.4
Wonga Pigeon	<i>Leucosarcia picata</i>	12	2	23	9.6
Wompoo Fruit-Dove	<i>Ptilinopus magnificus</i>	1	4	4	0.5
Topknot Pigeon	<i>Lopholaimus antarcticus</i>	3	13	20	2.9
Glossy Black-Cockatoo	<i>Calyptorhynchus lathami</i>	7	11	32	5.3
Yellow-tailed Black-Cockatoo	<i>Calyptorhynchus funereus</i>	5	5	12	1.9
Australian King Parrot	<i>Alixterus scapularis</i>	7	8	31	5.7
Crimson Rosella	<i>Platycercus elegans</i>	15	17	127	20.1
Eastern Rosella	<i>Platycercus eximius</i>	1	2	2	0.5
Musk Lorikeet	<i>Glossopsitta concinna</i>	1	4	4	0.5
Brush Cuckoo	<i>Cacomantis variolosus</i>	12	2	13	5.7
Fan-tailed Cuckoo	<i>Cacomantis flabelliformis</i>	17	2	35	15.3
Horsfield's Bronze-Cuckoo	<i>Chalcites basalus</i>	2	2	3	1.0
Shining Bronze-Cuckoo	<i>Chalcites lucidus</i>	6	2	6	1.9
Eastern Koel	<i>Eudynamys orientalis</i>	8	2	10	3.8
Channel-billed Cuckoo	<i>Scythrops novaehollandiae</i>	2	3	6	1.4
Pheasant Coucal	<i>Centropus phasianinus</i>	1	1	1	0.5
Tawny Frogmouth	<i>Podargus strigoides</i>	1	1	1	0.5
White-throated Nightjar	<i>Eurostopodus mystacalis</i>	1	2	2	0.5
White-throated Needletail	<i>Hirundapus caudacutus</i>	2	25	33	1.0
Azure Kingfisher	<i>Ceyx Azurea</i>	1	2	4	1.4
Laughing Kookaburra	<i>Dacelo novaeguineae</i>	10	4	22	7.7
Sacred Kingfisher	<i>Todiramphus sanctus</i>	3	1	3	1.9
Dollarbird	<i>Eurystomus orientalis</i>	2	1	3	1.9
Superb Lyrebird	<i>Menura novaehollandiae</i>	3	1	3	1.4
White-throated Treecreeper	<i>Cormobates leucophaea</i>	18	3	55	25.4
Red-browed Treecreeper	<i>Climacteris erythrops</i>	1	1	1	0.5
Superb Fairy-wren	<i>Malurus cyaneus</i>	20	30	540	46.4
Variegated Fairy-wren	<i>Malurus lamberti</i>	10	5	51	7.2
Red-backed Fairy-wren	<i>Malurus melanocephalus</i>	8	6	39	4.8
Southern Emu-wren	<i>Stipiturus malachurus</i>	1	4	5	1.0
Spotted Pardalote	<i>Pardalotus punctatus</i>	21	15	19	46.4

Striated Pardalote	<i>Pardalotus striatus</i>	2	2	3	5.7
Yellow-throated Scrubwren	<i>Sericornis citreogularis</i>	2	1	2	1.4
White-browed Scrubwren	<i>Sericornis frontalis</i>	16	6	91	27.8
Large-billed Scrubwren	<i>Sericornis magnirostra</i>	7	3	12	3.8
Speckled Warbler	<i>Chthornicola sagittata</i>	4	2	8	3.8
Brown Gerygone	<i>Gerygone mouki</i>	15	10	131	18.2
White-throated Gerygone	<i>Gerygone olivacea</i>	10	6	30	8.1
Brown Thornbill	<i>Acanthiza pusilla</i>	18	6	127	34.4
Buff-rumped Thornbill	<i>Acanthiza reguloides</i>	9	6	40	5.7
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>	4	11	38	3.8
Yellow Thornbill	<i>Acanthiza nana</i>	16	10	123	17.2
Striated Thornbill	<i>Acanthiza lineata</i>	18	27	293	18.7
Red Wattlebird	<i>Anthochaera carunculata</i>	5	1	7	3.8
Noisy Friarbird	<i>Philemn corniculatus</i>	20	12	111	23.4
Bell Miner	<i>Manorina melanophrys</i>	13	50	598	31.1
Noisy Miner	<i>Manorina melanocephala</i>	5	8	34	5.7
Lewin's Honeyeater	<i>Meliphaga lewinii</i>	21	13	290	70.3
Yellow-faced Honeyeater	<i>Lichenostomus chrysoptus</i>	21	40	389	50.7
White-plumed Honeyeater	<i>Lichenostomus penicillatus</i>	1	1	1	0.5
Brown-headed Honeyeater	<i>Melithreptus brevirostris</i>	1	2	2	0.5
White-naped Honeyeater	<i>Melithreptus lunatus</i>	12	20	112	14.8
Eastern Spinebill	<i>Acanthorhynchus tenuirostris</i>	18	3	64	23.4
Scarlet Honeyeater	<i>Myzomela sanguinolenta</i>	19	7	62	16.7
Jacky Winter	<i>Microeca fascinans</i>	6	3	31	8.6
Scarlet Robin	<i>Petroica boodang</i>	1	1	1	1.0
Rose Robin	<i>Petroica rosea</i>	9	1	10	5.7
Eastern Yellow Robin	<i>Eopsaltria australis</i>	21	3	86	35.9
Eastern Whipbird	<i>Psophodes olivaceus</i>	16	6	110	29.7
Spotted Quail-thrush	<i>Cincoloma punctatum</i>	3	2	9	2.9
Varied Sittella	<i>Daphoenositta chrysoptera</i>	3	3	9	1.4
Crested Shrike-tit	<i>Falcunculus frontatus</i>	2	1	2	1.0
Golden Whistler	<i>Pachycephala pectoralis</i>	21	2	102	42.6
Rufous Whistler	<i>Pachycephala ruficentris</i>	16	5	28	11.0
Grey Shrike-thrush	<i>Colluricincla harmonica</i>	21	3	117	45.0
Black-faced Monarch	<i>Monarcha melanopsis</i>	8	3	20	5.3
Leaden Flycatcher	<i>Myiagra rubecula</i>	10	4	20	6.2
Restless Flycatcher	<i>Myiagra inquieta</i>	1	1	1	0.5
Magpie-lark	<i>Grallina cyanoleuca</i>	4	2	15	5.3
Rufous Fantail	<i>Rhipidura rufifrons</i>	2	1	2	1.0
Grey Fantail	<i>Rhipidura albiscapa</i>	21	6	201	50.7
Willie Wagtail	<i>Rhipidura leucophrys</i>	10	6	61	17.7
Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	7	5	22	45.3
Cicadabird	<i>Coracina tenuirostris</i>	14	2	19	9.1
White-winged Triller	<i>Lalage sueurii</i>	1	1	1	0.5
Olive-backed Oriole	<i>Oriolus sagittatus</i>	10	3	20	7.2
Australasian Figbird	<i>Sphecotheres vieilloti</i>	2	2	3	1.0
Dusky Woodswallow	<i>Artamus cyanopterus</i>	1	3	6	1.4
Grey Butcherbird	<i>Cracticus torquatus</i>	12	2	25	10.5
Pied Butcherbird	<i>Cracticus nigrogularis</i>	5	2	11	3.8
Australian Magpie	<i>Cracticus tibicen</i>	12	5	46	16.3
Pied Currawong	<i>Strepera graculina</i>	21	26	300	44.0
Australian Raven	<i>Corvus coronoides</i>	5	3	13	4.3
Little Raven	<i>Corvus mellori</i>	6	7	18	4.3
Green Catbird	<i>Ailuroedus crassirostris</i>	4	3	7	2.4
Satin Bowerbird	<i>Ptilonorhynchus violaceus</i>	9	15	43	11.0
Double-barred Finch	<i>Taeniopygia bichenovii</i>	2	9	18	1.9
Red-browed Finch	<i>Neochmia temporalis</i>	20	40	394	28.7
Mistletoebird	<i>Dicaeum hirundinaceum</i>	8	5	19	6.7
Welcome Swallow	<i>Hirundo neoxena</i>	5	10	36	7.2
Tree Martin	<i>Petrochelidon nigricans</i>	2	12	43	2.9
Rufous Songlark	<i>Cincloramphus mathewsi</i>	1	2	2	1.4
Silveryeye	<i>Zosterops lateralis</i>	18	15	220	27.8

