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THE SUNBIRD

Volume 28 No. 2 June 1998

THE PREVALENCE OF SPENT LEAD SHOT IN WETLAND SEDIMENTS AND INGESTED BY WILD DUCKS IN COASTAL QUEENSLAND

G.S. BAXTER, C. MELZER, D. BYRNE, D. FIELDER and R. LOUTIT

ABSTRACT

Ingestion of spent lead shot by waterfowl, leading to lead poisoning, has been recorded in many parts of the world. In Australia most attention has been in the southern states where hunting is more popular than elsewhere, and the assumption has been that, except for a few places, the prevalence of lead poisoning is low. To test this assumption we collected digestive tracts of ducks from four localities and sediments from two wetlands in coastal Queensland where hunting occurs, but where there has been no suggestion that large numbers of birds may be exposed to the possibility of ingesting lead.

We found a high prevalence of lead shot in the gut and sediment samples, suggesting that large numbers of birds may be at risk of lead poisoning, and that the prevalence is greater than the State-prescribed threshold which would trigger a ban on the use of lead shot at some wetlands.

INTRODUCTION

Spent lead shot has been shown to cause death in waterfowl which ingest pellets (Pain 1992), but authors of previous local studies (e.g. Lavery 1971) have concluded that only a small number of birds were likely to be poisoned in Queensland. The number of licenced hunters in Queensland is far fewer than in any other Australian state (Australian & New Zealand Environment & Conservation Council 1996) and there has been a widespread assumption that lead contamination is unlikely to be a serious problem in Queensland. Nonetheless in 1992 Queensland adopted a Nature Conservation (Duck and Quail) Plan which determined that the use of lead shot will be banned at wetlands where more than 5% of an unspecified sample of waterfowl are found with lead shot in their gizzards (Queensland Department of Environment & Heritage 1995).

The study reported here was aimed at obtaining information on the prevalence of lead in both wetland sediments and waterfowl digestive tracts to aid in management of waterfowl hunting.

METHODS

Wetlands with a known history of waterfowl hunting were subjectively selected for study with the assistance of members of the Queensland Field and Game Association Inc. These people advised that most ducks are likely to be taken in the first few days of the season. Since we relied on hunters to supply us with carcasses, members of our team collected ducks on the first three days of the 1996 duck season which began on 29 June. We collected ducks from wetlands at Greenlakes, Rockhampton (23°1'S, 150°32'E) and Plantation Creek, Ayr (19°40'S, 147° 25'E). We also received ducks and/or their digestive tracts from two other wetlands; one near Maryborough and the other near Lake Manchester, close to Ipswich. The digestive tracts of ducks were removed and searched for lead shot. Only shot gun pellets found inside the digestive tract were counted. We did not examine whole carcases for subcutaneous pellets, or attempt any diagnosis of lead poisoning. Across all four sites we collected six species, namely Pacific Black Duck *Anas superciliosa*, Grey Teal *A. gracilis*, Chestnut Teal *A. castanea*, Australasian Shoveler *A. rhynchotis*, Australian Wood Duck *Chenonetta jubata* and Hardhead *Aythya australis* (Table 1).

We planned to visit these four wetlands in September 1996 to obtain sediment samples for examination. However, between the time the ducks were collected and the end of the hunting season, co-operation from the hunters was withdrawn. Since we required the assistance of hunters to locate two of these wetlands we were neither able to definitively identify, nor take sediment samples from, wetlands at Maryborough and Ipswich.

We visited Greenlakes and Plantation Creek during the period 24-26 September 1996. At each wetland we took thirty samples of the top 5 cm of sediment (each 1.8L) with either a bottom grab sampler or a spade, depending on water depth. Sample sites were located haphazardly in clear water where hydrophytes would not clog the sampler. Samples were passed through a 2mm sieve and examined *in situ*. This sieve retained all shot gun pellets (numbers 4 to 7) which could be used to hunt waterfowl.

RESULTS

A single lead pellet was found somewhere in the digestive tract in 8 of 59 ducks examined (Table 1). Only one pellet was found in the hindgut, in a Pacific Black Duck: all others were found in the gizzard. Ingested lead pellets were found in birds collected at each wetland, but the proportion which had ingested any lead

TABLE 1. Number of ducks with ingested lead pellets. Only one pellet was found in any bird.

Location	Pacific Black Duck		Hardhead		Grey Teal, Chestnut Teal, Shoveler and Wood Duck		All species	
	No. sampled	No. affected (%)	No. sampled	No. affected (%)	No. sampled	No. affected (%)	No. sampled	No. affected (%)
Ipswich	20	1(5.0)	1	0	4	0	25	1(4.0)
Plantation Creek	1	0	3	2(66.7)	2	0	6	2(40.0)
Maryborough	9	4(44.0)	0	0	1	0	10	4(40.0)
Greenlakes	11	1(9.0)	4	0	3	0	18	1(5.5)
Total	41	6(14.6)	8	2	10	0	59	8(13.6)

pellets varied greatly from 4% to 40% (Table 1). However, the sample size from Plantation Creek was small (Table 1).

