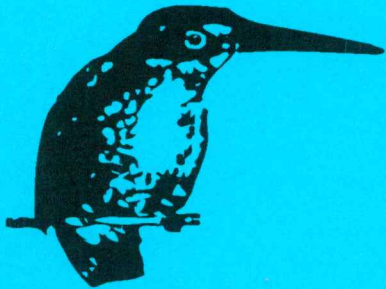


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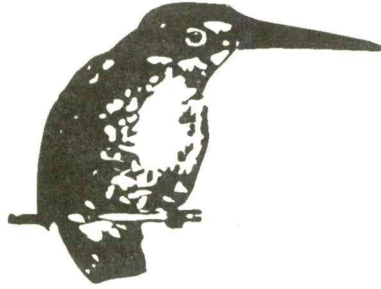
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AUSTRALIAN BIRDS



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FURTHER NOTES ON TERRITORY, BREEDING AND PLUMAGE OF THE LITTLE EAGLE

S.J.S. DEBUS

Further casual observations mainly in the Armidale area (NSW) on the behaviour of the Little Eagle *Hieraaetus morphnoides* provide additional information to that reported previously (Debus 1983, 1984a). Ten eagle pairs and their territories, identified by number in Debus (1984b), were all within a 15 km radius of Armidale city in 1980.

Further observations on captive, known-age birds provide information on plumage additional to that previously reported (Debus 1989a).

TERRITORY OCCUPANCY AND SUCCESS

In 1990 I attempted to re-survey 10 Little Eagle breeding territories occupied in the Armidale district in 1980 (Debus 1984b). I was able to check only half of these, but pairs were present at all five sites (territories 2, 3, 4, 6 and 9): two nests had fledglings or large young about to fledge, one failed (female disappeared) and the success of the other two pairs was not determined (Tables 1, 2). The number and location of occupied territories thus seems to have remained stable over the 10 years, as birds have been observed casually in the intervening years in these five territories and in some of the others (territories 1, 5 and 8 in the mid 1980s: Table 1). The species has remained common, with no indication of a marked change in density.

Sketchy data were obtained on the progress of pairs. Only one of these (territory 6) was affected by habitat change, being on the edge of Armidale city: urban expansion reached the nest tree. The rest were in the surrounding wooded and rural areas.

Pair 1 abandoned the nest successfully used in 1980, and adult birds were occasionally sighted 0.5-1 km to the east, in a different gully, in later years.

Pair 2 abandoned their 1980 nest which failed. In the 1986 season the male carried prey towards a new nest c. 1 km to the south-east. In 1990 the pair had large young near fledging (brood size undetermined) in a new nest c. 1 km east of the original site, in the crown of a mature creekside Manna Gum *Eucalyptus viminalis*.

The male in territory 3 was replaced for the second time in 10 years: in 1990 the male was an exceptionally dark bird, whereas in 1980 the male was pale (himself a new bird in that year, having replaced a moderately dark bird: Debus 1983, 1984a). This pair has occupied and nested in a *Pinus radiata* plantation continuously.

Territory 4 was monitored intermittently by myself and Lynda Bridges for most of the 10 years. Both sexes were pale birds throughout this time, therefore no mate changes were detected. In 1984-85 they had one fledgling which was still begging in early March. It was thus dependent for at least two months post-fledging (local fledging being early December to early January: Debus 1984b and pers. obs.). Each year from 1985 to 1989 the pair used the same nest on a mistletoe in the top of a mature but sparsely foliated Manna Gum, on the northern edge of a 200 ha open forest block bordering pasture. They raised one chick in most of these years: 1985, 1987 and at least one of the other three years (L. Bridges pers. comm.), here assigned to 1988 (Table 2). In about 1986 an adult male was found dead (decomposed) in the forest, cause unknown but possibly shot as it was beside a track frequented by vandals. In 1989 the nest tree died, but the eagles used the nest (L. Bridges pers. comm.). In 1990 the tree was completely leafless and the branch and nest had fallen down. The pair built a new nest c. 1 km east, on a mistletoe 15 m up in a mature (20 m) Manna Gum, on the south-east side of a knoll in the forest block; the space around the tree was slightly greater than the average inter-tree distance in the forest. On 30 November there were two large, almost fledged nestlings (S. Tremont pers. comm.). This is the first record of a successful brood of two at Armidale, a year when rabbits were exceptionally abundant. In mid September 1991 the pair was occupying the 1990 nest.

In the 1990 season a second (pale) pair was suspected on the eastern edge of the forest block containing territory 4. In September 1991 this was confirmed: a pair was occupying a nest on a mistletoe in the top of a 20 m Yellow Box *Eucalyptus melliodora*, on the eastern boundary of the forest, 1.3 km south-east of territory 4. If this was a "new" pair in a period and locality of high rabbit numbers, the birds' arrival offset apparent disappearances in other territories (Table 1), i.e. there was little net change in eagle numbers.

Pair 5 consisted of a light male and a dark female, first seen in 1980. In 1983 they fledged one young from a nest in a large Manna Gum on a south-east slope (different nest

from the 1980 one which failed). In 1984 they nested, success unknown, and the dark bird was not seen in subsequent years (J. Currey pers. comm.). This pair had stayed together for at least four years, but continued territory occupancy could not be confirmed during occasional visits in later years.

Pair 6 lost their nest tree in the years after 1981, when urban expansion encroached on their territory and houses were built virtually where the tree had stood. However, suitable habitat remained about a kilometre away, and a pair was still present in December 1990.

In 1980 both sexes in territory 8 were pale, but in 1983 the male was dark. A nest was suspected but not found, and there was no indication that the successful 1980 nest had been re-used.

Both adults in territory 9 were seen intermittently, sometimes displaying, since 1982 (particularly 1987-89), but their nest area was not found until 1990. They had several nests in various stages of disrepair in a group of mature creekside Manna Gums. Both were pale birds over the nine years. In 1990 the male was seen alone several times in the breeding season, and in December he was perched beside the most recent but unrenovated nest with no sign of the female or fledgling(s).

For all pairs combined for which success was known, at least eight young were raised in eight pair years 1983-1990, giving 1.0 young per pair per year. The mid to late 1980s were wetter than the drought around 1977-81 when success was 0.5 young per pair per year (Debus 1984b). The result in later years may have been biased by the greater likelihood of successful nests being detected. However, the high success in territory 4 (six young in five years) may have been general for the district in recent years, culminating in a brood of two in a "good" rabbit year. The higher success in recent years is similar to the 0.8 and 1.0 young per pair per year recorded for the Little Eagle by Baker-Gabb (1984) and Mallinson et al. (1990).

For the eight territories (16 birds) revisited over the 10 years, there were three cases of mate replacement (different morphs); two cases of adult disappearance; and one case of adult mortality detected. There was thus a turnover of at least 38% of the adult population in 10 years or a minimum of 4% adult mortality per year but it may have been higher. If major shifts of nest site are sometimes associated with mate changes in eagles, then mate replacement may have occurred in territories 1 and 2 also. This would give 50% turnover in 10 years or 5% annual adult mortality (assuming departure = death). An annual mortality (m) of 5%, and the formula $(2-m)/2m$ in Newton (1986), give a mean expectancy of further life of 19.5 years, which may be too high (i.e. mortality was greater than detected). The formula in Ridpath & Brooker (1986) and a mean Little Eagle mass of 833 g (male 619 g, female 1046 g; unpubl. data) give an average life span of 16 years, therefore some birds may have outlived the 10 year study. The oldest Little Eagles banded and recovered were 10 years 3 months and 9 years 9 months (banded as adults: Waterman 1983 and editorial comment).

