VICTORIAN WADER STUDY GROUP

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VICTORIAN WADER STUDY GROUP INC.

BULLETIN NO 16 CONTENTS JULY 1992

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SUMMARY OF VWSG ACTIVITIES IN 1991

1991 was an unusual, but valuable year for the VWSG. Fieldwork was maintained at a high level but the number of waders caught (4074) was the second lowest since cannon netting was introduced in late 1978 and well below the average for the last thirteen years (6397).

There were two main reasons - one deliberate and the other unintentional. A greater proportion of the Group's efforts was directed at the less numerous and less frequently caught species. This was particularly successful with the first major catch of Sanderlings (208), a record year for Turnstone (211), good catches of Red Knot (332) and Bartailed Godwit (164), and the first catch of Greenshank (22) for nearly two years. A catch of 191 Sharptailed Sandpipers, at Yallock Creek in December, was also the best single catch of this species for some years. The total of Pied and Sooty Oystercatchers (219) was twice the total for the previous year, though at times in the field it did not feel like that as we regularly failed to achieve the hoped-for catch size. Only Eastern Curlew (8, compared with the record 127 in 1990) disappointed.

The real shortfall in numbers in 1991 came from the Group's inability to make the usual large catches of Rednecked Stints and Curlew Sandpipers in the January/February and November/December periods at Werribee S.F, Queenscliff, Inverloch and, to a lesser extent, Yallock Creek. Bad (windy) weather on some catching days was a significant problem. Queenscliff now has much smaller numbers than formerly due to habitat change and disturbance on the Sand Island part of Swan Island. The wader roosts deserted Yallock Creek temporarily at year end due to regular disturbance by low flying micro-light aircraft from a nearby airfield.

In parallel with the different catching profile in 1991, there were also marked departures from the normal distribution of wader catch locations. There was a marked increase (to 1052) in the catches at Corner Inlet (adding 25% to the total for the previous 12 years). The assistance of the Yarram Region of the Department of Conservation and Environment is particularly appreciated in facilitating, by the provision of boat transport, this expanded catching programme in the area which has the largest numbers and diversity of waders in Victoria. In contrast only 52 waders were caught at Werribee S.F.! This is the prime long-term study site for Rednecked Stints and Curlew Sandpipers and 36,234 of the 85,619 waders caught by the VWSG since operations commenced in the late 1975 have been caught there. It is to be hoped that better fortune prevails in 1992.

Killarney Beach, near Port Fairy, features in the banding locations for the first time. After some years of recceing and unsuccessful attempts an excellent catch of 208 Sanderling was finally made on 2 March. Some Turnstone were also caught then but greater success was obtained on a return visit in late November/early December when a total of 151 Turnstone was caught in five catches. 80% of these were juveniles.

The above was one of several indications that the 1991 breeding season in the Arctic was an excellent one for many of at least the smaller and medium sized species of waders. The proportion of young birds in summer 91/92 catches of Rednecked Stint, Curlew Sandpiper, Sharptailed Sandpiper, Red Knot and Turnstone - as well as visible sightings of juvenile Grey Plover - suggests that all of these species had a near record breeding success in 1991. This followed a fairly good breeding season for some species in 1990. If the three-yearly cycle theory is correct, the 1992 breeding season ought to be a disaster!

Biometric and moult data continues to be accumulated as detailed in the "waders processed" table. Noteworthy filling of gaps in the data were the first samples of Red Knot in August (81) and Greenshank in December (21), but the monthly samples of a number of species were boosted significantly. This greatly facilitates the comprehensiveness and value of the ongoing programme of analysis and publication of biometric and moult data by Mark Barter and other VWSG members.

Valuable recoveries of banded birds continue to flow in. A highlight in 1991 was the recovery of an Eastern Curlew on its breeding grounds in the mountains of Manchuria, Northern China. Even more exciting was a Curlew Sandpiper caught on its nest by a Russian wader ornithologist in the Taimyr Peninsula. This is the most northerly part of Siberia and over 13,000 km from the banding location at Werribee S.F. It is also interesting that it is in the same area as Curlew Sandpipers banded in South Africa and Western Europe have been recovered indicating remarkably diverse migrations from a common breeding ground.

The programme of colour leg-flagging palearctic waders in Victoria, commenced in January 1990, has proved to be spectacularly successful. A further listing of sightings (see 1991 VWSG Bulletin also) is included in this Bulletin. Most notable were sightings of two Sanderlings on southward migration in Japan (as well as some sightings on the Victorian coast away from the banding site). A Golden Plover seen on the New South Wales coast adds to other data suggesting this species arrives in Victoria via the northeast of Australia in contrast to other species which travel via northwest Australia. And a Bartailed Godwit seen in Japan on northward migration in May 1992 in company with colour flagged birds from New Zealand and from Queensland is a fine indication of the mixing of populations at migratory staging sites.

Another feature of the colour flagging programme has been a glut of sightings of Rednecked Stints and Curlew Sandpipers in the late March to May period at locations away from the banding sites. This is part of the "explosion" of immature one year old birds into new areas which seems to coincide with or follow the departure of adults on northward migration.

The tern banding programme - both the banding of chicks and the cannon netting of adults of a variety of species - continued successfully in 1991 and in the summer of 91-92. The results are reported in detail elsewhere in this Bulletin.

Overall the VWSG had another enjoyable and productive year, contributing to a greater knowledge and understanding of the waders and terns which occur in

Victoria. This information is increasingly being used for habitat conservation purposes, most recently in relation to Andersons Inlet (spartina problems and recreational activities), to the western shores of Port Phillip Bay (Coode Island relocation options), to Killarney Beach (seaweed harvesting) to Sand Island/Swan Island (dredge spoil dumping) and to an assessment of the biological importance of the whole of the Victorian coast (Heritage Commission).

