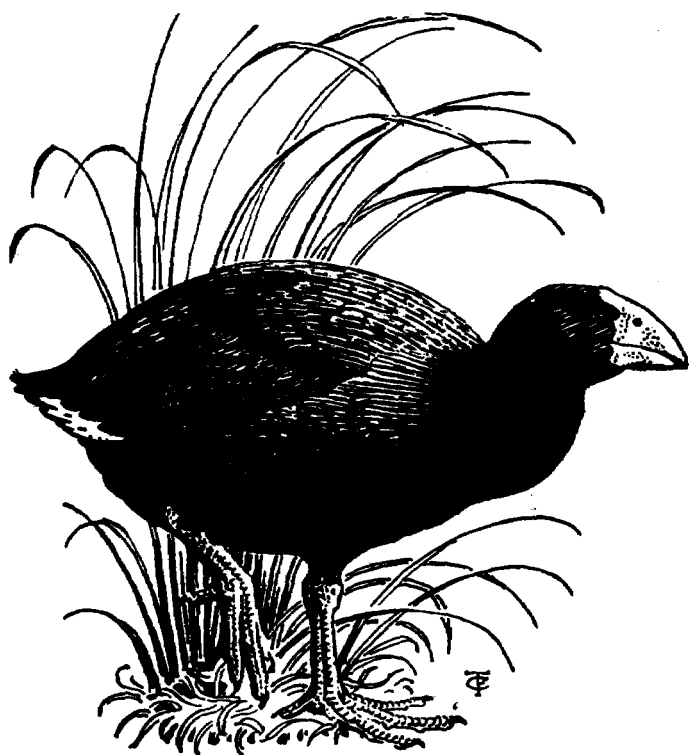


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A NEW SPECIES OF STARLING (STURNIDAE, *Aplonis*) FROM AN ARCHAEOLOGICAL SITE ON HUAHINE, SOCIETY ISLANDS

By DAVID W. STEADMAN

ABSTRACT

A new species of extinct starling, *Aplonis diluvialis*, is described from the Fa'ahia Archaeological Site on Huahine, Society Islands, French Polynesia. *Aplonis diluvialis* was larger than any Indo-Pacific congeners except *A. atrifusca* of Samoa. The only other Eastern Polynesian islands where starlings have been recorded with certainty are Rarotonga (*A. cinerascens*) and Mauke (*A. mavornata*). In pre-human times, however, species of *Aplonis* may have occurred through much of Eastern Polynesia.

INTRODUCTION

Many extinct populations of non-passerine birds have been discovered recently by studying bones from archaeological sites in Eastern Polynesia. Especially prevalent among these extinct birds are rails, pigeons, and parrots (Steadman 1985, 1987, 1988, 1989; Steadman & Olson 1985; Steadman & Zarriello 1987). Until now, the only extinct populations of passerine birds known from fossils in Eastern Polynesia is a monarchine flycatcher (*Myiagra* sp.) from Ua Huka, Marquesas (Steadman 1989). The main reason for this scarcity is that the small bones of passerines seldom are retained in the ¼ inch (6 mm) or ½ inch (13 mm) mesh screens that generally have been used to sieve archaeological sediments. This situation contrasts markedly with that in Hawaii, where thousands of bones of extinct passerines have been collected with the use of 1/16 inch (1.5 mm) mesh screens (James *et al.* 1987).

Four recently excavated bones from Fa'ahia Archaeological Site on Huahine, Society Islands (Fig. 1, 2) provide a glimpse of the passerines that lived during the early Polynesian occupation of the island. Two of these bones (a humerus and ulna) do not seem to agree with any currently available

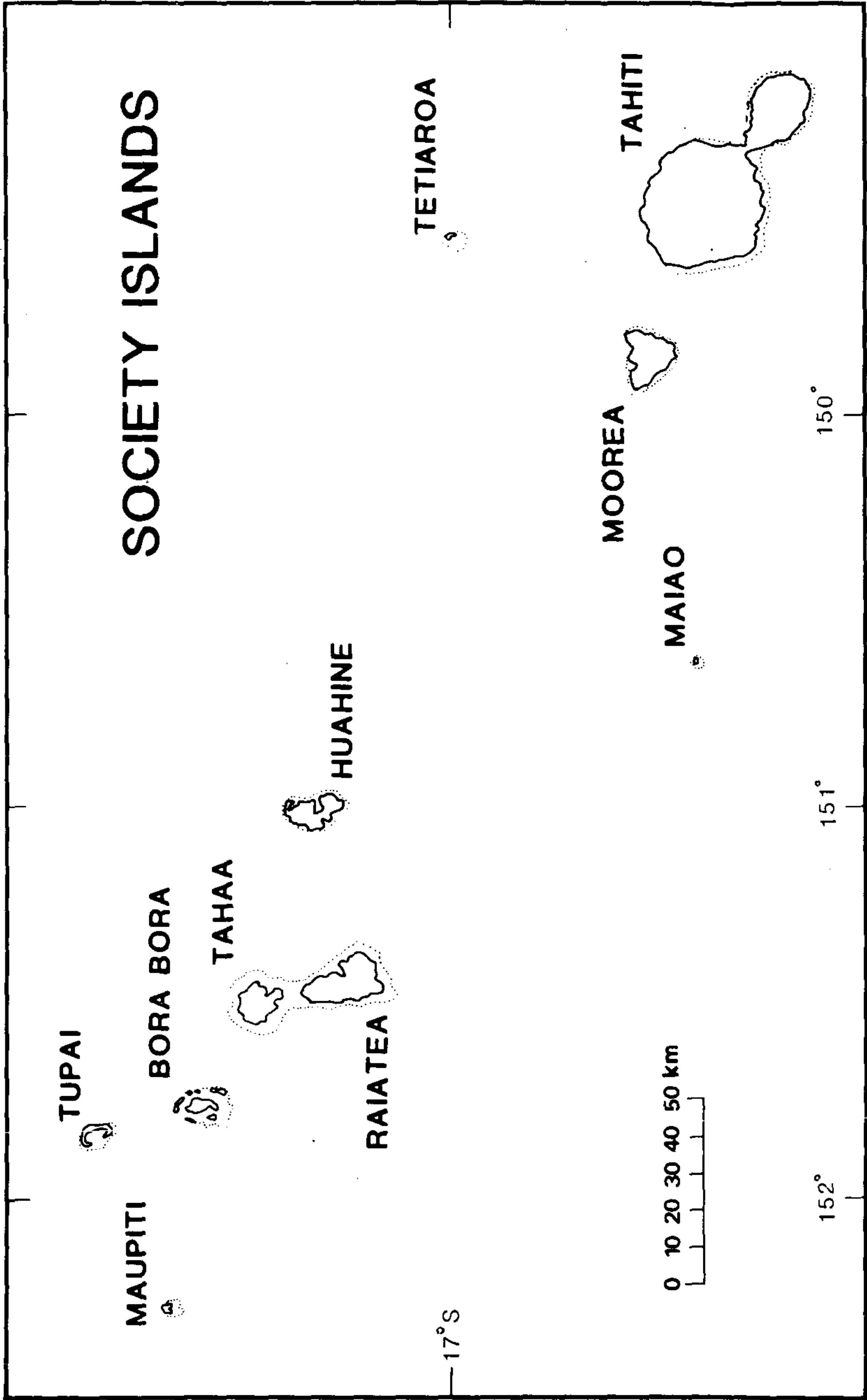


FIGURE 1 — The Society Islands

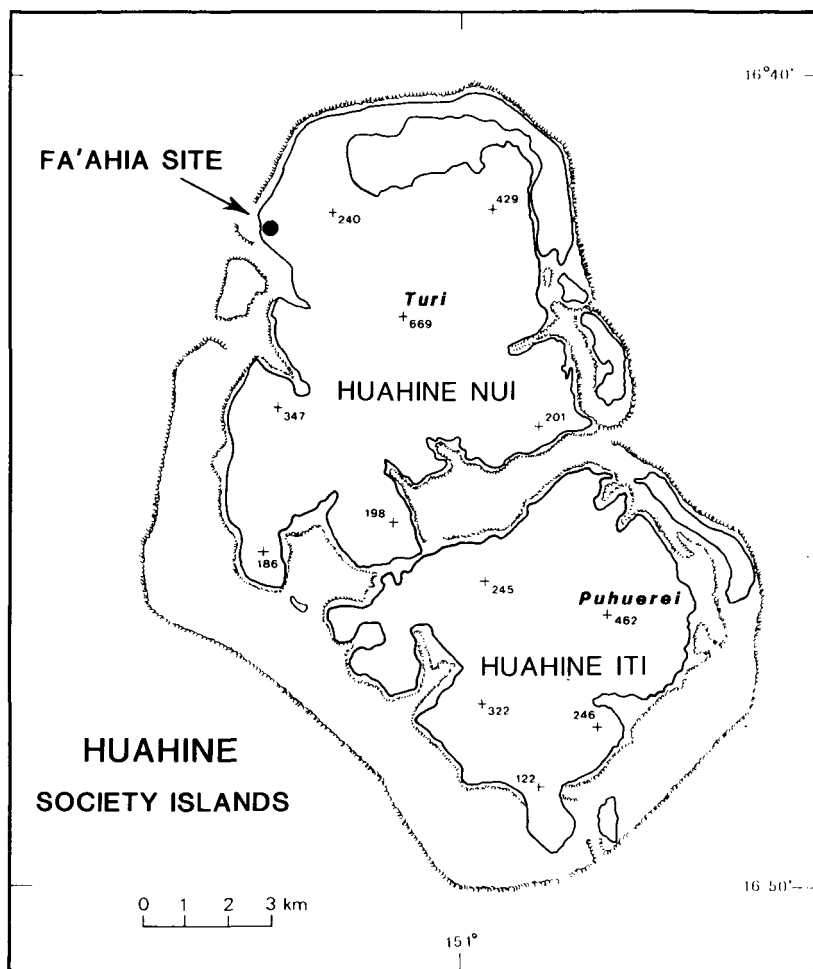


FIGURE 2 — Huahine, showing the location of the Fa'ahia Archaeological Site

skeletons of Eastern Polynesian passerines; they will be the topic of a future study. The third passerine bone from Huahine is a synsacrum that might pertain to *Acrocephalus caffer*, which has been extirpated on Huahine (Hoyoak & Thibault 1978). (No modern skeletons of *A. caffer* are available; comparisons were made with skeletons of congeners.) The fourth passerine bone from Huahine is from an extinct species of starling, described herein.

The archaeology, stratigraphy, and chronology of excavations at the Fa'ahia Site have been reported by Sinoto & McCoy (1975), Bellwood (1979), Emory (1979), Sinoto (1979, 1983), Pigeot (1985, 1986), and Kirch (1986).

Radiocarbon dates from Fa'ahia range from c. 1250 to 750 years BP. The cultural sediments are at the edge of a coastal lagoon, below the modern water table. Certain organic materials, such as wood and bone, have been exceptionally well preserved because of rapid burial under anoxic sedimentary conditions.

Among the cultural materials at the Fa'ahia Site are wooden adze handles, wooden boards from voyaging canoes, wooden tapa beaters, and whalebone clubs. Most of the 300+ identifiable bird bones from the site are also beautifully preserved, mainly of seabirds (16 species represented, including petrels, shearwaters, tropicbirds, boobies, herons, and terns). Bones of 13 or 14 species of landbirds (rails, pigeons, parrots, kingfishers, and passerines), 11 of which are extinct on Huahine (Steadman 1989), are represented as well.

MATERIALS AND METHODS

Bird bones from the Fa'ahia Site are catalogued in the collections of the Département Archéologie, Centre Polynésien des Sciences Humaines, Tahiti (DAPT), and the Vertebrate Zoology Department of the Bernice P. Bishop Museum (BPBM). Modern skeletal specimens are from the National Museum of Natural History, Smithsonian Institution (USNM), the New York State Museum (NYSM), and the University of Washington Burke Museum (UWBM). Osteological terminology follows that of Baumel *et al.* (1979). Measurements were taken with dial calipers with increments of 0.05 mm, rounded to the nearest 0.1 mm.

The following modern skeletal specimens were examined in this study. All catalog numbers are USNM unless otherwise designated. *Hirundo rustica* NYSM 1453, *Lalage aurea* 557308, *L. maculosa* 290436, UWBM 42846, *Coracina tenuirostris* 557307, *Turdus poliocephalus* 559860, *Acrocephalus luscini* *luscini* 559139, *A. syrinx* 431411, *A. aequinoctialis* *pistor* 498372, 498373, *A. mendanae* *mendanae* NYSM 1148, 1149, *A. mendanae* *aquilonis* 318786, *A. atyphus* *atyphus* 318782, *A. kerearako* 559592, 559594, 559597, 559599, *Rhipidura rufifrons* 556243, *Myiagra oceanica* 431413, *Pachycephala simplex* 489242, *Artamus leucorhynchus* 290435, *Aplonis pelzelni* 430057, *A. atrifusca* 498059-498061, *A. cinerascens* 559603, 559604, UWBM 42817-42820, *A. tabuensis* 319773, 319777, UWBM 42839, 42858, 42883, 42890, *A. striatus* 121757, 121818, 121932, 561615, *A. opacus* 431418, 556239, *A. cantoroides* 345068, *A. mysolensis* 557251, 557257, 557260, 558324, *A. minor* 488933, *A. panayensis* 432061, 432063, 559091, 559091, 559094, *A. metallica* 557278, 557283, 557286, 557288, *Myzomela cardinalis* 556240, *Cleptornis marchei* 556246, *Foulehaio carunculata* 498062, UWBM 42887, *Philemon gilolensis* 557474, *Chaetoptila* sp. BPBM 388987 (Holocene fossil), *Zosterops conspiciata* 431416, *Erythrura trichroa* 431420.

SYSTEMATICS

The fossil tarsometatarsus is referred to *Aplonis* (Family Sturnidae) rather than to other passerine genera of Western or Eastern Polynesia (listed in Materials and Methods) because of the following unique combination of characters: stout shaft; all trochleae stout and short, with the inner trochlea especially broad; foramen vasculare distale located very near the trochleae.

Aplonis diluvialis, new species

Holotype: Complete tarsometatarsus, BPBM 166037, from Square U43, Layer IV, Fa'ahia Archaeological Site, Huahine, Society Islands, French Polynesia. Collected in 1984 by Y. H. Sinoto and associates.

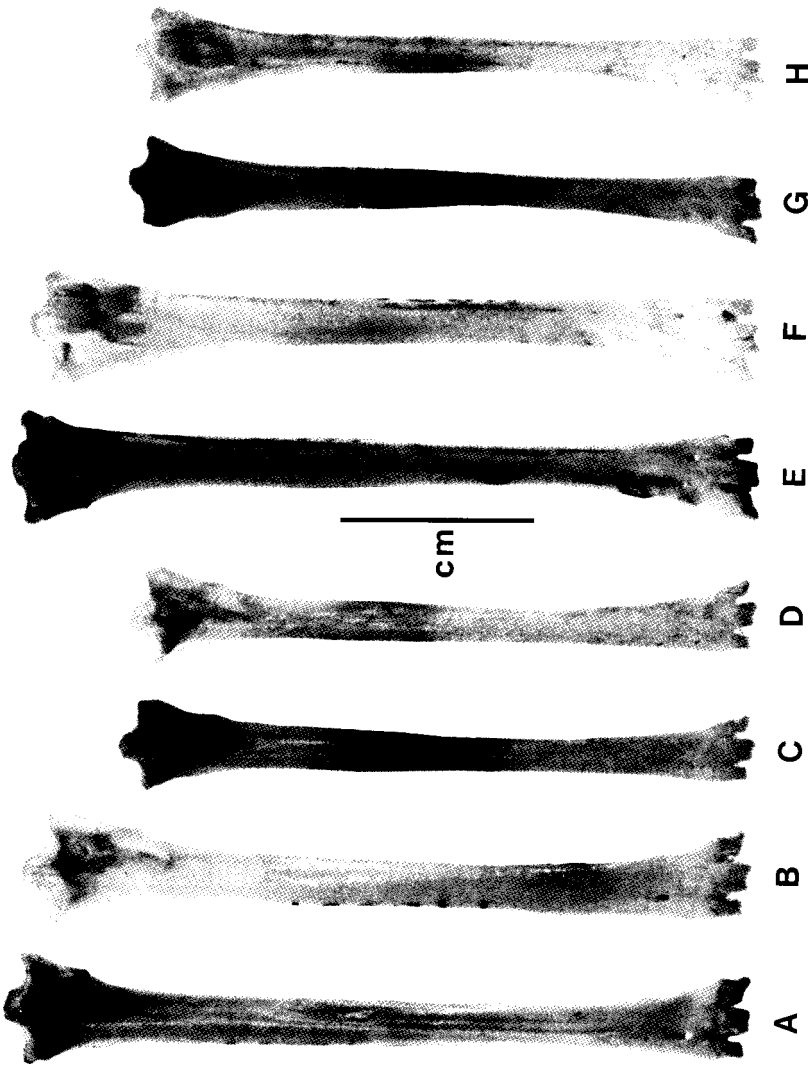


FIGURE 3 — The tarsometatarsus in dorsal (A-D) and plantar (E-H) aspects, A, E. *Aplonis diluvialis*, holotype, BPBM 166037, sex unknown. B, F. *Aplonis atrifusca*, USNM 498059, male. C, G. *Aplonis tabuensis*, UWBM 42839, male (hypotarsus damaged). D, H. *Aplonis cinerascens*, UWBM 42819, male. Scale bar = 1 cm

TABLE 1. — Measurements (in mm) of the tarsometatarsus of *Aplonis*, giving mean, range, and sample size. F = female, M = male, U = sex unknown

	Total length	Proximal width	Proximal depth	Minimum width of shaft	Minimum depth of shaft	Distal width	Depth of middle trochlea
<i>Aplonis diluvialis</i>	38.0	5.3	5.1	1.9	1.3	4.2	2.0
Holotype, BPBM 166037	1	1	1	1	1	1	1
Society Is.: Huahine (U)							
<i>A. atrifusca</i>	35.3	5.5	5.7	2.1	1.2	4.3	2.4
American Samoa:	33.6-36.9	5.4-5.6	5.5-5.8	2.0-2.1	1.2-1.3	4.3-4.4	2.3-2.4
Tutuila (M)	3	3	3	3	3	3	3
<i>A. cinerascens</i>	32.7	4.8	4.5	1.8	1.1	3.5	2.0
Cook Islands:	31.9-33.8	4.4-5.1	4.4-4.6	1.7-1.9	0.9-1.2	3.3-3.7	1.8-2.2
Rarotonga (2M, 4F)	6	6	6	6	6	6	6
<i>A. tabuensis</i>	29.2	4.3	3.8	1.2	0.8	2.9	1.6
Tonga: Niuafo'ou (U)	29.1-29.3	4.2-4.4	3.8-3.9	1.2	0.8-0.9	2.8-3.0	1.6-1.7
	2	2	2	2	2	2	2
<i>A. tabuensis</i>	30.5	4.6	4.2	1.8	1.2	3.4	2.2
Eua, Tonga (2M, 2F)	28.9-32.6	4.5-4.7	4.1-4.3	1.7-1.8	1.2	3.3-3.5	2.0-2.2
	4	4	3	4	4	4	4
<i>A. striatus</i>	25.2	4.0	3.9	1.2	1.0	2.9	1.9
New Caledonia (M)	24.7-25.8	3.8-4.2	3.6-4.1	1.2-1.3	0.8-1.1	2.8-2.9	1.8-2.0
	4	4	4	4	4	4	4
<i>A. pelzelni</i>	26.7	3.9	3.9	1.3	0.8	2.9	2.6
Caroline Islands:	1	1	1	1	1	1	1
Ponape (F?)							

<u>A. opacus</u>	30.3	4.7	4.4	1.6	0.9	3.5	2.0
Caroline Islands:	1	1	1	1	1	1	1
Ponape (M)							
<u>A. opacus</u>	28.6	4.3	4.0	1.5	0.7	3.4	1.9
Marianas Islands:	1	1	1	1	1	1	1
Serigan (F)							
<u>A. cantorioides</u>	ca.20.6	3.4	3.4	1.3	0.8	2.6	1.5
Captive (M)	1	1	1	1	1	1	1
<u>A. mysolensis</u>	22.7	3.6	3.4	1.2	0.8	2.8	1.5
Northern Moluccas:	22.1-23.2	3.4-3.8	3.3-3.6	1.1-1.3	0.7-0.8	2.5-2.9	1.4-1.6
Halmahera (2M,2F)	4	4	4	4	4	4	4
<u>A. minor</u>	20.6	3.4	3.0	1.0	0.6	2.3	1.4
Philippines: Mindinao	1	1	1	1	1	1	1
(F)							
<u>A. panayensis</u>	22.4	3.5	3.4	1.2	0.8	2.7	1.5
Philippines: Negros,	22.2-22.8	3.3-3.6	3.4	1.0-1.3	0.7-0.8	2.6-2.7	1.4-1.6
Culion, Busuanga	4	4	4	4	4	4	4
(2M,2F)							
<u>A. metallica</u>	22.0	3.5	3.4	1.1	0.8	2.8	1.4
Northern Moluccas:	21.4-22.4	3.3-3.8	3.2-3.5	1.0-1.1	0.6-0.8	2.6-2.9	1.4-1.5
Halmahera (2M,2F)	4	4	4	4	4	4	4

Diagnosis: A large species of *Aplonis* (Table 1), the tarsometatarsus of which differs from that of congeners as follows: intercotylar tuberosity smaller than in *A. atrifusca*, *A. cinerascens*, or *A. metallica*, and blunter than in *A. striatus*; more proximal placement of tuberositas musculo tibialis cranialis; fossa metatarsi I shorter and more distally located than in all except *A. pelzelni*; foramen vasculare distale located nearer to the trochleae than in *A. cinerascens*, *A. striatus*, *cantoroides*, *A. mysolensis*, *A. minor*, *A. panayensis*, or *A. metallica*; inner trochlea more expanded laterally and dorso-ventrally; in dorsal aspect, medial flange of middle trochlea smaller (= same size as lateral flange); incisura intertrochlearis medialis shallower; small sulcus on the medial side of inner trochlea deeper than in *A. atrifusca*, *A. tabuensis*, *A. opacus*, or *A. mysolensis*; inner trochlea originates and extends farther distally (relative to middle trochlea) than in all except *A. pelzelni* and *A. tabuensis*.

Etymology: The new name is taken from the Latin *diluvialis*, meaning of an inundation, of a flood, or of a deluge (Brown 1956:337), in reference to the fact that the cultural strata of the Fa'ahia Site are saturated today by ground water and are overlain by sand deposited by storm waves.

DISCUSSION

Aplonis diluvialis is matched in its large size and stoutness only by *A. atrifusca* of Samoa, from which it differs in many qualitative features (see Diagnosis). No skeletons are available for *A. mavornata*, an historically extinct species known only from Mauke, Cook Islands (Olson 1986). *Aplonis mavornata* is smaller than *A. cinerascens* in all dimensions, including a tarsal length (from a skin) of 27.4 mm (Olson 1986). Therefore *A. mavornata* was much smaller than *A. diluvialis*.

"*Turdus*" *ulietensis* was a passerine bird of unknown affinities, collected on Raiatea (Ulietea), Society Islands, during Cook's Second Voyage (Greenway 1958: 377, 378; duPont 1976: 121; Olson 1986: 203, 205; Pratt *et al.* 1987: 327; Fuller 1988: 196, 197). The only existing specimen of *T. ulietensis* is a painting dated 1 June 1774 by Georg Forster in the British Museum (Natural History). Based on descriptions of *T. ulietensis* by Latham and Forster (quoted in Greenway 1958: 378), I believe that *T. ulietensis* may have been a starling rather than a thrush, although this cannot be demonstrated with certainty unless a whole specimen is found that agrees with the painting. "*Turdus*" *ulietensis* was very similar in size to *Aplonis cinerascens*, and thus was significantly smaller than *A. diluvialis*.

To summarise, the only unequivocal Eastern Polynesian records of *Aplonis* are from Rarotonga (*A. cinerascens*; extant but rare), Mauke (*A. mavornata*; extinct in the 19th century), and Huahine (*A. diluvialis*; extinct, probably for centuries). This extremely discontinuous distribution suggests that other extinct species or populations of starlings await discovery elsewhere in the Cook and Society islands, and perhaps in the Tuamotus and Marquesas islands as well.

The current rarity of *Aplonis cinerascens* and the complete loss of *A. mavornata* and *A. diluvialis* indicate that the starlings of Eastern Polynesia are (were) more vulnerable to human activities than the widespread and usually common *A. tabuensis* of Western Polynesia, which seems to thrive in second growth or forest edges. The extinction of *A. diluvialis* probably was caused by human factors, such as the clearing of forests, the introduction of non-native plants, the introduction of diseases carried by non-native birds, and predation by humans and rats. Like at least 11 other extinct landbirds from

the Fa'ahia Site, *A. diluvialis* has not been recorded on Huahine during the past 200 years. It probably became extinct before the European discovery of Huahine.

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SHORT NOTE

Number of presacral vertebrae in *Dinornis*

Not until 1883, 43 years after bones of moas first came to the notice of Richard Owen, was a moa skeleton described that had a complete complement of presacral vertebrae. This specimen had 27 and was *Anomalopteryx didiformis* (= *Dinornis parvus*) (Owen 1883). Hutton (1892) stated that all moas have 27 presacral vertebrae, and this was endorsed by Archey (1941) and Oliver (1949, 1955). The first indication that *Dinornis* species may have more than 27 was noted by Falla (1941): "... most complete example of *Dinornis* recovered . . . the set of vertebrae lacks the axis but 20 cervical and seven free dorsals were collected". This specimen (XIIIA) of *D. giganteus* Owen therefore had a minimum of 28 presacral vertebrae. R. J. Scarlett (pers. comm.) observed 29 in another specimen of *D. giganteus* from Pyramid Valley, where the vertebrae were excavated in a position of articulation.

I have made the following observations:

A skeleton of *Dinornis novaezealandiae* Owen that I collected (WO51, Waitomo Caves Museum) has 6 thoracic and 22 cervical vertebrae preserved with only the axis and atlas missing, a total of 30.

Another *D. novaezealandiae* (National Museum - NMNZ S23654) had the vertebrae in a position of articulation when I collected it. It has 6 thoracic and 24 cervical vertebrae, a total of 30.

A third skeleton of *D. novaezealandiae* (NMNZ S211) has 6 thoracic and 23 cervical vertebrae preserved with only the atlas missing, a total of 30.

A skeleton of *Euryapteryx geranoides* (Owen) I excavated with a complete complement of vertebrae in articulation (NMNZ S25656) has 6 thoracic and 21 cervicals, i.e. 27.

A skeleton of *Euryapteryx curtus* (Owen) (NMNZ S441) is remarkably complete and has 6 thoracic and 21 cervical vertebrae.

A skeleton of *Anomalopteryx didiformis* (Owen) collected with vertebrae in a position of articulation by Peter De Lange (skeleton in Waitomo Caves Museum from Erebor Cave) has 6 thoracic and 21 cervical vertebrae.

These data support the contention that moa species of the family Emeidae (all species other than *Dinornis*) consistently have 27 presacral vertebrae but that, in the Dinornithidae, *D. giganteus* has at least 29 and *D. novaezealandiae* 30 presacral vertebrae.

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THE EFFECTS OF WIND AND SEA ON THE FEEDING OF ANTARCTIC TERNS AT THE SNARES ISLANDS, NEW ZEALAND*

By PAUL M. SAGAR and JOY L. SAGAR

ABSTRACT

The effect of wind and sea conditions on the feeding of Antarctic Terns (*Sterna vittata bethunei*) was studied during three visits to the Snares Islands. The terns preyed upon fish and swarms of crustaceans. Increasing wind speed significantly reduced the terns' capture rate and feeding success. The terns fed in similar ways with calm and moderate seas. However, rough seas significantly reduced the attempt rate, capture rate, and feeding success of terns feeding on fish and the capture rate and success of terns feeding on crustaceans. Foraging techniques varied with the type of prey sought and sea conditions. To catch fish, the terns mostly plunge dived in calm seas but contact dipped for 40-46% of attempts in moderate and rough seas. They caught crustaceans mainly by contact dipping, but used partial plunge diving more in moderate and rough seas. Wind speed and sea conditions seemed to affect terns feeding on crustaceans by making prey move away from the surface. Several other species of seabirds joined the terns to feed on crustacean swarms. Interspecific interactions were minor; however, large flocks of Sooty Shearwaters (*Puffinus griseus*) displaced terns from feeding on swarms.

INTRODUCTION

Most terns of the genus *Sterna* feed at sea by diving. Because they find their prey by sight and then do elaborate aerial manoeuvring their ability to feed is affected by such environmental factors as wind speed and sea conditions. For example, the fishing success of Arctic Terns (*Sterna paradisaea*) decreased in windy conditions (Bengtson 1966). However, although increasing wind significantly reduced the capture rates of Common Terns (*S. hirundo*) and Sandwich Terns (*S. sandvicensis*), their capture success did not change (Taylor 1983). Dunn (1973) observed Common Terns and Sandwich Terns feeding at sea and, although he was unable to observe birds feeding in high winds, found that capture rates were greater in moderate than in calm sea conditions. Reed & Ha (1983) also found that the capture rate of aerial feeding Forster's Terns (*S. forsteri*) increased from calm to mild-wind conditions.

Wind and sea conditions, by affecting the food capture rate of adult terns, may also affect the growth rate of tern chicks. Dunn (1975) showed that greater wind speed markedly slowed the growth rate of Roseate Tern (*S. dougallii*) chicks, that even light winds may reduce the growth rate of Common Tern chicks, but that wind speed had negligible effect on the growth rate of Sandwich Tern chicks. Presumably the terns could not feed their chicks sufficiently in windy conditions (Roseate Terns) or calm conditions (Common Terns).

The Antarctic Tern (*S. vittata*) is circumpolar, breeding in coastal areas from about 47°S to 68°S (Watson 1975). In the New Zealand region it breeds

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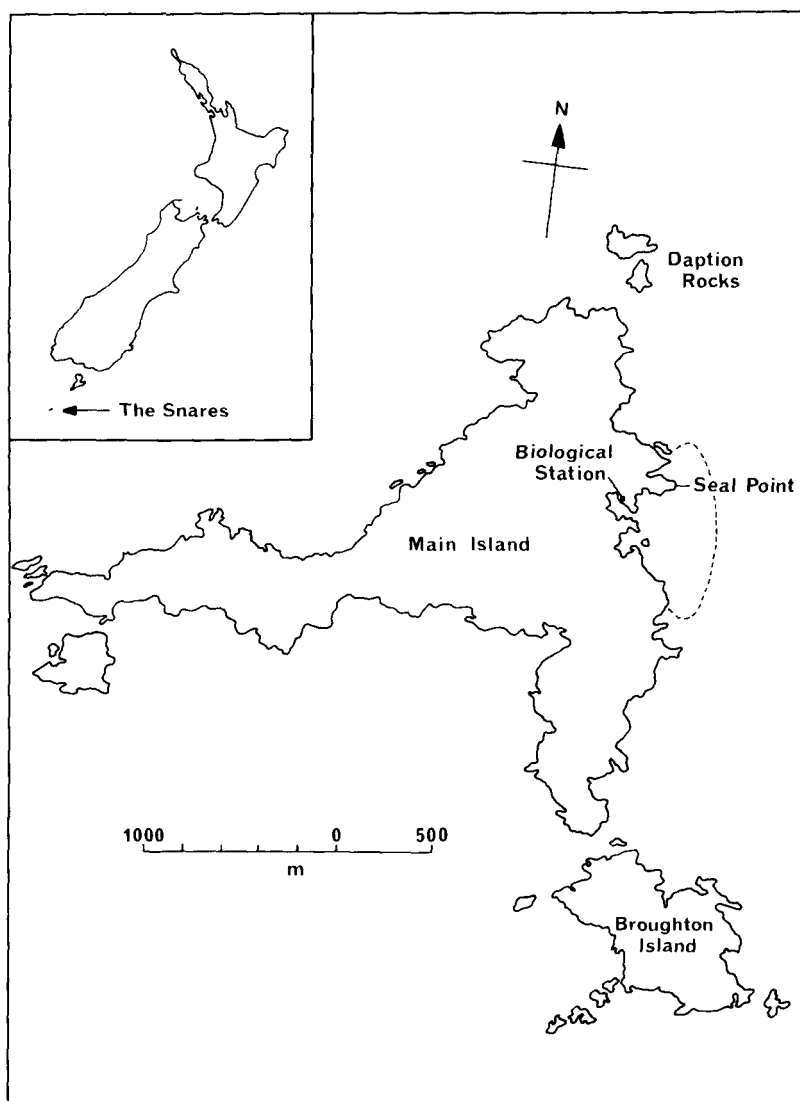


FIGURE 1 — The Snares Islands, showing the location of place names mentioned in the text (Western Chain and Vancouver Rock excluded from the map). Dotted line indicates approximate limit of observations made from Seal Point

on Campbell, Auckland, Snares, Antipodes, Bounty and South Cape Islands (Falla *et al.* 1970). The climate at these islands is very windy and the seas are rough, and so we expected them to affect the feeding ability of Antarctic Terns. Bad weather at the Snares can severely restrict the growth of Antarctic Tern chicks and be a major factor in chick mortality (Sagar 1978), and so our aim during three visits to the Snares was to study more precisely the effects of wind speed and sea conditions on the feeding of Antarctic Terns.

STUDY AREA

The coastline of all the islands of the Snares (44°02'S, 166°36'E) (Figure 1) consists of precipitous cliffs and there is no shallow water in the vicinity. Kelp (*Durvillea antarctica*) predominates in the intertidal zone of the cliff faces, and its fronds may extend several metres offshore, depending on the tidal surge.

The climate is cool temperate, moist and windy. In the daily weather records taken on Station Point at 0900 h during the three summers of this study, the main wind directions were westerly (28%), northerly (20%), and northwesterly (13%). The most recorded surface-wind strength during November to January was 3 on the Beaufort scale (12-19 km/h), with winds of 20 km/h and above occurring 38% of the time. Gales (8 and above on the Beaufort scale) were recorded on up to 8 days each month.

METHODS

The feeding of Antarctic Terns at the Snares was observed during visits from 3 to 26 January 1984, 2 to 21 November 1985, and 22 October to 16 November 1986. How many terns fed about the islands and where they fed was noted. The main study site, however, was near the tip of Seal Point (within the dotted line in Figure 1), where the terns were observed as they foraged close inshore. All observations were made by PMS using a 20-45x telescope. In estuaries the availability of food for terns can vary according to the state of the tide (Taylor 1983) and so, although this may not apply to the relatively deep water off the Snares, all observation periods were restricted to two hours about mid-tide. Sea spray prevented observations at wind speeds above 50 km/h (i.e. gale force).

TABLE 1 — Summary of Antarctic Tern feeding observations recorded at the Snares

Main prey	Year	Sea conditions								
		Calm			Moderate			Rough		
		No. days	No. birds	No. feeding attempts	No. days	No. birds	No. feeding attempts	No. days	No. birds	No. feeding attempts
Fish	1984	6	45	510	9	99	874	4	32	189
	1985	1	6	14	0	0	0	2	16	103
	1986	0	0	0	0	0	0	2	20	26
Crustacea	1984	2	15	521	2	24	893	1	8	169
	1985	7	71	1718	1	11	138	4	40	717
	1986	10	101	1309	3	30	480	2	20	439

During each of 56 observation periods (Table 1) we watched adult terns in breeding plumage foraging (flying with bill pointed down) for at least 2 minutes per tern. We attempted to record the timed foraging activities of at least 10 terns during each observation period, but this was not always possible.