DISPLAYS

Displays serve to advertise territory occupancy, to deter rivals without the need for physical fighting, and to attract a mate or maintain the pair bond in readiness for breeding. In eagles and other raptors, these often involve conspicuous aerial displays (visual and vocal) and demonstrations of the male's agility (described previously for the Little Eagle by Debus 1983).

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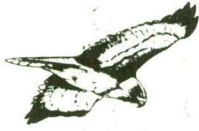
Breeding Little Eagles adopt a characteristic posture when soaring in display high over their territory. Either before or after performing undulating advertisement displays, males typically soar or glide on flat, fully extended wings with the primaries slightly lowered and turned back, and the tail tightly furled. This resembles the posture of the Golden Eagle *Aquila chrysaetos* illustrated in Brown (1976, Figure C, p. 127). The silhouette is subtly but recognisably different from that of Little Eagles soaring for other reasons (e.g. hunting), and during such displays they typically give the same whistling call as during undulations. The posture seems to be a signal that a territory is occupied. Displaying territorial males also soar high and flap with short, stiff wing-beats while calling. During high undulating displays, distant males of the pale morph produce a conspicuous flash-pattern when their white underparts are lit by the sun as they change direction, a feature noted by Lane (1913) who described other aspects of Little Eagle behaviour.

Territorial defence

Intrasexual territorial encounters involving aggression (pursuit) seem to be rare: one between two females in 181 hours of observation in one breeding season (Debus 1983), and one between two males in >300 casual sightings over the ten years following the intensive observations. In the case involving two males, both birds were in high soaring flight perhaps 100 m apart in the breeding season. One, the presumed territory owner, pursued the other, presumed intruder, about 50 m behind and over a short distance (perhaps 500 m). The gliding pursuit was rather leisurely, with a few flaps, and the pursuer called twice with a rarely heard wailing whistle - a double note *kee-ee* of one second duration. The intruder glided out of sight, and the other remained.

Courtship

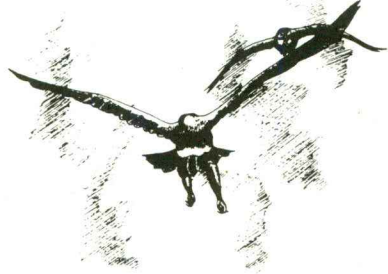
Further observations of courtship flights add to previous information. One case will serve as a typical example. In summer, after her single young had fledged, a female was soaring high with her primaries turned back and tail furled (in the display posture, as described). The male dived steeply at her with his wings folded to his tail, and she rolled and presented her talons. This was repeated, and the pair seemed to touch feet as the female rolled. No calls were uttered. At the start of breeding activity another pair soared up together from their nest site with bursts of short, stiff wing-beats. Also at the start of breeding activity, when claiming an existing stick nest in their territory, adult birds were



Little Eagle gains height over slowly circling Wedgetail, unconcerned by it's presence.



Little Eagle makes several head-on dives towards Wedgetail, which lowers it's talons in anticipation of a strike.



Wedgetail avoids vertical stoop by Little Eagle, almost stalling, thrusting it's talons at the passing attacker.



* After several minutes of harrasing the Wedgetail made a rapid exit from the Little Eagle's territory.

Little Eagle territorial defence against Wedgetailed Eagle.
(Observed Mt. Blackheath, Blue Mountains.)

Steve Tredinnick '91

standing conspicuously on nests. Some of these activities probably have an advertisement as well as courtship function.

INTERACTIONS WITH WEDGE-TAILED EAGLES

There appears to be some competitive interaction between Little Eagles and Wedge-tailed Eagles *Aquila audax*, with the two species possibly holding mutually exclusive breeding territories. As previously noted (Debus 1983; Bonnin 1988), Little Eagles often attack Wedge-tailed Eagles, sometimes vigorously, and occasionally call at them in a manner usually reserved for intruding conspecifics. The Armidale district is a more-or-less complete territorial mosaic of Little Eagle pairs, with the exception of the forested Mt Duval (<2000 ha) which is occupied by one or two pairs of Wedge-tailed Eagles (two nests of the latter c. 2 km apart, at opposite ends of the mountain). Little Eagles occupy the surrounding lower, more open country. In another patch of open forest of c. 150 ha, a Wedge-tailed Eagle nest was active and fledged one young in 1980 but was subsequently deserted, probably related to increasing passive human disturbance (recreation). In later years Little Eagles frequented the area, and bred there (T. Cross pers. comm.). Little Eagles occasionally use unoccupied Wedge-tailed Eagle nests (Sedgwick 1989, Mallinson et al. 1990). Conversely, in Victoria a pair of Little Eagles abandoned their nest, used the previous year, when a pair of Wedge-tailed Eagles nested 300 m away (D. Baker-Gabb pers. comm.). It appears that Little Eagles are intolerant of the close proximity of Wedge-tailed Eagles, and are subordinate in any competition for nesting territories as might be expected from the size difference. Similar competitive interactions between Golden Eagles and Bonelli's Eagles *Hieraaetus fasciatus* are known, with the larger Golden Eagle dominant in competition for nest sites (e.g. Muntaner & CRPR 1985).

BREEDING BEHAVIOUR AND DIET

Few additional data were obtained, mainly from territory 4. In 1987 a few pellets under the nest contained rabbit remains. In 1988 the female ate an adult Australian Magpie *Gymnorhina tibicen* which she presumably caught (Debus 1989b). On 10 September 1990 the female eagle attacked an adult Forest Raven *Corvus tasmanicus* in what looked like attempted predation but may have been territorial defence (Debus 1991). The female was on eggs by the third week in September 1990; on 6 November she was feeding a downy chick at 0900 hrs; and on 13 and 19 November she was brooding the chicks at c. 0800 and 0730 hrs respectively. Also at about 0730 hrs on 19 November the male eagle was flushed from a freshly killed (warm and limp) rabbit kitten at the entrance to its warren. On 5 December the male was on the nest at 0600 hrs, and at 0950 hrs the female was feeding the nestlings and fledging seemed imminent. On 20 December the nest was empty (S. Tremont pers. comm.). A pellet below the nest contained rabbit and passerine remains.

In the 1986 season the male in territory 2 carried a freshly caught rabbit kitten to the nest. Elsewhere in the Armidale district, since 1980, I twice observed adult Little Eagles (a male and a female) feeding on fresh road-killed rabbits.

PARENTAL FEEDING RATES

I recalculated parental feeding rates for 1980, a drought year (Debus 1984b), to present the data in a way more comparable with those of Dell (1971) and Bollen (1989, 1991). In 15 hours' observation (pooled) for pairs 1, 2 and 3 in the incubation period there was only one delivery by a male to an incubating female (0.1 deliveries per hour). Early in the nestling period (downy chick stage) at the same three nests, each with a single chick, in 12 hours' observation (pooled) there were two prey deliveries (0.2 deliveries per hour). The corresponding figure obtained by Dell (1971) at one nest with two downy chicks was six deliveries in 10 hours (0.6 per hour). Later in the nestling period at Armidale (single nestlings, feathering stage to fledging), pair 3 delivered 13 items in 56 hours and pair 6 delivered 11 items in 76 hours, giving an average of 0.2 deliveries per hour, mostly large items (rabbits). Corresponding figures obtained by Bollen (1989, 1991) for one pair with a single nestling in two years were 0.4 and 0.6 deliveries per hour, mostly small items (birds). In the post-fledging period at Armidale, pair 3 delivered one item (rabbit) to their fledgling in 24 hours' observation during its first week out of the nest (<0.1 deliveries per hour). These results suggest higher feeding rates during the nestling period than incubation or post-fledging periods; higher feeding rates at nests with two chicks (perhaps enabling the survival of the second chick); higher feeding rates in good than poor seasons; and feeding rates varying according to prey size (small items being delivered more frequently than large). However, sample sizes are small and confounding effects cannot be separated among the different studies. Nevertheless, high feeding rates at Goulburn (NSW) seem to correspond with high breeding success at Canberra <100 km away (cf. Bollen 1989, 1991; Mallinson et al. 1990), the reverse of the situation at Armidale where there were low feeding rates and low breeding success during drought.

