An Avifaunal Survey of Littoral Habitats near Ballina, New South Wales

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A systematic account is given of birds recorded during censuses of the coastline (littoral habitats) near Ballina, northern New South Wales, from 1977 to 1979. Eighteen species occurred regularly and an additional 40 species intermittently. Three habitat types were distinguished: beaches, rock platforms and nearshore waters. These were used primarily for feeding and roosting. Number of species and local abundance were influenced by the proximity of the Richmond River estuary.

Censuses of birds inhabiting beaches, rock platforms and nearshore waters were conducted at two sites, Flat Rock and Patches Beach, near Ballina. The locations are shown in a previous paper (Gosper 1981 b, Fig. 1.). Flat Rock (Sand Point) is a low rock platform with connecting sandspit on the coastline 4 km north of the entrance of the Richmond River. It is about 1.4 ha in area and is occasionally inundated at high tide or during rough weather. Patches Beach (in the remainder of the paper termed Patches for brevity) is a 9 km section of an uninterrupted beach extending from Ballina to Evans Head. The censused section commenced about 1.5 km south of the river mouth at South Ballina Beach. The beach runs nearly parallel to the lower reaches of the river and at its northern end is immediately adjacent to the estuary. Patches is an open sandy ocean beach with a low foredune sparsely vegetated on the seaward side, mainly by Hairy Spinifex. *Spinifex hirsutis*.

The three habitat types distinguished were:
Beach: sandy shore extending from the crest of the foredune to the surf, terminating at an imaginary line where the water depth exceeded 20 cm.

Rock Platform: rocky shore extending from the beach (or cliff top) to the surf, terminating at an imaginary line where water depth exceeded 20 cm.

Nearshore waters: marine waters extending from the beach or rock platform seaward for a distance of approximately 500 m.

A total of 77 censuses was conducted on a monthly basis over 31 months from June 1977 to December 1979 (none in May 1979). The two sites were censused on the same or consecutive days with Flat Rock often being visied twice. Both Flat Rock and Patches had been visited irregularly since 1972 (Gosper *et al* 1978, Gosper 1981 b) and other beaches in the district were occasionally visited concurrently with the present survey. Patches was censused on foot, taking from two to three hours depending on conditions and number of birds encountered. Visits to Flat Rock were usually of 20 to 45 minutes duration, sufficient to count birds present or passing nearshore. The timing of censuses was random with respect to time of day, tides and weather conditions. All birds found within the habitat zones defined were counted (see Table 1), excluding Procellariiformes (albatrosses, petrels, shearwaters) and beach-washed seabirds (*cf* Gosper 1981 b). Exact counts or estimates were made using methods described previously (Gosper 1981 a). A summary of the occurrence of species recorded during the survey is given in the systematic list.

To complement data obtained during the survey a series of watches was subsequently carried out in 1981 to monitor local movements of terns, gulls and cormorants in the study area. Morning and evening watches were made from observation points on the coastline: at Patches Beach access (10.5 km south of river mouth) and Flat Rock (4 km north of river mouth) and

TABLE 1

Habitat use: frequency of observation of individual species in each littoral habitat zone i.e. percentage of total censuses of each habitat that each species was recorded. No adjustment is made for species seasonally present (e.g. migrants).

● (<10%) occasional ●● (10-30%) uncommon ●●● (31-60%) frequent ●●●● (>60%) extensive

Bird Species	Littoral habitat zones: Beach	Rock Platform	Nearshore Waters
Australian Pelican	●	●	
Australasian Gannet			●●●●
Great Cormorant	●	●●●●	●●
Pied Cormorant	●	●●●●	●●●●
Little Black Cormorant		●●	●
Little Pied Cormorant		●●	
White-faced Heron	●●	●●	
Straw-necked Ibis	●		
Teal			●
Osprey	●		●
Black-shouldered Kite	●	●	●
Brahminy Kite	●●●●	●	●
Whistling Kite	●●●	●	●
White-bellied Sea Eagle	●		●
Australian Kestrel	●		
Pied Oystercatcher	●●●●		
Sooty Oystercatcher		●●	
Masked Lapwing	●●	●	
Lesser Golden Plover	●●	●	
Mongolian Plover	●●	●●●	
Double Banded Plover	●●	●	
Large Sand Plover	●●	●●	
Red-capped Plover	●●●●	●●●	
Ruddy Turnstone	●●●●	●●●●	
Eastern Curlew	●●		
Whimbrel	●●	●	
Grey-tailed Tattler	●	●●	
Wandering Tattler		●●	
Greenshank		●	