ACKNOWLEDGEMENTS

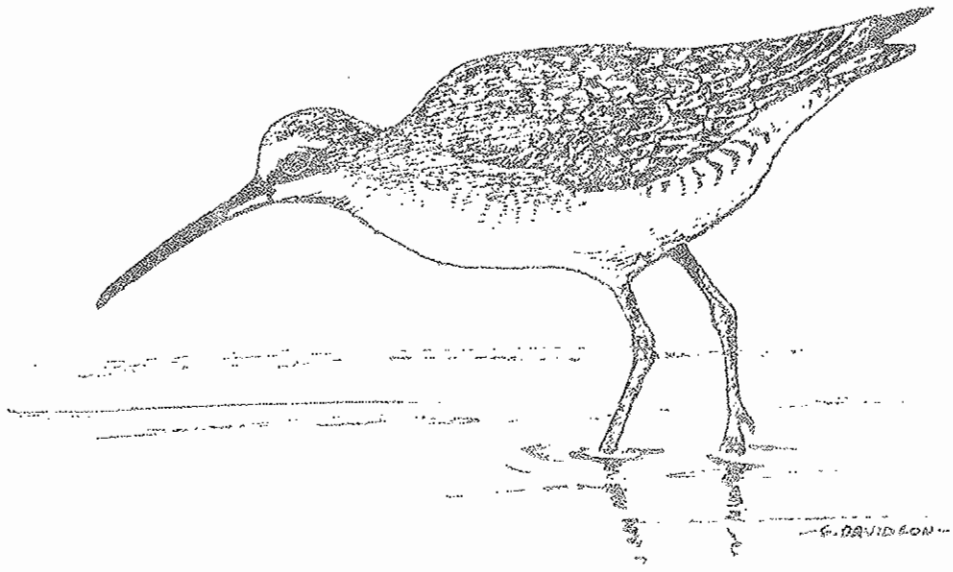
The VWSG thanks the many people who helped it in a variety of ways in 1991.

Permission to visit banding sites at Yallock Creek, The Gurdies, Inverloch, Swan Bay and Tooradin was kindly given by local farmers. Melbourne Water generously granted access to the Werribee Sewage Farm complex. The authorities at Swan Island were most helpful with permission to enter (including to the specially restricted area). BHP/Esso kindly allowed us to traverse their property to reach the foreshore at Barry Beach, and the Department of Conservation and Environment and the National Parks Service granted access to many areas under their jurisdiction including Corner Inlet (the Nooramunga National Park), Stockyard Point, Mud Island and Point Wilson on Spermwhale Head (Lakes National Park).

Special thanks go to Woodside Petroleum who made a generous grant of $700 for the manufacture of a new trailer to carry the Group's equipment. Finally thanks go to all members of the VWSG who participated and assisted in so many ways to make another enjoyable and successful year. I would particulary like to thank Alan Clarke for taking over the onerous task of equipment officer. His first job was to design and construct the new trailer!

Many thanks to everyone.

Clive Minton



RECOVERIES OF BANDED BIRDS

PIED OYSTERCATCHERS

100-96920	Adult	22.07.90	Rhyll, Phillip Island
	Found dead	22.07.91	Cowes 13 km W
100-96785	Adult	20.05.89	Stockyard Point
	Found dead	10.11.91	Fairhaven, French Is.23 kmW

These were the only reports of dead birds. Pied Oystercatchers appear to be long lived and there have been many retraps of birds, up to 12 years old so far. In contrast there have been only four recoveries of dead birds reported via the Banding Office during the last seven years.

EASTERN CURLEW

091-06118	Adult	25.11.84	Inverloch
	Killed	04.09.89	Orgohan Neiming China (49° 30'N, 121° 18'E) 10,086 km N

This recovery was on the breeding grounds in Manchuria, northern China. It is the VWSG's first overseas recovery of an Eastern Curlew and the only one from Australia recovered in the breeding area.

RED KNOT

051-42994	2nd Year	11.08.91	Stockyard Point
	Recaptured	22.11.91	Kaipara Harbour, New Zealand 2,547 km E.

There are now several recoveries of Red Knot which have been banded in Victoria during their "first winter" and then recovered in New Zealand in a subsequent summer. It is not clear whether these are birds which spend the whole of their first year in Australia before moving to New Zealand as a 2nd Year/Adult or whether they originally went to New Zealand as a juvenile, but moved to Australia for their first winter before returning again to New Zealand.

It is probable that many of the numerous leg-flagged Red Knot seen in New Zealand in the 91/92 summer (see elsewhere in this Bulletin) were movements of a similar nature, as most leg-flagged birds were marked as juveniles/1st year/early 2nd year birds during the autumn and winter in Victoria.

RED-NECKED STINT

For the first year since 1979 there were no recoveries of Rednecked Stints reported via the Banding Office.

In contrast note the number of valuable sightings of leg-flagged birds (see 1991 VWSG Bulletin and elsewhere in this Bulletin).

CURLEW SANDPIPER

040-93897	Juvenile	25.11.78	Werribee S.F.
	Killed	27.06.89	Yakut, Alikseevsky, USSR 11,208 km N
041-60318	Adult	12.01.91	Yallock Creek
	Captured	10.05.91	Ying Kou, Liaoning, CHINA
	(later released)		9,018 km NNW
041-43141	Adult	03.01.88	Werribee S.F.
	Caught at nest	24.06.91	Taimyr Peninsular, USSR (76°N, 98°E) 13,096 km NNW
041-61748	Adult	29.02.92	Werribee S.F.
	Recaptured	14.04.92	Mai Po, HONG KONG 7,447 km NW

A marvellous series of recoveries. 041-43141 was caught by a Russian Wader Study Expedition. At 76°N it was almost as far north as it is possible to get in Siberia (only 14° from the North Pole). The 13,096 km movement is thought to be the longest of any bird banded in Australia.

041-60318 was found sick/injured by a Chinese schoolchild. It was rehabilitated and released.

041-61748 was recaptured in Hong Kong only six weeks after it had been banded at Werribee S.F.