PLUMAGE

In May and September 1990 I re-examined a captive male Little Eagle (pale morph) then in its third year, its second-year plumage having been described previously (Debus 1989a). Compared to its second-year plumage, in May 1990 (post-moult) it was paler on the underparts with bolder chest streaks; it had pale median upperwing coverts with no rufous spots on the lesser coverts; light brown eyes; and grey-white cere and toes. It was adult in appearance, except that even in September 1990 its eyes were not as "red" as those of an older male housed with it. Little Eagles thus seem to acquire fully adult plumage after two annual moults, although their eye colour may continue to change.

In 1990 I also examined a first-year captive female Little Eagle of the dark morph. In May it was essentially as previously described for a small sample of dark juveniles (Debus 1989a), i.e. dark rufous (rich tawny) on the underparts; some black streaks on the forehead and crest; narrow chest streaks; dark fawn median upperwing coverts (but lacking the rufous spots on the lesser coverts often present in juveniles); brown eyes; and cream cere and feet. In September it was unchanged, with no moult.

In June 1991 I obtained a captive juvenile male of the pale morph. It was essentially as previously described for pale juveniles (see Debus 1989a), except that the pale tips to

secondary coverts, secondaries and inner primaries were narrower and less distinct than in many juveniles. It had brown eyes, and cream cere and feet. Its pale rufous belly and undertail coverts seemed to fade somewhat over three months towards the end of its first year, pre-moult. Nevertheless, it was richer brown and rufous than a pale adult housed with it.

The white tips (translucent trailing edges) to the secondaries and tail were identified as tentative age characters in the Little Eagle (Debus 1989a). Further field observations show that adults in fresh plumage may have pale tips on new flight and tail feathers. In the field, any resulting translucent trailing edges to wings and tail are narrower than in most juveniles, and the pale tips to the secondary coverts are narrower and do not form the prominent pale line present in many juveniles.

As previously noted, age characters in the Little Eagle are variable and a matter of degree. The limited information available is presented as a basis upon which to begin a better understanding of the species.

ACKNOWLEDGEMENTS

I thank Lynda Bridges, June Currey and Steve Tremont for their information on some of the Little Eagle pairs and nests; Bruce Kubbere and Featherdale Wildlife Park staff (Sydney) for permission and access to study captive birds; Peter Debus, Sue Debus, John Fields, Stuart Green, Kay Holdsworth, Ursula Munro, Ruth Tremont and Zoology staff for facilitating the care of captive birds at Armidale; NPWS for providing a permit; and Rod Kavanagh and referees for comments on a draft.

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S.J.S. Debus, Zoology Department, University of New England, Armidale, NSW 2351

Table 1

Territory occupancy by Little Eagles according to colour morph (P = pale, D = dark) of each sex (M = male, F = female) at Armidale, 1980-1990. Territories numbered according to Debus (1984b). X = bird died or disappeared.

| Territory | Year | | | | | | | | | | |
|-----------|------------------|----|----|----|----|----|------|----|-------|----|----|
| | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 1 M | P—————>P—>? | | | | | | | | P ->? | ? | |
| F | P—>? | | | | | | | | | | ? |
| 2 M | P—————>P—>? | | | | | | P—>? | | | | P |
| F | P—————>P—>? | | | | | | P—>? | | | | P |
| 3 M | D->P—————>P->? | | | | | | | | | | D |
| F | P—————->P->? | | | | | | | | | | P |
| 4 M | P—————>XP—————>P | | | | | | | | | | |
| F | P—————>P—————>P | | | | | | | | | | |
| 5 M | P—————>P->? | | | | | | | | | | ? |
| F | D—————>D->X | | | | | | | | | | ? |
| 6 M | P->P->? | | | | | | | | | | P |
| F | P->P->? | | | | | | | | | | P |
| 8 M | P->? D | | | | | | | | | | ? |
| F | P->? | | | | | | | | | | ? |
| 9 M | P—————>P—————>P | | | | | | | | | | |
| F | P—————>P—————>?X | | | | | | | | | | |

Table 2

Reproductive success of six Little Eagle territories at Armidale, 1983-1990. Territories numbered according to Debus (1984b).

| Year | Territory | | | | | |
|------|-----------|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 9 |
| 1983 | | | | 1 | | |
| 1984 | | | 1 | ? | | |
| 1985 | | | 1 | | | |
| 1986 | ? | | ? | | | |
| 1987 | | | 1 | | | |
| 1988 | | | 1 | | | |
| 1989 | | | ? | | | |
| 1990 | 1+ | ? | 2 | | ? | 0 |

SEASONAL FLUCTUATION OF LITTLE TERN *STERNA ALBIFRONS* AT WINDANG, NEW SOUTH WALES DURING THE 1989-90 AUSTRAL SUMMER

C.J. CHAFER AND C.C.P. BRANDIS

SUMMARY

This paper discusses the results of a 33 week study of a population of Little Tern *Sterna albifrons*, at Windang N.S.W. during the 1989-90 Austral summer. Arrival, increase, stability, subsequent decline and departure are discussed. Percentage of non-breeding individuals, details of foraging technique, feeding zones and disturbance of the population are also presented. Comparisons with a previous six year study and limited data from 1954 to 1963 is made which corroborates observed seasonal fluctuations at this site.

INTRODUCTION

The Little Tern *Sterna albifrons*, is generally regarded both as a summer breeding visitor and a non-breeding visitor to the east coast of Australia. Together with an autumn breeding population in the Gulf of Carpentaria, the subspecific taxonomy of these populations is not fully understood (Pringle, 1987; McAllen and Bruce, 1988; Smith, 1990). Harrison (1983) describes *S.a.sinensis* as the Asian breeding sub-species migrating south to Australia in summer and *S.a.placens* as the Australian breeding sub-species. In the Illawarra region of New South Wales, the Little Tern is regarded as a summer visitor, now only occasionally breeding at locations where it has historically been recorded as breeding regularly (Gibson, 1989; Chafer, 1989; Smith, 1990). The largest current regional population is at Windang, the entrance to Lake Illawarra, approximately 100 kilometres south of Sydney (Wood, 1985; Chafer, 1989).

During a previous study (Chafer, 1989) it was found that individuals generally begin arriving at Windang in late August and early September, increasing to a plateau in January, February and March followed by a decline with all birds having departed by mid May. This paper reports on a more comprehensive weekly study of the site during the 1989-1990 Austral summer. These data compare favourably with a limited data set from 1954/55 to 1962/63.

METHODS

The Windang population was monitored on a weekly basis from the time of the first observed arrival on 17 September, 1989 (week 1) until the last observation on 3 May, 1990 (week 33).

