

## Notes on the Birds of Nadgee, Particularly the Striated Fieldwren *Calamanthus fuliginosus*

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### Summary

Nadgee Nature Reserve and adjacent protected areas in the New South Wales/Victorian border region conserve habitat for a rich avifauna. During spring 1995, 89 species were recorded including six threatened taxa. The Pied Oystercatcher *Haematopus longirostris*, Sooty Oystercatcher *H. fuliginosus* and Hooded Plover *Thinornis rubricollis* were scarce along the coastline. The Ground Parrot *Pezoporus wallicus* was common in the coastal heathland. The Eastern Bristlebird *Dasyornis brachypterus* was uncommon with a total of 26 individuals found in a variety of vegetation types. The Striated Fieldwren *Calamanthus fuliginosus* was uncommon, although in its preferred habitat which was low, dry *Allocasuarina/Hakea*/monocotyledon heath, it had a relatively high density of 0.62 birds/ha. The densities of two other heathland species were estimated: the Tawny-crowned Honeyeater *Phylidonyris melanops* was abundant with a density of 1.6–2.1 birds/ha; the Southern Emu-wren *Stipiturus malachurus* was common with a density of 1.6 birds/ha.

### Introduction

Nadgee Nature Reserve (NR) and Ben Boyd National Park (NP) south are two coastal reserves in New South Wales between Eden and the Victorian border. Both contain a variety of heath, woodland, forest, wetland and littoral vegetation types, which were described by Gilmour (1983). The climate is warm temperate, characterised by warm summers and cool winters, with rain distributed throughout the year.

Nadgee NR and Ben Boyd NP south combine to form one of the longest and least disturbed coastal complexes in New South Wales (and, together with the adjacent Croajingolong NP in Victoria, one of the least modified coastal areas in south-eastern Australia). Norris et al. (1983) described the fauna of the East Gippsland region of Victoria (contiguous with Croajingolong NP), with an atlas distribution of all bird species including those of regional and national significance.

Several threatened bird taxa are known to occur in the region (Blakers et al. 1984), including the Striated Fieldwren (see Appendix 1 for scientific names). Although the taxonomy of the Striated Fieldwren has been debated for some time (Schodde 1975, Keast 1978, Parker & Eckert 1983, Christidis & Boles 1994), little information has been published on the ecology of the species (but see Sharland 1953, Watson 1955, Keast 1978). This is especially the case for the northern end of its range in south-eastern New South Wales. Recher (1981) and Thackway et al. (undated) documented the occurrence of Striated Fieldwrens in Nadgee NR and Morton NP respectively, including some notes on abundance and preferred habitat.

This paper aims to:

- (1) document the avifauna of Nadgee NR, particularly the coastal heathland,
- (2) record the distribution and abundance of some taxa, and
- (3) present detailed notes on aspects of the ecology of the Striated Fieldwren.

### Methods

Data for this study were collected during visits to Nadgee NR in spring in two consecutive years: 23 October to 3 November 1994 (JB), 7 to 10 October 1995 (CRG & JB) and 15 to 17 October 1995 (JB). During these periods records were kept of all species encountered within the reserve. In 1995, additional information was collected on the number of individuals of each species recorded from casual

observations, allowing a classification into abundance categories (Appendix 1). Additional efforts were made to detect and record the distribution and abundance of particular species. These species were selected on the basis of their rarity (listed under the N.S.W. *Threatened Species Conservation Act* 1995), or apparently high densities in the survey area as determined from data collected in 1994. The location of all detections of species listed on the *Threatened Species Conservation Act* were mapped to within 100 m using photocopies of 1:25 000 topographic maps, and forwarded to the N.S.W. Wildlife Atlas (run by the N.S.W. National Parks & Wildlife Service).

In 1994, 138 km were walked on 53 km of roads and tracks at Nadgee NR during 64 hours of observation by JB. In 1995, 60 km were walked along 26 km of tracks during 38 hours by CRG and JB and a further 41 km were walked during 27 hours by JB. Most of the tracks walked in 1994 were re-sampled in 1995 and most sections of track were walked more than once each year.

Several days (10 to 12 October 1995) were also spent in the southern section of Ben Boyd NP (Bittangabee Bay and Green Cape areas), during which additional information was collected for several species.

Most information collected constituted opportunistic observations as the tracks were walked. Specific surveys were carried out, however, to estimate the densities of Striated Fieldwrens, Tawny-crowned Honeyeaters and Ground Parrots. Two survey techniques were used. Fixed-width transects 25 m by 400 m walked over a period of one hour (nine transects in low, dry heathland, walked between 9 and 16 October 1995, all in Nadgee NR) and fixed-width transects 100 m wide and of variable length (1 to 1.5 km) walked over a period of approximately one hour (six transects in low, dry heathland, three in Nadgee NR walked on 9 and 10 October, and three in Ben Boyd NP south walked on 11 and 12 October 1995). Both 25 m and 100 m wide transects were conducted on Nadgee and Endeavour Moors in Nadgee NR, with 100 m wide transects also undertaken near Green Cape and Hegarty Bay in Ben Boyd NP south. With the exception of one of the Nadgee NR transects, all of the 100 m wide transects were conducted along formed vehicular or walking tracks. All surveys were conducted within four hours of sunrise. Birds were counted using sight and call by a single observer walking quietly along a transect line.

