THE SUNBIRD

Journal of the
QUEENSLAND ORNITHOLOGICAL SOCIETY

Volume 28 Number 1 March 1998

OFFICERS AND COUNCIL FOR 1998

President
DAWN MUIR

Vice President
CARLA CATTERALL

Past President
JULIAN BIELEWICZ

Country Vice Presidents
DAWN ALLEN, LLOYD NIELSEN

Treasurer
LYAL GRUNDY

Secretary
SHEENA GILLMAN

Outings Officer
DAWN MUIR

Campouts Officers
ANNETTE CROOKE, NEIL STRODE

Records Officer
STUART PELL

Sunbird Editor
PETER BRITTON

Assistant Editor
JEREMY THOMPSON

Librarian
ROSLYN LAUNDON

Audiovisual Librarian
ERNA BRAZIER

Projects Officer
IAN VENABLES

Conservation Officer
DAVID MILTON

Membership Secretary
GARTH INNES

Newsletter Editor
GARY FISHER

Property Officer
JAN BELL

Council Members
LINDSAY AGNEW, FRED ARMBRUST
PHIL BATTLEY, LYNDA LITZ-TYNE, ROY SONNENBURG

The objectives of the Society are to promote the scientific study and conservation of birds by all means possible, with particuler reference to the birds of Queensland.

Annual subscription rates to the Society are:

Ordinary Member	$35.00
Family Member	$40.00
Student Member	$20.00
Country Member	$30.00
Sunbird subscription only	$25.00
Libraries, Universities	$30.00
Overseas	$30.00(Aust.)

All members receive a monthly newsletter and a copy of the quarterly journal, *The Sunbird*. The price of *The Sunbird* to non-members is $6.00 per issue. The Society holds a general meeting and a field excursion each month.

General correspondence, including membership fees, should be addressed to the Secretary. *The Society's address is:*

P.O. Box 97, St. Lucia, Queensland, 4067.

SUNBIRD 28(1) **March 1998**

CONTENTS

THE SUNBIRD

Volume 28 No. 1 March 1998

RECREATIONAL IMPACTS ON WADERS ON FRASER ISLAND

FIONA FISHER, MARC HOCKINGS and ROD HOBSON

ABSTRACT

Concerns have been raised over the possible impact of vehicle and associated recreational use of beaches on waders. We surveyed wader populations and levels of vehicle and camping use along stretches of the eastern and northern beaches on Fraser Island. There was a significant negative correlation between the numbers of Pied Oystercatchers and Red-capped Plovers and levels of vehicle and camping use. These species are in very low numbers along much of the Fraser Island coastline in areas of otherwise apparently suitable habitat. In contrast, we found a positive correlation between the numbers of Masked Lapwings and our measures of human activity. Camping on the swales and foredunes may be extending areas of favourable habitat for this species.

INTRODUCTION

The use of four-wheel drive vehicles on beaches is increasing. They are used not only as a recreational pursuit in themselves but also to give visitors access to remote areas for purposes such as camping, sightseeing and fishing. This trend is evident on Fraser Island, where the number of permits issued for private vehicles to visit the island has shown an increase of approximately 30% between 1991/2 and 1993/4 (24 442 permits to 33 202 permits (Queensland Department of Environment and Heritage 1992, 1994)).

A number of studies have suggested that beach traffic impacts significantly upon the flora and fauna of sandy beaches (Godfrey & Godfrey 1981, Jeffery 1987, Melvin *et al.* 1994, Buick & Paton 1989, Melvin *et al.* 1991, Newman 1992, Cooper *et al.* 1976, McFarland 1993 and Wilson 1994). Wading birds have been the focus of a number of these studies. They commonly forage in the sections of the beach used by vehicles and their roosting or nesting areas in the beach swales may also be impacted by camping and other recreational uses.

The use of four-wheel drive vehicles on the beaches of Fraser Island and the Cooloola coast has been implicated in the posited decline of the Pied Oystercatcher *Haematopus longirostris* (Anon 1994, 1995; McFarland 1993, Queensland Government 1994, Wilson 1994). In a preliminary study, McFarland (1993) noted that the density of Pied Oystercatchers was considerably lower along the Fraser Island and Cooloola coast than in other areas of Australia. He identified increasing recreational use, especially beach traffic, as an impact of particular concern (McFarland 1993).

A number of measures have already been taken in order to minimise the impact of four-wheel drive vehicles in the Great Sandy Area (Queensland Government 1994). For example, the stretch of beach between Wathumba Spit and Rooney Point on the west coast of Fraser Island is presently closed to traffic. The management plan proposes closure of the stretch of beach between Hook Point and Dilli Village, at the southern end of Fraser Island, and the area of the beach from Sandy Cape Lighthouse to South Wathumba (Queensland Government 1994). These closures are, in part, motivated by a recognition that recreational use of vehicles on the beaches of the Great Sandy Region may have an impact on flora and fauna.

The management plan (Queensland Government 1994) also proposes a monitoring programme to assess the impact of vehicles on beach fauna. This study will go some way to achieving this objective. It aims to:
- establish baseline data on bird abundance and beach activity;
- establish if there is any correlation between the level of vehicle and recreational activity and wader distribution and abundance that may suggest some causal linkage.

METHODOLOGY AND DATA COLLECTION

Study area

The beaches on Fraser Island were divided into twelve transects (Fig. 1) which were chosen so that each had a relatively homogenous pattern of vehicle and recreational use (i.e. major vehicle entry/exit points were not located in the middle of a transect). Not all transects share the same aspect; transects one and two are on the more sheltered west coast of Fraser Island while transects three to twelve are on the exposed ocean beaches on the east coast of Fraser Island.