Table 1B. 15 Species recorded outside of survey time limits or in other areas of the park

Common name	Scientific name	Details
Australian Brush Turkey	<i>Alectura lathami</i>	One bird on the Mernot track between sites 3 and 4 in April 2012.
White-headed Pigeon	<i>Columba leucomela</i>	One or more birds feeding in fig trees overhanging the Barnard River Site 16 February 2013.
Common Bronzewing	<i>Phaps chalcoptera</i>	Single birds foraging on the track at Mernot Sites 4 and 7, in May 2010 and November 2011.
Australian Owlet-Nightjar	<i>Aegotheles cristatus</i>	Heard from Homestead Site 17, January 2010.
Pied Cormorant	<i>Phalacrocorax varius</i>	One bird flying up the Barnard River at site 16, July 2013.
White-necked Heron	<i>Ardea pacifica</i>	One bird flying up the Barnard River at Site 17 November 2011
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	Single birds over the Barnard River in September 2010 and April 2012.
Australian Hobby	<i>Falco longipennis</i>	Observed from the Homestead Site 17 in January 2010 and February 2013.
Buff-banded Rail	<i>Gallirallus philippensis</i>	One bird foraging in the Homestead garden Site 17 January 2010
Galah	<i>Eolophus roseicapillus</i>	Single birds recorded from the Homestead Site 17, flying towards Giro Station, January and May 2010.
Southern Boobook	<i>Ninox novaeseelandiae</i>	Heard from Homestead Site 17 several times and at Site 3 November 2011.
Regent Bowerbird	<i>Sericulus chrysocephalus</i>	Seen after time at Site 3, 31 January 2010 day of survey, and at ruined cottage site on 30 January 2010.
Fairy Martin	<i>Petrochelidon ariel</i>	Several birds observed at Curricabark Site 10 February 2013.
Bassian Thrush	<i>Zoothera lunulata</i>	Single bird flushed on the track near Mernot Site 5 September 2010.
Common Myna	<i>Sturnus tristis</i>	Two birds observed from Homestead Site 17 in January and May 2010.

Table 2 - Threatened Species

Six species listed as Threatened and Endangered under the New South Wales Threatened Species and Conservation Act 1995 were recorded.

Common name	Scientific name	Details
Wompoo Fruit Dove	<i>Ptilinopus magnificus</i>	Four recorded Site 16 August 2011 foraging in fig trees flanking river.
Glossy Black-Cockatoo	<i>Calyptorhynchus lathami</i>	Present in steep woodland, usually in groups of two or three, where <i>Allocasurina sp</i> present and once at Barnard River Site 16. Maximum number at one time, 11 perched in dead tree at Site 7 August 2011.
Speckled Warbler	<i>Chthonicola sagittata</i>	Recorded seven times in open woodland with good shrub layer and thick grass at Sites 9, 16, 17, MT1 and MT2. Site 16 was deserted after floods mid 2011 when most small birds moved up hill to Site 17, including the warblers.
Varied Sittella	<i>Daphoenositta chrysoptera</i>	Groups of three recorded at Site 8 May 2010, Site 9 February 2011 and Site MT1 May 2011.
Crested Shrike-tit	<i>Falcunculus frontatus</i>	One recorded at Site 7 in May and at Site 5 in September 2010.
Scarlet Robin	<i>Petroica boodang</i>	One recorded at Site 17 July 2012 and a pair April/July 2012 at Site 16.

Migratory Movements

Migratory activity of species was noted as detailed in **Table 3**. It was observed that birds used the Barnard River as a route connecting to the Manning River and the coastal belt. Migrating groups were observed in spring flying over the Homestead and the ridge behind to access the Curricabark Valley and areas beyond, and vice versa in autumn. There is a high thickly forested ridge on the east side of the Barnard River which would appear to force the birds to take a south-easterly route before they can turn north-east into the Manning valley.

