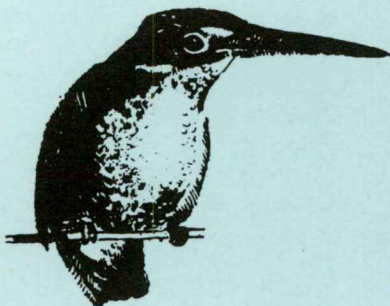


# AUSTRALIAN BIRDS



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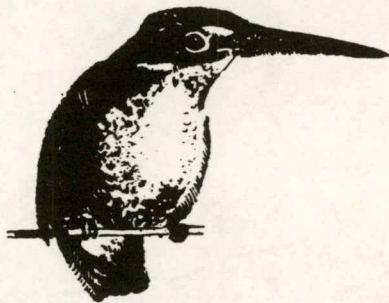
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# AUSTRALIAN BIRDS



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## THE AVIFAUNA OF BASS POINT, NEW SOUTH WALES

L.E. SMITH and C.J. CHAFER

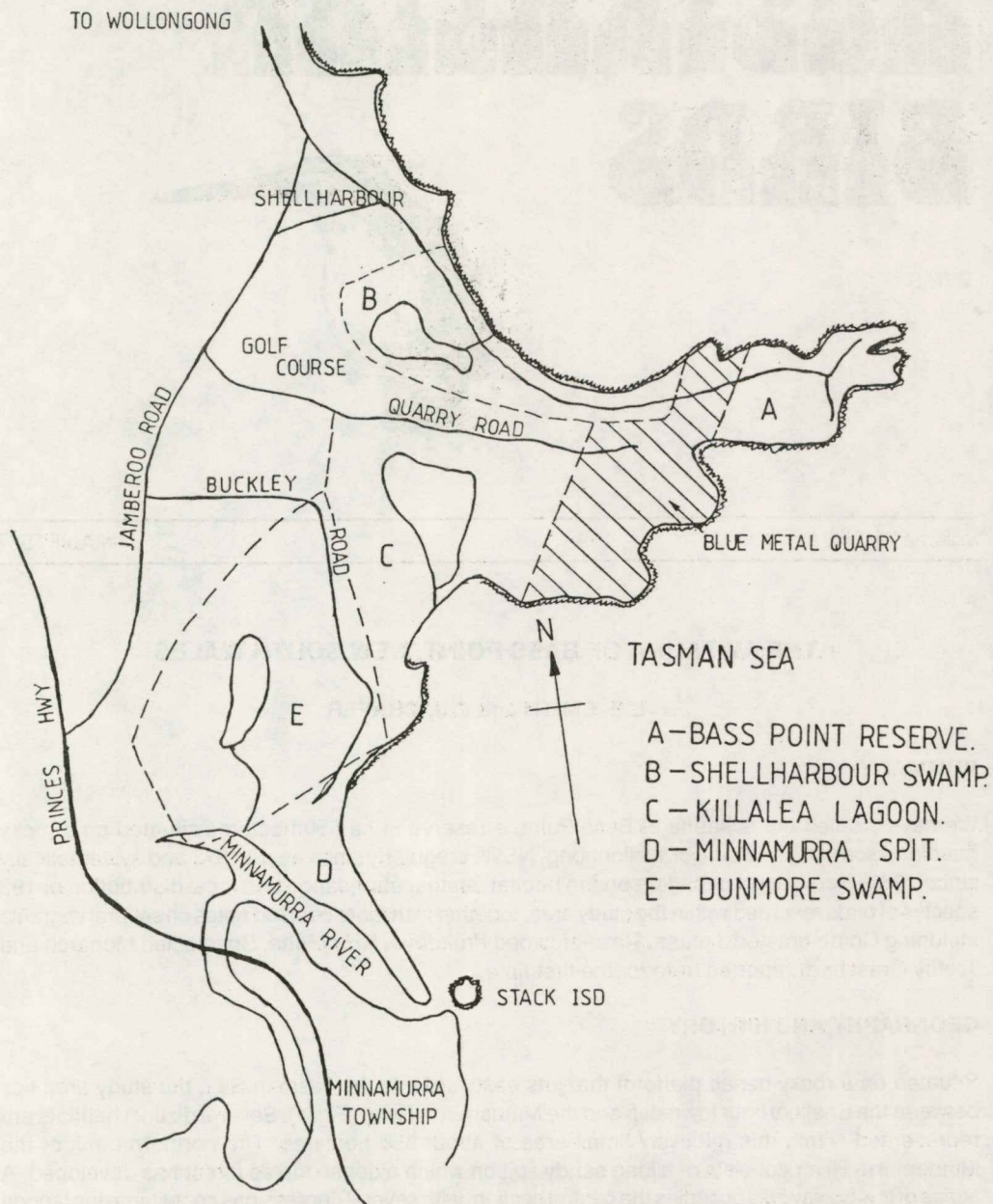
### SUMMARY

We have studied the avifauna of Bass Point, a reserve of ca 650 hectares situated on a rocky headland some 17 km south of Wollongong, NSW, irregularly since about 1977 and systematically since 1983. Here we present data on the habitat, status, abundance and local distribution of 193 species of birds recorded within the study area, together with more detailed notes on several vagrants including Comb-crested Jacana, Rose-crowned Fruitdove, Noisy Pitta, Spectacled Monarch and Tawny Grassbird, reported here for the first time.

### GEOGRAPHY AND HISTORY

Situated on a rocky basalt platform that juts eastward into the Tasman Sea, the study area lies between the Shellharbour township and the Minnamurra River (Fig. 1). Several distinct habitats are represented within this relatively small area of about 650 hectares. The northern bank of the Minnamurra River consists of a long sandy spit on which a dense mixed forest has developed. A series of low grassy hills occupies the central section, with several depressions containing one lagoon and two swamps. On the eastern headland a series of low rolling sand dunes support a mixture of dense coastal heath and littoral rainforest.





Figures 1 and 2. Sketch maps of Bass Point study area, showing localities and major features.



The area has been little studied. The region is mentioned briefly in an account of the birds of the County of Camden (Gibson, 1977), and irregular visits were made by R. Imisides and one of us (LES) during surveys for the RAOU Atlas of Australian Birds, 1977–81. In June 1984 an interim report listing 138 species (prepared by LES) was presented to the NSW National Parks and Wildlife Service at the request of Mr A. Skirka, in connection with a proposal to gazette the site as a State Recreation Area. A revised paper (also prepared by LES) detailing habitat, status and abundance of birds within the Bass Point Reserve and proposed S.R.A. was presented to Shellharbour Municipal Council and N.P.W.S. in January 1985. This list contained 161 species.

## THE STUDY AREA

The study area is bounded by the Shellharbour township to the north, the Jamberoo Road to the west and the Minnamurra River to the south (Fig. 1). Approximately 50% of the land within the study area is reserved in the Bass Point Reserve and the Bass Point State Recreation Area. The area was broken up into five zones for the purposes of our study, because the specialised habitats are relatively fragmented (Fig. 2).

### A – Bass Point Reserve

This zone includes all land east of the Blue Metal Quarry. Well vegetated, it is surrounded by a rocky shoreline with several small pebbly beaches; three small sections have been cleared to provide picnic and car parking facilities. Major vegetation consists of Coastal Tea Tree *Leptospermum laevigatum*, Coastal Banksia *Banksia integrifolia*, Swamp She-oak *Casuarina glauca*, and Coastal Rosemary *Westringia fruticosa*. In the central northern section of the zone is a strip of littoral rainforest and lantana thickets: dominant species include Small-leaved Fig *Ficus obliqua*, Plum Pine *Podocarpus elatus*, Ribbonwood *Eurashinus falcata*, Lilly Pilly *Acmena smithii* and Red Cedar *Toona australis*.

22 species were recorded only in this zone; the total was 93 species, of which 13 bred.

### B – Shellharbour Swamp

This zone covers the strip of land between the Blue Metal Quarry and residential housing along Boollawarroo Parade, west to the perimeter of Shellharbour Golf Course. The swamp is partly degenerated, some of the northern section having been used as a rubbish dump until recently. Several playing fields now exist on the reclaimed land, but the remainder is densely vegetated with rushes (Juncacea spp.). An overflow channel empties into the sea at the southern end of South Shellharbour Beach, but this normally occurs only after heavy rain as the swamp acts as a catchment area for Shellharbour's stormwater channels. North of the channel and behind the beach is a strip of low dunes vegetated with marum grass, while to the south the shoreline consists of a narrow tidal rockshelf. The remainder of the zone consists of open grassland sparsely dotted with *Casuarina glauca*.

This zone is to be redeveloped into a large tourist complex by the local council. The proposal includes a 160-berth marina, golf course, other sporting facilities and tourist accommodation.

Four species were recorded only in Zone B; the grand total was 51 species, of which seven bred.

#### C – Killalea Lagoon

This zone, centred around the large freshwater lagoon, is bounded to the east by the Blue Metal Quarry, the Quarry Road to the north and Buckley Road to the west. The southern end of the lagoon is divided from the sea by a series of low sand dunes and small surfing beach. The lagoon is partly vegetated with two species of rush, *Juncaea krausii* and *Eleocharis sphacelata*, while the shoreline is dotted with clumps of the sedge *Cyperus lucidus*. At the southwestern corner of the lagoon an overflow channel empties into the sea after heavy rain. The lagoon is otherwise surrounded by grassy hills. On the upper parts of the western ridge are several patches of remnant rainforest and a small creek bordered by rank grasses. The rainforest is dominated by figs, including Morton Bay Fig *Ficus macrophylla*, Port Jackson Fig *F. rubiginosa* and Small-leafed Fig *F. obliqua*. Other trees include Giant Stinging Tree *Dendrocnide excelsa* and Corkwood *Duboisia myopuroides*. Large blackberry thickets and a fairly extensive grove of *Melaleuca armillaris* are also present on top of the ridge. During the survey period the grassland around the lagoon was being grazed by a small herd of cattle. This zone is now included in the Bass Point S.R.A.