Censusing was generally carried out at their main high tide roosting site, an elongated sand spit on the north side of the entrance channel to Lake Illawarra. When not at this site they could be noted fishing out to sea, in the Lake proper and on occasions, roosting on exposed mud flats at the western end of the entrance channel (Chafer, 1991). During each census birds in non-breeding and breeding plumage were recorded with details of a moult change in late February also noted. While feeding their general behaviour, and where possible, the prey type was noted. Censusing was conducted independently by each author at personally suitable times during each week which generally resulted in more than one count available. In this case the counts with the highest number of individuals was recorded as the weekly population. Human disturbance of roosting terns was also recorded.

RESULTS

Individual censusing results were highly variable ranging from zero to the weekly maximum birds being noted on the same day. The number of birds counted roosting tended to relate to the feeding activity, as within a minute all or some of the roosting birds could depart and be later noted feeding. Mass roosting at the Lake entrance is generally confined to high tide, periods of strong winds that cause the water surface to chop and approximately 15 to 30 minutes before sunset. Often during periods of roosting, birds will bathe in the channel shoals, particularly on an ebb tide.

During the 33 week study period (Fig. 1) the population numbers increased gradually over the first six weeks (mid September to the end of October), followed by a rapid increase over the two week period of 29 October to 11 November (week 8 & 9). During the next 17 week period to week 24 the population was relatively stable, (mean 226, range 125 to 362, SD 58.8). The highest count of 362 was recorded on 22 February (week 23), shortly after which the population declined until the last three individuals were recorded on 3 May (week 33). This change in population followed closely the trend obtained from a previous study (Chafer, 1989) as shown in Fig. 3.

One pair in breeding plumage were present between 8 October and 27 January and although no breeding was recorded, pre-nuptial displays of fish offering and tandem flights were observed during November and early December. Four birds in breeding plumage were noted during week 8 but two only were recorded in the following weeks (Fig. 2).

Two immature birds were observed being fed by moulting adults in mid to late February, similar observations having been made during the previous two summers.

All the other birds noted during the population increase period were in non-breeding plumage. This remained the case until the first week in February when several birds were noted to be moulting into breeding plumage (Fig. 2). The number of birds observed in full

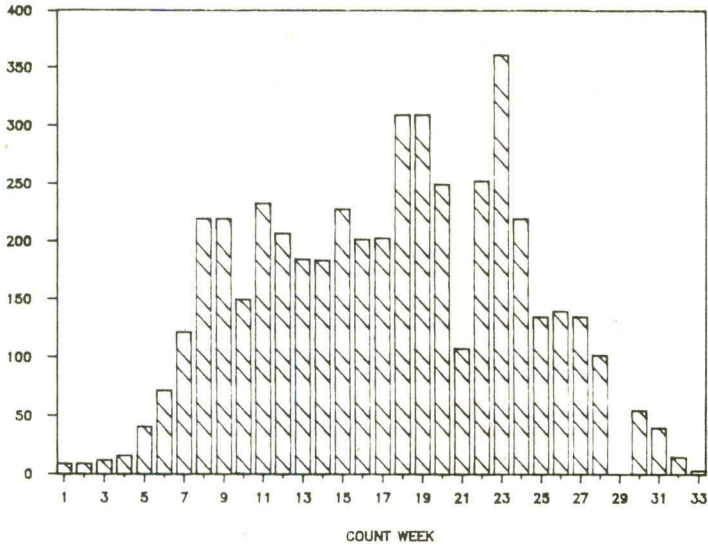


Fig 1: Maximum weekly number of Little Tern in all plumages recorded at Windang NSW from 17 September 1989 to 5 March 1990.

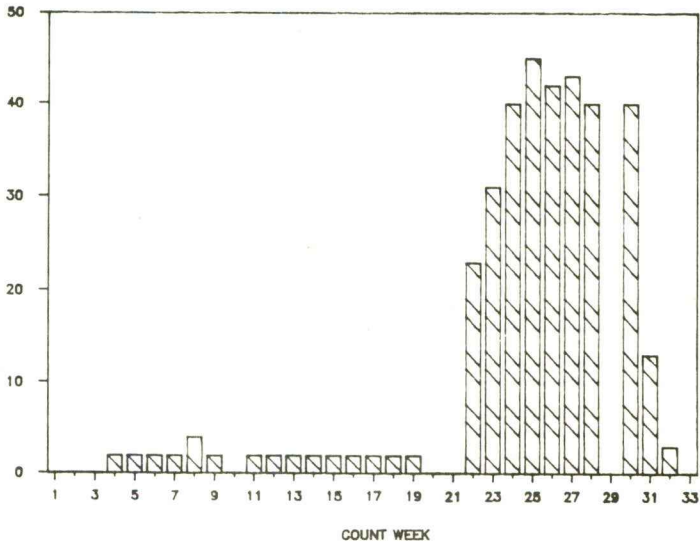


Fig 2: Maximum weekly number of Little Tern in breeding plumage recorded at Windang NSW from 17 September 1989 to 5 March 1990.

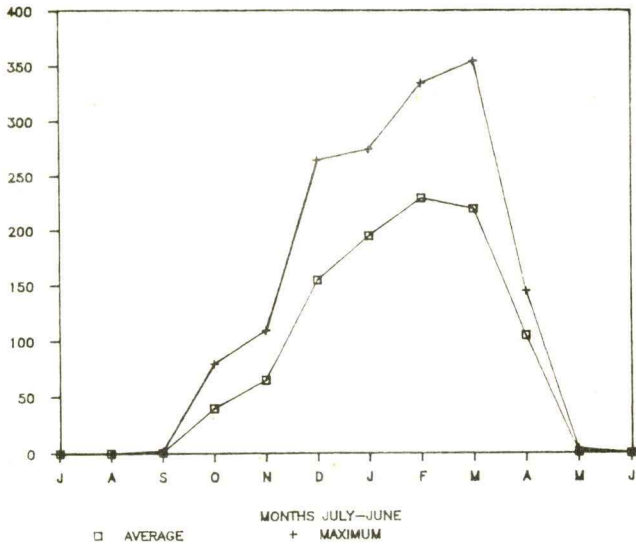


Fig 3: Average monthly maximum and average numbers of Little Tern recorded at Windang NSW each Austral summer from 1982/83 to 1989/90 adapted from Chafer 1989.

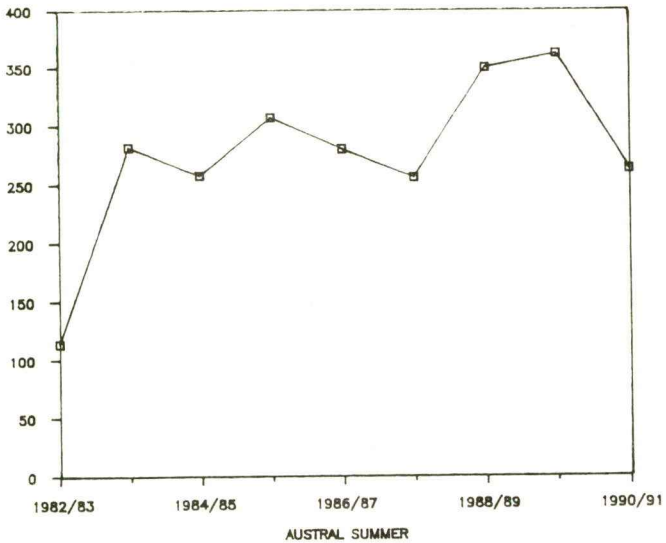


Fig 4: Maximum number of Little Tern recorded at Windang NSW over each Austral summer from 1982/83 to 1990/91.

or partial breeding plumage increased to 45 in mid March (week 25) at which point the total population declined rapidly. The number of birds in breeding plumage over this 7 week period (weeks 24 to 30) were relatively stable, (mean 41.7, range 40 to 45, SD 2.1).

