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## AVIAN PREDATORS OF SEA TURTLES IN SOUTH-EAST QUEENSLAND ROOKERIES

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### 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

*Melaleuca* sp. and *Eucalyptus tessellaris*. Along the rocky coastline is a low open forest dominated by *Pandanus* sp. Three small streams, that drain the immediate hinterland of the dunes, join to form several hundred hectares of intertidal mud flats that drain into the sea across the southern end of the beach. One of these watercourses lies parallel to and some 400m behind the seaward dunes. In recent years there has been planting and subsequent dispersal of *Casuarina equisetifolia* so that some 600m of the otherwise grass covered dunes are now covered by *Casuarina* up to approximately 10m high. All turtle nesting occurs on top or in front of the seaward dune where the vegetation is almost entirely scattered runners of the grass *Spinifex hirsutus* and convolvulus *Ipomoea pes-caprae*.

Mon Repos is the nesting place of 300-400 loggerhead turtles, 3-10 flatback turtles *Chelonia depressa*, and 0-1 green turtles *Chelonia mydas* annually. Nesting usually begins in late October and ends in early March. The first clutches hatch in the last week in December and hatching usually continues until late April. Each turtle lays several times in each season, at approximately fortnightly intervals, loggerheads laying up to five times and flatbacks up to four times. Clutch sizes vary from season to season, but typical clutches have been - loggerheads: 125 eggs (with a range of 58 to 189); flatbacks: 50 (7 to 75); and greens: 114 (82 to 154). Maximum numbers of nestings per night occur in late December with peaks of 30 to 50 turtles laying each night. Most of the observations have been made during a period of six continuous weeks, from mid December to late January, and weekends throughout the rest of the season, in each of the past five breeding seasons. My surveys of the Queensland coast to as far north as Cairns have shown that Mon Repos, with more than 1,000 nests annually being laid in this small strip of dunes, has the greatest density of nesting per unit length of beach and is the most significant loggerhead rookery on the mainland of eastern Australia.

#### RESULTS

The following birds have been observed preying on the hatchlings by day: Silver Gull *Larus novaehollandiae*, Red-backed Sea Eagle *Haliastur indus*, Whistling Eagle *H. sphenurus*, Nankeen Kestrel *Falco oenochroides*, 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 hatchling 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 hatchling 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 hatchling 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 hatchling loggerhead from the beach. It returned to the vantage point with the hatchling in its talons and there proceeded to tear at it with its beak. Often remains of hatchling 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 hatchling, and the Red-backed Sea Eagle tearing at a partly dismembered hatchling 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. connivens* 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 Tern *Sterna bergii* and White-breasted Sea Eagle *Haliaeetus leucogaster* in the death of hatchlings in the Capricorn Group, and Worrell (1963) includes Jabiru *Xenorhynchus asiaticus* in his list (locality not specified). Osprey *Pandion haliaetus*, Caspian Tern *Hydroprogne caspia*, cormorants, Laughing Kookaburra *Dacelo gigas* and Pied Butcherbird *Craicticus 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, <i>Puffinus tenuirostris</i>	r
Australian Pelican, <i>Pelecanus conspicillatus</i>	P?
Australian Gannet, <i>Morus serrator</i>	P?
Little Black Cormorant, <i>Phalacrocorax sulcirostris</i>	P?
Little Pied Cormorant, <i>P. melanoleucos</i>	P?
Little Grebe, <i>Podiceps novaehollandiae</i>	B
White-faced Heron, <i>Ardea novaehollandiae</i>	
White Egret, <i>Egretta alba</i>	
Little Egret, <i>E. garzetta</i>	
Nankeen Night Heron, <i>Nycticorax caledonicus</i>	r
Jabiru, <i>Xenorhynchus asiaticus</i>	r, P?
White Ibis, <i>Threskiornis molucca</i>	r
Royal Spoonbill, <i>Platalea regia</i>	
Black Swan, <i>Cygnus atratus</i>	B
Black Duck, <i>Anas superciliosa</i>	B
Red-backed Sea Eagle, <i>Haliaeetus indus</i>	P