SILVER GULL

082-57796	Nestling	13.10.85	Mud Island
	Recaptured	08.12.91	Yallock Creek 61 km E

COMMON TERN

?	Full grown	Jan-Mar 89	Spermwhale Head, Lakes National Park
	Seen	04.10.91	Cooktown, Queensland 2,515 km N
051-29642	Adult	04.03.89	Spermwhale Head
	Captured	14.10.91	Leyte, PHILIPPINES 5,889 km NNW

COMMON TERN (continued)

?	Full grown Seen	Jan-Mar 90 11.02.92	Spermwhale Head Elephants Trunk, NSW 537 km NE

These are our first three distant recoveries of Common Terns banded at Spermwhale Head. Two were sightings of colour-banded birds. The recovery in the Philippines is only the second overseas recovery from Australia. The first was a bird from Newcastle, NSW, recovered in Siberia (at 60°N, 127°E) in 1977. It is thought that this is the origin of Common Terns visiting Australia. The above recoveries are starting to elucidate the migration route, and timing of movements, through Asia and down the east coast of Australia. It is now becoming apparent that the Gippsland Lakes are one of the main non-breeding areas for this species.

CRESTED TERN

Crested Tern chicks banded at Mud Island, Port Phillip Bay, have been recovered as follows:-

Banded 13.12.87

071-82599	Found sick	26.04.92	Fishermans Island, QLD	1441 km NE

Banded 17.12.88

071-95755	Found dead	05.11.91	Port Melbourne	50 km NNE

Banded 16.12.89

072-04499	Seen	28.01.91	Spermwhale Head	259 km E

Banded 15.12.90

072-15080	Caught & released	09.07.91	Stockton, NSW	871 km NE
072-05154	Caught & released	10.07.91	Burrum Heads, QLD	1632 km NNE
072-15079	Found dead	05.08.91	Ascot Vale	57 km NNE
072-15229	Found dying	04.08.91	Tomakin, NSW	553 km ENE
072-15151	Found dying	10.08.91	Lakes Entrance	286 km E
072-14811	Found dying	13.08.91	Williamstown	46 km NNE
072-05114	Found dying	27.09.91	Altona	45 km N
072-05462	Found dying	03.10.91	Moruya River,NSW	541km ENE
072-15132	Found dying	06.10.91	Hampton	42 km NNE
072-15176	Found dying	13.10.91	Seaspray	213 km E
072-05365	Found dying	21.10.91	Corsair Rock	9 km SSW
072-14677	Found dying	24.10.91	Sandringham	41 km NNE
072-05384	Caught & released	31.10.91	Macleay River, NSW	1116 km NE
072-15507	Found dead	13.11.91	Point Cook	36 km N
072-05439	Found dead	14.11.91	Middle Park	50 km NNE
072-14970	Caught & released	18.11.91	Mordialloc	41 km NE
072-05424	Found dying	19.12.91	Ballina, NSW	1322 km NE

072-05135	Found dead	21.12.91	McLaughlins Beach	165 km ESE
072-15445	Caught & released	11.01.92	Mud Island	-
072-14639	Found dying	19.01.92	Gunnamatta	23 km SE
072-14810	Found dead	06.03.92	Corner Inlet	147 km ESE
072-15578	Found dead	27.03.92	Tennyson, SA	674 km WNW

Banded 14.12.91

072-22957	Found dead	16.01.92	Cape Woolamai	60 km SE
072-22959	Found dead	21.01.92	Mud Island	-
072-15880	Found dead	--.02.92	Point Wilson	30 km NW
072-23022	Found dead	--.02.92	Point Wilson	30 km NW
072-23071	Found dead	--.02.92	Point Wilson	30 km NW
072-16261	Found dead	19.02.92	Killarney Beach	211 km W
072-23084	Found dead	23.04.92	Seaford	37 km ENE

A marvellous series of recoveries which is now building up to a level which enables preliminary analysis (see elsewhere in Bulletin).

The above recoveries illustrate the generally eastward dispersal round the coast and northward along the whole of the New South Wales coast. 072-05154 is our second recovery in Queensland, and the furthest movement.

Many one year old birds return to the vicinity of Port Philip Bay, even though they do not breed. However, note 072-05384 and 072-05424 which appear to have remained in northern New South Wales.

Note also the occasional westerly movements. 072-15578 is the first recovery in South Australia of a chick banded in Victoria. 072-16261 showed a significant westerly movement (to Killarney Beach, 211 Km) within a few weeks of fledging. (see also below)

There were no recoveries during the year of Crested Tern chicks banded at Box Bank, off Manns Beach, Corner Inlet. However two of the chicks banded at the new nesting site, off McLaughlin's Beach, Corner Inlet, on 21.12.91 were seen by Thomas Putt at Brighton Beach. These are the most westerly movements yet recorded of chicks from the Corner Inlet colony. Details were:-

072-23265	Seen	05.09.92	Brighton	174 km WNW
072-23341	Seen	05.09.92	Brighton	174 km WNW

These birds were in a flock also containing a number of young birds from the Mud Island colony.

Clive Minton.

WADER BANDING TOTALS - VICTORIA - 1991

	NEW	RETRAP	TOTAL
Pied Oystercatcher	148	42	190
Sooty Oystercatcher	26	3	29
Lesser Golden Plover	12	-	12
Double-banded Plover	83	12	95
Red-capped Plover	13	1	14
Ruddy Turnstone	188	23	211
Eastern Curlew	8	-	8
Greenshank	16	6	22
Terek Sandpiper	2	-	2
Bar-tailed Godwit	155	9	164
Red Knot	301	31	332
Great Knot	2	-	2
Sharp-tailed Sandpiper	238	13	251
Red-necked Stint	1409	570	1979
Curlew Sandpiper	415	140	555
Sanderling	208	-	208
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	3224	850	4074

ANNUAL WADER BANDING TOTALS BY VWSG IN VICTORIA

CALENDAR YEAR	NEW	RETRAP	TOTAL
1975	9	-	-
1976	616	4	620
1977	482	12	494
1978	1296	42	1338
1979	7436	486	7922
1980	6121	1206	7327
1981	4561	869	5430
1982	3774	796	4570
1983	2875	628	3503
1984	4272	1045	5317
1985	4073	1051	5124
1986	7144	2057	9201
1987	5350	1559	6909
1988	8019	2697	10716
1989	5437	1584	7021
1990	4094	1950	6044
1991	3224	850	4074
Total catches in Victoria to end 1991	68783	16836	85619

Average annual total for 1979 to 1991 period of 6397.