## Results and discussion

A total of 89 species was recorded in Nadgee NR during the 1995 visit. However, it must be noted that all habitats in the reserve were not sampled and data were collected in only one season, spring (Appendix 1). The bird species recorded in Nadgee NR from a previous visit by JB and published accounts by Recher (1981), Morris (1970) and Fox (1978) supplement this list to provide a more complete picture of the bird community of Nadgee NR. Combining the four accounts produces a reserve total of 172 species, including fourteen listed in the N.S.W. *Threatened Species Conservation Act*. Notes on the threatened species recorded, interesting behaviour observed and the estimated densities of other species are described in the following accounts of particular species. 'Bird Report' for a given year refers to the N.S.W. Field Ornithologists Club annual bird report for that year, published in *Australian Birds* (1972-94, vols 15-27).

### *Striated Fieldwren*

Striated Fieldwrens were uncommon but widely distributed across the lowland heaths of Nadgee NR and Ben Boyd NP south. Considering the proximity of these two reserves and the similarity of the vegetation, data from all the 100 m wide transects were combined to obtain an overall abundance measure for the region. This equated to an average density of 0.62 Striated Fieldwrens per hectare (range 0.4 to 0.9 birds/ha, a minimum estimate assuming total detection of birds within the survey area).

The Striated Fieldwren is classified as Vulnerable in New South Wales under the *Threatened Species Conservation Act*. The species occurs there in the southern coastal region north to the upper Clyde River (Budawang Range), with outlying records at Towra Point (Botany Bay), Bilpin and Mittagong (Dibley 1976, Morris et al. 1981, Bird Report 1992). Sites at which Striated Fieldwrens have been regularly recorded include the Tianjarra Plateau and surrounding areas on the Budawang Range and Nadgee NR (Bird Reports 1971 to 1992, Thackway et al. undated).

Blakers et al. (1984) described the habitat of Striated Fieldwrens as low vegetation, either wet or dry with shrubs well spaced in an incomplete canopy (including samphire, saltbush and heath) and with or without an emergent layer of trees. Loyn (1980) and Friend (1982) also documented the occurrence of Striated Fieldwrens in young (<4 years old) pine plantations in Victoria. At Tianjarra Plateau, Morton NP (approximately 250 km north of Nadgee NR), Striated Fieldwrens inhabit mallee, heath in open forest and dry heath on rocky rises (Thackway et al. undated). Of the little information available on the densities of Striated Fieldwrens, Blakers et al. (1984) reported a density of at least 0.07 birds/ha at Laverton Saltworks (see Morgan 1954, Watson 1955). However, the area on which this estimate was based includes large patches of habitat in which Striated Fieldwrens did not occur (Watson 1955). Thus, in preferred habitat, Striated Fieldwrens occurred at a higher density than that reported above.

Previous records of Striated Fieldwrens in Nadgee NR included a maximum of 28 birds on 11 January 1971 (Bird Report 1972). Recher (1981) also recorded Striated Fieldwrens from all the lowland heaths visited during a survey in 1979 (Newtons, Little River, Impressa, Nadgee and Endeavour moors). Birds generally occurred in areas with greater shrub content, in comparison with a greater monocotyledon component in wet heath. The number of records (228), and the widespread distribution of the species in suitable habitat, suggested that the Striated Fieldwren may have been locally common in Nadgee at that time.

Similar vegetation occurred at all sites where Striated Fieldwrens were recorded in Nadgee NR. This was low (0.2–0.5 m), dry heath dominated by Swamp She-oak *Allocasuarina paludosa* and a variety of monocotyledons. *Boronia*, *Dillwynia*, *Banksia* and *Darwinia* were also common small shrubs. Emergent shrubs to 1 m characterised the vegetation, with Furze *Hakea* *Hakea ulicina* and Bushy Needlebush *H. sericea* particularly prominent. Striated Fieldwrens preferred the low, dry heaths, with no birds recorded in adjoining taller (to 2 m) wet Scented Paperbark *Melaleuca squarrosa* heaths. Striated Fieldwrens also utilised Bracelet Honey-myrtle *M. armillaris* scrub (to 3 m) on the edges of low dry heath, such as adjoining Nadgee Lake. Birds sheltered in this vegetation, and also used the tops of these shrubs for calling perches.

The vegetation at sites where Striated Fieldwrens were recorded in Ben Boyd NP south was very similar to that in Nadgee NR, although with less emergent *Hakea* and often a band of Bracelet Honey-myrtle between the heath and the rocky headland. Striated Fieldwrens were also recorded in wind-pruned Bracelet Honey-myrtle coastal heath (0.2 m high) at Green Cape lighthouse and in low dry *Allocasuarina*/monocotyledon heath with emergent Broad-leaved *Hakea* *H. dactyloides* on the headland north of Hegarty Bay.

The estimated density of Striated Fieldwrens in the Nadgee/Ben Boyd region substantially exceeds the previously published estimate (Blakers et al. 1984), by a factor of nearly 10 times (although in addition to underestimating density in preferred habitat, the site of this work, Laverton Saltworks, constitutes a heavily human-modified environment). Taking the area of low, dry heath on Nadgee Moor to be approximately 180 ha, an extrapolation of the generated density estimate produces about 110 birds for Nadgee Moor, a similar number of individuals to that recorded over the same area by Recher (1981) 16 years previously. Nadgee NR and Ben Boyd NP south thus probably constitute, along with the Tianjarra Plateau area, the stronghold for Striated Fieldwrens in New South Wales.