Table 3. Observations of spring and autumn migration

Month/year	Observations
May 2010	Parties of Noisy Friarbirds, Australian Figbirds, Yellow-faced Honeyeaters and Silvereyes flying over the Homestead Site 17 from the ridge behind, down to and following the Barnard River.
September 2010	Parties of Spotted Pardalotes and Yellow-faced Honeyeaters flying over the Homestead Site 17 and ridge behind, north and west into Mernot and Curricabark Creek valleys.
August 2011	Yellow-faced and White-naped Honeyeaters and Silvereyes migrating in small groups, flying up the Barnard River valley and over the Homestead into Mernot and Curricabark Creek valleys. Many Scarlet Honeyeaters present.
April 2012	Small parties of Yellow-faced Honeyeaters passing over the Homestead south to the Barnard River, some stopping to feed in flowering grevillea in the garden.
February 2013	Noisy Friarbirds at Site 4 exhibiting pre-migratory behaviour, calling and assembling.

Nocturnal Species

Although night-time call-back was not carried out systematically, all sightings made or calls heard were recorded as shown below in **Table 4**.

Table 4. Observations and calls recorded of nocturnal species

Month/year	Observations
Tawny Frogmouth <i>Podargus strigoides</i>	Recorded during survey at Site 17 January 2010.
Australian Owlet-nightjar <i>Aegotheles cristatus</i>	Heard once at the Homestead in January 2010.
White-throated Nightjar <i>Eurostopodus mystacalis</i>	Heard at night calling from the hillside behind the Homestead in January 2010 and two flushed during survey at Site 3 November 2011.
Southern Boobook <i>Ninox novaeseelandiae</i>	Heard at night on several occasions from the Homestead Site 17 and once at Site 3 November 2011.

Raptor Species

Table 5 details all records of raptors. It was apparent that the pair of Wedge-tailed Eagles, regularly observed from the Homestead Site 17 and in the Curricabark Valley, occupied this section of the park. Sightings of Wedge-tailed Eagles over the ridge near Drovers Gate and beyond the Curricabark valley leading into Watchimbark, may indicate another territory. Two Nankeen Kestrels recorded in 2010 were not reported subsequently. The Black Falcon is fairly often recorded in the Hunter Valley but to the author's knowledge has not previously been recorded in the Gloucester area.

Table 5. Sightings and calls recorded of raptor species

Black-shouldered Kite <i>Elanus axillaris</i>	A pair seen from the Homestead Site 17 Feb 2013 and recorded at Sites 10, 11 and 12A in the Curricabark Valley.
Brown Goshawk <i>Accipiter fasciatus</i>	Recorded at Site 17 and Sites 7 and MT2 Mernot track and 11, 12 and 12A Curricabark Track.
Grey Goshawk <i>Accipiter novaehollandiae</i>	Recorded November 2011 at Sites 14 and 15 Curricabark Track. Second sighting possibly the same bird or mate of one at Site 14.
White-bellied Sea-Eagle <i>Heliaeetus leucogaster</i>	Single adult and an immature observed flying over the Barnard River in September 2010 and April 2012 respectively.
Wedge-tailed Eagle <i>Aquila audax</i>	A pair usually seen from the Homestead Site 17 and in the Curricabark and Mernot Creek valleys. Two adults observed May 2010 harassing two immature eagles at Site 17. Recorded all visits.
Black Falcon <i>Falco subniger</i>	An unusual record of one at Site 10 Curricabark valley in February 2013.
Brown Falcon <i>Falco berigora</i>	One or two recorded in open areas of the Curricabark Valley at Sites 10, 11 and 12.
Nankeen Kestrel <i>Falco cenchroides</i>	A pair recorded at the Homestead Site in 17 January, May and September 2010, but not since.
Australian Hobby <i>Falco longipennis</i>	Recorded at Homestead Site 17 in January 2010 and February 2013.

Reporting rates, abundance and distribution of species

The relative frequency of occurrence of the 111 bird species recorded during the 2ha surveys is indicated in the Reporting Rates in **Table 1A**, in which the reporting rates (RR which is the percent frequency of occurrence of a species in all 2ha surveys across the 21 survey sites) and the total number of species seen in all the surveys, gives an indication of relative abundance. The spread of the distribution of each species is indicated by the number of 2ha sites in which each species was recorded (e.g. White-throated Treecreeper was widespread being recorded at 18 of the 21 2ha survey sites).

Species of Conservation Concern

Three species of conservation concern were recorded but at the time of the surveys, only one, the Bell Miner, might be considered of immediate significance.

Bell Miners - present in large flocks along Mernot Creek and slightly smaller flocks along Curricabark Creek. There is some damage to trees in these areas and over the three years of surveys an increase in numbers and a slight movement of the flocks along the creeks was noted. Bell Miner colonies are mainly found in wet gullies with dense vegetation. Colonies periodically redistribute when the damage to the foliage renders an area unsuitable.

Noisy Miners - recently listed as a Threatening Process, were present in low numbers in two areas and judged to be breeding in the Curricabark Creek valley at Site 11 which features prime Noisy Miner habitat of open grazing land with large trees lining a creek. The records of six and five at Site 9 in September 2010 and February 2011, could have been birds temporarily visiting from Site 11 as none were recorded there again. The records of three and two at Sites 16 and 17 in February 2011 were not repeated and could have been visitors from Giro Homestead further south, Noisy Miners having been noted in that area during travel to and from Karamea. Most of the study area is heavily wooded with dense understorey vegetation, which makes it unsuitable for Noisy Miners (Newman 2013). Removal of cattle results in increased understorey growth in the absence of grazing and the study area is expected to become progressively less suitable for Noisy Miners in the future, except around the Homestead and Barnard River Sites 16 and 17, areas which are kept mown.

Common Mynas - one bird was recorded at the Barnard River and Homestead Sites 16 and 17 in May 2010, a possible visitor from Giro.