Bird species	Littoral habitat zones: Beach	Rock Platform	Nearshore Waters
Terek Sandpiper	●	●●	
Black-tailed Godwit	●		
Bar-tailed Godwit	●●●●		
Great Knot	●	●	
Sharp-tailed Sandpiper		●●	
Red-necked Stint	●●●	●●●●	
Curlew Sandpiper	●	●●●	
Sanderling	●●	●	
Arctic Jaeger			●
Silver Gull	●●●●	●●●●	●●●
Kelp Gull	●		
White-winged Tern		●	
Gull-billed Tern	●●●●	●●	
Common Tern	●●●	●●●●	●●●●
White-fronted Tern		●	●
Sooty Tern	●		●
Little Tern	●●●●	●●●	●●●●
Crested Tern	●●●●	●●●●	●●●●
Black Noddy		●	●
Feral Pigeon			●
Sacred Kingfisher	●		
Rainbow Bee-eater	●		
Welcome Swallow	●●	●	●
Tree Martin	●		
Richard's Pipit	●●		
Willie Wagtail	●		
White-breasted Woodswallow	●		
Australian Magpie	●		
Torresian Crow	●●●	●	

at the entrance to the Richmond River from the North Wall breakwater. Morning watches commenced from first light and terminated 45 minutes later. The duration of evening watches was 60 minutes terminating at dusk. The direction of birds passing the observation points was plotted i.e. north/south movements along the coastline and movements (east/west) to and from the estuary via the river mouth (see Table 2).

Results and Discussion

Beaches, rock platforms and nearshore waters near Ballina were used regularly by up to 18 species (Table 1). These habitats were important primarily as feeding and roosting areas. Only the Red-capped Plover*, Pied Oystercatcher and Rainbow Bee-eater were found breeding.

* Scientific names of all species referred to in the text are listed in the Systematic List.

The Pied Cormorant, Australasian Gannet, Silver Gull, Crested Tern, Common Tern and Little Tern regularly utilized nearshore waters. Off Ballina the Pied Cormorant, Little Tern and Common Tern feed mainly inshore whereas the Silver Gull, Crested Tern and Australasian Gannet also range well offshore, having been observed 25 km or more to sea in continental shelf waters (J. Izzard, pers. comm.).

Flat Rock was a diurnal and/or high tide roosting site for large numbers of birds inhabiting the coastline in the area and was also a regular feeding place for several species of waders. Roosting assemblages of up to 1 650 terns, gulls, waders and cormorants congregated on the rock platform. It was the main habitat of Sooty Oystercatcher and Wandering Tattler which occurred locally in small numbers. Ruddy Turnstones and Red-necked Stints also regularly foraged there. These species were usually the only waders to be found on the rock platform at low tide.

Beaches were a major feeding habitat for the Pied Oystercatcher, Gull-billed Tern and Sanderling. The Ruddy Turnstone, Bar-tailed Godwit, Red-necked Stint, Double-banded Plover, Red-capped Plover and Silver Gull also foraged regularly on Beaches. Brahminy Kite, Whistling Kite and Torresian Crow commonly scavenged along the coastline. More secluded beaches adjacent to the estuary, particularly the northern end of South Ballina Beach, were also used by roosting terns, gulls and waders.

The avifauna of the coastline near Ballina, both in number of species and local abundance, was influenced by proximity to the estuary of the Richmond River. In casual surveys of other beaches further from the river mouth (e.g. Seven Mile, Broadwater and Jerusalem Creek) fewer species were found and densities of birds were lower. Migrant waders in particular were generally absent from these parts. The absence of offshore islands on this section of the coast may have contributed to the local scarcity of some species.

Birds in the study area moved freely between the nearby estuary and the coastline (and to a lesser extent offshore continental shelf waters) throughout the day, moving back and forth to forage, rest, roost and bring food to young (e.g. Pied Cormorant nesting colony). Flight paths followed the river or passed directly overland between the estuary and the coastline. Terns, gulls and cormorants deserted the coastline for the estuary at night presumably to roost at more secure sites such as island sandbars and training walls. In the late afternoon a steady stream of terns and gulls passing along the coastline and into the estuary, the rate of birds returning to the estuary peaking about sunset. This movement was reversed in the morning with birds leaving the estuary before sunrise and dis-

TABLE 2

Morning/evening movements of four common species along the coastline past Flat Rock and Patches Beach access, and to and from the estuary via the river mouth at the *North Wall breakwater.