23 species were found only within this zone; a total of 123 species were recorded of which 14 bred.

#### D – Minnamurra Spit

This long sandy spit is densely vegetated. Behind the popular surfing beach on the eastern side, low dunes carry a mixture of acacias, Coastal Tea Tree *Leptospermum laevigatum* and Coastal Banksia *Banksia integrifolia*. A complex littoral rainforest has developed beyond the dunes and all along the spit; dominant trees include Swamp Mahogany *Eucalyptus robusta*, White Cedar *Melia azedarach*, Red Cedar *Toona australis*, Red-fruited Olive Plum *Elaeodendron australe* and Coachwood *Ceratopetalum apetalum*. On the western shore of the spit there are extensive stands of Swamp She-oak *Casuarina glauca* and Grey Mangrove *Avicennia marina*, intermingled with *B. integrifolia* and *L. laevigatum*. On the ridge above the northern part of the zone can be found examples of Cabbage Gum *Eucalyptus amplifolia*, Black Wattle *Acacia decurrens*, Morton Bay Figs *Ficus macrophylla*, two introduced species of pine and a number of Indian Coral Trees *Erythrina indica*. There is also a large area of open grassland and lantana thickets. Along the edge of the cliffs to the north of the surfing beach are several pockets of Coastal Rosemary *Westringia fruticosa*. Stack Island, a small high rocky island, lies a few hundred metres off the southern end of the spit (Fig. 2).

A total of 103 species were recorded in this zone; 17 bred and nine were recorded only here.

#### E – Dunmore Swamp

This zone, centred around an elongated freshwater swamp, is bounded to the north, east and south by low grassy hills. The western side is bounded by the Minnamurra River, a rubbish dump and council works depot. The swamp is well vegetated with grasses and rushes, and its southern shore



contains stands of *Melaleuca armillaris* which thicken and follow the overflow creek, mingling with a large stand of *Casuarina glauca*. Behind this vegetation and continuing to the base of the hill (Fig. 1) is a large area of rank grassland (0.5-1.5 m high) and blackberry thickets.

This zone was not included within the Bass Point S.R.A. and the western grassland areas were under threat by sand mining. After discussions with the local council it may be possible to protect the majority of this zone, but its immediate future remains uncertain.

Four species were found only within this zone; a total of 86 species was recorded, of which five bred.

## METHODS

The study covers a period of 42 months from January 1983 to June 1986. We visited each zone about once a fortnight, although zone D and E were not included in the survey until January 1984. Observations from several other local observers were included. No attempt was made to census each species on each visit.

## RESULTS

A total of 193 species has now been recorded in the study area, representing 49% of the total number of species found within the County of Camden (Gibson 1977; W. Emery, pers. comm.) This is a high total considering that the study area represents only 0.25% of the land mass within the county. 125 species (65%) could be regarded as resident or regular visitors, and 35 species (18%) were found breeding. Thirteen were recorded on only one occasion. Sixteen species recorded within the study area are regarded as rare in the County of Camden. Two of these, Comb-crested Jacana and Rose-crowned Fruitdove, had not previously been recorded in the region (Gibson 1977), while the Noisy Pitta sighting is the first local sighting this century.

## SYSTEMATIC LIST

Hoary-headed Grebe *Poliiocephalus poliocephalus*. Visitor; breeds (Aug–April). Recorded most months in zones C and E, generally in numbers <30.

Australasian Grebe *Tachybaptus novaehollandiae*. Resident; breeds (Aug–April). Recorded all months in zones C and E, generally in numbers <30.

Wandering Albatross *Diomedea exulans*. Winter visitor (June–Sept). Small numbers, (max 5), observed from Bass Point, generally in rough weather. Occasionally beachwashed.

Black-browed Albatross *Diomedea melanophrys*. Winter visitor (June–Nov). The most common coastal albatross, counts sometimes exceeding 50 recorded from Bass Point especially during rough weather. Occasionally beachwashed.

Shy Albatross *Diomedea cauta*. Winter visitor (July–Nov). One or two birds occasionally observed from Bass Point during rough weather.



Northern Giant-petrel *Macronectes halli*. Winter visitor (July–Nov). Status uncertain, owing to difficulty in distinguishing from next species. Several positive records; one or two birds occasionally seen from Bass Point, but specific identification usually impossible.

Southern Giant-petrel *Macronectes giganteus*. Winter visitor (July–Nov). Status uncertain, owing to difficulty in distinguishing from preceding species. Several positive records; one or two birds occasionally observed from Bass Point, but specific identification usually impossible.

Great-winged Petrel *Pterodroma macroptera*. One record: a flock of 50+ birds observed on the northern side of Bass Point during a very severe storm on 17 June 1983.

Fairy Prion *Pachyptila turtur*. Winter visitor (June–Aug). Rafts typically >30 observed from Bass Point.

Flesh-footed Shearwater *Puffinus carneipes*. One record: 2–10 observed from Bass Point in March 1984.

Wedge-tailed Shearwater *Puffinus pacificus*. Summer visitor (Aug–March). Common offshore, often >100. Often beachwashed after summer storms.

Sooty Shearwater *Puffinus griseus*. Two records: 1 off Bass Point on 3 Nov 1984 and 2 on 2 May 1986.

Short-tailed Shearwater *Puffinus tenuirostris*. Summer visitor (Sept–March). Common offshore; flocks often exceed 1000 during southern migration Sept–Oct. Often beachwashed after summer storms.

Fluttering Shearwater *Puffinus gavia*. Uncommon visitor, recorded most months, generally during rough weather. Counts rarely exceed 25, but on 26 Aug 1983 a raft of 2000+ birds was seen resting on the water 50–100 metres off the northern side of Bass Point. Occasionally beachwashed.

Australian Pelican *Pelecanus conspicillatus*. Uncommon visitor in zones C, D and E, generally <10. One roosted with gulls on Dunmore Tip during May–June 1986.

Australasian Gannet *Morus serrator*. Visitor. Recorded most months with main influx May–Nov. Numbers highly variable, but flocks of 75+ have been observed.

Darter *Anhinga melanogaster*. One record: 1 at Killalea Lagoon 21 Feb 1986.

Pied Cormorant *Phalacrocorax varius*. Rare visitor. Several sightings of single birds at Killalea Lagoon in 1983–84.

Little Pied Cormorant *Phalacrocorax melanoleucos*. Resident. Common, found throughout study area.

Great Cormorant *Phalacrocorax carbo*. Resident. Common, found around rocky shoreline, Killalea Lagoon and Minnamurra River.

Little Black Cormorant *Phalacrocorax sulcirostris*. Uncommon, recorded in zones A, C and D in small numbers.

Pacific Heron *Ardea pacifica*. Scarce visitor, one or two birds occasionally observed in zones C and E.

White-faced Heron *Ardea novaehollandiae*. Common visitor, small numbers recorded in all zones.

Cattle Egret *Ardeola ibis*. Moderately common; counts seldom exceed 50. Associates with grazing cattle. Entirely absent from mid-November to March. A bird banded at Gatton, Queensland was observed for several weeks in June–July 1984 at Killalea Lagoon.

Great Egret *Egretta alba*. One or two birds observed occasionally in all zones except A.

Little Egret *Egretta garzetta*. Rare visitor. A few records of single birds in zones B and C.

Eastern Reef Egret *Egretta sacra*. Visitor. One or two birds infrequently observed around rocky shoreline and beaches. Breeding recorded on Stack Island.

Striated Heron *Butorides striatus*. Rare. Several sightings of single bird along Minnamurra River in 1985.

Australasian Bittern *Botaurus poiciloptilus*. One record: 1 in reed beds at Killalea Lagoon, 3 March 1985.

Glossy Ibis *Plegadis falcinellus*. Rare. Up to 20 birds recorded in zones C and E.

Sacred Ibis *Threskiornis aethiopica*. Common, recorded in zones B, C, D and E, generally <100.

Straw-necked Ibis *Threskiornis spinicollis*. Uncommon, recorded in zones C and E, generally <50.

Royal Spoonbill *Platalea flavipes*. Uncommon, recorded in zones C and E, generally <20.

Yellow-billed Spoonbill *Platalea regia*. Scarce, recorded in zones C and E, generally 1–2 birds.

Black Swan *Cygnus atratus*. Resident; breeds (June–March). Confined to zones C and E; up to 17 pairs nesting at the same time.

Pacific Black Duck *Anas superciliosa*. Visitor. Recorded in zones B, C and E, generally <100.

Mallard *Anas platyrhynchos*. Rare, recorded only at Killalea Lagoon.

Grey Teal *Anas gibberifrons*. Resident; breeds. Recorded in zones C and E, generally <50. Breeding occurs mainly after heavy rain.



- Chestnut Teal *Anas castanea*. Visitor. Recorded in zones C and E, generally <30.
- Australasian Shoveller *Anas rhynchotis*. Visitor. Recorded in zones C and E, generally <20.
- Pink-eared Duck *Malacorhynchus membranaceus*. Visitor. Recorded only at Killalea Lagoon in numbers <10.
- Hardhead *Aythya australis*. Visitor. Recorded only at Killalea Lagoon, generally <30.
- Maned Duck *Chenonetta jubata*. Visitor. Recorded in zones B and C, generally <40.
- Blue-billed Duck *Oxyura australis*. Rare. Six birds observed at Killalea Lagoon in Jan 1985, one or two birds observed by several observers from Feb–April 1986.
- Musk Duck *Biziura australis*. Visitor. Recorded only at Killalea Lagoon in numbers up to four. Sometimes absent for lengthy periods.
- Black-shouldered Kite *Elanus notatus*. Visitor. Recorded in all zones, most sightings during winter months.
- Whistling Kite *Haliastur sphenurus*. Visitor. Recorded in zones C, D and E. Breeds just outside study area along Minnamurra River.
- Brown Goshawk *Accipiter fasciatus*. Visitor. Recorded in all zones, generally single birds. Breeds along Minnamurra River outside study area.
- Grey Goshawk *Accipiter novaehollandiae*. Visitor. Recorded in zones A, C, D and E, generally single birds. Both colour morphs noted. Breeds along Minnamurra River just outside study area.
- White-bellied Sea-eagle *Haliaeetus leucogaster*. Visitor. 1–3 recorded all zones except B. One pair breeds annually just outside study area along Minnamurra River.
- Wedge-tailed Eagle *Aquila audax*. Rare. 1–2 observed in zones C and D during May 1985 and March, May–June 1986.
- Little Eagle *Hieraaetus morphnoides*. At least one pair patrols the survey area regularly and nests just outside the study area along the Minnamurra River. Dark and pale morphs noted.
- Swamp Harrier *Circus approximans*. Visitor. Recorded in zones C, D and E, generally single birds. Bred at Killalea Lagoon before 1980.
- Peregrine Falcon *Falco peregrinus*. Few records of single birds recorded in all zones except B. One was seen feeding on a dead Silver Gull at Bass Point in Sept 1983.