A significantly greater proportion of sediment samples at Plantation Creek (33%) contained one or more lead pellets than at Greenlakes (3%; $Z = 3.29$, $P = 0.001$). All affected samples from both wetlands had a single lead pellet, except for one sample from Plantation Creek which had three pellets.

DISCUSSION

The number of digestive tracts examined at some wetlands was relatively small; hence statistical inference should not be drawn from the findings. Further, since we have no data on the movement of ducks, there can be no inference about the origin of lead found in digestive tracts. However, the prevalence of ingested lead should be viewed as minimum estimates since data were obtained by manual examination of the duck gut contents. Overseas studies, which compared different methods of detecting lead in the digestive tract of waterfowl, found that manual examination underestimated the number of lead shot present by 20-25% (Anderson & Havera 1985) because small, eroded shot may be obscured by grit, food and the muscular wall of the gizzard (Sanderson & Bellrose 1986). However, even these underestimates indicate that the new Queensland Duck and Quail Conservation Plan (1992) would call for a ban on the use of lead shot at the Plantation Creek, Maryborough and Greenlakes wetlands.

The results from the gut analyses are supported by the findings from the sediment analyses. At each wetland we collected only 54L of sediment, yet at Plantation Creek we found twelve pellets, suggesting that there is a high residual lead load in sediments at that wetland. If a similar density of pellets is found in the top 5 cm of sediment over 1 ha of that wetland, there could be as many as 67 000 pellets potentially available for waterfowl to ingest in a single hectare.

A large amount of spent lead shot is likely to be deposited in wetlands each year, even in Queensland where hunting does not occur on State owned land, and is more *ad hoc* than hunting in other states (Australian & New Zealand Environment & Conservation Council 1996). For example the minimum estimate of the total legal Queensland duck harvest in 1994 was 13 842 (Queensland Department of Environment & Heritage 1995). If, for example, only two cartridges were expended for each bagged duck then, depending on the size of shot used, between 7 and 8 million pellets may be released into wetlands annually.

Ingestion of a single lead pellet is sufficient to cause lead poisoning in some cases (Sanderson & Bellrose 1986). However, the susceptibility of any bird to lead poisoning generally increases with decreasing bird size, the degree to which the

bird feeds in a manner likely to pick up spent shot, and the paucity of protein and phosphorus in the bird's diet (Sanderson & Bellrose 1986).

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THE BIRDS OF ROCKY ISLETS, NORTH QUEENSLAND

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ABSTRACT

During a continuous forty-one day stay on Rocky Islets from 26 November 1995 until 5 January 1996, birds were observed and counted on a daily basis. Thirty-six species were counted including eleven breeding species.

STUDY AREA

The Rocky Islets group comprises three small continental islands about 20 km south of Lizard Island. Rocky Islet itself is about 750m x 300m with a 46m high granite ridge along its southern side (Smith & Ogilvie 1989). On the northern side of the ridge there is an extensive *Pisonia grandis* forest growing on sand, bordered in the east by grassland, also on sand. In the north-western corner, at the base of the granite ridge, there is dense vine thicket leading into a forest of *Terminalia sp.* growing on a substrate of sand and coral blocks. *Cordia subcordata* lines the beach. Along the ridge there are large Fig trees *Ficus* sp. and lianes which give way to low impenetrable scrub in the east. Patches of *Lantana camara* were discovered growing in two places on the north-western corner of the island, presumably brought in by the Pied Imperial-Pigeons which nest there. On the western tip there is a stand of *Casuarina sp.* backing on to sand dunes which are covered with grass and shrubs. South-west Islet is a sparsely vegetated, oval shaped collection of granite boulders and limestone slabs. It is about 60m x 40m, and 8m high, and lies in deep water approximately 1 km south-west of the main islet. East Islet is about 90m x 50m, and 15m high, vegetated with grass and shrubs, and lies at the edge of the fringing reef about 800m from Rocky Islet. For further information on Rocky Islets, including a map and aerial photograph, see Smith & Ogilvie (1989).

DISCUSSION

There are at least eleven documented visits by ornithologists to Rocky Islets in recent years, yet none of the authors stayed on the islets for an extended period during the main breeding season. This species list complements previous records by giving a detailed account of all the breeding, non-breeding and migratory birds encountered during a visit lasting from 26 November 1995 to 5 January 1996. With a total of thirty-six species, Rocky Islets has fewer species than some of the neighbouring islands such as Eagle Island (fifty-two species, Smith 1987) and Three Isles (fifty-seven species, McLean 1993). Its importance as a stopover for migrating waders, whose maximum number never exceeded twenty-one, is minimal. The dominance of sandy and rocky shorelines ensured

that species such as Ruddy Turnstone and tattlers were the most frequently encountered waders. Rocky Islets also appears to function as a stepping-stone for mainland birds flying to South Direction Island, approximately 8km to the north-east. Eleven species were recorded breeding during this period, while Yellow-bellied Sunbird and Beach Stone-curlew are probable breeding species. Smith & Ogilvie (1989) recorded Crested Tern eggs on South-west and East Islets, bringing the total number of breeding species to fourteen. The behaviour of the White-breasted Woodswallows towards two species of cuckoo suggests that these birds occasionally breed on the main islet, although only a single individual of each species was recorded and no vocalisations were heard.