The maximum population recorded during the nine Austral Summers for the period of 1982/83 to 1990/91 has been extracted from a previous study (Chafer, 1989) as well as additional data for 1990/91 and is shown in Fig. 4. The 1982/83 count may be underestimated as the number of visits to the area were less than for following years and is not used in calculations. The mean of 295, standard deviation (SD) 38, allows an expected range of the maximum population to be the mean + or - 3x (SD), i.e. 181 to 409 (Spiegel, 1972).

Fishing was conducted primarily in three locations; off shore and to the prevailing leeward side of the channel entrance to the sea, in the estuary channel itself and in the eastern half of Lake Illawarra, from Karroo Bay in the south to Griffins Bay in the north (Chafer, 1991).

Off shore the terns generally fish out beyond the breaker line to a distance of approximately 500 metres from the shore. Fishing at sea is often conducted during periods of light winds with the birds using the winds to hover. On sighting prey, birds would dive 5 to 10 metres vertically, stall momentarily and then continue with a shallow dive into the water. Once a catch is made, the individual may be occasionally chased by other Little Terns, Silver Gulls *Larus novaehollandiae* or Kelp Gulls *Larus dominicanus*.

In the estuary channel, fishing is mainly conducted on the sea end of the channel along the waters edge during periods of tidal ebb and flow. Here the birds hover between 3 and 6 metres above the water where small fish and crustaceans appear to be taken.

Within the Lake fishing is conducted in a similar manner to that off shore. Occasionally birds swoop steeply without a stall and appear to either just dip their bills into or close to the water surface around areas of floating vegetation as if catching insects. Estimates of catch success rate could not be ascertained due to distance from shore.

Disturbance of the population is high and consists of both intentional human and animal interference as well as activities of humans oblivious of the presence of roosting birds. Human pressure is highest during fine days, especially during the January school holiday period when there is a considerable influx of tourists into several nearby caravan parks and picnic areas. Animal disturbance is generally in the early morning and late afternoon while dogs are being exercised. Very little vehicular activity is permitted in the area, although professional fishermen are allowed to drive over what was the nesting grounds to fish the channel for prawns, but as nesting has not been recorded for years this is now negligible.

DISCUSSION

The results of the 33 week study agree broadly with results obtained from a previous six year study at this site (Chafer, 1989) and the records of the late J.D. Gibson (now in our possession). Results indicated that 99% of the Windang population of Little Tern are migrating non-breeders. The endemic breeding sub-species is poorly represented with a maximum of two breeding pairs in the estuary which is similar to that of the historical data collected by Gibson. Seasonal fluctuation of the overall population were similar to that obtained previously (Fig. 3).

Smith (1990) states that both the breeding and non-breeding populations in N.S.W. have declined in the last decade. The following data has been extracted from the records of the late J.D. Gibson and is used for comparative purposes against the 1982/83 to 1990/91 data presented:-

| | | |
|-------------------|-----------------|--|
| 18 October 1954 | Quite a few | All non-breeding |
| 7 November 1954 | 50 | |
| 21 November 1954 | Many | All non-breeding |
| 20 February 1955 | 100 (c) | |
| 23 February 1955 | 200 (c) | |
| 14 March 1955 | 20 | |
| 3 April 1955 | 2 | |
| 24 September 1955 | 2 | |
| 18 February 1956 | 200 | 3 or 4 in breeding plumage |
| 7 October 1956 | 100 (c) | |
| 5 January 1957 | 100 | 2 in breeding plumage |
| 24 January 1957 | 80 | 58 in partial or full breeding plumage |
| 23 March 1957 | Fair complement | |
| 3 October 1959 | 100 | |
| 3 February 1963 | 300 | Less than 12 in some breeding plumage |

The numbers quoted appear to be estimates rather than counts as they are generally multiples of hundreds and appear to be the result of infrequent visits to the area. Even so the maximum numbers counted of 200 and 300 are within the expected population range of 181 to 409 as previously calculated and suggests that the Windang population has remained relatively stable through the 36 year period.

Local breeding has not been recorded since the early 1960s (personal observations and L.E. Smith pers. comm.) although dependent young have been noted in the estuary

over the last 3 years. Breeding at other historical colonies in the area has not been recorded since one pair nested at Coniston Beach in 1985 (R. Almond pers. comm.). It is apparent that a number of colonies from Bellambi in the north to Shoalhaven in the south have ceased to exist (Chafer, 1989; Smith, 1990), while 80 kilometres to the north a population of about 200 in Botany Bay with less than 10 breeding pairs is under pressure from development (Larkins 1983; Morris, 1989; Eagan, 1991). A similar habitat 80 kilometres to the south, at the considerably larger Shoalhaven/Crookhaven estuary and the adjacent Lake Woolumboola, the species is only recorded infrequently although a small breeding colony previously existed in the area (Chafer, 1989). The implications of this are not clear, although it appears the ecological requirements of the Little Tern are poorly understood and further study into this aspect is required.

While previous studies on this species have provided useful information on breeding populations (Vincent, 1983; Larkins, 1984; Clancy, 1987; Smith, 1990), very little has been documented on the visiting non-breeding populations. The precise sub-speciation of these populations needs to be identified (Smith, 1990). A specimen of Saunders Tern, *S.a.saundersi* was collected from Wollongong in 1903 (Condon, 1975) and it has been observed that some departing breeding plumage birds, (April), appear to lack white shafts in the outer primaries and have brownish legs as described for *S.a.saundersi*. This is contra to Pringle (1987) and Smith (1990) who regard *S.a.sinensis* as the departing sub species. These observations obviously need further confirmation. During the past 8 years of observations most of the Windang population at any one time is in apparent non-breeding plumage throughout the Austral summer. During this period sections of the population moult out of and into breeding plumage, indicating that the phylogenetic relationship of Little Tern subspeciation in Australia may be in need of review.

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C.J. Chafer 69 Lake Heights Road, Lake Heights, 2502

C.C.P. Brandis 10 Charlton Street, Mt. Warrigal, 2528

OBSERVATIONS OF POWERFUL OWLS AT PENNANT HILLS

C. "SANDY" SANSOM

Following our original discovery on 2 December 1990 of Powerful Owls *Ninox strenua* using day roosts in Pennant Hills Park, my wife and I continued to visit the area occasionally. The day roost area is a small rainforest grove close to a creek. Tree species are predominantly Coachwood *Ceratopetalum apetalum* and Crabapple *Schizomeria ovata* which provide most of the roost perches. The surrounding habitat is dry sclerophyll forest and woodland typical of Sydney sandstone areas with Turpentine *Syncarpia glomulifera*, Blackbutt *Eucalyptus pilularis*, Smooth-barked Apple *Angophora costata* and Christmas Bush *Ceratopetalum gummiferum* among others. The birds in question are a mature pair plus a juvenile which achieved adult plumage about late January 1991. Since late December 1990 the birds have been under close observation by R.P. Kavanagh (Forestry Commission,

Research Division) who is currently researching forest owls. In support of this program both my wife and I have assisted with site visits, pellet collection and general observations. Two such observations are here detailed.

