AVIAN PREDATORS OF SEA TURTLES IN SOUTH-EAST QUEENSLAND ROOKERIES

C. J. LIMPUS

INTRODUCTION

Sea turtle hatchlings normally emerge at night from their nests to enter the sea. Bustard (1967) and Hendrickson (1958) suggest this is a behavioural adaptation to avoid the lethal hot surface sands of the daylight hours. Indeed, I have seen hatchlings of the loggerhead turtle Caretta caretta which have died while attempting to cross to the sea during the heat of the day. However, this may be only a partial explanation for nocturnal emergence being an advantage since there are several hours of daylight each morning and afternoon during which turtle hatchlings are not adversely affected by the surface sand temperatures. Yet relatively few hatchlings leave the nests to cross the beaches in these cooler daylight hours. The second advantage suggested by Hendrickson (1958) is that nocturnal emergence would eliminate diurnal predation. Birds are often listed among the important diurnal predators (Bustard 1972; Caldwell 1959; Carr 1967). During a continuing study of sea turtles in south-east Queensland, begun in 1968 and based principally at the Mon Repos rookery on the coast adjacent to Bundaberg (approximately 25°S), it has been found that bird predation of sea turtles was negligible in the mainland rookeries.

MON REPOS SEA TURTLE ROOKERY

Mon Repos is an exposed surf beach, 1.3km long bounded by basalt boulders at either end and backed by sand dunes rising two to seven metres high. The dunes were cleared of their original vegetation well before 1946 when I first began visiting the area. About one kilometre inland from the southern end of the beach there are grassy open forests dominated by mature
**RESULTS**

The following birds have been observed preying on the hatchlings by day: Silver Gull *Larus novaehollandiae*, Red-backed Sea Eagle *Haliaetus indus*, Whistling Eagle *H. sphenurus*, Nankeen Kestrel *Falco cenchroides*, and Australian Crow *Corvus orru*. Silver Gulls and Red-backed Sea Eagles account for most of the predation.

Most mornings small flocks of Silver Gulls, usually two to three birds, flew back and forth along the surf edge. When they encountered loggerhead hatchlings crossing the beach, each would land, run to a hatchling and after an initial pecking grasp it in the beak and manipulate it with accompanied shaking and knocking against the sand until it was swallowed whole. The gulls flew short distances along the beach carrying the hatchlings if approached by other gulls. By the time this feeding
was completed, most of the remaining hatchlings had crossed the beach into the surf and I did not witness a single attempt by a gull to take a hatching in the surf. I have previously suggested (Limpus 1971a) that the larger size of the flatback hatchlings prevented Silver Gulls eating them since Silver Gulls made no attempt to peck at flatback hatchlings under circumstances similar to the above, (the mean hatching weights are: flatbacks 43.6g, greens 25.7g, loggerheads 19.4g). Unfortunately, no other bird species has been observed in an encounter with flatbacks hatchlings but raptors with their different method of feeding should be able to prey on them.

Small flocks of crows flew along the dunes just after dawn each morning. However, the one recorded predation by crows occurred when a perched crow flew some 50m to loggerhead hatchlings crossing the beach to pick up one in its beak and returned to a Casuarina. It was immediately joined by two other crows which in turn flew to the beach to take a hatching each. As they returned to the Casuarina, another flock of crows approached and the first group retreated inland carrying their prey. I did not see them eat the hatchlings.

Crows and Silver Gulls scavenged among the broken eggs dug from incubating nests during the previous night by foxes or nesting turtles. Although eggs are often left exposed in the egg chambers by foxes, I have not seen gulls or crows prey on the undamaged eggs. This scavenging was a daily event during the major part of the hatching season.

The Red-backed Sea Eagle was rarely observed scavenging around fox-dug nests. One to three were present on Mon Repos on most days. When they were not soaring over the dunes they were usually perched on vantage points along the beach. On two occasions one was seen to fly from its vantage point to take a hatching loggerhead from the beach. It returned to the vantage point with the hatching in its talons and there proceeded to tear at it with its beak. Often remains of hatching loggerhead turtles were found among crab fragments scattered below the favoured vantage points.