Aspects of the behaviour of Striated Fieldwrens were also noted in Nadgee NR and Ben Boyd NP south. Birds usually sang from prominent perches, generally emergent shrubs in or on the edge of the heath (as described in Keast 1978). Flushed birds also commonly flew and perched on top of tall shrubs or, if they disappeared

into the heath, usually re-appeared on the top of shrubs shortly afterwards. Emergent shrubs were also used for foraging, with one bird on Nadgee Moor observed pecking insects from around the foliage at the top of a Furze Hakea shrub, in much the same manner as a Southern Emu-wren took insects from a spider's web (observation described p. 116). Sufficient views were not obtained to confirm the foraging substrate utilised in this case.

No particular species of emergent shrub seemed to be preferred for singing, shelter or foraging. Commonly used plants included Furze Hakea on Nadgee Moor, Bracelet Honey-myrtle on Endeavour Moor and Bittangabee/Hegarty Bay heaths, Broad-leaved Hakea on the moor north of Hegarty Bay, and Saw Banksia *Banksia serrata* and Black She-oak *Allocasuarina littoralis* at Green Cape. These plants were utilised in proportions seemingly similar to their abundance. Along the Bittangabee Bay-Hegarty Bay transect most Striated Fieldwrens were observed in a thin (25 m) band of low, dry heath between the walking track and a Bracelet Honey-myrtle thicket around a headland. Flushed birds generally flew and perched on top of the Bracelet Honey-myrtle shrubs at the edge of the heath. Emergent shrubs were rare within the heath at this site.

The fixed-width transect procedure appeared to measure the abundance of Striated Fieldwrens fairly accurately. The habit of Striated Fieldwrens to sing, forage and perch after flushing on top of emergent shrubs facilitated detection. The song can also be heard readily to well beyond 50 m. Striated Fieldwren detection was maximised if, when one individual was recorded by call or sight, the observer paused to scan the vegetation near the detected bird for a short period. A second bird often became visible shortly after the first, as Striated Fieldwrens were regularly encountered in pairs.

### *White-bellied Sea-Eagle*

The inclusion of shearwaters *Puffinus* spp. in the diet of the White-bellied Sea-Eagle has been noted previously (Barker & Vestjens 1989, Marchant & Higgins 1993), and considered to be common (A. Morris pers. comm.). Offshore from Green Cape a single, immature-plumaged White-bellied Sea-Eagle was observed attempting to capture a shearwater (most likely an exhausted Short-tailed *P. tenuirostris*) at sea. The Sea-Eagle grasped the shearwater twice, but appeared to labour under the weight of the struggling prey which was subsequently dropped. The Sea-Eagle abandoned the hunt and returned to soar over the coast where it was joined by seven adult-plumaged Sea-Eagles. Possibly the Sea-Eagles recognised that the combination of strong onshore (south-east) winds and the shearwater southern migration would bring much potential prey within easy hunting distance of the coast. A single Wedge-tailed Eagle joined the Sea-Eagles, presumably attracted by the large number of raptors present at the site. Beach-cast shearwaters may make easy prey for the Wedge-tailed Eagle.

A White-bellied Sea-Eagle nest was located c. 7 km north of Green Cape, on the western side of Bittangabee Bay, Ben Boyd NP south. The nest was c. 25 m above the ground in the fork of a Coastal Grey Box *Eucalyptus bosistoana*, which was one of the larger trees in a stand of dry sclerophyll forest along a gully.

### *Oystercatchers*

Both the Pied Oystercatcher and the Sooty Oystercatcher were scarce along the coastline at Nadgee NR. The maximum numbers observed were four Pied at Nadgee Lake beach and four Sooty on the rocky headland north of Nadgee Lake. Each was in typical habitat as described by Blakers et al. (1984) and Bransbury (1985).



**Pied Oystercatchers, Queenscliff, Victoria**

Plate 10

Photo: the late Peter Klapste

Both species are listed as Vulnerable in New South Wales under the *Threatened Species Conservation Act*. Recreational activities such as the collection of cunjevoi *Pyura stolonifera* for fishing bait (Chafer 1993) and pedestrian and four-wheel-drive use of beaches (Bransbury 1985, Sutton 1990), may threaten the abundance and breeding success of the Sooty and Pied Oystercatcher respectively. Hence, the Nadgee 'wilderness' may form important habitat for the two oystercatcher species, having lower impacts associated with human use compared with other areas of coastline in south-eastern Australia.

### *Hooded Plover*

In Nadgee in 1995 Hooded Plovers were recorded at three locations: the beach at Nadgee Lake (pair on 9 October), Nadgee Beach (pair on 9 October) and Little River Beach (pair on 10 October). This probably totalled only four birds, however, with the Nadgee Beach and Little River records likely to be the same birds. On 17 October four birds were recorded on Nadgee Lake beach. All records were at sandy beaches at the mouths of rivers or lakes along an otherwise rocky stretch of coastline. In all cases the bars were closed and the birds loafing or feeding amongst either beach-cast material or adjacent to the lake or river's edge.