Discussion

This paper places on record an inventory of the bird species present in this eastern section of Curracabundi National Park during the period 2010 to 2013, and to draw general conclusions related to the objectives of this study. While the statistics presented in **Tables 1A and 1B** provide an inventory of the birds recorded and their relative abundance, there are some limitations that should be recognised. Recording birds during surveys depends heavily on detection by call. Certain species advertise their presence loudly in response to the disturbance caused during a survey and are easily detectable. The most frequently recorded species, the Lewin's Honeyeater (RR 70.3%; 21 survey sites), being a typical example. Others like the Eastern Yellow Robin (RR 35.9%) and Grey Shrike-thrush (RR 45%) which were also recorded at every site, although both were only present in small numbers. Seasonal variations in the intensity of calling may impact on the detectability of some species. Other species present in small numbers may be under-reported because of their cryptic nature, while migratory are only present seasonally. Species possessing large territories such as the Wedge-tailed Eagle may be over-reported, with the same eagle recorded at several different sites overlooking the Curricabark valley during one survey campaign.

Numbers of migratory species in particular increased when passing through the study area during spring and late summer, examples being Spotted Pardalotes and Yellow-faced and White-naped honeyeaters. The effectiveness of mid-summer surveys in woodland sites was adversely affected by the presence of large noisy Bell Miner colonies and by loud cicada calls which masked other bird calls. Highly territorial species like the Bell Miner exclude other species from the vicinity of their colonies.

Superb Fairy-wrens (RR 46.4%: 20 survey sites), usually absent from woodland sites, were often present in large family groups in open grassy areas and track edges. Pied Currawongs (RR 44%; 21 survey sites) formed large flocks in winter, particularly around fruiting figs trees lining the Barnard River Site 16. Crimson Rosellas formed flocks in winter, particularly near the Homestead Site 17, and feeding parties of smaller species were recorded at woodland sites.

The 14 species recorded outside of survey time limits (**Table 1B**) tended to be those that are normally present in small numbers. The small flock of Fairy Martins noted in February 2013 could have been passing through as no other sightings were made and no signs of breeding observed.

Cryptic species resident year round might reveal themselves more openly depending on weather conditions or time of year, such as a spike in Spotted Quail-thrush and Brown Quail sightings in May 2011.

There was a marked difference in species variety and numbers between steep dry north and north-west facing woodland, wet rainforest gulleys facing south and south-east, and open grassy riverine sites edged with forest, such as the latter surrounding the Homestead and Barnard River Sites 16 and 17 and the open grassy valley around Curricabark Creek Sites 10 and 11. In addition it was more difficult to locate birds when large colonies of Bell Miners were present, particularly along the Mernot Creek track between Sites 4 and 7, making it difficult to hear other bird calls. Bell Miners are known to exclude congeners. Extremely loud cicada calls also out competed bird calls during summer surveys.

The most distant sites, Curricabark Creek Sites 13, 14 and 15 and Mernot Site MT3 (between 7 and 10km from the Homestead), recorded the least number of species. Although the former were only surveyed seven times and the latter eight times, the nature of these sites is such that they are considered unlikely to show much increase in bird abundance if surveyed more frequently, although it could result in an increase in species diversity. Bird presence decreased the higher one penetrated the creek beds as they became narrower, darker and more densely edged with casuarinas and vines, as is apparent in the results shown in Table 6.

Over the three years of surveys, shrub and tree regrowth in the cleared grassy areas at Sites 1, 9, 10, 11, 12, 13 and 14, was beginning to change the nature of these sites, and may in time alter species composition unless fire limits regrowth. However regrowth of rainforest vegetation in the gully Sites 5 and 6 on Mernot Track may take many years to markedly change the habitat, partly due to heavy vine growth strangling young rainforest trees. Their present more open character should continue to attract the same species in the

near future.

Taking into account the wide range of weather conditions that Australia is noted for and which was experienced during the three years of this project, field surveys conducted over a limited time will not record every species likely to be present. Weather conditions in the study area and the east coast of Australia generally are unpredictable and in this instance impacted on several occasions on this study's results. For instance heavy rainfall higher up the catchment made creeks unfordable in May 2010 and September 2010, and flooding of the Barnard River causeway in 2012 forced the cancellation of two survey visits.

These variations in conditions may impact both short term and longer term changes in the diversity of bird populations. Consequently, it is anticipated that further survey effort in this section of Curracabundi National Park would increase the species list for the study area. Unfortunately the intensive short duration survey method used in this study did not provide time for detailed assessment of bird behaviour and consequently breeding behaviour was under-reported.

Conclusion

The range of species recorded in this study (**Tables 1A and 1B**), clearly shows that Curracabundi National Park is an important reserve for eastern Australian woodland birds, many of which are in decline as urbanisation and land clearing continues to eat away at their habitat. The presence of six threatened species strongly supports the gazetting of the area as Wilderness and National Park and its value as a vital link in the Great Eastern Ranges Corridor.

This study provides a baseline against which the impact of the ongoing management of the Park on its bird populations can be assessed.

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The following three appendices provide further details on most frequently recorded bird species for each 2ha site, site descriptions, and accidental records of mammals and reptiles.

Appendix 1

Table 6 details the most frequently recorded species at each site, taking into account the number of times each site was surveyed, ie. 10, 9, 8 or 7 times due to the access and other factors detailed earlier.