On one occasion only have I witnessed what could be described as intense predation of hatchling turtles by birds at Mon Repos. Just on sunrise a loggerhead emergence had occurred at a site from which the hatchlings headed inland instead of in the typical seaward direction. Within minutes two Whistling Eagles, two Nankeen Kestrels and a Red-backed Sea Eagle were over them preparing to feed. From 500m I saw them gathering and immediately approached. On arriving at the nest site, I found two Nankeen Kestrels and a Whistling Eagle on the ground each clutching a loggerhead hatching, and the Red-backed Sea Eagle tearing at a partly dismembered hatching on top of a post. I stopped any further predation by gathering some 80 hatchlings.
from the grassy area behind the dune, and releasing them in the surf. When hatchlings are misdirected inland by day, they are either killed by the rising temperatures or apparently taken by birds. Fortunately this non ocean-finding behaviour by turtle hatchlings at Mon Repos is not common (Limpus, 1971b). Apart from this one occasion, I have no evidence of more than a few individuals being taken by birds from any one emerged brood. My observations of what amounts to scores of daytime emergences in the five years indicate that in the majority of cases the entire hatchling group crossed the beach to the surf without any predation occurring. I estimate that, for nests at Mon Repos from which diurnal emergence occurs, bird predation accounts for less than 1-2% of the loggerhead hatchlings involved.

What proportion of the turtles are involved in diurnal emergence? Bustard (1967) working with green turtles in a hatchery at Heron Is. had 3% diurnal emergence of hatchlings. At Mon Repos, no more than 5% (3 out of 66) of flatback nests observed for time of emergence had the main group of hatchlings emerge in daylight hours. At Mon Repos, at the height of the emergence when 20-30 loggerhead nests per night were involved, diurnal emergence occurred at the rate of about one nest every two days, that is diurnal emergence occurs from approximately 2% of loggerhead nests. The similarity of these values for different species obtained by different methods suggests that an estimate of 2-5% emergence of hatchlings during daylight hours is close to the actual value. Combining the values thus obtained, it is apparent that at Mon Repos bird predation can account for less than 0.1% of all hatchling loggerhead turtles produced annually. Bird predation of the smaller numbers of flatback hatchlings is probably zero.

DISCUSSION

To date no nocturnal birds have been found preying on turtle hatchlings even though Tawny Frogmouth Podargus strigoides, Boobook Owl Ninox novaeseelandiae, and Barking Owl N. conspicua have been sighted in the naturally vegetated dunes of the turtle rookery at Wreck Rock, 40km north of Mon Repos. Also no birds have been found to prey on turtle eggs. Carr (1967) reports buzzards digging into nests presumably as the eggs are laid on Costa Rican beaches.

Birds and less frequently crabs ( Ocypoda ceratophthalma) were the only diurnal predators of hatchling turtles observed on the mainland turtle rookeries of south-east Queensland. At Mon Repos, the predation by birds of turtle hatchlings (less than 0.1%) is insignificant when compared with the destruction of incubating nests. The combined action of erosion and flooding by windswept seas, foxes and nesting turtles can destroy approximately 30% of nests in some seasons.
My less frequent observations of the rookeries at Wreck Rock (loggerheads) and Curtis Is. (flatbacks) failed to reveal any bird predation. Very low predation by birds would seem typical of mainland turtle rookeries in south-east Queensland. Hendrickson (1958) in the course of an extensive ecological survey of green turtles in Sarawak did not include birds in his list of predators. During a similar study of the South African loggerheads, Hughes et al. (1967) recorded only one instance of bird predation in the first three years of their study; this was by a Yellow-tailed Kite Milvus aegyptius. These instances of very low predation seem to contrast with the higher level of bird predation on Heron Is. and other cays of the Great Barrier Reef supporting turtle rookeries (greens and loggerheads) where Bustard (1972) and Moorehouse (1933) indicate that most hatchlings crossing the beach by day are taken by birds. Clare (1971) even describes a scene of gulls preying on green hatchlings under a photographer's floodlight at night on Heron Is. The low level of predation by birds at the Mon Repos rookery is not just due to lack of potential predators. The bird species identified during the 1972/73 turtle nesting season within 400m of the beach and dunes are listed in the appendix. While there are no sea bird rookeries within many kilometres of Mon Repos, there are hundreds of gulls, large terns and Australian Gannets Morus serrator which follow the prawning boats often within a kilometre of Mon Repos beach. These birds often roost by night on the rocky area adjacent to the beach. Bustard (1972) implicated Silver Gull, Reef Heron Egretta sacra, Crested TernSterna bergii and White-breasted Sea Eagle Haliaeetus leucogaster in the death of hatchlings in the Capricorn Group, and Worrell (1963) includes Jabiru Xenorhynchos asiaticus in his list (locality not specified). Osprey Pandion haliaetus, Caspian Tern Hydroprogne caspia, cormorants, Laughing Kookaburra Dacelo gigas and Pied Butcherbird Cracticus nigrogularis all seem potential hatchling predators as well and, along with Jabiru and Crested Tern, occur on the Mon Repos rookery (see Appendix).