On 8 March 1990 R. Turner advised me that the female was roosting with a particularly large Ring-tail Possum *Pseudocheirus peregrinus* in her grasp. Arriving late in the roost area about 1820hrs with the light fading fast, I located the bird but couldn't discern any prey in the poor light. After returning to my vehicle for a torch, I was halfway back when I heard typical female calls. Approaching the roost area I twice heard a faint answering call from further downstream along the creek - too faint to identify as male. I also thought the female might have changed her perch as her calls were apparently coming from slightly upstream of the earlier perch. Entering the roost area the female calls continued and then she flew past me, through the densely shaded grove and out into open eucalypt woodland higher up the slope. I followed the calls through a tangle of undergrowth and was able to relocate her silhouetted against the night sky on an open branch, still calling. I shone my torch at her and couldn't see any prey. Moving a short distance, I tried shining my torch at the shady perch where I had originally seen her, and was very surprised to find a bird still sitting there! Two birds! After juggling with binoculars and torch, I finally confirmed that the bird on the original perch still clutched the Ring-tail Possum remains.

It was too dark for me to recognise either bird but the calling bird was still giving typical female calls. About 1850hrs the "female" caller stopped typical calling and shortly flew in to a closer perch and commenced another call I had not previously heard - at the time I thought it was like a horse whinnying, but very low pitched and about one second duration, repeated about every five seconds. "She" then changed perch again and came closer, still whinnying. The bird with the Ring-tail Possum remained silent but started to pick at the carcass. Next the "female" flew to the other bird and perched alongside, immediately provoking a seemingly aggressive reaction from the possessor of prey who gave a series of shrill piping notes and pushed its face towards the "female". The "female" continued whinnying calls and mostly sat motionless beside the bird with the prey. From about 1900hrs I kept the torch on them continuously for half an hour; the torch was not too bright but I could see most of what was happening as it got darker and my night vision adjusted. Twice the "female" seemed to have made a slight move toward the other's prey and each time this provoked the same shrill piping calls and seemingly threatening head movements from the other. After a while, the bird with the prey settled down to eat, seizing the prey in the bill and tearing it upwards by straightening the body. I could hear snapping noises during the process. The "female" continued to sit alongside making short whinnying calls. At 1930hrs both birds flew off - possibly there was another squabble over the prey, but in the flurry I did not even see which bird moved first.

However, I could still hear whinnying calls some distance away and was able to

relocate the "female" sitting on an open perch. Because "she" seemed to be still "begging", I thought the other bird and the prey must still be near. After about 20 minutes "she" finally stopped calling and although I stood underneath "her" for a further 20 minutes nothing happened and I finally left.

Throughout this episode, I had the strong impression that I was witnessing an unsuccessful begging performance. The question remains - which bird was which? I have in my notes initially referred to the bird which was clearly giving typical female calls as the female, having originally assumed it was the same female with prey identified in daylight by R. Turner. When confronted with two birds it became obvious that they could not both be the mature female; possibly the bird giving typical female calls was in fact the juvenile, sex unknown? (After this I entered this bird as "female" in my notes.) This possibility seems to fit the behaviour of a juvenile which at this time of year should be becoming independent of parental feeding. There is also a possibility that the birds were in fact the adult pair engaging in pre-nuptial food sharing - except that there appeared to be no willingness to share food during this observation.

The second observation was made about a week later, on 16 March 1991. My wife and I visited the roost site at about 1745hrs primarily to listen to the typical calls after dark but also to check the roosts in use and any prey held, before it got dark. We found the male and female roosting together quite close to the creek and then withdrew from the area, making our departure quite obvious and walking well away before later quietly returning as darkness fell and waiting about 100 metres from the roost.

At 1840hrs we heard the low "whinnying" calls I had previously associated with possible begging behaviour. By 1850hrs the calls sounded louder and higher up in the trees, it has a very nasal quality. Standing quietly and screened from where we thought the birds were, we heard the whinnying calls quicken and then there was a flurry above our heads immediately in front of us. We imagined an owl had pounced on some prey as we tried to catch the moving silhouette against the sky. When I switched on the torch we discovered two owls facing us and apparently about to copulate! The male had mounted the female with wings spread for balance - after a momentary stare at our light they continued their copulation, one (or both?) birds giving shrill piping calls similar to the previous "aggressive" calls heard during the assumed "begging" incident a week earlier. The performance lasted about half a minute and then the male abruptly flew downstream. The female sat and preened for ten minutes, staring at us when we switched on the torch, although mostly we just watched her dark silhouette through binoculars. The bare branch was about ten metres above ground and several metres in front of us. Then she too flew downstream. No typical calls were heard that evening.

Since these events I have had the opportunity of consulting Fleay (1968). He is

obviously describing the same call I likened to a very low and short horse's whinny when he writes of "rumbling guttural calls somewhat like the low bleating of a sheep". He apparently regards them as general conversational calls. The shrill piping calls heard both as a probable aggressive response to begging and also similar calls during copulation are also described by Fleay during his observations of a copulation as "soft and somewhat rabbit-like squealing". His observations in Victoria are that courting takes place in late April to early May and that birds in northeast NSW may be three weeks earlier. Schodde and Mason (1980) also give April as the commencement of courting. This observation is at least two weeks earlier.

My thanks to A.K. Morris and R.P. Kavanagh for assistance and suggestions in presenting my original rough notes.

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C. "Sandy" Sansom, 15 Aeolus Ave, Ryde, NSW, 2112.

PAINTED HONEYEATERS IN THE NORTHERN TERRITORY

ALAN K. MORRIS

On my first trip to the Northern Territory on 1st July 1987, I camped the first night at a bushland site 20km south of Dumara Road-house, just off the Stuart Highway. The location was between Newcastle Waters and Daly Waters, at 16°53'S, 133°25'E. The following morning at daybreak a pair of Painted Honeyeaters *Grantiella picta* was observed for a period of 10 minutes perched on a dead twig at the top of an acacia bush. All the typical features of a Painted Honeyeater were noted, viz. pink bill, white underparts, black head and back, yellow in wing and tail, and their typical whistle call.

I am familiar with Painted Honeyeaters having observed them at various locations, but regularly at Munghorn Gap Nature Reserve near Mudgee, New South Wales. No detailed notes were taken at the time because a quick check of my Slater *et al.* (1986) *Field Guide to Australian Birds*, which I was carrying, showed that this observation was within, but on the edge of, their north-west range. I pointed out the birds to other people who were with me, but none were familiar with the species.

I had thought no more of the observation until, when reading the newly published

book W. Longmore (1991) *Honeyeaters and Their Allies of Australia*, it was noted that he recorded only two observations for Northern Territory (one in 1913, the other in July 1978, at Little River). Longmore stated that Painted Honeyeaters breed in eastern Australia, but migrate northwards to Queensland and (probably) the Northern Territory for winter. However, in the same article is a photograph of a Painted Honeyeater taken at Booraloola, N.T. in 1978, photographed by J.A.E. Estbergs - making three records? Consequently a check of M. Blakers *et al.* (1984) *The Atlas of Australian Birds*, shows that Painted Honeyeaters were recorded at four locations north of 18° latitude in Northern Territory during the period 1978-82. Possibly the "Little River" record is one of these four locations. There is an inference that at two of the four locations the bird was recorded on more than one occasion. My observation, therefore, is consistent with other published records for the Painted Honeyeater north of 18° latitude in that it was in winter but from the limited material available it would appear that it has not previously been recorded in the Dunmara district.

Alan K. Morris, 1 Wombat St, Berkeley Vale, 2259, NSW.

ROCK WARBLERS FEEDING ON YELLOW-BOX SEEDS

BILL YATES

Mike and Sue Pridmore, Breakfast Creek, Kandos (32°39'S, 150°00'E) are known to many FOC members as a result of recent visits to that area. The Pridmores live in a mudbrick cottage surrounded by tall trees. For floor coverings they have Superb Fairy-wrens *Malurus cyaneus*, White-browed Scrub-wrens *Sericornis frontalis* and Rock Warblers *Origma solitaria*. The latter species share the butter dish at meal times with Sue and Mike.