	Flat Rock				Patches				North Wall*			
	7-8 August 1981				7-8 August 1981				5 October/27 June 1981			
	NORTH		SOUTH		NORTH		SOUTH		WEST (to)		EAST (from)	
	‡ a.m.	p.m.	a.m.	p.m.	a.m.	p.m.	a.m.	p.m.	a.m.	p.m.	**a.m.	p.m.
Pied Cormorant	21	1	1	23	0	4	3	0	2	40	115+	2
Silver Gull	30	0	0	13	0	5	11	0	0	18	39+	3
Gull-billed Tern	24	3	6	10	0	6	26	0	0	8	0(?)	0
Crested Tern	252+	19	49	126+	1	112+	197+	1	1	480	743+	44

* Count totals relative not absolute as many birds flew directly overland between estuary and coastline and did not follow the river.

‡ Duration of watch: a.m. — 45 minutes from first light.
p.m. — 60 minutes to dusk.

** Morning counts North Wall conservative as insufficient light in first 15 minutes of watch to locate and identify all birds passing.

persing along the coastline and further to sea (Table 2).

Movements of waders were controlled by the tides. Many of the waders which foraged on the estuary at low tide moved to roosts on beaches on the southern side of the estuary and to Flat Rock as the incoming tide forced them from the tidal flats. The reverse movement followed after high water as the flats began to be exposed again and all but a few waders deserted the coastline. Occasionally this pattern of movements was disrupted briefly when flooding in the river caused the tidal flats to remain partly or completely submerged at low water. During such periods many wader species resorted to foraging on the beaches.

Very few birds were found on the coastline during censuses made in rough weather. Observations suggest that during these conditions many birds resorted to the more sheltered estuary and some species even to parks and playing fields in Ballina township.

The coastline in the study area is being subjected to rapidly increasing pressure from human recreational usage. The ready access now available to previously little frequented stretches of coastline (e.g. Patches) by 4-wheel drive vehicle in particular may already be having adverse consequences for some species. For example there was no evidence of successful fledging of young among the resident pairs of Pied Oystercatchers distributed along Patches. The absence of post breeding flocks evident in earlier year (i.e. flocks of 20-25 birds at South Ballina Beach in late summer in 1972-73 when regular visits were first made) may be a further indication of lack of breeding success. Further study is required to assess the situation.

It is also not known what effects the alienation of secluded roosting areas may have on the suitability of the estuary as a wintering area for migrant Palaearctic waders. The combined effects of reclamation of saltmarshes fringing the estuary (mainly for residential uses) and increasing recreational pressure on the adjacent coastline may ultimately eliminate undisturbed roosting areas required by migrant waders.

SYSTEMATIC LIST

Conventions used in the systematic list, including terms describing frequency of observation, follow Gosper (1981 a). For commoner species actual frequency of observation (i.e. percentage of the total censuses that each species was recorded) is shown in parenthesis. Extreme dates for migrants (i.e. first and last dates of observed occurrence) are given only when they extend dates given previously (Gosper 1981 a). Some data from outside the survey period (i.e. from 1972-77 and 1980-81) are included in species summaries where such data supplement those obtained during the survey. These inclusions are indicated in the text.

Australian Pelican *Pelecanus conspicillatus*
Occasional; one or two periodically on beaches.

Australasian Gannet *Morus serrator*
Common visitor (71%) on nearshore waters; numbers highest June to September, census totals mostly 20-45 birds with occasional feeding concentrations up to 80+; few or absent (0-5) January to April; records for all months. Local movements not monitored but southward movements of gannets were observed on a number of evenings e.g. on 28 June 1981 during the last 40 minutes to dusk a total of 418 gannets passed moving south off the North Wall while only one bird passed moving north; the gannets were mostly in parties of <10 flying steadily south in formation. Of 158 gannets counted in censuses from June to October 1977, 47% were adult and 53% immature plumaged. This proportion is similar to that observed off Sydney (Milledge 1977) but differs markedly from that found in the beach-washed assemblage in the study area (*c.f.* Gosper 1981 b).

Great Cormorant *Phalacrocorax carbo*
Moderately common (52%); mostly small numbers (1-9) regularly on Flat Rock or feeding around the rock platform.

Pied Cormorant *P. varius*
Very common (90%) feeding nearshore and resting on rock platforms and beaches (aggregation up to 63); numbers highest in summer. Pied Cormorants moved freely between estuary and adjacent nearshore waters; 150 pairs nested in estuarine mangroves in 1981.