Diurnal predation, particularly by birds, seems to be unimportant at Mon Repos and other turtle rookeries of mainland south-east Queensland. It is exerting little selective pressure against emergence during the apparently suitable cooler morning and evening hours of the day. If this is the case then, there is need to reexamine the reasons suggested for nocturnal emergence and also the mechanisms by which such behaviour may be controlled.

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APPENDIX

Birds identified within 400m of the beach and foredune of the Mon Repos turtle rookery during the 1972/73 turtle breeding season. Names follow CSIRO, 1969 (A list of Australian Bird Names. Divn of Wildlife Res. Tech. Paper No. 20). A number of small wading birds were not identified.

P = identified predator of turtles at Mon Repos.
P? = potential predators.
B = breeding observed in this area in recent years.
r = sighted only once during the season.

Short-tailed Shearwater, Puffinus tenuirostris
Australian Pelican, Pelecanus conspicillatus
Australian Gannet, Morus serrator
Little Black Cormorant, Phalacrocorax sulcirostris
Little Pied Cormorant, P. melanoleucus
Little Grebe, Podiceps novaehollandiae
White-faced Heron, Ardea novaehollandiae
White Egret, Egretta alba
Little Egret, E. garzetta
Nankeen Night Heron, Nycticorax caledonicus
Jabiru, Xenorhynchus asiaticus
White Ibis, Threskiornis molucca
Royal Spoonbill, Platalea regia
Black Swan, Cygnus atratus
Black Duck, Anas superciliosa
Red-backed Sea Eagle, Haliaeetus indus
Whistling Eagle, Haliastur sphenurus
Osprey, Pandion haliaetus
Nankeen Kestrel, Falco cenchroides
Spur-winged Plover, Vanellus novaehollandiae
Red-capped Dotterel, Charadrius alexandrinus
Black-fronted Dotterel, C. melanops
Eastern Curlew, Numenius madagascariensis
Pectoral Sandpiper, Calidris melanotos
White-headed Stilt, Himantopus himantopus
Silver Gull, Larus novaehollandiae
White-winged Black Tern, Chlidonias leucoptera
Caspian Tern, Hydroprogne caspia
Crested Tern, Sterna bergii
Peaceful Dove, Geopelia striata
Crested Pigeon, Ocyphaps lophotes
Rainbow Lorikeet, Trichoglossus haematodus
Scaly-breasted Lorikeet, T. chlorolepidotus
Cockatiel, Nymphicus hollandicus
Pale-headed Rosella, Platycercus adscitus
Pheasant Coucal, Centropus phasianinus
Laughing Kookaburra, Dacelo gigas
Sacred Kingfisher, Halcyon sanata
Rainbow Bee-eater, Merops ornatus
Dollar-bird, Euryzonus orientalis
Welcome Swallow, Hirundo neoxena
Tree-martin, Petrochelidon nigricans
Australian Pipit, Anthus novaeseelandiae
Black-faced Cuckoo-shrike, Coracina novaehollandiae
White-throated Warbler, Gerygone olivacea
Grey Fantail, Rhipidura fuliginosa
Willie Wagtail, R. leucophrys
Mistletoe Bird, Dicaeum hirundinaceum
Black-headed Pardalote, Pardalotus melanocephalus
White-throated Honeyeater, Melithreptus alboflagraris
Noisy Miner, Manorina melanocephala
Banded Finch, Poephila bichenovii
Magpie Lark, Grallina cyanoleuca
Pied Butcher-bird, Cracticus nigrogularis
Black-backed Magpie, Gymnorhina tibicen
Australian Crow, Corvus corvus
SPECIMEN RECORDS OF THE BLACK-BELLIED STORM-PETREL
FROM SOUTH-EAST QUEENSLAND