Table 6 Most frequently recorded species per site – sites surveyed 10 times

Site No.	Most commonly recorded species over 10 surveys	No. of times recorded during all surveys	Highest no. recorded one survey	Total no. recorded all surveys	No. of sites on which recorded	Total no. of species recorded	Average no. of species recorded	No. of species recorded after time
1	Superb Fairy-wren	6	12	31	19	41	9.4	8
	Lewin's Honeyeater	6	3	10	21			
	Yellow-faced Honeyeater	6	20	32	21			
	Spotted Pardalote	5	3	8	21			
	Eastern Yellow Robin	5	2	6	21			
	Golden Whistler	5	2	7	21			
2	White-browed Scrubwren	7	3	13	16	40	10.8	1
	Brown Thornbill	7	4	12	18			
	Golden Whistler	7	2	8	21			
	Spotted Pardalote	6	9	19	21			
	Lewin's Honeyeater	6	2	7	21			
	Yellow-faced Honeyeater	5	5	13	21			
	Eastern Yellow Robin	5	2	7	21			
	Grey Fantail	5	4	8	21			
Silvereye	5	5	22	18				
3	Lewin's Honeyeater	10	2	18	21	34	12.2	5
	Bell Miner	8	20	85	13			
	Eastern Whipbird	8	4	19	16			
	Grey Fantail	8	4	18	21			
	Yellow Thornbill	7	10	37	15			
	Striated Thornbill	7	27	90	18			
	Yellow-faced Honeyeater	7	10	32	21			
	Silvereye	7	10	32	18			
	Fan-tailed Cuckoo	6	1	6	17			
	Spotted Pardalote	6	7	19	21			
	Grey Shrike-thrush	6	2	9	21			
	4	Spotted Pardalote	9	6	20			
White-throated Treecreeper		7	3	10	18			
Striated Thornbill		7	10	29	18			
Yellow-faced Honeyeater		7	6	30	21			
Lewin's Honeyeater		6	4	14	21			
White-naped Honeyeater		6	4	16	12			
Grey Shrike-thrush		6	2	9	21			
Noisy Friarbird		5	12	22	20			
5	Lewin's Honeyeater	10	8	37	21	44	14.5	4
	Bell Miner	8	15	80	13			
	Eastern Whipbird	8	6	22	16			
	White-browed Scrubwren	7	6	15	16			
	Golden Whistler	7	2	9	21			
	Pied Currawong	7	2	9	21			
	Red-browed Finch	7	10	30	20			
	Spotted Pardalote	6	2	12	21			
	Brown Thornbill	6	2	11	18			
	Eastern Spinebill	6	2	10	18			
	Grey Fantail	6	2	9	21			
	Silvereye	6	15	42	18			
	Grey Shrike-thrush	5	2	9	21			

9	Yellow-faced Honeyeater	9	20	43	21	44	11.4	1
	Lewin's Honeyeater	8	4	15	21			
	Superb Fairy-wren	5	12	32	19			

Most frequently recorded species per site - sites surveyed eight times

Site No.	Most commonly recorded species over 10 surveys	No. of times recorded during all surveys	Highest no. recorded one survey	Total no. recorded all surveys	No. of sites on which recorded	Total no. of species recorded	Average no. of species recorded	No. of species recorded after time
12	Superb Fairy-wren	6	12	35	19	40	9.8	1
	Yellow-faced Honeyeater	6	5	16	21			
	Lewin's Honeyeater	5	2	6	21			
	Grey Fantail	4	3	7	21			
12A	Superb Fairy-wren	8	20	64	19	37	10.1	1
	Pied Currawong	6	24	36	21			
	Brown Thornbill	5	2	8	18			
	Grey Fantail	5	5	14	21			
	Red-browed Finch	5	20	40	20			
	Lewin's Honeyeater	4	2	5	21			
	Grey Shrike-thrush	4	2	6	21			
MT1	Spotted Pardalote	6	3	11	21	36	9.8	4
	Yellow-faced Honeyeater	6	5	20	21			
	Grey Shrike-thrush	6	2	7	21			
	Lewin's Honeyeater	4	2	5	21			
	Golden Whistler	4	2	5	21			
	Grey Fantail	4	6	10	21			
MT2	Superb Fairy-wren	6	10	38	19	42	12.6	2
	Yellow-faced Honeyeater	6	6	20	21			
	Lewin's Honeyeater	5	2	9	21			
	Golden Whistler	5	2	8	21			
	Grey Shrike-thrush	5	2	7	21			
	White-browed Scrubwren	4	2	5	16			
	Brown Thornbill	4	4	10	18			
	Bell Miner	4	10	24	13			
	Eastern Yellow Robin	4	1	4	21			
	Pied Currawong	4	2	5	21			
	Red-browed Finch	4	10	25	20			
	MT3	Lewin's Honeyeater	8	4	14			
Brown Thornbill		5	2	9	18			
Superb Fairy-wren		4	6	17	19			
White-browed Scrubwren		4	2	7	16			
Yellow-faced Honeyeater		4	7	16	21			

Most frequently recorded species per site – sites surveyed seven times

Site No.	Most commonly recorded species over 10 surveys	No. of times recorded during all surveys	Highest no. recorded one survey	Total no. recorded all surveys	No. of sites on which recorded	Total no. of species recorded	Average no. of species recorded	No. of species recorded after time
13	Pied Currawong Yellow-faced Honeyeater Grey Shrike-thrush	5 4 4	3 3 1	9 9 4	21 21 21	39	9.5	4
14	Spotted Pardalote Lewin's Honeyeater Eastern Yellow Robin	6 4 4	3 2 1	10 6 4	21 21 21	35	10	2
15	White-throated Treecreeper Lewin's Honeyeater Brown Thornbill Yellow-faced Honeyeater Eastern Yellow Robin Golden Whistler	7 5 4 4 4 4	1 1 2 2 1 2	7 5 7 7 4 5	18 21 18 21 21 21	32	9.	

Appendix 2

Detail on habitat and comment on overall survey results at the 21 designated sites

Site 1 Homestead Track – 10 Surveys GPS 31 40 07 / 151 44 40 BLA No. 20125

Track behind Homestead rising steeply through cleared woodland with grass, weeds and regrowth of acacia sp., facing south-east over the Barnard River valley.

Activity and number of species varied considerably due to season and/or weather conditions with some open country species recorded. Fairy-wrens were commonly present in low regrowth acacia and paddock weeds, with other woodland species keeping to the surrounding taller trees. The number of species recorded per survey varied from 20 in November 2011 to two in February 2013. The most consistently present species (all recorded 6 times) were Superb Fairy-wrens, Lewin's and Yellow-faced Honeyeaters, with the latter observed migrating in April 2012.

Site 2 Homestead Track – 10 Surveys GPS 31 40 14 / 151 43 56 BLA No. 20126

Track through regrowth woodland, mainly acacia sp., on steep dry stony hillside with shrubs, vines, lantana and xanthorea sp in drainage line.

Activity was more consistent than at the previous site and bird numbers slightly higher. Species recorded varied from 16 in November 2011 to seven in September 2010. Frequently noted species were White-browed Scrubwrens, Brown Thornbills, Golden Whistlers, Spotted Pardalotes and Lewin's Honeyeaters.