Some time ago one of the Yellow Box *Eucalyptus meliodora* trees near the house shed a limb which fell on the roof and then slid off onto the verandah. Mike did not bother moving it because his resident Ringtail and Brush-tail Possums used it as an easy access to the roof. As the fruits of the Yellow Box dried off they shed seed and Mike and Sue noticed that the Rock Warbler spent a lot of time eating these seeds. One Rock Warbler was noticed on several occasions to pick an individual fruit and vigorously twirl it in its beak to dislodge the seed which was then eaten. This action continued until such time as the fruit ceased to yield seeds. The bird then moved to another fruit and repeated the process. This event took place in August 1990, after a fall of snow. The snow would have made searching the forest floor for seeds and insects more difficult than usual. I am sure that this observation gives an insight into a little known feeding habit of the Rock Warbler.

W. Yates, 12 Russel St, Kandos, NSW, 2848.

CHANNEL-BILLED CUCKOO AND MULTIPLE BROODS

INEZ & COLIN WOOD

Having had a house in Pearl Beach 33° 32'S, 151° 15'E in the tree area, we were up to date with all the Australian wildlife, mostly Laughing Kookaburra *Dacelo novaeguinea*, Pied Currawong *Strepera graculina*, Australian Magpie *Gymnorhina tibicen* and the Noisy Miners *Manorina melanocephala*, an occasional Grey Butcherbird *Cracticus torquatus* and small wrens.

However, in December 1990 we became aware of what we thought was an eagle for just a few days, then it left but we now know that it was a Channel-billed Cuckoo *Scythrops novaehollandiae*, presumably the female. We did not get a close look. Some two weeks later we found that one of the Pied Currawongs had hatched three chicks and were quite confounded that they did not look like Currawongs. However, never having seen their chicks before we were waiting for them to turn dark. We knew that Australian Magpies were always lighter than their elders.

We first thought that the Currawongs were raising three Laughing Kookaburra chicks but on investigation and advice from a long-standing neighbour we realised that they were Channel-billed Cuckoos. They were identical with the drawings in the two books we referred to.

The three young finally learned to fly and still had their feathery legs. They were insatiable and called for their mother Currawong all the time. We became very sorry for the one Currawong who was feeding them so that we even bought beef off-cuts for them (about 50g a day) as our off-cuts were not enough.

The poor Currawong parent was very frazzled and was chased everywhere by the offspring. About a month afterwards we realised that there were four chicks - one very much behind the others in learning and also feeding. We realised it was a late hatching but we presumed from the same nest. The nest was a large one high in a Rough-barked Apple *Angophora floribunda*.

No young Currawongs hatched in the same nest and we presumed that the Cuckoo chicks had thrown out the eggs or the young chicks or that the parent Cuckoo had removed an egg each time one was deposited by her. It appeared that the Currawong was convinced they were her chicks.

In early March three of the Cuckoos, after having perfected their flying and we had noticed they were starting to feed for themselves (although only when the Currawong was

absent or too exhausted to help them), left and we presumed migrated. The last chick then became more friendly and we were allowed to take food for it very near without it flying away. One day that chick stayed on the deck all day in the same place, puffing up its wings and eating what we fed it. Next morning, 16 March 1991, it was gone.

Inez & Colin Wood, 26 Cornelian Rd, Pearl Beach, 2256.

EDITOR'S NOTE: Multiple nesting by Channel-billed Cuckoos is not unknown, see M.G. & C.L. Brooker, 1989, Cuckoo Hosts in Australia. *Aust. Zool. Reviews* 2.

HUDSONIAN GODWIT : FIRST AUSTRALIAN AND NEW SOUTH WALES RECORD

A.K. MORRIS

The first Australian and New South Wales record of the Hudsonian Godwit *Limosa haemastica* was for a bird seen at Kooragang Island Nature Reserve, the Hunter River Estuary near Newcastle 32°12'S, 151°26'E, commencing 26th December 1982, when it was seen over a number of days by seven observers (T.R. Lindsey 1984 *Aust. Birds* 18,51). This bird remained until February 1983 with subsequent sightings in May, June and December 1983. A further 18 people were recorded as having seen this bird (T.R. Lindsey 1985 *Aust. Birds* 19,85). In both the NSW Annual Bird Reports for 1982 and 1983, it was recorded that details of the observation were in preparation. The report was subsequently accepted by B. Lane (1987 *Shorebirds in Australia*) as being the only Australian record.

Nine years have passed without any published description of the Hudsonian Godwit at Kooragang Island, although the observation has achieved widespread acceptance. Four of the earlier observers viz. A.R. McGill, R. Wheeler, R. Bigg and J.N. Hobbs, who could be expected to write up the observation, have now died. While approaches have been made to a number of the other observers recorded in the two aforementioned NSW Annual Bird Reports, to write up the observation, each has declined. So, until someone comes forward with a better description and photographs, I have been able to prevail upon Judith Russill and Athol Colemane to provide some information on the important observation.

They record *in litt* on 9th April 1991, that they were at least the "100th person to have seen this bird!" Their first sighting was on 1st January 1983, when the bird was found roosting on the Stockton sandspit, the northern side of the Hunter River and opposite Kooragang Island, about 1km from the Nature Reserve. This bird was watched from a distance of 50m with binoculars. The Hudsonian Godwit was with, and looked similar to,

nearby Bar-tailed Godwits *L. lapponica*, as both have slightly upturned bills and the sizes were much the same. The Hudsonian raised its wings several times when the black auxiliaries and the black under-wing coverts could be readily seen. When the godwits were put to flight, the Hudsonian flew with some Black-tailed Godwits *L. limosa* and thus enabled the flight patterns of both species to be compared. The Hudsonian led the group much of the time and the narrower band of white was noticeable on the tail, compared to the broader white tail band of a Black-tailed Godwit, while there was less white observed on the wing bar and on the rump of the Hudsonian, compared to the Black-tailed Godwit.

During 1984 a Hudsonian Godwit was recorded at Kooragang Island, Stockton sandspit on 21st January, 7th April and 11th November 1984 (T.R. Lindsey 1986 *Aust. Birds* 21,119) and again on 5th January and 7th April 1985 (R.M. Cooper 1989 *Aust. Birds* 22,21). Whether or not it has been the same bird each time will never be known. It is conceivable that the same bird was present continually over the two and half years or alternatively was present 29th December 1982 to 7 April 1985, staying its first winter in Australia, but then returning to the Northern Hemisphere after April 1984, and coming back to Australia in the following spring. This would be similar to the pattern of the other Godwits in Australia for the first year birds.

I wish to thank Judith Russill and Athol Colemane for their assistance in the preparation of this note. It is hoped that when the NSW Rarities Committee comes into operation, that observations of such importance as this one, will not be overlooked but rather reviewed and published in the appropriate manner.

Alan K. Morris, 1 Wombat St, Berkeley Vale, NSW, 2259.

BOOK REVIEW

HONEYEATERS AND THEIR ALLIES IN AUSTRALIA. By Wayne Longmore. Produced by The National Photographic Index of Australian Wildlife. Published by Collins, Angus and Robertson Publisher, Australia. 390 colour photographs, 450pp. Cost \$85.00.