GREG ROBERTS

On 22 July, 1973, Chris Corben, Anita Smyth and myself were combing the ocean beach of North Stradbroke Island, approximately 12 kilometres south of Point Lookout, for washed-up seabirds. I picked up a storm-petrel (Hydrobatidae) from the debris along the high-tide line. Our first reaction to the black upperparts and white rump was that the bird was a Wilson's Storm-petrel Oceanites oceanicus. However, the pale upperwing markings, diagnostic of this species, were absent.

An inspection of the underparts left no doubt that it was a Black-bellied Storm-petrel, Fregata tropica. The tarsus, culmen and middle toe plus claw measurements are significantly larger than those for the closely-related White-bellied Storm-petrel, F. grallaria.

On the dorsal side, the head, back, wings and tail were sooty-black except the upper tail coverts which were black and white. Underparts are white except for sooty black throat, posterior 3/4 of tail and 8 mm wide weak line running down median line of the abdomen. The "sooty black" feathers on the belly each had approximately 3/4 of their length white with only the terminal portion black. Underwings were mainly sooty black with off-white to greyish-white greater and primary covert feathers.

The specimen, QM014391, was donated to the Queensland Museum and measurements in millimetres are as follows:- wing 158, tail 76, tarsus 40.5, middle toe and claw 28.5 and culmen 15.4.

The same three people plus Paul Grimshaw found another specimen approximately nine kilometres south of Point Lookout on 8 September. This specimen, which lacked its head and was generally in a far worse condition, was identified from the measurements of its tarsus (41.0 mm) and middle toe and claw (27.0 mm).

There seems to be some confusion as to whether this species should be included in checklists of Queensland birds. Lavery (1969) includes it, apparently on the basis of reported sightings at sea. Elks (1966) and Storr (1973) fail to mention it. Slater (1970) does not include Queensland in his distribution map for the species. Serventy et al., (1971) state that there are no specimen records from the Australian mainland. There
are no published records of this species from Queensland.

The specimen collected on 22 July was probably a casualty from a severe storm two weeks prior to our discovery. Other beach washed specimens found that day were:

2 Grey-headed Albatross Diomedea chryostoma (juveniles)
1 Grey-mantled Sooty Albatross Phoebetria palpebrata
20 Dove Prion Pachyptila desolata
7 Fairy Prion P. turtur
1 Fluttering Shearwater Puffinus gavia
1 Little Shearwater P. assimilis
4 White-tailed Tropic-bird Phaethon lepturus (juvenile)
1 Common Noddy Anous stolidus.

All of the above specimens except the two Grey-headed Albatross are in the Queensland Museum.

I gratefully acknowledge the assistance of Mr Don Vernon of the Queensland Museum.

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MR G. ROBERTS, 65 Enoggera Terrace, Red Hill, Queensland 4059.
A SIGHT RECORD OF THE LONG-TAILED SKUA IN QUEENSLAND

CHRIS CORBEN

At approximately 0830 on 1 April 1973, Greg Roberts and I saw a Long-tailed Skua *Stercorarius longicaudus* from Camel Rock, Stradbroke Island (27°26'S, 153°33'E). Strong southerly winds were blowing, and occasional rain squalls passed. The skua was flying about a metre above the water in a roughly south south-westerly direction and eventually disappeared into the distance. Illumination was quite good at first, but as the bird moved to the south, it became silhouetted.