The Hooded Plover is classified as Endangered in New South Wales under the *Threatened Species Conservation Act*. The state-wide population of adults was estimated at 62 birds (Morris 1989). Australia-wide, Watkins (1993) estimated the total population of the species at 5000 birds. Hooded Plovers occur on coastal beaches in southern New South Wales north to about Jervis Bay (Morris et al. 1981). In the 1994 Hooded Plover survey, 20 individuals were counted from Green Cape to Nadgee Lake (Cape Howe beach not visited; Straw 1995). This accounted for about 25% of the 1994 population of Hooded Plovers in New South Wales.



Although the rocky nature of the coastline restricts the population of Hooded Plovers in the area, Nadgee NR may constitute important habitat for the species given the lower recreational use of the area by pedestrians and, particularly, off-road vehicles, and also the reduced occurrence of domestic animals. These factors have contributed to the decline of the species elsewhere, principally through reduced breeding success (Schulz & Bamford 1987, Buick & Paton 1989).

### *Ground Parrot*

Ground Parrots were common and recorded in all sections of coastal heathland at Nadgee NR. They were also recorded at Ben Boyd NP south. The Ground Parrot is listed as Vulnerable in New South Wales under the *Threatened Species Conservation Act*. Recovery of Ground Parrot populations after fire in their heathland habitat is an intriguing and challenging management problem (Baker & Whelan 1994). The data collected during the present study will be used to address this issue in a separate paper (Baker & Gosper in prep.).

### *Southern Emu-wren*

Southern Emu-wrens were common and widely distributed throughout the lowland heaths at Nadgee NR and at Ben Boyd NP south. They occurred in low dry heathland (as described for Striated Fieldwren habitat) and in wet heathland dominated by Scented Paperbark. The 25 m wide transects had an average density of 1.6 Emu-wrens per hectare (a minimum estimate assuming complete detection of birds within the census area). These were encountered as individuals or pairs but not as family parties, indicating that breeding had not reached the fledging stage. Similar densities have been reported at Barren Grounds: 1.5 (winter) to 4.25 (summer) Emu-wrens per hectare (Jordan 1987) and 2–3 per hectare (Bramwell 1990).

On one occasion a Southern Emu-wren was observed picking insects from a spider's web while perched on top of a Furze Hakea shrub. Insect-laden spiders' webs were commonly spread amongst the foliage of emergent Furze Hakea and Dagger Hakea *H. teretifolia* shrubs, so this behaviour may represent an efficient method of foraging.

### *Eastern Bristlebird*

Eastern Bristlebirds were uncommon and appeared to be restricted to the south-eastern part of Nadgee NR (Little River south to the Victorian border). They were not recorded at Ben Boyd NP south. It is almost certain that some individual birds were detected on more than one occasion so counts were based on the likely maximum number of individuals. During the survey period in 1994, 13 individual Eastern Bristlebirds were counted. In 1995, with an increased survey effort in the south-eastern part of Nadgee NR, a total of 26 Eastern Bristlebirds was recorded. They inhabited a variety of vegetation types including grass-tree *Xanthorrhoea* plain, swamp, coastal scrub, coastal heath, low woodland, woodland and open forest (Silvertop Ash *E. sieberi*/Red Bloodwood *Corymbia gummifera*). The maximum density of Eastern Bristlebirds was nine birds in 150 hectares directly south of Nadgee Lake in 1995. The sparse and irregular distribution of Eastern Bristlebirds throughout various vegetation types at Nadgee NR cautions against extrapolating this density estimate to calculate the absolute population size. Previously, three Eastern Bristlebirds were recorded at Nadgee NR by Recher (1981): in forest near the mouth of Little River and on the edges of Impressa and Endeavour Moors. Recher (1981) suggested that the species had declined before the wildfire in 1972, but presented no supporting data.

The Eastern Bristlebird is listed as Vulnerable in New South Wales under the

*Threatened Species Conservation Act*. However, Baker (1996) argued that its status should be changed to Endangered because of its fragmented distribution and because the total of all populations was less than 2000 birds. With the exception of Croajingolong NP, which is contiguous with Nadgee NR, the viability of any populations in Victoria is uncertain (Baker 1996). Hence, the Nadgee/Croajingolong areas probably support the only substantial population of Eastern Bristlebirds in the south of the species' range.

### *Tawny-crowned Honeyeater*

Tawny-crowned Honeyeaters were abundant across the coastal low, dry heaths in Nadgee NR. Density estimated from 100 m wide transects averaged 1.6 birds per hectare (range 1.5–1.7 birds/ha). The average Tawny-crowned Honeyeater density derived from 25 m wide transects was 2.1 birds per hectare (range 0–9 birds/ha).

Generally, Tawny-crowned Honeyeaters inhabit short and open heaths throughout coastal south-eastern and south-western Australia (Blakers et al. 1984). Blakers et al. (1984) reported densities ranging from 0.28–0.63 birds per hectare in low heath at Holsworthy, 25 km south-west of Sydney (after Bell 1965), to 1.15–1.38 birds/ha at Pearl Beach, north of Sydney (after Recher 1971). However, Bell (1965) noted a fairly consistent population density of Tawny-crowned Honeyeaters at the Holsworthy site approximating 1 bird per acre (2.47 birds/ha). Furthermore, data from monthly mean counts of a regular census area by Bell (1965) over a period of one year equated to an average density of 2.21 Tawny-crowned Honeyeaters per hectare (with a monthly range of 1.56–3.40 birds/ha). The density estimate quoted in Blakers et al. (1984) from the data in Recher (1971) also incorrectly stated Tawny-crowned Honeyeater abundance, owing to the inclusion of territories of breeding pairs only partially within the survey area. Blakers et al. (1984) therefore overestimated the true density of Tawny-crowned Honeyeaters at the Pearl Beach site. The density estimates obtained from Nadgee Moor are similar to those at Holsworthy (from Bell 1965) and appear to be greater than at Pearl Beach, which Recher (1981) noted contained much sub-optimal habitat. Recher (1981) reported that the Tawny-crowned Honeyeater was the most abundant species across the Nadgee heaths.