Before opening this book I was impressed by the jacket design depicting one of our spectacular birds, the male Scarlet Honeyeater, also the title, *Honeyeaters and Their Allies in Australia*, a group of birds which I recollect has been totally documented only twice before. The two reviews I refer to were written by G.R. Gannon, Distribution of the Australian Honeyeaters, *The Emu* 62;145-66 and Brigadier H.R. Officer, *Australian Honeyeaters*, 1964, Bird Observers Club. Gannon figured distribution maps and two photographs, White-eared Honeyeater and the Brown Honeyeater. Officer's illustrations by Peg Maltby, although stiff in comparison to today's standards, never the less provided good diagnostic-character paintings.

After Gannon and Officer, an additional species, the Eungella Honeyeater *Meliphaga hindwoodi*, was discovered in 1978 in central-eastern Queensland by N.W. Longmore and W.E. Boles and was described by them in 1983, *The Emu* 83;59-65 as a new species which they named after Longmore's mentor, the late K.A. Hindwood. Apparently J.S. Robertson was biased in 1961 when he thought the species was a Brindled Honeyeater.

The addition of allied species namely, Sittellas, Treecreepers, Sunbirds, Flowerpeckers and White-eyes (Silvereyes) makes additional interesting reading and valuable field information.

The format is reminiscent of *Nests and Eggs of Australian Birds* (A.J. North, 1901-1906) with useful information regarding each species, both honeyeaters and their allies, without the seemingly gory collecting activities of North's, a necessary requirement in North's day. These collections are today an important unit of Natural History Museums for the study of ornithology. The large collections of study specimens in Australian Museums, acquired many years before and after North includes an almost complete range of specimens.

Considering the high standard of photography which has been shown in all of the Photographic Index books, this current edition is no exception which magnifies the amazing talent of bird photographers in Australia and the magnitude of the collection in The Index for selection and reproduction, excelled in this book.

The photographs aid identification of problem field observations concerning birds and their eggs. The illustrations of all the honeyeaters' eggs is a first for a book featuring a large specific group.

The advantages of colour illustrations over North's black and white photographs provides the reader with a more accurate representation of the bird, its nest and eggs and in many cases, and aesthetic photograph combining attractive native plants, one of many examples being the Noisy Friarbird perched on top of a Waratah on page 77. This is not a criticism of black and white photography; there were innumerable superb photographs taken before the advent of colour. Imagine some of our favourite black and white shots by experienced photographers if they were in colour. Many of the early black and white photographers were converted to colour and magnificently displayed their expertise as is seen in this book. Norman Chaffer is a shining example.

It seems, by writing reviews, the writer is obligated to be critical and the belief is, not any book is 100% perfect. What can one say about this attractive book? My concern, written with a degree of reluctance which is not necessarily a criticism, but in wonderment as on

page 40, it reads _ "The genus *Meliphaga* and several closely related groups form two distinct clusters of species. One typified by Lewin's Honeyeater is mainly associated with rainforests and feeds on fruit and nectar. The other, often regarded as a separate genus *Lichenostomus*, of which the familiar White-plumed Honeyeater is a typical example, has many species widespread in southern and inland Australia"... Etc. It is unusual that 10 species in the *Handlist of Birds in NSW*, (Morris *et al.*, 1981) and *Field Guide to the Birds of Australia*, (Simpson & Day, 1984) are listed in the genus *Lichenostomus* whereas *Birds of Australia*, (Macdonald, 1973) and *Field Guide to Australian Birds*, (P. Slater *et al.*, 1974) include them in the *Meliphaga* genus. The Queensland connection?

Since Officer and Gannon there have been 13 generic name changes, two species changes and one vernacular change. These systematists have to get together and come up with some uniformity to ease the confusion. However, this is no reflection on Longmore and does not detract from the appeal of a delightful publication as are all of the Photographic Index Books.

Two birds from a total of 68 species, the Brown-backed and Bar-breasted Honeyeaters have the appearance of honeyeaters but seem to have been left behind or raced ahead in evolution. They both build covered nests which is contrary, with a few exceptions, to the open cup-shaped structures of all other honeyeaters. One would expect them to have evolved from a genera of birds which build covered hanging nests or has not yet developed the simpler open cup type nest and the habit of communal nesting is another factor. We realise some species of honeyeater nest in loose colonies, the Noisy Miner family being an example but in many cases, this could be an ecological factor. The Yellow-bellied Sunbird, although not a honeyeater but sucks nectar, also builds a suspended covered nest.

Gannon's distribution is generally consistent with Longmore's with slight extensions of range in most species. Gannon's Noisy Miner extends to the south-west corner of Queensland but this appears to be an error of identification with the Yellow-throated Miner which has a wide range across the continent. Gannon has the Bar-breasted Honeyeater with a more south east-coast range than Longmore and Longmore has the Banded, Painted and White-fronted Honeyeaters with a wider distribution than Gannon.

It must be remembered many of these areas were not investigated during Gannon's day and there are more interested observers travelling around the continent in search of birds and gathering new information for *The Atlas of Australian Birds* (M. Blakers *et al.* 1984) and their personal pleasure.

The text for the Painted Honeyeater refers to only two records in the Northern Territory (1913 and July 1978, Little River) but one of the photographs depicts a bird at

Boorooloola, N.T. in August 1978! (three records). "The Atlas" has at least five sites in N.T. where the birds were observed on more than one occasion.

In summary, this book is an informative and impressive publication. The photographs are superb, the information instructively adequate. The cost of \$85 is consistent with the inflationary climate of printing costs for such a publication.

I highly recommend this book for use by everybody interested in the study of our fascinating birdlife.

About the author: Wayne Longmore has had many years experience in ornithology with the New South Wales National Parks and Wildlife Service, the Australian Museum Ornithological Department and the Queensland Museum Department of Ornithology.

I like to think that the late K.A. Hindwood and myself with our association with Wayne, instilled in him his early inclination, by contributing to his interest in bird observing when we met him occasionally near his hometown as a schoolboy in the Richmond (Sydney) area. Wayne would hide his pushbike in the bush and join us in our excursions in the Windsor district in search of birds. Keith Hindwood would be as I am, very pleased with Wayne's success in his profession.

E.S. Hoskin

NOTICE TO CONTRIBUTORS

Contributors are requested to observe the following points when submitting articles and notes for publication.

1. Species, names, and the order in which they occur are to be in accordance with "Handlist of Birds in New South Wales". A.K. Morris, A.R. McGill and G. Holmes 1981 Dubbo: NSWFOC.
2. Articles or notes should be type written if possible and submitted in duplicate. Double spacing is required.
3. Margins of not less than 25mm width at the left hand side and top, with similar or slightly smaller at the right hand side of pages.
4. No underlinings and no abbreviations except as shown in the examples.
5. Photographs should be glossy finish and not too small.
6. The *Style Manual*, Commonwealth Government Printing Office, Canberra (1966) and subsequent editions will be the guide for this Journal.
7. Diagrams should be on plain white paper drawn with india ink. Any lettering is to be 'professional style' or lightly pencilled.
8. Dates must be written "1 January 1990" except in tables and figures where they may be abbreviated.
9. The 24 hour clock will be used, times being written 06:30, 18:30 for 6:30am and 6:30pm respectively
10. Mr, Mrs, Dr are not to be followed by a full stop.
11. In text, numbers one to ten are spelt; numbers of five figures or more should be grouped in threes and spaced by a thin gap. Commas should not be used as thousands markers.
12. References to other articles should be shown in the text - '...B.W. Finch and M.D. Bruce (1974) stated...' and under heading

REFERENCES

Finch, B.W. and M.D. Bruce. 1974. The Status of the Blue Petrel in Australian Waters *Aust. Birds* 9, 32-35

13. Acknowledgements to other individuals should include Christian names or initials.

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