The long central tail-streamers were seen well enough for us to appreciate their great length. However, because of the distance involved and the dark appearance of the water, they were not visible all the time. The bird immediately aroused interest by its shape, flight and colouration. The slender body and narrow wings gave the impression of a rather long-winged bird, creating a very different effect to that produced by an Arctic Skua *Stercorarius parasiticus* or Pomarine Skua *S. pomarinus*. The flight, when compared with the other skuas, appeared quite relaxed and tern-like, despite the bird's flying more or less into the wind. The under-surfaces of the wings and tail appeared uniformly dark brown, with no signs of pale patches at the bases of the primaries. The remainder of the underparts was white. The upperparts appeared uniformly brown, with a blackish cap which was sharply demarcated from the white underparts, in the manner of a tern.

Apart from a possible sighting in Sydney Harbour about 1930 (Iredale 1940), there are two previous sight records from Australia. Carter (1966) records an adult in Port Phillip Bay, Victoria on 4 April 1965, and Cox (1973) reports the sighting of another adult at Robe, South Australia on 12 April 1971. It is interesting to note that both these sightings, and the present one, have been made in early April, in wet, windy conditions.

As mentioned by Cox (1973), adult Long-tailed Skuas are quite readily identified by the slender build, narrow wings, tern-like flight and black cap sharply defined from the white underparts. If the projecting tail feathers are present and not broken or badly worn, their great length makes identification easy. Immatures would be more difficult to distinguish, but as Carter (1966) points out, the suspicions of anyone familiar with the Arctic Skua would be aroused by the Long-tailed Skua's
shape and flight.

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MR C. CORBEN, 65 Enoggera Terrace, Red Hill, Queensland 4059.

A SIGHT RECORD OF THE WHITE TERN IN SOUTHEAST QUEENSLAND

A. GREENSMITH

During the weekend of 19-20 May 1973, Miss H.V. Belso and myself were watching for seabirds from Point Lookout, the north-eastern point of Stradbroke Island. The wind was moderate to fresh from the south-east on both days with occasional rain showers; the weather clearing on the afternoon of the second day. Small numbers of shearwaters, terns and Australian Gannets *Morus serrator* were about but no marked passage of species was observed.

At 14:25 on 20 May I sighted a White Tern *Gygis alba* flying in a north-easterly direction about 200 metres offshore. We both watched the bird through binoculars as it flew past the point about 150 metres from us and about six metres above the water. It carried on in a north-easterly direction, gradually loosing height until it eventually started dipping to the surface of the water in a manner characteristic of the Bridled Tern *Sterna anaetheta* and the noddies *Anous* spp. After feeding for a short period the bird circled high in the air and was last seen heading in an east south-east direction.

The Queensland Museum recently obtained an immature specimen of the White Tern which was the first record of this species for Queensland (Vernon, 1973). That specimen was found alive, although in a weak condition, at Meeandah, near the mouth of the Brisbane River and donated to the Queensland Museum by Mr J. Liddy on 30 April, 1973. In the south-west Pacific Ocean, the
nearest breeding colonies of this species to the Australian mainland are on Norfolk Island, ca 1500 km, and on Kermadec Islands, ca 2700 km (Serventy et al., 1971), although McKean and Hindwood (1965) suggest it may breed on Lord Howe Island (ca 480 km) since it regularly migrates there in summer.

REFERENCES


MR A. GREENSMITH, 86 Jean Street, Woodridge, Queensland 4114.

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SOME BEACH-WASHED SHEARWATERS FROM SOUTHEAST QUEENSLAND

J.S. ROBERTSON

SOOTY SHEARWATER PUFFINUS GRISEUS

The details of two Queensland beach-washed specimens of the Sooty Shearwater are here put on record as it has been noticed that this species is not included in the recent 'List of Queensland Birds' (Storr 1973). Similarly, Serventy et al., (1971) omit Queensland though mentioning that "Derelicts have been collected from Victorian and New South Wales beaches, and once in South Australia". However, Slater (1970) includes in his distribution map the south-eastern fringe of the Queensland coastline where these two derelicts were collected.