The preferred habitat of Tawny-crowned Honeyeaters in Nadgee NR appeared to be low dry *Allocasuarina/Hakea*/monocotyledon heath, as described for Striated Fieldwren habitat. Tawny-crowned Honeyeaters were less abundant (with an apparent corresponding increase in New Holland Honeyeater abundance) in taller vegetation types, including Bracelet Honey-myrtle coastal scrub, mallee and Scented Paperbark wet heath. There was only one observation of a Tawny-crowned Honeyeater in woodland.

Estimation of Tawny-crowned Honeyeater density was complicated by the rate of bird individual movement into and out of the survey area (compared with the rate of observer movement). In particular, their display flights resulted in much movement into and out of the census area. Individual birds fluttered upwards more or less vertically to 10–30 m while calling, then descended in a glide which began steeply, then flattened out near the ground with the bird gliding and/or flying to a prominent perch, up to 200 m from where the display commenced (cf. Bell 1965).

### Conclusion

Nadgee NR and adjacent protected areas in the New South Wales/Victoria border region conserve habitat for a rich avifauna. Nadgee NR also comprises an important area for conserving threatened species in New South Wales. Seven species listed in the N.S.W. *Threatened Species Conservation Act 1995* have been recorded in the

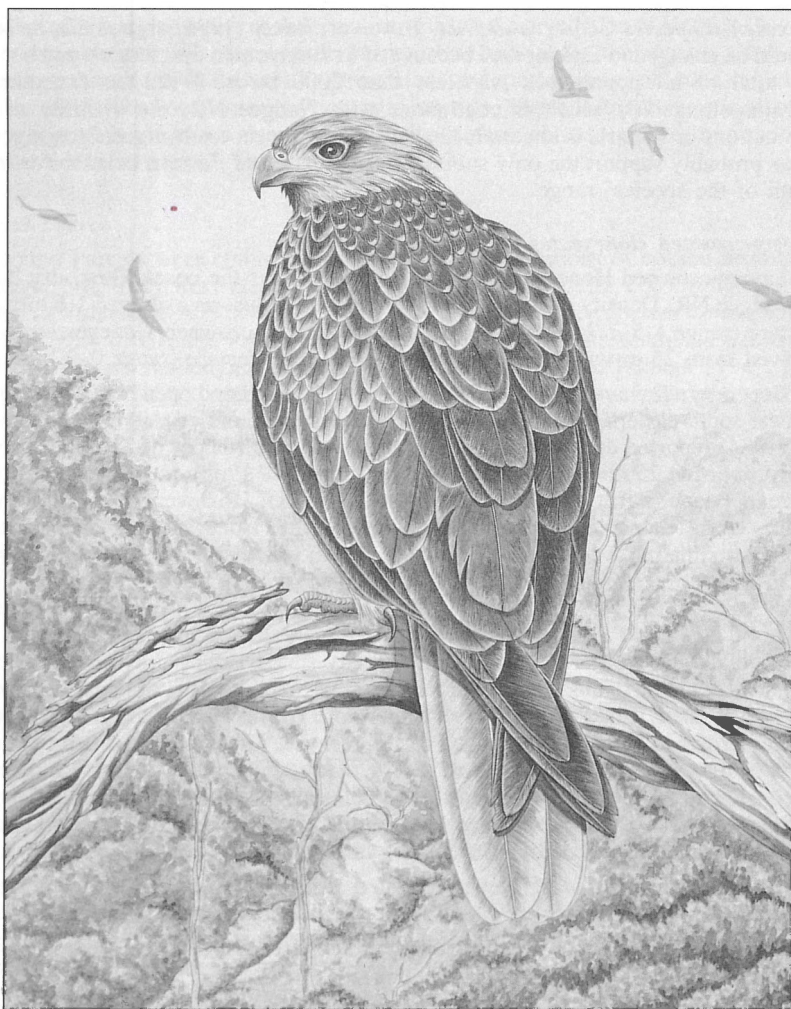
**Whistling Kite**

Plate 11

Painting: Steve Tredinnick

reserve in recent times (Appendix 1). In the present study, high densities of Ground Parrots and Striated Fieldwrens were recorded in both Nadgee NR and Ben Boyd NP south. Pied and Sooty Oystercatchers, Hooded Plovers and Eastern Bristlebirds were also located in Nadgee NR. A comparison with a nearby regional fauna survey of the East Gippsland region in Victoria, an area containing broadly similar habitats (Norris et al. 1983), further emphasises the importance of Nadgee NR for the conservation of several threatened species. Although Norris et al. (1983) recorded many species not listed for Nadgee (primarily related to more intensive sampling of a wider geographic area and variety of habitats), several species were noticeably absent. Despite several past records for each species, neither Ground Parrots nor Eastern Bristlebirds were recorded in the region, suggesting that each has declined in recent times.