ANNOTATED SPECIES LIST FOR ROCKY ISLETS

* Indicates breeding.

Wedge-tailed Shearwater *Puffinus pacificus.* * Common in all suitable areas, but absent from South-west Islet. Burrowing had begun before 27 November with activity increasing and still continuing on 5 January. Certain areas on the southern and western slopes of East Islet have a layer of soil and humus which allows Wedge-tailed Shearwaters to scrape out nesting cavities underneath boulders. An estimated 10-15 pairs breed on East Islet where a hatchling (about 1 week old) was found on 18 December. The estimated breeding population is about 800-900 pairs, which compares closely with the estimate of Smith & Ogilvie (1989).

Masked Booby *Sula dactylatra*. One second-year bird appeared on 12 December after rain and squalls, and took up residence on South-west Islet where it was still sitting on 5 January.

Red-footed Booby *Sula sula*. One seen by Milton Lewis on 28 November.

Brown Booby *Sula leucogaster*. Seen daily resting on large boulders near East Islet and feeding in deep water around East and South-west islets. A maximum of eleven individuals including several juveniles on 1 December.

Great Frigatebird *Fregata minor*. Observed four times with a maximum of thirteen birds on 24 December soaring on updrafts over the granite ridge.

Lesser Frigatebird *Fregata ariel*. Two males with a flock of thirteen Great Frigatebirds on 24 December.

Eastern Reef Egret *Egretta sacra* . Two pairs, each involving mixed morphs, were always present, with a third pair appearing on the exposed reef flat during spring tides in late December.

Osprey *Pandion haliaetus.* * One pair was frequently seen around cliffs at the northern corner of the main islet where a nest is presumably located. A disused Osprey nest was found on South-west Islet.

White-bellied Sea-Eagle *Haliaeetus leucogaster.* * Two adults and one juvenile. A nest was located on the ridge of the main island in a large Fig tree. The juvenile was seen to take a Bridled Tern in flight and was observed on another occasion at a feeding perch in the forest eating a Bridled Tern rendered flightless from

Pisonia seeds. The remains of at least forty carcasses of different tern species were scattered in this area.

Buff-banded Rail *Gallirallus philippensis.* * Numerous. Commonly seen singly or in groups of up to four individuals on all parts of the island down to the high water line. An adult with three pulli was seen on 21 December. Rails were probably responsible for some of the plundered eggs frequently seen near tern nests and shearwater burrows, although nesting birds did not harass the rails. One rail fed on a noddy *Anous* sp. carcass underneath the Sea-Eagle's nest. The carcass of a rail was also found on East Islet.

Whimbrel *Numenius phaeopus.* One was observed on 3 December and 8 December.

Eastern Curlew *Numenius madagascariensis* . One was seen on 12 December.

Grey-tailed Tattler *Heteroscelus brevipes.* Two were seen regularly on the rocky shores of the main island at low tide, and on the other islets at high tide.

Wandering Tattler *Heteroscelus incanus.* One individual appeared on 24 December, associating with Grey-tailed Tattlers. Two were seen on East Islet on 28 December.

Ruddy Turnstone *Arenaria interpres.* The most common wader, increasing in number throughout the period, reaching a maximum of fourteen on 28 December.

Beach Stone-curlew *Esacus neglectus.* One pair was often seen on the sandy beaches of the main islet, particularly on the dunes on the north-western corner near a stand of casuarinas.

Pacific Golden Plover *Pluvialis fulva.* Two birds were seen almost daily. One bird with an injured foot was resident for the entire forty-one day period.

Silver Gull *Larus novaehollandiae.* Numbers seemed to increase, reaching a peak of thirty-six birds. Whether the increase was due to the breeding activities of the terns or due to the presence of the researchers could not be judged. Up to four gulls congregated on the beach in front of the camp site indicating that they were attracted by humans, even though they received no food (see King, Hicks & Cornelius 1992). Despite many hours of observations, no gulls were seen to plunder tern nests, although many broken eggs were continually being discovered.

Lesser Crested Tern *Sterna bengalensis.* Two were resting on a sand spit on 9 December.

Crested Tern *Sterna bergii.* Up to forty-two birds in various plumages were seen almost daily, most commonly on a sand spit on the eastern side of the main island. There was no mating or nesting activity displayed by the Crested Terns.

Black-naped Tern *Sterna sumatrana.* * Numbers increased throughout the period, with a maximum of thirty-six birds seen on 18 December. These terns showed a preference for East Islet and its fringing rocky reefs. A single egg was found on bare, exposed rock on East Islet on 31 December, but was gone the following day.