Wading birds

Wader distribution and abundance were assessed by counting the birds while driving a vehicle along each transect at approximately 40 km/h. This speed allowed the driver and observer to spot smaller wading birds such as Red-capped Plovers *Charadrius ruficapillus*. Most surveys for bird data were undertaken

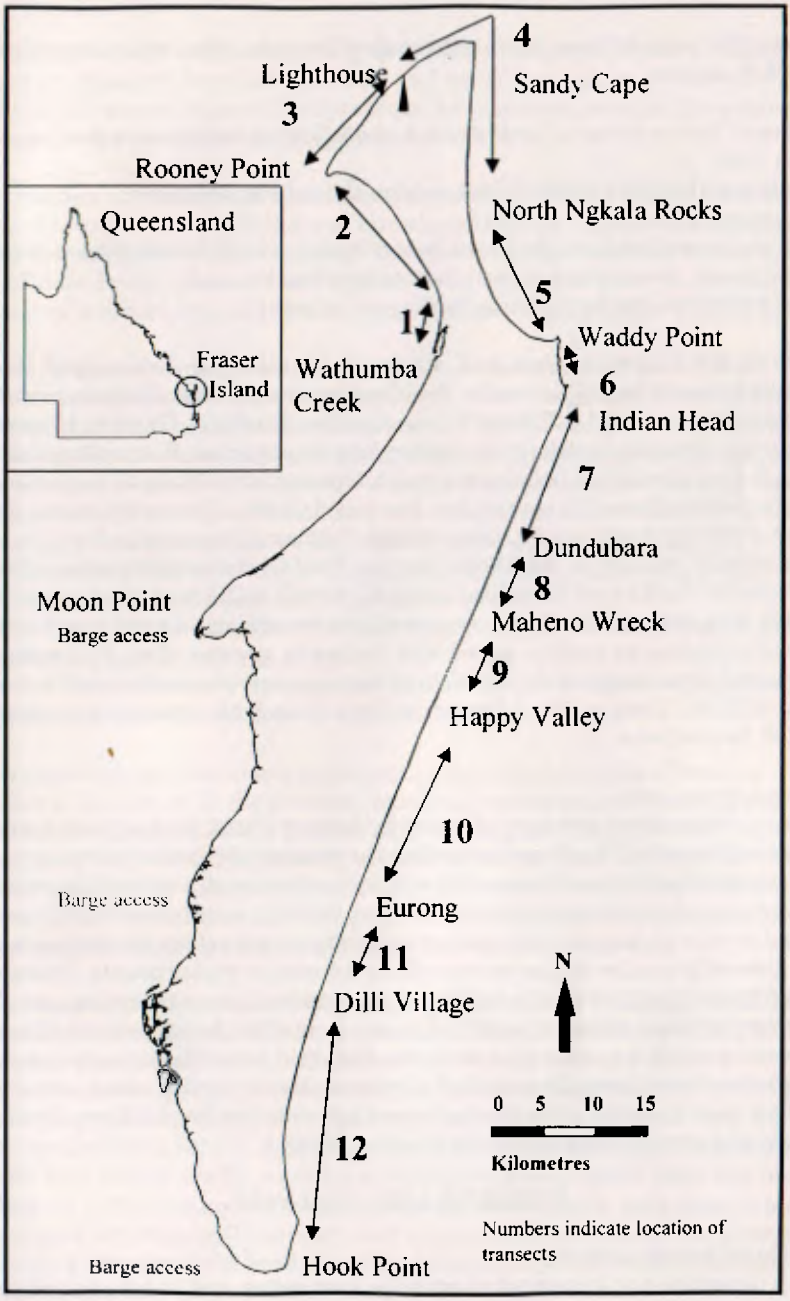

Fig. 1. Fraser Island showing survey transects

during the periods three hours either side of low tide, when vehicle travel on the beach is easiest.

For each bird or group of birds sighted, the following information was recorded:
- the time,
- distance along the transect (taken from the vehicle odometer),
- the species and number of birds,
- the position of birds on the beach (water's edge, middle beach, high tide mark, upper beach, lower dune, upper dune or tyre tracks), and
- the activity of the bird (flying, feeding or loitering).

Data on the following species of waders were collected; Red-capped Plover, Double-banded Plover *C. bicinctus*, Pied Oystercatcher, Masked Lapwing *Vanellus miles*, Lesser Sand Plover *C. mongolus*, Eastern Curlew *Numenius madagascariensis*, Beach Stone-curlew *Esacus neglectus*, Sanderling *Calidris alba*, Red-necked Stint *Calidris ruficollis*, Greater Sand Plover *C. leschenaultii*, Pacific Golden Plover *Pluvialis fulva*, Bar-tailed Godwit *Limosa lapponica*, Great Knot *Calidris tenuirostris*, Grey-tailed Tattler *Heteroscelus brevipes* and Whimbrel *N. phaeopus*. Additional data on Pied Oystercatchers were collected by National Parks staff travelling along the beach in the normal course of their duties. The same methodology was used, but recording was restricted to Pied Oystercatchers, as vehicle speed was normally greater than 60 km/h, and consistent observation of the smaller or less conspicuous species would not have been reliable. Data on Pied Oystercatchers from both survey methods were pooled for analysis.

Recreational use.
Data on recreational use were obtained by driving a vehicle along each transect at approximately 60 km/h and recording the number of vehicles (stationary and moving) and the number of campsites visible from the beach. For each observation, the distance along the transect was recorded. Surveys were taken over the period from January to August 1995. Survey intensity varied across the transects and was generally similar to the survey efforts devoted to wader counts. There was no particular pattern to the timing of recreational use surveys on any day. However, to make efficient use of field time, most of the beach activity data was collected around the same time as the wading bird data. The intention was not to correlate beach activity with bird numbers on a day to day basis, but rather to allow each transect to be characterised into relative levels of use. Transect details and survey frequencies are given in Table 1.

RESULTS AND ANALYSIS

Levels of beach activity
Mean densities per kilometre of vehicles, campsites and the three principal

wader species were calculated using data from all surveys (Table 1). Although data were obtained from both the east and northwest coasts of Fraser Island, analysis will concentrate on the data from the east coast because the number of surveys for the northwest coast is limited.

The beaches at the northern and southern ends of Fraser Island have lower levels of beach activity, while those elsewhere, around Dundubara and Happy Valley, have higher levels of activity. The short transect between Indian Heads and Middle Rocks recorded the highest level of vehicle activity, principally because of a concentration of stationary vehicles at this popular fishing spot.