The first of this pair of Queensland wash-ups was picked up at Tugun on the Gold Coast on 20 October 1956 by my friend, F.M. Hamilton, who has kindly made his field notes available for inclusion in this note. The second specimen was found by myself at Narrow Neck, also on the Gold Coast, on 7 November 1956. This latter one was complete and fresh. It was made into a study skin and retained until 1963 when, unfortunately, it was destroyed during a move to a new home site.

The Tugun bird is mentioned briefly in the RAOU, Queensland
Branch Notes, of December 1956. When picked up this bird was headless. The following details and measurements in millimetres were recorded from it at the time: Wing 297, tail 96, tarsus 59, wingspan 1000. The legs projected 20 mm beyond the tail. The underwing coverts were almost white. Three of these feathers are still glued to the original record of details.

The field records of the Narrow Neck specimen with measurements in millimetres are: Culmen 44, depth at centre 12, wing 296, tail 87, tarsus 55, length 472. With the bird lying on its back, both the toes and wingtips extended beyond the tail; the toes by 15, and the wings by 25 mm. (It will be noted that the culmen/tarsus ratio is 0.8). Legs dark on their outer face, purply black on their inner face; webs and inner toes grey with slight purple tinge. Upper plumage dark almost black feather tips but inner two-thirds dark grey, the under aspect of the feathers is lighter; upper wing almost black as are the wing coverts; tail black and rounded. Under surface generally dark grey; chin lighter; wing from carpel joint to edge of primary coverts white, this white extending inwards to merge with the dark grey at next joint. A thicker heavier bird than is P. temuirostris.

SHORT-TAILED SHEARWATER PUFFINUS TENUIROSTRIS

Storr (1973) states of the Short-tailed Shearwater "Northward migration in autumn evidently well to east of Queensland Seas; only one record, a derelict at Burleigh Heads in May."

Without disagreeing with this statement it may be of interest to record another similar derelict of this species. On 29 April 1973 on the Ocean beach of North Stradbroke Island a live sea bird in weak condition was secured by George Benussi. He sent it to me but it died that night. It proved to be a Short-tailed Shearwater.

Before sending the specimen on to the Queensland Museum, the following particulars were recorded: Length 410 mm; wingspan 865; culmen 32; wing 241; tail 86; tarsus 49; middle toe and claw 62; claw 9; weight 225 g. The feet extended 10 mm beyond tail; the iris brown. (The culmen/tarsus ratio is thus 0.65).

The Queensland Museum later found the bird to be a male with testes small and the skull fully ossified.

REFERENCES

BIRD OBSERVATIONS AT THE PLANTATION CREEK ESTUARY, AYR, NORTH QUEENSLAND

A. EWART

Plantation Creek emerges at the coast approximately 17 km north of the main Burdekin River Estuary (in fact, nearly midway between the Burdekin Estuary and Cape Bowling Green). It is a rather typical tidal estuary, bordered on the seaward side by an extensive sandspit and bar, and bordered along the inland side by extensive mangrove swamps. Low tides result in the exposure of widespread mudflats and sandflats. The following notes are based on two periods of observation: 18 December 1971 to 7 January 1972 and 19 December 1972 to 8 January 1973. On each visit exactly the same area was covered. This was a 4 km length of the estuary, adjacent sandspit, and immediately adjacent mangroves which were regularly observed and estimates of the numbers of waders and some seabirds were made. With the exception of the Great Knots Calidris tenuirostris, wader counts were made during high tide periods when these birds congregate into well defined flocks.

The most notable feature was the increase in both species and numbers during the 1972/73 visit. Names follow CSIRO, 1969 (An index of Australian Bird Names. Divn of Wildlife Res. Tech. Paper No. 20).

Australian Pelican *Pelecanus conspicillatus*

1971/72, 11 birds 1972/73, 31 birds

Lesser Frigate-bird *Fregata ariel*

1971/72, 1 bird 1972/73, nil
Pied Oystercatcher *Haematopus ostralegus*

1971/72, 2 pairs 1972/73, 2 pairs

Red-capped Dotterel *Charadrius alexandrinus*

1971/72, very common 1972/73, very common

These were mainly on open mud and sandflats.