LOCATION OF WADERS CAUGHT IN VICTORIA

	To Dec 1990	1991	TOTAL
Werribee	36182	52	36234
Westernport	17589	2161	19750
Queenscliff/Pt Lonsdale	16147	400	16547
Anderson Inlet (Inverloch)	6157	-	6157
Corner Inlet	4204	1052	5256
Altona	937	-	937
Killarney Beach	-	409	409
Bendigo (Sewage Farm)	143	-	143
Seaford Swamp	98	-	98
Mud Island	35	-	35
Geelong (Point Henry)	25	-	25
Seaspray (Lake Reeve)	18	-	18
Toowong	10	-	10
	81545	4074	85619

Totals include 68,783 newly banded birds and 16,836 retraps of 31 species.

VICTORIAN WADER CATCHES

1975 TO 31 DECEMBER 1991

	NEW	RETRAP	TOTAL
Pied Oystercatcher	724	270	994
Sooty Oystercatcher	108	9	117
Masked Lapwing	127	3	130
Grey Plover	72	6	78
Lesser Golden Plover	189	21	210
Red-kneed Dotterel	133	11	144
Hooded Plover	15	1	16
Mongolian Plover	66	4	70
Double-banded Plover	2903	927	3830
Large Sand Plover	16	1	17
Red-capped Plover	489	173	662
Black-fronted Plover	52	4	56
Black-winged Stilt	13	-	13
Red-necked Avocet	174	1	175
Ruddy Turnstone	467	119	586
Eastern Curlew	311	8	319
Whimbrel	1	-	1
Grey-tailed Tattler	33	1	34
Greenshank	109	25	134
Terek Sandpiper	24	1	25
Latham's Snipe	54	-	54
Bar-tailed Godwit	942	63	1005
Red Knot	1522	127	1649
Great Knot	310	32	342
Sharp-tailed Sandpiper	4057	142	4199
Little Stint	1	-	1
Red-necked Stint	42383	12179	54562
Long-toed Stint	1	-	1
Curlew Sandpiper	13258	2708	15966
Sanderling	228	-	228
Broad-billed Sandpiper	1	-	1
31 Species	68783	16836	85619

In addition, the Group has been involved in handling a further 28,024 waders during joint operations with local groups in other States. If these are included, the VWSG has now been involved in the catching of 113,643 waders.

NUMBERS OF WADERS "PROCESSED BY VWSG IN VICTORIA IN EACH MONTH TO DECEMBER 1991

Processing" includes measuring wing length, bill length and/or total head length (as appropriate) and weight; also recording full details of primary feather moult (if any). Additional wing moult has been gathered on some birds which were not fully processed. The table below is used to plan fieldwork, with the object of obtaining useable (preferably on at least 50 birds) data for each month of the year for all the main wader species.

	J	F	M	A	M	J	J	A	S	O	N	D	TOTAL
Pied Oystercatcher	68	78	92	177	149	198	126	45	10	15	9	20	987
Sooty Oystercatcher	2	-	3	27	3	24	43	14	-	1	-	-	117
Masked Lapwing	4	3	77	-	-	13	-	-	-	3	18	11	129
Grey Plover	1	14	4	3	-	2	-	-	2	35	16	-	77
Lesser Golden Plover	21	26	30	1	-	-	-	-	-	28	47	39	192
Red-kneed Dotterel	-	10	-	20	-	44	11	16	12	8	22	-	143
Hooded Plover	-	-	-	-	-	15	-	-	-	-	-	-	15
Mongolian Plover	46	1	6	7	1	2	2	-	-	-	1	-	66
Double-banded Plover	-	1	143	257	693	792	903	898	1	-	-	-	3688
Large Sand Plover	14	-	-	-	-	1	1	-	-	-	1	-	17
Red-capped Plover	11	66	48	111	200	79	61	14	8	11	11	5	625
Black-fronted Plover	-	7	-	-	11	16	6	9	2	-	4	7	62
Black-winged Stilt	-	6	-	-	-	-	-	-	-	4	2	1	13
Red-necked Avocet	39	-	-	-	-	-	-	10	2	41	46	36	174
Ruddy Turnstone	17	1	117	27	1	7	-	1	12	7	355	40	585
Eastern Curlew	16	-	1	-	22	15	-	43	85	73	59	5	319
Whimbrel	-	-	-	-	-	1	-	-	-	-	-	-	1
Grey-tailed Tattler	28	-	-	3	-	3	-	-	-	-	-	-	34
Greenshank	1	-	76	-	-	-	-	-	-	-	36	21	134
Terek Sandpiper	10	1	-	1	2	-	-	1	-	1	-	10	26
Latham's Snipe	29	44	-	-	-	-	-	-	-	1	4	8	86
Bar-tailed Godwit	134	8	85	14	-	157	-	-	64	79	191	267	999
Red Knot	192	65	156	34	2	44	73	81	76	435	255	174	1587
Great Knot	96	1	3	-	-	4	-	-	16	54	40	129	343
Sharp-tailed Sandpiper	1057	499	93	2	-	-	-	9	519	332	271	1155	3937
Little Stint	-	-	-	-	-	-	-	-	-	-	1	-	1
Red-necked Stint	1403	685	3604	1860	500	333	436	324	463	1225	2396	2128	15357
Long-toed Stint	-	-	-	-	-	-	-	-	-	1	-	-	1
Curlew Sandpiper	492	771	927	144	210	67	141	408	178	827	561	800	5526
Sanderling	11	-	207	-	-	-	-	-	-	1	6	2	227
Broad-billed Sandpiper	-	1	-	-	-	-	-	-	-	-	-	-	1
													35469

The majority of the birds caught when the VWSG visited other States were also processed including 1327 birds caught in Tasmania (Nov 1979), 820 birds caught in South Australia (Feb 1980), 921 birds in New South Wales (Mar 1981), and 24956 birds in Western Australia (Aug/Sept 1981, Aug/Sept/Nov 1982, Oct/Nov 1983, Mar/Apr 1985, Aug/Sept 1986, Mar/Apr 1988 and Mar/Apr 1990).

PIED AND SOOTY OYSTERCATCHER COLOUR-BANDING PROGRAMME

The intensive comprehensive long term study programme on Pied and Sooty Oystercatchers continued in 1991. A near-record number of birds were caught in the autumn/winter flocks in Port Phillip and Westernport Bays and Corner Inlet. All birds were individually colour-banded.