Ngkala Rocks is the main access route to the northern end of Fraser Island. This stretch of coast is often difficult to traverse, which, together with the lack of facilities, may limit use of the northern areas. Orchid Beach at the southern end of transect 5 is the most northerly point where food, fuel, fresh water and other amenities are available. The stretch of beach from Indian Head to Dundubara has relatively low levels of beach activity although it falls within the broader area of high recreational use on the central eastern coast. Hockings & Twyford (1997) also found lower levels of camping use and camping impact in this area. There are two factors which may explain this result:
- the northern section of the beach within this transect is closed to camping (25% of transect);
- the foredunes are very narrow and backed by steep dunes which restrict camping and recreational use.

The transects from Dundubara to Eurong all showed high levels of beach activity and this is the area with the greatest density of campsites and camping activity (Hockings & Twyford 1997). The towns of Eurong and Happy Valley, and the campsites of Cathedral Beach and Dundubara, are in this area, together with a concentration of day use sites (Lake Wabby, Cathedral Rocks, The Maheno and Eli Creek). The beach between Eurong and Dundubara is usually easily trafficable and at most times of the year can even be traversed at high tide.

The transects from Eurong to Dilli Village and from Dilli Village to Hook Point exhibit lower vehicle and campsite densities. The lower density of vehicles is somewhat unexpected because the barge from Inskip to Hook Point is one of the main access routes to Fraser Island and it runs throughout the day. Two factors may be responsible for the lower than expected vehicle use in this area. Beach access around Hook Point is restricted to two hours on either side of high tide and outside this period traffic uses an alternative inland route from the barge landing to Dilli Village. Secondly, camping densities in this area are low (Hockings & Twyford 1997), so that while vehicles transit the area when arriving and leaving the island, the level of daily vehicle activity associated with camping and associated recreation is lower than in areas further north.

TABLE 1. Transects, survey frequency, beach activity and wader abundance.

Transect number	Start point	Finish Point	A	B	C	D	E	F	G	H	I	J	K
1	Wathumba Spit	Platypus Bay Road	4.3	2	2	1	0.47	0.23	6	27.79	1.16	0.35	0
2	Platypus Bay Road	Rooney Point	18.7	2	0	1	0.05	0	12	5.56	0.21	0.67	0
3	Rooney Point	Sandy Cape Lighthouse	13.5	7	5	7	0.3	1.1	4	1.15	0.29	0.73	0
4	Sandy Cape Lighthouse	North Ngkala Rocks	27.9	10	10	9	0.71	0.06	5	0.85	0.26	0.49	0.05
5	North Ngkala Rocks	Middle Rocks	12.5	10	7	8	1.34	1.15	3	0.38	0.03	0.18	0.18
6	Middle Rocks	Indian Head	1.6	11	6	9	7.29	1.6	2	0.04	0.22	0.17	0
7	Indian Head	Dundubara	19.2	11	14	11	1.64	1.07	5	0.72	0.14	0.23	0.36
8	Dundubara	Maheno	11.8	12	6	13	2.81	3.53	4	0.71	0.02	0.2	0.49
9	Maheno	Happy Valley	8.6	10	7	13	2.35	2.25	3	0.34	0.11	0.03	0.17
10	Happy Valley	Eurong	20.2	14	13	12	1.99	2.92	3	0.71	0.08	0.37	0.28
11	Eurong	Dilli Village	10.1	18	12	12	1.25	1.05	6	2.68	0.61	1.66	0.28
12	Dilli Village	Hook Point	22.5	12	8	9	0.53	0.02	6	2.55	0.16	0.08	0.09

A -Length (km); B - Number of full wader surveys; C - Number of additional Pied Oystercatcher surveys; D - Number of beach activity surveys; E - Mean number of vehicles/km;F - Mean number of campsites/km; G - Number of species; H - Mean number of waders/km; I - Mean number of Pied Oystercatchers/km; J - Mean number of Red-capped Plovers/km;K - Mean number of Masked Lapwings/km.

Wader abundance and distribution

There are marked differences in the numbers of waders present across transects (Table 1). Species diversity and abundance of waders is greatest at the northern and southern ends of the island. The two northwest coast transects (transects 1 and 2), which have by far the highest densities of waders, are prime sites because of the wide sheltered beaches. Transect 1, including the mouth of Wathumba Creek and its associated nutrient-rich spit, attracts large concentrations of waders such as the Bar-tailed Godwit that are rarely seen on the eastern beaches. Transect 2 has a greater diversity of wader species but fewer individuals than Transect 1. Because of the major habitat difference between the east and west coasts, these transects are considered separately in subsequent analyses.

In addition to data on total wader numbers, Table 1 presents data on abundance of Masked Lapwings, Red-capped Plovers and Pied Oystercatchers (the principal species of waders on the east coast of the island). The general pattern of distribution of Masked Lapwings differs from that of both Red-capped Plovers and Pied Oystercatchers. On stretches of the beach where Red-capped Plovers and Pied Oystercatchers are most common, there are few Masked Lapwings, and where Masked Lapwings are most common, there are fewer Red-capped Plovers and Pied Oystercatchers.

Is there a correlation between bird numbers and levels of beach activity?

Spearman rank correlation coefficients were calculated between the abundance of the principal wader species and the levels of vehicle and camping activity for each transect. A two-tailed Student's t-test was used to determine the significance of the correlations.

TABLE 2. Spearman rank correlation coefficient values for Pied Oystercatchers, Red-capped Plovers and Masked Lapwings for the east coast of Fraser Island.

	Pied Oystercatcher	Red-capped Plover	Masked Lapwing
Vehicle	-0.426	-0.355	0.201
Campsite	-0.438	-0.241	0.366

There was a significant negative correlation between the numbers of Pied Oystercatchers (Table 2) and the rank of vehicle use ($t = -6.6756$, $p<0.001$, $df=202$). There was also a significant negative correlation between the numbers of Pied Oystercatchers and the rank of the number of campsites ($t = -6.911$, $p<0.001$, $df=202$). Not surprisingly there was a strong positive correlation between campsites and vehicles ($r=0.886$). This high correlation between campsites and vehicles confounds the interpretation of results (i.e. either

vehicles or camping activity or both could be responsible for the reduction in bird numbers).

There was also a significant negative correlation between the numbers of Red-capped Plovers (Table 2) and rank of vehicle use ($t= -3.9827$, $p<0.001$, $df=111$), and Red-capped Plovers and rank of campsites ($t= -2.6044$, $p<0.001$, $df=111$). As was the case with Pied Oystercatchers, the data suggest that either vehicles or camping activity may be negatively affecting Red-capped Plovers.