Site 3 Homestead Track – 10 Surveys GPS 31 40 18 / 151 43 56 BLA No. 20127

A clearing at top of steep-sided ridge with dry dam; view through acacia/eucalypt woodland into Curricabark and Barnard valleys.

Species recorded each survey varied from seven in February 2011 to 19 in January 2010. In May 2010 and May 2011 the Bell Miner colony was below the survey site, in the Curricabark valley, reflected perhaps in the higher number of Yellow-faced Honeyeaters recorded during the surveys. Bell Miner numbers were arbitrarily estimated at 10 to 20 per survey. Yellow and Striated Thornbills were in good numbers, Lewin's Honeyeaters, Eastern Whipbirds, Grey Fantails and Golden Whistler very vocal and easily observed. A Regent bowerbird was seen January 2010 after survey. Migrating flocks of Silvereyes and Yellow-faced Honeyeaters were noted in May 2010 and May 2011. Two White-throated Nightjars were disturbed beside the track in November 2011. Late evening callback in May 2011 brought a response from a Southern Boobook.

Site 4 Mernot Track – 10 Surveys GPS 31 40 21 / 151 43 23 BLA No. 20128

Steep closed canopy grassy eucalypt/ allocasuarina woodland on sharp bend in track with one small fig and sparse understorey shrubs.

Bell Miners intruded on this site in January 2010 and April 2012. Other species recorded varied from four in February 2011 to 22 in January 2010. The most frequently recorded were Spotted Pardalotes, White-throated Treecreepers, Striated Thornbills and Yellow-faced Honeyeaters. Glossy Black-Cockatoos were recorded out of survey time in January 2010. Noisy Friarbirds were observed noisily assembling to migrate in February 2013. A sighting of Musk Lorikeets, four in February 2013 (others observed at the Homestead), appeared to be passing through.

Site 5 Mernot Track – 10 Surveys GPS 31 40 23 / 151 43 00 BLA No. 20129

Rainforest over deep drainage line with regrowth, thick grass, dense creepers and introduced weeds, and dry eucalypt/acacia open forest above the track.

There was a greater range of rainforest shrubs and trees at this damp site, including a Koda *Khretia acuminata*, its copious berries attracting many birds. Perhaps because of its weedy state and more open position, species numbers were generally high, ranging from 26 in January 2010 to 10 in July 2012 (44 overall) despite the presence of a Bell Miner colony above the track. The most frequently recorded species were Lewin's Honeyeaters, Eastern Whipbirds, White-browed Scrubwrens, Golden Whistlers, Pied Currawongs and Red-browed Finches. Superb Lyrebirds called from forest above the track. Three Glossy Black-Cockatoos were seen after time in January 2010. A single Crested Shrike-tit was recorded in September 2010. A Bassian Thrush was observed on the track near the site in September 2010. A flock of about 25 White-throated Needle-tails circled over the site February 2011.

Site 6 Mernot Track – 10 Surveys GPS 31 40 35 / 151 42 46 BLA No. 20130

Steep track with remnant rainforest below and dry eucalypt/acacia open woodland above.

Species diversity varied from seven in July 2012 to 17 in September 2010 and February 2013. Migrating flocks of Yellow-faced Honeyeaters August 2011 and White-naped Honeyeaters in February 2013 were recorded but generally honeyeaters, except for Lewin's, were difficult to locate, due to the large Bell Miner colony. Three Glossy Black-Cockatoos were recorded after time February 2013.

Site 7 Mernot Track – 10 Surveys GPS 31 40 45 / 151 42 18 BLA No. 20131

Ford over Mernot Creek in deep gully, lined with casuarinas *C. cunninghamiana*, lily pillies and other rainforest shrubs.

Species recorded varied from five in April 2012 to 16 in January 2010. Bell Miners dominated the site with low numbers of other nectar eaters present, except for Lewin's Honeyeaters recorded at each survey. A Crested Shrike-tit was present in May 2010 and a Brown Goshawk in November 2011. Eleven Glossy Black-Cockatoos was recorded perched in a dead tree in August 2011, being the highest number of this threatened species observed at one time during the survey period.

Site 8 Curricabark Track – 10 Surveys GPS 31 40 25 / 151 44 10 BLA No. 20132

Steep mixed dry woodland with rainforest gulleys falling to valley below.

Species recorded varied from 19 in January 2010 to 4 in February 2013. Honeyeater numbers was higher when the Bell Miner colony remained below the track and during migration - Yellow-faced Honeyeaters in September 2010 and November 2011 flying over the escarpment to the Curricabark valley along with Spotted Pardalotes. This site had the highest number of Glossy Black-Cockatoo sightings, three being present in January 2010 and February 2011 and one in February 2013, with evidence of feeding in allocasuarinas at other times. Three Varied Sittellas were recorded in May 2010.

Site 9 Curricabark Track – 9 Surveys GPS 31 40 36 / 151 44 21 BLA No. 20133

Steep mixed dry woodland with rainforest gulleys giving way to grassland with regrowth encroaching, overlooking the valley.

Species recorded each survey varied from four in April 2012 to 18 in November 2011. Yellow-faced Honeyeaters and Spotted Pardalotes were noted migrating in September 2010; these together with Lewin's Honeyeaters were the most commonly recorded species. Superb Fairy-wrens were also frequently recorded, benefitting from the edge effect and grassy vegetation. One Speckled Warbler and three Varied Sittellas were recorded in February 2011.

Site 10 Curricabark Track – 10 Surveys GPS 31 40 54 / 151 44 31 BLA No. 20134

Drainage gully in open grassland with some large casuarinas and remnant rainforest shrubs/trees and weeds, including false tobacco.

The open nature of this site attracted species not found in the woodland sites, such as Brown Quail, Jacky Winter, Welcome Swallow, Tree Martin and four raptor species (Black-shouldered Kite, Wedge-tailed Eagle, Brown and Black falcons) with the number of species recorded at each survey varying from 4 in May 2010 and August 2011 to 16 in November 2011. Southern Emu-wrens were recorded twice and Jacky Winters were resident at the site and noted seven times. Family groups of Brown Quail were recorded. An unexpected visitor from the western districts of NSW was a Black Falcon present in February 2013. Superb Fairy-wrens were present at each survey and Red-backed Fairy-wrens twice.