Australian Hobby *Falco longipennis*. 1–2 recorded irregularly in zones C and E. Has bred nearby at Blackbutt Forest Reserve, Shellharbour.

Brown Falcon *Falco berigora*. 1–2 recorded irregularly in zones C and E. Has bred in forest above Killalea Lagoon.

Australian Kestrel *Falco cenchroides*. 1–3 recorded in all zones.

Stubble Quail *Coturnix pectoralis*. Rare. 1–2 flushed from grassland at Killalea Lagoon in Jan 1985 and Feb 1986.

Brown Quail *Coturnix australis*. Rare. Small numbers flushed from rank grassland around Dunmore Swamp in April–May 1986.

King Quail *Coturnix chinensis*. Rare. Single male flushed from wet grassland in gully above Killalea Lagoon on 23 May 1986. Two birds, possibly of this species, were sighted briefly one week earlier.

Painted Buttonquail *Turnix varia*. Rare. One disturbed from leaf litter along Minnamurra spit on 15 June 1986 and at Bass Point Reserve on 20 June 1986.

Buff-banded Rail *Rallus philippensis*. One record: 1 recorded at Shellharbour Swamp in April 1986.

Baillon's Crake *Porzana pusilla*. First recorded at Killalea Lagoon on 14 Jan 1985, thereafter up to five birds recorded by various observers until March 1985. Possibly a regular visitor in suitable conditions.

Australian Crake *Porzana fluminea*. Uncommon visitor. Up to five birds have been recorded at Killalea Lagoon infrequently since Jan 1985.

Dusky Moorhen *Gallinula tenebrosa*. Scarce. Occasionally observed at Killalea Lagoon.

Purple Swampphen *Porphyrio porphyrio*. Resident; breeds (July–Dec). Recorded in zones C and E generally <100. Often found feeding in grassland well away from water.

Eurasian Coot *Fulica atra*. Resident; breeds (Aug–Dec). Confined to Killalea Lagoon in numbers up to 250.

Comb-crested Jacana *Irediparra gallinacea*. On 7 July 1984 a single immature was located by four observers (C.J. Chafer, D. Fischer, L. Klumpes and L. Williams) in the southwestern corner of Killalea Lagoon. It was feeding on floating vegetation in the overflow channel, continually working up and down the thirty metre stretch of vegetation. One week later presumably the same bird was located on Dunmore Swamp, where it remained until at least 16 August 1984, and was seen by many observers. Our study area is some 120 km south of the Hawkesbury River marshes, the southernmost known locality for this species (Morris, McGill & Holmes 1981; Blakers *et al.* 1984).

Pied Oystercatcher *Haematopus longirostris*. Rare; a pair recorded once at South Shellharbour Beach and once at Killalea Beach.

Sooty Oystercatcher *Haematopus fuliginosus*. Resident. Uncommon along rocky shoreline and Minnamurra Spit. Post-breeding flocks of up to 14 have been recorded at Bass Point.

Masked Lapwing *Vanellus miles*. Resident; breeds (April–Nov). Recorded in all zones, generally in numbers <20.

Lesser Golden Plover *Pluvialis dominica*. Summer visitor (Nov–April). Recorded only in grassland between Shellharbour Swamp and the Blue Metal Quarry. Up to 20 birds have been observed feeding in washed up seaweed on the tidal rockshelf.

Red-kneed Dotterel *Erythrogonyx cinctus*. Uncommon visitor to Killalea Lagoon where up to 11 have been observed.

Double-banded Plover *Charadrius bicinctus*. Winter visitor (March–Aug). Recorded in zones B, C and D, numbers generally <5.

Large Sand Plover *Charadrius leschenaultii*. One record: 1 seen at South Shellharbour Beach 1–3 Oct 1984.

Red-capped Plover *Charadrius ruficapillus*. Uncommon visitor, 1–4 recorded in zones B and D.

Black-fronted Plover *Charadrius melanops*. Visitor. Recorded in zones B and C in number <10 when conditions are suitable.

Black-winged Stilt *Himantopus leucocephalus*. Visitor; breeds. Recorded in zones B, C and E in number <20. On 24 Nov 1985, L.E. Smith located four nests at Shellharbour Swamp: two had eggs, the others each had two chicks. Heavy overnight rain flooded the nests, but the four chicks survived and were observed sitting on higher ground. At least two were successfully raised.

Eastern Curlew *Numenius madagascariensis*. One record: 1 flying south over Bass Point, Sept 1983.

Whimbrel *Numenius phaeopus*. Summer visitor (Oct–Nov). Recorded in Minnamurra River (once) and Shellharbour Swamp. On 1 Oct 1984 five birds were located in the dunes behind South Shellharbour Beach. They remained here and on the adjacent football field until at least 6 Nov 1984. They apparently fed on small insects taken from the ground and at no time were observed in the adjacent swamp or overflow channel.

Greenshank *Tringa nebularia*. Summer visitor (Nov–May). Single birds occasionally observed in zones B and C.

Latham's Snipe *Gallinago hardwickii*. Summer visitor (Nov–Jan). Up to ten birds observed irregularly in zones B and C.



Bar-tailed Godwit *Limosa lapponica*. Summer visitor. Scarce, only recorded at Killalea Lagoon in numbers <3.

Sharp-tailed Sandpiper *Calidris acuminata*. Summer visitor (Dec–Feb) Recorded in zones B and C in numbers <40.

Red-necked Stint *Calidris ruficollis*. One record: a few at Killalea Lagoon in April 1986.

Curlew Sandpiper *Calidris ferruginea*. One record: 2 at South Shellharbour Beach in Feb 1983.

Southern Skua *Catharacta antarcticus*. One record: 1 off Bass Point on 22 June 1986.

Arctic Jaeger *Stercorarius parasiticus*. Summer visitor (Sept–March). Single birds recorded irregularly at Bass Point.

Pomarine Jaeger *Stercorarius pomarinus*. Summer visitor (Oct–March). Single birds recorded irregularly in zones A and C.

Silver Gull *Larus novaehollandiae*. Resident. Very common, recorded in all zones, up to 2000 being recorded on the Minnamurra River.

Kelp Gull *Larus dominicanus*. Resident. Recorded in all zones except E, generally 2–3 birds.

Whiskered Tern *Chlidonias hybrida*. One record: up to 30 at Killalea Lagoon in Oct–Nov 1983.

Caspian Tern *Hydroprogne caspia*. Uncommon, single birds occasionally observed in zones C and D.

Common Tern *Sterna hirundo*. Summer visitor (Oct–Dec). Up to 30 have been observed roosting at Bass Point.

White-fronted Tern *Sterna striata*. Winter visitor (June–Aug). Up to five birds recorded around the shoreline.

Sooty Tern *Sterna fuscata*. One record: 1 at Bass Point on 10 July 1983 during a severe storm.

Crested Tern *Sterna bergii*. Resident. Common, recorded in all zones except E, numbers generally <50.

Rose-crowned Fruitdove *Ptilinopus regina*. Rare. On 27 Aug 1984 W. and H. Emery located a female in littoral rainforest at Bass Point Reserve. This bird was observed by several observers until 6 Oct, when a pair were found by CJC at the same location, which remained until at least 20 Oct. On 23 Aug 1985 an immature bird was seen at the same place and was observed until at least 1 Sept. These sightings are well south of the normal range (Morris, McGill & Holmes 1981).



Topknot Pigeon *Lopholaimus antarcticus*. Uncommon, only recorded in fig trees on the hill above Minnamurra Spit where a flock of up to 25 has been sighted.

White-headed Pigeon *Columba leucomela*. Scarce but regular visitor to rainforest sections in zones A and C, generally 1–3 birds.

Feral Pigeon *Columba livia*. Small numbers occasionally observed around the Blue Metal Quarry and Killalea Lagoon.

Spotted Turtledove *Streptopelia chinensis*. Rare. A few sightings of single birds near the entrance gates to Bass Point Reserve.

Bar-shouldered Dove *Geopelia humeralis*. Resident. Uncommon, recorded in zones A, D and E. Up to eleven birds have been observed in the picnic areas at Bass Point Reserve.

Emerald Dove *Chalcophaps indica*. One record: 1 feeding on fallen berries in rainforest at Bass Point Reserve on 24 Aug 1983.

Yellow-tailed Black Cockatoo *Calyptorhynchus funereus*. Only recorded in introduced pine trees on the hill above Minnamurra Spit.

Galah *Cacatua roseicapilla*. Visitor. Recorded in zones A and B in numbers <40.

Sulphur-crested Cockatoo *Cacatua galerita*. Uncommon visitor to all zones except B in numbers <20.

Swift Parrot *Lathamus discolor*. Winter visitor (June–Sept). One flock of 12 birds observed at Bass Point Reserve during July–Sept 1983 and two at Minnamurra Spit in June 1986. All observations were of birds feeding in *Banksia integrifolia*.

Crimson Rosella *Platycercus elegans*. Only seen feeding on Indian Coral Trees on the hill above Minnamurra Spit.

Eastern Rosella *Platycercus eximius*. Up to ten birds recorded in zones D and E.

Pallid Cuckoo *Cuculus pallidus*. One record: 1 seen twice at Bass Point Reserve during August 1985.