The number of Masked Lapwings (Table 2) shows a significant positive correlation with the rank of vehicle use ($t=2.0824$, $p<0.001$, $df=104$), as well as with the rank of the number of campsites ($t=3.9914$, $p<0.001$, $df=104$). This result contrasts with the results for both Red-capped Plovers and Pied Oystercatchers.

Wader location across beach

There were marked differences in the sections of the beach frequented by the three major species (Table 3). Pied Oystercatchers were largely observed at or close to the water's edge, Red-capped Plovers were concentrated around the water's edge and mid-beach, and Masked Lapwings were evenly spread across the beach zones and foredunes.

TABLE 3. Wader location across beach.

Percentage of individuals in each location	Number of observations	Foredune	Upper beach	Mid-beach	Water's Edge
Masked Lapwing	244	16	28	29	27
Red-capped Plover	358	4	10	22	64
Pied Oystercatcher	216	5.5	5.5	7	82

DISCUSSION

The data suggest that waders on the east coast of Fraser Island are being affected by beach activity. The distributions of Pied Oystercatchers and Red-capped Plovers are negatively correlated with levels of vehicle and camping activity, whereas for Masked Plovers the reverse is true.

Pied Oystercatchers

The sand beaches of Fraser Island provide extensive areas of apparently suitable habitat for Pied Oystercatchers. Pipis *Donax deltoides*, which are their principal food, are common along the east coast. The grassy foredunes, which

provide a vantage point with good visibility, are the favoured nesting areas on sandy beaches (Marchant & Higgins 1993). Despite this abundance of apparently suitable habitat, Pied Oystercatcher densities on Fraser Island are now low compared to those in other areas (McFarland 1993), and their distribution is patchy. In 1984-85 Pied Oystercatchers were seen regularly between Eurong and Dundubara (R.H. pers.obs.) where few were seen in this study or in 1988 (McFarland 1993). Densities recorded in this study are similar to those found by McFarland (1993) seven years previously. We recorded an average of sixteen birds between Hook Point and North Ngkala Rocks compared to an average of nineteen birds between Hook Point and Ocean Lake (5 km south of North Ngkala Rocks) in 1988 (McFarland 1993). In contrast, Makin (1968) recorded more than twelve birds over the 16 km between Sandy Cape Spit and North Ngkala Rocks, while in this study only an average of seven birds were recorded over the longer 26 km stretch between Sandy Cape Lighthouse and North Ngkala Rocks (a decline of over 60%). This suggests that a decline in Pied Oystercatcher numbers most probably occurred at some time during the 1970's and early 1980's.

Vehicles could directly affect the distribution of waders, either by continued disturbance prompting the birds to leave the area, or by strikes resulting in mortality of birds. The Pipis on which Pied Oystercatchers feed are concentrated along the water's edge and most birds were recorded in this area. Their distribution also coincides with the area of hard sand along which most vehicles travel, often at high speed, and there are three records of vehicle strikes in the last year between Eurong and Dilli Village (Cemone Hedges, pers. comm.). Given the low population densities of Pied Oystercatchers on Fraser Island, this mortality represents a significant impact on the population. However, the birds seem to take little notice of vehicles driving along the beach and generally do not take flight or even move away as the vehicles pass. More detailed investigation would be needed to determine if vehicle induced disturbance affects the foraging efficiency of this species. Vehicles could also affect Pied Oystercatchers indirectly by impacting on the abundance of Pipis. However this seems unlikely, as general observation during this study was that Pipi beds were common all along the east coast (Pipi beds are easily recognisable by the characteristic 'bumps' in the hard sand near the water's edge). Vehicles, camping and associated pedestrian traffic on the foredunes could have a negative impact on Pied Oystercatchers through disturbance to nesting sites. The nesting site fidelity of this species (Marchant & Higgins, 1993) would make it especially sensitive to such disturbance.

Red-capped Plovers

Red-capped Plovers are more widely distributed along the east coast of Fraser Island than Pied Oystercatchers, where they favour areas of wide, gently sloping beach. The negative correlation of the distribution of this species and levels of recreational use of beaches cannot be explained by coincidental changes in habitat, for there are extensive areas of apparently suitable habitat with very

low densities of plovers. In comparison to Pied Oystercatchers, their catholic diet (Marchant & Higgins, 1993), more widespread distribution across the beach and speed of evasive movement make them less susceptible to vehicle strikes. Disturbance to nesting sites on the dunes could impact on island populations of this species.

Masked Lapwings

These plovers prefer areas of short grass, often at the margins of shallow wetlands, for both feeding and nesting (Marchant & Higgins, 1993), and camping activity on the foredunes and swales is increasing the area of favourable habitat for this species. Their tolerance of close contact with humans and effective nest defence strategies mean that they are less likely to be affected by camping, while their more widespread distribution across the beach renders them less likely to be affected by vehicle strikes.

CONCLUSION

The beaches north of Ngkala Rocks and between Dilli Village and Eurong offer the best prospect of a secure future for Pied Oystercatchers and Red-capped Plovers on the east coast of Fraser Island. Camping activity, which is currently low in these areas (Hockings & Twyford, 1997), should be prohibited or strictly controlled along these stretches of the Fraser Island coastline. In contrast, Masked Lapwings are likely to prosper in association with beach camping developments along the central east coast of the island.

ACKNOWLEDGEMENTS

The District Ranger, Keith Twyford, provided encouragement and support for this project, including access to vehicles and assistance with bird surveys. Damian Head, Niki Price, Dave Redman and many others provided assistance with wader surveys. Bill Carter, Greg Baxter and David McFarland provided useful comments on the draft manuscript.

REFERENCES

ANON. 1994. The Bell Tolls for Oystercatchers. *Moonbi 86:3,* 12 December.

ANON. 1995. Of Birds and Vehicle Beach Kills How Many Oystercatchers. *Moonbi* 3 June.

BUICK, A. & PATON, D. 1989. Impact of Off-Road Vehicles on the Nesting Success of Hooded Plovers *Charadrius rubricollis* in the Coorong Region of South Australia. *Emu* 89:159-172.