Little Tern *Sterna albifrons.* This species was seen daily, mostly at low tide over the reef flats and on a sand spit on the eastern side of the main island. A maximum of five individuals noted.

Bridled Tern *Sterna anaethetus.** An estimated 300-400 breeding pairs compares favourably with previous estimates (Domm 1977). Nests were found in many habitats from below the spring tide mark to the steep, liane-covered slopes in the centre of the main island. In addition, 20-30 pairs were breeding on South-west Islet and at least 30 pairs were breeding on East Islet. Numbers of both breeding and non-breeding birds increased throughout the period, with over 230 in the air together above the grassy area on the eastern side of the main island on 2 January. The presence of Sea-Eagles greatly aggravated the terns, and the juvenile Sea-Eagle was seen to take a Bridled Tern in midflight on 6 December.

Common Noddy *Anous stolidus.* An estimated 600 birds roosting in *Pisonia* forest each evening. These birds arrived in mixed flocks with Black Noddies and appeared to roost together with them.

Black Noddy *Anous minutus.* An estimated 6000+ birds roosting each evening in *Pisonia* forest. Black Noddies were regularly being trapped in sticky *Pisonia* seeds and falling prey to the juvenile Sea-Eagle.

Bar-shouldered Dove *Geopelia humeralis.** A common bird in all vegetated areas, but most common at the base of the ridge where a flock of thirty was once counted.

Rose-crowned Fruit-Dove *Ptilinopus regina.** Often heard calling from thicker areas of vegetation on granite slopes and in *Terminalia* forest. An adult was seen feeding *Ficus* fruits to a juvenile on 21 December. There were about 6-8 breeding pairs present.

Pied Imperial-Pigeon *Ducula bicolor.** Two evening counts of birds returning from Cape Flattery gave totals of 325 and 320, respectively. Small groups were observed flying onwards to South Direction Island. Many birds remained on the main island during the day, probably to look after nestlings and fledglings of which there were good numbers.

Oriental Cuckoo *Cuculus saturatus.* One adult bird seen on several occasions was being regularly harassed by White-breasted Woodswallows.

Channel-billed Cuckoo *Scythrops novaehollandiae.* One individual seen on 24 December being pursued by White-breasted Woodswallows in the direction of South Direction Island.

White-throated Needletail *Hirundapus caudacutus.* Two birds were soaring on updrafts over the central ridge on 19 December after a day of strong northerly winds.

Fork-tailed Swift *Apus pacificus.* Seven birds were soaring on updrafts over the main islet on 19 December.

Spectacled Monarch *Monarcha trivirgatus.* One individual was calling from vine thickets at the same time each day for the entire period. The presence of this single individual indicates that smaller passerines occasionally disperse across the 20km ocean barrier from the mainland at Cape Flattery.

White-breasted Woodswallow *Artamus leucorynchus.** Many birds noted in and above *Pisonia* forest and hawking insects blown across reef flats. One pair

was observed mating on 2 December in front of a nest cavity in *Pisonia*. Another pair was observed feeding young on 21 December.

Yellow-bellied Sunbird *Nectarinia jugularis*. Groups of 2-3 birds were seen almost daily, most frequently in *Cordia subcordata* along the strand. No nests were found.

Pale White-eye *Zosterops citrinellus** A very common species in all levels of *Pisonia* forest. The behaviour of small groups of these birds foraging on the slopes of the main islet as they darted over and under boulders was reminiscent of Dusky Grasswrens *Amytornis purnelli* at Simpson's Gap. When in the canopy they behaved in a similar fashion to Silvereyes *Z. lateralis*. In the sub-canopy they behaved and appeared almost identical to the European Wood Warbler *Phylloscopus sibilatrix* in their manner of fluttering and gliding from branch to branch. Holmes (1986) recorded similar flight behaviour to this. A disused nest found in an understorey shrub in the forest had a mass of 13g and consisted of approximately 400 twigs. It was 140 mm long, 95mm wide and 45mm deep, with a cup depth of 10 mm. Rocky Islet is the southernmost recorded limit of this species (Holmes 1986).

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DISTRIBUTION AND ABUNDANCE OF BEACH STONE-CURLEWS ON NORTHERN GREAT BARRIER REEF ISLANDS

DAVID MILTON

ABSTRACT

Counts of the Beach Stone-curlew on uninhabited islands of the northern Great Barrier Reef between latitudes 10°S and 15°S were made during semi-annual bird surveys by staff of the Queensland Department of Environment from 1981 to 1995. A total of 387 birds were seen on 68 of the 131 islands visited at least once during the study (mean 2.2±0.2 birds per island with birds). Birds were seen on most visits to each of these 68 islands, usually a single pair. The estimated population of Beach Stone-curlews on the northern Great Barrier Reef appeared to be stable throughout the study period at approximately 100-120 birds. This represents about 10% of the estimated Australian population and it is almost as large as the number of birds recorded along the entire Queensland mainland. These data confirm the importance of the islands of the northern Great Barrier Reef for Beach Stone-curlews and highlight the need to maintain their protected status because of the increasing threats and disturbance of birds on the Australian mainland.