Mongolian Sand-dotterel *C. mongolus*

1971/72, very common 1972/73, very common

One flock of 220, apparently of both species, was seen accumulated at high tide on the sand spit (5/1/73). They forage on open mud and sandflats.

Large Sand-dotterel *C. leschenaultii*

1971/72, very common 1972/73, very common

Eastern Golden Plover *Pluvialis dominica*

1971/72, 6 birds 1972/73, 14 birds

The birds feed and move in one flock. At high tide, they sit in vegetation in sand dunes. They forage on open mudflats, sandflats, and also in mangroves.

Grey Plover *Pluvialis squatarola*

1971/72, 2 birds 1972/73, 3 birds

They were seen on open sandflats in a flock of Curlew Sandpipers.

Turnstone *Arenaria interpres*

1971/72, 1 bird 1972/73, nil

Whimbrel *Numenius phaeopus*

1971/72, at least 20 birds 1972/73, at least 20

They show a strong preference for feeding and resting within mangrove areas.

Eastern Curlew *N. madagascariensis*

1971/72, 35 birds 1972/73, 50 birds

They show a preference for foraging on open sandflats and accumulate in a single flock at high tide in sheltered embayments.

Greenshank *Tringa nebularia*

1971/72, 2 birds 1972/73, 6 birds

These birds feed as individuals, keeping mainly to the water's edge, generally covering a considerable length of shoreline by rapid continuous movement. They accumulate together in a flock at high tides.

Tattler *Tringa sp.*

1971/72, 10 birds 1972/73, ca 10 birds

Tattlers occur on open mudflats, sandflats, and in mangroves during feeding periods at low tide. They feed individually. One was identified positively as a Grey-tailed tattler *T. brevipes*.

Terek Sandpiper *Xenus cinereus*

1971/72, 20 birds 1972/73, ca 20 birds

They forage on open mud and sandflats and in mangroves. The
following behaviour was noticed when the birds were foraging on sandflats: When another wader (same or different species) approached too closely to the area in which feeding occurred the bird would run to and crouch down in a nearby shallow depression in the sand, with its chest, throat, and bill almost touching the surface of the sand. The bird would then either rapidly charge at the other approaching bird, or in some cases just run away.

Knot *Calidris canutus*

1971/72, nil 1972/73, 2 birds
Two identifications of Knot were made on the basis of rump patterns in flight. These birds were in the flocks of Great Knot.

Great Knot *C. tenuirostris*

1971/72, nil 1972/73, see comments
Numbers were estimated on every day and ranged from 300 to 1900 birds (average 1058, n = 19). The birds forage on open mudflats in very tight flocks and are extremely difficult to approach. When alarmed, the whole flock would rise simultaneously and fly around in a tight group before settling again. At high tide, the birds would rest in several flocks, often mixed with Bar-tailed Godwits.

Sharptailed Sandpiper *C. acuminata*

1971/72, nil 1972/73, 30 birds
They feed and rest in flocks, usually on open mud and sandflats.

Red-necked Stint *C. ruficollis*

1971/72, common 1972/73, common
Usually seen on sandflats, especially exposed beaches.

Curlew Sandpiper *C. ferruginea*

1971/72, 2 birds 1972/73, 21 birds
They were seen feeding on open mudflats and sandflats only. They flock at high tide.

Sanderling *C. alba*

1971/72, nil 1972/73, 2 birds
Sanderlings were seen only on sandflats exposed to the open sea.

Black-tailed Godwit *Limosa limosa*

1971/72, nil 1972/73, 25 birds
These were seen foraging on both open sandflats and in mangroves. They occasionally occurred in a flock of Bar-tailed Godwits at high tide.

Bar-tailed Godwit *L. lapponica*

1971/72, 82 birds 1972/73, 120 birds
This species forages mainly on open mudflats and sandflats and less often in mangroves. They accumulate into a single flock at high tide in sheltered bays on the water edge.
Beach Stone Curlew *Esacus magnirostris*  
1971/72, 1 bird  
1972/73, 1 bird  
It was observed on the sand spit only.