**Little Tern**

Plate 12

Photo: G.A. Cumming



**Striated Pardalote (black-headed race)**

Plate 13

Photo: N. Male

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### Appendix 1: Bird Species of Nadgee Nature Reserve

**JB 1994:** species list compiled by Jack Baker between 23.10.1994 and 3.11.1994.

**JB & CRG 1995:** species list and abundance score compiled by Jack Baker and Carl Gosper between 7 and 10 October, and 15 and 17 October 1995.

Abundance score over the area visited:

S = Scarce (1–10 birds)

U = Uncommon (11–30 birds)

C = Common (31–100 birds)

A = Abundant (101+ birds)

# = Specifically targeted (surveyed by call over very large areas)

**Recher (1981):** species list from surveys of Newtons, Little River, Impressa, Nadgee, Endeavour (all coastal) and Tabletop (highland) moors in Nadgee NR, 1979. Only areas of heath were surveyed.

**Morris (1970):** species list for all of Nadgee Nature Reserve.

**Fox (1978):** number and species of birds found dead on Nadgee NR beaches in January 1973, following the wildfire of December 1972.

<sup>a</sup>Additional species to above lists provided by H.F. Recher (pers. comm.).

\*Introduced taxa

?Sighting unconfirmed

Species listed in the N.S.W. *Threatened Species Conservation Act* are marked:

V – Vulnerable, E – Endangered.

NB: pelagic species excluded.

Species	JB 1994	JB & CRG 1995	Recher 1981	Morris 1970	Fox 1978
Emu <i>Dromaius novaehollandiae</i>				+	
Stubble Quail <i>Coturnix pectoralis</i>				+	2
Brown Quail <i>Coturnix ypsilophora</i>			+		
King Quail <i>Coturnix chinensis</i> <sup>a</sup>					
Musk Duck <i>Biziura lobata</i>	+	C		+	
Black Swan <i>Cygnus atratus</i>	+	A		+	
Australian Wood Duck <i>Chenonetta jubata</i>		S		+	
Pacific Black Duck <i>Anas superciliosa</i>				+	
Australasian Shoveler <i>Anas rhynchotis</i>				+	
Grey Teal <i>Anas gracilis</i>				+	
Chestnut Teal <i>Anas castanea</i>				+	
Pink-eared Duck <i>Malacorhynchus membranaceus</i> <sup>a</sup>					
Australasian Grebe <i>Tachybaptus novaehollandiae</i>				+	
Hoary-headed Grebe <i>Poliiocephalus poliocephalus</i>				+	
Australasian Gannet <i>Morus serrator</i>		U		+	
Little Pied Cormorant <i>Phalacrocorax melanoleucus</i>	+	S		+	

<i>Species</i>	<i>JB 1994</i>	<i>JB &amp; CRG 1995</i>	<i>Recher 1981</i>	<i>Morris 1970</i>	<i>Fox 1978</i>
Pied Cormorant <i>Phalacrocorax varius</i>				+	
Little Black Cormorant <i>Phalacrocorax sulcirostris</i>				+	
Great Cormorant <i>Phalacrocorax carbo</i>	+	C		+	
Australian Pelican <i>Pelecanus conspicillatus</i>		S		+	
White-faced Heron <i>Egretta novaehollandiae</i>	+	S		+	
Eastern Reef Egret <i>Egretta sacra</i>				+	
Great Egret <i>Ardea alba</i>				+	
Nankeen Night Heron <i>Nycticorax caledonicus</i>				+	
Black Bittern <i>Ixobrychus flavicollis</i> — V				+	
Straw-necked Ibis <i>Threskiornis spinicollis</i>				+	
Yellow-billed Spoonbill <i>Platalea flavipes</i>				+	
Black-shouldered Kite <i>Elanus axillaris</i>	+			+	
Whistling Kite <i>Haliastur sphenurus</i>				+	
White-bellied Sea-Eagle <i>Haliaeetus leucogaster</i>	+	S		+	
Swamp Harrier <i>Circus approximans</i>	+	S	+	+	
Brown Goshawk <i>Accipiter fasciatus</i>			+	+	
Collared Sparrowhawk <i>Accipiter cirrhocephalus</i>	+	S			
Wedge-tailed Eagle <i>Aquila audax</i>		S		+	
Brown Falcon <i>Falco berigora</i>		S		+	
Peregrine Falcon <i>Falco peregrinus</i>		S	+	+	
Nankeen Kestrel <i>Falco cenchroides</i>				+	
Dusky Moorhen <i>Gallinula tenebrosa</i>				+	
Painted Button-quail <i>Turnix varia</i> <sup>a</sup>					
Latham's Snipe <i>Gallinago hardwickii</i>				+	
Bar-tailed Godwit <i>Limosa lapponica</i>				+	
Whimbrel <i>Numenius phaeopus</i>				+	
Eastern Curlew <i>Numenius madagascariensis</i>				+	
Grey-tailed Tattler <i>Heteroscelus brevipes</i>				+	
Ruddy Turnstone <i>Arenaria interpres</i>		S			
Red Knot <i>Calidris canutus</i>				+	
Red-necked Stint <i>Calidris ruficollis</i>		S		+	
Sharp-tailed Sandpiper <i>Calidris acuminata</i>				+	
Curlew Sandpiper <i>Calidris ferruginea</i>				+	
Painted Snipe <i>Rostratula benghalensis</i> ? — V	+				
Pied Oystercatcher <i>Haematopus longirostris</i> — V	+	S		+	
Sooty Oystercatcher <i>Haematopus fuliginosus</i> — V	+	S		+	
Red-capped Plover <i>Charadrius ruficapillus</i>	+			+	
Double-banded Plover <i>Charadrius bicinctus</i>				+	
Lesser Sand Plover <i>Charadrius mongolus</i> — V				+	
Black-fronted Dotterel <i>Elseyaornis melanops</i>				+	
Hooded Plover <i>Thinornis rubricollis</i> — E	+	S		+	
Masked Lapwing <i>Vanellus miles</i>		S		+	
Pacific Gull <i>Larus pacificus</i>		S		+	
Silver Gull <i>Larus novaehollandiae</i>	+	S		+	