COOPER, J., SOMMERS, R. & PRINGLE, J. 1976. Conservation of Coastal Habitats of Waders in the South-Western Cape, South Africa. *Biological Conservation* 10:239-247.

GODFREY, P. & GODFREY, M. 1981. Ecological Effects of Off-Road Vehicles on Cape Cod. *Oceanus* 23:56-67.

HOCKINGS, M. & TWYFORD, K. 1997. Assessment and Management of Beach Camping Impacts within Fraser Island World Heritage Area, South-east Queensland. *Australian Journal of Environmental Management* 41:26-39.

JEFFERY, G. 1987. Influence of Human Disturbance on the Nesting Success of African Black Oystercatchers. *African Journal of Wildlife Research* 17:71-72.

MCFARLAND, D. 1993. Notes on the Pied Oystercatcher *Haematopus longirostris* in the Cooloola-Fraser Island area. *Sunbird* 23:110-113.

MAKIN, D. 1968. Birds of Sandy Cape, Fraser Island. *Queensland Naturalist* 19:31-42.

MARCHANT, S. & HIGGINS, P.J. (Eds.) 1993. *Handbook of Australian, New Zealand and Antarctic Birds*, Vol 2: *Raptors to Lapwings*. Melbourne: Oxford Univesity Press.

MELVIN, S., GRIFFIN, C. & MACIVOR, L. 1991. Recovery Strategies for Piping Plovers in Managed Coastal Landscapes. *Coastal Management* 19:21-34.

MELVIN, S., HECHT, A. & GRIFFIN, C. 1994. Piping Plover Mortalities Caused by Off-Road Vehicles on Atlantic Coast Beaches. *Wildlife Society Bulletin* 22:409-414.

NEWMAN, M. 1992. Pied Oystercatcher Breeding at Mortimer Bay, Tasmania. *Emu* 92:87-92.

QUEENSLAND DEPARTMENT OF ENVIRONMENT AND HERITAGE. 1992. *Annual Report 1991-1992*. Brisbane: Queensland Government.

QUEENSLAND DEPARTMENT OF ENVIRONMENT AND HERITAGE. 1994. *Annual Report 1993.-1994*. Brisbane: Queensland Government.

QUEENSLAND GOVERNMENT. 1994. *Great Sandy Region Management Plan*. Brisbane: Queensland Government.

WILSON, G.W. 1994. The Status of the Pied Oystercatcher *Haematopus longirostris* on the Coastal Flats of Keppel Sands and Joskeleigh on the Capricorn Coast of Central Queensland. *Sunbird* 24:73-79.

*FIONA FISHER, *MARC HOCKINGS & ROD HOBSON, School of Natural and Rural Systems Management, University of Queensland, Gatton College, Q 4345.*

** author to whom correspondence should be addressed*

WHISKERED TERN BREEDING IN SOUTH-EAST QUEENSLAND

RICHARD JOHNSON and ROD HOBSON

The Whiskered Tern *Chlidonias hybridus* is found principally on freshwater wetlands over much of Africa, Eurasia and Australasia (Higgins & Davies 1996). In Australia the species is represented by the race *C. h. javanicus*, which breeds in Australia during spring and summer and disperses after breeding to northern Australia, Indonesia and New Guinea. Breeding occurs mostly south of 25° S and in particular within the Murray-Darling Basin, though there are records of breeding in northern Western Australia (Higgins & Davies 1996, Blakers *et al.* 1984).

Little has been published on the breeding of this species in Queensland. Neilson (1963) reported breeding at Lake Bullawarra, 25 km WNW of Thargomindah (27°53'S, 143°36'E), simply noting that "Marsh Terns" and several other species were "common and breed freely". Beruldsen (1980) stated that there were a few breeding records from south-west Queensland; this was based on information supplied by Neilson and others (G. Beruldsen pers. comm.). Storr (1984) noted that there were records from the Cunnamulla and Thargomindah districts but provided no dates or more specific locations. It is notable that at the Dynevor Lakes (a chain of wetlands including Lake Bindegolly (28°02'S, 144°10'E), lying not far from Lake Bullawarra) large numbers of Whiskered Terns are sometimes present, including birds in breeding plumage, but the species is not known to breed there (Corben 1972, M. Handley pers. comm.).

The few records from southwestern Queensland may be an underestimate of breeding there, as during conditions conducive to breeding (following heavy rains) the region is often inaccessible to observers for protracted periods. Nevertheless, the absence of breeding records for this conspicuous visitor to water bodies which also attract human visitors, including ornithologists, suggests that the Whiskered Tern breeds only very infrequently in Queensland despite the many records of birds in breeding plumage during spring and summer in other parts of the state (Garnett & Cox 1983, Blakers *et al.* 1984, Higgins & Davies 1996). In this note we describe nesting by Whiskered Terns on three wetlands in the Lockyer Valley, about 90 km west of Brisbane. As far as we can determine these represent the first recorded instances of breeding in south-east Queensland.

In late November 1995 heavy rain in the Lockyer Valley broke a three to four year drought. One happy consequence of this was the filling of many wetlands, both natural and artificial, that had been dry for up to three years. Among the many waterbirds attracted to the area were large numbers of Whiskered Terns. Nesting occurred at three previously dry locations: Seven-Mile Lagoon (27°27' S, 152°26' E), Karrasch's Dam (27°34' S, 152°16' E) and Hood's Lagoon (27°32' S,

152°07' E). Seven-Mile Lagoon is a natural drainage depression filled by local run-off and in very wet years by overflow from the nearby Atkinson's Dam. When full it covers some hundreds of hectares. Karrasch's Dam and Hood's Lagoon are farm irrigation and stock watering impoundments. When full, the former covers about 12 ha and the latter about 5 ha. All three wetlands are surrounded by cattle pasture and when dry the basins are grazed. By mid-December the three wetlands were large expanses of open water with extensive areas of emergent or floating aquatic vegetation present, most notably mats of Water Primrose *Ludwigia peploides*.