INTRODUCTION

The Beach Stone-curlew *Esacus neglectus* is a sedentary wader that is declining in numbers throughout most of its range (Watkins 1993). It occurs throughout the coastal parts of northern Australia, Papua New Guinea and Indonesia and ranges into peninsula Malaysia (Marchant & Higgins 1993), as well as occurring on many offshore islands of northern Australia and the Torres Strait (Draffan *et al.* 1983). It usually lives in pairs that rely on their cryptic colouring to avoid predation. Coastal populations near human habitation have suffered severely from the impact of predation by dogs and nest disturbance by people (Clancy 1986). It is likely that island populations have suffered less than coastal populations and islands may be the stronghold of the species in northern Australia.

Watkins (1993) estimated the Australian population of Beach Stone-curlews to be about 1000 and the species is considered vulnerable because of its low reproductive rate, habitat loss, predation and disturbance by humans. It lives solitarily or in adult pairs and prefers coastal habitats, being found on almost all types of beaches in some part of its range (Warham 1962, Marchant & Higgins 1993). Breeding has been recorded from the upper edge of sandy beaches of islands and open coast (Meyer 1936, Clancy 1986). The islands of the northern Great Barrier Reef have been noted as the most significant area for Beach

Stone-curlews in Australia (Watkins 1993), although this ranking was based on a short-term study of a few islands (Cornelius 1987, 1988).

Driscoll (1997) summarized recent surveys of waders along the entire Queensland coast and recorded less than two hundred Beach Stone-curlews. The highest abundances were recorded on the mid-central coast (Mackay-Rockhampton) and birds were seen mainly in pairs. Few birds were seen during aerial surveys along the eastern coast of Cape York (Garnett 1987). However, all these surveys were confined to the mainland and no islands were surveyed. The total Queensland population of Beach Stone-curlews is likely to be much higher than that estimated from these mainland surveys.

The aim of this study is to assess the distribution and abundance of Beach Stone-curlews on islands of the northern Great Barrier Reef between 10°S and 15°S in order to determine the relative importance of these populations for the species in Australia.

METHODS AND MATERIALS

Beach Stone-curlews were counted from 1981 to 1995 as part of seasonal bird surveys of islands of the northern Great Barrier Reef (north of 15°S, Fig. 1). Bird sightings came from two sources: (a) Queensland Department of Environment semi-annual monitoring surveys of islands in the region. During these surveys at least 20 islands were visited on each survey of up to 14 days. All birds seen on each island were recorded during each visit of two to four hours. (b) Surveys by the author as part of a study to assess the affects of fishing on seabird populations (Blaber *et al.* 1995). Sampling methods used in both studies were similar and the distribution of effort is given elsewhere (Milton *et al.* 1996).

Beach Stone-curlews are crepuscular and are mainly active around dawn and dusk (Pringle 1987). During the day they usually remain inactive around the upper margins of the beach and adjacent foreshore. Typically, this habitat is not heavily vegetated on northern Barrier Reef islands so that Beach Stone-curlews are easily detected when their cryptic habits are taken into account.

The size of the Beach Stone-curlew population on the northern Great Barrier Reef during each survey was estimated by multiplying the total number of birds seen by the inverse of the proportion of islands visited that are known to support Beach Stone-curlews.

RESULTS AND DISCUSSION

A total of 387 Beach Stone-curlews were seen on 68 of the 131 islands visited during the survey period (Table 1). Birds were distributed in pairs and family groups (mean 2.2$\pm$ 0.2 birds per island). There were two islands where birds were seen on at least ten occasions (North Bird Island and Pelican Island) during