Species	JB 1994	JB & CRG 1995	Recher 1981	Morris 1970	Fox 1978
Caspian Tern <i>Sterna caspia</i>		S		+	
Crested Tern <i>Sterna bergii</i>		U		+	
Little Tern <i>Sterna albifrons</i> — E				+	
Brown Cuckoo-Dove					
<i>Macropygia amboinensis</i>		S			
Common Bronzewing <i>Phaps chalcoptera</i>				+	
Brush Bronzewing <i>Phaps elegans</i>	+	S	+	+	4
Wonga Pigeon <i>Leucosarcia melanoleuca</i>	+	S		+	
Glossy Black-Cockatoo					
<i>Calyptorhynchus lathami</i> — V				+	
Yellow-tailed Black-Cockatoo					
<i>Calyptorhynchus funereus</i>	+	S	+	+	
Gang-gang Cockatoo					
<i>Callocephalon fimbriatum</i>	+			+	
Rainbow Lorikeet					
<i>Trichoglossus haematodus</i>	+	S	+	+	1
Musk Lorikeet <i>Glossopsitta concinna</i>				+	
Little Lorikeet <i>Glossopsitta pusilla</i>				+	
Australian King-Parrot <i>Alisterus scapularis</i>	+			+	1
Crimson Rosella <i>Platycercus elegans</i>	+	U	+	+	7
Blue-winged Parrot <i>Neophema chrysostoma</i>				+	
Ground Parrot <i>Pezoporus wallicus</i> — V	+	C#	+	+	5
Pallid Cuckoo <i>Cuculus pallidus</i>	+			+	
Brush Cuckoo <i>Cacomantis variolosus</i>				+	
Fan-tailed Cuckoo					
<i>Cacomantis flabelliformis</i>	+	U		+	1
Horsfield's Bronze-Cuckoo					
<i>Chrysococcyx basalis</i>	+	S	+	+	
Shining Bronze-Cuckoo					
<i>Chrysococcyx lucidus</i>	+	U	+	+	
Common Koel <i>Eudynamis scolopacea</i>				+	
Powerful Owl <i>Ninox strenua</i> — V				+	
Barking Owl <i>Ninox connivens</i>				+	
Southern Boobook <i>Ninox novaeseelandiae</i>				+	1
Barn Owl <i>Tyto alba</i>				+	1
Tawny Frogmouth <i>Podargus strigoides</i>				+	1
Australian Owlet-nightjar					
<i>Aegotheles cristatus</i>				+	2
White-throated Needletail					
<i>Hirundapus caudacutus</i>			+	+	
Azure Kingfisher <i>Alcedo azurea</i>	+			+	
Laughing Kookaburra					
<i>Dacelo novaeguineae</i>	+	S		+	
Sacred Kingfisher <i>Todiramphus sanctus</i>	+	S		+	
Superb Lyrebird <i>Menura novaehollandiae</i>	+	S		+	
White-throated Treecreeper					
<i>Cormobates leucophaeus</i>	+	C		+	10
Red-browed Treecreeper					
<i>Climacteris erythrops</i>	+	S		+	
Superb Fairy-wren <i>Malurus cyaneus</i>	+	C	+	+	3
Southern Emu-wren <i>Stipiturus malachurus</i>	+	C	+	+	1
Spotted Pardalote <i>Pardalotus punctatus</i>	+	C		+	1
Striated Pardalote <i>Pardalotus striatus</i>	+	S		+	
Eastern Bristlebird					
<i>Dasyornis brachypterus</i> — V	+	U	+	+	