Brush Cuckoo *Cuculus variolosus*. Summer visitor (Oct–Feb). Recorded in zones A and D, generally 1–2 birds.

Fan-tailed Cuckoo *Cuculus pyrrhophanus*. Visitor. Recorded most months in zones A, C and D.

Horsfield's Bronze-cuckoo *Chrysococcyx basalis*. Summer visitor (Sept–Jan). Recorded in zones A, C and D.

Shining Bronze-cuckoo *Chrysococcyx lucidis*. Summer visitor (Sept–Jan). Recorded in zones A, C and D.

Channel-billed Cuckoo *Scythrops novaehollandiae*. One record: 1 in fig trees above Killalea Lagoon.

Powerful Owl *Ninox strenua*. One seen regularly in rainforest at Bass Point Reserve during Aug–Dec 1984 and Aug–Dec 1985. Occasionally recorded at Minnamurra Spit.

Southern Boobook *Ninox novaeseelandiae*. Uncommon, single birds occasionally sighted in zones A, D and E.

Barking Owl *Ninox connivens*. One record: 1 roosting in casuarinas at Dunmore Swamp on 18 May 1986. Locally rare (Gibson 1977).

Barn Owl *Tyto alba*. Scarce, occasional sightings of single birds in zones D and E.

White-throated Needletail *Hirundapus caudacutus*. Summer visitor. Small flocks occasionally sighted over Killalea Lagoon.

Fork-tailed Swift *Apus pacificus*. Rare summer visitor. Flock of 50+ observed hawking over Killalea Lagoon on 5 April 1986 (A. Coleman pers. comm.) and four birds at same location on 25 April.

Laughing Kookaburra *Dacelo novaeguineae*. Uncommon visitor to zones C, D and E.

Sacred Kingfisher *Halcyon sancta*. Summer visitor. Single birds occasionally observed in zones A and D.

Noisy Pitta *Pitta versicolor*. One record: on 2 Oct 1984 one was flushed in a lantana thicket adjacent to rainforest at Bass Point Reserve by W. Emery. The bird was heard calling on 6 Oct and again observed by CJC and Emery on 13 Oct in the rainforest section. This represents the first record in the Illawarra region since 1883 (Gibson 1977), and it seems to be the southernmost occurrence on record (Blakers *et al.*, 1984).

Skylark *Alauda arvensis*. Resident; breeds (Nov). Recorded in all zones except A. Common; up to 100 birds observed feeding in the playing field adjacent to Shellharbour Swamp.

Welcome Swallow *Hirundo neoxena*. Resident. Common, recorded in all zones.

Tree Martin *Hirundo nigricans*. Summer visitor. Scarce; recorded only in zones D and E.

Fairy Martin *Hirundo ariel*. Summer visitor. Scarce; recorded occasionally in zones B, C and E.

Richard's Pipit *Anthus novaeseelandiae*. Resident; breeds. Common, recorded in all zones.

Black-faced Cuckooshrike *Coracina novaehollandiae*. Uncommon, recorded in all zones in small numbers.

Red-whiskered Bulbul *Pycnonotus jocosus*. Common resident; breeds. Recorded in all zones except B.



White's Thrush *Zoothera dauma*. Rare. Recorded in rainforest at Bass Point Reserve, lantana thickets at Minnamurra Spit and melaleuca swamp at Dunmore Swamp.

Rose Robin *Petroica rosea*. Winter visitor (May–July). Occasionally recorded in zones A and D.

Eastern Yellow Robin *Eopsaltria australis*. Resident; breeds (Aug–Jan). Common, recorded in all zones except B.

Crested Shrike-tit *Falcunculus frontatus*. Rare, recorded only at Minnamurra Spit.

Golden Whistler *Pachycephala pectoralis*. Resident. Uncommon, recorded in all zones except B.

Rufous Whistler *Pachycephala rufiventris*. Summer visitor. Uncommon, recorded in all zones except B.

Grey Shrike-thrush *Colluricincla harmonica*. Uncommon visitor to zones D and E.

Black-faced Monarch *Monarcha melanopsis*. Summer visitor; breeds. Uncommon; recorded in zones A and D.

Spectacled Monarch *Monarcha trivirgatus*. One record: 1 in rainforest at Bass Point Reserve on 10 Nov 1985, the fourth occurrence in the Illawarra since 1975: previous records at Dapto, Balgownie and Mt Keira.

Satin Flycatcher *Myiagra cyanoleuca*. One record: 1 in rainforest at Bass Point Reserve, 19 Feb 1986 (I. Rowles pers. comm.)

Restless Flycatcher *Myiagra inquieta*. Rare. Single birds recorded on several occasions at Minnamurra Spit.

Rufous Fantail *Rhipidura rufifrons*. Uncommon passage migrant recorded in spring and autumn only, in zones A and D.

Grey Fantail *Rhipidura fuliginosa*. Resident; breeds (Aug–Jan). Common, recorded in all zones except B.

Willie-wagtail *Rhipidura leucophrys*. Resident. Uncommon, recorded in all zones.

Eastern Whipbird *Psophodes olivaceus*. Resident; breeds (Aug–Dec). Common, recorded in zones C and D.

Clamorous Reed-warbler *Acrocephalus stentoreus*. Summer visitor. Uncommon, recorded in zones B and C.

Tawny Grassbird *Megalurus timoriensis*. Rare. Up to three birds recorded in rank grassland on the south-western end of Dunmore Swamp in May–June 1986, but possibly previously overlooked; may



prove to be a resident. The only other known localities in the Illawarra are Comerong Island (once), Commonderry Swamp and Tallawarra.

Little Grassbird *Megalurus gramineus*. Resident; breeds (Sept–Dec). Uncommon, recorded in zones B, C and E.

Golden-headed Cisticola *Cisticola exilis*. Resident; breeds (Aug–Dec). Common, recorded in all zones except A.

Superb Fairywren *Malurus cyaneus*. Resident; breeds (Aug–Feb). Common, recorded in all zones except B.

Variiegated Fairywren *Malurus lamberti*. Resident; breeds (Aug–Dec). Moderately common, recorded in zones A, D and E.

Southern Emuwren *Stipiturus malachurus*. Scarce. Small flocks (max. 9) recorded recorded in zones D and E.

Large-billed Scrubwren *Sericornis magnirostris*. Resident. Recorded only in rainforest section at Bass Point Reserve.

White-browed Scrubwren *Sericornis frontalis*. Resident; breeds (July–Nov). Common, recorded in zones A, C, D and E.

Brown Gerygone *Gerygone mouki*. Resident; breeds (Sept–Dec). Common, recorded in zones A, B, C and E.

Brown Thornbill *Acanthiza pusilla*. Resident; breeds (Aug–Dec). Common, recorded in all zones except B.

Yellow-rumped Thornbill *Acanthiza chrysorrhoa*. Uncommon visitor to casuarina forest at Dunmore Swamp.

Yellow Thornbill *Acanthiza nana*. Resident. Uncommon, recorded in all zones except B.

Striated Thornbill *Acanthiza lineata*. Resident; breeds (Sept). Uncommon, recorded in zones A, C and D.

White-throated Treecreeper *Cormobates leucophaea*. Rare, recorded twice in June 1986 at Minnamurra Spit.

Red Wattlebird *Anthochaera carunculata*. Uncommon visitor to zones A and D.

Little Wattlebird *Anthochaera chrysoptera*. Uncommon visitor to zones A and D.

Noisy Friarbird *Philemon corniculatus*. Uncommon visitor to zones A and D.

Lewin's Honeyeater *Meliphaga lewinii*. Resident; breeds (Aug–Jan). Common, recorded in all zones except B.

Yellow-faced Honeyeater *Lichenostomus chrysops*. Uncommon visitor to zones C and D.

White-naped Honeyeater *Melithreptus lunatus*. Scarce visitor to Minnamurra Spit.

New Holland Honeyeater *Phylidonyris novaehollandiae*. Resident; breeds. Common, recorded in all zones except B. Nesting all months except Dec–Feb when the species is apparently absent, probably due to a lack of flowers at this time.

Eastern Spinebill *Acanthorhynchus tenuirostris*. Resident; breeds (Aug–Dec). Common, recorded in all zones except B.

Scarlet Honeyeater *Myzomela sanguinolenta*. Uncommon autumn and winter visitor to zones A and D. Feeds in flowering banksias and Indian Coral Trees.

White-fronted Chat *Epthianura albifrons*. Resident; breeds (Oct–Dec). Recorded in all zones except A. Total population <50.

Mistletoebird *Dicaeum hirundinaceum*. One record: observed in forest above Killalea Lagoon in Jan 1986.

Spotted Pardalote *Pardalotus punctatus*. Resident; breeds (Aug–Dec). Uncommon, recorded in zones A and D.

Silvereye *Zosterops lateralis*. Resident; breeds (Aug–Jan). Common, recorded in all zones. The local population is augmented in autumn and winter by migrating Tasmanian subspecies *lateralis*.

European Goldfinch *Carduelis carduelis*. Visitor. Uncommon, recorded in all zones.

House Sparrow *Passer domesticus*. Resident. Uncommon, recorded in zones B, C and E.

Red-browed Firetail *Aegintha temporalis*. Resident; breeds (Sept–Jan). Common, recorded in all zones.

Zebra Finch *Poephila guttata*. Visitor; breeds (Sept–Jan). Uncommon, recorded in all zones except A. Generally <20, but on 7 July 1984 a flock of 200+ were observed in seeding grasses near the junction of Buckley and Jamberoo Roads.

Double-barred Finch *Poephila bichenovii*. Rare. Small numbers observed near Killalea Lagoon, April–June 1986.

Chestnut-breasted Mannikin *Lonchura castaneothorax*. Visitor. Uncommon. Recorded in zones C, D and E, generally <20, but on 7 July 1984 a flock of 200+ were found feeding on seeding grasses



on the hill above Minnamurra Spit. The flock increased to 300+ on 15 July and then slowly decreased until the last sighting of six on 25 Aug.