Since this programme was commenced in April 1989 annual catches (including retraps) have been:-

	Pied Oystercatcher	Sooty Oystercatcher	Total
1989	203	24	227
1990	92	16	108
1991	190	29	219
1992 (to 10/6/92)	131	85	216

The number of individual birds colour banded in this four year period at each location is:-

	Pied Oystercatcher	Sooty Oystercatcher
Werribee S.F.	107	3
Queenscliff	9	-
Long Island, Hastings/ Fairhaven	65	-
Stockyard Point	41	-
Rhyll	23	-
Inverloch	2	-
Corner Inlet (including Barry Beach)	224	132
	471	135

This represents about 25% of the Victorian population for each species.

Sightings of colour-banded birds continue to be reported from the full length of the Victorian coastline. The VWSG is extremely grateful to those people who go to the trouble of identifying and reporting sightings. Please note that there are three colour bands on one leg (usually the left leg) and two identical colour bands above a metal band on the other leg.

It was not possible to mount the planned intensive search of the Victorian coastline for banded birds during the 1991 breeding season. However it is hoped this can be achieved in 1992 with large parts being accomplished during the biennial Hooded Plover survey.

A detailed analysis of the sightings and movements of colour-banded Oystercatchers will be included in the 1993 VWSG Bulletin.

Clive Minton

WHY COUNT WADERS?

Jeff Campbell

During compilation of reports on the 1990 Population Monitoring Counts for the most recent issue of The Stilt (the Bulletin of the Australasian Wader Studies Group) it was particularly evident to me that a number of sites throughout Australia which had been regularly surveyed are now not covered at all, or if so, only irregularly. Apparently some counters feel that it is no longer worth continuing their counts of these sites.Given that regular wader counts have now been carried out for more than ten years (National Wader Counts organised by the Royal Australasian Ornithologists Union from 1981 to 1985 and Population Monitoring Counts organised by the AWSG from 1986 to the present) this may seem to be a reasonable conclusion however for a number of reasons it is not.

As a tool for arguing for the conservation of wader habitat long term counts are second to none. If one wishes to convince planning authorities that a particular area of wader habitat is worth maintaining when it is threatened by proposed development of some sort it is essential to be able to prove that it is important for waders. Because of a number of variables,such as the success or otherwise of breeding,and/or the effects on habitat of rainfall patterns throughout Australia short term counts of waders do not give an accurate picture of distribution or numbers that regularly use a site. Only long term counts will give this.

Another benefit of long term counts, of equal importance,is that they are able to show up rises and falls in numbers of particular wader species, which are not immediately apparent with short term counts or casual observation. An instance of this is the recent realisation that numbers of Red-necked Stints appear to be declining. Because this is such a commonly encountered species it would not generally be considered to be decreasing in numbers however it does appear that this may be so. Even with over ten years of regular counting it is still not possible to say that this is definitely the case however, partly because birds may have been missed due to the gaps in the surveys mentioned above. It is also possible of course that inland flooding, etc. may have resulted in large numbers of stints moving into areas that have never been regularly counted. Only continued long term counting will enable these questions to be answered.

Because of the above all wader enthusiasts are urged to take part in the Population Monitoring Counts, and other wader surveys such as the BOCA Western Port Survey, whenever possible.

PERSPECTIVES

Hugo Phillipps

It is interesting to see how the latest taxonomic methodology has affected our understanding of the relationships within that group of birds we call waders or shorebirds. I think that most of us who watch them and study them for pleasure have tended to take for granted the assumption that they form some sort of coherent taxonomic group, and that the terms 'wader' in the European or Australian sense, and 'shorebird' in the American, have a taxonomic validity. This conceptual neatness is a satisfying one; plovers, sandpipers and oystercatchers are all 'waders', and focussing our efforts on them rather than on other birds who may use the same habitats such as herons, ducks and gulls has the pleasing aesthetic wholeness associated with collecting the stamps of a particular country or the books of a certain genre.

Well, it is no longer quite as simple as that. Taxonomy has moved over the years from the times of Linnaeus and earlier through various methodological approaches. At first classification was based on largely intuitive and utilitarian judgements. One might sort animals, for instance, on the basis of size, habitat or edibility. Without wide acceptance of a common fundamental principle on which to base taxonomy, every basis of classification was as good as any other.

The revolution that revitalised taxonomy as a means of understanding the natural world began with Linnaeus' use of structural similarities to classify life forms. It continued with the acceptance of evolution as the underlying cause for both the diversity and the interrelatedness of life, with natural selection as the driving mechanism. Over the decades it has moved spasmodically away from subjective judgements to increasingly objective and quantitative assessments. It is just possible that the development of molecular taxonomy over the last couple of decades is the beginning of the final phase of the taxonomic revolution.

Most prominent amongst the exponents of this approach are Charles Sibley and Jon Ahlquist who have been using one of the methods of molecular taxonomy, that of DNA-DNA hybridisation, to compare the genomes of different species of bird to determine, in essence, the relative lengths of time that have passed since any pair of taxa shared a common ancestor. This has enabled them, through a prodigious amount of work over the years, to construct a phylogeny of the birds of the world.

It would be wrong to imply that the new classification has achieved complete and unquestioning acceptance amongst all researchers in the field. In fact there are so many uncertainties with the degree of precision, at least at the higher taxonomic levels, that an ultimate phylogeny is not likely to emerge for some time and not until after much more work has been done. However, the concepts behind the techniques seem to have a strong theoretical foundation, and many of the findings confirm judgements made on the basis of anatomy, geography and behaviour.

Many, but not all; some surprising rearrangements of traditional relationships have been made. While keeping in mind the continuing controversy about the exact branching patterns that define a phylogeny, look at the accompanying chart to see what has happened to the traditionally monophyletic group called 'waders', the suborder Charadrii, one of three suborders in the order Charadriiformes.

Firstly, the Charadriiformes itself has disappeared, having been subsumed by the Ciconiiformes, now an enormous and disparate order which also includes herons, flamingos, raptors, petrels and penguins. Secondly, and moving down the taxonomic hierarchy, the suborder Charadrii has swallowed its siblings, the Lari and the Alcae, and now contains two infraorders, the Charadriides (which now holds all the traditional wader taxa) and the Pteroclides (which holds the sandgrouse).