Caspian Tern *Hydroprogne caspia*  
1971/72, 6 birds  
1972/73, 3 birds

Gull-billed Tern *Sterna nilotica*  
1971/72, 10 birds  
1972/73, 20 birds

Common Tern *S. hirundo*  
1971/72, ca 100 birds  
1972/73, 75 birds

Little Tern *S. albifrons*  
1971/72, 200 birds  
1972/73, ca 200 birds  
They were mostly immature birds.

Crested Tern *S. bergii*  
1971/72, 19 birds  
1972/73, 30 birds

Lesser Crested Tern *S. bengalensis*  
1971/72, 6 birds  
1972/73, 2 birds

Other resident birds common or regularly seen in the estuary and associated mangroves include:

- Darter *Anhinga rufa*
- Pied Cormorant *Phalacrocorax varius*
- Little Pied Cormorant *P. melanoleucos*
- Mangrove Heron *Butorides striatus*
- White Egret *Egretta alba*
- Little Egret *E. garzetta*
- Jabiru *Xenorrhynchus asiaticus*
- White Ibis *Threskiornis molucca*
- Straw-necked Ibis *T. spinicollis*
- Royal Spoonbill *Platelia regia*
- Red-backed Sea Eagle *Haliastur indus*
- Whistling Eagle *H. sphenurus*
- Osprey *Pandion haliaetus*
- Masked Plover *Vanellus miles*
- Silver Gull *Larus novaehollandiae*
- Peaceful Dove *Geopelia striata*
- Galah *Cacatua roseicapilla* (one seen on 31/12/71)
- Blue-winged Kookaburra *Dacelo leachi*
- Mangrove Kingfisher *Halcyon chloris*
- Rainbow Bee-eater *Merops ornatus* (occasional)
- Dollar-bird *Eurystomus orientalis*
- Australian Pipit *Anthus novaeseelandiae*

Other birds seen after heavy rain (24/12/71 and 7/1/72) which formed widespread fresh and brackish pools behind mangrove swamp areas include - Magpie Goose *Anseranas semipalmata*; Grass Whistling Duck *Dendrocygna eytonii*; Green Pygmy Goose *Nettapus pulchellus* (four seen on 14/1/71); Brolga *Grus rubicunda*, and Black-fronted Dotterel *Charadrius melanops*.

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During the winter of 1972, I frequently saw a flock of egret at a swamp near Manly Road, Tingalpa (a south-eastern suburb of Brisbane) as I drove home from work in the late afternoon. On some days the flock had just taken flight from the swamp and was flying north-west. Later in the year (October) the birds attained their breeding plumage and were identified as Cattle Egret *Ardeola ibis*.

During November and December flocks were seen feeding near livestock between Wynnum and Morningside. At this stage flocks were also seen in the early evening flying north across Wynnum Road near Murarrie. On 8 January 1973, birds were seen feeding near cattle at Hemmant and at dusk they moved off in a westerly direction.

I attempted to find the rookery by plotting the various flight lines on a map. The area of Doboy was indicated as worth investigating. The next day I located the rookery in a swamp 90 metres south-east of Doboy Railway Station (153°6'E, 27°27'S). The swamp covered an area of 1.5 hectares with a depth of water of one metre. The main trees were *Melaleuca quinquenervia* and *Casuarina glauca*, the former being dominant with some specimens reaching a height of ten metres.

My next visit to the swamp on 14 January revealed that together with the Cattle Egret there were also White Egret *Egretta alba*, Plumed Egret *Egretta intermedia* and Glossy Ibis *Plegadis falcinellus*. All four species were nesting. I visited the swamp again on 29 January with Barry and Joanna Morgan and a second Glossy Ibis nest was located. Cattle Egret, White Egret and Plumed Egret nested in the centre of the swamp at heights of one to four metres, while the Glossy Ibis nested outside the northern perimeter of the egrets nesting area, at a height of four metres. Most of the nests were built in *Melaleuca*.

Nesting appeared to be almost completed and no attempt was made to estimate the numbers which had used the swamp for breeding during the season.

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