We recorded each tern's capture attempts, successful captures, foraging action and, when possible, the kind of prey captured.

Any distinct initiation of a dive towards the water was taken as a capture attempt. When a bird did not reach the water the attempt was recorded as aborted. The capture of fish was easy to observe because the tern emerged from the water with the fish held across its bill. The capture of a crustacean, however, could only be assumed, based on a tern swallowing shortly after emerging from the water.

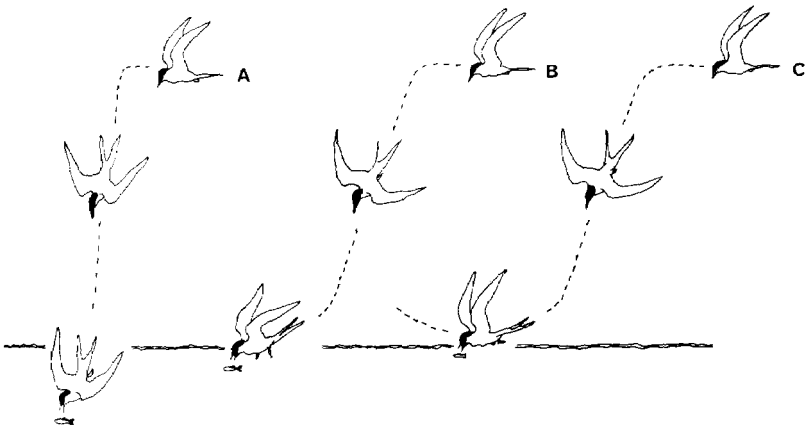


FIGURE 2 — Prey capture methods used by Antarctic Terns. A — Full plunge. B — Partial plunge. C — Contact dip.

Reproduced with permission from *Ornis Scandinavica*.

The terns used three capture methods (Figure 2), the same as Taylor (1983) recorded during his study of Common and Sandwich Terns:

1. *Contact dipping*: A bird descended to the water but only its bill came into contact with the water, the prey being caught from near the surface and the tern remaining in flight throughout.
2. *Full plunge*: A tern descended almost vertically and submerged completely.
3. *Partial plunge*: This was like the full plunge but the bird levelled out partly before reaching the water so that only its head and breast were submerged.

By combining observations of all birds recorded during an observation period we calculated their mean attempt rate (number of feeding actions each minute), mean capture rate (number of prey caught each minute), and mean percentage feeding success (proportion of successful feeding actions).

Terns feeding alone usually defended fishing areas and chased off other terns, but this behaviour was rare when the terns fed in a flock. Although wind and sea conditions presumably affect them in the same way, solitary and flock feeders feeding on fish on the same days might differ in their attempt

and success rates. We have therefore omitted observations of terns in flocks feeding on fish. In the following analyses all terns feeding on fish were solitary and all terns feeding on crustaceans were in flocks.

For each observation period, the sea surface was classified as calm (surface smooth or slightly ruffled and a light swell), moderate (wind chop and a light swell), or rough (white water and swell greater than 1 m). Wind speeds during each observation period were taken at the Biological Station about 200 m from the study area (1984) or from a hand-held anemometer at the observation site (1985 and 1986).

RESULTS

Feeding areas

Whenever we arrived at or left the Snares (by boat) we did not see Antarctic Terns more than about 1 km offshore. From the shore, the terns were seen to favour the small bays of the east coast of Main and Broughton Islands, the channels between islands or islets, and kelp-covered submerged or partly submerged rocks.

The bays of the east coast of Main and Broughton Islands provided relatively calm water and sheltered conditions during the prevailing westerly winds. Here, single terns tended to concentrate their foraging just off the kelp. Groups of 10-20 feeding terns were usually seen in the channels between islands, where the tidal current was strong. Swarms of crustaceans off Seal Point attracted up to 55 terns, which took mainly crustaceans but also a few fish.

Effects of wind speed and sea conditions on feeding

The attempt and capture rates and percentage of successful attempts of terns preying on fish decreased significantly at higher wind speeds (Figure 3). Increasing wind speed had no apparent effect on attempt rate when the terns were preying on crustaceans but caused a significant decrease in the capture rate and a highly significant decrease in success (Figure 4).

TABLE 2 — Mean attempt rate, capture rate and percentage success (± 1 s.e.) of Antarctic Terns preying upon fish and crustaceans in calm, moderate and rough sea conditions

Sea Conditions	Prey					
	Fish			Crustacea		
	Attempts (min ⁻¹)	Prey (min ⁻¹)	Success (%)	Attempts (min ⁻¹)	Prey (min ⁻¹)	Success (%)
Calm	1.88 \pm 0.17 (n = 51 birds)	1.00 \pm 0.01	49.8 \pm 3.47	6.88 \pm 0.36 (n = 187 birds)	4.49 \pm 0.24	66.4 \pm 1.19
Moderate	1.87 \pm 0.11 (n = 99 birds)	0.93 \pm 0.06	49.6 \pm 2.21	5.91 \pm 0.36 (n = 60 birds)	3.84 \pm 0.26	65.1 \pm 1.46
Rough	1.19 \pm 0.19 (n = 68 birds)	0.39 \pm 0.05	32.0 \pm 4.10	7.24 \pm 0.63 (n = 68 birds)	3.51 \pm 0.27	52.4 \pm 2.10

For both kinds of prey, wind speed was clearly not the variable influencing the feeding ability of the terns. We therefore examined the effect of sea conditions (Table 2).

There was no significant difference ($P > 0.05$) between the attempt rate, capture rate and success of terns feeding on fish and crustaceans in calm and moderate sea conditions (Table 2.) In rough sea conditions, however, the attempt rate, capture rate and success of terns feeding on fish were significantly less than during calm and moderate seas combined ($z = -3.09$, 5.99 and -3.78 respectively, $P < 0.01$). Terns feeding on crustaceans were not significantly different ($P > 0.05$) in their attempt and capture rates in any sea conditions and in their success in calm and moderate seas. The success of terns feeding on crustaceans, however, was significantly less in rough seas than that recorded in calm and moderate seas combined ($z = -4.97$, $P < 0.01$).

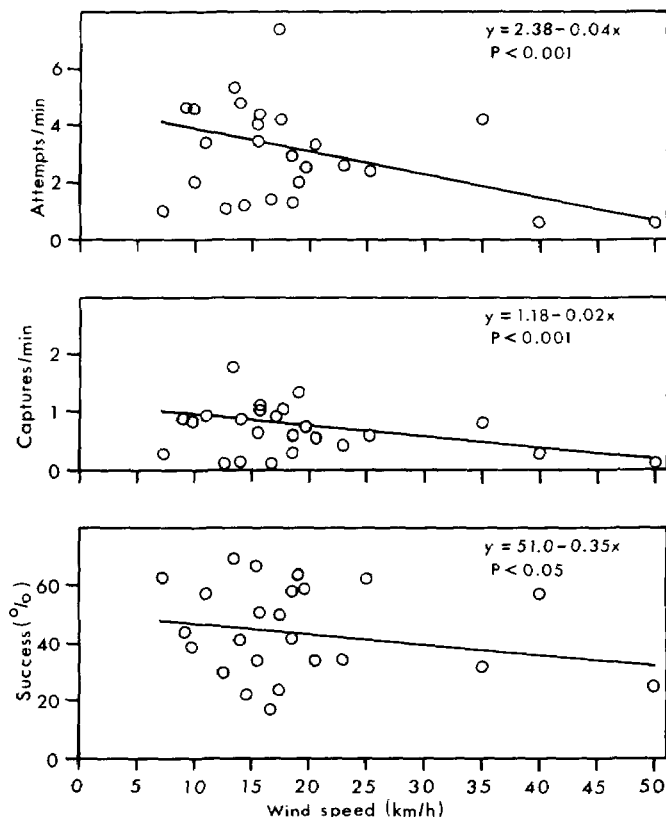


FIGURE 3 — The relationship between wind speed and attempt rate, capture rate and feeding success of Antarctic Terns preying on fish. Each point is the mean for the observation period

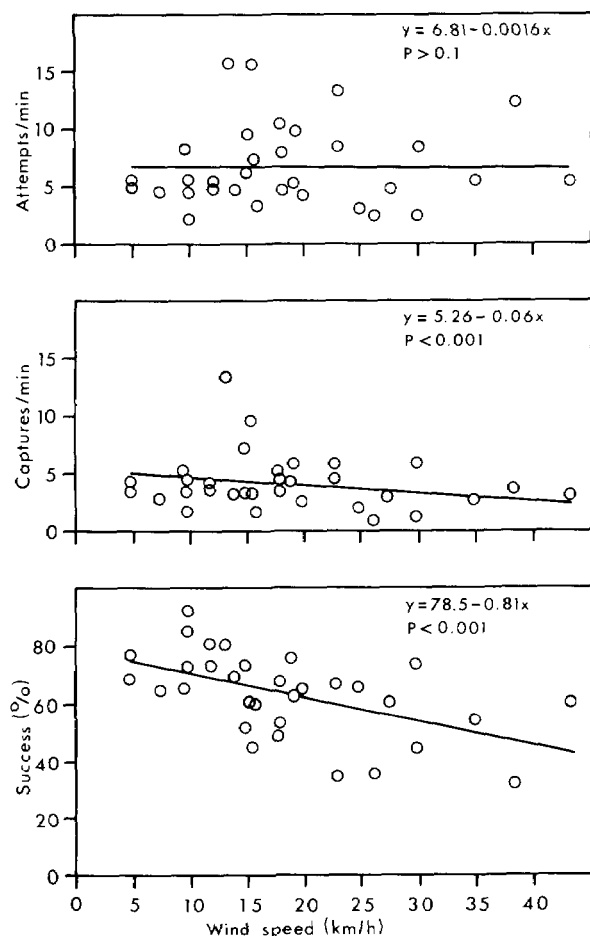


FIGURE 4 — The relationships between wind speed and attempt rate, capture rate and feeding success of Antarctic Terns preying on crustacea

Wind speed and sea conditions were highly correlated for terns feeding on fish, and their individual effects could not be statistically separated. However, for terns feeding on crustacean prey we could compare capture rates in different wind speeds with capture rates in different sea surface conditions. The range of wind speeds recorded during moderate sea conditions (5.0-25.0 km/h) overlapped completely wind speeds recorded during calm seas (5.0-27.7 km/h). For any particular wind speed within the range 5.0-25.0 km/h, the capture rate of crustaceans was higher in calm than moderate seas (Figure 5).

Neither the calm nor the moderate regression was significant, however, and there was no significant difference between the mean capture rates (calm \bar{x} 4.70 s.d. 3.33, moderate \bar{x} 3.84 s.d. 2.03, $t = 2.32$ $P > 0.05$). The overlap in wind speeds between calm and rough seas was in the range 14.4 to 27.7 km/h. Neither regression was significant ($P > 0.05$), and there was no significant difference between the mean capture rates (calm \bar{x} 3.65 s.d. 2.75, rough \bar{x} 4.10 s.d. 2.37, $t = 0.87$ $P > 0.05$). In addition, the elevation of all three regressions in Figure 5 suggest that sea conditions do not significantly affect capture rates independently of wind speed when Antarctic Terns prey on crustaceans.

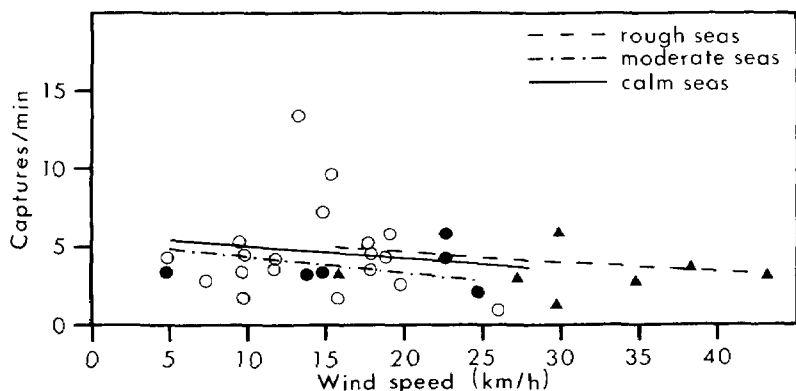


FIGURE 5 — Capture rates of crustacea by Antarctic Terns in calm (o) ($y = 5.85 - 0.08x$), moderate (●) ($y = 5.31 - 0.10x$) and rough (▲) ($y = 4.90 - 0.04x$) sea conditions

Changes in capture behaviour

The terns used different capture methods for fish and crustaceans and sea conditions (Table 3). They contact dipped much more when catching crustaceans than when catching fish, presumably because the crustaceans were closer to the surface than the fish. By contact dipping, the terns could feed faster than by plunge or partial plunge diving. When contact dipping, the terns usually descended from a height of only 1-3 m above the sea and, because only their bill touched the water, could regain height rapidly, ready for the next dip. The crustaceans were usually in dense swarms, as we could see from the shore, and so the terns did not have to search for each crustacean. With fish, however, they usually had to plunge dive or partial plunge dive from 3-10 m high and enter the water, which took longer than dipping. The fish were less clumped than the crustaceans, and so the terns took longer to find them — hence the greater feeding rate of terns preying on crustaceans than on fish (Table 2).

Sea conditions also affected the terns' feeding methods (Table 3). When preying on fish in calm seas, they plunge dived or partial plunge dived. With rising seas, however, they did more contact dipping, about 33% more in moderate seas, and even more in rough seas, when almost half the feeding actions were contact dips. When contact dipping in rough seas the terns usually picked the fish off the top of waves.

TABLE 3 — The relative use (%) of capture methods by Antarctic Terns when catching crustaceans and fish under different sea conditions. Sample size in brackets. Percentages calculated for each prey type and sea condition. X^2 fish = 149.4, d.f. = 4, $P < 0.001$; X^2 crustacea = 43.2, d.f. = 4, $P < 0.001$

Sea conditions	Percentage of Total Attempts					
	Fish			Crustacea		
	Full plunge	Partial plunge	Contact dipping	Full plunge	Partial plunge	Contact dipping
Calm	50.1 (207)	42.6 (176)	7.3 (30)	2.8 (43)	29.5 (449)	67.7 (1,029)
Moderate	42.1 (109)	17.4 (45)	40.5 (105)	2.5 (11)	40.4 (180)	57.2 (225)
Rough	32.9 (51)	21.3 (33)	45.8 (71)	2.4 (10)	44.7 (190)	52.9 (225)

Crustacea were rarely taken by full plunge diving, whatever the sea conditions. The large number of observations involved in calculating the X^2 value results in a bias towards showing a significant change in feeding techniques. As the sea rose, however, the terns increased their use of partial plunge diving to catch crustaceans (Table 3).

Interspecific interactions

The terns feeding on fish usually fed alone and covered a relatively large area in their search. Dense swarms of crustaceans, however, attracted not only more terns (maximum count 55) but also large numbers of other species.

Terns were recorded feeding on crustaceans during 32 observation periods. Other birds feeding in the same area were Cape Pigeons (*Daption capense australe*) 30 times; Red-billed Gulls (*Larus novaehollandiae*) 27; Sooty Shearwaters (*Puffinus griseus*) 16; Snares Crested Penguins (*Eudyptes robustus*) 9; Diving Petrels (*Pelecanoides urinatrix*) 7; Fairy Prions (*Pachyptila turtur*) 5; Buller's Mollymawk (*Diomedea bulleri*) 4; Salvin's Mollymawk (*Diomedea cauta salvinii*) 3.

Sooty Shearwaters disrupted the terns the most. Flocks of several thousand shearwaters would arrive, diving into the water over the swarm of crustaceans, forcing the terns to go elsewhere. Usually, as soon as the terns found another swarm of crustaceans nearby and began contact dipping, the shearwaters would move and disrupt the terns again.

Cape Pigeons and Red-billed Gulls caused 10 and 7 aborted feeding attempts respectively to single terns by flying underneath as the tern was diving.

DISCUSSION

Effects of wind speed and sea conditions on feeding

The results show that high winds and rough seas reduce the feeding ability of Antarctic Terns. Rough seas significantly reduced the capture rates and plunge diving of terns feeding on fish. Taylor (1983), who had similar results with Common Terns and Sandwich Terns, suggested that changes in wave amplitude were probably more important than wind speed. This was based on the assumption that, as wave action increased, fish became harder or impossible to see. Other suggestions are that terns cannot dive well in high winds and that the fish stay deeper in rough seas (Dunn 1973).

We could not distinguish between the effects of wind speed and sea conditions for terns feeding on fish. However, Dunn (1973) reported that, for any particular wind speed, moderate sea conditions were generally associated with higher capture rate for Sandwich Terns than were calm conditions. He proposed two explanations:

1. With a light wind, terns flap less than in calm conditions while hovering before plunge diving, making them less noticeable to fish; and
2. With a slight disturbance of the sea surface, the terns may be less visible to fish.

The study of the foraging efficiency of Forster's Tern by Reed & Ha (1983) supported the second explanation. Diamond (1973), commenting on Dunn's results, suggested that, in calm conditions, the fish easily sense the tern's entry into the water and so escape (the "Mauthner Reflex" or startle-response of teleost fish). A choppy sea, however, creates enough background noise to mask the tern's splash. By this attractive explanation, prey that can be taken by contact dipping should be more vulnerable to predation than those which lie deeper in the water.

Antarctic Terns feeding on crustaceans seemed less affected by stronger winds and rough seas than terns feeding on fish. As wind speed increased, terns feeding on crustaceans increased their diving rate and so, despite a significant decrease in feeding success, their overall capture rate remained much the same. In moderate and rough seas they used partial plunge diving more and contact dipping less. One conclusion is that changes in wind and sea do not change the flying ability of the terns, possibly because the wave troughs give enough shelter from the wind for the terns to dive well. The change from contact dipping to partial plunge diving in stronger winds and rougher seas may indicate that the crustaceans had moved deeper from the rough surface waters. To catch crustaceans, the terns may need to see them well because the terns rarely plunge dived for crustaceans in any sea conditions and had less success when using partial plunge diving in rough seas.

Importance of crustaceans

Swarms of crustaceans are important for Antarctic Terns at the Snares. During this study they were the major prey of the terns during 32 of the 56 observation periods. Fenwick (1978) reported two species of euphausiids and three species of hyperiid amphipods in swarms close to the Snares. He recorded that, on two occasions, several swarms were present and that each swarm was very dense, measured about 1 m x 2 m x 2 m and moved at

2-4 m/min at 0.5-4.0 m depth. Loose swarms were at the surface, between the dense swarms. Schools of fish fed on these swarms. Presumably the swarms of crustaceans we saw were similar to those described by Fenwick (1978). Certainly fish were with the swarms because terns caught fish occasionally while feeding mainly on the crustaceans.

Most of the feeding areas favoured by Antarctic Terns at the Snares have sharply defined topographical features (e.g. narrow straits between islands and around submerged rocks) that are affected by strong tidal flow. Fenwick (1978) also noted that the sea around the Daption Rocks is often very turbulent because of strong tidal currents flowing over the irregular bottom. The resulting patches of upwelling concentrate some kinds of prey, making tern feeding very localised (Brown *et al.* 1979). Thus Braune & Gaskin (1982) were able to study large numbers of migrating gulls and terns feeding on surface concentrations of euphausiids and small fish off New Brunswick, Canada.

Disruption by shearwaters

Large numbers of petrels breed at the Snares. For example, Warham & Wilson (1982) estimated that 2.75 million pairs of Sooty Shearwaters were breeding on the islands. Sooty Shearwaters, like the terns, feed largely on such planktonic crustaceans as euphausiids and hyperiid amphipods (Fenwick 1978). Sooty Shearwaters seemed to disrupt the Antarctic Terns most, their sheer numbers driving them away from the swarms of crustaceans. In these circumstances the terns left the area, initially to avoid being hit by flying shearwaters and then because the resulting dense raft of shearwaters covered the seas where the swarm occurred. The terns then looked for other swarms nearby, and so did not seem to lack food. Shearwaters, being mainly offshore feeders, displaced terns feeding on swarms during only 50% of the observation periods. Other species seen with the terns seldom disrupted their feeding.

Although this study shows that high winds and rough seas hinder the feeding of Antarctic Terns, whether their breeding is affected is still not known. The mortality of Antarctic Tern chicks was high during a prolonged period of wet and windy weather at the Snares in 1976-77 (Sagar 1978), but the food supplied to chicks was not estimated. Ideally, food abundance and chick growth should be measured at the same time.

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SHORT NOTE

Starlings quick to find a new source of food

Naturalists in northern New Zealand are well aware that, when the pohutukawa (*Metrosideros excelsa*) and the flax (*Phormium tenax*) are flowering in early summer, many Starlings (*Sturnus vulgaris*) become such avid nectar-feeders that often their pates and faces are stained red with pollen.

In my garden a shrubby feijoa, somewhat less than 2 metres high, began to flower about mid-October. There seems to be no limit to the enterprise of Starlings. They are always ready to extend their empire. On 14 October 1988, when the first dark-red feijoa flowers were rather inconspicuous, I noticed a pair of local Starlings darting in and out of the heart of the feijoa where nearly all the early flowers were. The birds were very active; and it appeared to me that the activity was sparked by their excitement at finding nectar-producing flowers so early in the season, a month or more before the full flush of the pohutukawa flowering.

Pohutukawa and feijoa belong to the same family, Myrtaceae, and their flowers are superficially alike, both in size and in colour.

Nearly four weeks later, on 9 November when importunate fledgling Starlings were noisy both at the nest and in the nearby trees, I again watched a pair of yellow-billed adults busily visiting new flowers on the feijoa.

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"DARK-FACED" ROCKHOPPER PENGUINS AT THE SNARES ISLANDS*

By ALAN J. D. TENNYSON and COLIN M. MISKELLY

INTRODUCTION

The Rockhopper Penguin (*Eudyptes chrysocome*) is a circumpolar species of subantarctic waters, breeding on islands in the southern Atlantic, Pacific and Indian Oceans. Two forms of Rockhopper Penguin were recognised by the Checklist Committee of the Ornithological Society of New Zealand (Kinsky 1980): *E. c. chrysocome* and *E. c. moseleyi*. However, most recent authors recognise three forms of Rockhopper Penguin (e.g. Falla & Mougín 1979, Harrison 1983, Lindsey 1986), with the following breeding distributions and distinguishing characteristics:

E. c. chrysocome (Western Rockhopper Penguin) breeds on islands off Cape Horn and at the Falkland Is (Falla & Mougín 1979). It has black skin at the base of the bill, short yellow crest feathers and a pale underflipper pattern (see e.g. Carins 1974, Plate 1a; Pettingill 1974, pp. 40, 66-70 & 72; Woods 1975, p.70; Strange 1982; Buxton & Price 1983, pp. 21, 27-30 & 63).

E.c. filholi (Eastern Rockhopper Penguin) breeds at Prince Edward, Marion, Crozet, Kerguelen, Heard, Macquarie, Campbell, Auckland and Antipodes Is (Falla & Mougín 1979, Roberston & van Tets 1982). It has pink fleshy margins at the base of the bill, short yellow crest feathers and a pale underflipper pattern (see e.g. Bailey & Sorensen 1962, pp. 103-106; Serventy *et al.* 1971, Fig. 21 & 128; Carins 1974, Plate 1b; Lindsey 1986, pp. 34-41).

E. c. moseleyi (Northern, Moseley's or Subtropical Rockhopper Penguin). This form is sometimes given full species status (Jouventin 1982). It breeds at Tristan da Cunha, Gough, Amsterdam and St Paul Is (Falla & Mougín 1979). This, the largest form of Rockhopper Penguin, has particularly long crest feathers. It has a comparatively large bill and long flippers, black skin at the base of the bill, and darker underflipper pattern (see e.g. HRH the Duke of Edinburgh 1962, Plate 26; Segonzac 1972, Plates 1-3; Moors & Merton 1984, Fig. 1).

Most Rockhopper Penguins that have occurred in New Zealand region are presumably of the *filholi*, which breeds locally at Antipodes, Auckland, Campbell and Macquarie Is. However, two examples of *E. c. moseleyi* have been recorded from New Zealand (Moors & Merton 1984) and this form is often recorded from Western Australia (Serventy *et al.* 1971, Condon 1975). Here, we report two birds of the nominate race *E. c. chrysocome* from the Snares Islands. True *E. c. chrysocome* have not been reliably recorded from the Australasian region before. Claims by Falla & Mougín (1979) and Lindsey (1986) that *E. c. chrysocome* has straggled to Australia and New Zealand have not been confirmed or were due to confusion over the taxonomic status of *E. c. filholi*.

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FIGURE 1a — Adult *Eudyptes chrysocome chrysocome*, HoHo Bay, Snares Islands, 4 November 1986 (bird A).

Photo Colin Miskelly



FIGURE 1b — Adult *E. c. filholi*, Station Cove, Snares Islands, 10 December 1985

Photo Alan Tennyson

SNARES ISLANDS SIGHTINGS

Rockhopper Penguins are frequent visitors to the Snares Islands (48°01'S 166°36'E), up to 20 being seen each summer (pers. obs.). At least 49 Rockhopper Penguins have been recorded at the Snares Islands during the seven University of Canterbury expeditions between December 1982 and December 1987. Most were immatures moulting during January and February, but some were in adult plumage. Of these birds, 47 were typical *E. c. filholi* with conspicuous pink fleshy margins at the base of the bill (Fig 1b.) The other two were immediately recognised as being different because they lacked these fleshy margins (Fig. 1a). Their descriptions are as follows.

Bird A: This penguin was standing at an empty nest in a colony of Snares Crested Penguins (*E. robustus*) above HoHo Bay on 20 December 1985. Although it resembled an adult *E. c. filholi* in having a black throat and well-developed superciliary and occipital crests, it did not seem to have exposed skin at the base of the bill, and the superciliary stripe in front of the eye was broad and triangular (Fig. 1a). When captured, this bird was found to have a 1-2 mm strip of black skin along the proximal edge of the ramicorn, gape, latericorn and culminicorn. The eyes were bright red-brown. The yellow tassels reached just past the black-white demarcation line on the upper breast if flattened (longest yellow plume 60.2 mm). Underflipper markings are shown in Fig. 2. Measurements were: culmen length (to skin at base) 44.9 mm, flipper length 165 mm, weight 3050 g.

This bird was not seen again, but the next season T.C. and C.S. Lamey saw presumably the same bird at exactly the same nest site in the colony on 26 October 1986. The bird was seen by all expedition members on at least 11 further days until 14 January 1987. On several occasions it was seen giving a bowing display and calling (Warham 1963: Fig. 4). The crest was the same size as when first measured. Measurements are given in Table 1. In addition, culmen length (to feathers) was 47.7 mm and bill depth at base was 28.3 mm. This same location was searched several times for Rockhopper Penguins between 7 November and 8 December 1987, without success.

Bird B: A similar 'dark-faced' Rockhopper Penguin was seen in Station Cove on 17 November 1986 by all members of the 1986-87 expedition. This bird was smaller than bird A, but was also black-throated, with bright red eyes and well-developed superciliary and occipital crests. The superciliary stripe in front of the eye was a narrow line. The underflipper pattern was similar to that of bird A (see Fig. 2). Measurements are given in Table 1. In addition, the culmen length (to feathers) was 42.2 mm and bill depth at base was 23.7 mm. This bird was marked with picric acid but was not seen again, whereas bird A was seen sporadically for a further two months.

DISCUSSION

The black throat, large bill and well-developed crests of bird A and its frequent display at its nest site indicated that it was an adult and probably a male. The black throat, small bill and well-developed crests of bird B were suggestive of an adult or subadult female, or possibly a subadult male.

TABLE 1 — Measurements of birds A and B from the Snares Islands compared with measurements of *E. c. chrysocome* from the Falkland Islands and Cape Horn. All measurements in millimetres. Bill length was measured from tip to skin at base of culminicorn. Method of measuring culminicorn width after Warham (1972) and Strange (1982). Neither Murphy (1936) nor Strange (1982) gave ranges for measurements other than the flipper length

	Males		Bird A	Females		Bird B
	Murphy (1936) n=3	Strange (1982) n=10	1986	Murphy (1936) n=2	Strange (1982) n=10	1986
Bill length	47.5	46.3	46.1	42.5	40.0	40.0
Bill width at base	22.8	-	22.1	21.0	-	18.8
Culminicorn width	-	10.4	9.8	-	9.4	8.8
Crest length	66.1	50+	60.2	63.0	50+	51
Flipper length (range)	173	176 (170-185)	179	162	168 (165-175)	166
Tail length	93.8	-	100	97.4	-	-

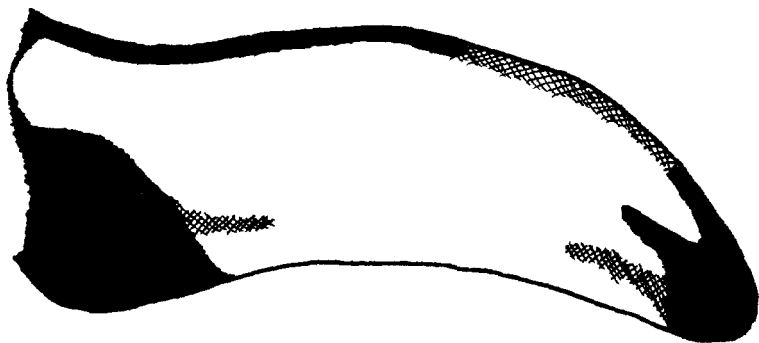


FIGURE 2 — The underflipper pattern of birds A and B

As the two birds were in adult plumage, the thin strip of black skin around the base of the bill of both birds indicated that they were not of the local race *E. c. filholi*. (Yearling *filholi* may show little bare skin at the base of the bill.) Bird A also differed from typical *filholi* in the shape of the superciliary stripe in front of the eye. Bird A had similar measurements to adult male *filholi* from Antipodes, Crozets, Kerguelen, Macquarie, Marion and Campbell Is (Murphy 1936, Falla 1937, Rand 1954, Bailey & Sorensen 1962, Warham 1972, Williams 1980). The plume length of bird A (60.2 mm) was longer than the 55.8 mm given by Murphy (1936) for four males from Antipodes I. but slightly shorter than the 62-70.5 mm for eight adults of both sexes at Campbell I. (Moors & Merton 1984) and the 65-83 mm given by Rand (1954) for seven males from Marion I. Bird B had similar bill and flipper lengths to adult female *filholi* (Murphy 1936, Falla 1937, Rand 1954, Bailey & Sorensen 1962, Warham 1972, Williams 1980). The crest plumes of bird B (51 mm) were similar to Murphy's (1936) measurement of 49.5 mm for three females from Antipodes I. but shorter than Rand's (1954) measurements of 73 and 79 mm for two females from Marion I. and Moors & Mertons' (1984) measurements from Campbell I.

Although the dark skin at the base of the bill of these two birds was suggestive of *E. c. moseleyi*, the form of their crests and their pale underflipper markings indicated that they were not of that subspecies. Adult and subadult *moseleyi* have long, pendulous head plumes, reaching over 70 mm in length and averaging about 90 mm (Hagen 1952, Elliott 1957, Duroselle & Tollu 1977, Moors & Merton 1984). The underflipper of *moseleyi* has much larger areas of black, especially distally, than we observed on birds A and B. (Compare our Fig. 2 with Fig. 20 in Serventy *et al.* 1971 and Fig. 1 in Moors & Merton 1984.) Most adult male and female *moseleyi* are larger billed and have longer flippers than birds A and B respectively. (See Hagen 1952, Swales 1965, Segonzac 1972, Duroselle & Tollu 1977, Williams 1980.)

The black skin around the bill margins, the crest form and the underflipper patterns of birds A and B agreed perfectly with photographs and descriptions of *E. c. chrysocome* from the Falkland Is (e.g. Carins 1974, Pettingill 1975, Woods 1975, Strange 1982, Buxton & Price 1983). The shape of the superciliary stripe varies considerably in birds from the Falkland Islands, but *E. c. chrysocome* often has broader and more triangular superciliary stripes than *E. c. filholi*. (See photographs in Carins 1974, Pettingill 1975, Buxton & Price 1983.) Bird A had a broad superciliary stripe (Fig. 1a) and had similar measurements to adult male *E. c. chrysocome* from the Falkland Islands and Cape Horn (Table 1). Bird B had a narrow superciliary stripe but similar measurements to adult female *E. c. chrysocome* (Table 1). However, the narrow bill and comparatively short crests of bird B suggest that it was a subadult, but too few measurements of *E. c. chrysocome* are available to determine this.

The two *E. c. chrysocome* that we found at the Snares Is differed from *E. c. filholi* in when they were present and where they occurred. Both birds were present in November or earlier in 1986, whereas we have no records of *E. c. filholi* from the islands before 6 December. Most Rockhopper Penguins recorded from the Snares Is were seen in the later half of January and in February. Of a minimum of 47 *filholi* that we have recorded in the Snares Is, only one was seen at a nest site (one day only) among a colony of Snares Crested Penguins,

whereas bird A was seen in the same colony on 13 days. The remaining 47 Rockhopper Penguins (including bird B) were seen around the coastal fringe, among roosting or moulting Snares Crested Penguins.

The finding of two *E. c. chrysocome* at the Snares Islands, c. 7500 km from known breeding areas, indicates how widely Rockhopper Penguins can range at sea. Long-distance vagrancy has already been recorded for Moseley's Rockhopper Penguin (Moors & Merton 1984), Fiordland Crested Penguin (*E. pachyrhynchus*; Serventy *et al.* 1971), Erect-crested Penguin (*E. sclateri*; Napier 1968, Strange 1982) and Macaroni Penguin (*E. chrysolophus*; Kinsky 1969).

There is still a need for standardised measurements and plumage descriptions of Rockhopper Penguins of known sex and status to be collected from all breeding localities before variability within and between subspecies can be understood (see Warham 1980). However, there is ample evidence of three morphologically distinct forms of *E. chrysocome*, all with discrete breeding ranges. Adults of these three forms are readily distinguishable on land but must have widely overlapping ranges at sea; all three are now known to occur in the Australasian region.

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SHORT NOTE

Gould's Petrel from Dunedin City

On 19 December 1988 an unusual seabird was recovered from under a truck in south Dunedin and handed to Portobello Marine Laboratory staff. The bird was weak but in apparently good condition. However, it died on the night of 19-20 December. In the days before the bird was found, the weather was anticyclonic over the lower South Island, with light or moderate southeast or east winds in Dunedin. The specimen was identified as a Gould's Petrel (*Pterodroma leucoptera*), as confirmed by J. T. Darby of the Otago Museum. It has the Otago Museum catalogue no. OM Av 936.

Description: Crown, nape and hindneck sooty black. Grey mottle on forehead, fading out below and behind the black bill to white throat and breast. Black around eye. White belly. Tail pale grey (upper) and white with pale grey tip (lower). Incomplete M from very dark grey (upper) wing to back, and pale grey forward part of inner wing and mantle. Underwing white with narrow, dark grey leading edge turning diagonally inwards at the carpal joint. Primaries and secondaries pale grey, darkening distally to very dark grey. Legs pale grey-blue. Inboard webs very dark grey toward claw; outboard webs very dark grey except for a small section of pale grey-blue towards the ankle.

Measurements (mm)

Body:	Length	310	Foot:	Tarsus	29.1
	Wingspan	710		Mid-toe and claw	37.5
	Wing	230	Bill:	Length	26.4
	Tail	95		Depth	10.7
				Width	12.0

Weight: 125 g

Discussion: Identification of the "Cookilaria" petrels is frequently difficult. However, the specimen's very dark crown and nape, narrow underwing bar and the lack of any significant throat collar is diagnostic of *P. leucoptera* (Harrison 1983).