There are, incidentally, a few intriguing minor revelations in the chart; the oystercatchers are fairly closely related to the avocets and stilts, and closer to the plovers than are the stone-curlews or thick-knees. By comparison the woodcocks and snipes seem surprisingly distant from the orthodox sandpipers. Looking at the chart as a whole, and taking into account how molecular taxonomy has rearranged other traditional avian relationships, it is apparent that the importance of ecological convergence has been underestimated. It is even more apparent that the potential speed of ecological divergence has not always been fully appreciated. Who would have supposed that the auks and the pratincoles were united at the superfamily level?

So what are waders? It is obvious that the term has no taxonomic validity in the new phylogeny, unless you include such groups as the auks, gulls and the sheathbills. People have traditionally divided most waders into 'plover' and 'sandpiper' categories. This is strongly emphasised, the chart shows no close relationship between these two groups. It does, however, show that the parvorder Charadriida, which contains pratincoles, plovers, oystercatchers and avocets, also has the auks, gulls and terns. On the other side of the great divide the parvorder Scolopacida holds the sandpipers, jacanas and Painted Snipe, but also includes the Plains Wanderer.

What does this mean as far as the VWSG is concerned? Really, nothing at all. As a practical data-gathering group it should not be worried in the slightest by the vagaries of classification. Just out of purely self-indulgent whimsy, however, you might consider that the VWSG's lowest inclusive taxon of interest is the infraorder Charadriides, which has the virtue of including the terns. If you look at the groups it contains, and exclude those that do not occur in Australia, you will see that the only ones that have not had representatives caught at least occasionally in cannon-nets or mist-nets by the VWSG or AWSG are skuas, jacanas, the Painted Snipe and the Plains Wanderer.

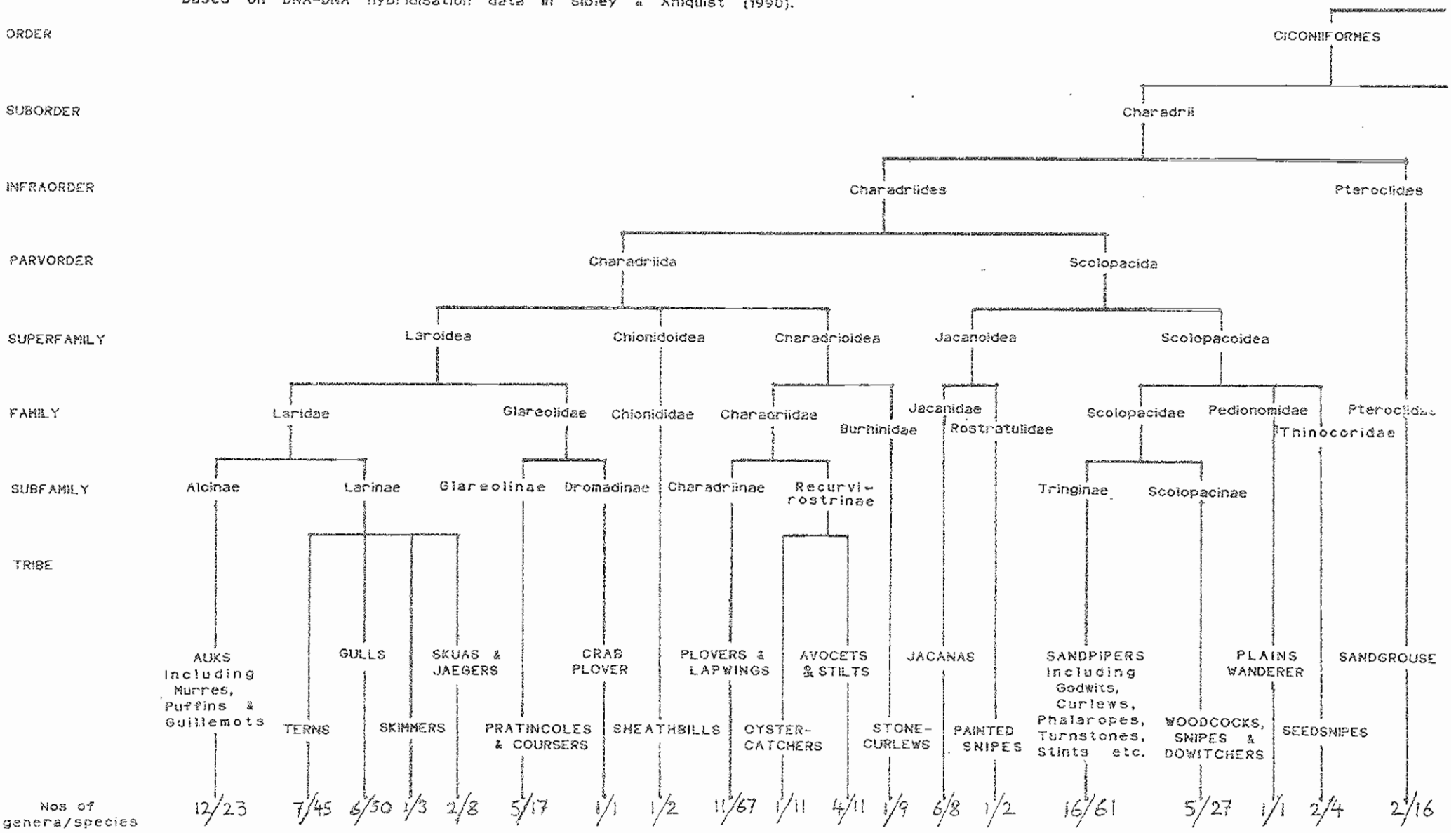
Any molecular taxonomic purist in the membership would demand that the name be altered to the Victorian Charadriidean Study Group. The more robust would want the inclusion of gulls in the catch program. The more poetic might wish to haunt the secluded swamps of the inland for Painted Snipe, or dazzle Plains Wanderers at night in the rough grazing paddocks of the Riverina. Both would be collectors chasing an illusory inclusivity.