Common Starling *Sturnus vulgaris*. Resident. Moderately common, recorded in all zones except A.

Common Mynah *Acridotheres tristis*. Scarce. Recorded occasionally near Killalea Lagoon.

Olive-backed Oriole *Oriolus sagittatus*. Visitor. Uncommon, recorded in zones A and D.

Figbird *Sphecotheres viridis*. Scarce visitor, recorded only in fig trees on the hill above Minnamurra Spit. Six birds observed in July 1984.

Spangled Drongo *Dicrurus hottentottus*. Scarce visitor recorded in zones A, C and D.

Satin Bowerbird *Ptilonorhynchus violaceus*. Resident. Moderately common, recorded in zones C and D, mainly in and around fig trees. At least two active bowers present, which suggests that this species may breed within the study area.

Magpielark *Grallina cyanoleuca*. Resident; breeds (Aug–Dec). Common, recorded in all zones except A.

Dusky Woodswallow *Artamus cyanopterus*. Scarce visitor recorded in zones C and D.

Grey Butcherbird *Cracticus torquatus*. Resident. Uncommon, recorded in all zones except B.

Australian Magpie *Gymnorhina tibicen*. Resident; breeds (July–Dec). Common, recorded in all zones.

Pied Currawong *Strepera graculina*. Winter visitor. Uncommon, occasionally recorded in zones D and E.

Australian Raven *Corvus coronoides*. Resident; breeds (July–Dec). Common, recorded in all zones.

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## A POSSIBLE SPOTTED REDSHANK IN QUEENSLAND

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On 23 August 1980, a group of observers including Dariel Larkins, J.J. Francis, Alan Dampney, Fred Johnston, Peter Cole and the writer visited Michaelmas Cay, off Cairns, Queensland. After birding around the cay and walking a final circuit we observed two unusual waders on the eastern shore.

A description was noted as follows: a medium-sized *Tringa*, slightly larger than a Grey-tailed Tattler *Tringa brevipes* (one of which had been seen on the island some fifteen minutes earlier); bill dark, straight and about 1.5 times the length of the head; legs long and dark; upperwing generally dark grey with white mottling on coverts, lacking a noticeable wing-bar but fading to white on the trailing edge (quite extensively on the secondaries), primaries extensively dark-tipped; underwing pale, whiter down much of the central area; rump white; back pale mottled grey merging to white on lower back; tail seemed dark; crown grey extending down to nape; indistinct supercilium; face near-white with grey streaks on cheeks, extending onto the neck; breast white; flanks white, spotted grey extending onto belly though with fewer spots, almost pure white.

The birds were in view for less than five minutes in very bright sunlight and were standing on the sandy shore with water lapping close to their feet. On being flushed one bird called and they both flew south over the water.

They were not seen again and we had to leave the cay shortly thereafter. The call was noted as "a three-note call" but only one of us (FJ) heard it distinctly.

The observation was brief and unsatisfactory in a number of respects. Nevertheless, the bird was clearly a sandpiper of the genus *Tringa*, most species of which are familiar to all the observers. The pale grey colour, white rump, long straight bill and long dark legs strongly indicates a Spotted Redshank *Tringa erythropus*. FJ later identified the call he heard as a Spotted Redshank from a number of unidentified wader calls on tape.

This species has apparently been recorded in Australia only once (McKean & Dampney, 1984. N.T. Naturalist no. 7: 8-9), but it occurs with some frequency in Indonesia and might be expected to occur more frequently in this country; we feel that observers should be alert to this possibility.

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## NESTING HABITS OF THE WONGA PIGEON

S. MARCHANT

Frith (1982) gave a comprehensive account of the Wonga Pigeon *Leucosarcia melanoleuca*, which makes it clear that the bird is hard to observe in the field and that little is known of its natural breeding habits beyond the bare facts of nest, eggs and nesting sites. From 1975 to 1986 I have noted 11 breeding attempts at Maulbrooks Road, Moruya, NSW (35°56'S 150°06'E) from which some details of the routine at the nest can be added. Background information on the locality has already been given (Marchant 1979). All times are given as Eastern Standard.

Most of my information comes from a nest that I watched in November–December 1986. I found it by seeing a bird carrying a twig on 23 November; it flew past me at 10:30 hrs, absolutely silently, perched for about five minutes, looking anxiously about, and flew on low out of sight. This has been the only occasion in 12 years when I have seen the species building. The extreme stealth and quietness of the building bird, in contrast to the noisy flight of birds when flushed, no doubt explains why I have seen this activity so rarely. Searching in the direction to which this bird flew, fortuitously at 06:15 hrs on 26 November I spotted an adult on a nest on a big sloping branch of a large Spotted Gum *Eucalyptus maculata* over 15 m from the ground, inaccessible. The bird left the nest and was not sitting at 15:30–15:45 hrs but was again on the nest at 08:30 on 27 November; it was not on at 10:30, 14:00 or 14:45 but was again sitting at 19:00. I have little doubt that the clutch was laid during these two days, probably in the evenings, as is customary for columbids (Goodwin 1967). Thereafter I watched the nest daily for a total of 2316 minutes until the morning of 8 December when the eggs were on the ground, sucked.

Table 1 shows the result of my watches. In the mornings the adults changed over regularly between 07:25 and 08:25. I probably missed the change on 30 November when I could not watch between 06:20 and 07:30. The change at 05:35 on 28 November was exceptional and probably represented the male relieving the female after laying. In the afternoons change-overs were seen only between 16:14 and 16:51. Doubtless they were missed on 29 November and on 2, 4 and 7 December because I could not watch for long enough. They probably did not take place before the start of my watches because, considering the general habits of columbids, I do not think that they occur from about 11:00 to 15:00, when I did not watch at all. Thus the afternoon relief probably occurs somewhat less regularly than in the morning.

All reliefs were carried out similarly in so far as the relieving bird flew up from the ground or from very low below the nest without any sound of wingbeats and landed within a metre or so of the nest. Usually the sitting bird quickly stood up, stepped off the nest and glided away for 70+ m till out of sight without any sound from the wings. Once the process was dragged out for about 10 minutes with the sitting bird reluctant to leave. In the mornings the relieving bird perched on one side of the nest; in the evenings on the other. It quickly stepped onto the nest and covered the eggs after briefly poking about in the nest. There was no ceremony between the two adults.

A notable difference between events at morning and afternoon reliefs was that in the mornings they were rarely heralded by bouts of advertisement calling and, if there was any such, it was in

one or two brief series of 6-9 notes; no calls were given when both birds were at or near the nest together. In contrast, at afternoon reliefs persistent bouts of calling usually preceded the change-over, sometimes of very long series of notes; short soft series of 4-5 notes were also usually given by the relieving bird after its arrival near the nest (Table 1). The exceptional calling in the morning of 28 November was in line with the usual afternoon performance and, judged by what Frith (1982) said, makes it likely that the male then relieved the female. He stated that the female gives the advertising call less often than the male and then seldom with more than 4-5 notes in a series. Thus probably the male sits all night, having relieved the female at about 16:00-17:00, and the female for about eight hours during the day, relieving the male at about 08:00. This agrees with Goodwin's (1967) statement for columbids in general that the sexes incubate for about the same number of daylight hours.

Observations at three other nests support the above. Four out of five morning watches ended at or before 07:30 so that no doubt I missed change-overs. During the sixth (05:20-09:40 hrs) the

TABLE I

Date	Time of watch	Time of change-over	Calling			At nest Series x notes
			Before relief			
			No. of series	Range of notes per series	Aver. length of series	
<b>Morning</b>						
Nov. 28	04:40-05:41	05:35	31	2-94	14	0
30	05:50-06:20	none		0		-
	07:30-11:10	none		0		-
Dec. 1	04:40-08:10	07:54		0		0
2	04:55-08:05	08:00		0		0
3	05:30-07:40	07:26	2	7,8	-	0
4	05:55-08:30	08:25	1	6	-	0
5	06:55-07:55	07:51		0		0
6	07:00-09:00	07:28		0		0
7	06:30-07:35	07:30	2	6,9	-	0
<b>Afternoon</b>						
Nov. 29	15:15-16:45	none		0		-
30	13:20-16:50	16:45	7	12-170	58	0
Dec. 2	15:10-16:55	none		0		-
3	13:25-16:25	16:14	17	5-86	29	1 x 5
4	15:10-17:45	none	44	8-154	34	-
5	15:20-16:30	16:20	13	10-211	47	1 x 5
6	15:00-16:55	16:51	32	5-274	43	2 x 4,5
7	15:15-17:45	none		0		-



relieving bird came almost to the nest at 09:22, remained there till 09:36 and then left. From hindsight, on another occasion, when not specifically watching the nest, I was nearby when a change-over occurred at 09:30. In the afternoons I recorded five reliefs between 15:40 and 17:30 but during four other watches of 85–120 minutes that all ended between 18:10 and 18:45 I noted none. At all these other nests behaviour of the birds was as described above and the amounts of calling were similar.

All the nests that I have known have been inaccessible or have lost their eggs, though in any case for fear of causing desertion I did not disturb the sitting bird to inspect contents. Thus unfortunately I have no accurate idea of incubation and nestling periods. B.E. Triggs is quoted by Frith (1982) as recording one nestling period of 26–27 days. If that is standard, at one definitely successful nest incubation lasted for a least 13–14 days. At another, the adults began to sit between 22 and 25 November and I found hatched shells below the nest on 17 December so that incubation must have been for less than 24–25 days and perhaps for 6–7 days less, because the young had gone between 31 December and 2 January, just possibly successfully.

When incubating during the daylight shift (08:00–16:00 hrs), the bird (?female) usually sat with its tail well raised, displaying the mottled undertail coverts and thus being surprisingly cryptic (Frith 1982; Dunn 1983). Sometimes the tail was raised so exaggeratedly and almost vertically that the bird seemed to be resting on its breast rather than on its abdomen or brood-patch. On exposed nests on the fairly slender branches of casuarinas it also tended to shift round as I passed by, to keep the undertail displayed towards me, something that was not so apparent on nests on substantial branches of gum trees. The supposed male before and after the daily reliefs seemed to incubate in a much more normal or horizontal pose with flat tail. If this second bird incubates mostly during darkness, it may not have needed to develop the cryptic pose.