Since 1942, 22 specimens of *P. leucoptera* have been recovered in New Zealand, 10 of these from Muriwai Beach in 1942. Before the present record at 47°S, the most southern specimen was from Titahi Bay, Wellington (42°S), in 1973 (Veitch 1975). Imber & Jenkins (1981) presented sightings from the Tasman sea. These results show significant *P. leucoptera* observations in the southeast Tasman Sea extending from west of Fiordland into Foveaux Strait. Subtropical waters from this region flow up the east coast of the South Island as the Southland Current (Jillett 1969, Heath 1985). The present record from Dunedin is therefore oceanographically consistent with the field observations of Imber & Jenkins (1981). although it is 1-2 months earlier than expected.

Imber & Jenkins (1981) also analysed previous records of *P. leucoptera* in New Zealand and argued that the relatively large measurements of New Zealand birds were consistent with a subspecies of *P. leucoptera*, *P.l. caledonica*. They then argued that most of the sightings in the Tasman Sea toward New Zealand have been of the subspecies *P.l. caledonica* and not of *P. l. leucoptera*. Although I have not been able to compare plumage characteristics, measurements of the present specimen generally fit the conclusions of Imber & Jenkins (1981). However, I have retained the *P. leucoptera* nomenclature in the light of present usage and the apparent absence of further evidence supporting the description of a subspecies.

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MOAS OF THE SUBALPINE ZONE

By T. H. WORTHY

The highest recorded altitude at which bones of moas (Aves; Dinornithiformes) have been found is 1600 m above sea level (a.s.l.) in the Garvie Mountains, Central Otago (Wilmot 1885). Bones of five moa species were recorded by Bell & Bell (1971) from 1350 m a.s.l. on Mt Owen, northwest Nelson. Although the published records of moas in subalpine areas are few, speleologists, when exploring caves in such areas on Mt Arthur and Mt Owen, have often noted, but not identified, moa bones. Such observations generally go unrecorded but some are noted in the *New Zealand Speleological Bulletin*.

Perhaps because of the few records there is a feeling, echoed by Trotter & McCulloch (1984), that moas generally did not frequent subalpine areas:

"... with isolated, but largely unconfirmed reports of moa bones being found up to 2000 metres, well above the maximum altitude for present-day tree growth. High elevation records might suggest that the moa was not restricted to a forest habitat, but we believe that they should be treated with caution. Assuming the reports are accurate it is not impossible, for instance, that the remains were of birds driven upslope by forest fires."

These remarks treat all moa species as a unit, not allowing for varied ecological preferences. Currently 11 species of moa are recognised (Worthy 1988), all of which probably had distinct, although no doubt overlapping, ecological niches.

The purpose of this note is to show that some species of moa *did* frequent subalpine areas, one species in particular being predominant. Moa bones are found in three main types of deposit: aeolian deposits of dune sands and loess, swamp deposits and cave deposits. Fossil deposits in the first two occur only at low altitude, and caves, although common at low altitudes, are in only four small areas of the subalpine zone. Therefore the records from this zone are few.

The four areas are Mt Arthur (1795 m) and Mt Owen (1870 m) in northwest Nelson and Mt Luxmore and Takahe Valley adjacent to Lake Te Anau in Fiordland. Here I review past data and present new data on moa discoveries from these areas. Identification of bones follows the criteria outlined by Worthy (1988).

Mt Arthur: On Mt Arthur the uppermost limit of forest growth is about 1200 m a.s.l. Almost the whole mountain is marble, and it has many caves. The only published records of moa remains are in the *NZ Speleological Bulletin*. Those in Archey (1941) and Oliver (1949) refer to localities on the Salisbury Tablelands about 1050 m a.s.l. (which is below the bushline, although land clearance has resulted in large tussock clearings). Moa bones from Mt Arthur have been recorded from HH and Laghu Caves (Worthy 1980); and from TCC 1, PSV 10, PSV 15 (Pugsley 1987) and Obscene Phonecaller Cave (Bunton 1983), all near HH Cave. In the Ellis Basin, Newman (1973) recorded a skeleton in EK 316 and 2 skeletons in EK 353.

Moa bones were also recorded from Misty Pot (Ravens 1987) and Blizzard Pot (Ravens 1988). Only those caves in the Ellis Basin and TCC 1 are above the present forest edge. The other sites are mainly in the forest-shrubland zone. In addition I have observed moa bones in Farriers Cave and EK 401 in the Horseshoe Basin about 100 m above the forest edge.

All these records are of unidentified species, except for the three skeletons in HH Cave, which are of *M. didinus* (Upland Moa). A cranium and pelvis of one of these specimens is in the Waitomo Caves Museum (WO 66). However, other than a specimen in Misty Pot, all the Mt Arthur records appear to have been small moas of similar size to the Upland Moa.

The timely discovery in January 1989 of Ratites Rest Home, a cave in the upper Horseshoe Basin at c. 1480 m a.s.l., has revealed a fossil bird fauna that is rich for a subalpine site. The only moa was the Upland Moa [minimum number of individuals (MNI) = 5], for which the voucher specimens National Museum of New Zealand (NMNZ) S 25890 were collected but most were left *in situ*. Eight other bird species are represented: *Apteryx australis* or *haastii* (Brown or Great Spotted Kiwi) (MNI = 2, NMNZ S 25886), *Gallirallus australis* (Weka) (MNI = 4, NMNZ S 25888), *Fulica chathamensis prisca* (Extinct Coot) (MNI = 1, NMNZ S 25882), *Euryanas finschi* (Finsch's Duck) (MNI = 1, NMNZ S 25883), *Strigops habroptilus* (Kakapo) (MNI = 7, NMNZ S 25889 plus 7 skeletons left *in situ*), *Falco novaeseelandiae* (Falcon) (MNI = NMNZ S 25885), *Circus eylesi* (Extinct Harrier) (MNI = 3, NMNZ S 25884), *Xenicus gilviventris* (Rock Wren) (MNI = 1, NMNZ S 25887).

Of these species only weka and falcon still inhabit the mountain; kiwis and Rock Wrens are further west, and Kakapo persisted until recently in the headwaters of the Karamea River (Williams 1956).

Mt Owen: Mt Owen, like Mt Arthur, is marble and has caves all over it. The forest edge is about 1200 m a.s.l.. Moa bones were first recorded from the subalpine areas of Mt Owen by cavers: Coates (1963), when describing Giants Staircase Cave, stated "found a moa bone -800 feet [depth] – the first one found in the area." The first 'identification' was recorded by Doug Wheeler, although whether the bone was collected and who identified it are not stated. In describing Chunder Din Cave, Wheeler (*in* Watson 1970) recorded a "leg bone of *Euryapteryx gravis*".

Bell & Bell (1971) made the first study of a collection of moa bones from Mt Owen. They recorded five species: *Dinornis novaeseelandiae* (2 birds) *Euryapteryx gravis* (1), *Megalapteryx hectori* (1), *Anomalopteryx didiformis* (1), and *A. parvus* (1). I have re-examined these remains in the National Museum of New Zealand (NMNZ) and confirmed the identity of the *Dinornis* (NMNZ S 23342, 23343), reidentified the *E. gravis* as *Pachyornis australis* (NMNZ S 23345), confirmed the identity of the *Megalapteryx* (NMNZ S 23344), which by synonymy is now called *M. didinus*, and reidentified bones previously identified as being from two *Anomalopteryx* species as being from 1 individual of *M. didinus* (NMNZ S 23346).

In January 1987 I collected the partially mummified remains of a *M. didinus* (NMNZ S 23808) from Whales Blowhole Cave (Worthy 1989). I also

collected bones from a cave in Poverty Basin at 1645 m a.s.l. as follows (x/y = no. of bones/minimum number of individuals): $53 + /12$ *M. didinus* (NMNZ S 23527-557, 23559-567), $7/1$ and $2/1$ *Dinornis struthoides* (NMNZ S 23570, 23571), $5/1$ *P. australis* (NMNZ S 23568). Also two bones from a skeleton of *M. didinus* discovered in Owen Heights Cave, about 1740 m a.s.l., were deposited in the National Museum (as NMNZ S 23558). Bones were also found in the Castlekeep Entrance to the Bulmer Cave System at 1600 m a.s.l. In January 1989 I visited this site and identified bones *in situ* of 3 adult and 1 juvenile *M. didinus* and 1 adult *Pachyornis australis*. Of this last, a tibiotarsus (NMNZ S 23569) had been collected in 1987, but I saw a premaxilla, mandible and femur still in the cave. Further bones of this specimen lie deeper in the cave, below vertical drops of 10 m and 44 m. The specimen is unusually robust for the species. I observed bones of 2 adults and 1 juvenile *M. didinus* in a small cleft discovered by Judith Fraser 150 m west of the main Bulmer Entrance in January 1989 (Fig. 1). A preliminary description of the Bulmer Cave System is given by Paterson *et al.* (1989) and provides location data.



FIGURE 1 — A skeleton of *Megalapteryx didinus* lying with its bones essentially in their position of articulation. This skeleton was found and left in a small cave near Bulmer Entrance on Mt Owen in January 1989

Mt Luxmore: On the southern flanks of Mt Luxmore are two small discrete karst fields, at about 1000 m a.s.l., developed in shallow Oligocene limestone. In November 1985 I visited caves in these karst fields and collected a few moa bones (now in the Waitomo Caves Museum) as follows: Steadfast Cave,

a tibiotarsus and a fibula of *M. didinus*; The Hole, a tarsometatarsus of *M. didinus* and a femur shaft of *D. novaezealandiae*; a small cave near Third Cave, a tarsometatarsus and a tibiotarsus of *M. didinus*.

The cave areas of Mt Luxmore are surrounded by a typical subalpine tussock and low shrub community. The few caves do not present many pitfall traps and so have a limited fauna, but as on Mt Arthur and Mt Owen, moas were represented.

Takahe Valley: Limestone strata similar to those on Mt Luxmore crop out on the flanks of the Takahe Valley, west of Lake Te Anau. Many moa bones were collected from small caves in the subalpine zone at about 900 m a.s.l. in August and December 1949 by R.A. Falla, K. Miers, and J. Ollerenshaw. This collection, split among the National Museum of New Zealand (NMNZ S 443-449), Canterbury Museum (CM Av 8505, 8507, 8513, 10335-9) and Otago Museum (OM A. 52.1-14), includes at least 37 femora, or conservatively 19 *M. didinus*.

G. R. Williams collected on 20 February 1954 2 bones (NMNZ S 472) of *M. didinus* from Point Burn, a valley adjacent to Takahe Valley. Also T. Riney collected 15 bones (NMNZ unreg.) of at least 3 *M. didinus* from Takahe Valley in 1952-53.

Between 500 and 600 m lower, and in beech forest, is the extensive Aurora or Te Ana-au Cave System from which I recorded 4 *M. didinus* and 2 *A. didiformis* (Worthy 1985). However the National Museum has additional material which was not located by me in 1984. So a complete list for the cave is as follows: *A. didiformis* $7/1$ (NMNZ S 478) and $4/1$ (NMNZ S 479) collected by K. H. Miers on 5 May 1955; NMNZ S 435,438 – skull and 9 vertebrae of *M. didinus*, NMNZ S 436-7 – $7/1$ juvenile *A. didiformis*, NMNZ S 439 – $3/2$ *M. didinus* and $6/2$ *A. didiformis* all collected by R. A. Falla in January 1949; WO 201 $37/1$ *A. didiformis* from Kneewrecker Entrance, WO 209 $4/4$ *M. didinus* from Kneewrecker Entrance, WO 200 $12/1$ *A. didiformis* from Midway Entrance, collected by me in 1984. To summarise, 7 *A. didiformis* and 7 *M. didinus* are recorded from Aurora Cave.

The vegetation of subalpine areas near the cave site: In all subalpine areas tussock (*Chionochloa* spp.) predominates but a wide variety of dicotyledons occurs as well; for example, *Celmisia* spp., *Ranunculus* spp., *Aciphylla* spp., gentians and orchids. Low-growing shrubs are also common, for example, *Dracophyllum* spp. and *Hebe* spp. The vegetation is thus characteristically open and provides little shelter, especially for a bird as large as a moa.

Age of fossil deposits from subalpine areas: Areas now in the subalpine zone were probably covered by permanent ice and snow during the last glaciation (Otira). On Mt Arthur and Mt Owen glaciers extended below the present forest edge, as shown by ice-scoured surfaces, cirques etc. Thus, although some major caves developed before and during the last glaciation, most of the surface karst features and the associated pitfall traps developed after the retreat of the ice. Therefore, fossil bones in these subalpine caves are probably less than 14 000 years old. There is a remote possibility that older remains will be discovered on Mt Owen. The erosion of the marble has left fragments of very old phreatically developed caves in which there

are fluvial gravel deposits. These deposits are undated but probably are hundreds of thousands, if not millions, of years old. Owen Heights Cave, one such example, is only about 130 m below the summit of Mt Owen.

There are only three radiocarbon dates for bone material from Mt Owen, and none from Mt Arthur, Luxmore or Takahe Valley. The following dates are reported as calculated using the old half-life for C14 (Libby T_{1/2}) equals 5568 years. Two of the bones described by Bell & Bell (1971) were dated: *Dinornis novaezealandiae* (NMNZ S 23342), R 4901/1, CR 4550, was dated as 2100 ± 60 yr BP; *M. didinus* – NMNZ S 23446 (R 4901/2, CR 4600) was dated as 11 850 ± 2250 yr BP. The other dated specimen is NMNZ S 23808 – *M. didinus* (R11412/1, NZ 7325), which gave a result 3350 ± 70 yr BP (Worthy 1989). These results support the contention that most bones are likely to be younger than 14 000 years.

DISCUSSION

In subalpine areas there are only a few restricted areas with caves, which are also often difficult of access, and so recorded moa remains are few. The few caves reported here have many remains of moas, showing that some moas did occupy the subalpine zone. Only three species are confirmed from subalpine sites: *Dinornis novaezealandiae*, *Pachyornis australis* and *Megalapteryx didinus*. The last is by far the most common moa species represented, and the largest accumulations of its bones are from subalpine sites. Bones of *P. australis* are next most abundant. In the Oparara, at Honeycomb Hill Cave, *M. didinus* dominated the fauna during the Oira Glaciation, when the cave was at the forest-shrubland junction (Worthy & Mildenhall 1989), and the main associate was *P. australis*. Thus, although bones of *M. didinus* are found in sites at lower altitude, which are currently forested and probably were during deposition, its remains are relatively less abundant than those of other species. The conclusion derived from observations of the Aurora Cave fauna and Honeycomb Hill (Worthy & Mildenhall 1989) is that the similar sized *Anomalopteryx didiformis* (Little Bush Moa) replaced *Megalapteryx didinus* at lower altitude. There would, however, have been a broad altitudinal zone of overlap because *M. didinus* would have been forced, seasonally, into lower altitudes by the onset of snow.

In general, if something is there to be eaten something will eat it. It is thus no surprise that the rich seasonally available flora of the subalpine zone was a habitat for some moas. On general ecological principles only one or two species would predominate and I have shown that *M. didinus*, the Upland Moa, was the main species using such areas, in association with *P. australis*, the Crested Moa. Invoking catastrophic events such as forest fires to explain the presence of moas is unwarranted.

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The patience of many fellow cavers has been sorely tested time and again as, instead of getting on with exploration, I have been sidetracked by an old bone.

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CLASSIFIED SUMMARISED NOTES, NORTH ISLAND

1 July 1987 to 30 June 1988

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E. & O. E.

Abbreviations: asl above sea level; BoP Bay of Plenty; B Beach; E Estuary; FoT Firth of Thames; F Forest; FP Forest Park; H Harbour; HB Hawkes Bay; HQ Headquarters; imm/s immature/s; I/s Island/s; juv/s juvenile/s; Lag Lagoon; L Lake; NP National Park; Pen Peninsula; Pt Point; Res Reserve; R River; SF State Forest; SP Sewage Ponds; sp species.

NB: Manukau H census dates: winter 14/6/87, summer 22/11/87. FoT census dates: summer 6/12/87, winter 3/7/88.

BROWN KIWI *Apteryx australis*

Wellsford, Logue's Bush, 1 released to join a prior 5 on 19/3 (KW). Tapora, c.3 prs heard on 17/1 (MJT). Ponui I, heard at night on 11/1 (PC). Pirongia, Walter Scott Res, clump of feathers found on track on 17/1 (BRK).

BLUE PENGUIN *Eudyptula minor*

Aupouri Pen, Rarawa B, 2 chicks under dense *Scirpus* and flax on 16/1 (PA). Waipoua, W Coast, numerous, including many chicks, in vegetation on 16/1 (PA).

NEW ZEALAND DABCHICK *Podiceps rufopectus*

Waiwera, Straka's Refuge, 4 on 10/8 (MJT). L Kereta, 6 on 30/12 (BS). S Kaipara lakes, 45 on 6 lakes on 13/2 (GAP, MG). Mangere SP, 2 with Grey Teal on 4/3 (GJE, RBS). L Waahi, 2 on 1/5 (BJZ *et al.*). L Ngaroto, 1 on 30/5 (ARP), 1 on 31/7 (ASR, JMR). L Rerewhakaaitu, 4 on 25/1 (KO). Kawerau, L Tamurenui, at least 9 forming prs on 12/7; 10 in front of maimai 4 days into duck-shooting season on 10/5 (RMW). Matata, 3 on 5/7 and 14/5; Thornton Lag, 2 on 5/7, 11 on 14/5 (CJ, PCML). L Taupo, Waihi Bay, 2 on 29/12 (Sch). Westshore Lag, 2 on 7/5; E Clive, 1 on 11/7; Hurimoana Swamp, 19 on 16/8 (KVT). Waimarama Rd swamp, 2 on 26/9 (JMcC). Longridge L, HB, 2 on 25/1; Porangahau - Blackhead road, 2 in farm pond 25/1 (BDH). Woodville, Bolton's L, 2 on 30/12 (Sch). Wanganui Camp L, 2 on 26/1; Wanganui R, 1 on 27/1 (PFB). Palmerston N, Centennial L, 1 on 16/8 (RG). Foxton No. 1 L, 2 prs with 3 and 2 young on 7/2; 15 on 24/4; Foxton No. 2 L, 2 on 7/2; Levin, Heatherlea Pond, 1 on 11/10, 2 on 26/1 (JLM, MM). Rakauhamahama Lag, Levin coast, 4 prs on 18/7 (BDH, WRJ, MO, MO). L Horowhenua, 186 on 14/5 (AC, WRJ). Waikanae E, 2 on 1/4 (AJT).

AUSTRALIAN LITTLE GREBE *Tachybaptus novaehollandiae*

Jack's L, 16 on 3/8/86 (GW). L Kereta, pair with 1 chick on 12/1 (GM, BS).

WANDERING ALBATROSS *Diomedea exulans*

Alderman I, 1 offshore on 10/4 (PS, AJT).

NEW ZEALAND BLACK-BROWED MOLLYMAWK

D. melanophrys impavida

Astrolabe Reef, off Motiti I, 4 on 22/5, 2 (1 imm, 1 adult) on 26/5 (KWLB). Foxton B, 1 imm passing on 4/7 (JLM, MM).

YELLOW-NOSED MOLLYMAWK *D. chlororhynchos*

Great Barrier I, 2 during crossing on 26/7 (RJL). Mercury Is, 3 offshore on 4/8 (JED, TGL, AJT).

SALVIN'S MOLLYMAWK *D. cauta salvini*

Ohope B, 1 dead (oiled) on 30/10 (WMH).

ALBATROSS/MOLLYMAWK sp.

Foxton B, 6 passing on 6/7 (JLM, MM).

NORTHERN GIANT PETREL *Macronectes halli*

Muriwai B, 1 live juvenile in late June (AJT). Astrolabe Reef, 1 on 30/5 and 23/6 (KWLB).

SOUTHERN GIANT PETREL *M. giganteus*

Muriwai B, 1 live juvenile in late June; Cook Strait, 1 dark phase with green bill tip, on 3/8 (AJT).

CAPE PIGEON *Daption capense*

Great Barrier I, 1 seen during crossing on 26/7 (RJL). Mercury I, 1 offshore on 4/8 (JED, TGL, AJT).

GREY-FACED PETREL *Pterodroma macroptera*

Mt Maunganui, 4 seen, many others heard on 8/8; 1 on ship at wharf on 4/7 (PCML). Ohope, 1 alive on beach, released off Whale I on 22/1 (WMH).

COOK'S PETREL *P. cookii*

Kamo, 1 found alive and released after feeding on 24/3 (RP). Little Barrier I, few calling about summit on 11-13/5 (MJI, AJT).

ANTARCTIC PRION *P. desolata*

Mitimiti, 1 live bird ashore on 2/8/86 (GW).

BLACK PETREL *Procellaria parkinsoni*

Foxton B, 1 passing on 22/8; 10 on 27/12 (JLM,MM).

WHITE-CHINNED PETREL *P. aequinoctialis*

East Clive, HB, 1 dead on beach on 14/11 (KVT).

FLESH-FOOTED SHEARWATER *Puffinus carneipes*

Waipu E, many offshore feeding with terns on 14-15/1/87 (PB).

BULLER'S SHEARWATER *P. bulleri*

Waipu E, few offshore 12-17/1/87 (PB). Little Barrier I, 1000s offshore on 16/5 (PS, GAT, AJT).

SOOTY SHEARWATER *P. griseus*

Foxton B, 20 passing on 4/7, 1 on 27/12 (JLM, MM).

FLUTTERING SHEARWATER *P. gavia*

Waimangu, c.1000 close inshore on 29/12/86 (GW). Waipu E, many feeding with terns offshore on 12/1/87 (PB). Waharau, large numbers close inshore on 2-5/4 (JVD). Coromandel Pen, Waikawau Bay, 1000 + c.30 m offshore on 12/4; Te Kouma Bay, 1000 + close inshore on 21/6 (AVP, JVP). Rangitaiki R mouth, 200-300 offshore on 14/5 (CJ). Foxton B, recorded in July, Aug, Feb, June; max 1000 on 6/2; Wellington H, present July-Oct, Mar-June; max c.300 at Pt Nicholas on 25/9 (JLM,MM).

LITTLE SHEARWATER *P. assimilis*

Maungakaramea, 1 found on farm and released on 23/11/87 (RP).

AUSTRALASIAN GANNET *Sula bassana serrator*

Muriwai, c. 450 nests (including 250 on stack, 115 on upper cliff, 72 on lower cliff) on 6/2 (MJT); Oaia I, 98 chicks remaining on 6/3 (GT). Great Barrier I, nesting colony of 1000 + birds on rocky islands north of Whangaparapara on 10/12 (SC, GS). Weymouth, unusually high numbers feeding 20/8 - 8/9; max 49 on 1/9 (BJB); 28 replete on water on 26/4 (AJG). Waitangi E, HB, 5 on 14/11; Tukituki E, 3 on 14/11 (JRP, MTC); Kairakau, c.16 flying past on 10/10 (KVT); Pourere-Aramoana, flocks of up to 20 flying north in lines; total of c.200 on 31/1 (ARG, ALH). Porangahau E, 1 on 21/11 (KVT). Foxton B, 3 on 22/8; recorded most months (JLM, MM). Wellington H, ones or twos recorded Aug-Nov and June (JLM, MM).

BROWN BOODY *S. leucogaster*

Weymouth, 1 immature dead ashore on 15/5 (BB).

BLACK SHAG *Phalacrocorax carbo*

L Omapere, 180 fishing in groups on 27/9/86; 300 on 18/10/86 (GW). Manukau H census, summer 10, winter 23 (AJG, MJT). FoT census, summer 32, winter 115 (AJG). Miranda, 130 in trees on 5/5 (TGL, PS, RBS, AJT). Raglan, Kotuku Creek, colony in karaka trees, 56 + including juvs, on 10/9 (JMR, ASR). L Rotoroa, Hamilton, 8 on 19/9, 30 on 30/2, 6 on 23/4; Kawhia, 10 on 21/11; L Ngaroto, 100 in tree roost put up by passing plane (ASR).

Kaituna Cut, 10 nesting in pines among Pied Shags on 18/10; Maketu E, 5 on 17/11, 4 on 5/6; Little Waihi, 15 on 17/11; Matata, 3 on 8/11, 7 on 14/5; Thornton Lag, 3 on 5/7 and 20/9; Rangitaiki R mouth, 2 on 19/6 (PCML). Ahuriri E, 9 on 11/7, 28 on 14/11; Tukituki E, 4 on 11/7, 27 on 14/11; Waitangi, 27 on 14/11; Porangahau E, 30 on 11/7; L Poukawa, 12 in July (KVT). Pourere-Aramoana, 2 on 31/1 (ARG, ALH). Wanganui, L Westmere, 5 on 26/1; Camp Lake, 8 on 26/1; Wanganui R, 17 on 28/1 (PB). Palmerston North, Centennial Lag, 2 on 7/5 (RG). Manawatu E, 3 on 27/10 (RG), 15 on 29/3 (RAC, SEC, RPS), 41 on 15/5 (JLM, MM). L Horowhenua, 9 on 15/5 (AC, WRJ). Whirokino, c.20 nests with large chicks on 24/10 (JLM, MM).

PIED SHAG *P. varius*

Te Weraki Lag, 1 on 14/2 (BS). Mangonui, 1 on 22/11; Whangaruru South, 1 on 2/5 (MH). Noises I, nesting colony of 41 adults with chicks, on 20/8 (SD). Hobson Bay, colony of 22 pairs, on 13/12 (MJT). Kawau I, Dispute Cove, colony of c.40 adults on 16/3 (AF). Goat I, colony of c.25 birds on 16/3; Ti Point, colony of c.35 birds on 16/3 (MJT). Manukau H census, summer 105, winter 218 (AJG, MJT). Waikato R mouth, 107 on 13/3 (AJG). Wairoa R, Clevedon, 22 on 1/1 (TH). FoT census, summer 4, winter 43 (AJG). Kawhia H, 1 on 21/11 (ASR). Matakana I, Panepane Pt, 5 on beach on 22/11; Sulphur Pt, 10 roosting on breakwater on 18/6; Kaituna Cut, 50+ in pines, including many imms Oct-Mar; mating observed on 22/10, nesting material being carried on 20/3 (PCML); c.70 birds on 5/6 (GH). Maketu E, 8 on 5/6; Little Waihi, max 9 on 7/11; Otamarakau, 2 on 8/11, 14 on 19/6; Tarawera R mouth, 10 on 8/11, 5 on 14/5; Rangitaiki R mouth, 9 on 8/11, 3 on 19/6; Ohope Spit, 3 on 13/3 (PCML). Waitohi E, 24 on 8/11 (WS), 4 on 24/5 (BS); Waiaua E, 25 on 8/11 (WS). Petone, 1 resting with Black and Little Shags on 5/9 (JLM, MM).

LITTLE BLACK SHAG *P. sulcirostris*

Whangarei H, Kissing Pt, 30 on 13/7, 69 on 2/4 (RP). Waikato R delta, 120 fishing as pack on 23/8 (BB). Manukau H census, summer 1, winter 192 (AJG, MJT). FoT census, summer 4, winter 3 (AJG). L Waahi, 6 on 1/5 (BJZ *et al.*); L Rotorua, Hamilton, 2 on 19/9 (ASR); L Ngaroto, 1 on 31/7 (ASR, JMR). L Rotomahana, c.100 nesting on island on 25/1 (KO). Plummers Pt, Tauranga H, 1 on 8/9 (BRK). Sulphur Pt, 32 on breakwater on 18/6; Maungatapu, c.100 roosting on power pylon on 4/6; Hairini, c.50 on sandbank on 13/5; Kaituna Cut, 2 on 18/10; Maketu E, 20 on 5/6; Little Waihi, 7 on 7/11, 1 on 5/6; Matata, 3 on 5/7, 13 on 14/5; Tarawera R mouth, 6 on 6/9, 1 on 19/6; Rangitaiki R mouth, 3 on 5/7 and 14/5, 1 on 19/6 (PCML). Ahuriri E, 19 on 11/7, 58 on 14/11, 85 on 9/4; Waitangi E, 5 on 11/7, 13 on 14/11; Porangahau E, 23 on 21/11 (KVT). Manawatu E, 24 on 27/9 (JLM, MM), 17 on 29/3 (RAC, SEC, RPS, LJD); Foxton Loop, 16 on 28/12, 10 on 17/1 (JLM, MM). Turakina E, 2 on 27/3 (PB, OT). Palmerston North Centennial Lag, 2 in May (RG). Pauatahanui Lag, 22 on 25/4; Wellington H, Petone to Ngauranga, max 35 on 25/8 (JLM, MM).

LITTLE SHAG *P. melanoleucos brevirostris*

Hobson Bay, nesting colony of 21 pairs on 13/12 (MJT). Manukau H census, summer 7, winter 25 (AJG, MJT). Duder's, Clevedon, 19 on 16/6;

FoT census, summer 2, winter 57 (AJG). L Rotoroa, Hamilton, 4 on 19/9, 13 on 20/2, 7 on 23/4; Aotea H, 1 on 21/11; Kawhia H, 1 on 21/11 (ASR). Sulphur Pt, Tauranga H, 20 on breakwater on 18/6; Maungatapu, c.10 on power pylon on 4/6; Kaituna Cut/Maketu E, max 20 on 1/11; Little Waihi, 30 on 7/11; Matata, 5 on 14/5; Tarawera R mouth, 12 on 14/5; Rangitaiki R/Thornton Lag, 5 on 20/9, 4 on 14/5 (PCML). Ahuriri E, 28 on 11/7, 30 on 14/11; East Clive, 14 on 11/7, 9 on 14/11; Porangahau E, 14 on 11/7 (KVT). Manawatu E, 1 on 22/11, 1 on 21/2 (RAC, SEC *et al.*); Foxton No. 1 L, 10 on 13/3 (JLM, MM). Palmerston North, Centennial Lag, max 18 on 7/5 (RG). L Horowhenua, 7 on 15/5 (AC, WRJ). Wellington H, Petone to Ngauranga, max 14 on 14/7 (JLM, MM).

SPOTTED SHAG *Stictocorbo punctatus*

Oaio I, 1 juv in nest on 6/3 (GT). Ponui I, 56 at Oranga Bay on 3/1 (TRH). FoT, Tarata Pt, 60-70 fishing on 11/11 (JU), 145 on 5/6 (PA, DA). East Clive, on sewer outfall, 24 on 2/7, 37 on 11/7 (KVT). 1 adult, 1 juv on 7/5; 2 juvs on 4/6 (JRP, MTC). Wellington H, Petone to Ngauranga, 1 July-Oct (JLM, MM).

FRIGATE BIRD sp.

Miranda, 1 reported flying over shellbank on c. 3/3 (MJT). Kaiaua, 1 found dead by resident on c. 1/4 (GA).

WHITE-FACED HERON *Ardea novaehollandiae*

Paua, Parengarenga H, 20 on 11/2 (BS). Awhitu Pen, Gordon's Rd, partial albino present on 19/6 (JVD). Manukau H, census, summer 197, winter 259 (AJG, MJT). FoT census, summer 150, winter 24 (AJG). Coromandel H, 83 on 29/11 (AVP, JVP). Moana Pt, Whangamata, 47 on 27/7/86 (HMS). Kawhia H, 28 on 21/11, 27 on 18/6 (ASR). Matahuiti Pt, Tauranga H, 10 on 22/11 (PCML), 60 on 19/5 (BS). Kaituna Cut/Maketu E, c.40 on 18/10, 68 on 5/6; Little Waihi, c.50 on 1/11; Papamoa, c.40 in field on 4/6 (PCML). Ohiwa H, 30 on 16/11 (WMH). Ahuriri E, 29 on 11/7, 54 on 14/11; East Clive, 6 on 11/7, 2 on 23/8; one with bright orange/red legs, other pale orange/pink; Meeanee, 15 in paddock on 30/6 (KVT); Taradale, 3 pairs carrying nest material into trees on golf course in spring (MTC). Porangahau E, 2 on 11/7, 4 on 21/11 (KVT). Pourere-Aramoana, 30+ on 31/1 (ARG, ALH). Whirokino, 23 on 2/8 (JLM, MM). L Horowhenua, 63 on 14/5 (WRJ, AC).

WHITE HERON *Egretta alba*

Waipu E, 1 on 12-16/1/87 (PB). Jordan's Farm, Kaipara H, 1 on 7/11 (SD), 2 on 21/4 (BG), 1 on 17/5 (GA). Mangere Bridge, 1 on 19/7 (GA); East Tamaki E, 1 on 22/2 (GR). Waikato R, Klondyke Rd, 2 on 26/7 (AJG *et al.*). Miranda, 1 on 13/7 and 28/9 (BRK); FoT census, summer 1; Kauaeranga R, 1 on 6/12 (AJG). Matata, 1 on 6/9 and 24/4; 2 on 14/5 (PCML, AMcC). Waiaua E, 1 on 30/4 (WS). Ahuriri E, 1 on 11/7 (KVT). Meeanee, 1 with White-faced Herons in May (JRP); possibly same bird present at Anderson Park, Napier, throughout June; Tukituki E, 1 on 11/7 (KVT), seen bathing and almost submerged in chest-high water on 2/8, still present on 19/9 (MT, PWT); East Clive, 1 with breeding plumes on 27/9 (KVT). Manawatu E, 1 on 18/7 (JLM, MM), 1 on 28/6 (RG, GG, LJD). Ohau E, 1 on 22/6; Otaki Golf course, 2 on 1/5 (WRJ).

LITTLE EGRET *E. garzetta*

Mangere SP, 1 on 8/5 (DGB) and 1/6 (GJHM). Waikato R, 1, possibly imm, remained between Klondyke Rd and Port Waikato from 5/7 to 1/3 (BB, PA, DA).

REEF HERON *E. sacra*

Far North/Northland region, 15 reports, mostly of single birds, but including 4 at Karikari on 1/8 (RP) and 2 at Waipu E, on 12/1 (PB). Omaha Spit, 1 on 24/11 (MJT). Waiheke I, Te Matuki Bay, 1 on 22/11 (BS). Motutapu I, Administration Bay, 1 on 23/8 (SB). Great Barrier I, 2 single birds on 16/2 (SG). Ponui I, 2 single birds on 3/1 (TRH). Whangaparaoa Pen, 1 on 6/2 (SC). Wade R, 1 on 25/3 (SG), 2 on 20/1 (SCh). Kohimarama B, 1 on 12/11 (RGam); Tahuna Torea, 1 on 12/12 (RJL); Judge's Bay, 1 on 28/9 (MJT); Bucklands B, 2 on 11/1 (SB); Howick, Mellon's Bay, 1 on 5/4 (BE). Mangere SP, 1 on 3/1 (RJL). Whitianga H, 1 on 20/2 (SC). Awhitu Pen, Graham's B, 1 on 27/2 (BB). Clevedon, Duder's B, 1 on 10/4 (TH) and chasing a White-faced Heron on 16/5 (JLP). Tawhitokino, 1 on 1/4 (AJG). Waharau, 1 on 10/11 (JVD). Whakatiwai, 1 in Jan (AJG). Raglan, 2 on 12/4 (SC); Aotea H, 2 on 21/3 (PMB), 2 on 18/6 (ASR); Kawhia H, 1 on 18/6 (MAB). Tauranga H, Sulphur Pt, 1 on 22/11 (RC); Mt Maunganui, 1 on 14/6 (CJ); Kaituna Cut, 3 on 22/10 (GB); Maketu E, 1 on 1/11 and 7/11; Little Waihi, 1 on 20/3 and 6/6 (PCML). Whakatane Heads, 2 on 11/12 (RMW); Ohiwa, 1 on 16/11 (WMH). Waiotahi E, 1 on 24/5 (BS) and 23/6; Waiaua E, 1 on 8/11 (WS). Ahuriri E, 1 on 11/7, 1 undisturbed by fishing net being set in nearby channel on 30/1; Kairakau, 2 almost invisible against rocks as they fed, on 10/10 (KVT). Pukerua Bay, 1 on 9/4 (AJT); Wellington H, Pt Nicholas, 2 on 31/8, 1 present throughout year (JLM, MM).