Seriously, though, the term 'wader' is losing its taxonomic underpinning and, in the long term, is likely to fade away as it is gradually replaced by more rigorous and descriptive labels. The term 'shorebird' is a little more appropriate, at least as far as the VWSG is concerned, although it is far from perfect. One might invent a word that would include those migratory birds that breed in the northern Palearctic and Nearctic that aggregate upon the mudflats of the tropics and the southern hemisphere during the non-breeding season. Such a term would have no taxonomic meaning, but be a tribute to convergent evolution. Those plovers and sandpipers that would fit into such a category have ancestors that have followed two quite separate evolutionary tracks through the climatic pulsing of the ice-ages and over the moving continents; their descendants may now feed and roost together on the same beach.

REFERENCE

Sibley, Charles G.; & Ahlquist, Jon E. (1990). Phylogeny and Classification of Birds. A study in molecular evolution. (Yale University Press: New Haven, CT, U.S.A.).

PHYLOGENY OF THE SUBORDER CHARADRII (AVES: CICONIIFORMES)
Based on DNA-DNA hybridisation data in Sibley & Ahlquist (1990).



HAP 1992

LEG-FLAGGING WADERS IN AUSTRALIA - WHY AND HOW?

Mark Barter, 21 Chivalry Avenue, Glen Waverley, VIC 3150
Megan Rush, 24 Fulton Crescent, Burwood, VIC 3125

1. INTRODUCTION

Knowledge of migration routes is essential in order to develop effective plans for the conservation and management of migratory waders and their habitats. Such information is especially required in the East Asian-Australasian flyway where habitat destruction is widespread (Howes and Parish 1989), stageing sites are being destroyed and adequate protection of the remaining sites is particularly important.

During the last fifteen years approximately 100,000 waders have been banded in Australia but only 222 bands have been recovered overseas up to the end of 1991. This dividend represents a microscopic 0.2%. Banding activity elsewhere in the flyway is not so intensive, although the level of activity is now increasing, and 20 foreign-banded birds have been recovered in Australia to date (ABBBS 1992).

It is interesting to compare these results with those obtained in the UK where, on average, three birds in 100 caught will provide information on international movements. One of these will be wearing a foreign band when captured, whilst the other two will be recovered later overseas (Clive Minton, pers. comm.).

The difference in band recovery rates between the East Asian-Australasian and East Atlantic Flyways is due to the less intensive banding activity and lower population density in the former Flyway. Additionally, a lack of understanding of the significance of recovered bands in most of the countries comprising the East Asian-Australasian Flyway means that many do not get returned to the relevant banding office.

Recently, the Victorian Wader Study Group (VWSG) has commenced attaching leg-flags to migratory waders in an attempt to quickly increase our knowledge of migration routes. The advantage of using leg-flags is that they can be easily seen with the aid of binoculars or a telescope, thus providing additional information on migratory movements to that obtained from recovered bands. This greatly increases the opportunity to gain information on movements, as many more sites can be covered.

During two years of leg-flagging (1991-92), the VWSG has been able to:

(a) identify a suitable leg-flag material,
(b) develop satisfactory leg-flag manufacturing and attachment techniques, and

(c) confirm satisfactory performance of the leg-flags with respect to visibility, colour-fastness and durability.

It is hoped that leg-flagging will be adopted by other countries in the flyway and a draft leg-flagging protocol has been developed by the Australasian Wader Studies Group and the Asian Wetland Bureau, which comprises a list of target species by country and leg-flag colour (Barter and Parish, unpub.). It is essential that the final protocol be rigorously followed otherwise the resulting confusion will seriously invalidate the results. Similarly, other flagging schemes must take into account the requirements of this scheme in order to avoid confusion.

Although leg-flags have been widely used in Europe and the Americas, little published information is available on manufacturing and attachment methods. The purpose of this paper is to describe the techniques developed by the VWSG and the flag-performance to date, so that the information is readily available to other groups interested in leg-flagging.

2. LEG-FLAG MANUFACTURE

2.1 Material

The material used for flag manufacture is 0.5mm thick un-plasticized PVC sheet, made by Imperial Chemical Industries in the UK under the tradename of "Darvic".

Darvic has been used before for the manufacture of both colour bands and flags. The dyes are colour-fast and serious fading does not occur.

The VWSG purchased Darvic from:

VT Plastics
49 Wates Way
Willow Lane Industrial Estate
Mitcham, Surrey CR4 4HR
UK

Tel: (081) 685 9545
Fax: (081) 640 4018

The plastic is supplied by ICI in 6ft x 4ft (1.83m x 1.22m) sheets and VT Plastics will cut sheets up into 24 x 1ft x 1ft (30cm x 30cm) squares upon request. The smaller size is more easily transportable and very convenient to handle.

2.2 Manufacture

Flags are made to the same internal diameter (D) and height (h) as the equivalent Australian metal band, eg. size 04, suitable for Curlew Sandpipers and Large Sand Plovers, D=3.3mm, h=5.5mm. The basic design is

illustrated in Fig 1 (size 04 band), which shows that the flag portion has sides which can be glued to ensure that the leg-flag remains securely attached to the bird's leg.

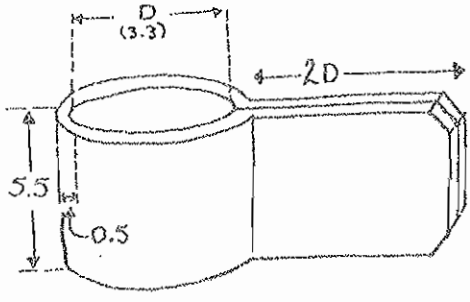


Figure 1

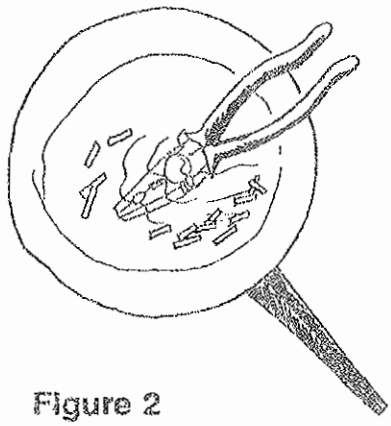


Figure 2

The first stage in the manufacturing process is to cut the plastic squares into strips with a width which is equal to the height of the band to be made, eg. for size 04, width=5.5mm. This can be easily done on a sharp office paper guillotine. The wide strip which is inevitably left over at the end (unless you want to slice the tips of your fingers off!) can be utilised by slicing off the appropiate widths at right angles to the original cutting direction. The yield will be virtually 100% if the wide strip remaining is equal to the flag blank length required. Pre-planning will achieve this.