An adult sat with the squabs right up to the time when they fledged, which in my experience does not occur with all columbids. For two or three days after leaving the nest the squabs are barely able to fly and on at least three occasions I have found them during this period on the ground in much the same place each day.

Frith (1982) gave records showing that Wonga Pigeons throughout their range may start their nests in almost every month. At Moruya all nests that I have seen were started between the extreme possible dates of 22 August and 26 November, including recently fledged young whose nest I never found. Twice I noted the interval between the loss of a nest and the start of its replacement: one nest was lost between 16 and 20 October and the bird was again sitting on the same nest on 29 October; the other was lost on 19–20 November, the replacement was being built on 23 November and its clutch started on 26–27 November.

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## THE PHEASANT COUCAL IN SOUTHERN NEW SOUTH WALES, AND A RECENT RECORD FROM THE ILLAWARRA

KEVIN MILLS

The Pheasant Coucal *Centropus phasianinus* is found from the northwest of Western Australia across the tropical north to Cape York and down the east coast as far as the central coast of New South Wales (Blakers *et al.*, 1984); it also occurs in Timor and New Guinea. Two subspecies are recognised in Australia (Condon, 1975; Mason, McKean & Dudzinski, 1984): *phasianinus* occurs from New South Wales northwards to the vicinity of Ayr and Proserpine, Queensland, where it meets and intergrades with *melanurus*, which extends across northern Australia to the Pilbara region of Western Australia. The species occupies a variety of habitats including "rank grassland, swamp margins, dense heath and similar low vegetation, and pandanas thickets" (Beruldsen, 1980) and it has also adapted well to sugar cane fields.

Its distribution is mainly coastal in New South Wales (and elsewhere); it is generally absent at altitudes above 400 m and in the interior, although it has been recorded at Narran Lake, Bingara, Lake Cargelligo, Orange and several other western localities (Morris, McGill & Holmes, 1981). It is fairly common in northern coastal regions, but in the Newcastle-Gosford district north of Sydney, Morris (1975) reported it as uncommon and commented on the pressures of development on the species' coastal habitats.

It regularly occurs as far south as Royal National Park south of Sydney (34/151 in Blakers *et al.*, 1984), where it is an uncommon resident in thick coastal "heathy and swampy areas" (NSW National Parks and Wildlife Service, 1977, 1980). However, only one bird has been recorded (in November 1984) in the park in the Sydney Bird Counts since 1983 (NSW Field Ornithologists Club Newsletters), which indicates that it cannot be regarded as common. Hindwood (1954) commented that the species is "looked upon as a comparatively rare bird...[in the]...Sydney district". Hindwood & McGill (1958) offered no comment as to its abundance in the Sydney region, but stated that it "inhabits thick grassy swamplands, the rank growth bordering creeks, damp heaths, and scrubby hillsides", adding that it is not found in the shale country immediately to the west of the city. Bell (1983) reported the demise of the species at Long Bay Rifle Range (south of Sydney), commenting that the destruction of habitat was the cause of its loss to the area during the 1940s. There has been only one record of the Pheasant Coucal from the Sydney region published in the NSW Bird Reports in recent years, that of two birds at Penrith Lakes on 29 November 1981 (Lindsey, 1982).

Records of the Pheasant Coucal available from the NSW Field Ornithologists Club's files (T.R. Lindsey, pers. comm.) and elsewhere for the Sydney region (ie, south of 33°35'S) are summarised below:

	J	F	M	A	M	J	J	A	S	O	N	D	Total
No.	4	4	2	—	2	1	3	2	6	7	12	7	50
%	8	8	4	—	4	2	6	4	12	14	24	14	100



In seasonal terms the percentage of sightings are: summer 30.0%; autumn 8.0%; winter 12.0%, and spring 50.0%. There is clearly a bias in the records for the spring-summer period, particularly for the months from September to December, when 64% of all sightings occurred.

In the Sydney area three locations are prominent among the recorded sightings of the species: Beacon Hill, Ku-ring-gai Chase National Park and Royal National Park. This is probably because these areas contain the largest areas of suitable coastal vegetation still extant in the Sydney region.

Gibson (1977) recorded the species as being rare in the County of Camden and the Illawarra district, providing two records: Lake Illawarra in 1973 and on the escarpment north of Bulli in September 1956; he suggested that the species was resident along the Mt Keira-Wilton road (the plateau west of Wollongong) before severe bushfires in 1968. On 2 August 1975 the species was recorded from Bargo Wier, near Picton, 33 km west of Bulli (NSWFOC files).

The southern limit of the species has been identified as Jervis Bay (McGill, 1960; Readers Digest, 1979), Ulladulla (Morris, McGill & Holmes, 1981), and Conjola (Slater, 1970; Caley, 1974; Condon, 1975; and Blakers *et al.*, 1984). Each of the above references appears to be based upon the records of Hindwood (1954) who reported on observations of the coucal made around 1910 in the Jervis Bay area and on two later records in the 1950s at Conjola and Tabourie, both in the Jervis Bay area. The species has not been reported in this district in recent years (e.g. Nix & Brooker, 1978; Disney, 1970; and Blakers *et al.*, 1984), and has apparently disappeared since the records given by Hindwood were made (C. Humphries, Ulladulla, *pers. comm.* 1985). It is likely that development pressures on the coastal zone have adversely affected the habitats and occurrence of the coucal in the Jervis Bay area (C. Humphries, *pers. comm.*).

Hindwood (1954) also gave two questionable records from Victoria, at Mallacoota Inlet and near Geelong and commented that further evidence was required before these records could be accepted.

On 19 August 1985 I collected a road-killed specimen of a Pheasant Coucal on the F6 freeway to the northwest of Wollongong (at 34°20'40"S, 150°52'20"E), at an altitude of 330 metres. The location is near Bellambi Creek which is lined with *Typha* sp. reeds and has a small weir and dam with stands of the rush *Eleocharis sphacelata*. The specimen was in good condition and was not there earlier in the day; it was in non-breeding plumage, a general brown colour instead of the black colouring associated with breeding. The surrounding habitat is grassland to one metre tall dominated by *Imperata cylindrica* and *Pteridium esculentum*, with scattered trees and adjacent tall eucalypt forest and rainforest. The area was originally cleared and is now regularly burnt. Interestingly, Mackness (1979) mentioned the grass *I. cylindrica* as part of one of the habitats of the species in an area north of Townsville, where a nest was found made entirely of this grass.

This recent record was in the area between two locations mentioned by Gibson (1977), Bulli and the Mt Keira Road, suggesting that the species may be present in small numbers in the extensive water catchment areas of the Woronora Plateau. Most of this area is infrequently visited by ornithologists because of entry restrictions, which may explain the absence of other records. Upland swamps (sedgeland) are common on the eastern side of the plateau and the upper reaches of the

water storage dams have extensive areas of rank grass and reeds or dense shrublands and forests. Both habitats may be suitable for the Pheasant Coucal.

The picture that emerges of the distribution of the Pheasant Coucal in southern New South Wales is that the species is rare, being consistently recorded only from the Gosford area northwards, with a small population in the Royal National Park, and the possibility that it may be resident in small numbers in the water catchment areas west of Wollongong. The southern records given by Hindwood (1954) for the Jervis Bay area are probably from an extinct population, the area now being outside the usual distribution.

All records of the coucal south of Sydney have been made between August and November, especially in November, perhaps suggesting the birds are more mobile at this time of the year, prior to the breeding season (October to January).

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## A FOURTH BIRD COUNT ON THE MURRUMBIDGEE

J. WAUGH

From 20 to 30 November 1985 my wife, Pauline, and I travelled by canoe from Darlington Point to Hay along the Murrumbidgee River. The journey of about 215 kilometres took 83 hours of paddling. A count was kept of those birds seen or heard over and along the river.

Of the 51 species seen by Guppy (1974, Birds 8:85–88) on a similar journey through this area we saw 45 and added another 44 species. Of the birds recorded by Guppy we did not see: Emu, Little Egret, Blue-winged Shoveler, Dusky Moorhen, Feral Pigeon and Crimson Chat. Nine species, the Yellow-billed Spoonbill, Pacific Black Duck, Grey Teal, Maned Duck, Whistling Kite, Peregrine Falcon, House Sparrow, Common Starling and Magpielark were observed breeding. No Superb Parrots were observed west of Carrathool Bridge.

Changes in the habitat as described elsewhere (Waugh 1981, Aust. Birds 15:44–46) included the appearance west of Carrathool Bridge of Black Box *Eucalyptus largiflorens* on the higher banks and patches of River Cooba *Acacia stenophylla*. Only one high sandy bank suitable for nesting Rainbow Bee-eaters was seen, and no gravel beaches. The river level was low.

In Table 1 the common and scientific names follow the number given by Morris, McGill & Holmes (1981. Handlist of birds in New South Wales. Sydney: NSWFOC). The next column shows whether the bird was recorded by Guppy in 1972, the next the number of entries for each species, and the last the total number of each species recorded during the trip.