The exact date of commencement of nesting is not known but by 29 December many terns and several nests were present at Karrasch's Dam (M. Nuis, pers. comm.). On 8 January 1996 one of us (RH) waded out to inspect two nests at Karrasch's Dam; they contained two and three eggs. About fifty pairs of terns were present at the time. A visit to Seven-Mile Lagoon on the same day revealed 150-200 terns including many birds sitting on nests on rafts of Water Primrose. On 10 January there were 70-80 terns at Karrasch's Dam and 38 nests were counted, while at Hood's Lagoon 32 terns and 11 nests were noted. At all three sites at this time many birds were seen to carry nest material. The large size of Seven-Mile Lagoon precluded an accurate nest count but results from the other sites, where breeding pairs seemed to account for most of the terns present, suggest that up to 100 nests may have been present.

Nests were examined more closely at Karrasch's Dam on 13 January, using a canoe for access. At this site the water depth under the nests was 1.0-1.2 m. The nests were low floating platforms 0.8-0.9 m in diameter, constructed principally of fresh stems of a rush *Eleocharis* sp. and anchored to aquatic vegetation, most commonly to mats of Water Primrose. A central low mound about 8 to 10 cm high contained a shallow depression in which the eggs were laid. Of seventeen nests examined, ten contained two eggs and seven contained three eggs. The eggs were light brown with irregular dark brown spots and blotches. The smallest distance between adjacent nests was about 3 m.

Higgins & Davies (1996) indicate that the entire breeding cycle in the Whiskered Tern may last 40 days. The colonies described here were not monitored closely. However, by 18 February the colony at Karrasch's Dam was reduced to about 30 birds including three volant juveniles. Several well-grown young were seen to swim from the nest upon being disturbed at this time. At Hood's Lagoon on 4 March, four volant juveniles and two downy young outside the nest were seen. Of the latter, one was seen to be resting on a lily pad while the other was swimming nearby.

Other studies have shown that birds rapidly leave the nesting area after the young are fledged (Higgins & Davies 1996), and this was borne out at Karrasch's

Dam and Hood's Lagoon where birds were absent by the end of February. On the much larger Seven-Mile Lagoon, however, Whiskered Terns were still present as late as 26 May, following flooding rains earlier that month. No measures of breeding success were made but one abandoned clutch of three eggs was found at Karrasch's Dam.

If, as we believe, these are the first records of Whiskered Terns breeding in south-east Queensland and among few for the state, interesting questions are raised as to why this should be so. As we suggest earlier, it is unlikely that the lack of records simply reflects a lack of observers at the right time, at least in the well-populated coastal and sub-coastal parts of the state. During the breeding season large numbers of Whiskered Terns, including many birds in breeding plumage, are seen over much of the state. The species is typically associated with shallow freshwater wetlands, either temporary or permanent (Higgins & Davies 1996), though Fjeldsa (1985) argued that the species was part of a waterbird community most closely associated with deep, perennial wetlands. In either case there is an association with the presence of much submerged and emergent vegetation. Wetlands of this type would appear to be widely distributed, at least seasonally, in Queensland. Our observations may represent opportunistic use of a newly available resource, but irregular and unpredictable flooding is the pattern throughout much of the continent. Such occurrences do not, on present knowledge, always lead to breeding by Whiskered Terns, even in areas where they are regularly seen. The environmental conditions triggering breeding in this species may be more exacting and less well known than the current literature would suggest. This has implications for the conservation of the species in Australia for it may rely on a small subset of the available wetlands for breeding sites.

REFERENCES

BERULDSEN, G. 1980. *A Field Guide to Nests and Eggs of Australian Birds.* Brisbane: Rigby.

BLAKERS, M., DAVIES, S.J.J.F. & REILLY, P.N. 1984. *The Atlas of Australian Birds.* Melbourne: Melbourne University Press.

CORBEN, C. 1972. Notes on waders, gulls and terns in south west Queensland: summer 1971-72. *Sunbird* 3: 80-84.

FJELDSA, J. 1985. Classification of waterbird communities in south-eastern Australia. *Emu* 85: 141-149.

GARNETT, S. & COX, J. 1983. *Birds of Townsville Town Common.* Townsville: Authors.

HIGGINS, P.J. & DAVIES, S.J.J.F. 1996. *Handbook of Australian, New Zealand and Antarctic Birds.* Vol. 3: *Snipe to Pigeons.* Melbourne: Oxford University Press.

NEILSON, L. 1963. Birds of Lake Bullawarra, south-west Queensland. *Aust. Bird Watcher* 2: 58-59.
STORR, G.M. 1984. Revised List of Queensland Birds. *Rec. West. Aust. Mus.* Suppl. 19: 1-189.

RICHARD JOHNSON, 21 Murry St, Gatton, Q 4343.
RODNEY HOBSON, 31 Webb St, Toowoomba, Q 4350.

A NORTH QUEENSLAND SPECIMEN OF LONG-TAILED JAEGER *STERCORARIUS LONGICAUDUS*

J.A. McLEAN

On 17 February 1996, a freshly dead specimen of the Long-tailed Jaeger *Stercorarius longicaudus* was found a few metres above high water mark at Finch Bay (15° 28'S, 145° 17'E), Cooktown. Weather conditions prevailing at the time of and prior to the find were fine with a light to moderate south-east trade wind.

The Long-tailed Jaeger is the most oceanic and least piratical of its congeners (Cramp & Simmons 1982). It breeds in scattered Arctic colonies and winters at sea in the southern hemisphere, occasionally reaching Australian and New Zealand waters (Pizzey 1997). While most literature cites the Long-tailed Jaeger as a rare Palearctic summer vagrant in the Australasian region, other authors consider the species to be much more common than once thought; and the sightings off New South Wales in 1985 of up to 20 in a day support this notion (Simpson & Day 1996). Unprecedented numbers recorded from other Australian offshore areas during 1983-84 coincided with a major influx in northern New Zealand (see Higgins & Davies 1996). Of 52 birds off south-eastern Australia, 41 were recorded over continental slope, nine were over open ocean more than 2000 m deep, and two were over continental shelf (Higgins & Davies 1996). The apparent paucity of records from Queensland include: Gulf of Carpentaria (Slater *et al.* 1990); singles at Michaelmas Cay in 1983 and Stradbroke Island in April 1973 (Higgins & Davies 1996); and two off Cape Moreton on 29 November 1986 (Redhead 1988). This specimen record has been accepted by the QOSI Records Appraisal Committee.