CATTLE EGRET *Bubulcus ibis*

Awanui, 114 (75% in breeding plumage) with 60 Red-billed Gulls among cattle on 1/10 (PA). Parakai, 120 on 22/8 (CE). Orewa SP, 20 on 22/8 (JED). Mangere SP, 14 on 22/8 (MJT, KH), 13, mostly in breeding plumage on 26/9 (MJT), 6 on 5/11 (GA, RBS). Whatipu B, 1 flew south after resting on 16/4 (MG, SG). Otaua, Waikato R delta, 57 on 5/7, 56 on 23/8, 50 on 27/9 with 20% showing some colour; 54 on 12/6 (BB, JVD, *et al.*). Piako, 63 on 16/8, 85 on 7/9, 60 on 30/10, 28 on 28/5, 47 on 6/6 (LG, KWL B, BS, CS). Whangamata, 2 on 14/8 (HMS). Ohinewai, c.200 on 7/6 increasing to max of 474 on 23/8 (FN), 3 still present on 30/11 (BHS). Rototuna, 10 on 16/7, 14 on 19/9 (BRK). Ruakura, 1 on 20/4 (FN). Ohaupo, 13 on 11/11, 1 on 18/11 and 2/12; L. Ngaroto, 29 on 10/5, 33 on 13/6 (RWD). Te Anga, 5 on 11/5 (JWR). Maketu, 24 on 18/10 and 26/10, 2 on 1/11 (PCML), 16 on 5/6, 23 on 18/6 (KWL B, PCML, NS); Awaitei/Matata, 49 on 5/7 and 6/9 (PCML), 34 on 4/6 (WMH). Kukumoa, Oporiki, 31 on 10/7, 2 on 28/4 increasing to 10 by 23/6 (WS). Meeanee, 1 reported early June, 2 on 30/6 with 15 White-faced Herons; Te Hauke, 17 mostly in breeding plumage, on 4/10 (KVT). Whirokino, 350 on power pylons on 4/7 (WRJ, MO, MO), 230 on 5/7, 17 on 25/6 (JLM, MM). Waitotara, 23 on 27/8; Whangaehu, 18 on 30/8 (GR), 13 on 25/6 (PB). Woodville, 22 on 1/9 (WRJ). Longburn, 13 on 24/8 (REC, RW).

AUSTRALASIAN BITTERN *Botaurus poiciloptilus*

Far North Region, 11 records of 1-3 birds from North Cape to Kaikohe (RP). Ngawha Springs, 2 on 3/11 (PA). Waipu Cove, 1 on 12/1/87 (PB). Straka's Refuge, 1 in raupo on 29/11 (VL). L. Kereta, 2 on 15/11 (DF). Whatipu, 1 on 7/7 (JES). Clevedon, 1 roadside report; 1 at Urungahau Stream on 16/3 (AJG). Waikato R, Sandmine Lookout, 1 at water's edge drew reeds towards it with foot to make a platform to stand on, on 23/8 (AJG *et al.*). L. Waipoua, booming on 3/9 (IR). L. Waahi, 2 on 1/5 (BJZ *et al.*); Taupiri, 1 on 28/4 and 1/5 (ASR, JMR); L. Ngaroto, 1 on 28/10 (GB), 2 on 18/5 (RWD); Kawhia H, near Oparau, 1 on 18/5 (BHS). Kaituna Cut, 1 flew from reed-bed carrying 400 mm eel on 20/3; Pongakawa, 1 flew across main road on 22/1 (PCML). L. Taumarenuui, Kawerau, 1 dive-bombed by Harrier, jumped twice high into air and drove Harrier off, on 4/6; L. Rotoma, 2 on 12/7 (RMW). Tarawera R Mouth, 1 on 18/11 (PCML), 2 on 24/5 (BS); Thornton Lag, 1 on 5/7, 20/9 (PCML), 5 on 31/7 (WMH), 10 all in air at once on 10/5 (RMW). Hurimoana Swamp, H.B., 1 near road on 16/8; East Clive, 3 flushed from swamp together on 23/8 (KVT). L. Taupo, 12+ on east side on 27/8 (AD, GL, AJT). Foxton No. 1 L, 1 on 24/4 (JML, MM).

GLOSSY IBIS *Plegadis falcinellus*

Miranda, 6 flew inland on 10/11 (BHS). Ohinewai, 7 on 27/11, 1 associating with Cattle Egrets on 7/6 (FN *et al.*). Manawatu E, 1 on 5/7 (JML, MM). L. Wairarapa, 2 on 29/5 (BDH, HAR, AJT).

ROYAL SPOONBILL *Platalea regia*

Jordan's Farm, Kaipara H, 2 on 1/5 (JED), 3 on 17/5 (GA). Mangere SP, 13 on 12/9 (R JL), 6 on 5/11 (MJT), 1 on 20/12 (R JL), 16 on 4/5 (CB); Ambury Farm Park, Mangere, 21 on 31/7 (DGB). Coromandel, 1 feeding near wharf on 16/3 (MT). Kaituna Cut, 2 on 22/8 in pine tree with nesting Pied Shags, appeared to be 'playing' at nesting; in breeding dress on 27/9, still present on 26/10; gone on 7/11 (GB). 1 adult on 4/4 (PCML), still present on 18/6 (KWL B). Matata, 2 on 20/9, probably Kaituna birds (BC). Ahuriri E, 16 (included at least 7 adults, 7 imms) on 11/7 (PWT); 12 on 2/4, 22 on 12/6 (included at least 12 adults, 7 imms) (MT, PWT); evening roost established in nearby trees (ALH, ACS); Tukituki E, 1 on 14/11 and 5/3 (BMT). Porangahau E, 2 on 11/7 (KVT). Wanganui R, 2 on 6/3, 3 on 3/4, 4 on 9/4, 6 on 7/5, 1 on 28/6 (OT, PB). Manawatu R, Longburn, 1 on 30/10 (MT). Manawatu E, 31 on 4/7, 34 on 26/3 (JLM, MM), 37 on 29/3 (REC, RG, RS, PS, LJD). Waikanae E, 1 on 28/11 (BAT), 6 on 3/4 (MAF, JL, AJT).

MUTE SWAN *Cygnus olor*

L. Poukawa, HB, 7 on 30/6 (KVT).

BLACK SWAN *C. atratus*

Te Werahi Lag, Te Pahi, 8 on 14/2 (BS). Tuakau SP, 150 on 12/7 (JVD), 110 on 29/5 (AJG *et al.*). Matarangi Spit, 136 on 27/5 (AVP, JVP). L. Rotorua, Hamilton, 40 on 20/2, 50 on 23/4 (ASR). Matahui Pt, c.370 on 22/11; Kaituna Cut/Maketu E, 20 on 7/11, 45 on 5/6 (PCML); Matata, c.50 (including 2 broods of c.10 day cygnets) on 20/9 (BC), c.80 on 8/11; Thornton Lag, 2 pairs on 20/9 (PCML). Ahuriri E, 170 on 11/7, 57 on 21/11;

East Clive, 6 out at sea on 5/5; Hurimoana Swamp, 66 on 16/8; L Poukawa, c.300 in July, 600+ (total of 2 flocks 11 km apart) on 21/8; Porangahau E, 55 on 11/7, 30 on 21/11 (KVT). Wanganui, Kaitoke L, 102 on 16/1; Turakina E, 4 on 27/3 (PB, OT). Palmerston North, Centennial Lag, 1 during May (RG). Manawatu E, 5 on 31/12, 6 on 5/6; Foxton No. 1 Lake, c.710 on 9/4; No. 2, 2 on 7/2; Whirokino, 140 on 22/8, 128 on 25/6 (JLM, MM). L Horowhenua, 320 on 15/5 (AC, WRJ). Wellington H, Petone to Ngauranga, 5 on 21/8, 1 on 31/5 (JLM, MM).

CANADA GOOSE *Branta canadensis*

Tuakau SP, 7 on 12/7, 4 on 29/5 (AJG *et al.*). Clevedon, Urungahauhau, 4 reported on dam 20/9 - 10/8 (PF). L Hakanoa, 40 on 1/5 (ASR). L Waahi, 120 on 23/3 (BHS), 430 on 1/5 (BJZ *et al.*). L Rotorua, Hamilton, 2 on 20/2 and 23/4; increasing in Waikato region (ASR). L Rerewhakaaitu, 4 adults and 15 goslings on 25/1 (KO). Pahoia, Tauranga H, c.500 in May; Kaituna Cut/Makeru E, max 63 on 4/4 (including 5 with orange neckbands, 1 with red); Little Waihi, max 74 on 5/6; Matata, 34 on 24/1 (PCML). Hicks Bay Lag, 1 on 10/11 (KO). Longridge L, HB, 32 on 25/1 (BDH). Foxton No. 1 Lake, 1 on 7/11, 9 on 1/1; Waikanae E, 2 or 3 recorded 9 times Oct-May (AJT, BAT). Petone, Hutt R. railbridge, 5 from July-Nov. Feb-May (JLM, MM).

PARADISE SHELDUCK *Tadorna variegata*

Te Werahi Lag, Te Pahi, 11 on 14/2 (BS). Mimiwhangata, 32 on 11/11/86 (AG), 12 on 2/5 (MH). Whananaki South, 40 on 8/6/86; Oakleigh, 20 on 14/7/86 (BW). Waipu E, 9 on 15/1/87 (PB). Wentworth Valley, 66 in one paddock on 1/3/87 (HMS). Waikorea R, 47 on 3/8, 5 on 28/8 (ASR). L Waahi, 2 pairs on 23/3, 140 on 1/5 (BJZ *et al.*); increasingly common & widespread in Waikato region. Little Waihi, 3 on 1/11; Matata, 15 on 6/9, 13 on 14/5; Awaitei wetlands, 10 on 5/7 (PCML). Ahuriri E, 128 on 11/7, 24 on 14/11 (KVT), 300+ in single flock on 3/4 (MT, PWT); Hurimoana Swamp, 20 on 16/8; L. Poukawa, c.12 in July; Pukehou, 350+ in wet fields on 21/8 (KVT). Foxton, Moutoa floodway, 57 on 9/4; Foxton No. 1 L, 12 on 7/2, 50 on 24/4; Whirokino, 3 on 12/9, 54 on 25/6 (JLM, MM). L Horowhenua, 2 on 15/5 (AC, WRJ). Pauatahanui Lag, up to 4 July/Aug, 4 on 10/4; Hutt R, Silverstream bridge, pair with 5 young on 11/11 (JLM, MM).

MALLARD *Anas platyrhynchos*

Clevedon, albino drake shot, slight cream tinge to breast, on 25/5 (PF). Taruru, Thames, 500 "Grallard" hybrids on 4/2 (MJT). Kaituna Cut, 20 with 12 ducklings on 1/11, c.60 on 20/3; Otamarakau, c.50 rafting offshore on 19/6; Matata, c.2000 on 14/5; Awaitei Wetlands, c.100 on 5/7; Thornton Lag, 20 on 20/9 (PCML). Ahuriri E, 490 on 11/7, 389 on 14/11; Waitangi E, 278 on 11/7, 99 on 14/11; Tukituki E, 22 on 11/7, 7 on 14/11; Porangahau E, 100 on 11/7 (KVT). Wanganui, 30 on 26/1 (PB). Manawatu E, 220 on 22/11 (RAC, SEC, *et al.*), 329 on 17/4 (RG, GG), 200 on 14/5 and 25/6; Foxton No. 1 L, 200 on 7/2 (JLM, MM). L Horowhenua, 450 on 15/5 (AC, WRJ).

GREY DUCK *A. superciliosa*

Aurere E, 2 on 22/11 (MH). Tuakau SP, 2 on 29/5 (AJG *et al.*). Matata, c.10 on 14/5 (PCML). Ahuriri E, 2 on 11/7 (KVT). L Westmere, 8 on 27/1 (PB). Manawatu E, 8 on 22/7, and 22/8; Foxton No. 1 L, 1 on 7/2 and 24/4; Foxton No. 2 L, 3 on 7/2 (JLM, MM). L Horowhenua, 200 on 15/5 (AC, WRJ).

GREY TEAL *A. gibberifrons*

Jack's L, Pakaraka, 40 on 7/2/87 (GW). Mangere SP, 140 feeding on surface on 10/1 (BHS), 280 on 21/4 (TGL, RBS). Tuakau SP, 158 on 12/7 (JVD), 70 on 29/5 (AJG *et al.*). Miranda, 98 on 21/4 (AJG). L Waahi, 20 on 1/5 (ASR *et al.*). Taupiri, Komakorau Stream, 2 on 28/9, 3 adults with 1 duckling on 5/10 (BRK). Gordonton, 3 on 7/5 (DJR). Plummer's Pt, Tauranga H, 2 with roosting godwits on 8/9 (BRK); Kaituna Cut, 80 on 20/3, 60 on 4/4, 20 on 5/6 (PCML). Ahuriri E, 117 on 11/7, 54 on 14/11 (KVT), c.200 on 26/3 (PWT). Westshore Lag, c.350 on first day of shooting, 7/5; Waimarama Rd Swamp, 21 on 21/3, 1 taking shallow dives like shag; L Roto-o-kiwa, c.100 on 4/10; Porangahau E, 7 in July (KVT); Longridge L, 24 on 25/1 (BDH). L Westmere, 8 on 26/1 (PB). Manawatu E, max 95 on 25/6; Foxton No. 1 L, 30 on 13/3, 5 on 24/4 (JLM, MM). Waikanae E, 13 on 3/4 (AJT). Pauatahanui Lag, max 7 on 26/6 (JLM, MM).

BROWN TEAL *A. Chlorotis*

A detailed survey of coastal strip between Bay of Islands and Tutukaka 16-23 Feb 1988 is recorded here in full because of the localised distribution of this species. All observations are by RP, except for one by PA. Perekura Bay, 3 groups of 3, 87, 16; Clendon Cove, 59 including 6 ducklings; Manawaroa, Gordon's Dam, 32; Ngaiotonga Pond, 12; Tutaematai Stream, c.100; Punaruku Stream, 6; Mimiwhangata, 43; Teal Bay, 32; Ngahau Bay, 10; Whananaki, 4 groups of 19, 2, 15, 82; Matapouri E, 3; Kowharewa B, Tutukaka, 3.

NEW ZEALAND SHOVELER *A. rhynchotis*

Tuakau SP, 67 on 12/7 (JVD), 57 on 29/5; Waikato R, Sandmine Lookout, 60 on 12/6; Clevedon, Duder's 16 on 16/6 (AJG). Miranda, 11 pairs on 16/8, 110 on 5/6 (PA, DA, JLP). L Waahi, 20 on 1/5 (BJZ *et al.*). Taupiri, Komakorau Stream, 3 on 28/9 (BRK). Kaituna Cut, 8 on 18/10, 12 on 1/11; Matata, c.200 on 14/5; Thornton Lag, 2 pairs on 20/9 (PCML). Ahuriri E, 626 on 11/7, 18 on 14/11; Westshore Lag, 100 + with a further 150 + on nearby Southern Marsh on 7/5; Waitangi, 21 on 14/11; Hurimoana Swamp, 2 on 16/8 (KVT). Waimarama Rd Swamp, 1 pair with 11 ducklings on 26/9 (JMcC). Porangahau E, 4 on 11/7, 11 on 14/11 (KVT). L Kaitoke, Wanganui, 28 on 30/1 (GR, OT). Manawatu E, 10 on 18/7, 35 on 14/5; Foxton No. 1 L, 75 on 7/2, 200 on 13/3, 100 on 24/4; Foxton Loop, 2 on 24/10 (JLM, MM). L Horowhenua, 6 on 15/5 (AC, WRJ). Waikanae E, 143 on 4/4 (AJT).

BLUE DUCK *Hymenolaimus malacorhynchus*

Mangorewa Gorge, BoP, 1 pair on 25/2 (PCML). Waioeka Gorge, 2.8 km above Manganuku R, 1 pair on 24/5 (BS). Whirinaki SF, 2 on Whirinaki R on 26/9 (BMT). Ongarue R, near Pureora, 1 pair on 29/9 (Sch).

NEW ZEALAND SCAUP *Aythya novaeseelandiae*

Jack's L, Pakaraka, 2 on 29/8/86 (GW). Tuakau SP, 1 on 29/5 (AJG *et al.*). L Rotorua, Hamilton, 1 feeding with Coot on 13/9 (MJD). Taharoa, 12 on 11/7 (ARP, ND). Matata, 143 max for year on 5/7 (PCML). HB region, always present on Ls Tutira, Horseshoe, Roto-o-kiwa and on Hurimoana Swamp (KVT). L Kaitoke, Wanganui, 1 adult with 6 ducklings on 16/1, 28 with 6 ducklings on 30/1 (GR, OT).

AUSTRALASIAN HARRIER *Circus approximans*

Waipu E, 1 'bombed' by nesting oystercatchers and Black-backed Gulls on 13/1/87 (PB). Miranda, after flushing roosting waders, bird 'stooped' from 150 feet to 6 feet from ground but caught nothing, on 18/6 (BHS). Tarawera R bridge on Highway 2, very pale male on 22/1, thought to be same bird first reported in April 84; Awaitei Wetlands, 6 in air at once on 20/9 (PCML). Ahuriri E, 13 on 11/7, 4 on 14/11; pair seen passing food in mid-air; East Clive, 2 on 11/7, 4 on 14/11; L Poukawa, 6 in July (KVT).

NEW ZEALAND FALCON *Falco novaeseelandiae*

Cossey's Dam, Hunua, 1 reported at east end, early Dec (AJG). Mt Pirongia, 1 on 30/8 (JMR, ASR); Oparau, 1 on 28/6 (BHS); Waitomo, 1 on 18/7 (ASR *et al.*); Pureora SF, 1 spiralling high on 9/12 (Sch); Upper Tawarau Gorge, 1 calling on 19/3 (ASR). Craig's Walk, north HB, 1 on 26/10 (KVT). Napier, Bluff Hill, 1 present between 2/4 and 16/5 (DA). Pakipaki, 1 on fence post on 1/7 (JMcC). Te Awanga, 1 seen close to village, calling, on 6/1 (BMT). Taihape, 1 on 4/7 (GR). Wanganui, 1 on 21/5 (DJ). Levin, 1 chasing Silvereyes on 2/1 (MO, MO).

NANKEEN KESTREL *F. cenchroides*

Te Mata Peak, Havelock North, 1 on 3/7, 1 circling and spiralling slowly on 25/2 (BMT).

RED-LEGGED PARTRIDGE *Alectoris rufa*

Pollok, Awhitu Pen, pairs on territory answering taped calls on 13/11 (F. Thompson *per* AJG). Horotiu, 2 in mid-Jan; Tamahere, 1 in mid-Jan (PCDC).

CHUKOR *A. chukar*

Kahuranaki, HB, 1 at summit around Telecom buildings on 13/4 (BMT).

BROWN QUAIL *Synoicus ypsilophorus*

Rangiahua, 5-6 beside Highway 1 on 21/5 (TT). Tiritiri Matangi I, widespread and numerous on 25/3 (SB). Taupaki, pair beside road on 11/10 (MG, SG). Otamarakau, a male heard calling on 20/9, Kaituna Cut, covey of 5 on 4/4 (PCML). Pongakawa, near L Rotoiti, 4 on road on 8/12 (Sch). Harakeke Forest, north side Whangaeu E, 2 on 16/5 (GR).

CALIFORNIA QUAIL *Lophortyx californica*

Mt Maunganui, 4 on 10/7; Maketu, 2 males, 1 female on 26/10; Little Waihi, 1 male on 7/11; Ohiwa H, 1 pair on 19/1; Potaka, Cape Runaway, 1 pair on 21/1 (PCML). Taradale, covey of 13 on golf course seen several days in April (MTC). Clifton Station, HB, covey of 10 on 26/5 (KVT). Foxton B, heard on 24/10 and 25/4 (JLM, MM).

PHEASANT *Phasianus colchicus*

Papamoa, plentiful in coastal dunes (PCML).

BANDED RAIL *Rallus philippensis*

Ngawha, 1 on 3/11 (PA). Wenderholm Regional Park, 5 feeding in mangroves (Sch). Clevedon, still breeding at Cruising Club on Wairoa R, 1 with 6 tiny chicks on 16/11, pair with 2 half-grown chicks on 20/3 (PA, TH). Opoutere, pair with 4 chicks by car park on 11/2 (AVP, JVP). Hauraki Plain, reported between Mangateparu and Tahuna on 8/4 (*per* DJR).

Maketu, seen throughout year feeding in open (PCML). Te Maunga, regularly feed in open (KS, NS). Matata, 1 feeding in open at midday on 5/7 (PCML), 1 on 4/9 (SCh); Waitohi, 1 on 20/7; Ohiwa H, Burma Rd, 1 on 21/2 (WMH).

WEKA *Gallirallus australis*

Tiritiri Matangi I, single bird introduced from Kawau I on 15/11 (SB).

MARSH CRAKE *Porzana pusilla*

Westshore, Napier, 1 with a Spotless Crake at edge of pool on 12/11 (BHS).

SPOTLESS CRAKE *P. tabuensis*

Tiritiri Matangi I, present in at least 3 localities on 25/3 (SB). Moumoukai Dam, Hunuas, present in stream below outlet on 11/10 (AJG). Ardmore, Quarry Rd, 3 at reservoir on 17/11 (JLP). Meremere, Island Block Rd, 2 responding to tapes on 1/3; Meremere Cableway, responding at several sites on 18/4 (FN). L. Waahi, 1 heard on 1/5 (BJZ *et al.*); Taupiri, Komakorau Stream, 2 seen and others heard on 5/10 (BRK); L. Ngaroto, 1 heard on 30/5 (ARP). Westshore, Napier, 1 with a Marsh Crake at edge of pool on 12/11 (BHS). L. Taupo, 2 on east side on 27/8 (AD, GL, AJT).

PUKEKO *Porphyrio melanotus*

Glen Massey, 2 chicks in nest of 5 eggs hatched on 16/9 (PMB). L. Rotorua, Hamilton, 8 on 20/2, 11 on 23/4 (ASR); Chartwell, Hamilton, frequently heard at night over built-up area, moving between damp gullies (BRK). Te Maunga, pair with c.10 day-old chicks on 18/5 (AMC). Ahuriri E, 18 on 11/7, 12 on 14/11, East Clive, 8 on 14/11; L. Poukawa, c.80 in July (KVT). L. Horowhenua, 13 on 15/5 (AC, WRJ).

AUSTRALIAN COOT *Fulica atra australis*

L. Pupuke, 1 on 30/3 (FT). Western Springs, 25 adults and 4 juvs on 14/2 (KH), 50 on 29/5 (VL). L. Rotorua, Hamilton, 81 and 1 chick on 20/2, 179 and 1 chick on 23/4 (ASR). L. Aniwhenua, 50-100 on 25/1 (KO). L. Tutira, carries greatest population in HB (KVT). Waitotara, 4 on 17/5; Westmere L, 13 on 26/1, 18 on 17/5 (GR). Centennial Lag, Palmerston North, 18 on 16/8; Hokowhitu Lag, 10 on 7/5, 15 on 14/5, 17 on 29/5 (RG).

SOUTH ISLAND PIED OYSTERCATCHER *Haematopus ostralegus finschi*

Paua, 10 on 20/9/86 (GW). Ruakaka, 100+ on 14/1/87; Waipu E, 1 on 14/1/87 (PB). Kaipara H, South Head Pen, groups of 2, 60 and 50 on 29/4 (MH). Manukau H census, summer 3728, winter 26 700 (AJG, MJT). Waikato R mouth, 74 on 26/7; Mataitai, 750 on 21/3; FoT census, summer 1147, winter 6274; Miranda/Taramaire, 9300 on 21/4 (AJG). Thames 4000-5000 on 6/2 (MJT). Fletcher's Bay, 300 on 10/5 (AVP, JVP). Aotea H, 135 on 21/11, 188 on 18/6; Kawhia H, 494 on 21/11, 830 on 10/9, 1072 on 18/6 (FN, BHS). Bowentown Shellbanks, 70 on 22/11 (BC, NS); Plummer's Pt, 8 on 8/9 (BRK); Sulphur Pt, 23 on 22/11 (PCML), 12 on 20/3 (BC). Maketu, 3 on 5/6 (NS); Little Waihi, 8 on 1/11, 5 on 20/3 (PCML). Ohiwa H, 19 on 8/11 (WS). Ahuriri E, 10 on 11/7, 2 on 14/11; Porangahau E, 2 on 21/11 (KVT). Mangatahi, 3 on 26/9 (MT, PWT). This place, 31 km inland, has been a SIPO haunt for over 10 years with some recent breeding attempts (BRK). Pourere - Aramoana, 15 on 31/1 (ARG, ALH). Wanganui R, 39 on 26/1, 1 on 29/1 (PB). Foxton B, 20 on 28/2 (JLM, MM). Manawatu E, 5 on 28/8, 13 on 27/10, 63 on 21/2 (RAC, RG *et al.*).

VARIABLE OYSTERCATCHER *H. unicolor*

Te Weraki Lag, Te Paki, 2 on 14/2 (BS). Rawara B, 21 on 1/10 (PA), 8 on 15/2 (BS). 90 Mile B, 65 on 10/8/86; Waimango, 10 pairs on 2/11/86 (GW). Aurere E, 2 black pairs on 22/11; Mimiwhangata, 3 on 2/5 (MH); Okura, 17 on 24/8/86; Bland Bay, 10 on 30/8/86 (GW). Muriwai Stream, Waipoua Coast, 7 on 16/1 (PA). Ruakaka, 140 on 9/2/87 (GW); 12 pairs raised 7 chicks, 3 pairs still on eggs on 28/1; Waipu E, north side, 6 pairs raised 9 chicks (including 3 chicks raised by adult threesome); Waipu E, south side, 32 pairs with 16 chicks hatched of which 14 fledged. Poor success where public usage high (RP). Port Waikato to Karioitahi, 41 on 13/3 (BB *et al.*). Manukau H census, summer 5, winter 4 (AJG, MJT). Wairoa E, Clevedon, 2 pairs resident; FoT census, summer 15, winter 15 (AJG). Coromandel H, 10 on 26/3; Tairua, 21 on 9/2; Opoutere, 59 on 11/2 (AVP, JVP). Waikorea B, 5 on 3/8 (ASR); Ruapuke, 2 pairs on 18/9 (ASR, JMR); Aotea H, 10 on 21/11, 6 on 18/6 (ASR). Kawhia H, max 9 on 10/9 (BHS). Bowentown B, 5 on 22/11; Bowentown shellbanks, 10 on 22/11; black pair raised 2 chicks, 1 black, 1 pied. Probably same pair have nested here since at least 81-82, raising 1 pied chick most years (BC). Sulphur Pt, 19 mostly territorial pairs, 1 nest in lupin with 2 eggs on 22/11 (PCML). Plummer's Pt, 20 on 8/9 (BRK). Panepane Pt, Matakana I, 8 pairs on territories on 22/11 (PCML); Tauranga H, near bridge toll plaza, 82 on 18/2 (KS); Mt Maunganui, 2 on 28/6 (CJ). Kaituna Cut/Maketu E, 10 breeding pairs, 2 clutches of 2 eggs by 26/10; flock of 38 on 5/6; Little Waihi, 17 on 1/11, 71 on 20/3; Otamarakau, max 3 pairs on 8/11; Matata, 2 pair on 5/7; Tarawera R mouth, 2 on 5/7 (PCML); Rangitaiki R mouth, max 10 on 24/5 (BS, PCML). Maraetotara Stream, Ohope, 14 on 18/11; Whakatane R mouth, 10 on 7/11; Ohope Spit, nest with 2 eggs on 5/11 (WMH); Ohiva, 22 on 8/11; Waiotahi E, 4 on 8/11; Waioeka E, 2 on 8/11; Waiaua, 18 on 8/11 (WS); 2 pairs, 1 chick on 16/11 (WMH). Orauaiti B, Waihou Bay, 2 on 21/1 (PCML). Ahuriri E, 1 on 17/4; Porangahau E, 8 on 21/11 (KVT). Wanganui R, 1 on 27/1 (PB). Manawatu E, max 13 on 1/9 (RAC, RG, GG). Ohau Beach, 37 on 19/7 (BDH). Wellington H, Petone-Ngaurangi, max 6 on 23/3 (JML, MM).

SPUR-WINGED PLOVER *Vanellus miles novaehollandiae*

Karikari Pen, 12 on 20/1 (PA). Aurere E, 2 on 22/11 (MH). Sweetwater Swamp, 8 on 5/8 (PA). Okura, 7 on 17/8; L Omapere, 20 on 19/10/86 (GW), 2 probably nesting on 1/10 (AG). Taheke, 4-5 seen all year round (MT). Pakiri B, 2 on 26/7 (FJT). Motuihe I, 2 on 23/8 (DH). Ponui I, 1 on 23/4 (TRH). Pukekohe, Helvetia Rd, pair with 4 chicks reported on 18/7 (BB). Papakura, Settlement Rd, 1 sitting on 2/10 (JLP); Clevedon, 12 on 29/11 – now well established (AJG); Kawakawa Bay, 9 on beach on 10/4 (RS); Orere, up to 6 in recent months, 5/11; Miranda/Taramaire, 40 on 5/6 (AJG *et al.*). Whangamata, 7 on 18/8 (HMS). Rangiriri, 58 on 23/8 (ASR *et al.*). Roto-o-rangi, pair with 4 week-old chicks on 28/8 (BHS). Plummer's Pt, Tauranga H, 2 on 8/9 (BRK). Papamoa, max 20 on 6/6 (PCML); Kaituna Cut, 25 on 24/4 (AMcC); Maketu, 8 on 5/6; Little Waihi, 2 on 7/11; Awaiti, Matata, c.40 on 5/7 (PCML). Waioeka E, 28 on 10/7 (WS). Potaka, Cape Runaway, 5 on 21/1 (PCML). Ahuriri E, 34 on 11/7, 20 on 25/4 (MT, PWT);

Waitangi E, 34 on 11/7; Tukituki E, 12 on 11/7; Porangahau E, 28 on 11/7; Hurimoana Swamp, 41 on 16/8; L Poukawa, 84 in July, c.150 on 4/10 greatest concentration in HB (KVT). Whirokino/Moutoa, 149 on 25/6; Manawatu E, 26 on 4/7 (JML, MM). L Horowhenua, 24 on 15/5 (AC, WRJ); Levin, Hokio B road, 56 on 2/5 (WRJ). Waikanae E, c.40 on 28/5 (AJT). Lower Hutt, 4 flying over Waiwhetu on 10/3 (JLM, MM).

GREY PLOVER *Pluvialis squatarola*

Paua, 1 on 25/1/87 (GW). Miranda, 1 on 20/1 (BC).

LEAST GOLDEN PLOVER *P. fulva*

Paua, 200 on 30/11/86, (GW), 2 on 11/2 (BS). Okura, 3 on 4/10/86, 26 on 18/1/87 (GW). Jordan's Farm, Kaipara H, 30 on 3/1 (PH), 49 on 1/4 (BG). Mangere SP, 1 on 31/10 (RJL); Manukau H census, summer 80 (AJG, MJT). Mataitai, 10 on 21/3; FoT census, summer 9 (AJG); Miranda, 2 on 30/1 (BS). Sulphur Pt, Tauranga, 6 on 28/12 (BS). Kaituna Cut/Maketu E, 3 with some breeding colour on 18/10; 27 on 7/11 (PCML), 22 on 23/3 most well into breeding dress (BC); Little Waihi, 22 on 7/11 (PCML). Ohope Spit, max 18 on 22/1 - 19/3 (WMH). Ahuriri E, 3 on 14/11, 9 on 2/4 (MT, PWT). Porangahau E, 1 on 21/11 (KVT). Manawatu E, 20 on 27/10 (RG, GG) increasing to max 37 on 27/3 (JLM, MM *et al.*).

NEW ZEALAND DOTTEREL *Charadrius obscurus*

Rawara B, 6 on 15/2 (BS). Waimango, 20 on 18/10/86 (GW). Aurere E, 2 pairs on 22/11 (MH). Okura, 18 on 8/2/87; Bland Bay, 10 on 30/8/86 (GW). Muriwai Stream, Waipoua coast, 5 on 16/1; Wairoa E, 14 on 7/1 (PA). Ruakaka, 15 on 9/2/87 (GW); 9 pairs nesting, 2 nests of 2 eggs hatched with chicks surviving: one pair still on eggs (4th attempt) on 28/1 (RP). Waipu, 10 on 19/2/87 (GW); at least 16 pairs nested with at least 11 eggs hatched, summer 87/88 (RP). Omaha Spit, 12 birds nesting on 24/11 (SC, JED). S Kaipara Heads, 8 birds nesting on 22/11 (MG, SG); Muriwai B, One Mile Stream, 2 pairs, 1 nesting on 10/1 (PC). Manukau H census, summer 20, winter 20 (AJG, MJT). Mataitai, 12 on 19/11, 32 on 21/3; FoT census, summer 22, winter 19 (AJG). Coromandel H, 14 in May; Fletcher's Bay, 14 on 10/5 (JVP, AVP). Waikawau B, 6 on 31/8 (JB). Waikorea B, 7 on 3/8, 2 pairs on 28/8; Aotea H, 1 on 21/11; Kawhia H, 3 on 21/11, 4 on 18/6 (ASR), max 10 on 2/5 (BHS). Whitianga, 1 pair on 3/1 (PCML); Hot Water B, 1 pair on 21/10; Kuaotunu, 1 on 22/10 (WMH). Bowentown B, 3 (1 nest with eggs) on 22/11 (BC). Sulphur Pt, 8 (1 nest in lucerne with 2 eggs) on 22/11 (PCML), max 36 on 20/3 (BC). Panepane Pt, Matakana I, 2 pairs on 22/11; Maketu Spit, 8 pairs, 2 nests with 3 eggs, 2 nests with 1 egg, on 18/10; all 4 nests empty, new nest with 3 eggs deep in clump of sea-rocket on 26/10, 9 pairs with no sign of any breeding success on 7/11; Maketu E, max 33 on 20/3; Kaituna Cut, 1 pair on 7/11 (PCML); Little Waihi, max 5 on 5/6 (KS); Otamarakau, max 3 pairs and 1 single bird on 8/11; Herepuru, Matata, 3 pairs on 31/10 (WMH); Tarawera R mouth, 3 on 11/5 (AMcC). Whale I, Boulder Bay, 3 on 5/1; Whakatane R mouth, 1 on 24/6; Ohope Spit, max 61 on 19/3 (WMH); Ohiwa, 2 on 8/11; Waiotahi E, 10 on 8/11 and 23/6; Waiau E, 12 on 10/7 (WS). Whangaparaoa B, Cape Runaway, 1 on 12/8 (WMH), 2 on 8/11 (KO).