Site 11 Curricabark Track – 10 surveys GPS 31 41 03 / 151 44 34 BLA No. 20135

Woodland edging Curricabark Creek, with casuarinas, remnant rainforest and regrowth, and cattle yards in open grassland with remnant forest eucalypts. Evidence of feral bulls present at most survey visits.

This site attracted woodland and open country birds although species numbers recorded each survey varied considerably - from 20 in February 2011 to nine in August 2011. Azure Kingfishers were recorded twice and four species of raptor - Black-shouldered Kite and Brown Goshawk once, and Wedge-tailed Eagle and Brown Falcon twice. Superb Fairy-wrens were present at nine surveys, Red-backed Fairy-wrens once, and Grey Fantails seven surveys. Rufous Songlark was recorded in November 2011. Noisy Miners occupy this site, eight being the highest number recorded.

Site 12 Curricabark Track – 8 Surveys GPS 31 41 24 / 151 44 25 BLA No. 20136

Cleared grassy ridge with two large eucalypts surrounded by lantana and weeds, falling steeply down into rainforest creek gully. By February 2013 advancing regrowth of acacia and dodonea sp and introduced weeds was starting to change the habitat.

Although species numbers were average, this was usually a quiet site with most bird activity off site below in the river valley, including a Bell Miner colony. Species present varied from three in September 2010 to 18 in November 2011. Superb Fairy-wrens were in high numbers and along with Yellow-faced Honeyeaters, recorded during six surveys.

Site 12A Curricabark Track – 8 Surveys GPS 31 41 24 / 151 44 15 BLA No. 20169

Curricabark Creek with grassy banks, lantana and other weeds, edged with rainforest and eucalypt woodland. Evidence of feral bulls at most surveys.

Species present varied from 19 in September 2010 to five in August 2011. Superb Fairy-wrens were the most common resident recorded at eight surveys. Also recorded frequently were Grey Fantails, Red-browed Finches, Pied Currawongs and Brown

Thornbills. In September 2010 eleven Pacific Black Duck ducklings were present without an adult. An Azure Kingfisher was recorded May 2011 and a flock of 24 Pied Currawongs was present in February 2013.

Site 13 Curricabark Track – 7 Surveys GPS 31 41 40 / 151 43 28 BLA No. 20137

Cleared grassy ridge surrounded by dry eucalypt woodland sloping steeply to Curricabark Creek. Regrowth starting to encroach.

This was generally a quiet site with species numbers ranging from seven in May 2011 and April 2012 to 14 in November 2011 and July 2012. A Bell Miner colony in the creek below intruded once in April 2012. A pair of Glossy Black-Cockatoos was recorded in February 2013, Red-backed Fairy-wrens in July 2012 and Jacky Winter in February 2011. Spotted Quail-thrush recorded three times.

Site 14 Curricabark Track – 7 Surveys GPS 31 41 40 / 151 43 09 BLA No. 20138

Steep grassy ridge and track surrounded by dry eucalypt woodland with regrowth encroaching from the edges.

Species numbers varied from six in February and May 2010 to 17 in November 2011. The most commonly recorded species was Spotted Pardalote. A Grey Goshawk was recorded in November 2011 and a pair of Glossy Black-Cockatoos in August 2011. Small flocks of mixed woodland species and White-naped Honeyeaters were noted migrating in May 2011. Superb Fairy-wrens were recorded only once when 10 were seen and a flock of 12 Crimson Rosellas in November 2011.

Site 15 Curricabark Track – 7 Surveys GPS 31 41 54 / 151 47 35 BLA No. 20139

This deep gully is the final site on the Curricabark track, the old track beyond the creek being overgrown and impassable. Large *Casuarina cunninghamiana* trees line the grassy creek bed with rainforest trees, shrubs and a few weeds, and open woodland above.

Species numbers varied from seven in August 2011 and February 2013 to 15 in May 2011. Numbers of each species were on average low with only one, White-throated Treecreeper, recorded at each survey. A pair of Glossy Black-Cockatoos were recorded in May 2011 and a Grey Goshawk, perhaps the same bird or mate of the one at Site 14, was seen November 2011. Black-faced Monarchs with a dependent fledgling were seen in February 2011.

Site 16 Barnard River – 10 Surveys GPS 31 40 05 / 151 45 05 BLA No. 20140

River flats with White Cedars *Melia azedarach*, a large dead eucalypt and shrubs looking across the river to a cliff face with massed fig trees at base, grass trees, lantana and other trees/shrubs on almost vertical stony slope with eucalypts on the ridge above. Several severe floods in mid 2011 cleared the river flats of most vegetation and removed the dead tree, leaving a deep layer of gravel.

This site attracted the highest selection of species as it included a fast flowing river, fruiting figs and White Cedars. It was also surveyed more times than other sites along the Mernot and Curricabark tracks but only the results of 10 surveys have been included for comparison. When the fig and cedar trees were in fruit large flocks of Pied Currawongs and other fruit eaters were present, including in August 2011 four Wompoo Fruit-Doves and 15 Satin Bower-birds (with six black males feeding on the ground together).

A flock of eight White-throated Needletails foraged very low over the water in November 2011. Channel-billed Cuckoos (with immatures present late summer 2010, 2011 and 2012) and Eastern Koels arrived each spring. Two Speckled Warblers were recorded in February and one in May 2011 before floods swept the area clear of vegetation but recorded again in July 2012.

Other notable records included Scarlet Robins recorded in April 2012 and July 2012, four Double-barred Finches in May 2010 and two in February 2013, and a Glossy Black-Cockatoo heard calling behind trees in November 2011.

A flock of 23 Little Black Cormorants were co-operatively feeding in the river in July 2012, and a pair of Australasian Grebes with a juvenile in May 2011.

Site 17 Karamea Homestead – 10 surveys GPS 31 39 57 / 151 44 54 BLA No. 20141

Homestead with fenced garden containing exotic and native trees, shrubs and fruit trees, backed by an overgrown vegetable garden on the west, cleared drainage line with exotic pines on the east, areas of mown grass in front leading to weedy steep river bank facing south-east over the Barnard River and down the valley.