Little Black Cormorant *P. sulcirostris*
Uncommon; few (1-4) Flat Rock fairly regularly, at times feeding around rock platform; large flocks (<120) occasionally flying along coastline.

Little Pied Cormorant *P. melanoleucos*
Uncommon; one or two resting on Flat Rock most visits throughout year; occasionally feeding in rock pools but not seen in nearshore waters.

Least Frigatebird *Fregata ariel*
Not recorded during survey; two over coastline South Ballina Beach 1976 (Gosper 1981 a).

White-faced Heron *Ardea novaehollandiae*
Relatively uncommon on coastline where mostly scattered singly along beaches, fore-dunes and rockplatforms throughout year; once flock of 11 flying nearshore.

Eastern Reef Heron *Egretta sacra*
Not recorded during survey; one Flat Rock 8-9 August 1981.

Straw-necked Ibis *Threskiornis spinicollis*
Occasional; few feeding on sparsely vegetated fore-dunes in rain.

Teal *Anas* sp.
Occasional; seven unidentified teal flying nearshore July 1977.

Osprey *Pandion haliaetus*
Scarce; individuals Patches 26 June 1976, 2 February and 23 May 1981 and Flat Rock 18 March 1978.

Black-shouldered Kite *Elanus notatus*
Occasional; individuals, pairs over coastline.

Brahminy Kite *Haliastur indus*
Moderately common (48%); regularly patrolling beaches throughout year with up to four adults along Patches.

Whistling Kite *H. sphenurus*
Similar to *H. indus* but less regular (30%), occurred throughout the year with occasional concentrations (up to 13) attracted by offal washed up on beach.

White-bellied Sea-Eagle *Haliaeetus leucogaster*
Individuals on coastline; four records, only at irregular intervals.

Australian Kestrel *Falco cenchroides*
Occasional; once over beach and fore-dune.

Pied Oystercatcher *Haematopus longirostris*
Moderately common (40%) resident on long open stretches of beach backed by low frontal dune; mostly pairs, occasionally small parties, distributed along beach; monthly counts up to 17 along Patches with no marked seasonal fluctuation. In earlier years flocks, probably post breeding aggregations, were recorded e.g. 25 South Ballina Beach 18 January 1972; 21 on 3 February 1973. Breeding: display flight and copulation Patches 6 October 1979; two nests on fore-dunes Patches October to December 1973 (Clutch 2-3 eggs).

Sooty Oystercatcher *H. fuliginosus*
Very uncommon to scarce; 13 records of single birds Flat Rock at irregular intervals; outside the survey period small parties (up to 6) recorded infrequently: September 1974, April 1976, March and April 1980; records for all months except October.

Masked Lapwing *Vanellus miles*
Few (1-4) on beaches, rock platforms periodically, sometimes feeding.

Lesser Golden Plover *Pluvialis dominica*
Visitor; uncommon on coastline, small numbers (1-17) mostly resting on beaches, rock platforms at high tide, occasionally feeding; records for most months including winter; larger numbers (<50) roosted at high tide with other waders on beach adjacent to estuary at northern end of South Ballina Beach (outside census area).

Mongolian Plover *Charadrius mongolus*
Visitor; moderately common (48%); roosting flocks (<100 on spit, rock platform at Flat Rock at high tide; mainly late September to April with few (2-16) through rest of year; absent from open beaches such as Patches and seen feeding on coastline only occasionally.

Double-banded Plover *C. bicinctus*
Uncommon but regular visitor mainly March to August on open beaches: usually small numbers but larger counts (up to 46) June-July each year; absent mid-September to January.

Large Sand Plover *C. leschenaultii*
Similar to *C. mongolus*, with which usually associated, but less common (32%); small flocks (<30) mainly September to March with few (1-5) April to August; no records for June; largest group 57 in roosting wader assemblage at South Ballina Beach 20 November 1977.

Red-capped Plover *C. ruficapillus*
Common (70%); mostly pairs, small groups (1-9) scattered along beaches; numbers tended to increase late summer to winter when counts up to 36 along Patches. Breeding: on fore-dune Flat Rock October and March (Clutch 1-2 eggs).

Ruddy Turnstone *Arenaria interpres*
Very common visitor (83%), mainly late August to March; parties, small flocks (mostly <20) feeding on rock platforms, beaches, with high tide roosting assemblages regularly of 100+ at Flat Rock during summer all years (maximum count 125 in October); few (1-20) April to July, present all months.