The Cooktown specimen was donated to the Queensland Museum on 20 February 1996. Details of the specimen are as follows: QMO.30583, location Cooktown, subadult female (approximately 3-4 years of age). Head and neck areas: forehead, crown and lores mottled and flecked dark brown-black; cheeks, chin and throat finely mottled pale brown on white; neck and nape finely mottled pale brown on white; and a small black patch near the central anterior of the neck. Upperparts: mantle and back, greyish-brown with small pale indistinct traverse scallops; rump grading to blackish tone; tail blackish, base tinged brown, two pointed central feathers projecting 2 cm beyond the rest of the tail. Upperwing areas: base of scapulars, adjoining the mantle, has a longitudal pale grey-white streak (when the wing is slightly spread); secondaries, greater and lesser coverts dark grey tinged brown; primaries dark grey-black, grading to black at tips, with a distinct white shaft noticeable along the longest anterior primary, less conspicuous on the following four primaries; small indistinct pale greyish crescents along the leading edge of both wings. Underparts: breast and belly, whitish interspersed with pale yellow; undertail coverts with grey patches; tail dark grey-black. Underwing area: primaries dark grey with black hind margins,

each with a conspicuous white shaft, particularly along the longest anterior primary; secondaries brown-dark grey, grading to black tips; anterior coverts pale grey; posterior coverts blackish. Soft parts: bill black, with daylight noticeable through the longitudal nasal slit; legs blackish, but paler than the black feet. Measurements: mass 157 g, total length 395 mm, wingspan 985 mm, wing 305 mm, tail 155 mm (some damage), head 68.8 mm, culmen (to skull) 33 mm, tarsus 47 mm; not moulting.

The Long-tailed Jaeger specimen detailed here represents the second *Stercorarius* record for the Cooktown area; the previous bird was either an Arctic Jaeger *S. parasiticus* or Pomarine Jaeger *S. pomarinus*, which remained for one week from 12 March 1991 (McLean 1994).

ACKNOWLEDGEMENTS

My thanks to G. Czechura, Dr G. Ingram, H. Janetzki and J. Marney of the Queensland Museum for supplying statistics of the specimen; to Dr W.E. Boles (of the Australian Museum) and P. Britton for literature supplied; and to L. Roberts and A. Steeles for their initial interest.

REFERENCES

CRAMP, S. & SIMMONS, K.E.L. (Eds.). 1982. *The Birds of the Western Palearctic. Vol. 3, Waders to Gulls.* Oxford: Oxford University Press.

HIGGINS, P.J. & DAVIES, S.J.J.F. (Eds.). 1996. *Handbook of Australian, New Zealand & Antarctic Birds. Vol. 3, Snipe to Pigeons.* Melbourne: Oxford University Press.

McLEAN, J.A. 1994. The Charadriiformes of the lower Endeavour and Annan rivers, North Queensland. *Sunbird* 24: 49-60.

PIZZEY, G. & KNIGHT, F. 1997. *Field Guide to the Birds of Australia.* Sydney: Angus & Robertson.

REDHEAD, D.I. 1988. The Queensland Ornithological Society Bird Report, 1986. *Sunbird* 18: 28-51.

SIMPSON, K. & DAY, N. 1996. *Field Guide to the Birds of Australia*. Melbourne: Penguin Books.

SLATER, P., SLATER, P. & SLATER, R. 1990. *The Slater Field Guide to Australian Birds.* Sydney: Weldon.

J.A. McLEAN, Box 203, Cooktown, Q 4871.

ORIENTAL CUCKOO AT BRIBIE ISLAND, SOUTH-EAST QUEENSLAND

IVAN FIEN and JOYCE FIEN

At approximately 1700h EST on 1 December 1996, four Oriental Cuckoos *Cuculus saturatus* were observed on the Pumicestone Passage side of Bribie Island (27° 05' 30" S, 153° 09' 30" E). There was no sign of the birds when the site was visited the next day.

Pizzey & Knight (1997) say that this species occurs singly, in pairs to small gatherings, and is generally uncommon. Frith (1976) describes the bird as not often seen but probably a common migrant to northern Australia, occurring singly, in pairs or in fours or fives. Slater *et al.* (1986) say that it is uncommon with periodic irruptions of juveniles. According to Storr (1984), this Palaearctic migrant is uncommon in humid and subhumid zones, frequenting open forests and the edges of scrubs and closed forests, mostly November-April.

The birds were observed for 30 minutes at a mean range of about 100 metres. They were followed over approximately half a kilometre of beach and the grey breast, bold ventral barring on a white ground, grey upper parts, yellow legs and yellow eye ring were clearly seen. No plumage variations suggesting age differences were noted and the birds were not heard to call.

For much of the time all four birds were in view together, although they were only loosely associated as a party. They were active and appeared to be feeding in low succulents growing just above high water mark. Several times birds were seen sitting on the sand of the frontal dunes and at times perched in Casuarinas *Casuarina equisetifolia*. One bird which had been perched in a dead Casuarina flew over the observers and immediately returned to the tree.

REFERENCES

FRITH, H.J. (Ed.) 1976. *Complete Book of Australian Birds.* Sydney: Reader's Digest.

PIZZEY, G. & KNIGHT, F. 1997. *A Field Guide to the Birds of Australia*. Sydney: Collins.

SLATER, P., SLATER, P. & SLATER, R. 1986. *The Slater Field Guide to Australian Birds.* Sydney: Rigby.

STORR, G.M. 1984. Revised List of Queensland Birds. *Rec.West Aust. Mus.* Suppl.19:1-189.

IVAN FIEN & JOYCE FIEN, 30 Murray Court, Beachmere, Q 4510.

BOOK REVIEW

JOHN GOULD IN AUSTRALIA : letters and drawings with a catalogue of manuscripts, correspondence and drawings relating to the birds and mammals of Australia held in The Natural History Museum, London. Ann Datta, The Miegunyah Press (Melbourne University Press), Melbourne, 1997, 502 pages, $80.

The first 287 pages are subtitled 'John Gould His Life and Times', and this description serves to identify the book's character and appeal. Of the approximately one-quarter of a million words in this splendid tome, in the biographical genre, almost half involve an appendix entitled 'Letters, manuscripts and drawings'; but, even this apparently 'dry' collection of memorabilia contains interesting biographical information on many prominent persons of his exciting times.