Whistling Eagle, <i>Haliastur sphenurus</i>	P
Osprey, <i>Pandion haliaetus</i>	r, P?
Nankeen Kestrel, <i>Falco cenchroides</i>	P
Spur-winged Plover, <i>Vanellus novaehollandiae</i>	
Red-capped Dotterel, <i>Charadrius alexandrinus</i>	
Black-fronted Dotterel, <i>C. melanops</i>	
Eastern Curlew, <i>Numenius madagascariensis</i>	
Pectoral Sandpiper, <i>Calidris melanotos</i>	
White-headed Stilt, <i>Himantopus himantopus</i>	
Silver Gull, <i>Larus novaehollandiae</i>	
White-winged Black Tern, <i>Chlidonias leucoptera</i>	
Caspian Tern, <i>Hydroprogne caspia</i>	P?
Crested Tern, <i>Sterna bergii</i>	P?
Peaceful Dove, <i>Geopelia striata</i>	
Crested Pigeon, <i>Ocyphaps lophotes</i>	
Rainbow Lorikeet, <i>Trichoglossus haematodus</i>	
Scaly-breasted Lorikeet, <i>T. chlorolepidotus</i>	
Cockatiel, <i>Nymphicus hollandicus</i>	
Pale-headed Rosella, <i>Platycercus adscitus</i>	
Pheasant Coucal, <i>Centropus phasianinus</i>	
Laughing Kookaburra, <i>Dacelo gigas</i>	P?
Sacred Kingfisher, <i>Halcyon sanata</i>	
Rainbow Bee-eater, <i>Merops ornatus</i>	B
Dollar-bird, <i>Eurystomus orientalis</i>	
Welcome Swallow, <i>Hirundo neoxena</i>	
Tree-martin, <i>Petrochelidon nigricans</i>	
Australian Pipit, <i>Anthus novaeseelandiae</i>	
Black-faced Cuckoo-shrike, <i>Coracina novaehollandiae</i>	
White-throated Warbler, <i>Gerygone olivacea</i>	
Grey Fantail, <i>Rhipidura fuliginosa</i>	r
Willie Wagtail, <i>R. leucophrys</i>	
Mistletoe Bird, <i>Dicaeum hirundinaceum</i>	r
Black-headed Pardalote, <i>Pardalotus melanocephalus</i>	B
White-throated Honeyeater, <i>Melithreptus albugularis</i>	
Noisy Miner, <i>Manorina melanocephala</i>	
Banded Finch, <i>Poephila bichenovii</i>	
Magpie Lark, <i>Grallina cyanoleuca</i>	
Pied Butcher-bird, <i>Cracticus nigrogularis</i>	P?
Black-backed Magpie, <i>Gymnorhina tibicen</i>	
Australian Crow, <i>Corvus orru</i>	P

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## 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, *Fregatta 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 bill, legs and feet were black.

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 chrysostoma* (juveniles)
- 1 Grey-mantled Sooty Albatross *Phoebastria 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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## 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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#### 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 losing 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.

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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, purple 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 carpal 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. tenuirostris*.

#### 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.

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

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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 <i>Pelicanus conspicillatus</i>	
1971/72, 11 birds	1972/73, 31 birds
Lesser Frigate-bird <i>Fregata ariel</i>	
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* )  
Large Sand-dotterel *C. leschenaultii* )  
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.
- 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 <i>Esacus magnirostris</i>	
1971/72, 1 bird	1972/73, 1 bird
It was observed on the sand spit only.	
Caspian Tern <i>Hydroprogne caspia</i>	
1971/72, 6 birds	1972/73, 3 birds
Gull-billed Tern <i>Sterna nilotica</i>	
1971/72, 10 birds	1972/73, 20 birds
Common Tern <i>S. hirundo</i>	
1971/72, ca 100 birds	1972/73, 75 birds
Little Tern <i>S. albifrons</i>	
1971/72, 200 birds	1972/73, ca 200 birds
They were mostly immature birds.	
Crested Tern <i>S. bergii</i>	
1971/72, 19 birds	1972/73, 30 birds
Lesser Crested Tern <i>S. bengalensis</i>	
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. melanoleucus*  
 Mangrove Heron *Butorides striatus*  
 White Egret *Egretta alba*  
 Little Egret *E. garzetta*  
 Jabiru *Xenorhynchus asiaticus*  
 White Ibis *Threskiornis molucca*  
 Straw-necked Ibis *T. spinicollis*  
 Royal Spoonbill *Platylea regia*  
 Red-backed Sea Eagle *Haliaeetus 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 eytoni*, Green Pygmy Goose *Nettapus pulchellus* (four seen on 14/1/71), Brolga *Grus rubicunda*, and Black-fronted Dotterel *Charadrius melanops*.

## A CATTLE EGRET ROOKERY NEAR BRISBANE

D.J. WATSON

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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