<i>Species</i>	<i>JB</i> 1994	<i>JB &amp; CRG</i> 1995	<i>Recher</i> 1981	<i>Morris</i> 1970	<i>Fox</i> 1978
Pilotbird <i>Pycnoptilus floccosus</i>	+	U		+	
White-browed Scrubwren					
<i>Sericornis frontalis</i>	+	C	+	+	1
Large-billed Scrubwren					
<i>Sericornis magnirostris</i>				+	
Chestnut-rumped Heathwren					
<i>Hylacola pyrrhopygia</i>			+	+	
Striated Fieldwren					
<i>Calamanthus fuliginosus</i> — V	+	U	+	+	
Brown Gerygone <i>Gerygone mouki</i>		C		+	
White-throated Gerygone					
<i>Gerygone olivacea</i>	+				
Brown Thornbill <i>Acanthiza pusilla</i>	+	A	+	+	25
Yellow-rumped Thornbill					
<i>Acanthiza chrysorrhoa</i>				+	
Yellow Thornbill <i>Acanthiza nana</i>				+	
Striated Thornbill <i>Acanthiza lineata</i>	+	C		+	11
Red Wattlebird <i>Anthochaera carunculata</i>		S		+	
Little Wattlebird <i>Anthochaera chrysoptera</i>	+	U	+	+	120
Noisy Friarbird <i>Philemon corniculatus</i>				+	
Regent Honeyeater					
<i>Xanthomyza phrygia</i> — E				+	
Bell Miner <i>Manorina melanophrys</i>	+	U		+	1
Lewin's Honeyeater <i>Meliphaga lewinii</i>	+	S		+	
Yellow-faced Honeyeater					
<i>Lichenostomus chrysops</i>	+	C	+	+	29
White-eared Honeyeater					
<i>Lichenostomus leucotis</i>	+	S		+	
Yellow-tufted Honeyeater					
<i>Lichenostomus melanops</i>				+	
Brown-headed Honeyeater					
<i>Melithreptus brevirostris</i>	+			+	5
White-naped Honeyeater					
<i>Melithreptus lunatus</i>	+	U		+	1
Crescent Honeyeater					
<i>Phylidonyris pyrrhoptera</i>	+	S		+	
New Holland Honeyeater					
<i>Phylidonyris novaehollandiae</i>	+	A	+	+	226
Tawny-crowned Honeyeater					
<i>Phylidonyris melanops</i>	+	A	+	+	
Eastern Spinebill					
<i>Acanthorhynchus tenuirostris</i>	+	U	+	+	12
Scarlet Honeyeater					
<i>Myzomela sanguinolenta</i>				+	
White-fronted Chat <i>Epthianura albifrons</i>		S		+	
Jacky Winter <i>Microeca fascians</i>				+	
Scarlet Robin <i>Petroica multicolor</i>	+			+	1
Flame Robin <i>Petroica phoenicea</i> <sup>a</sup>					
Rose Robin <i>Petroica rosea</i>	+	S		+	
Eastern Yellow Robin <i>Eopsaltria australis</i>	+	C		+	49
Eastern Whipbird <i>Psophodes olivaceus</i>	+	C	+	+	1
Spotted Quail-thrush <i>Cinclosoma punctatum</i>				+	
Varied Sittella <i>Daphoenositta chrysoptera</i>	+	U		+	2
Crested Shrike-tit <i>Falcunculus frontatus</i>				+	2
Olive Whistler <i>Pachycephala olivacea</i> — V				+	

<i>Species</i>	<i>JB 1994</i>	<i>JB &amp; CRG 1995</i>	<i>Recher 1981</i>	<i>Morris 1970</i>	<i>Fox 1978</i>
Golden Whistler <i>Pachycephala pectoralis</i>	+	C		+	21
Rufous Whistler <i>Pachycephala rufiventris</i>	+	C	+	+	2
Grey Shrike-thrush <i>Colluricincla harmonica</i>	+	C	+	+	1
Black-faced Monarch <i>Monarcha melanopsis</i>	+	S		+	
Leaden Flycatcher <i>Myiagra rubecula</i>		S		+	1
Satin Flycatcher <i>Myiagra cyanoleuca</i>	+				
Rufous Fantail <i>Rhipidura rufifrons</i>	+			+	
Grey Fantail <i>Rhipidura fuliginosa</i>	+	C	+	+	
Willie Wagtail <i>Rhipidura leucophrys</i>		S		+	
Black-faced Cuckoo-shrike <i>Coracina novaehollandiae</i>	+	S	+	+	
Cicadabird <i>Coracina tenuirostris</i>				+	
Olive-backed Oriole <i>Oriolus sagittatus</i>	+	S		+	1
Dusky Woodswallow <i>Artamus cyanopterus</i>	+	S	+	+	2
Grey Butcherbird <i>Cracticus torquatus</i>	+	S		+	
Australian Magpie <i>Gymnorhina tibicen</i>				+	
Pied Currawong <i>Strepera graculina</i>	+	S		+	2
Grey Currawong <i>Strepera versicolor</i>	+			+	
Australian Raven <i>Corvus coronoides</i>	+	U	+	+	
White-winged Chough <i>Corcorax melanorhamphos</i>				+	
Satin Bowerbird <i>Ptilonorhynchus violaceus</i>	+	U		+	1
*Skylark <i>Alauda arvensis</i>			+	+	
Richard's Pipit <i>Anthus novaeseelandiae</i>		S	+	+	
Red-browed Finch <i>Neochmia temporalis</i>	+	S		+	3
Beautiful Firetail <i>Stagonopleura bella</i>	+	S		+	3
*European Goldfinch <i>Carduelis carduelis</i>		S	+	+	
Mistletoebird <i>Dicaeum hirundinaceum</i>				+	
Welcome Swallow <i>Hirundo neoxena</i>	+	U	+	+	
Tree Martin <i>Hirundo nigricans</i>	+	U	+	+	
Fairy Martin <i>Hirundo ariel</i>			+	+	
Silvereye <i>Zosterops lateralis</i>	+	C	+	+	
Bassian Thrush <i>Zoothera lunulata</i>		S		+	
*Common Blackbird <i>Turdus merula</i>		S		+	5
*Common Starling <i>Sturnus vulgaris</i>				+	