BANDED DOTTEREL *C. bicinctus*

Paua, 250 on 25/1/87; Waimango, 60 on 29/12/86 (GW). Waipu E, max 23 in Jan 87 (PB). Manukau H census, summer 5, winter 778 (AJG, MJT). Sunset B, Port Waikato, 37 on 13/3 (BB *et al.*). Clevedon, Wairoa E, 47 on 15/6; FoT census, summer 37, winter 105; Miranda/Taramaire 114 on 21/4 (AJG). Coromandel H, 75 on 26/3 (AVP, JVP). Waikorea B, 13 on 3/8, 4 pairs on 28/8; Aotea H, 4 on 21/11, 73 on 18/6; Kawhia H, 500 on 21/11, including 6 banded birds (2 from HB, 1 Greymouth, 2 Canterbury, 1 Manawatu) (ASR). Whitianga, 16 at mouth of Mother Brown's Creek on 3/1 (PCML). Bowenton B, max 220 on 1/5 included 1 bird colour-banded on Ashley R, and wintering for 5th consecutive year (BC). Sulphur Pt, at least 5 pairs breeding on 22/11 (PCML), max 633 on 19/2 (RP). Kaituna Cut/Maketu E, 11 on 20/3, 40 on 6/6; Little Waihi, 4 on 5/6; Otamarakau, 4 pairs on 8/11; Herepuru, Matata, 4 pairs on 8/11; Tarawera R mouth, 1 on 19/6 (PCML). Ohope Spit, 10 pairs on 8/11 (PCML), max 462 on 23/6 (WMH); Ohiwa H, 2 on 8/11 (WS); Waiaua E, 2 on 16/11 (WMH). Ahuriri E, 2 on 11/7, 12 on 2/4 (MT, PWT); Waitangi E, 4 on 11/7, 9 on 14/11; Clive, flock of 24 on riverbed on 4/6 (KVT); Tukituki E, 99 feeding on ploughed fields on 16/4 (MT, PWT). Porangahau E, 108 on 11/7, 5 on 14/11 (KVT). Wanganui R, 64 on 29/5; Turakina E, 50 on 27/3 (PB). Moutoa Floodway, 57 on 25/6 (JLM, MM). Manawatu E, 41 on 22/11 (RAC, SEC *et al.*), 105 on 24/4 (JLM, MM). Waikanae E, 3 chicks on 11/10, first for many years (AJT), 22 on 1/1 (Sch).

MONGOLIAN DOTTEREL *C. mongolus*

Karaka, 1 on 2/11 (DAL, DMW) and 4/3 (BHS). Porangahau E, 1 on 11/7 and 21/11 (KVT), 1 on 24/1 (BDH).

LARGE SAND DOTTEREL *C. leschenaultii*

Paua, 1 on 25/1/87 (GW). Taporu, 1 on 20/11 (MJT). Karaka, 1 on 2/11 (DAL, DMW), Miranda, 1 between 12/10 and 10/1 (PA, DA, RJL, BHS).

BLACK-FRONTED DOTTEREL *C. melanops*

Ahuriri E, 97 on 11/7, 8 on 14/11; Waitangi E, 20 on 11/7, 7 on 14/11; East Clive, nest with 3 eggs on shingle among driftwood on 27/9; 7 at Muddy Creek on 26/5 (KVT); Tukituki E, 6 on 16/4 (MT, PWT); Hurimoana Swamp, 22+ on 16/8 (KVT). Maraetotara E, 10 on mudflat on 22/7 (BMT). Porangahau E, 7 on 11/7 (KVT); L Hatuma, 2+ 2 juv on 25/1 (BDH). Turakina E, 10 on 27/3 (PB, OT).

WRYBILL, *Anarhynchus frontalis*

Paua, 19 on 25/1/87; Mitimiti, 2 on 2/8/86 (GW). Ruakaka E, 1 on 14/1/87; Waipu E, 1 on 14/1/87, 4 on 15/1/87 (PB). Jordan's Farm, Kaipara H, 350 on 19/2 (SD). Pollen I, Waitemata H, 6 on 10/10; Mangere SP, 220 on 26/9 (MJT), 70 on 10/1 (BHS), 500+ on 7/2 (MJT), 750 on 4/3 (GE, RBS), 1200 on 21/4 (RBS, TGL). Manukau H census, summer 32, winter 1366 (AJG, MJT). FoT census, summer 141, winter 650; Miranda, 3000 on 27/3 (PA, DA) and still present on 9/6 (GM, RBS). Sulphur Pt, Tauranga H, 4 on 28/12, 72 on 6/5 (BS), 47 on 18/6; Kaituna Cut, 5 on 20/3, 2 on 4/4; Little Waihi, 2 on 1/11 (PCML). Ohope Spit, 2 on 19/2 (WMH). Ahuriri E, 2 on 11/7 (KVT), 1 on 25/10 (MT, PWT); Tukituki E, 1 on 4/4 (PWT); Porangahau E, 44 on 11/7, 2 on 21/11 (KVT), 33+ on 24/1 (BDH).

Wanganui, 3 on 27/1; Turakina E, 2 on 27/3 (PB, OT, GR). Manawatu E, 5 on 28/8, 30 on 6/9, 7 on 22/11, 18 on 21/2, present in all months (JLM, MM, LJD *et al.*). Petone foreshore, 2 being harassed by Red-billed Gull as they fed, on 29/9 (PRN).

FAR-EASTERN CURLEW *Numenius madagascariensis*

Paua, 3 on 20/9/86 and 24/10/86, 4 on 29/11/86 (GW), 2 on 11/2 (BS). FoT, Access Bay, 2 on 2/10, 4 on 8/11, 5 on 28/11, 6 on 25/12 and 24/1 (RJL, PA, DA, AJG). Maketu, 1 on 5/6 (PCML). Manawatu E, 1 present between 12/9 and 27/3 (RG, MO, MO *et al.*).

ASIATIC WHIMBREL *N. phaeopus variegatus*

Paua, 100 on 20/9/86, 5000 on 24/10/86, 2000 on 29/11/86 (GW); c.200 knots on 15/10 (SG, JED). Jordan's Farm, Kaipara H, 23 on 19/2 (SD, AR). Manukau H census, summer 3 (AJG, MJT); Karaka, 2 on 28/12 (RJL). Duder's, Wairoa E, 2 on 2/7, 3 on 19/1, 2 on 16/6 (AJG, RJL). FoT census, summer 2 at Piako (AJG). Porangahau E, 1 on 11/7 (KVT); 1 on 24/1 (BDH).

WHIMBREL sp.

FoT, Access Bay, 6 on 16/8, 1 on 24/11 and 5/6 (BB *et al.*). Kaituna Cut/Maketu E, 4 on 7/11 (PCML), 6 on 20/3 (RC), 5 on 23/3 (BC), 1 on 5/6 (PCML). Ohope Spit, 4 on 11/10 and 5/11, 5 on 19/3 (WMH). Porangahau E, 1 on 21/11 (KVT). Manawatu E, 1 on 23/1 (JLM, MM).

LITTLE WHIMBREL *N. minutus*

FoT, Access Bay, 1 on 21/1 (BC).

ASIATIC BLACK-TAILED GODWIT *Limosa limosa*

Mangere SP, 1 or 2 birds recorded on 9 occasions between 1/11 and 23/2 (RJL).

HUDSONIAN GODWIT *L. haemastica*

Mangere SP, 1 bird recorded on 12 occasions between 1/7 and 4/10 (RJL).

BAR-TAILED GODWIT *L. lapponica*

Paua, 100 on 20/9/86, 5000 on 24/10/86, 2000 29/11/86 (GW); c.200 on 11/2 (BS). Waimango, 500 on 1/2/87 (GW). Waipu E, 105 on 15/1/87 (PB). Manukau H census, summer 11 234, winter 1314 (AJG, MJT). Clevedon, Wairoa E, 54 on 17/7, 708 on 8/12; FoT census; summer 4226, winter 472; Access Bay, 7269 on 11/10 (BB, AJG *et al.*). Coromandel H, 360 on 29/11; Fletcher's Bay, 51 on 10/5; Tairua, 260 on 9/2; Opoutere, 85 on 11/2; Matarangi Spit, 251 on 6/12 (AVP, JVP). Aotea H, 1487 on 21/11, 245 on 18/6; Kawhia H, 370 on 10/9, 120 on 18/6 (ASR). Bowentown Shellbanks, c.3000 on 22/11 (BC, NS). Matahūi Pt, Tauranga H, c.700 on 1/8 (RC), 1 on 22/11 (KWLB); Plummer's Pt, 255 on 8/9 (BRK); Sulphur Pt, c.2500 on 22/11 (PCML), 400 on 28/12 (BS), 30 on 18/6. Increased disturbance at this roost seems to have forced birds to use other sites (PCML). Aerodrome Bay, courtship (head-bobbing and bill touching) and mating observed on 27/10 (GB); Maketu E, max 800 on 20/3, min 44 on 19/6 (PCML); Little Waihi, max 500 on 1/11, min 31 on 19/6 (PCML, KS). Ohope Spit, c.4000 on 8/11; Ohīwa H, c.3000 on 13/3 (PCML). Waiotahi E, 20 on 8/11; Waiaua E, 12 on 8/11 (WS). Ahuriri E, 36 on 11/7, 394 on 14/11; Waitangi E, 16 on 11/7; Tukituki E, 15 on 14/11; Porangahau E,

8 on 11/7, 138 on 21/11 (KVT). Pourere-Aramoana, 200+ on 31/1 (ARG, ALH). Wanganui E, 104 on 20/12 (PB, OT), 94 on 29/1 (PB). Manawatu E, max 535 on 22/11 (LJD *et al.*), min 10 on 2/8, recorded all months (JLM, MM).

LESSER YELLOWLEGS *Tringa flavipes*

Mangere SP, 1 seen on several occasions between 30/10 and 23/2 (RJL, RBC, RBS).

GREENSHANK *T. nebularia*

Paua, 3 on 29/11/86, 2 on 25/1/87 (GW). Parengarenga H, 3 feeding with Turnstones, 1 caught small fish; 2 behaved as a pair, on 5/1 (MG, SG). Houhora H, 1 on 22/11 (RP, PA). Matahui Pt, Tauranga H, 1 on 27/2 (BC).

MARSH SANDPIPER *T. stagnatilis*

Waimango, 1 on 29/12/86, and 1/2/87 (GW). 90 Mile B, L Half, 1 with Pied Stilts between 15/11 and 4/1 (VH, MG, SG). Jordan's Farm, Kaipara H, 1 on 3/1 (PH) and 19/2 (SJD). FoT, Access Bay, 1 seen throughout the year, but elusive (RJL, PA, DA, BRK, GMHP, BHS). Kaituna Cut, 2 between 18/3 and 4/4, by which time 1 moulting into breeding dress (RC, PCML); 1 on 9/4 (WMH).

WANDERING TATTLER *T. incana*

Omaha Spit, 1 with godwits and knots on 15/10 (SC, JED).

SIBERIAN TATTLER *T. brevipes*

Waipu E, 1 between 12/1 and 17/1/87, seen to eat small crab after discarding its legs (PB). Jordan's Farm, Kaipara H, 1 calling on 7/11 (SD), 1 on 1/4 (BG). FoT, Access Bay, 1 between 17/7 and 28/12 (BC, BRK, RJL, PA, DA). Bowentown Shellbanks, 1 calling in flight on 12/12 (BC).

TATTLER sp.

Bay of Is, Urupukapuka I, 1 on 10/10 (PA, RP). Karioitahi B, 1 on 3/10 (RJL). East Cape, 1 on reef on 1/2 (BW).

TEREK SANDPIPER *Xenus cinereus*

Jordan's Farm, Kaipara H, 2 on 7/11 and 19/2 (SD). Mangere SP, 1 on 12/12; Karaka, 1 on 10/10 (RJL). FoT, Access Bay, 1 on 19/7 and 13/9, 2 between 10/11 and 23/1, 1 on 4/3 (RJL, BHS, CJ, PA, DA, GP, RG).

TURNSTONE *Arenaria interpres*

Paua, 100 on 20/9 and 24/10/86, 1500 on 29/11/86 (GW); c.60 on 11/2 (BS). Waipu E, 28 on 17/1/87 (PB). Manukau H census, summer 501, winter 124 (AJG, MJT). FoT census, summer 187, winter 9 (AJG). Kawhia H, 1 on sandbank roost on 10/9 (FN, BHS), 1 on 21/11 (ASR). Bowentown B, 70 on 22/11; Bowentown Shellbanks, 250 on 28/11 (BC); Matahui Pt, 30 on 1/8 (RC). Maketu E, 4 on 18/10, 38 on 20/3, 4 on 6/6 (PCML). East Clive, 6 on muddy lagoon margin on 3/10; Porangahau E, 1 on 21/11 (KVT). Manawatu E, 1 on 1/9, 4 on 25/12, 1 on 10/4 (JLM, MM *et al.*).

KNOT *Calidris canutus*

Paua, 100 on 20/9/86, 5000 on 24/10/86, 4000 on 29/11/86 (GW), c.20 on 11/2 (BS). Raukaka, 43 on 9/2/87 (GW); Waipu E, 180 on 13/1/87 (PB). Manukau H census, summer 14 560, winter 2414 (AJG, MJT). Mataitai, 1050 on 21/3; FoT census, summer 5200, winter 3 (AJG). Matarangi Spit, 5 on 6/12 (AVP, JVP). Aotea H, 34 on 21/11 (ASR); Kawhia H, 5 on 10/9

(FN, BHS). Bowentown Shellbanks, 70 on 22/11 (BC, NS); Matahui Pt, c.200 on 27/2 (BC); Kaituna Cut/Maketu E, 30 on 18/10, c.80 on 26/10, 67 on 7/11 (PCML) and 20/3 (RC), 14 on 5/6 (NS). Ohope Spit, 1 on 5/11, 4 on 19/2 (WMH). Westshore, HB, 5 on 31/10 (KVT), 1 on 12/11 (BHS); Waitangi E, 4 on 14/11; East Clive, 5 on 19/10; Tukituki E, 16 on 14/11; Porangahau E, 14 on 21/11 (KVT). Wanganui R, 1 on 28/1 (PB, OT). Manawatu E, max 315 on 28/2, 1 on 4/5 (JLM, MM *et al.*).

GREAT KNOT *C. tenuirostris*

Manawatu E, 1 on 27/12 and 28/12 (JML, MM, RG, GG).

SHARP-TAILED SANDPIPER *C. acuminata*

Waimango, 2 on 18/10/86, 7 on 2/11/86, 13 on 29/12/86, 15 on 1/2/87 (GW). Mangere SP, 7 on 5/11 (GA, RBS), 15 on 3/1 (RJL); Manukau H census, summer 13 (AJG, MJT); Karaka, 10 on 28/12 (RJL). FoT census, summer 14 at Access Bay (AJG), 26 on 30/1 (BC). Kaituna Cut, 2 on 19/9 (BC), 5 on 18/10, 11 on 1/11, 10 between 20/3 and 9/4 (PCML, WMH). Napier, Southern Marsh, 1 on 29/11, 2 on 7/1 (MT, PWT). Manawatu E, 2 on 24/10, 10 on 22/11, 12 on 21/2, 14 on 27/3, 11 on 25/4 (RG, MO, MO *et al.*).

PECTORAL SANDPIPER *C. melanotos*

Waimango, 2 on 29/12/86 (GW). Pakiri B, 1 at river mouth on 22/11 (RJHC, NR). Mangere SP, 1 on several occasions between 27/11 and 3/1 (RJL, MJT). Kaituna Cut, 2 between 7/11 and 9/4 (PCML, WMH). Napier, Southern Marsh, 1 on 7/11 (MT, PWT). Manawatu E, 1 on 27/12 and 31/12 (JLM, MM).

CURLEW SANDPIPER *C. ferruginea*

Paua, 20 on 29/11/86; Waimango, 3 on 18/10/86 (GW). Manukau H census, summer 20 (AJH, MJT). FoT, Access Bay, 3 on 13/9, 17 on 12/10, 20 on 22/11 and 4/3, 23 on 21/5, 2 on 5/6 (RJL, BC, BHS, PA, DA, CJ, NCP). Kaituna Cut, 1 between 26/10 and 20/3 (PCML).

RED-NECKED STINT *C. ruficollis*

Waimango, 10 on 2/11/86; Waipu E, 3 on 9/2/87 (GW), 5 between 12/1 and 17/1 (PB). Manukau H census, summer 13 at Seagrove, 24 at Karaka (AJG, MJT). FoT, Access Bay census, summer 5, winter 1 (AJG); 7 on 28/12 (PA, DA). Kaituna Cut, 7 on 31/10, and 7/11 (PCML), 5 on 9/4 and 5/6 (WMH, NS). Napier, Southern Marsh, 3 on 25/10, 5 on 7/11 (MT, PWT). Porangahau E, 2 on 11/7, 7 on 21/11 (KVT), 18 on 24/1 (BDH). Manawatu E, 1 overwintered, 4 on 25/10, 3 on 22/11, 3 Jan-April, 7 on 25/6 (RG, LJD *et al.*).

SANDERLING *C. alba*

Tapora, 1 with Golden Plovers on 20/11 (KG, BG). Maketu E, 4 on 27/4 (KO).

PIED STILT *Himantopus himantopus leucocephalus*

Paua, c.70 on 11/2; Rawara B, 11 on 15/2 (BS). Aurere E, 2 on 22/11; Mimiwhangata, 17 on 2/5 (MH). Jordan's Farm, Kaipara H, 500 on 19/2 (SJD). Mangere SP, c.300 birds, 20 nests, 4 chicks on 22/11 (MJT). Manukau H census, summer 733, winter 4826 (AJG, MJT). FoT census, summer 809, winter 2909 (AJG). Thames, c.6000 on 6/2 (MJT). Aotea H,

20 on 21/11, 25 on 18/6; Kawhia H, 100 on 21/11, 55 on 18/6 (ASR). Matahui Pt, Tauranga H, 100 on 19/5 (BS); Plummer's Pt, 16 on 8/9 (BRK). Kaituna Cut, 50 on 26/10, 200 on 20/3; Maketu E, 100 on 7/11, 277 on 5/6 (PCML); Little Waihi, 105 on 20/3, 209 on 5/6 (PCML, KS); Herepuru Stream mouth, 4 pairs nesting on beach on 8/11 (PCML); Matata, c.500 on 20/9 (BC), 50 on 14/5 (PCML); Ohiwa H, 56 on 16/11 (WMH); Waiotahi E, 12 on 8/11 (WS); Waiaua E, 21 on 16/11, some nesting (WMH). Ahuriri E, 1177 on 11/7, 503 on 14/11; East Clive, 127 on 11/7, 123 on 14/11; L Poukawa, c.150 in July; Porangahau E, 123 on 11/7, 26 on 21/11 (KVT). L Hatuma, 500 + on 25/1 (BDH). Wanganui E, 37 on 5/7, 81 on 20/12 (OT). Manawatu E, 58 on 22/11, 231 on 21/2 (RG), 250 on 14/5 (JLM, MM). Foxton No. 1 L, 25 on 6/2; Foxton No. 2 L, 10 on 6/2; Foxton Loop, 20 on 24/4 (JLM, MM).

BLACK STILT *H. novaeseelandiae*

FoT, Access Bay, 1 hybrid with flank patches on 5/6 (NCP). Waikorea B, hybrid with white face and belly on 28/8 (ASR). Kawhia H, 8 hybrids, 4 (including 1 juv) with bands, on 2/5 (BHS); 6 hybrids, 2 with bands, on 18/6 (ASR). Hairini, Tauranga, 1 reported on 13/6 (PCML); Matahui Pt, 1 reported in early July (BC), 2 on 1/8, 1 black, 1 smudgy belly (RC). Manawatu E, 1 hybrid on 14/5 (JML, MM).

POMARINE SKUA *Stercorarius pomarinus*

Foxton B, 1 on 26/3 (JLM, MM).

ARCTIC SKUA *S. parasiticus*

Miranda, 1 light phase and 1 dark phase on 7/12 (BRK). Whale I, 1 light phase on 3/2 (WMH). Mt Maunganui, 2 light phase, 1 dark phase on 9/4 (BRK). Rangitaiki R mouth, 1 dark phase harrying White-fronted Terns on 14/5 (PCML). Ohiwa H, 1 light phase on 4/2 (WMH). Foxton B, 2 on 6/2, 7 on 26/3, 2 on 27/3 (JLM, MM).

SKUA sp.

Urquhart's Bay, 2 chasing White-fronted Terns on 7/2 (RP, KB, PA). Waikanae E, c.23 offshore chasing terns on 10/4 (AJT).

SOUTHERN BLACK-BACKED GULL *Larus dominicanus*

Shelly Beach I, Kaipara H, 34 nests on 7/11; Mangere SP, 150 birds, 40 nests on 22/11 (MJT). Cochran's Gap, Awhitu Pen, nests on inaccessible ledges to the north, on 15/11 (AJG *et al.*). Manukau H census, summer 377, winter 675 (AJG, MJT); Karaka, 1 nest on shellbank on 2/12 (JLP). FoT census, summer 297, winter 744 (AJG). Kawhia H, 104 on 18/6 (ASR). Bowentown shellbanks, 6 pairs nesting, feeding on chicks of nearby White-fronted Tern nests, Nov-Dec (BC); Panepane Pt, Matakana I, c.100 pairs nesting on 22/11 (PCML). Ahuriri E, 125 on 11/7, 235 on 14/11 (KVT); Waitangi, c.400 on 16/4; Tukituki E, c.400 on 16/4 (MT, PWT); E Clive, 167 on 11/7, 100 on 14/11; Porangahau E, 10 on 11/7, 24 on 14/11 (KVT).

RED-BILLED GULL *L. novaehollandiae scopulinus*

Te Kao, 1000s, possibly a prebreeding assembly before dispersal to Three Kings Is, on 20/9/86 (GW). Manukau H census, summer 5, winter 518 (AJG, MJT). FoT census, summer 182, winter 5798; Miranda, following the incoming tide catching small flies as they rose off the mud on 20/10 (AJG).

Kawhia H, 32 on 18/6 (ASR). Bowentown shellbanks, c.60 pairs nesting, colony flooded mid-Nov and no chicks raised (BC). Kaituna Cut, 80 on 20/3; Maketu Spit, c.350 on 18/10, c.50 with 22 nests with 1 or 2 eggs on 26/10; Tarawera R mouth, c.200 on 5/7 (PCML). Ahuriri E, 93 on 11/7, 71 on 14/11 (KVT); Marine Parade, Napier, c.400 in one flock on 16/4 (MT, PWT). Wanganui R, 165 on 4/3 (PB). Manawatu E, 200 on 25/6; Whirokino, 2500 on 25/6 (JLM, MM). Waikanae E, 224 on 3/4 (AJT).

BLACK-BILLED GULL *L. bulleri*

Yates Dam, Karaka, 1 on 14/6 (RJJ). Mataitai, 21 on 17/7; FoT census, summer 156, winter 121 (AJG); Miranda, large flock courting and copulating on 12/10 (BHS); this colony was later washed out (AJG). Otamarakau, 1 on 8/11 and 19/6; Tarawera R mouth, 4 on 8/11, 3 on 14/5 and 19/6 (PCML). Ohope Spit, c.80 preparing to nest on 8/11; c.80 with chicks on 12/12 (WMH). Ahuriri E, 20 on 11/7; Waitangi, c.70 on 11/7; c.244, of which c.150 on nesting site with c.400 White-fronted Terns, on 14/11; a successful breeding season followed (KVT). Tukituki E, 138 on 11/7, 17 on 14/11; L Poukawa, c.30 in July; Porangahau E, c.60 on 11/7, 15 and 3 nests on 21/11 (KVT); Tangimoana, 6 on 6/9 (RG). L Hatuma, 59 on 25/1 (BDH). Manawatu E, 41 on 27/10, 8 on 22/11, 76 on 21/2 (RG, GG, LJD *et al.*). L Horowhenua, 30 on 12/7, 205 on 7/2 (RG); Levin SP, 400 on 8/6 (WRJ). Wellington H, Ngauranga, 1 on 4/5, 2 on 13/6 (JLM, MM).

WHITE-WINGED BLACK TERN *Chlidonias leucopterus*

L Waiporohita, Karikari Pen, 1 on 29/12/86 (GW).

GULL-BILLED TERN *Gelochelidon nilotica*

Ahuriri E, 1 on 11/7 (KVT); 1 in breeding plumage on 2/4 and 28/5; 1 with full cap on 12/6 (PWT, MT).

CASPIAN TERN *Hydroprogne caspia*

Paua, 4 on 11/2 (BS). Aurere E, 2 on 22/11; Mangonui, 1 on 22/11; Taipa, 1 on 22/11 (MH). Kerikeri Inlet, 15 on 18/1/87; Waitangi, 44 on 17/1/87 (GW). Te Haumai E, Bay of Is, 32 on 31/10; Muriwai R mouth, 2 on 16/1 (PA). Mangawhai, 165 adults, 89 incubating, 29 chicks on 15/10 (MJT); 7 large chicks remaining on 11/1 (CH). Shelly Beach I, Kaipara H, 17 nests on 8/11 (MJT). Manukau H census, summer 37, winter 108 (AJG, MJT). FoT census, summer 19, winter 132. Miranda/Taramaire, 116 on 23/3 (AJG). Thames, 96 including 2 juv on 4/2 (MJT). L Whangape, 5 on 22/3 (BHS); Hamilton, 1 flying over suburban Chartwell on 19/6 (BRK); Aotea H, 5 on 18/6; Kawhia H, 8 on 21/11, 4 on 18/6 (ASR). L Aniwhenua, 1 on 25/1 (KO). Bowentown Shellbanks, 110 adults and c.10 chicks (BC); Matahui Pt, 3 on 22/11 (PCML); Plummer's Pt, 42 on 8/9 (BRK); Sulphur Pt, 26 on 22/11, 21 on 18/6; Maketu E, 2 on 18/10, 3 on 1/11, 6 on 5/6; Little Waihi, 3 on 1/11, 1 on 20/3 (PCML), 6 on 5/6 (KS); Otamarakau, 1 on 8/11; Tarawera R mouth, 3 adults, 2 immes on 6/9, 2 on 14/5 (PCML), 5 on 24/5 (BS). Ohope Spit, 18 on 5/11, 35 with eggs and chicks on 22/1; Ohiwa H, Uretara I, small colony with 13 eggs on 14/12, flooded out on 10/1 (WMH); Waioeka E, 2 on 10/7 (PCML). Ahuriri E, 3 on 14/11, 26 on 2/4 (MT, PWT); Tukituki E, 9 on 11/7, 13-16 April-June (JRP, MTC); Ahuriri outfall channel and Tukituki E are the main winter roosts for 30-40

birds. Pourere- Aramoana, 3 on 31/1 (ARG, ALH). Porangahau E, 4 on 11/7, 7 including 2 chicks on 21/11 (KVT). Manawatu E, 23 on 7/2 (JLM, MM), 8 on 22/2 (RG). Waikanae E, 26 on 26/1 (BAT).

BLACK-FRONTED TERN *Sterna albobriata*

Matahui Pt, 2 probables on 26/2 (RC). Maketu, 1 in winter plumage with 4 White-fronted Terns on 20/3, first record for Maketu (PCML); Tarawera R mouth, 1 on 5/7 and 24/4; Rangitaiki R mouth, 1 first-year bird on 5/7, 19 on 23/7 (BC, PCML); 2 on 24/4, 11 on 11/15 (BC, AMcC), 13 on 14/5 (PCML), 27 on 24/5 (BS); 45, mostly in full or almost full breeding dress, on 19/6; this is the largest flock since 1980 (PCML); 1 on 4/6 (WMH). Napier, Marine Parade, 6 on 11/7 (KVT); 13 on 24/4, 30 on 12/5 including 2 first-years (MT, PWT); East Clive, 4 hawking over field on 4/6; Tukituki E, 24 on 11/7 (KVT), 3 on 16/4, 11 on 12/5 (MT, PWT), 13 on 4/6 (JRP, MTC). Manawatu E, 1 on 23/4, 4 on 24/4 (JLM, MM). Waikanae E, 111 on 28/5 (AJT).

CRESTED TERN *S. bergii*

Waikanae E, 1 with full black cap and fresh plumage on 11/10 (AJT, RBC).

COMMON TERN *S. hirundo*

Bowentown Shellbanks, 1 in breeding dress on 29/11, 1 in complete non-breeding dress on 19/12; 3 on 27/12; 1 on 3/1 and 24/1. All sightings were among White-fronted Terns (BC). Manawatu E, 1 in winter plumage between 25/12 and 17/1 (JLM, MM). [Waikanae E, 1 probable on 1/4 and 4/4 (AJT).]

ARCTIC TERN *S. paradisaea*

Bowentown Shellbanks, 1 possible first-year bird at White-fronted Tern colony on 28/11 (BC).

FAIRY TERN *S. nereis*

Waipu E, pair on eggs on 4/12, 1 hatched on 21/12, other on 23/12, chicks last seen end of Jan; second pair seen twice but not nesting (RP); 5, including 1 juv, on 16/1/87 (PB). South Kaipara Heads, 1 pair, not breeding on 22/11 (MG, SG). Mangawhai Spit, 2 pairs, not breeding on 20/11 (JED), 1 pair breeding on Sand Island, 2 chicks fledged on 11/1 (CH).

EASTERN LITTLE TERN *S. albigrons*

Manukau H census, summer 8, winter 2 (AJG, MJT). FoT census, summer 9 (AJG); Access B, 15 on 23/1 (GP, RG), 11 on 21/3 (BRK), 6 on 5/5 (TGL, PS, RBS, AJT); 1 on 23/6 (PA, DA). Ahuriri E, 2 on 30/1 and 2/4; Southern Marsh, Napier, 1 on 25/10 and 31/10, when it was chased by a Spur-winged Plover which, after landing, was swooped over and harassed by Tern! (KVT, MT, PWT). Waitangi E, 1 on 14/11 (KVT). Manawatu E, 1 on 10/10, 2 on 22/11, 3 on 21/2 and 27/3 (RG, MO, MO *et al.*).

WHITE-FRONTED TERN *S. striata*

Aurere E, 21 on 22/11 (MH). Waipu E, 600 on 12/1/87 (PB). Mangawhai, 80-90 pairs nesting on Sand I, on 11/1 (MJT, CH). Motutara I, 79 nests on rocks alongside 82 Red-billed Gull nests, on 25/11 (SC). Muriwai, 54 nests on cliff faces of Gannet colony on 6/12 (MJT). Whatipu,

c.100 birds nesting on Ninepin Rock on 28/11 (GS). Orakei Wave-screen, Waitemata H, c.300 birds with 50+ nests on 12/12 (MJT). Manukau H census, summer 22, winter 55 (AJG, MJT). FoT census, summer 427, winter 60 (AJG). Access Bay, c.2000 on 22/10 (BB); this colony later washed out (AJG). Tairua, 261 on 9/2; Tairua B, 508 on 9/2 (AVP, JVP). Bowentown Shellbanks, c.200 pairs with eggs on 22/11, raised no more than 35 chicks because of predation by Black-backed Gulls (BC). Sulphur Pt, 13 flying in unusual manner as though searching for nesting sites on 22/11; Maketu E, c.130 including 4 striated subadults on 20/3; Otamarakau, 42 on 8/11 with 1 nest, the first so far recorded here; Little Waihi, 63 on 20/3; Tarawera R mouth, 30 on 5/7, 15 on 13/3, 35 on 14/5, 15 on 19/6; Rangitaiki R mouth, 7 on 13/3, c.400 on 14/5, 20 on 19/6 (PCML). Ohope Spit, c.320 on 27/10, c.300 nesting on 12/12 (WMH). Waioeka E, 30 on 10/7 (PCML); Waiau E, c.200 on 8/11 (WS). Napier, Marine Parade, c.90 on 11/7, 200+ in single flock on 15/5, c.150 on 27/6 (KVT, MT, PWT); Waitangi E, c.419 on 14/11, large nesting colony and a successful breeding season (KVT); Tukituki E, 14 on 11/7, 26 on 14/11 (KVT). Ohau E, c.4000 with 9 Arctic Skuas (D. Mudge, MO, MO). Manawatu E, 40 on 22/11, 1250 on 7/2, 81 on 22/2 (RG, JLM, MM). Waikanae E, c.2560 on 10/4 (AJT).

NEW ZEALAND PIGEON *Hemiphaga novaeseelandiae*

Tiritiri Matangi I, flock of 6 in patch of older forest on 25/3 (SB). L Rotoroa, Hamilton, 1 on 19/4 (GB); Waikato R, Hamilton, 1 feeding regularly and often chased by magpies, July-mid-Aug (BJZ). Herepuru, 1 flying NW along beach on 5/7 (PCML). Napier city, 1 feeding on puriri berries on 30/11 (PWT). Lower Hutt, Waiwhetu, 2 on 16-20/11 and 16/1 feeding on ornamental 'cherry fruits' (JLM, MM).

ROCK PIGEON *Columba livia*

Otamarakau, 30 on beach on 19/6; Herepuru, 35 on beach on 5/7, 20 on 8/11 (PCML). Ahuriri E, 17 on 11/7 (KVT). Manawatu E, 3 on 13/3; Foxton No. 1 L, 2 on 24/4; Moutoa Floodway, 3 on 9/4 (JLM, MM).

WHITE COCKATOO *Cacatua galerita*

Mauro Forest, 35 in pines on 16/11 (JVD). Wairamarama, Nolan's Rd, 136 on 8/5 (DMW), 181 on 14/5 (PA, DA). Waingaro, 29 foraging in long grass on 10/9 (ASR, JMR). Karapiro, 1 feeding on young pine foliage, late Mar (TBST). Maraetotara, HB, 1 on 16-17/9 (JMcC). Turakina Valley, 14 on 6/12 (RG, RAC, LJD), 4 on 20/7 (RG, GR); Pohangina Reserve, 2 on 20/7 (GR).

GALAH *C. roseicapilla*

This species is new to CSN (BRK). Ponui I, flock of 13 on 11/1 (PC). Pakihi I, 6 flying along beach, Sep 87 (JMcC). Bombay, 4 on 5/4; Mangatawhiri, 8 on 14/5 (TH).

KAKA *Nestor meridionalis*

Waipoua Forest, 2 Oct-Dec, thought to be breeding (MJT). Matarau SF, 2 (MP). Parahaki Mt, 1 flying at 500 feet on 12/8 (BY). Whangarei, Mair Park, 1 in walnut tree on 23/8 (RP). Parua Bay, 1 heard calling in coastal forest on 13/12 (PA). McLeod's Bay, 2 on 2/10 (BY). Takahiwi, 1 reported by farmer on 16/6/87; Lang's B, Waipu, 1 shot June 87 (RP). Omaha Spit, pair seen in bush on 11/1 (RJHC). Tiritiri Matangi I, pair feeding on early flowering

pohutukawa on 14/11 (MG, SG, BWa). Birkdale, 1 on 15/5; Birkenhead Domain, 2 on 29-30/8 (DJC). Remuera, 1 feeding on kowhai in Purewa Cemetery on 9/10 (DMW). Maraetai, 5 in flowering pohutukawas on 15/12 (FN). Manurewa, 1 in *Acacia baileyana* on 22/6 (JT). Keri Hill, Papakura, 1 flying south on 1/9 (JGM). Drury, 1 reported in garden (JLP). Karapiro, 1 by school on 18/8 (BHS), 1 being fed walnuts at house next to school on 21/10 (TBST). Rangiuru, BoP, 1 seen several times in and near school grounds in June, usually in puriri or lemon tree (RL). Kaweka Range, HB, 2 near MacIntosh Spur on 27/3 (TAS).

EASTERN ROSELLA *Platycercus eximius*

Manurewa, 2 trying to get into starling nest box on 27/8 (JVD). Waikato Region, now widespread and apparently still increasing (DJR). Plummer's Pt, Tauranga H, 2 feeding in wattle tree just above tide-line on 8/9 (BRK).