Eastern Curlew *Numenius madagascariensis*
Visitor; uncommon on coastline; few (mostly 1-4, but up to 30) periodically on beaches mostly at high tide; records for most months but mainly summer; up to 70 regularly in wader assemblage northern end South Ballina Beach.

Whimbrel *N. phaeopus*
Similar occurrence to *N. madagascariensis*.

Grey-tailed Tattler *Tringa brevipes*
Visitor; uncommon on coastline but regularly resorted to Flat Rock at high tide; roosting aggregations up to 110 late August to April, up to 30 through winter; rarely on beaches and seldom feeding on coastline.

Wandering Tattler *T. incana*
Scarce visitor; 13 records (1-2) Flat Rock over the three summers of the survey; has been recorded at this site fairly regularly since 1974 (i.e. six out of eight summers from 1973-74 to 1980-81). Most records August to February; extreme dates 28 August (breeding plumage) and 17 May. *T. incana* showed no tendency to associate with *T. brevipes*. The latter, as with most other waders, deserted Flat Rock for the estuary as the tide fell whereas *incana* remained on the platform at all tides. It differed from *brevipes* by foraging actively along the rock platform edges and in the wave wash.

Greenshank *T. nebularia*
Occasional: single birds at Flat Rock at high tide.

Terek Sandpiper *T. terek*
Visitor; uncommon on coastline; small numbers (mostly <10, occasionally up to 65) with other waders at Flat Rock at high tide, seldom feeding; records for all months except June; extreme dates 30 July and 10 May.

Black-tailed Godwit *Limosa limosa*
One, Patches with *L. lapponica* 18 March 1978.

Bar-tailed Godwit *L. lapponica*
Moderately common visitor (36%); regularly in small numbers (mostly <20) resting or feeding along Patches mainly at high tide; present all year with occasional larger groups (up to 100) October to April; the northern end of South Ballina Beach was a roosting area for up to 330 godwits during summer.

Red Knot *Calidris canutus*
Scarce; five records (1-3) on beaches and rock platforms September, October and April during survey period; eleven additional records from study sites since 1973 with maximum 18 birds Flat Rock 4 October 1976; records September to April (except February) but mainly spring and autumn; extreme dates 12 September and 18 April.

Great Knot *C. tenuirostris*
Not recorded during survey; ten records (1-15) in wader roosting assemblage northern end South Ballina Beach in summer 1972-73, 1973-74.

Sharp-tailed Sandpiper *C. acuminata*
Visitor; very uncommon on coastline; small numbers, occasionally flocks (up to 120) periodically with other waders at Flat Rock at high tide; August to March but most frequent in spring.

Red-necked Stint *C. ruficollis*
Common visitor (62%); regularly in small numbers resting and feeding on beaches, rock-platforms throughout year; parties, small flocks up to 130+ in summer, 54 through winter.

Curlew Sandpiper *C. ferruginea*
Visitor; uncommon on coastline but regularly resorted to Flat Rock at high tide; roosting aggregations up to 240+ in summer, 40 in winter; seldom foraged on coastline.

Sanderling *C. alba*
Scarce visitor (eight records); small numbers (1-25) on beaches, occasionally rock platforms; recorded annually in survey area over eight consecutive summers from 1973-74 to 1980-81; all months September to May; extreme dates 9 September and 23 May.

Arctic Jaeger *Stercorarius parasiticus*
Jaegers *Stercorarius* sp. recorded in small numbers (1-7, eight records) nearshore each summer; extreme dates 8 November and 24 March; specific identification not made in all instances but *S. parasiticus* present on at least four occasions.

Silver Gull *Larus novaehollandiae*
Very common (100%), moderately plentiful along coastline overall with numbers highest late summer to early winter, declining markedly in spring (September to November or December); resting assemblages up to 360+; a few recently fledged juveniles present from late December; nearest breeding station Solitary Island (Lane 1979), 120 km south of Ballina.

Kelp Gull *L. dominicanus*
Two, Patches 26 November 1977 resting on beach, one 5 November 1978 eating fish on beach.

Whiskered Tern *Chlidonias hybrida*
Not recorded during survey; three in breeding plumage Flat Rock 8 November 1980.

White-winged Tern *C. leucoptera*
One Flat Rock 19 December 1977 only occurrence during survey; other records from outside this period: single birds Patches — South Ballina Beach 28 December 1972, 10 November 1974, 18 April 1979 (breeding plumage) and Flat Rock 16 March 1980.