TABLE 1. Bird species recorded along the Murrumbidgee River between Darlington Point and Hay 20-30 November 1985

No.	Species	1972	entries	total
54	Australian Pelican <i>Pelecanus conspicillatus</i>	28	95	
59	Darter <i>Anhinga melanogaster</i>	*	6	6
61	Great Cormorant <i>Phalacrocorax carbo</i>	*	135	180
63	Little Black Cormorant <i>Phalacrocorax sulcirostris</i>	*	9	10
64	Little Pied Cormorant <i>Phalacrocorax melanoleucos</i>	*	13	13
68	Pacific Heron <i>Ardea pacifica</i>	*	3	3
69	White-faced Heron <i>Ardea novaehollandiae</i>	*	42	48
71	Great Egret <i>Egretta alba</i>	*	6	7
76	Rufous Night Heron <i>Nycticorax caledonicus</i>	*	87	187
82	Sacred Ibis <i>Threskiornis aethiopica</i>	*	1	2
83	Straw-necked Ibis <i>Threskiornis spinicollis</i>	*	8	40
85	Yellow-billed Spoonbill <i>Platalea flavipes</i>	*	10	12
89	Black Swan <i>Cygnus atratus</i>	*	1	2
94	Pacific Black Duck <i>Anas superciliosa</i>	*	114	292
96	Grey Teal <i>Anas gibberifrons</i>	*	93	478
100	Pink-eared Duck <i>Malacorhynchus membranaceus</i>		2	2
102	Maned Duck <i>Chenonetta jubata</i>	*	215	1199
111	Black Kite <i>Milvus migrans</i>	*	11	12
115	Whistling Kite <i>Haliaster sphenurus</i>	*	35	36
116	Brown Goshawk <i>Accipiter fasciatus</i>	*	7	7

121	Wedge-tailed Eagle <i>Aquila audax</i>	*	3	4
122	Little Eagle <i>Hieraaetus morphnoides</i>	*	10	10
126	Peregrine Falcon <i>Falco peregrinus</i>	*	7	12
127	Australian Hobby <i>Falco longipennis</i>	*	1	1
130	Australian Kestrel <i>Falco cenchroides</i>	*	43	48
156	Bush Stone-curlew <i>Burhinus magnirostris</i>		1	2
173	Black-fronted Plover <i>Charadrius melanops</i>	*	3	3
245	Peaceful Dove <i>Geopelia placida</i>	*	127	138
252	Crested Pigeon <i>Ocyphaps lophotes</i>	*	7	9
259	Galah <i>Cacatua roseicapilla</i>	*	442	1459
261	Little Corella <i>Cacatua sanguinea</i>		27	50
263	Sulphur-crested Cockatoo <i>Cacatua galerita</i>	*	20	57
272	Superb Parrot <i>Polytelis swainsonii</i>	*	31	74
274	Cockatiel <i>Nymphicus hollandicus</i>		1	1
280	Yellow Rosella <i>Platycercus flaveolus</i>	*	319	634
284	Red-rumped Parrot <i>Psephotus haematonotus</i>	*	103	256
294	Pallid Cuckoo <i>Cuculus pallidus</i>		2	2
296	Fan-tailed Cuckoo <i>Cuculus pyrrhophanus</i>		3	3
298	Horsfield's Bronze-cuckoo <i>Chrysococcyx basalus</i>		71	74
299	Golden Bronze-cuckoo <i>Chrysococcyx lucidus</i>		3	3
305	Southern Boobook <i>Ninox novaeseelandiae</i>		10	14
307	Barn Owl <i>Tyto alba</i>		1	1
311	Tawny Frogmouth <i>Podargus strigoides</i>		4	7
313	Australian Owlet-nightjar <i>Aegotheles cristatus</i>		3	4
320	Laughing Kookaburra <i>Dacelo novaeguineae</i>	*	225	305
323	Sacred Kingfisher <i>Halcyon sancta</i>	*	399	466
325	Rainbow Bee-eater <i>Merops ornatus</i>		10	12
326	Dollarbird <i>Eurystomus orientalis</i>	*	63	64
334	Welcome Swallow <i>Hirundo neoxena</i>	*	155	335
335	Tree Martin <i>Cecropis nigricans</i>		301	1106
336	Fairy Martin <i>Cecropis ariel</i>		2	3
340	Black-faced Cuckooshrike <i>Coracina novaehollandiae</i>	*	112	130
345	White-winged Triller <i>Lalage sueurii</i>		17	32
360	Shrike-tit <i>Falcunculus frontatus</i>		12	12
365	Rufous Whistler <i>Pachycephala rufiventris</i>		7	7
367	Grey Shrike-thrush <i>Colluricincla harmonica</i>	*	442	508
372	Leaden Flycatcher <i>Myiagra rubecula</i>		1	1
374	Restless Flycatcher <i>Myiagra inquieta</i>		12	18
377	Willie-wagtail <i>Rhipidura leucophrys</i>	*	107	130
385	Grey-crowned Babbler <i>Pomatostomus temporalis</i>		4	26
389	Clamorous Reed-warbler <i>Acrocephalus stentoreus</i>	*	8	13
393	Rufous Songlark <i>Cinclorhamphus mathewsi</i>		49	50
395	Superb Fairywren <i>Malurus cyaneus</i>		15	22
415	Weebill <i>Smicrornis brevirostris</i>		9	11
418	Western Warbler <i>Gerygone fusca</i>		50	54
419	White-throated Warbler <i>Gerygone olivacea</i>		6	7
432	Brown Treecreeper <i>Climacteris picumnus</i>		277	350
437	Noisy Friarbird <i>Philemon corniculatus</i>		3	3
438	Little Friarbird <i>Philemon citreogularis</i>	*	224	323
440	Blue-faced Honeyeater <i>Entomyzon cyanotis</i>		4	14
442	Noisy Miner <i>Manorina melanocephala</i>	*	38	112
455	White-plumed Honeyeater <i>Lichenostomus penicillatus</i>	*	1407	3712
475	Mistletoebird <i>Dicaeum hirundinaceum</i>		2	2
481	Striated Pardalote <i>Pardalote striatus</i>	*	225	233
483	Silvereye <i>Zosterops lateralis</i>		48	69



486	House Sparrow <i>Passer domesticus</i>	*	18	50
499	Common Starling <i>Sturnus vulgaris</i>		209	951
501	Olive-backed Oriole <i>Oriolus sagittatus</i>		3	3
509	White-winged Chough <i>Corcorax melanorhamphos</i>	*	45	276
511	Magpielark <i>Grallina cyanoleuca</i>	*	348	477
512	White-breasted Woodswallow <i>Artamus leucorhynchus</i>	*	26	135
515	Black-faced Woodswallow <i>Artamus cinereus</i>		1	1
516	Dusky Woodswallow <i>Artamus cyanopterus</i>		5	32
519	Pied Butcherbird <i>Cracticus nigrogularis</i>	*	3	3
520	Australian Magpie <i>Gymnorhina tibicen</i>	*	70	97
521	Pied Currawong <i>Strepera graculina</i>		1	1
523	Australian Raven <i>Corvus coronoides</i>	*	105	178
525	Little Raven <i>Corvus mellori</i>		87	604

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## A WHISTLING KITE WITH DEFORMED LEGS

JOHN PASTORELLI and DAVID TURNER

On 25 August 1984 an immature Whistling Kite *Haliastur sphenurus* was received by Bill Sullivan, an officer of National Parks and Wildlife Service, South Metropolitan District, from a resident of Grays Point, a southern suburb of Sydney, New South Wales. An interesting feature shown by this bird was an additional foot protruding from above the tarsus on each leg (Figure 1). As the bird appeared healthy it was released, but it remained in the area of the district office at Audley and appeared to be dependent on humans for food, continuing to call until it was fed.

After two weeks the kite began to gather sticks, placing them in the air cooling tower of the district office. It was assumed from this behaviour to be a female. At this time a second Whistling Kite was sighted in the area.

On 8 September 1984 the bird was banded by Stephen Wilson of the Department of Agriculture (band number 011-90704, wing length 375 mm, tail length 240 mm). It seems to have left the district office area shortly afterwards, and on 11 September 1984 it was reported at East Heathcote, a suburb on the western boundary of the Royal National Park, some 20 kilometres south of Sydney. Here it was seen taking chickens and food from chicken coups. Together with Stephen Wilson, we made several unsuccessful attempts to catch the bird, but it was wary of humans and appeared to be reverting to a wild state. About a week later it left the East Heathcote area and was last seen in Woronora, about 15 km southwest of Sydney.

This or similar deformities in raptors apparently have not been previously recorded in Australia. However Beebe (1910. *Zoologica* 1: 150-152) recorded supernumary toes in the Broad-winged Hawk *Buteo platypterus* of North America. We would like to thank W.E. Boles, L. Clayton, S.J.S. Debus, B. Kubbere, P. Olsen and S. Wilson for discussing this bird with us and for their help with this note.

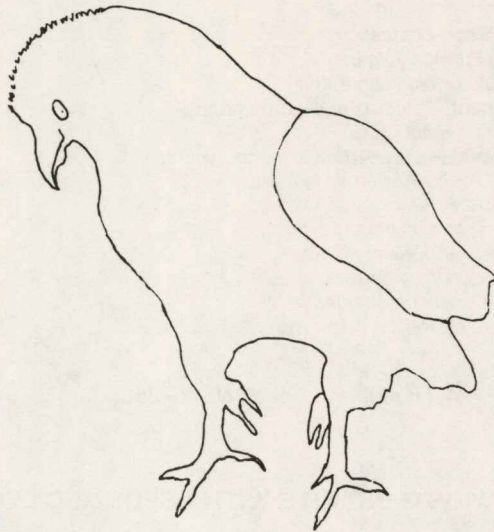


Figure 1. Sketch of Whistling Kite showing the position of supernumary feet on the tarsus (drawn from a photograph).

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## A POPULATION SURVEY OF THE LORD HOWE ISLAND CURRAWONG

BRUCE J. KNIGHT

In 1974 Fullagar *et al.* (in Recher *et al.* (eds). Environmental survey of Lord Howe Island: a report to the Lord Howe Island Board. Australian Museum: Sydney) estimated the population of the Lord Howe Island subspecies of the Pied Currawong *Strepera graculina crissalis* as "between 30 and 50 birds". In the course of three visits to Lord Howe Island between 1974 and 1982 (in September and May) it became apparent that I regularly encountered Pied Currawongs in a number of specific small areas. Consequently I made two visits of ten days each to the island in May 1984 and August 1985 to confirm that the birds were territorial during these months and, on confirmation, to use territoriality as a basis on which to estimate population numbers.

Method: The island was traversed on foot daily so that all areas were visited on at least two days of each visit, exceptions being Erskine Valley and Mount Gower, which were covered in a one day excursion in May 1984, and Big and Little Slopes, which were not visited at all. Three adjoining territories near Sea Breeze Lodge were under observation daily, showing that the groups of two to five birds remained consistently within a defended area, apart from early morning and late afternoon gatherings at a "meeting ground". Consequently other groups located by sight or calls two or more times within a specified area, between 10:00 and 15:00 hrs, were considered to be holding territory.