RED-CROWNED PARAKEET *Cyanoramphus novaezelandiae*

Tiritiri Matangi I, widespread, usually in groups of 2 or 3, on 25/3 (SB).

PARAKEET sp.

Northland, Logan's Bush scenic reserve, heard on 6/7; Mt Manaia, heard on 6/7; McLeod's Bay, aviary owner reported up to 8 have visited a pair in aviary (RP). Upper Tawarau Gorge, 1 on 12/12 (BW). Mangorewa Gorge, 2 or more heard squabbling but not seen on 18/3 (C. Adams *per* PCML).

FAN-TAILED CUCKOO *Cuculus pyrrhophanus*

Pukekohe, 1 heard clearly as it flew from shelter belt, mobbed by other birds on 9/2 (DAL).

SHINING CUCKOO *Chrysococcyx lucidus*

Clevedon, first song on 17/9 and again on 25/9; still singing on 14/1 (AJG). Waitakaruru, heard on 10/9 (SC). Pirongia SF, first heard on 27/9 (PMB). Hamilton, Grey Warbler pair feeding young cuckoo on river bank on 10/1 (Sch); late record on 14/5 (SC). Craig's Walk, northern HB, several on 26/10 (KVT); Napier, 1 in suburban area on 8/10 (PWT); Mohi Bush, 2 heard on 10/10 (JMcC). Foxton B, 2 heard on 8/11 and 1/1; Eastbourne, 1 heard on 17/10 (JLM, MM).

LONG-TAILED CUCKOO *Eudynamys taitensis*

Whau Valley, 1 flew into a window on 27/3 (PA). Tawharanui, 1 on 24/4 (MG, SG). Meadowbank, 1 on 1/3 (RBS). Craig's Walk, northern HB, heard on several occasions on 26/10 (KVT).

MOREPORK *Ninox novaeseelandiae*

Ohiwa H, McCoy Rd, many heard at night on 19/1 (PCML). Te Awanga, HB, 1 heard on 11/7 (BMT).

SPINE-TAILED SWIFT *Chaetura caudacula*

Tiritiri Matangi I, 2 seen around light-house, in strong NE wind on 15/11 (MG). S. Kaipara Heads, 1 on 15/11 (MW). Parnell, 1 over Stanley St Tennis Stadium on 29/1 (KB, LD). Howick, 1 on 23/1 (BE).

NEW ZEALAND KINGFISHER *Halcyon sancta vagans*

Kaitia, first one calling on 5/8 (PA). Kawhia H, 15+ along foreshore between Maketu Marae and Kawhia on 26/4 (BRK). Eskdale, HB, 1 all-white bird with normally coloured mate on 25/8 (JB); Ahuriri E, 28 on 11/7 (KVT).

KOOKABURRA *Dacelo novaeguineae*

Leigh, 4 resident at research station on 14/2 (FJT). Matakana, near Warkworth, resident pair on 22/12 (SC). Wenderholm, 1 seen, several heard on 4/1 (DS). Kaukapakapa, 1 on power lines on 6/6 and 19/3 (DB, DFB).

NORTH ISLAND RIFLEMAN *Acanthisitta chloris granti*

Pirongia FP, 1 on 30/8 (JMR, ASR). Mohi Bush, HB, 6 on 15/8 (JMcC).

SKYLARK *Alauda arvensis*

HB Region, common throughout, small flocks often seen in winter (KVT). Moutoa Floodway, 100 on 9/4 (JLM, MM).

WELCOME SWALLOW *Hirundo tahitica neoxena*

Rawara B, c.30 on 15/2 (BS). Aurere E, 1 on 22/11 (MH). Little Barrier I, 4 at summit on 12/5 (MJI, AJT). Tuakau SP, 200 on 29/5; Clevedon, singing after rain following 2 month's drought on 14/5 (AJG). Gordonton, 2 chicks reared from nest of 3 eggs built on wall-mounted telephone in cowshed, 2 metres from milking area 16/11-5/1; partial albino bird with red face and few black feathers, in late Nov; flocks of 1 to 3 dozen feeding over cows, mid-May to July (DJR). Waikato University, c.200 flying above buildings on 29/6 (FB). Thornton Lag, c.300 hawking insects on 5/7; Kaituna Cut, c.50 on 18/10 (PCML). Ahuriri E, c.43 on 11/7, c.206 on 14/11; East Clive, c.87 on 11/7, c.14 on 14/11, 200 filled the air on 23/8; L Poukawa, c.20 in July (KVT).

NEW ZEALAND PIPIT *Anthus novaeseelandiae*

Karioitahi B, seen regularly on beach patrols, 14 on 10/4 (PA, DA, DGB). Access Bay, FoT, 1 on 21/3 (BRK). L Rotoma, good population in district on 8/12 (Sch). Kaituna Cut, 1 on 4/4; Otamarakau, 2 on 20/9 (PCML). Rangitaiki R mouth, 2 on 11/5 (AMcC), 1 on 14/5 (PCML). Pakipaki, HB, 1 pair on 24/7 (JMcC); HB coastline, numerous in some parts, including an autumn flock of c.12 at Clifton (KVT). Manawatu E, 1 on 1/1 (JLM, MM).

HEDGE SPARROW *Prunella modularis*

Onerahi, heard singing on 13/9 (PA). Great Barrier I, 2 in dunes at Kaitoke B, on 2/1 (KB). Tiritiri Matangi I, recorded in 3 localities on 25/3 (SB). Red Hill, Papakura, resident pair on 11/8 (BB). Papamoa, 3 males calling from powerlines on 20/3; Kaituna Cut, 3 males singing on 18/10; Matata, calling but not full song on 14/5; Rangitaiki R mouth, 2 in full song on 20/9; Opotiki, males in full song from boxthorn bush tops on sand dunes, in calm warm weather on 10/7 (PCML). Waikoa F, northern HB, large numbers in cut-over pines on 2/7 (JGH). Hastings, whispering song heard on 29/8; 1 seen to pull small worm from lawn, look at it, then leave it wriggling (not part of diet?) on 16/6 (KVT).

NORTH ISLAND FERNBIRD *Bowdleria punctata vealeae*

North Cape/Aupouri Pen, fairly widespread in Mar 88 (RP); Paua, 2 on 11/2 (BS). Motutangi Wetlands, c.70 on 18-19/1; Kaitaia, Sweetwater Swamp, several seen or heard on 5/8 (PA). Pollen I, Waitemata H, 19 on 10/10 (DGB, WL, MJT), 10 on 9/4 (DGB). Kauaeranga Valley, 1 at Pinnacles Hut on 21/2 (MG, SG). Mt Maunganui, 1 on the Mount itself on 14/6 (CJ); Little Waihi, several seen and heard in ribbonwood on upper estuary on 7/11 (PCML); Matata/Tarawera R mouth, 2 seen on 28/11 (WMH), numerous birds heard in ribbonwood on 14/5 (PCML). Waikoa F, northern HB, 2 on 2/8 (JGH).

L Taupo, several on east side on 27/8 (AD, GL, AJT); Waitotaka Reserve, Turangi, 1 pair on 29/12 (Sch). Wanganui, Herekere Swamp, 4 on 11/7 (GR). Bulls, Santoft Forest, 4 on 11/10 (OSNZ group).

WHITEHEAD *Mohoua albigilla*

Pirongia SF, 15-20 on 30/8 (ASR, JMR); Hauturu Rd North, 3 flocks of 6-8 on 10/6, 5 on 20/8 (BHS); Waitomo, small flocks of up to 10 on 18/7 (ASR *et al.*). L Rotoma, several seen on 8/12; Atiamuri, good numbers in nearby pine forest on 29/12 (Sch). L Taupo, several on east side on 27/8 (AD, GL, AJT). Craigs Walk, northern HB, 2 responded to 'cork and bottle' on 26/10 (JGH). Eastbourne, Williams Park Reserve, c.10 on 17/10 (JLM, MM).

GREY WARBLER *Gerygone igata*

Aurere E, 2 on 22/11 (MH). Hamilton, pair feeding fully fledged chick in Jan (Sch); bird calling on a single note at intervals of 1 second (PCDC). Matata, 1 on 14/5 (PCML).

NORTH ISLAND FANTAIL *Rhipidura fuliginosa placabilis*

Papamoa, BoP, 1 in garden on 15/8, a winter visitor only; Matata, 1 on 14/5 (PCML). Hastings, present throughout the year in gardens (MTC).

PIED TIT *Petroica macrocephala tottoi*

Northland, recorded in many areas of forest including: Kaikohe, 1; Patakorokoro Bush, 1; Keikei Bush, 2; Mt Hikurangi, several; Kotaretahi Bush, 1; Gammon Rd Bush, several; Hue Hue Bush, 2 on 11-27/8 (RP). Hunua Range, Thousand Acre Clearing, pair in very low open scrub on 29/5 (M. Cutting, AJG). Jones Rd, Hunua, pair on 20/10 (JLP). Wairere Falls, Kaimai Range, 1 heard on 28/6 (BRK). Eastbourne, Williams Park Reserve, 3 males on 17/10 (JLM, MM).

NORTH ISLAND ROBIN *P. australis longipes*

Mangorewa Gorge, BoP, 2 pairs on 18/3 (PCML).

SONG THRUSH *Turdus philomelos*

Onerahi, first song on 1/5 (PA). Hamilton, one singing on 16/5 (BW). Papamoa, male in full song on 21/5 (PCML). Plummer's Pt, Tauranga H, very common with many nests in shelter belts round orchards, seeming to favour banksia in particular 2-9/9 (BRK). Hastings, 1 singing at 0400 hours on 1/10; 1 sang from 0345 for 3 hours almost continuously on 8/12 (KVT).

BLACKBIRD *T. merula*

Clevedon, 1 singing after rain on 23/1 (AJG). Hamilton, 2 establishing territory on 16/5 (BW). Arataki, Mt Maunganui, male in full song after some days of preliminary sub-song on 18/6 (AMcC). Hastings, first full song at dusk on 16/7 (KVT).

SILVEREYE *Zosterops lateralis*

Hunua Range, Kohukohunui Track, most commonly heard species 500-1500 m altitude on 30/4 (SE, AJG). L Ngaroto, 23 on floating weed, apparently feeding, on 30/5 (ARP).

BELLBIRD *Anthornis melanura*

Hunua Range, near Wairoa Dam, small numbers in secondary growth on 11/10 (AJG *et al.*). Waingaro, Skinner's Bush, 1 feeding on tree lucerne flowers on 7/8 and 11/6 (RSWS). Ohiwa H, McCoy Rd, fine dawn chorus on 19/1; Waihou Bay, Heron Creek, 1 seen, many heard on 21/1 (PCML). Craig's Walk,

northern HB, several on 26/10 (KVT). Levin, 2 feeding in trees all winter in urban garden (WRJ). Eastbourne, Williams Park Reserve, 2 + heard on 17/10 (JLM, MM).

TUI *Prosthemadera novaeseelandiae*

Cambridge, 1 feeding in garden (BHS). Craig's Walk, northern HB, numerous in flowering kowhai on 26/10 (KVT). Atiamuri, good population in pine forest on 29/12 (Sch). Lower Hutt, single birds in Trafalgar Park area in July/Aug and on 16/1 (JLM, MM).

YELLOWHAMMER *Emberiza citrinella*

Onerahi, first song on 9/9 (PA). Papamoa, c.100 feeding on newly sown grass seed in school grounds on 15/8 (PCML).

CHAFFINCH *Fringilla coelebs*

Whangarei, first calling on 3/8 (PA). Clevedon, first full song on 14/7 (AJG). Papamoa, 1 male in garden, first seen in 12 months, on 15/8 (PCML).

GREENFINCH *Carduelis chloris*

Awhitu Pen, 1 calling on 20/7 (AJG *et al.*). Mt Pirongia, flocking on farmland on 26/3 (BHS). Papamoa, 3 males in garden taking seeds from pine cone heap on 15/8 (PCML). Hastings, attracted to city garden by apple, pear, quince pips, sunflower and pumpkin seeds, winter 88 (KVT).

GOLDFINCH *C. carduelis*

Maio, at least 50 with House Sparrows in lupin on 10/4 (AJG). Red Hill, Papakura, 50 on pohutukawa seeds on 28/3 (BB). Papamoa, c.150 feeding on seeding *Poa annua*, many other flocks of 20-30 on 15/8 (PCML). Napier, Marine Parade, 200 + in feeding flock on 22/8 (MT, PWT). Havelock North, c.100 feeding on sow-thistle on 12/6 (KVT). Moutou Floodway, 100 on 1/8 (JLM, MM).

REDPOLL *C. flammea*

Mt Auckland, small group near summit on 1/11 (MG, SG). Hunua Range, Thousand Acre Clearing, good numbers on 18/10 (M. Cutting, AJG). Mt Maunganui, 2 on Mount itself on 28/6 (CJ). Esk F, HB, 100 + in cut-over pine forest on 15/7 (JGH).

HOUSE SPARROW *Passer domesticus*

Maio, hundreds with Goldfinches in lupin on 10/4 (AJG *et al.*). L Ngaroto, 500-600 flocking with 500-600 mixed finches, Starlings, Mynas, Silvereyes and Skylarks on 30/5 (ARP). Hastings, Civic Square, 2000-3000 roosting in 2 large *Quercus* trees throughout year (KVT). Puketitiri, HB, a canary-coloured bird feeding on lawn, head brown, blotchy brown shoulders, on 6/10 (BMT).

STARLING *Sturnus vulgaris*

Ngaioitonga, 50 on 30/8/86 (GW). Hamilton, 15 regularly feeding on ripe persimmon in May (JMR). Napier, Riverbend Rd, 2500 + coming in to roost between 1645 and 1730 hours on 26/7 (MT, PWT). East Clive, albino in feeding flock; Hastings, city garden, c.12 hunting snails among plants, brought on to lawn, removed from shells with few sharp jerks, eaten immediately; lawn littered with up to 50 shells on 22/12; adults losing breeding colours by 15/1, all bills black, legs dark, plumage dull by 18/1 (KVT). Moutoa Floodway, 5000 on 9/4 (WRJ).

NORTH ISLAND KOKAKO *Callaeas cinerea wilsoni*

Hunua Range, ARA water catchment area, 35 (possibly 39) confirmed by ARA/OSNZ survey team on 20-21/4 (B MacMillan *per* AJG). Mt Pirongia, 1 seen by possum hunter near top on west side on 27/10 (BHS). Hauturu Rd North, 4 or 5 calling 0645-0715 hours on 4/9 (IR), 1 heard on 10/6 (BHS).

ROOK *Corvus frugilegus*

Urungahauhau, Clevedon, 4 being attacked by Harrier on 26/5 (PF), 5 seen in same area through June (M. Hatch, AJG). Mangatangi turnoff, 70 on ground mid-Dec (DAL). Hauraki Plains, 30 'playing in the air' on 10/4 (SC). Hamilton, Ruakura Research Station, recorded in April (FN). Te Hauke-Pukehou HB, readily seen 5 nests being built by pairs on 21/8 (KVT). Aokautere, Palmerston North, 30 on 27/5 (LJD).

CLASSIFIED SUMMARISED NOTES, SOUTH ISLAND

1 July 1987 to 30 June 1988

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Regional Recorders: G. D. Quayle - Nelson, D. J. Onley - West Coast, A. Crossland - Canterbury, T. Hocken - Otago, M. L. Barlow - Southland.

Abbreviations: asl above sea level; ad adult; AF Air Field; B Beach; Crk Creek; E East; Est Estuary; grp group; Hbr Harbour; Hd Head; HQ Headquarters; ha hectare; h hours; I Island; juv juvenile; km kilometres; L Lake; Lgn Lagoon; max maximum; m metres; Mt Mount; NP National Park; Nth North; pr pair; Pen Peninsula; Pt Point; R River; RM River Mouth; Rd Road; SP Sewage Ponds; Sth South; Stm Stream; SF State Forest; V Valley; W West.

GREAT SPOTTED KIWI *Apteryx haastii*

West Coast, locally common, breeding. The usual records from the Charleston area to above the bushline in the Western Paparoas (PG, DJO, KS, RS). Canterbury, occasional records from Arthur's Pass, Bealey, Cox, Hawdon and Poulter Valleys (CFJO'D).

YELLOW-EYED PENGUIN *Megadyptes antipodes*

South East I, 1 on 24/3 (AJDT). Bushey B, Oamaru, 2 on 23/10, 3 on 3/3 (A&TH). Nuggets, Catlins, 1 moulting on 17/2. Papatowai, first-year moulting 5/2 to 1/3; 1 ad in moult on 24/3 (DJO). Ruapuke I at Nth Hd, 1 on 11/2; many tracks in bracken. Island owners report regular breeding at Nth Hd and on offshore islands (MLB). Codfish I, many birds moulting in forest Mar-Apr (JW).

BLUE PENGUIN *Eudyptula minor*

West Coast, common and breeding. Greymouth B, many tracks (CSL). Avon-Heathcote Est, 1 on 18/1 (AC). Chatham I, feathers in cat scat near the Horns on 17/10 (AJDT). Oamaru Hbr, a substantial established colony. Bushey B, Oamaru, White-flipped Penguin outside its range on 8/3 (A&TH).

SOUTHERN CRESTED GREBE *Podiceps cristatus*

L McRae, 2 in summer 87/88 (WFC). L Ianthe, 2 pr on 7/8 possibly nesting; 2 on 6/11; 1 on 30/11; 2 on 27/2 (CSL, CJ, CFJO'D). L Wahapo, none on 6/11. L Mapourika, 4 on 6/11. L Paringa and L Moeraki, none on 6/11 (CFJO'D). Canterbury, winter totals in July, Sumner grp 6, Pearson grp 9, Coleridge grp 24, Ashburton grp 46, Alexandrina grp 63, L Ohau 2, lowland Canterbury 21 – total 171. Horseshoe L, Nth Canterbury, 1 on 4/6, gone by 7/6; first record (DGo). L Sarah, 1 on 22/11, 2 on 2/4. L Grasmere, 12 on 21/11, 4 ad, 1 juv on 3/4. L Pearson, 2 pr summer 87/88, 1 pr nested. L Lyndon, 1 juv on 6/6 and 30/4, 1 ad on 9/10 (PAL). L Forsyth, 20 on 23/7, 6 on 27/5 (CFJO'D). L Ellesmere, 1 in March, 1 in May, 1 on 23/7 (CFJO'D); Hart's Crk 1 juv on 8/8 (PAL). L Clearwater, max of 19 ad, 3 juv to May, 26 on 4/6; 30 on 11/6. L Emma, 18 on 25/4 (LA). L Alexandrina, 91, including 12 juv, on 26/2, 84 on 25/4, including 4 juv, 65 on 25/5, 66 on 28/6. L McGregor, 6 on 26/1 (PAL), 5 ad, 3 small chicks on 26/2, 8 ad, 1 juv on 25/4, 5 on 25/5, 4 on 28/6 (SE). L Ohau, 1 on 21/6 (SE). Te Anau, DoC HQ, female and juv feeding near outlet creek on 10/6 (AW).

HOARY-HEADED GREBE *P. poliocephalus*

L McGregor, 1 on 28/6 (SE, DPM, CP, CER).

AUSTRALIAN LITTLE GREBE *Tachybaptus novaehollandiae*

Nelson, recorded several times in last 10 years. Druggans Dam, Aorere Goldfields 1 on 9/1 (AB). Present and breeding on St Anne's Lgn, Canterbury, for 10 years, 1 on 24/8 and 11/5 (PAL). Farm pond, Woodchester, Waiau, 1 on 26/12 (LD).

NORTHERN ROYAL ALBATROSS *Diomedea epomophora sanfordi*

Taiaroa Hd, 17 pr each with one egg; raised only 8 young (PS).

BLACK-BROWED MOLLYMAWK *D. melanophrys*

Pitt Strait, Chatham I, 1 ad on 20/10; plumage with relatively white underwings probably subsp. *melanophrys* (ADJT). Sth Hd, Waikawa, 1 on 21/2 (DJO).

YELLOW-NOSED MOLLYMAWK *D. chlororhynchos*

20-40 km off Bank's Pen, 1 ad of subsp. *bassi* on 1/9 (PAL).

BULLER'S MOLLYMAWK *D. bulleri*

Off the Nuggets light scavenging behind fishing boat on 22/3. Sth Hd, Waikawa, Catlins, 1 on 21/2 (DJO).

SHY MOLLYMAWK *D. cauta cauta*

Nuggets, 1 scavenging behind fishing boat on 22/3. Purakaunui B, several 100 on 25/6 (DJO).

SALVIN'S MOLLYMAWK *D. cauta salvini*

Most common *Diomedea* off Bank's Pen on 1/9, 100+ per trawl (PAL). Purakaunui B, 1 on 25/6 (DJO).

GIANT PETREL *Macronectes* sp.

Oamaru Hbr, 12 dark phase, scavenging behind fishing boat on 13/10 (A&TH). Moeraki, 1 exhausted white morph in December, released January (PS). Sth Hd, Waikawa, 1 on 21/2 (DJO).

CAPE PIGEON *Daption capense*

Common around Kaikoura (CFJO'D). Birdling's Flat, Canterbury, 1 in surf zone unusually close to shore on 5/9 (PAL). Oamaru Hbr, 70-80 on 13/10 scavenging behind fishing boat; 2 on 2/12 (A&TH). Purakaunui B, Catlins, 1 on 25/6 (DJO).

MOTTLED PETREL *Pterodroma inexpectata*

Codfish I, 50 study burrows had 21 chicks that had 4-5 weeks until fledging Mar-Apr (JW).

COOK'S PETREL *P. cookii*

Codfish I, 38 study burrows and 24 other burrows had produced 21-23 chicks (fledgling numbers unknown) Mar-Apr (JW).

PRION SP. *Pachyptila* sp.

Chatham I, feathers in cat scat on Sth W Coast on 19/1 (AJDT).

BROAD-BILLED PRION *P. vittata*

Upper Rakaia R, 100 km from sea, 1 flying down river on 16/12 (CFJO'D). Birds also found inland at Fairlie and Mayfield in same month and one in Christchurch city (CFJO'D,DG).

GREY PETREL *Procellaria cinerea*

Manapouri, 1 found by Electricorp staff on 25/5, banded at Te Anau Wildlife Centre and released on Milford Sound (AW).

SOOTY SHEARWATER *Puffinus griseus*

Razorback B, Punakaiki, 5 on 22/12 (DJO). Seal I, Fox R, 27 ad and 2 chicks with several other burrows on 26/1 (KS). Mt One One, Wanganui RM, Sth Westland, c.20 burrows under kiekie. Makawhio Hd, birds flying ashore at dusk in Nov (CFJO'D). Canterbury, Hurunui RM, 53 close inshore on 3/4. Woodend B, c.320 passing offshore per hour on 3/2. Birdling's Flat, 4000+ offshore on 25/4 (AC). Chatham I, a few burrows on Sth W coast on 19/10 (MI,AJDT). L Wainono, common offshore on 2/4 (SE). Catlins, many thousands at Nuggets, 17/2 and 22/3. Papatowai through Feb and Mar until 5/4; and Sth Hd, Waikawa, on 21/2. Only one at Sth Hd on 3/4 (DJO). Manapouri, 1 grounded 22/5, banded and released on L Te Anau. Te Anau, 1 crashed into house window 11 p.m. on 24/5, later died (AW). Codfish I, 50 study burrows had 26 chicks 4-6 weeks before fledging Mar-Apr (JW).

HUTTON'S SHEARWATER *Puffinus huttoni*

Hurunui RM, Canterbury, 124 close inshore on 3/4 (AC).

DIVING PETREL *Pelecanoides urinatrix*

Christchurch, 1 flew into suburban garden on 11/8, released at Taylor's Mistake (CFJO'D). Naseby, Central Otago, 1 dead bird on 19/1, 70 km from coast (PS).

AUSTRALASIAN GANNET *Sula bassana serrator*

Frequently seen feeding in Tasman and Golden Bays. Farewell Spit colonies, c.590 chicks on 2/2 (JMH). Present in small numbers along Canterbury coast from late summer to winter e.g. Gore Bay, 1 on 27/7 (PAL); Waipara RM, 1 juv on 28/8; Ashley Est, 1 on 6/7 (AC), 3 on 4/12; New Brighton B, 2 on 15/5 (PAL); Avon-Heathcote Est, 1 on 8/7 and 29/6; Taylor's Mistake, 15/12 (AC); Birdling's Flat, 1 on 5/9 (PAL); Kaitorete Spit, 1 on 30/8 (AC); L Wainono, 1 juv offshore on 2/4 (SE), 7 ad, 8 juv sitting on water at sea on 26/4 (RM). Otago Hbr, 4 sightings 5-17/4 between Dowling Bay and

Burns Pt (JV&KM). South Otago and Catlins Coasts, breeding at the Nuggets with 5 nests in Jan (PS,KCG); 6 birds remained 22/3. Several records of ad and juv birds along coast up to June (DJO).

BLACK SHAG *Phalacrocorax carbo*

Nelson, frequently seen in coastal areas and in numbers less than 10 from many inland sites (GDQ). Motueka Est, max of 123 on 1/9, 264 on 11/5 (AC). Head of L Rotoiti, c.20 on 3/2 (S&JR). West Coast, small numbers from many coastal sites and less frequently inland e.g. 1 in Waitaha V on 15/6. Max 13 at Karamea on 16/7 with 1 ad gathering sticks and one displaying (CSL). Canterbury, widespread and common. Ashley Est, highest count, 28 on 15/4. Avon-Heathcote Est, winter low of 40, summer high of 190 (AC). L Ellesmere, 63 in May, 19 in Aug, 150 in Feb, 91 in April (CFJO'D). L Clearwater, 50+ on 4/6 (LA).

PIED SHAG *P. varius*

Nelson, groups of up to 8 around coast (GDQ). Rocks Rd, Nelson, 120 with 25 nests in Norfolk pines in Sep (DB), 160+ with 40 nests in June (JMH, KDQ, SW, ZW). West Coast uncommon, Only 1 record compared with 8 last year. Buller R Est, 1 on 23/8 (DJO). Canterbury, now widespread in Pegasus Bay and Bank's Pen during autumn and winter. Expanding range and numbers slowly southwards since early 1980s. Hurunui RM, 22 on 3/4; Waipara RM, 1 on 23/2. Ashley Est, 9 on 6/7, 20 on 14/2, 22 on 5/2, 33 on 15/4. Brooklands Lgn, 19 on 18/2; Avon-Heathcote Est, max of 25 during Mar and April. Port Levy, 1 on 12/3. Lyttelton Hbr, 2 on 14/3 and 22/6. Okain's Bay, 13 on 25/4. Akaroa Hbr, 2 on 12/3 (AC). L Ellesmere, 5 in Aug (CFJO'D).

LITTLE BLACK SHAG *P. sulcirostris*

Seen frequently in Motueka, Waimea and Nelson Estuaries in summer months in groups of up to 10. Motueka Est, 10 on 15/5 (JMH). Barrytown, 1 on 2/2, the first West Coast record (CJ).

LITTLE SHAG *P. melanoleucos*

Nelson, frequently seen, particularly Waimea and Motueka Est. Rocks Rd, Nelson, 60+ roosting with Pied Shags in Norfolk pines in June (JMH,KDQ,SW,ZW). West Coast, many records of small numbers at coastal and inland sites. Max Karamea, 10 on 12-13/3; Okari, 10 on 16-17/2, Mikonui Est, 24 on 15/6 (CSL,CJ,DJO). Canterbury, common. Ashley Est, max 19 on 14/12. Brooklyn's Lgn 11 on 18/2, 22 on 4/5. Avon-Heathcote Est, winter low of 20, summer peak of 120, small numbers in Christchurch City, Victoria L, 2 on 20/3; L Bryndwr, 4 on 13/4; the Groynes, 2 on 21/6. Lyttelton Hbr, 62 on 13/5. Akaroa Hbr, 63 on 12/3 (AC). L Ellesmere, max 76 in Feb (CFJO'D). L Clearwater, max 60 on 30/7. L Emma 28 on 25/7 (LA). L Alexandra, 23 on 19/7 (BHS). Otago Hbr, 178 roosting between Anderson's Bay and Taiaroa Hd on 27/8 (JV&KM).

STEWART ISLAND SHAG *Leucocarbo carunculatus chalconotus*

Waitaki RM, single bronze morph on 15/3 (A&TH). Oamaru breakwater, 3 on 23/6 (CFJO'D). Nth of Kakanui, 1 pied morph on 4/3 (A&TH); Nth of usual range.

SPOTTED SHAG *Stictocarbo punctatus*

Tasman Bay present in 2-3 thousands during winter. Smaller numbers

in Golden Bay. Several roosts alongside coastline (GDQ). West Coast, locally common. Perpendicular Pt, Punakaiki, c.300 at colony on 18/6 with no obvious breeding. By 7/9, c.175 active nests (CSL,DJO). Ten-mile Crk (Nth of Greymouth), 4 visible nests and c.10 birds – no active nests on 24/8 (CSL). Small numbers along the coast with max of 15 at Buller Breakwater in Nov and Dec (DJO). Canterbury, flocks occasionally at river mouths e.g. Ashley Est, c.80 on 4/12; Waimakariri RM, c.150 on 7/5. Many thousands nesting around Bank's Pen, Tumbledown Bay c.100 nesting on 13/11 (PAL). Magnet Bay, c.240 on 25/4 (AC). Oamaru Hbr, c.30 to many hundreds roosting (A&TH). Nuggets, Sth Otago, c.500 on 17/2, c.1700 on 22/3 (DJO).

WHITE-FACED HERON *Ardea novaehollandiae*

West Coast, widespread records of small numbers. Max 23 at Karamea on 12-13/3 (CSL). Okari Lgn, 31 on 16-17/2 (CJ). Canterbury, common. Waipara RM, 11 on 21/2. Ashley Est, max 34 on 14/12. Brooklyns Lgn, 36 on 18/2. Avon-Heathcote, max 110 in July. Lyttelton Hbr, max 72 on 17/2. Akaroa Hbr, 94 on 12/3 (AC). L Ellesmere, max 368 in Feb (CFJO'D). Mangere I, Chatham grp, 1 or 2 seen 6 times 20/10-24/3 (AJDT,PMcC). Waikouaiti, Otago, nest in grass on ground (PW). Catlins Lgn, max 35 on 11/6 (DJO). Ruapuke I, 4 on 11/11 (MLB).

WHITE HERON *Egretta alba*

Nelson, arrive on estuaries in Jan e.g. Rangihueta Est, 1 on 21/1 (EN); Riwaka, 1 on 13/1 (AC); Waimea, 2 on 28/1 (JB). Golden Bay and Tasman Bay, max of 5 in June census; have been decreasing over last 2 years (GDQ). Wairau Lgn, 1 early 1988 (BN). Nth Westland, Blaketown and L Ryan on 4/7. Karoro, 1 flying south on 27/7. Orowaiti Est, 1 last seen on 30/7. Last Blaketown record for spring on 1/8 (CSL,DJO,KS). Inangahua Junction, 1 on 23/8. Black's Point, Reefton, 1 on 27/8 (PG,RL). Last spring records; Cobden, 1 on 5/9 (CSL) and Charleston, 1 on 6/9 (DJO). No records outside the breeding area at Okarito during Oct, Nov, Dec. At Okarito colony, 60 adults built 50 nests and raised 25 chicks (DoC). First record of post-breeding dispersal was Blaketown Lgn on 23/1 (CJ), over a month later than last year. Orowaiti, 1 had returned by 18/2, with 3 on 18/6 (CSL,DJO,KS). Other Feb records: Bassett's wetland, 1 on 18/2; Cobden, 1 on 19/2; Okari, 1 on 16-17/2 (CJ). Widespread West Coast records from March onwards: Oparara 1 on 13/3; Karamea 1 on 12-13/3; Blaketown Lgn, 1 on 20/3, 2 on 12/4, 1 on 11/5; Cobden Lgn, 1 on 9/6, 1 on 11/5, 1 on 9/6; L Ryan, 1 on 11/5, 1 on 18/6; Bradshaw's Lgn, 1 on 21/3; L Kaniere, 1 on 27/3; Harihari, 1 on 2/4; Mahitahi R, 3 on 3/4; L Moeraki, 1 on 1/3 (PG,CJ,CSL,DJO,KS,RS). Canterbury, Avon-Heathcote Est, 1 until late Sep, returned by mid-Jan (AC). Barry's Bay, Akaroa Hbr, 1 as late as 26/10 (PAL). Ashley Est 1 on 15/4 (AC). L Ellesmere, 3 in Aug, 1 in Feb and 11 in Apr (CFJO'D). L Wainono, 1 remained through summer and autumn (SE,RM,A&TH). Ohau R delta, 1 on 6/4 and 22/4 (SE). North Otago, regular winter population of at least 3 in Oamaru gardens, harbour, lagoons and estuaries (ARB,A&TH). Last record 27/10; first return 25/12 (A&TH). Waikouaiti Lgn, 3 records Feb-Apr (A&TH,PS) including 2 birds on 15/2 being aggressive towards each other (JAW). Berwick, 1 on 7/8 (PS). Kakanui Est, 1 on 11/6 (A&TH). Waituna Lgn, Southland, 1 intermittently all year July-June (Ray Waghorn). Lower Maitaia R, 1 between 22/10 and 21/12,

again on 18/1, possibly same bird as at Waituna (SLL). Clearly some birds spend summer on the East Coast, not returning to the Okarito colony. Invercargill Est, 1 on Waihopai arm on 27/9; 1 opposite Kew Rd on 30/4 (MLB).

LITTLE EGRET *Egretta garzetta*

Regularly from Nelson and West Coast regions. Waimea Est, Rough I, 1 on 18/9, (JB) and 1 in June census. Karamea 1 until 8/8 (PG). Buller RM, 1 on 23/8. Orowaiti, 1 throughout July,, last seen 23/8 (DJO). Seen again on 18/2 (KS), 1 on 22/3 (CJ) and possibly 2 on 18/6 (CSL).

REEF HERON *Egretta sacra*

Nelson, not often seen and usually in Golden Bay. Collingwood, 1 on 10/5. Pohara, 1 on 6/9 and 28/12 (AC). Marahau, 1 on 25/10 (GDQ). Riwaka RM, 1 on 13/1 (AC). Motueka Est, 1 in August (GDQ). Nelson Hbr and Haven, 1 during winter and Sep-Oct (DB,JMH,GDQ). Nuggets, Sth Otago, 1 on 22/3 (DJO).

CATTLE EGRET *Bubulcus ibis*

Nelson, occurs in certain localities from April to Nov. Takaka, max 48 in Aug (KES). Tasman Bay, max 47 on 22/8 (GDQ). Last spring record, Appleby, 10 on 15/11 (GDQ). Grovetown, c.10 in early May (BN). Karamea, 30 on 16/7 increased to 43 by end of month; reduced to 30 on 23/8 (CSL,RL). Orowaiti, 51 on 13/7, 43 on 23/8 and 38 on 28/10 (DJO). Only 2 spring-summer records: Buller R, Westport, 4 on 23/12, 2 of which were in full breeding plumage (DJO). Arahura, 11 on 3/8 and 7/8 (CSL). There were few records for 1988. First autumn record was Harihari, 1 on 2/4. Haast, 5 on 4/4 (CJ). Arahura, 1 on 19/4, 5 on 5/5 but had left by 6/6 (CSL,FO). Karamea, 7 on 18/6 (RL,DR). Waikuku, Canterbury, 27 on 25/7 (RM); 28 on 28/8 (AC). Barry's Bay, Akaroa Hbr, 3 on 5/9 (PAL). L Ellesmere, 11 at Embankment Rd on 5/7 (PAL); 39 stayed for summer near Selwyn R but only 35 remained in April (CFJO'D). Otago, regional max 137 on 23/8, with 60 on Taieri Plain and 57 at Balclutha (PS *et al.*). First record for 1988, 2 on 18/4, with 6 on 24/4 (PS). Catlins Lgn, 1 on 9/5 (DJO). Underwood, Southland, 10 on 2/5 (OJL). Seaward Downs, 20 on 2/5 (MLB). Thornbury, 30+ on 22/5 (OJL). Bay Rd, Invercargill, 2 on 25/5 (MLB).