Gull-billed Tern *Gelochelidon nilotica*
Very common (81%); single birds small parties (mostly <8) patrolling beaches (mainly above high tide line) throughout year; recorded most censuses with counts up to 31 Patches; generally little fluctuation in numbers although only a few present during summer 1978-79.

Caspian Tern *Hydroprogne caspia*
Not recorded during survey; single birds South Ballina Beach north of census area 1 January 1972, 26 November 1977.

Common Tern *Sterna hirundo*
Moderately common to common visitor (57%) on coast mainly October to April; small to large numbers feeding over nearshore waters, resting on rock platform and beaches; resting assemblages Flat Rock >175 all summers and apparently increasing each year with maximum 700+ on 3 November 1979; extreme dates (birds retaining/attaining breeding plumage) 8 September and 17 May.

Roseate Tern *S. dougallii*
Not recorded during survey; Flat Rock August-September and October 1976 (Gosper *et al.* 1978).

White-fronted Tern *S. striata*
Scarce visitor; few (1-5) about Flat Rock and breakwaters at river mouth all years; extreme dates 17 June and 6 October; appears to be a regular winter visitor, mainly in small numbers but with occasional minor influxes e.g. in June 1975 up to 50 appeared briefly in the area with several being found dead; approximately 70% were birds in juvenile plumage.

Sooty Tern *S. fuscata*
Two juveniles flying north along Patches in unsettled weather 4 February 1978; two adults and one juvenile twice passed overhead in storm 25 November 1977; the day following the latter observation an adult and two juveniles were found beach-washed between Patches and Broadwater Beach (W. Watson pers. comm.); see Gosper (1981 b) for other beach-washed records for survey area.

Little Tern *S. albifrons*
Moderately common (60%) visitor on coast mainly October to March or April; none recorded July-August during survey but a few Flat Rock through winter months 1976; mostly small numbers (<30) feeding over surf, resting on beaches, rock platforms; resting assemblages up to 130 Flat Rock; plumage changes in summer non-breeding populations in the study area are described in Morris (1979).

Crested Tern *S. bergii*
Very common (100%), plentiful on coastline all year; small to large numbers over nearshore waters, resting on beaches, rock platforms; assemblages (mostly <700 but up to 1 600) regularly at Flat Rock. Courtship feeding and copulation observed between 8 November and 21 January; newly fledged young being fed by adults from 16 January, becoming plentiful by late February and March; nearest breeding stations Juan

and Julia Rocks, 28 km north of Ballina and Solitary Islands, 120 km south (Lane 1979).

Common Noddy *Anous stolidus*

Not recorded during survey; one in weakened condition (later died) Patches 20 December 1975.

Black Noddy *A. minutus*

One, Flat Rock 8-9 April 1977; on first day feeding nearshore in mixed tern assemblage; next afternoon, in cold southerly winds, resting on rock platform and reluctant to flush allowing approach to within 1 m.

Feral Pigeon *Columba livia*

Several flocks totalling 40+ flying south nearshore Patches 30 September 1978; racing pigeons (?).

Sacred Kingfisher *Halcyon sancta*

Occasional; individuals or pairs on beaches mostly in winter, perched on driftwood, sand or overhanging roots.

Rainbow Bee-eater *Merops ornatus*

Few (1-10+) mainly October to December each year about beaches adjacent to heathland, especially where eroded fore-dunes provided nesting sites and perches (overhanging roots). Breeding: nest burrowing from 15 October, attending nest holes 1 December.

Welcome Swallow *Hirundo neoxena*

Uncommon to moderately common; small numbers (mostly <10 but up to 30) about coastline all times of year. During a morning watch from first light at Patches (8 August 1981) a southward movement of swallows was noted, commencing about sunrise. When observations ceased 15 minutes after sunrise, 83 swallows had passed flying low along the beach to the south.

Tree Martin *Cecropis nigricans*

Occasional; twice flocks up to 40+ over fore-dunes and beach; on one occasion many of the birds were landing on the sand which was wet from intermittent showers.

Richard's Pipit *Anthus novaeseelandiae*

Uncommon but few most times of year usually scattered along beach and fore-dune.

Willie Wagtail *Rhipidura leucophrys*

Occasional; individuals on beaches.

White-breasted Woodswallow *Artamus leucorhynchus*

Occasional over fore-dune and beaches; once four seen to land on the sand and appeared to be foraging.

Australian Magpie *Gymnorhina tibicen*

Occasional; up to three on beaches.

Torresian Crow *Corvus orru*

Moderately common; mostly parties (<7) along beaches; sometimes small concentrations (up to 20) attracted by offal washed up; present throughout year.

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