Territories located only by call were assumed to be occupied by two birds only. Observation from various vantage points made it possible to confirm occupations of several contiguous territories at a time. Sightings were marked on the CMA Tourist Map of Lord Howe Island 1:15 000.

Observations: In May 1984, 20 confirmed territories and five probable territories were mapped, indicating a minimum population of 52 birds plus any on Big and Little Slopes. In August 1985, 24 territories indicated a minimum population of 55 plus any on Mt Gower, Big and Little Slopes. Apart from a few known boundary changes, seventeen territories remained consistently from May 1984 to August 1985.

Three meeting grounds were located, serving from three to five territories and situated at the extreme end of one of the territories. Meetings were usually "friendly" with much calling, low grade challenges and group foraging. On dispersal participating birds were expected not to linger on any other area of the host's territory, such action resulting in aggressive pursuit. Additionally, birds from the northern hills, which normally meet at Old Settlement, are reported to meet on occasion with Transit Hill birds in the settled area, *i.e.* around the bowling club, usually on overcast or showery days. These meetings generally involve 10 to 15 birds (Clive Wilson, pers. comm.)

Territories are occupied by from two to five birds, presumably a breeding pair and juveniles. Observation of the Sea Breeze group suggests that the birds do not raise a brood every year and that territorial boundaries expand or contract depending on the size of the family. Overall, my observations indicate that one or two offspring are more common than three.

Ground and map observations show that each territory includes a section of stream or gully with tall timber. The area of three territories where the boundaries were fairly well defined average ten hectares. These territories included a large proportion of pasture land; other territories are entirely forest.

Conclusion: In August 1985 the minimum population was 55 birds. Assuming (1) that the territories on Mt Gower in May 1984 have remained constant at two birds each; (2) allowing three territories of two birds on Big and Little Slopes on the basis of terrain; and (3) discounting the very likely possibility that a number of territories held more than the two birds observed or assumed, I estimate the total population of the Lord Howe Currawong at 73 birds.

The estimate of some islanders that the currawongs exist in hundreds appears to be derived by taking the number of birds observed at a meeting (*i.e.* 10-15) and multiplying by the number of localities in which a bird or birds have been seen or heard, *i.e.* 30 territories plus birds in transit and displaced juveniles.

As a purely tentative conclusion, I suggest that the island probably provides suitable habitat for only 35 to 40 territories and that the present population is near optimum numbers. I strongly suspect that the Erskine Valley and Mt Gower area contains a more numerous population than has been allowed for in this estimate.

## BOOK REVIEWS

Shorebirds: an identification guide to the waders of the world. By Peter Hayman, John Marchant and Tony Prater. 412 pp. Croom Helm, London and Sydney. 1986. Pounds Stg 19.95.

Any commentary of this valuable book need only repeat Roger Tory Peterson's foreword to sufficiently extol its virtues. "Two hundred and fourteen species of waders or shorebirds swarm over the beaches, marshes, mudflats, plains and tundras of the world. This impressive guide by a team of skilled field experts is the first attempt to describe and illustrate them all within the covers of a single book...[the authors have] skilfully portrayed and described the many plumages of the world's waders, some of which have never been illustrated before".

Whilst some waders have near-cosmopolitan range, others such as the little-known sandpipers of the central Pacific (one already extinct), the woodcocks of south-eastern Asian islands and New Guinea (one probably extinct) and the snipes of the South American Andes, all with very restricted distributions, have never appeared in the pages of any popular field-guide. On the other hand, some, such as the Ruddy Turnstone, Sanderling and Black-winged Stilt, are widespread and appear in the handlists and books of most of the world's countries.

The 88 colour plates by Peter Hayman indicate excellently the breeding, eclipse, juvenile plumages and flight patterns of all species. As an indication of the comprehensiveness of the artwork, there are 28 separate figures for the Dunlin alone, depicting diagnostic differences between its six subspecies as well as the succession of plumages from juvenile to breeding adult. This illustrative section, with its full commentary, covers approximately half of the book; the remainder explains identification, voice, habits, movements and complete description, including measurements, in taxonomic order.

Systemic designation is fully up-to-date and follows some recent developments such as family status for the Ibisbill, peculiarly restricted to the "roof of Asia", and the Magellanic Plover, which is unique among shorebirds in that it feeds its young by regurgitation. Both taxonomic changes seem clearly warranted. However, the phalaropes, long considered a distinct family mainly by virtue that sexual coloration and habits are the reversal of most birds, are included in the Scolopacidae, and the sheathbills of the Antarctic are excluded altogether "as they are so different from the true waders and are well covered by the field guide for the seabirds, particularly Harrison (1983)". Thus, this present book if used in conjunction with Harrison's Seabirds will give a complete coverage of the whole Order Charadriiformes.

The research by John Marchant and Tony Prater, and the artistry of Peter Hayman clearly express the tremendous strides that have taken place in recent years by providing a book that so comprehensively covers part of one Order of birds. Probably no other group as that comprising the birds we call collectively waders or shorebirds has been so closely studied in recent times. With present-day knowledge (in Australia at least) it is difficult to realise that in 1926 (Emu 26: 316) a prominent museum identity stated, "how is it possible to distinguish the Bar-tailed Godwit from the



Black-tailed Godwit without securing a specimen?" and in 1938 D.L. Serventy (*Emu* 38:75) stated that on present knowledge (correctly so at that time) the Marsh Sandpiper, Wood Sandpiper, Terek Sandpiper and Mongolian Plover were unknown from southern Australia. New wader species are still being recorded in Australia, as indicated by an overall total of 51 in 1953 (Condon & McGill, *Field guide to the Waders*) to 1984 when the total had reached 73 (Simpson & Day, *Birds of Australia*). An increase of 22 birds of this group recorded here during a period of only 32 years!

Maps are included for all species, which are most helpful in depicting in one colour the breeding range and in another the places where they usually spend their "winter" months. In a comprehensive bibliography (pp. 401-407) it is surprising that D.L. Serventy's "A guide to the field identification of the waders (*Emu* 38: 65-76) and the Bird Observers Club publication *Field Guide to the Waders*, which appeared in 1952 and was fully revised and printed again in 1960, 1965, 1967, 1970 and 1974, were not included. Australian field ornithologists may regard both as the basis for most subsequent research in that continent.

In every way this book is an excellent publication, clearly and profusely produced in both text-matter and illustration, and a "must" for all wader enthusiasts.

*Arnold McGill*

Fair Isle's "Garden" Birds. by John Holloway. The Shetland Times, Lerwick, Scotland, 1984. 159 pages; 60 colour plates; 22 black and white drawings. 18.00 pounds Sterling.

Thanks to the efforts of some dedicated individuals under the guidance of the RAOU, bird observatories are now making a valuable contribution to the ornithological scene in Australia. While here they are operating more as field study centres, many observatories overseas concentrate mainly on observing and recording aspects of migration and are often geographically located accordingly, e.g. on remote islands, promontories or coastal flyways.

Such is the scene in the U.K. where observatories have been making important contributions to migrational knowledge since the first began operations on Skokholm in 1933. Over the years one such observatory has become legendary for the regularity of occurrence of rare species and its ability to consistently produce the "megaticks". Its remoteness, midway between the Orkneys and the Shetlands, and the fact that it supports a small but thriving population adds to its attraction.

John Holloway's first visit to Fair Isle was in 1966; his tenth visit was in 1977 when he returned with his wife and two children to take over the island shop. Obviously a twitcher and lister from way back, he set out to keep a garden list, which by 1983 had reached 177 species including those seen from and flying over. Not a bad effort considering the recording area comprised an acre or two of fairly barren country, stone walls, a few fences and hardly a tree in sight. Quite incredible when you consider that the list includes the likes of Red Kite, Bluethroat, Rustic Bunting, Buff-breasted Sandpiper, Hoopoe, Olive-backed Pipit, Gyrfalcon, etc.

The main body of the book, some 76 pages, comprises a personal diary recording the details of each new addition, text on the left and colour illustrations of selected species on the right. The latter, taken from field sketches built up over the author's visits are the strength and charm of the book since the written matter, while interesting, is fairly lightweight stuff.

Part 2, consisting of 48 pages in similar format, covers a selection of 31 rarer species seen by the author elsewhere on the island. These include some outstanding rarities such as Red-flanked Bluetail, Pechora Pipit, Cretzschmar's Bunting, Yellow-browed Bunting and Pallas's Grasshopper Warbler. Some of these species are seldom portrayed and this section could have been enhanced as an aid to identification by a more detailed accompanying text.

Part 3, covering 20 pages is a series of ornithological recollections as related by each of the Fair Isle households. These are entertaining with some amusing notes on birdwatcher watching but they emphasise again that on Fair Isle almost anything can turn up like "one morning in 1975 we saw a Tennessee Warbler on our fence". A sketch of each croft accompanies these accounts which are followed by a map that would have been better located at the beginning.

The bird illustrations vary from single half page portraits to a page devoted to several sketches of one species; e.g. the Bluetail includes a portrait plus smaller sketches showing front, rear and flight views and a head study. At the other end of the scale we get a thumb-nail of a Buff-breasted Sandpiper, not much more than a smudge on the page, yet unmistakably a Buff-breasted. In summary they are just delightful, both artistically and ornithologically, and colour and jizz are accurate at least for the species I have seen. With a few exceptions, which are slightly fuzzy – Reed Bunting, Wryneck, and Stonechat in my copy – reproduction is excellent.

There is no doubt that this book will have added attraction to those who have birded in Europe. It is not cheap, perhaps as a result of a smallish print-run, but for the plates alone it will be a joy to have on any bird book-shelf.

*Alan E.F. Rogers*



## 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 typewritten 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 1975" 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 6.30 a.m. and 6.30 p.m. respectively.
10. Mr, Mrs, Dr are not 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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