Since the surveying parties were accommodated in the Homestead, this site had considerably more observation time than other sites, hence the greater number of species recorded out of survey time. Only species recorded during 10 surveys are included for comparison with other sites. Species numbers varied from nine in August 2011 to 20 in July 2012.

Southern Boobook, Owllet Nightjar (January 2010) and White-throated Nightjar (January 2010) were recorded calling during the night. A pair of Kestrels was present in 2010 but absent thereafter.

Scarlet Robins are reported to be declining nationwide. A male was recorded in April 2012 and a pair in July 2012.

At least four families of Superb Fairy-wren and two of Red-backed Fairy-wren were resident.

A few sightings of Double-barred Finch were made - five in May 2010, nine in September 2010, and none again until two in February 2013. They have declined in the Gloucester district in the past ten years (pers.ob).

A pair of Black-shouldered Kites nest in a tree on the river bank on the Giro Station side.

Dollarbirds bred in hollows in the dead tree on the Homestead flats that was removed by the 2012 flood..

A pair of Wedge-tailed Eagles was observed harassing two juveniles in May 2010.

Birds using the river included White-bellied Sea-Eagle, Pied, Great, Little Pied and Little Black cormorants, Pacific Black Duck,

Australasian Grebe, Dusky Moorhen, White-faced and White-necked herons.

Site MT1 Mernot Track – 8 Surveys GPS 31 40 50 / 151 42 15 BLA No. 20170

Steep dry ridge of grassy woodland with allocasuarinas, angophoras and shrubs, edged by rainforest and eucalypt woodland. Eight surveys were carried out following clearance of the track by NPWS staff.

Species recorded here varied from one (five Bell Miners) in February 2011 to 18 in May 2011 and February 2013. The most commonly recorded species were Spotted Pardalotes, Lewin's and Yellow-faced Honeyeaters, Golden Whistler, Grey Shrike-thrush and Grey Fantail. Speckled Warblers were recorded in September 2010 and August 2011 and the only record of a Red-browed Treecreeper in May 2011.

Site MT2 Mernot Track – 8 Surveys GPS 31 41 05 / 151 42 08 BLA No. 20171

Grassy promontory surrounded on three sides by Mernot Creek, with eucalypts, rainforest and understorey shrubs, and weedy scrub and false tobacco encroaching from the edges. Eight surveys were carried following clearance of the track by NPWS staff.

This site was less affected by the Bell Miner colony further down the creek, making it easier to locate species, as well as having a greater variety of habitat. Speckled Warblers were present May 2011 and Superb Fairy-wrens were in abundance, along with Brown Gerygones, Brown Thornbills, and Red-browed Finches.

Site MT3 Mernot Track – 8 Surveys GPS 31 41 09 / 151 41 57 BLA No. 20172

Narrow stony rainforest gully formed by the creek and lined with *C. cunninghamiana*, vines and scrub. Eight surveys were carried out following clearance of the track by NPWS staff.

The first survey in September 2010 was the most successful with 20 species recorded, but this could have been influenced by the greater number of surveyors taking part than the usual two or three per visit. Following this the maximum number of species recorded was ten, with one recorded in April 2012. The most common species were Superb Fairy-wren, Lewin's and Yellow-faced honeyeaters and Red-browed Finches, with Lewin's Honeyeaters recorded during all eight surveys.

Appendix 3

Mammal and Reptile Observations

These observations were recorded on a casual basis during each visit to the park, as a reference for NPWS, as detailed in Tables 7 and 8 below in chronological order. Very few sightings of macropods were made, possibly due to vehicle noise on the tracks giving them good warning of our approach.

Table 7 Mammal Records

Brush-tailed Rock-Wallaby	<i>Petrogale poenicillata</i>	A male on the rock face at Site 16 January 2013. Appeared to eat fallen fig fruits on the steep track.
Dingo	<i>Canis lupus dingo</i>	Two black dingoes passing in front of the Homestead Site 17 at dawn, May 2010.
Platypus	<i>Ornithorhynchus anatinus</i>	One observed in the Barnard River Site 16 May 2010.
Dingo	<i>Canis lupus</i>	Heard howling from the Homestead Site 17, February 2011.
Euro	<i>Macropus robustus</i>	One very dark male near the Barnard River causeway Site 16, February 2011.
Eastern Grey Kangaroo	<i>Macropus giganteus</i>	One seen on the Mernot Track between Sites 3 and 4, February 2011.
Dingo	<i>Canis lupus dingo</i>	Heard distant howling at Mernot Site 4, April 2012.
Spot-tailed Quoll	<i>Dasyurus maculatus</i>	Scats noted at Curricabark Site 12A, April 2012.
Black Wallaby	<i>Wallabia bicolor</i>	One drinking at the Barnard River Site 16, April 2012.
Hereford Bull	<i>Bos taurus</i>	Two disturbed at Site 14 on Curricabark Creek, April 2012 and two big cream-coloured bulls – Charolais type.
Platypus	<i>Ornithorhynchus anatinus</i>	Two watched for 20 minutes feeding in the Barnard River Site 16, July 2012.
Feral Cat	<i>Felis catus</i>	Heard fighting at Curricabark Sites 11 and 12A, July 2012.
Feral Bull	<i>Bos taurus</i>	Fresh pats at Curricabark Sites 11 and 12A, 2012.
Dingo/dog	<i>Canis lupus dingo</i>	One passing at dawn in front of the Homestead Site 17, February 2013.

Table 8 Reptile Records

Red-bellied Black Snake	<i>Pseudechis porphyriacus</i>	One near Site 10, Curricabark track, May 2010.
Lace Monitor	<i>Varanus varius</i>	On Mernot track near Site 2, September 2010.
Eastern Water Dragon	<i>Physignathus l. lesueurii</i>	One at Mernot Creek, Site 7, September 2010.
Green Tree Frog	<i>Litoria caerulea</i>	In one of the Homestead toilets, September 2010.
Lace Monitor	<i>Varanus varius</i>	A large monitor under Homestead patio Site 17, and a small one on Mernot Track between Sites 3 and 4, February 2011.
Eastern Water Dragon	<i>Physignathus l. lesueurii</i>	Single dragons present at Curricabark and Mernot Creeks, February 2011.