NANKEEN NIGHT HERON *Nycticorax caledonicus*

Pateroa, Taieri R, 1 on 18/4 (MW)

AUSTRALASIAN BITTERN *Botaurus stellaris*

Nelson, rarely seen. Wakapuaka, 1 on 15/11 (KDQ). Karamea, 1 on 16/7 (CSL). Flowery Crk (Arahura), 1 on 28/7 and 10/8 (RS). Little Wanganui, 2 in wet pasture on 21/11 (CSL). Despite surveying many West Coast wetlands, only 1 seen, Bassett's wetland on 18/2 (CJ). Hart's Crk, L Ellesmere, 1-2 in raupo booming on 8/8, 3 booming on 19/9 (PAL). Washdyke Lgn, 1 on 21/9 (RM). Ahuriri R, 1 flying from a swampy stream was chased by a Harrier and forced to land on 31/5 (SE). L Waiholo, 1 on 15/3 (PS). Tokomairiro RM, 1 on 24/4 (PS). Papatowai, Catlins, 1 on 18/4 (DJO). Sandy Pt gravel pits, Southland, 1 on 29/1 (RRS).

GLOSSY IBIS *Plegadis falcinellus*

L Waiholo, 1 seen several times in July (PS). Ruapuke I, 1 on 10/11 at Moana Putakitaki Lgn. Not seen on next visit on 11/2 (MLB).

ROYAL SPOONBILL *Platalea regia*

Nelson, a regular visitor in winter months. Earliest autumn record, Farewell Spit, 4 on 23/3 (EN). Golden Bay, max 33 in June census. Motueka Est, 28 in June census. Rough I, Waimea Est, 29 on 19/9 (JB). Wairau Lgn, 73 in early 1988 (BN). Buller R Est, of 2 that arrived in Feb 1987, 1 remained until 23/8; 3 returned on 24/2 (DJO,KS). Oparara, 4 on 23/8 and 2 on 18/6 (RL,DR). Okarito, 18 adults built 6 nests but raised no young (DoC). Canterbury, present autumn to spring. Often move between Avon-Heathcote Est, Bromley SP and L Ellesmere. Avon-Heathcote area, 15 through July, 16 on 16/8, but only 8 by 27/9. Absent during Oct until 2 on 28/10, then 5 on 27/11. Absent Dec, 3 in Jan, 2 in Feb, then absent until 5 on 26/2. Increasing through March to 18 on 1/4, 25 on 24/4, 29 in May, falling to 17 on 24/6 (AC,KCH). L Ellesmere, 1 in Aug (CFJO'D); 8 at Kaituna Lgn on 26/10 (PAL); 21 on 24/1 (KCH); 13 in Feb and 16 in April (CFJO'D). Ashburton R, 1 on braided river on 24/10 (CFJO'D). Normanby, Timaru, 3 on 2/4 (SE). Breeding continued at Maukieke I, Moeraki, with 52 birds on 13/1 (WJC). Entire group of 52 at Karitane and Waikouaiti on 13/3 (A&TH,PS,JAW). This record indicates that birds in Canterbury in Jan and Feb must come from elsewhere. Less frequent in Nth Otago than previous years. Bowalley, 5 on 7/2. Kakanui Est, 2 on 12/4 (A&TH). Riverton Est, 1 on 21/11 (OJL).

MUTE SWAN *Cygnus olor*

Waipara RM, 2 on 28/8. Bromley SP, 1-3 April to June (AC). L Ellesmere, numbers continue to decrease, 23 in Aug, 2 in Feb, and 21 in April (CFJO'D). Ohau R delta, 2 from 6/4 to 7/6. Tekapo R, 2 on pond 16/6 (SE). Eglinton V, Deer Flat, 2 on tarn 20-24/9 (KM).

BLACK SWAN *C. atratus*

West Coast, locally common and breeding. Recorded from Break Crk, Oparara, Karama, Buller R Est, Okari, Barrytown, Cobden, L Ryan, Blaketown, L Karoro, Range Crk, L Poerua, L Ianthe, L Wahapo, Okarito, L Paringa, L Moeraki. Karama Lgn, max 60 on 12-13/3 (CJ). Canoe Crk, max 34 on 7/9 (DJO). Cobden Lgn, max 22-25, Oct-Nov and 29 in July. Otherwise less than 10 (PG,CJ,CSL,RS). Canterbury, max numbers occur on L Ellesmere with 8487 in Aug, 10 385 in Feb and 8733 in April (CFJO'D). Widespread elsewhere: Conway RM, 30 on 26/6 (JC); Waipara RM, 41 on 28/8; L Bryndwr, 6 on 13/4; Bromley SP, max 742 on 1/6; Akaroa Hbr, 10 on 12/3 (AC); L Clearwater, max 91 on 30/4; L Roundabout, 62 on 25/4; L Emma, 350 on 25/4 (LA); L Alexandrina, 74 on 19/7 (BHS). Oamaru, Fortification Rd, 92 on 2/8. Papanui Inlet, Otago Pen, 27 on 26/7 (A&TH). Kaikorai Est, pr with 4 juv on 18/10. Catlins Lgn, max c.50, Feb to June (DJO). Ruapuke I, 7 ad, 2 broods of 4 and 6 on 11/11 (MLB).

CANADA GOOSE *Branta canadensis*

West Coast, now occur widely in low numbers. Oparara Lgn, 3 on 11/3 (CJ). Mokihinui Est, 3 on 17/7 and 2 on 12/12 (DJO). Canoe Crk, Barrytown, 14 on 30/7 included 5 with neck collars that were banded there on 15/1/87 and 2 with collars banded at L Grasmere (Canterbury) in 1984 (DJO); 12 on 21/11 (PG,RS). L Poerua, 2 on 8/10. Dead birds at Greymouth B on 6/7 and 1/4 and at Canoe Crk on 30/7 (CSL, DJO). Canterbury. Max numbers occur at L Ellesmere with 12 096 in Aug, 9791 in Feb and 7822 in April

Mackenzie Basin, main concentration at L Alexandrina: 1605 on 19/7 (BHS), 838 on 26/2, 1253 on 25/4, 1281 on 25/5, 1087 on 28/6. Also L Tekapo, 15 on 15/2 (SE); L McGregor, 110 on 26/1 (PAL), 130 on 26/2, 196 on 25/4, 88 on 25/5, 227 on 28/6. Mailbox Inlet, 10 on 23/2, 27 on 9/6, 10 on 22/6; L Murray, 50 on 23/2; Godley R delta, 50 + on 3/5, 50 on 9/6; 30 + on 23/6; Tasman R delta, 16 on 5/4, 20 on 2/6; Ohau R delta, 2 on 25/3; Homestead Tarn, 57 on 4/3, 39 on 28/3, 37 on 12/4, 12 on 1/6; L Wairepo, 12 on 1/6 (SE). L Waipori, Berwick, 5 on 8/8 (A&TH). Waipori wetlands, 24-26 until 1/5 (HAS).

AUSTRALASIAN HARRIER *Circus approximans*

West Coast, numerous records from agricultural land and wetland areas. Courtship and display observed, Greymouth, on 29/9 and 2/10. Greymouth, 1 caught a starling in flight on 8/12. Cobden Lgn, 1 roosting with 8 ducks and their young on 19/2 (CSL). Reefton, 1 almost white bird on 28/10 (PG,RS). Canterbury and Otago, large concentrations seen in autumn and winter. Brooklands Lgn, 13 on 4/5. Avon-Heathcote Est, c. 20 during winter (AC). L Ellesmere, 1 in Aug, 9 in Feb, building up to 21 in April (CFJO'D). L Pukaki spillway, 35 circling in July (DPM,CER). Papatowai, c.40 on 25/4 and 10 on 26/4 out at sea flying south (DJO). Mangere I, Chathams, several Broad-billed Prions eaten on 16/3 and 21/3, 1 pipit eaten on 10/3 (AJDT). Ruapuke I, at least 4 on 11/11. Waihopai R at North Rd bridge in Invercargill Est, a pr nested and raised 1 chick (MLB).

NEW ZEALAND FALCON *Falco novaeseelandiae*

Mt Arthur, Salisbury hut, 1 on 15/1 (JR,SR). West Coast fewer records than last year. Charleston, 1 on 30/4 (KS). Marsden, near Greymouth, 1 attacking chickens during July and Aug (BMcA). Big R, Inangahua, 1 on 16/8 (PC). Canterbury, all high country records. Dashwood Pass, 1 chasing a Harrier on 31/8 (AC). Ada Pass, 1 found dead on 19/12. Boyle Huts, Lewis Pass, 1 on 7/6 (AC,DG). Sherwood Station, Waiau, 1 on 8/12 (PAL). Oxford SF, 2 in beech forest canopy in Aug (JW). L Lyndon, 1 on power pole above road on 18/7; 1 chased by 2 Keas on 29/8 (PAL). Maitland V, 1 on 21/2 and 27/3 in mountain beech. South Temple Stm, 2 heard on 27/2. Temple Stm gorge, 1 sitting on trig on 28/4. L Ohau Rd, 1 on side of road pecking at possible road kill on 28/3. Twizel, 1 at Black Stilt aviary on 8/6. Upper Ahuriri R, 1 on 30/3 (SE). Hollyford Valley Rd, 1 soaring or being chased by a Kea or Kaka on 21/11 (BHS). Cascade Crk, 1 with what looked like a Silvereye in its talons (SC). Henley, 1 on 30/3 (PS).

NANKEEN KESTREL *F. cenchroides*

Christchurch, Riccarton Race Course, 1 during May (DH).

CALIFORNIA QUAIL *Lophortyx californica*

Kaiata, 1 with young on 28/10 (PG,RS). First West Coast record since Nov 1985. Otago, widespread records; Waitaki RM, pr on 2/12 (A&TH); Whare Flat, Dunedin, 2 on 3/2, Outram Glen, 19 on 2/3 (PS); Puketeraki 1 on 3/2 and 5/10 in the small residential area (JAW).

BANDED RAIL *Rallus phillippensis*

Pakawau, 1 in full breeding plumage with 5 chicks on main road (FN,SN).

WESTERN WEKA *Gallirallus australis australis*

Golden Bay, and Abel Tasman NP, usual widespread records. Cobb V, 1 on 23/1 (JR,SR). West Coast, many records Nth of Taramakau R. Otherwise a few records just Sth, mainly along State Highway: 1 dead, Kumara on 8/10; 1 dead, Okuku SF on 16/10, 2 on 7/12; 1 dead at Wainihinihi on 20/10 (CSL); L Kaniere, 1 on 30/1 and 27/3. More southerly records: Ianthe SF, pr on 27/2 (CJ); site of a small population for some time; Makawhio SF, 1 on 6/11 (CFJO'D).

MARSH CRAKE *Porzana pusilla*

Gibson's Crk, Marlborough, 1 in 1988 (BN). Westport, O'Malley's Dredge, 1 or 2 on 24/3 (CJ). L Sarah, 1 on 3/4 (PAL). Southland, McLeod's Lgn, Thomson's Crossing, 1 in flight on 2/5 (RRS). Thornbury, footprints on snow-covered log in known territory on 23/5. Prints measured c.50 mm ("heel" to tip of mid toe); width at tip of lateral toes c.30 mm (OJL).

SPOTLESS CRAKE *P. tabuensis*

Westport, Bassett's wetland, 2 on 19/2, 1 or 2 on 18/2 (CJ).

PUKEKO *Porphyrio porphyrio*

West Coast, common and breeding (DJO). Canterbury, Brooklands Lgn, 163 on 4/5. Eastern Christchurch, winter population of c.850-1000 with Bromley SP, c.400; Travis swamp, c.300; Ferrymead-Heathcote V, c.150; and low numbers in Woolston and Bexley (AC). L Ellesmere, much lower numbers in recent years; e.g. 128 in Aug, 53 in Feb and 159 in April (CFJO'D). Bay Rd, Invercargill, flock changes through year: 212 on 4/7; 402 on 6/7; 398 on 25/7; 280 + on 7/8 and 8 on nearby paddocks, 240 on 14/8 and 60 nearby, 10 on 10/12, nil until 13/5 when there were 8, 91 on 21/5, 133 on 25/5, 227 on 5/6, 212 on 28/6 (MLB).

AUSTRALIAN COOT *Fulica atra*

Druggan's Dam, Aorere Goldfields, 1 on 9/1 (AB). Becoming well established around Christchurch. Kaiapoi Gravel Pits, 4 on 1/6. L Bryndwr, 6 on 13/4, 8 on 21/6, breeding within metropolitan area. Bromley SP, 1 in Aug, Sep and Feb (AC). L Heron, 134 in July (DG). L McGregor, 11 on 26/12, 9 on 25/4. L Alexandrina, 17 on 25/4 (SE). Max 26 in April (DoC). Pond with raupo near Otematata, 1 on 5/3 (SE). Waipori Wetlands, max 7 through May and June (HAS).

SOUTH ISLAND PIED OYSTERCATCHER *Haematopus ostralegus finschi*

Nelson, same distribution and concentrations as last year. West Coast, small numbers from many coastal estuaries. Main concentrations were Karamaea, 148 in March; Oparara, 50 + in March; Okari, 80 in Aug, 138 in Nov, c.700 in Feb, c.275 in June, and Orowaiti, 109 in July, 46 in Aug, 52 in Nov, 100 in Dec, 400 in Jan, 376 in Mar, 92 in May, 110 in June. Westport AF, c.100 on 18/6 was unusual. Pairs were seen at suitable breeding sites inland at Hokitika Gorge Rd on 7/8, Waitaha V on 7/8, Hurley's Crk, Sth Westland on 30/11 and Canoe Crk on 7/9 (PG, CJ, CSL, RL, DJO, KS, RS). Canterbury, Conway RM, 4 on 26/6 (JC). Ashley Est, max 285 on 6/7, Brooklands Lgn, 217 on 18/2, 261 on 4/5. Avon-Heathcote Est, max 4810 on 6/5. Lyttelton Hbr, max 744 on 13/5. Port Levy, 102 on 13/2. Pigeon Bay, 30 on 12/3. Okain's Bay, 26 on 25/4. Akaroa Hbr, 563 on 12/3 (AC). L Ellesmere, 114 in Aug (CFJO'D), 3 on 12/12 (PMS), 26 in Feb (CFJO'D).

L Wainono, 94 on 19/9, 107 on 1/11 (RM). Waitaki RM, c.60 on 8/9; Papanui, Otago Pen, 150 on 26/7 (A&TH). Cabbage Pt, Catlins, 605 on 13/3. Catlins Lgn, 1000 + on 22/2, 605 on 13/3, 390 on 12/6, 200 + on 25/6. Papatowai, 72 in Feb, 64 in March, 48 in April, 35 in May, 8 in June. Waikawa Hbr, 220 on 10/1, 515 on 31/1 (DJL), c.900 on 21/2 (DJO). Southland summer census, 2825 + on 21/11 (WJC). Thornbury, 2 on territory in same farm paddock from late April; courtship flight on 28/6 (OJL).

VARIABLE OYSTERCATCHER *H. unicolor*

Nelson, widespread around coast and estuaries. Motueka Est, max 56 on 11/1 (AC). Nelson Haven, winter numbers appear to be increasing, max c.60 in April (JMH). L Grassmere, max 1 Jan-Mar (PSG). West Coast, small numbers reported from many coastal sites. Max: Little Wanganui, 15 on 21/11; Karamea, 18 on 12-13/3; Okari, c.15 on 16-17/2; Orowaiti, 14 on 18/6; Jackson's Bay, 20 on 3/4 (PG, CJ, CSL, DJO, KS, RS). Feeding 15 km inland along Paringa R in Nov (CFJO'D). Uncommon in Canterbury. Ashley Est, 1 on 6/7. Avon-Heathcote Est, 1 in July, 2 in Aug, 3 in Sep, 1 from Oct to Dec, absent Jan and Feb, 1 in Mar, 5 in Apr and May including 1 juv and 2 pied birds, 4 in June (AC). Cave Rock, Sumner, 2 on 11/9 (PAL). Lyttelton Hbr, 1 on 14/4 (AC). Otago, widespread but in low numbers. Kakanui Est, 1 pied phase on 13/12 (PS *et al.*), 1 on 7/2, 2 on 12/4 (A&TH). Karitane, 2 pied birds on 24/11 (LE). Otago Pen, 6 at Papanui on 26/7 (A&TH), 3 pr with 5 young and 4 ad at Victory B on 13/12 (JV&KM). Catlins Lgn, max 4 on 3/5. Papatowai, max 8 on 10/4. Waikawa, 9 on 21/2 (DJO).

CHATHAM ISLAND OYSTERCATCHER *H. chathamensis*

Survey during summer 87-88 recorded c.100 birds. Previously the population was thought to number c.50 birds (AG).

SPUR-WINGED PLOVER *Vanellus miles*

West Coast, reports from many coastal agricultural and wetland areas. Max: Orowaiti, c.200 on 18/2 (KS). Canterbury, common throughout. Concentrations included Amberley, c.50 on 11/7 (PAL); Waipara RM, 122 on 28/8, 27 on 21/2; Avon-Heathcote Est, 40-50 present all year; Lyttelton Hbr, max 40 on 26/7; Akaroa Hbr, 50 on 12/3 (AC); L Ellesmere, max 898 in Aug (CFJO'D). Mangere I, Chathams, 2 on 11/10 (PMcC). Ruapuke I, 22 on 11/11 (MLB).

LEAST GOLDEN PLOVER *Pluvialis fulva*

Blaketown-Greymouth AF, 2 on 7/11, 23/1 and 20/3 – only West Coast location where they are regular (CSL). Jarvis Rd, L Ellesmere, 44 on 19/2 (AC). Southland summer census, 145 on 21/11 (WJC). Gorge Rd, 2 wintered on farm paddock, last seen 22/7 (SLL).

NEW ZEALAND DOTTEREL *Charadrius obscurus*

Farewell Spit, only 2 in June census. Wainui, 2 on 18/11 (CMcC). Motueka Sandspit, 1 in breeding plumage on 12/9 (GDQ). Ruapuke I, none found on walk around all coastline, except Sth Hd, and all dunes on 11/11; none found on search of all dunes and coastline excluding Sth Hd and area between Nth Hd and Henrietta Bay on 11/2. Cow I, Awarua Bay, 19 on 15/2, including 1 colour-banded bird (MLB).

BANDED DOTTEREL *C. b. bicinctus*

Nelson, same distribution and concentrations as last year. West Coast, small numbers recorded on coast July-Dec at Break Crk Lgn, Oparara, Karamea, Little Wanganui, Mokihinui, Waimangaroa, Birchfield, Orowaiti, Westport AF, Okari, Pororari, Barrytown, L. Ryan, Blacktown/Grey AF, New R, Taramakau, Arahura, Mikonui, Okarito. Probably bred in many of these places but breeding was proved at Oparara, pr with 2 chicks on 21/11; Mokihinui, 2 prs; Birchfield, 3 prs; North Beach, Westport, 15-20 prs; Pororari, 3 prs; Canoe Crk, Barrytown, 2 prs. 50 + birds including 30 juv at North Beach on 15/12 had decreased to 10 by 26/1. Subsequently numbers increased at several estuaries: Greymouth AF, 24 on 23/1, 32 on 20/3; Oparara, 12 on 11/3; Karamea Lgn, 15 + on 12-13/3; Orowaiti, 25 on 22/3; Okari, 40 on 16-17/2; Barrytown, 30 + on 2/2; Okuru, 17 on 14/4; 17 were still at Blaketown Lgn on 9/6 (DJO *et al.*). Canterbury, common breeding bird on all braided rivers from Conway R to Waitaki R including MacKenzie Basin. Concentrations occur near coast mainly in autumn. Waipara RM, 67 on 28/8 (AC), 12 on 26/6 (JC). Ashley Est, 102 on 5/2. Brooklands Lgn, 29 on 18/2. Avon-Heathcote Est max 144 on 1/5. Lyttelton Hbr, max 62 on 26/7 (AC). L Ellesmere, 898 in Aug (CFJO'D), 222 on 12/12 (PMS), c.2900 on 19/2 denoted max during migration (AC). Numbers declined to 459 in April once most birds had left (CFJO'D). Ashburton R census 387 lowest count in 7 years on 24/10 (CFJO'D). Washdyke Lgn, 6 on 29/9 (BHS). L Wainono, 70 on 1/5, c.30 on 17/5. Oamaru, Fortification Rd, max 9 in June (A&TH). MacKenzie Basin, common on braided riverbeds in summer. Generally rare in autumn and winter after migration but a small number remain. Max 150 on Godley R delta on 3/4, 50 on 9/6, 100 + on 23/6. Otherwise usually single birds on Twizel playing fields on 22/3; Tasman R delta on 25/3, 5/4 but 40 + on 2/6; Ohau R delta on 25/3, 6/4, 1/6; Hopkins/Dobson R delta on 5/4; Mick's Lgn on 22/6 and frozen Homestead Tarn on 1/6 (SE). Otago regional survey, 252 on 13/3 (PS *et al.*). Karitane Est, 1 on 6/6 (JV&KM). Papanui Inlet, Otago Pen 17 on 10/4. Kaikorai Est, 7 on 26/3 (JV&KM). Catlins Lgn, c.15 on 22/2, 30 on 13/3, 35 on 12/6, 45 on 25/6. Cabbage Pt, c.30 on 17/3. Papatowai, 2 on 11/2, 1-3 in April (DJO). Mararoa R at Riverslea, 38 feeding in paddocks on 24/3; an exceptionally late inland record for Southland (Bruce Newlands). Thornbury, max 13, April to June, on muddy paddocks (OJL). Ruapuke 1, 45 ad, 27 fledged juv, 2 chicks on 11/11 (MLB).

MONGOLIAN DOTTEREL *C. mongolus*

L Wainono, 1 on 28/6 (RM).

LARGE SAND DOTTEREL *C. leschenaultii*

Ashley Est, 1 during summer (AC, KCH).

ORIENTAL DOTTEREL *C. veredus*

Greymouth AF, 1 on 24-26/10 was second West Coast record (AB, PG, CSL, RS). Invercargill Est, 1 on 8/2, not found 9/2. Waituna Lgn, 1 on 18-19/2. Plumage differences indicated that this was a second bird (MLB, RRS).

BLACK-FRONTED DOTTEREL *C. melanops*

Nelson Haven, 1 on 19/9 (KDQ), 1 on 17/5 (ZW). Wairau R, Wratts Rd, 2 in Mar (BN). Break Crk Lgn, 1 from 13/3 to 19/3 was the second West Coast record (CSL *et al.*). South Canterbury census, 84 on 24-25/10; Ashburton R,

24 – an increase of 14 on last year; Orari R, 23 compared with 15 in '86; Opihi R, 32 compared with 39 in '86; Temuka R, 1 compared with 5, Washdyke Lgn, 3, Spider Lgn, 1 (CFJO'D). Washdyke Lgn, 2 on 26/9 (BHS). L Wainono, 8 on 28/5. Oamaru, Fortification Rd, 2 on 31/5 and 12/6 (A&TH). Taieri R at Outram, 2 groups of 3 and 2, 2 km apart on 14/8; 2 birds overwintering were last seen on 22/6. Allanton, nest with 2 eggs on 4/11 (PS). Whitestone R, 1.5 km above Mararoa R junction, 1 ad on 5/9, farthest upstream record (JV&KM). Aparima R at Orautau, loose flock of 10-12 moving up and down over c.1.5 km of riverbed on 5/3 and 12/3 (Sid Smithies).

NEW ZEALAND SHORE PLOVER *Thinornis novaeseelandiae*

Summer survey on South East I, Chatham Is, indicates population is stable at c.120 birds (AG).

WRYBILL *Anarhynchus frontalis*

Motueka sandspit, 8 on 7/10 (JMH, GDQ). Nelson Haven, 1 on 28/9, 7 on 6/10 (JMH). L Grassmere, max 2, Jan-Mar (PSG). Orowaiti Est, 1 that arrived in April 87 was last seen on 23/7; the third recent West Coast record (DJO,KS). Canterbury, widespread and breeding on braided rivers south of the Ashley. Avon-Heathcote Est, 1 on 9/10, 6 on 26/10 (AC). L Ellesmere, 97 in Aug (CFJO'D), 25 on Greenpark Sands on 7/9 (PAL), 1 on 12/12 (PMS), 5 in Feb and 1 in April (CFJO'D). Ashburton R census, 3 on 24/10 (CFJO'D). L Wainono, 112 on 1/11 (RM). Hopkins/Dobson R delta, 1 on 4/3 a late record for this far inland (SE). Oreti B Sth, 5 on 25/7 (MLB). Te Anau, Upukurora RM, 1 on 23/10 (KM). Invercargill Est, 4 on 8/2 (MLB).

FAR-EASTERN CURLEW *Numenius madagascariensis*

As well as usual records from Farewell Spit, Nelson Haven, 1 on 18/9 (GDQ). Wairau Lgn, 2 in early 1988 (BN). Ashley Est, 2 during summer, 1 on 15/4 (AC,KCH). Invercargill Est, 4 on 9/2 (MLB). Waituna, 14 on 21/3, flying in easterly direction between Waituna and Mataura R, about 14 km inland (Ray Waghorn).

ASIATIC WHIMBREL *N.phaeopus variegatus*

Orowaiti Est, 1 that arrived in April '87 was seen on 23/7, 29/7, 23/8, 27/8 and 15/12 (DJO,KS, NW). Invercargill Est, 1 on 1/9 (MLB).

AMERICAN WHIMBREL *N.phaeopus hudsonicus*

Invercargill Est, 1 on 28/10 (MLB).

WHIMBREL sp.

As well as usual records from Farewell Spit, Waimea Est, 1 among stilts and godwits on 4/9 (AC).

ASIATIC BLACK-TAILED GODWIT *Limosa limosa melanuroides*

Cooper's Lgn, 2 during summer (KCH).

HUDSONIAN GODWIT *L.haemastica*

L Ellesmere, 1 in Nov and Dec (KCH,GW). Cabbage Pt, Catlins, 1 on 13/3. Catlins L, 1 on 13/3 and twice in June (DJO).

BAR-TAILED GODWIT *L.lapponica*

Nelson, an increase in wintering godwits was noted this year in June census (GDQ). L Grassmere, max 34 between Jan and Mar (PSG). West Coast, main concentrations were Karamea, c.230 on 21/11, 187 on 12-13/3;

Oparara, 34 on 21/11, 32+ on 11/3; Okari, 102 in Nov, 36 in Feb; Orowaiti Est, 9 in July, 11 in Aug, 69 in Nov, 33 in Dec, 45 in Jan, 41 in Mar, 30 in May, 7 in June. Other winter records were Okari, 1 in June, Westport AF, 11 on 18/6. Recorded in small numbers (<10) during Oct to Jan at Westport, Buller Est, Barrytown, L Ryan, Greymouth AF/Blaketown, New R, Taramakau RM, Arahura RM, Mikonui RM (PG, CJ, CSL, DJO, KS, RS). Canterbury, records from most coastal wetlands. Woodend B, 1 on 3/2. Ashley Est, 182 on 14/12, 167 on 5/2, 22 on 15/4. Brooklands Lgn, 231 on 18/2, 3 on 4/5. Avon-Heathcote Est, c.190 through winter, 270 on 24/8, 640 on 23/9, 908 on 28/9, 1180 on 9/10, max 2000 late Oct, c.1800 through summer, 1780 on 15/3, 865 on 23/3, 519 on 25/3, c.470 overwintering in '88. Lyttelton Hbr, none overwintering in '87, 135 on 9/10, 253 on 1/11, 365 on 3/12, c.960 Jan to Mar, c. 30 overwintering '88 (AC). L Ellesmere, 6 overwintered in '87 (CFJO'D), 70 on 31/10, 90 on 26/11 at Wolfe's Rd (PAL), 52 on 12/12 (PMS), 41 in Feb, 30 in Apr (CFJO'D). Blueskin Bay, Waitati, 30 on 1/2 (A&TH). Papanui Inlet, Otago Pen, max 539, Dec to Feb, then 36-151, Mar to June (JV&KM). Cabbage Pt, Catlins 285 on 13/3. Catlins Lgn, c.500 in Feb falling to c.50 in June. Papatowai, 1 to 3 in Feb and Mar (DJO). Waikawa, 80 on 10/1, 176 on 31/1 (DJL), c.300 on 21/2 (DJO). Invercargill Est, main flock arrived 28/9 between 1000 and 1630 h (RRS). Te Anau, Upukurora RM, 2 on 30/9, 8 on 22/10 (KM). Dipton, 2 feeding on riverbed on 20/11 (MLB). Southland summer census 2905+ on 21/11 (WJC). Ruapuke I, 2 on 11/2 (MLB).

LESSER YELLOWLEGS *Tringa flavipes*

L Wainono, 1 in Nov (RJP).

GREENSHANK *T. nebularia*

Puponga, 1 on 20/2, first Nelson sighting for several years (PA, DA, RL). Awarua Bay, 1 on 20/12 and 7/2 (MLB).

MARSH SANDPIPER *T. stagnatilis*

L Grassmere, 1 in Mar (PSG).

SIBERIAN TATTLER *T. brevipes*

Usually seen on Farewell Spit and Motueka Est, this year and last. Motueka Sandspit, 1 on 11/5 (AC). Port Motueka causeway, 1 on 11/12/86 (RP). Kaikoura, 3 on 26/2 (RM). Avon-Heathcote Est, 2 probably of this species on 23/9, 1 on 18/3 (AC).

TATTLER sp.

Papanui Inlet, Otago Pen, 1 on 7/3 (JV&KM). Awarua B, 3 on 20/12 and 7/2 (MLB).

TEREK SANDPIPER *Xenus cinereus*

L Ellesmere, 1 through summer from August, also overwintered (AC, KCH, PAL, CFJO'D, PMS).

TURNSTONE *Arenaria interpres*

Nelson, summer flocks mostly occur at Farewell Spit, Motueka Est, and Waimea Est, uncommon elsewhere. Motueka Est, 466 on 11/1 (AC). L Grassmere, 300+ Jan-Mar (PSG). West Coast, uncommon. Nth B, Westport, 1 on 16/10. Buller RM breakwater, 1 on 17/11 (DJO). Arahura Est, 5 on 22/11 (PG, RS). Canterbury, uncommon. Ashley Est, 7 on 5/2,

8 on 15/4. Avon-Heathcote Est, 2 in Oct and Nov (AC). L Ellesmere, 1 on 12/12 (PMS). Cooper's Lgn, 3 on 21/12 (KCH). Waitaki RM, 1-6 birds between 11/2 and 15/3 (A&TH). Tomahawk Lgn, Dunedin, 1 on 26/11; a new site (B&DMcK). Victory B, Otago Pen, 1 on 6/12 (JV&KM). Southland summer census, 830+ on 21/11 (WJC). Ruapuke I, 78 on 10/2 (MLB).

CHATHAM ISLAND SNIPE *Coenocorypha aucklandica pusilla*

Mangere I, Chathams, common from 20/10 to 24/3 (AJDT).

SNIPE *Gallinago* sp.

Cooper's Lgn, 1 on 21/12, presumably a Japanese Snipe (*G.hardwickii*) (KCH).

KNOT *Calidris canutus*

Nelson, same distribution and concentrations as last year (GDQ). Motueka Est, 157+ on 11/1 (AC). L Grassmere, max 31, Jan-Mar (PSG). West Coast, uncommon, Karamea Lgn, 17 on 12-13/3 (CJ). Orowaiti Est, 1 on 26/1 (DJO,NW); 1 on 21/5 (KS). L Ryan, 1 on 18/11 (CSL). Canterbury, uncommon with main concentrations at L Ellesmere. Waipara RM, 4 on 28/8. Ashley Est, 3 on 14/12, 2 on 5/2. Avon-Heathcote Est, 8 on 24/8, 5 on 27/9, 8 through Oct, 1 on 4/12 (AC). L Ellesmere, 110 on 26/11 (PAL), 85 in Feb. Ashburton R, 3 on 24/10. Opihi R, 2 on 25/10 (CFJO'D). Otago, no records. Wairaki RM, 1 on 26/10, 25 km from coast and 50 km from nearest coastal wader habitat (MLB). Southland summer census, 592+ on 21/11 (WJC).

SHARP-TAILED SANDPIPER *C.acuminata*

As well as usual records from Farewell Spit; Nelson Haven, 1 on 11/10 (GDQ,KDQ,SW,ZW). L Grassmere, max 3, Jan-Mar (PSG). Nth B, Westport, 3 on 15/12, 4 on 18/12, 2 on 26/1 (DJO,KS,NW). L Ryan, 1 on 17/11, 4 on 18-19/11, 3 on 27/11 and 5/12 (CSL); first West Coast records in recent years. L Ellesmere, 48 on 12/12 (PMS) was the largest flock on record, 21 on 20/1 (AC), 14 in Feb (CFJO'D). Cooper's Lgn, 14 during Jan (KCH). Otago, no records. Southland summer census, 41 on 21/11 (WJC).

PECTORAL SANDPIPER *C.melanotos*

L Grassmere, 1 between Jan and Mar (PSG). L Ellesmere, occurs annually; 1 on 20/1 (AC), 2 during Feb (CFJO'D). Kaikorai Est, 2 on 19-23/3 (DY). Ruapuke I, 1 on 10-11/2 (MLB).

CURLEW SANDPIPER *C.ferruginea*

L Grassmere, max 5, Jan-Mar (PSG). Waipara RM, 1 on 28/8 (AC). L Ellesmere, 1 overwintered in 1987 (CFJO'D), 31 on 12/12 (PMS), 23 on 15/1 (PAL), 23 on 19/2 (AC), 28 in April (CFJO'D). Cooper's Lgn, 9 on 21/12 (KCH).

RED-NECKED STINT *C.ruficollis*

Farewell Spit, only record for Nelson region (GDQ). L Grassmere, max 3, Jan-Mar (PSG). Nth B, Westport, 1 on 16/10, 1 on 15/12, 1 on 18/12 (DJO,KS,NW). L Ryan, 1 on 17/11 (CSL). The first West Coast records in recent years. L Ellesmere, 50 on 26/11 (PAL), 56 on 12/12 (PMS), 65 on 21/12 (KCH), 73 on 20/1 (AC), 65 in Feb (PMS), 42 on 2/4 (RM), 34 on 18/4 (CFJO'D). Cooper's Lgn, 20 on 21/12 (KCH). Otago, no records. Southland summer census, 32 on 21/11 (WJC). Waituna Lgn, 8 overwintering on 23/6 (MLB).

SANDERLING *C. alba*

Awarua Bay, 2 on 20/12 (MLB).

RUFF *Philomachus pugnax*

L Wainono, 1 on 1/11 and 10/11 (RM).