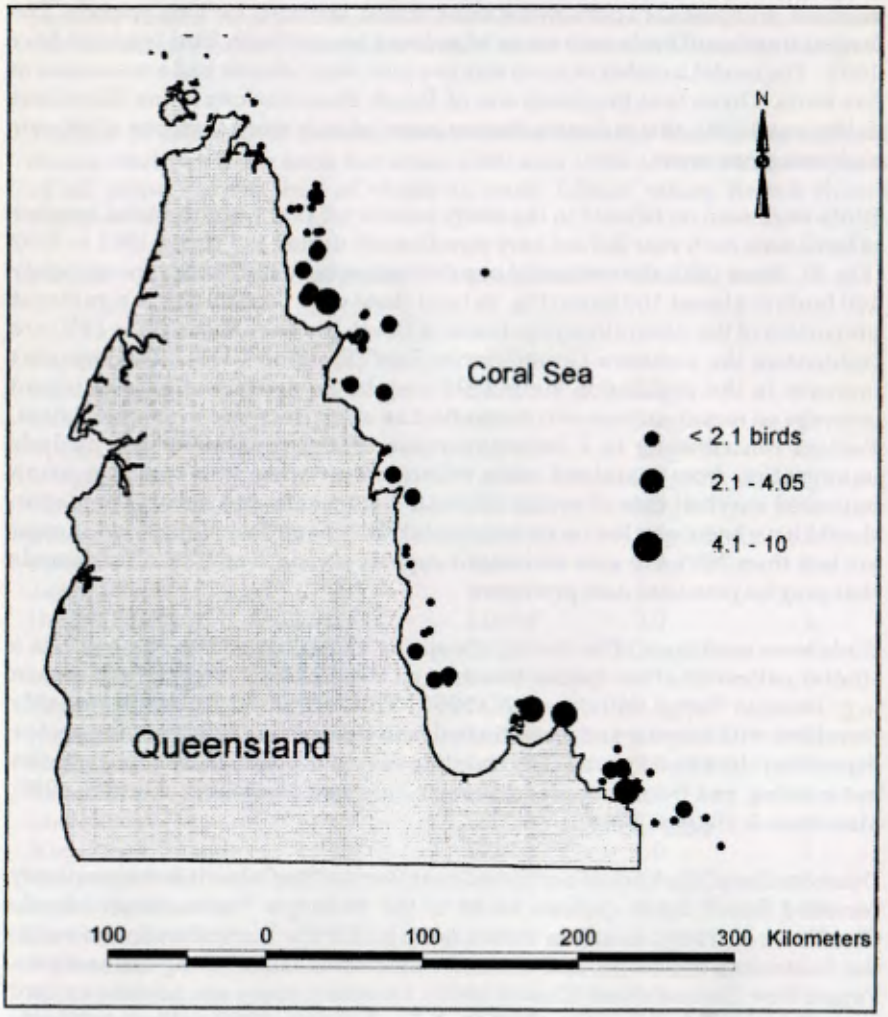

Fig.1. Map of the northern Great Barrier Reef showing the islands where Beach Stone-curlews were seen between 1981 and 1995.

the study (Fig. 1 and Table 1). This suggests that the Beach Stone-curlews are resident and probably occupy the same island territory for long periods. The largest number of birds seen on an island was ten on North Bird Island in May 1995. The modal number of birds was two and other islands had a maximum of five birds. Given that the clutch size of Beach Stone-curlews is one (Marchant & Higgins 1993), this indicates that on some islands more than one adult pair and young can occur.

Birds were seen on islands in the study area in all years and the total number of birds seen each year did not vary significantly during the period 1981 to 1992 (Fig. 2). Since 1992, the estimated population has increased from approximately 100 birds to almost 150 birds (Fig. 2a) and these data confirm that a significant proportion of the Australian population of Beach Stone-curlews (up to 15%) are resident on the northern Great Barrier Reef (Watkins 1993). The apparent increase in the population since 1992 may be an artifact of greater island coverage on recent surveys or it may reflect an actual increase in the population. Factors contributing to a recent increase in the population may include immigration from mainland sites, where disturbance is increasing, or an improved survival rate of young. Human disturbance and natural predation should have been very low on these islands throughout the study period as most are less than 200 ha in area and do not support populations of small mammals that may be potential nest predators.

Birds were seen more often during the spring and autumn (Fig. 2b), which is a similar pattern to other species breeding on these islands after the wet season (e.g. Roseate Terns, Milton *et al.* 1996). This increased frquency probably correlates with nesting and more diurnal activity in active defence of the nest or dependent chicks and young. The breeding season is poorly known in Australia but nesting has been recorded between July and November (Clancy 1986, Marchant & Higgins 1993).

Other studies of the birds of northern Great Barrier Reef islands have previously recorded Beach Stone-curlews on 33 of the 80 larger Torres Strait islands (Draffan *et al.* 1983), mostly in the southern half of the Torres Strait adjacent to the Australian mainland, and in small numbers on island along the southern Papua New Guinea coast (Coates 1985). However, there are no data on bird movements, with only twenty-three birds banded since 1953 and only two birds recovered, both at the banding site (Baker *et al.* 1995).

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TABLE 1. Islands of the northern Great Barrier Reef where Beach Stone-curlews were seen between 1980 and 1995. Counts are the mean of all trips. N=number of visits to each island when Beach Stone-curlews were seen.