The many illustrations will appeal to lovers of Gould's art, and these various colour reproductions are of an excellent quality. Many of his drawings, in pencil, watercolour, crayon and chalk, are published here for the first time, and a remarkable sequence of illustrations traces development from the actual specimen and John Gould's sketch to the published lithographic plate. Inevitably, perhaps, the controversial question of 'ownership' of many of these plates is explored in depth, and one concludes that plates bearing his name and that of Edward Lear, Josef Wolf, Henry Richter or his wife Elizabeth were typically a combination of artist (John Gould) and draughtsman. All four typographical errors noted in this meticulous work are insignificant, of the than/that, to/from or missing apostrophe type.

Gould's various books included *The Birds of Australia, The Mammals of Australia, The Birds of Asia, A Century of Birds, The Birds of Europe, The Birds of New Guinea* and *The Birds of Great Britain,* although he is best known for his Australian contributions and several have referred to him as the father of Australian ornithology. His numerous publications included over 300 scientific papers and he described 193 new Australian bird species. In 1837, only six days after receipt of the specimens, he described twelve of Charles Darwin's Galapagos finches; and it is widely believed that it was as a direct result of Gould's identifications that Darwin was able to work out retrospectively that birds in isolation had evolved a remarkable disparity in the form of their beaks in order to feed off different types of vegetation. Gould was responsible for the *Birds* volume of *Zoology of the Beagle* and the sheer range of tasks that he performed is impressive. He was a perfectionist and a very able businessman, leaving 80 000 pounds when he died at the age of 76 years.

Gould's nineteen month visit to Australia in 1838 was his only lengthy field trip

outside the British Isles, and this special relationship with Australia continued to at least 1858 when more than 2000 bird skins were dispatched to the National Museum of Melbourne. In November 1836, having seen Darwin's various Australian specimens, Gould wrote to Sir William Jardine "would not a work on the Birds of Australia be interesting". *The Birds of Australia* appeared in 1840-48, with supplements until 1869. John Gilbert and Frederick Strange were engaged by Gould as collectors in Australia, and descriptions of Albert's Lyrebird and Victoria's Riflebird, both named for the British royalty of the times, had to wait until the appearance of these later supplements.

Gould's formal education ended in 1817 when, at 13 years of age, he joined his father in the royal gardens at Windsor Castle; and, from these humble origins, he became Curator at the Museum of the Zoological Society of London only eleven years later. When only 21 years of age he was the first taxidermist to enjoy royal patronage in Britain and some three years later he married Elizabeth. This profoundly happy couple had eight children, and until her death in 1841 their joint skills were employed to create the publications for which John Gould became famous. She painted birds with great skill and delicacy, attempting to portray them in a lifelike manner at a time when birds were usually portrayed in stiff profile. Mrs Gould's Sunbird from the Himalayas and our own Gouldian Finch were both named for Elizabeth by John.

This lengthy text is punctuated by a wealth of 'nuggets' that provide further insight into the man himself. At sea, en route to Australia, he noted that "many of the gentlemen passed the time in wanton shooting of the seabirds that were invariably attracted to the ship"; while Gould himself preferred to capture and band Black-browed Albatrosses, noting that several ship followers covered in excess of 200 km each day. Though an excellent shot and an avid collector, an encounter with a Black Kite in Australia prompted the comment "I asked myself why should advantage have been taken of the confident disposition implanted in the bird by its Maker". Ever perceptive, and influenced mostly by extensive habitat destruction, he predicted the likely extinction of the Tasmanian Tiger some decades before this occurred.

More used to serious books on environmental or ornithological matters, I thoroughly enjoyed this eminently readable work which I strongly recommend to others.

PETER L. BRITTON, All Souls' & St Gabriel's School, Charters Towers, Q4820.

INSTRUCTIONS TO AUTHORS

The Sunbird is published quarterly by the Queensland Ornithological Society to further the knowledge of birds in Queensland and adjacent northern regions of Australia.

Papers are invited from non-members as well as members on all aspects of ornithology, e.g. life history, taxonomy, distribution, behaviour and ecology. Articles may take the form of major articles on specific birds, birds in specific areas or habitats, or short notes on either birds themselves or the literature on birds, such as reviews of books or comments on published articles.

Submission of a paper implies that the results reported have not been published and are not being considered for publication elsewhere. The editor reserves the right to submit records of rare birds to the Records Appraisal Committee of the Queensland Ornithological Society as a part of the refereeing process.

Manuscripts can be supplied on floppy disk (IBM or MACINTOSH systems in Wordperfect 5.1 or Word 4.0 format) or in typed form on paper. When typed, the manuscript should be double-spaced and two copies sent. Papers longer than four typed A4 pages should have a summary. If needed, help may be given to authors to find relevant literature. Common names, scientific names and order of names should follow Christidis, L. & Boles, W.E. 1994. *The taxonomy and species of birds of Australia and its territories*. RAOU Monograph 2. Intending authors should consult recent issues of *The Sunbird* to see acceptable forms of contributions.

References should be listed in alphabetical order at the end of papers in the following styles; titles of journals will be abbreviated as in the *World List of Scientific Periodicals:*

FLEAY, D.H. 1937. Nesting habits of the brush turkey. *Emu* 36: 153-163.
FRITH, H.J. (Ed.) 1976. Mallee fowl. In *Complete Book of Australian Birds,* pp. 136-137. Sydney: Reader's Digest.
SERVENTY, D., SERVENTY, V.N. & WARHAM, J. 1971. *The Handbook of Australian Sea-birds*. Sydney: Reed.
SLATER, P. 1970. *A Field Guide to Australian Birds. Non-Passerines.* Adelaide: Rigby.

Tables and Figures should be numbered with Arabic numerals. Drawings and diagrams should be in Indian Ink on cartridge paper or tracing paper. If authors cannot arrange suitable drawings, the editor may arrange the drawing of figures and diagrams. Authors may submit photographs (preferably black and white) with their manuscripts.

Reprints may be obtained at cost price by special request.

Manuscripts should be sent to:
Peter Britton (Editor Sunbird), C/- All Souls' and St Gabriel's School, Charters Towers, Queensland, 4820.