PIED STILT *Himantopus himantopus*

Nelson, usual flocking along the coast during winter with many more in Tasman Bay than Golden Bay during June census (JMH). L Grassmere, max 300, Jan-Mar (PSG). Wairau Lgn, 114 including 3 juv, 1 node D1 hybrid on 12/5 (DP&EM, CER, WFC). West Coast, widespread reports of small numbers from most coastal wetlands. Max numbers: Orowaiti Est, 44 on 15/12, 42 on 26/1, 60 on 22/3 (CJ,DJO); Okari, 23 on 16-17/2 (CJ); L Ryan, 26 on 7/11 (CSL). Nesting at L Ryan lasted Oct to Dec: 1 nest on 31/10, 1 on 17/11, 4 on 19/11 had all gone by 27/11, 1 on 5/12; produced only 5 young (CSL). Canterbury, common throughout, with largest concentrations at L Ellesmere. Conway RM, 5 on 26/6 (JC). Waipara RM, 66 on 21/2 (AC), 16 on 26/6 (JC). Ashley Est, 103 on 5/2, 51 including 11 juv on 11/5 (DPM,EM,CER); Woodend Lgn, 68 on 3/2. Brooklands Lgn, 146 on 18/2. Avon-Heathcote Est, c.210 Jan to June. Lyttelton Hbr, max 126 on 14/3 (AC), L Ellesmere, 2864 in Aug (CFJO'D), 1406 on 12/12 (PMS), 2067 in Feb, declining to 448 in April (CFJO'D). Common breeder on braided riverbeds e.g. Ashburton R census, 222 on 24/10. Orari R census, 102 on 25/10. Opihi R census, 163 on 25/10. MacKenzie Basin, most migrate by autumn but a few remain for winter: Cass R delta, 1 on 3/5; Mailbox Inlet, 1 on 20/4; Tasman R delta, 2 on 5/4, 3 on 2/6 with Black Stilts. Ohau R delta, 3 on 6/4 and 22/4 (SE). Waitaki RM, 2 pr each with 2 fledged juv on 2/12. Fortification Rd, Oamaru, 12 on 31/5 (A&TH). Cabbage Pt, Catlins, c.50 on 13/3 (DJO). Southland summer census, 272+ on 21/11 (WJC). Waikawa, 40 on 10/1 and 13/1 (DJL). Thornbury, 50+ on 12/6 (OJL). Ruapuke I, 20 including 3 juv on 11/11 (MLB).

BLACK STILT *H. novaeseelandiae*

Wairau Lgn, 1 node E hybrid on 12/5 (WFC). Ashley Est, colour-banded 1 ad, 2 juv and 1 node I hybrid on 5/2 and 10/2 (AC). L Ellesmere, 1 ad and 1 node I in Aug (RN,CFJO'D). Ashburton R, 1 banded node I nested, 2 eggs laid 7/10 (DG). MacKenzie Basin. Winter census, 43 ad, 11 juv (BHS). Summer, 11 breeding pr with total population of 46 ad; 13 juv fledged by Jan (PC,SE,DPM,CP,CER). L Wainono, 1 ad with node I mate through May and June (DC,A&TH,RM,DPM).

ORIENTAL PRATINCOLE *Glariola maldivarum*

Ruapuke I, 1 on 10/2, 11/2 loafing and roosting beside Lgn among Banded Dotterels, Turnstones and Black-fronted Terns; hawked alone above house and garden (MLB).

SOUTHERN GREAT SKUA *Stercorarius skua lonnbergi*

L Wainono, 1 chased White-fronted Terns on 2/4 (SE).

POMARINE SKUA *S. pomarinus*

Motueka Sandspit, 1 light phase on 11/1 chasing Caspian Terns. Hurunui RM, 1 light phase on 3/4 (AC).

ARCTIC SKUA *S. parasiticus*

Buller R breakwater, 1 dark phase on 17/11, 4 (3 dark, 1 light) on 15/12, 1 light phase on 26/1. Razorback B, Punakaiki, 2 dark phase on 22/12 (DJO,NW). Hurunui RM, 8 dark phase on 3/4 chasing shearwaters and terns. Ashley Est, 1 dark phase on 15/4. South New Brighton, Christchurch, 1 dark phase on 20/2 (AC). Birdling's Flat, 1 dark phase with pointed tail feathers on 16/4 (PAL).

SKUA sp.

Tasman Bay and Golden Bay, regularly seen in summer (GDQ). Ashley Est, 3 dark phase on 14/12, 2 (1 light, 1 dark) on 5/2 (AC). L Wainono, 1 chasing White-fronted Terns on 17/5 (A&TH). Pitt I, Chathams, 2, not Southern Skuas, at Sth end on 9/2 (AJDT).

BLACK-BACKED GULL *Larus dominicanus*

Farewell Spit, 3 colonies of c.34 nests. Nelson Boulder Bank, largest colony with c.1000 nests in Nov and Dec, only 200 young banded in late Dec. Bell's I, 147 nests in Nov. Rabbit I, 61 nests in Nov (JMH). West Coast max numbers: Orowaiti, 323 + (CJ); Cobden Lgn, c.100 on 1/8; Greymouth tip, 300-400 Jan to Mar (CSL). Western Paparoa Range, 2 above bushline on 26/10 and 3 fresh nests at Buckland Peaks on 1/11 (PG,RS). Brooklands Lgn, 518 on 18/2, 890 on 4/5. Teddington, Lyttelton Hbr, 1210 in 3 colonies on 1/11 (AC). L Ellesmere, 531 in Aug, 586 in Feb, 558 in April (CFJO'D). Common breeding bird on all Canterbury braided rivers e.g. Ashburton R, 4543 in 9 colonies on Nth Branch and 6338 in 12 colonies on Sth Branch on 24/10. Orari R, 179 on 25/10. Opihi R, 212 on 25/10 (CFJO'D). Invercargill area, large population increase in recent years. At least 6 colonies each of up to 800 pr within 20 km radius of city. 4200 + between NZAS jetty and Tiwai bridge on 5/2 (MLB).

RED-BILLED GULL *L. novaehollandiae scopulinus*

Nelson Boulder Bank, attempted nesting at 6 different sites, none successful (JMH). Waitapu c.220 in paddocks on 6/9 (AC). West Coast, bred at Wall Rock, Cape Foulwind with c.15 nests on 17/11 and Mokihinui RM, at least 1 nest on 12/12 (DJO). Canterbury, common along coast with main concentration on Avon-Heathcote Est. Breed around Bank's Pen (CFJO'D). Ashley Est, 630 on 5/2. Brooklands Lgn, 167 on 4/5. Avon-Heathcote Est, 4570 on 16/8, 6280 on 25/3. Lyttelton Hbr, 726 on 12/3. Akaroa Hbr, 373 on 22/6 (AC). L Ellesmere, 1 only in Aug census, 531 in Feb, 51 in Apr (CFJO'D). Rare inland on braided rivers, but 14 on Ashburton R census on 24/10, including 1 pr nesting with Black-billed Gulls 8 km inland. A second pr was displaying (CFJO'D). When visited 2 weeks later, 1 pr had clutch of 2 eggs (DG).

BLACK-BILLED GULL *L. bulleri*

Nelson, small numbers at many coastal areas in winter. Motueka Est, 31 on 11/5 (AC). L Rotoiti, seen in Feb (JR,SR). West Coast, max numbers: Karamea Est, 300-400 on 30/11; Orowaiti Est, 63 on 18/6 (CSL,KS); Whataroa, c.600 on 3/11 (CFJO'D). Conway RM, c.200 on 26/6 (JC). Hurunui RM, 293 on 3/4. Ashley Est, 630 on 5/2 (AC). L Ellesmere, 712 in Aug, 340 in Feb, but none in Apr census (CFJO'D). Washdyke Lgn,

20 on 26/9 (BHS). Common breeding bird on braided rivers in Canterbury from Conway to Waitaki, e.g. Ashburton R, Sth branch, 10 993 in 4 colonies on 24/10. Orari R, 2401 on 25/10 (CFJO'D). Widespread in MacKenzie Basin with small numbers (max 14) overwintering at Godley, Cass, Tasman, Hopkins/Dobson, and Ohau R deltas and playing fields around Twizel (SE).

WHITE-WINGED BLACK TERN *Chlidonias leucopterus*

Grey R Est, 1 on 7-17/11 (PG,CSL,RS); the fourth West Coast record. Kaitorete Spit, L Ellesmere, 1 on 24/3 (RM). Twizel R/Ohau R confluence, 1 ad on 27/9 (PC) and 24/12 (SE).

BLACK-FRONTED TERN *Sterna albobriata*

Nelson, recorded from coastal areas in winter. Motueka RM, 13 on 1/9, 12 on 11/1 (AC). Motueka R, c.14 ad at small breeding colony on 31/10 (GDQ). West Coast, apart from 1 ad in breeding plumage at Mohikini Est on 5/7 (DJO), all other records were in autumn; Oparara Lgn, 8 on 11/3; Kairek Crk Lgn, 7 on 11/3; Okari, 1 on 16-17/2 (CJ); Charleston, 3 in Mar; Barrytown, 1 on 21/5 (KS); a few more records than usual. Common along Canterbury coastline in autumn and winter. Conway RM, c.50 on 26/6 (JC). Hurunui RM, 26 on 3/4 (AC). Waipara RM, c.15 on 26/6 (JC). Avon-Heathcote Est, max 40 Mar-June. Bromley SP, 34 hawking over ponds on 1/4. Lyttelton Hbr, a rare visitor with 4 on 14/4, 2 on 13/5, 1 on 22/6 and 10/7 (AC). L Ellesmere, 35 in Aug, none in Feb, 48 in Apr (CFJO'D). Taumutu coastline, 8 on 12/1, c.15 on 30/2, 10-30 on 20/3 (PAL). Breed on all Canterbury braided rivers, e.g. Ashburton R, Sth Branch 220 and Nth Branch 11 on 24/10. Orari R, 162 on 25/10. Opihi R, 127 on 25/10 (CFJO'D). MacKenzie Basin, breed on rivers but most depart autumn and a few overwinter. Large flocks appear on paddocks in Feb. Late autumn and winter records up rivers of 1 or 2 birds include Ohau R on 25/3, 6/4, 1/6; Tekapo R, on 6/4, 16/6; Lower Ahuriri R, on 29/3; Upper Ahuriri R, on 30/3, 4/5. Other records of 1-6 birds Apr to June on Godley, Cass, Tasman, Hopkins/Dobson, Ohau R deltas with max c.150 on Tasman on 5/4 (SE). Early southern records: Waitaki RM, 10 on 12/6, 1 on 8/9; Ngapara/Georgetown Rd, 6 on 19/7. Kakanui Est, 1 on 7/2. Wainakaru Est, 4 on 7/2 (A&TH). Eglinton V, 3 pr with nests among lupins on 14/12 (SC). Autumn records in Catlins; Kaka Pt, Nuggets, 1 on 13/3; Papatowai, 1 to 4 juv in last week Mar, 1 on 24/4 (DJO).

CASPIAN TERN *Hydroprogne caspia*

Farewell Spit, main colony in Nelson region, c.200 birds on shellbanks in Nov; nests not counted. Bell's I, nesting again but no breeding on Nelson Boulder Bank (JMH). Takaka RM, 23 on 5/9. Motueka Sandspit, 23 on 11/1 (AC). West Coast, recorded in small numbers throughout the year at many coastal sites. Max Mokihinui Est, 8 on 19/6 (CSL). Hurunui RM, 5 on 3/4. Ashley Est, 23 on 15/4. Brooklands Lgn, 13 on 18/2, 15 on 4/5. Avon-Heathcote Est, max 101 on 28/2. Akaroa Hbr, 3 on 12/3, 6 on 22/6. Kaitorete Spit, 12 on 30/8 (AC). L Ellesmere, 28 in Aug, 18 in Feb, 16 in Apr (CFJO'D). Rangitata RM, 50 on 25/4 (SE). Washdyke Lgn, 1 on 26/9 (BHS). L Wainono, 3 on 17/5 (A&TH). MacKenzie Basin, pairs nest far inland on most braided rivers. Still some sightings Feb to June. Godley R delta, 2 on 2/3. Hopkins/Dobson R delta, 1 on 25/2, 4/3, 3 on 5/4, 1 on 22/4, 4 on 10/6, 1 on 21/6. Ohau R delta, 1 on 22/2, 4 on 3/3, 4 on 25/3.

Ahuriri R, 2 on 17/2 (SE). Irregular on Nth Otago estuaries; max 8 at Waitaki RM in June. Kaitiki B, 1 on 18/2 (A&TH). Hawkesbury Lgn, 2 on 8/2, 1 on 15/2 (JAW). Papanui Inlet, Otago Pen, 1-5, Dec-May (JV&KM). Cabbage Pt, Catlins, 11 on 13/3. Catlins Lgn, 4 to 11, Feb to June. Papatowai, 8 sightings of 1, Feb to June. Waikawa, 2 on 10/1 (DJL), 3 on 21/2 (DJO). Invercargill Est colony, 100 + ad, 1st nests in last week October; colony washed out 26/12, 58 chicks survived to 3+ days, 23 known to fledge. 18 ad and 21 juv colour-banded. 10 on 9/2 (MLB). Tuatapere B, 1 banded bird with broken wing on 4/6; destroyed, had been banded as chick at Invercargill Est on 23/11 (AW). Sandy Pt, ad and fledged juv, both colour-banded on 15/6 (MLB).

LITTLE TERN *S.albifrons*

Nelson, no sightings this year (GDQ). L Ellesmere, 3 during Mar and Apr (PMS). Invercargill Est, 1 on 1/1 (MLB).

WHITE-FRONTED TERN *S.striata*

Nelson, present around coast in summer but seldom seen between June and Oct. Motueka Sandspit, only 1 pr nesting this year in Jan (AC). Nelson Boulder Bank, no successful nesting though several attempts made (JMH). West Coast, records from many coastal areas. Max numbers: Okari Est, 281 on 18/6 (CSL). Taramakau Est, c.500 on 20/11 (PG,RS). Nested at Mohikiniui Est, 60 + with 15 + nests on 12/12, c.40 and no active nests on 15/12 (DJO). Canterbury, common along the coast. Hurunui RM, 264 on 3/4. Waipara RM, 31 on 28/8, 206 on 21/2 (AC), 2 on 26/6 (JC). Ashley Est, 230 on 14/12, 550 on 5/2, 266 on 15/4 (AC), c.400 on 1/5. Waimakariri RM, c.350 on 4/3 (PAL). Avon-Heathcote Est, max 750 on 15/1. Akaroa Hbr, 205 on 12/3 (AC). L Ellesmere, none in Aug census, 167 in Feb, 22 in Apr. Rakaia R, 3 flying upstream c.100 km inland on 16/12. Ashburton RM, c.2000 on 24/10. Opihi R, 3 on 25/10 (CFJO'D). Large colony at Waitaki RM. Oamaru Hbr, max 250 on 21/2 (A&TH). Catlins Lgn, max c.30 in Mar. Papatowai, present Feb to May, max 36; none in June. Waikawa, Sth Head, 8 on 21/2 (DJO). Invercargill Est, 204 nests on 22/12, washed out 26/12, 1 chick survived and 5 pr were reneesting on 1/1 (MLB).

NEW ZEALAND PIGEON *Hemiphaga novaeseelandiae*

West Coast, common and breeding (DJO). Greenstone RM, L Wakatipu, 24 feeding on new willow shoots on 18/9. They flew from cover as a Harrier flew over (CER).

WHITE COCKATOO *Cacatua galerita*

Inchbonnie, West Coast, 1 on 19/12 (CSL). Bank's Pen, a small population is now established. L Forsyth, 1 flying towards Okuti V on 23/7 (CFJO'D).

SOUTH ISLAND KAKA *Nestor meridionalis meridionalis*

Mt Mueller track, Lewis Pass, 1 on 6/6. W Paparoas, 1 on 26/10. Red Hills Range, 4 on 29/11 (PG,RS). Kowhai Bush, Mid-Canterbury Plains, 2 in beech on 6/11, one of the few lowland records in recent years (CFJO'D). Codfish I, several seen each day and heard calling at night Mar-Apr (JW).

KEA *N.notabilis*

NW Nelson, L Sylvester, 1 on 11/1. Cobb V, 1 on 18/1. Cupola Hut, 1 on 2/2 (JR,SR). West Coast, only 2 records reflects lack of observers:

L. Kanieri walkway, 1 on 19/9 (CSL); W Paparoas, 2 on 26/10 (PG,RS). Christchurch City, frequent records in mid winter. Bank's Pen, 1 in June. L Ellesmere, 1 in June (CFJO'D).

EASTERN ROSELLA *Platycercus eximius*

Lyttelton Hbr, 1 in June (CFJO'D). Whare Flat Rd, Dunedin, 2 in larch plantation on 17/1 (JV&KM).

PARAKEET spp. *Cyanoramphus* spp.

NW Nelson Flora Hut, several heard on 15/1; Cobb V, 2 or 3 on 18/1 (JR,SR); Mt Arthur, heard late Jan (JB). West Coast, recorded from Tiropahi on 10-14/2; Alex Knob Flat, on 2/4 (CJ); Inangahua R, 3 on 26/5; Turpentine Hill, 2 on 4/6. Mt Mueller track, Lewis Pass, c.6 on 6/6 (PG,RS). Cascade Crk, Fiordland, 13 Yellow-crowned Parakeets with 7 Yellowheads in 1 flock on 14-15/12 (SC). Codfish I, Red-crowned Parakeets common and Yellow-crowned Parakeets common and breeding in Mar-Apr (JW).

ORIENTAL CUCKOO *Cuculus saturatus*

Matai-Arahura Rd, 1 on 19/3 (PG, CSL, RS); the fourth West Coast record in recent years.

SHINING CUCKOO *Chrysococcyx lucidus*

Atawhai, Nelson, first heard in suburban garden on 13/9 (GC). Greymouth, first heard 7/10, 9/10 with several by 24/10 and regular by early Nov. First records several weeks earlier than usual. Widespread summer records on West Coast. Last record, Cobden in kowhai tree on 26/3 (PG,CSL,RS *et al*). Trotters Gorge, 2 on 14/11 (JV&KM). Otago Pen: Broad Bay, first record on 15/10 (CW), 1 through to Dec; Boulder B, 1 on 28/12 (JV&KM). Momona, 1 dead on 16/2 (G&DG). Long B, Waitati, 1 on 31/10 (JV&KM). Chaslands Bush, Southland, copulation observed on top of tall rata tree on 11/12 (SC).

LONG-TAILED CUCKOO *Eudynamis taitensis*

Nelson, recorded infrequently and then usually from high-altitude beech forest (PDG). Very occasionally from fringes of Nelson City. Mt Arthur, 1 on 16/1. Cobb V, 1 on 18/1 (JR,SR). West Coast, few records probably reflect number of observers. Greymouth, 1 calling at night on 25/12. Boddytown, 1 heard during thunder on 29/11 (CSL). Omotomotu, near Greymouth, present 10/10 and 20/11 (PG,RS). Millerton, 1 calling at night on 24/12 (DJO). Red Hills Range, 1 on 29/11 (PG,RS). Codfish I, last calls heard 4/4 (JW).

MOREPORK *Ninox novaeseelandiae*

Greymouth, present throughout the year (CSL). Charleston, 1 roosting in a pigsty in June (KS).

LITTLE OWL *Athene noctua*

Christchurch City, common in all parks with c.60 in Hagley Park (CFJO'D). Bromley Park, 1 on 26/3 (AC). Weston, Oamaru, common (A&TH). Sutton, Taieri, 1 on 4/1 (JV&KM). Catlins Lgn, 1 on 22/2 (DJO).

NEW ZEALAND KINGFISHER *Halcyon sancta*

Canterbury, uncommon in most areas. L Ellesmere, 3 in Aug. Ashburton R, 11 on 24/10. Orari R, 6 on 25/10. Opihi R, 7 on 25/10 (CFJO'D). MacKenzie Basin, rare: L Alexandrina, 1 on 19/7 (RM); L Tekapo, 1 on

26/2; Ohau R delta, 1 on 22/4 (SE). Washdyke Lgn, 2 on 7/6 (DG). Glenavy, 1 on 12/6. Oamaru and Weston, 1 on 24/1, 6/5, 17/5 (A&TH). St Clair B, Dunedin, 1 on 10/6 (JV&KM). Waihopai R, 1 seen most days, 2 occasionally 1/7 to 7/12; 1 appeared again 21/3 and seen most days until 30/6 (MLB). Gore, 1 eating Fantail on 28/5 during 4-day heavy snowfall in garden where species had not been seen for 15 years (Doreen Gilchrist). Progress V, Southland, 1 on 11/12 (SC).

SOUTH ISLAND RIFLEMAN *Acanthisitta chloris chloris*

W Paparoas, present on 26/10 (PG,RS). Present, Hoopers Inlet, Otago Pen (WWA). Cascade Crk, Fiordland, common on 14/12 (SC). Codfish I, several seen Mar-Apr (JW).

ROCK WREN *Xenicus gilviventris*

Harris Saddle, Mt Aspiring/Fiordland NP, 1 on 1/1 (JW). The usual birds recorded at Fox Glacier, 1 on 17/11; and Homer Tunnel, 1 on 21/11 (BHS), pr obviously nesting on 15/12, another bird seen higher above the tunnel (SC). Adam Burn, Fiordland NP, pr on 2/4 (PG,RS).

SKYLARK *Alauda arvensis*

West Coast, common and breeding (DJO). Two over 30 km off Bank's Pen flying low over water on 31/8 (PAL). Mangere I, Chathams, common from 20/10 to 24/3 (AJDT). Waituna, 65 + on 21/6 feeding alternately among sheep-cropped growing turnips and wet pasture; flew in loose flock between 2 sites several times over 40 minutes (MLB).

AUSTRALIAN TREE MARTIN *Hylochelidon nigricans*

Farewell Spit, 1 with Welcome Swallows at lighthouse end in Jan (Junior Course).

WELCOME SWALLOW *Hirundo tahitica neoxena*

West Coast, many records from Buller and Nth of Taramakau R, and so well established there. Max: 30 + at Okari on 16-17/2; 20 at Blaketown Lgn on 18/6 (PG,RS). Sth of Taramakau, fewer records: L Kaniere, present on 30/1, 27/3 (CJ); Mahinapua SF, 3 on 30/11; Waitaha V, 1 on 15/6; Whataroa, 3 on 30/11 (CSL); Okuru c.7 on 4/4 (CJ). Christchurch, Bromley SP, 238 on 24/4 (AC). L Ellesmere, 149 in Aug, 42 in Feb, 299 in Apr. Ashburton R census, 61 on 24/10. Orari R, 47 on 25/10. Opihi R, 51 on 25/10 (CFJO'D). Rare in high country Canterbury and absent pre-1980 but have spread into MacKenzie Basin in winter of recent years; pattern suggests probably from Lower Waitaki R. Max 20 on 29/4. L Poaka, 4 on 7/6. Ohau R, 5 on 31/5, 3 on 1/6. L Ohau, 2 on 21/6. Homestead Tarn, 2 on 26/4. Ahuriri R, 1 on 4/4, 20/6. Tara Hills wetland, 1 on 20/6. L Benmore, 2 on 21/6 (SE). Nth Otago, widespread from full length of Lower Waitaki R south. Max 27, Fortification Rd ponds, Oamaru (A&TH). Clinton, 400-500 on power lines on 22/2 (MIT). Shag R, 1 on 15/10. Palmerston, 1 on 26/11 (JAW). Merton, ad on nest under bridge on 4/1 (JV&KM). Papanui Inlet, Otago Pen, 7 ad and 2 fledglings on 13/12 (JV&KM). Wingatui, Taieri, 1 on 30/11 (JAW). Inchclutha c.30 on 13/3. Finegard/Telford, SE Otago, present Feb to June, max c.30 in June. Papatowai, southerly coastal movement, Mar to May, max 365 an hour on 19/4 (DJO). Te Anau/Manapouri Main Rd, 3 chicks fledged 12/10 (KM). Codfish I, 1 flying over beach and creek 4/4 (JW).

NEW ZEALAND PIPIT *Anthus novaeseelandiae*

Common in Charleston-Tiropahi area, e.g. 12 + on 10-14/2 (CJ). Also present above bushline in W Paparoas on 26/10 (PG,RS). Most coastal records in autumn and winter: Oparara, 2 on 11/3 (CJ); 9 mile B, Charleston, 1 on 20/5 (KS); Little B, 2 on 18/6, Blaketown Lgn, 2 on 4/7, Totara R Est, 2 on 15/6 (CSL); Okuru, 4 on 4/4 (CJ). Mangere I, Chathams, common from 20/10 to 24/3 (AJDT). Chaslands, Southland, common on roadsides 11/12 (SC).

HEDGESPARROW *Prunella modularis*

West Coast, common and breeding (DJO).

SOUTH ISLAND FERNBIRD *Bowdleria punctata punctata*

West Coast, locally common and breeding. Recorded from Oparara, Karamea, Orowaiti, Addison's, Cape Foulwind, Okari, Basset's Wetland, Charleston/Tiropahi, Barrytown, Red Jack's/Grey R wetland, German Terrace, Deep Crk, Fox R (Buller), Larry R, Okuru and above the bushline (1300 m) in the W Paparoas (PC,PG,CJ,CSL,DJO,RS,EBS). CJ estimated 3/ha max density in the Tiropahi area. Otago, Silver Peaks Reserve, 2 on 27/3. Mt Cargill, 4 on 7/5. Big Stream, Mt Allen, 1-4 birds, 24/4 and 4/6 in *Pinus radiata* and grass (JV&KM). Papatowai and Tautuku Est, Catlins, present Feb to June (DJO). Manapouri-Tuatapere Rd, Blackmount Hill, 2 at edge of young Douglas fir plantation on 5/7 (JV&KM).

CODFISH FERNBIRD *B.punctata wilsoni*

Population number unknown but several seen and heard around Sealer's Bay and in the pakihi habitats on high parts of the island (JW).

FERNBIRD sp.

Ruapuke I, Moana Putakitaki Lgn, 11/11, single call recorded as "possible fernbird"; 11/2, 0840-0900 h, mist, visibility 90-100 m, 8 fernbird calls heard, each a separate call note probably from a single bird (MLB).

BROWN CREEPER *Finschia novaeseelandiae*

West Coast, recorded from: Charleston-Tiropahi (CJ,DJO); L Wombat track on 2/4 (CJ); Maruia V ridgetops at 800 m asl on 2-3/4 with large flock of Silvereyes (PC); also with Silvereyes on Mt French track (near L Brunner) on 20/5; Turpentine Hill, c.20 on 4/6 (PG,RS). Herbert forest, Otago, several small flocks on 12/4. Waipori Rd, 8-10 on 12/7. Omaui Bush, Invercargill, pr with 3 young on 12/12. Ulva I, Stewart I, common on 13/12 (SC). Codfish I, common in some habitats Mar-Apr (JW).

YELLOWHEAD *Mohoua ochrocephala*

Hawdon V, Arthurs Pass NP, population crashed from 60-80 birds to only 12-14 after a stoat and mouse irruption in Nov (CFJO'D). Makarora Track, Haast Pass, 6 on 19/11. L Gunn-Cascade Lodge, 2 and 4 on 21/11 (BHS). Cascade Crk, 7 birds in 1 flock feeding with 13 Yellow-crowned Parakeets on 14-15/12 (SC).

GREY WARBLER *Gerygone igata*

Many records from throughout West Coast, including a bird or two in Greymouth gardens from April onwards (DJO). Codfish I, common Mar-Apr (JW).

CHATHAM ISLAND WARBLER *G.albofrontata*

Mangere I, common from 20/10 to 24/3 (AJDT).

CHATHAM ISLAND FANTAIL *Rhipidura fuliginosa penitus*

Chatham I, 4 at Waitangi on 13/2. Mangere I, none seen from 20/10 to 24/3 (AJDT).

YELLOW-BREASTED TIT *Petroica macrocephala macrocephala*

Arrowtown to Macetown, several sightings over 19 km on 3/4 (RRS). Codfish I, common Mar-Apr (JW).

SOUTH ISLAND ROBIN *P.australis australis*

West Coast, Tiropahi, present 10-14/2 (CJ); Tawhai SF, Sth of Reefton Saddle, 2 on 28/12, 1 on 4/3 (CSL). Maruia V, plentiful 2-3/4 (PC). Ianthe SF, 2 on 27/2 (CJ, CSL). Dunedin: Ross Crk, 2 on 18/1, 1 on 18/2 (WWA); Whare Flat, 1 in *Pinus radiata* on 17/1 (JV&KM). Cascade Crk, Fiordland, family group of 5 on 14/12 (SC).

BLACK ROBIN *P.traversi*

Total population, SE Island and Mangere I, 38 in Oct and 87 by Feb after summer breeding programme (AG).

SONG THRUSH *Turdus philomelos*

Chatham I, 1 at Waitangi on 13/2. Mangere I, none seen from 20/10 to 24/3 (AJDT).

BLACKBIRD *T.merula*

West Coast, common and breeding. Present above bushline (1300 m) in the W Paparoas on 26/10 (PG,RS).

SILVEREYE *Zosterops lateralis*

A pair feeding young in Ianthe SF on 27/2 was nesting at quite a late date (CSL).

BELLBIRD *Anthornis melanura*

Widespread records from native forest and forest remnants on West Coast. Some autumn/winter dispersal suggested by one in a Greymouth garden on 16/4 and 25/6 (CSL). Christchurch City, away from the hills, single birds also appear only during winter (CFJO'D). Codfish I, common Mar-Apr (JW).

TUI *Prosthemadera novaeseelandiae novaeseelandiae*

Widespread records from native forest on West Coast. Less common than Bellbirds at L Wombat and Alex Knob tracks (CJ). Spring visits to kowhais in Greymouth suburbs; 1 on 18/7 and 24/7, 5 on 27/7 (CSL). Hampden, Otago, several sightings during June of 1 bird; a new locality (TDM). Codfish I, common Mar-Apr (JW).

CHATHAM ISLAND TUI *P.novaeseelandiae chathamensis*

Mangere I, 2 on 23/10; 1 flew to Pitt I (PMcC). No others seen 20/10 to 24/3 (AJDT).

YELLOWHAMMER *Emberiza citrinella*

Chatham I, 2 near the Horns on 17/10. Mangere I, none seen 20/10 to 24/3 (AJDT).

CIRL BUNTING *E.cirlus*

Nelson Haven, regularly seen flocking with Yellowhammers during

winter. Polestead Rd, Stoke, flocking with other finches on sports field (AB,GDQ). Bromley SP paddocks, Christchurch, present July to Aug, max 9 on 27/7; returned May '88, 2 on 27/5, 6 on 24/6 (AC). Embankment Rd saltmarshes, L Ellesmere, 1 on 5/7 (PAL). Kaituna Lgn, Ellesmere, group of 4 on 23/7 (CFJO'D).

CHAFFINCH *Fringilla coelebs*

Blaketown Lgn, 18 feeding on tidal mudflats on 3/10 (CSL). Mangere I, Chathams, rare from 20/10 to 24/3 (AJDT).

GREENFINCH *Carduelis chloris*

West Coast, probably less common than other finches; only recorded by CJ at the Tiropahi on his wetland survey. Feeding on *Cotoneaster* berries at Charleston in June (KS).

GOLDFINCH *C. carduelis*

A flock of c.550 near Charleston on 27/4 (KS). Chatham I, several at Waitangi on 13/2 (AJDT).

REDPOLL *Acanthis flammea*

Mangere I, Chathams, common from 20/10 to 24/3 (AJDT).

STARLING *Sturnus vulgaris*

Greymouth, returned to nest sites 14/7, mating 14/10, building 22/10, hatching 29/10, many chicks by 31/10. Greymouth AF, on 5/12 including many juveniles; c.150 gathered in a willow on 9/6 left for roost at 1702 h. Wall I, Cape Foulwind, c.100 roosting on 18/6 (CSL). Mangere I, Chathams, common from 20/10 to 24/3 (AJDT). Ruapuke I, 610+ on 10/2 (MLB). Codfish I, a flock of 6-7 flew from among rocks on N Hd and returned there later on 3/4 (JW).

WHITE-BACKED MAGPIE *Gymnorhina tibicen hypoleuca*

Absent from Golden Bay and most of Waimea Plains. A few resident birds at Tapawera. Infrequent in Buller V, Matariki, 5 on 6/2 (GDQ). Nelson Hospital area, 1 in April (MC). Pelorus, 1 on 27/11 (GDQ).

MAGPIE sp.

Many records from inland Greymouth-Hokitika. Elsewhere, Westport, 1 flying Nth on 8/12 was first record for this area (DJO); Whataroa R, 1 on 30/11 (CSL); Okuru, 1 on 4/4 (CJ). Arahura V, 3 birds on 6/6 were the black-backed subspecies (CSL). Ruapuke I, heard on 11/11. Report from Trevor Waititiri that 4 came to island in 1986, but only 3 were seen in 1987 (MLB).

ROOK *Corvus frugilegus*

Woodend, 4 on 8/5. Port Levy, 8 on 12/3. Purau Bay, Lyttelton Hbr, 8 on 12/3, Duvauchelles Bay, Akaroa Hbr, 115 on 12/3 (AC) Greenpark, 100+ on 26/11 (PAL).

SHORT NOTE

The glossohyal and thyroid bone of *Aptornis otidiformes*

The glossohyal, or tongue bone, and thyroid bone of *Aptornis otidiformes* (Owen) are undescribed and so to help with their future recognition and to enable comparisons with other taxa I depict them here (Fig. 1). These specimens were collected during excavations in sediment 10 000-14 000 years old in the Graveyard Honeycomb Hill Cave System, Oparara Valley, Northwest Nelson (Worthy & Mildenhall 1989). They are associated with the specimen S23644 housed in the National Museum of New Zealand, which comprises the atlas, axis and cervicals 3 to 7 of *A. otidiformes*.

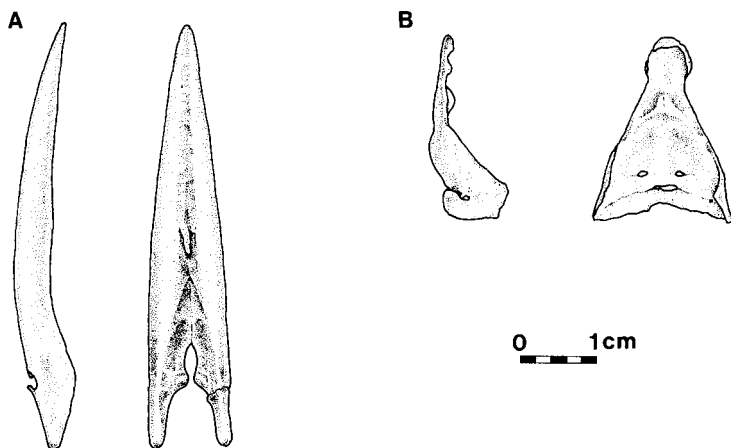


FIGURE 1 — The glossohyal (A) and thyroid bone (B) of *Aptornis otidiformes* in right lateral (left) and dorsal (right of each pair) views

Drawings by Sally Rowe

I am not certain that this association reflects the identity of this thyroid and glossohyal, but because of it and the following, I refer them to *Aptornis*. The thyroid bone is of similar size to those of small moas e.g. *Megalapteryx didinus* (Owen) but is of quite different form; no glossohyal is known for any moa; no bones of *Cnemidornis*, the only other bird of similar size to *Aptornis* likely to be found in inland sites, were recovered from the excavation. The glossohyal is 56.3 mm long and 9.8 mm wide where it bifurcates. The thyroid is 22.6 mm long along the medium line and 17.9 mm wide.

LITERATURE CITED

- WORTHY, T. H.; MILDENHALL, D. C. 1989. A late Otiran-Holocene Paleoenvironmental reconstruction based on cave excavations in northwest Nelson, New Zealand. *NZ J. Geol. Geophys.* 32: 243-253.