Island	Latitude	Longitude	Count±s.e.	N
Turtle Island	10°53'	142°41'	2.0	1
Sinclair Islet	11°6'	143°1'	1.3±0.3	3
Milman Islet	11°10'	143°1'	2.2±0.4	9
Aplin Islet	11°12'	143°2'	1.7±0.3	3
Douglas Islet	11°14'	142°59'	2.0±0.5	2
Cairncross Islet	11°15'	142°55'	1.5±0.5	2
Bushy Island	11°15'	142°52'	1.5±0.5	2
Chomondeley Islet	11°23'	143°3'	1.5±0.5	2
Jardine Islet	11°23'	143°1'	2.0	1
Halfway Islet	11°23'	142°58'	2.0	1
Wallace Islet	11°45'	143°2'	2.0±0.0	4
Little Boydong Is.	11°29'	143°2'	2.7±0.3	6
Boydong Is.	11°49'	143°1'	2.2±0.4	5
Hannibal Is. East	11°36'	142°56'	2.0±0.5	2
Hannibal Is. West	11°36'	142°57'	2.3±0.3	6
Raine Island	11°36'	144°1'	1.0	1
Bushy Islet	11°43'	142°59'	2.0±0.4	4
MacArthur Islands	11°43'	142°58'	4.0	1
Unnamed Reef Cay	11°45'	142°58'	4.0±2.0	2
Bird Island(north)	11°46'	143°5'	4.3±1.0	10
Bird Island (south)	11°47'	143°6'	2.5±0.3	4
Pig Island	11°50'	143°19'	1.0	1
Manley Island	11°51'	143°18'	1.0	1
Sir Charles Hardy Is	11°54'	143°45'	2.5±0.5	2
Harvey Island	11°58'	143°16'	1.0	1
Clerke Island	11°58'	143°17'	3.0	1
Hicks Island	11°59'	143°16'	1.0	1
Gore Island	11°59'	143°15'	2.0	1
Haggerstone Island	12°2'	143°18'	1.5±0.5	2
Beesley Island	12°14'	143°12'	1.0±0.5	2

Farmer Island	12°15'	143°13'	2.6±0.6	7
Forbes Island Group	12°17'	143°25'	2.5±0.5	2
Restoration Island	12°37'	143°27'	2.0	1
Unnamed Island	12°38'	143°26'	2.0	1
Lloyd island	12°46'	143°29'	3.0	1
Cairncross Islets	12°53'	143°36'	2.2±0.5	5
Chapman Island	12°53'	143°36'	2.2±0.5	5
Night Island	13°11'	143°35'	1.0±0.5	2
Binstead Island	13°13'	143°34'	2.0±0.5	2
Lowrie Island	13°17'	143°36'	2.0	1
Morris Island	13°30'	143°43'	1.0	1
Fife Island	13°39'	143°43'	1.8±0.4	5
Hay Island	13°40'	143°41'	1.5±0.5	2
Wilkie Island	13°47'	143°38'	3.0±0.5	3
Pelican Island	13°55'	143°50'	2.1±0.2	10
Burkitt Island	13°56'	143°45'	3.2±0.2	4
Stainer Island	13°57'	143°50'	1.5±0.5	2
Clack Island	14°4'	144°16'	2.0	1
King Island	14°5'	144°20'	5.0	1
Pipon Island	14°7'	144°32'	5.0	1
Stanley Island	14°9'	144°14'	2.0	1
Stapelton Islet	14°19'	144°54'	1.0	1
Ingram Island	14°25'	144°53'	2.4±0.4	5
Beanley Island	14°26'	144°53'	3.0	1
Bewick Island	14°26'	144°49'	2.5±0.5	2
Unnamed Reef Cay	14°27'	145°3'	1.0	1
Watson Island	14°28'	144°53'	1.5±0.5	2
Howick Island	14°31'	144°58'	1.3±0.3	3
Newton Island	14°31'	144°55'	1.0	1
Noble Island	14°31'	144°46'	1.0±0.5	2
Coquet Island	14°33'	144°59'	2.0±0.0	3
Leggat Island	14°33'	144°52'	2.0	1
Sinclair Island	14°33'	144°54'	6.0	1
Nymph Island	14°39'	145°15'	3.0±0.5	2
Eagle Islet	14°42'	145°23'	1.0±0.5	2
Turtle Island Group	14°43'	145°12'	1.3±0.3	3
Pethebridge Islet E.	14°44'	145°5'	1.0	1
Rocky Islets	14°51'	145°28'	1.0	1
Total			2.2±0.2	173

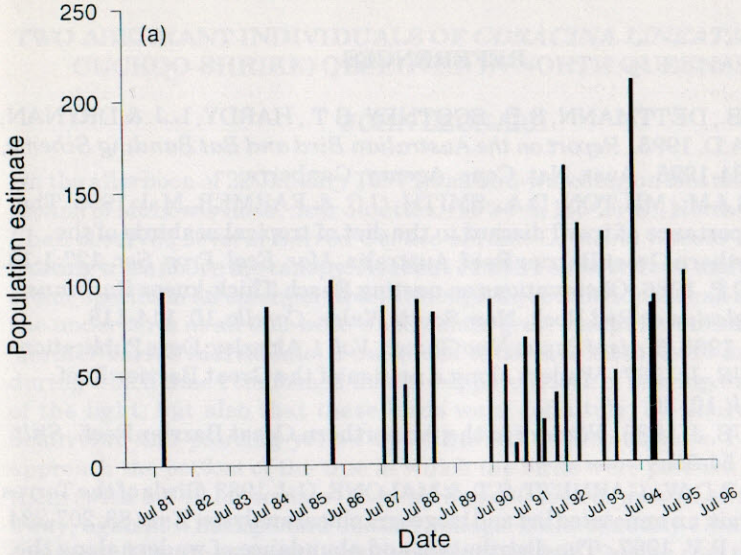

Fig. 2(a). Changes in the estimated total population of Beach Stone-curlews seen on islands of the northern Great Barrier Reef between 1981 and 1995.

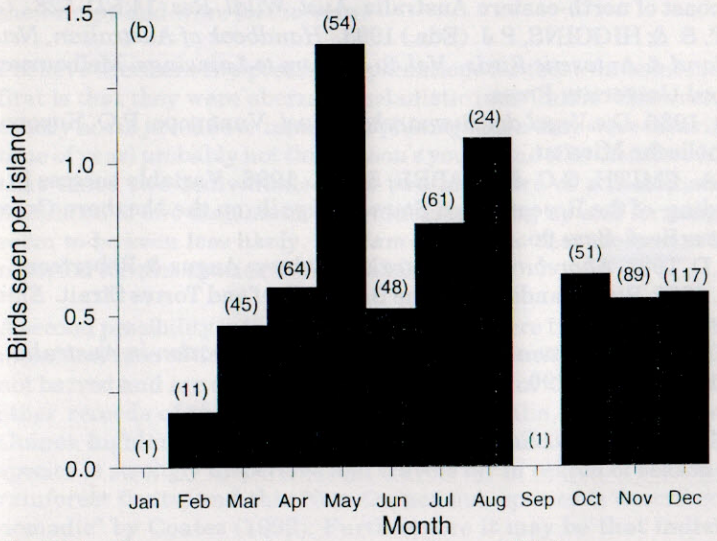

Fig 2(b). Changes in the mean number of birds seen on each island in each month of the year (all years combined). Numbers of island visits in each month are shown in brackets.

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TWO ABERRANT INDIVIDUALS OF *CORACINA LINEATA* (BARRED CUCKOO-SHRIKE) OBSERVED IN NORTH QUEENSLAND.

JOHN LEONARD

On the afternoon of 22 January 1997 I was bird-watching on foot along the lower section of Mt Lewis Road, near Julatten, (16°36' S, 145°20' E), North Queensland. I had observed several Barred Cuckoo-shrikes *Coracina lineata* in emergent, fruiting trees above the canopy. At about 14.00h I observed two more individuals of this species in an emergent tree, although these individuals had no barring on the underparts at all and were wholly slate-grey, except for darker lores (as in 'normal' barred individuals). I continued to observe them for 10 minutes or so, during which time I confirmed that the apparent lack of barring was not a trick of the light, but also that these birds were definitely, by their size, shape, behaviour and piercing yellow-eyes, Barred Cuckoo-shrikes. I was able to approach the bottom of the tree in which the birds were perched and observe them (with 8 x 40 binoculars) from perhaps 30 metres as well as from further away, against a background of other foliage. Unfortunately I was not able to compare them directly with any barred individuals. During this time they fed sporadically and loafed, interacting in the same way that I had observed other individuals interacting earlier that afternoon, (viz., very little). They were silent whilst under observation and at the end of this time they flew away together over the canopy and were lost to view.

I believe there are two possible explanations for these unusual individuals. The first is that they were aberrant melanistic individuals. However, as they were clearly not in juvenile or immature plumage then they were (bearing in mind the time of year) probably not this season's young and it is therefore highly unlikely that these two individuals were two members of a melanistic brood. The likelihood of two melanistic individuals meeting up and forming a pair would seem to be even less likely, for I am not aware that melanism has ever been reported for this species in Australia.

A second possibility is that these individuals were two males of the New Guinea mainland race of *Coracina lineata, C. lineata axillaris*, the males of which are not barred and are completely grey (Beehler *et al.* 1986). I am not aware of any other records of this sub-species from Australia, and its range, in the New Guinea highlands, is far from North Queensland. However, in Australia this species is strongly dispersive and travels far in search of seasonally-available rainforest fruits, and this New Guinea sub-species is described as "possibly nomadic" by Coates (1990). Furthermore it may be that individuals of this sub-species have been overlooked many times in Australia, for the habit of this species of frequenting emergent trees and the high canopy means that individuals are often seen as silhouettes, and in these cases wholly dark individuals would

not be noticed.

The QOSI Rarities Appraisal Committee has assessed this interesting sighting, and the possibility that the birds observed were of the mainland New Guinea race of the Barred Cuckoo-shrike. It concluded that, as it stands, there is insufficient evidence to be able to accept, without question, that the birds observed were of this New Guinea race. As Editor, Peter Britton has pointed out that the response from the independent referee in August 1997 included the comment "I think it is very important that this paper be published"; and, despite the essentially negative response from the Rarities Appraisal Committee, he feels that publication in *Sunbird* is indeed desirable. It is hoped that *Sunbird* readers and subscribers will likewise value publication rather than loss of this interesting sighting.

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