Flag-blanks are made from the strips by cutting to the desired length. The required blank-length can be calculated by allowing for the circular part of the flag and for a flag-length of approximately twice the flag diameter, ie. blank length = $\pi D + 4D = 7.14D$ (see Fig 1, where blank-length = πx3.3 + 4x3.3 = 7.14 x 3.3 = c.24mm). Following trimming, the resulting flag length will be somewhere between 1.5 and 2 times the internal band diameter.

Flags are formed by using hot water to soften the blanks, and a heated pair of thick-nosed pliers and a metal rod, of the same diameter as the desired internal diameter of the flag, to form the required shape. An electric frying pan is the most suitable equipment for heating both the water and forming implements. It is important that the frying pan be clean and free from oil and grease that could coat the internal surfaces of the flag sides and interfere with the glueing action. The pan should be thoroughly cleaned with hot water and detergent (more than once if necessary). A few drops of detergent should be added to the water used during the flag-forming operation in order to cope with any residual oil.

The technique used is to place a number of blanks in about 20-25mm of hot water, which is at approximately 90°C. The thick-nosed pliers are heated by leaning them against the side of the frying-pan with the jaws immersed in the water (see Fig 2). A blank is "fished out" with the metal rod and formed

into a "V-shape" around the rod and held with the thumb and index finger (see Fig 3). The heated thick-nosed pliers are used to grip the blank at the metal rod and the jaws are then squeezed toward the flag portion to form the leg flag (see Figs 4, 5 and 6). The clamped leg-flag, whilst still on the

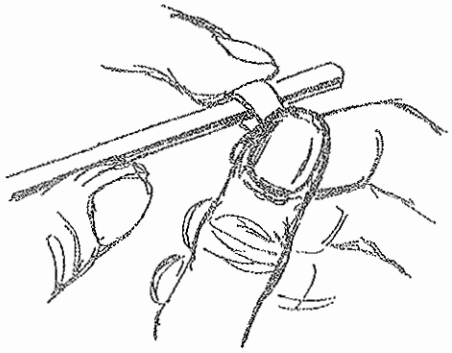


Figure 3

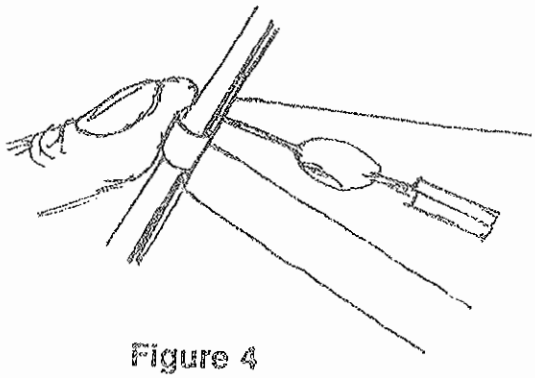


Figure 4

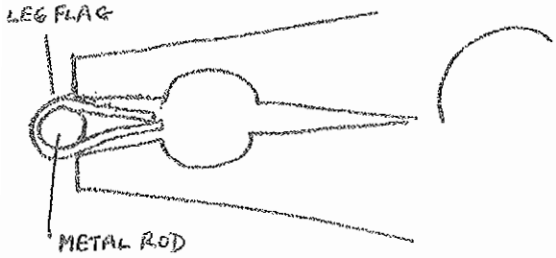


Figure 5

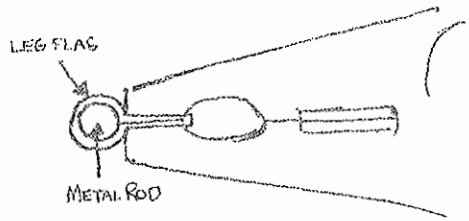


Figure 6

forming rod, is re-immersed in the hot water to allow the plastic to soften and take up its final shape. Accurate formation of the flag internal diameter, and achievement of proper contact between the internal surfaces of the flag sides, can be obtained by gently pressing the pliers towards the metal forming rod. The flag is then slid gently off the rod with the pliers and dropped into a container of cold water. The jaws of the pliers are re-immersed in the hot water to keep them hot, whilst another blank is removed. With a bit of practice, leg flags can be formed quickly with a reasonable degree of accuracy.

It is very important to get the correct squeezing action so that the inside surfaces of the flag sides are firmly in contact with each other in the finished flag. If the sides are separated to any extent, the "springiness" of the flag tends to work against the glue when the flag is being attached to the bird's leg and satisfactory glueing takes longer. The possibility of subsequent separation of the flag sides, and consequent flag loss, is also greater.

Badly formed leg flags can be re-used by re-immersing them in the hot water which will cause them to return to the un-formed flat state.

Slightly mis-formed flags can be renovated by replacing them on the metal rod, gripping to the correct shape with the pliers and then re-immersing for a short time in hot water. The flag can then be removed, as before, and dropped into cold water.

The formed flags are trimmed with a sharp pair of scissors to make both sides of the flag of equal length and to remove the sharp corners (see Figs 7 and 8).

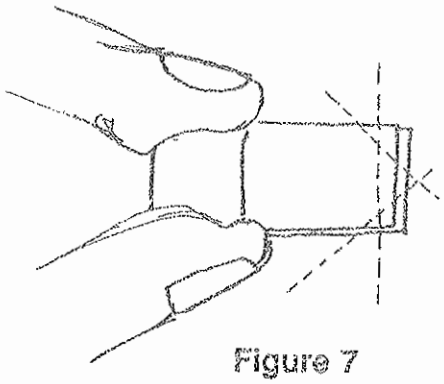


Figure 7

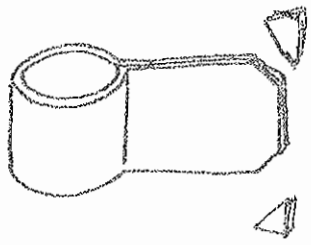


Figure 8

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The trimmed flags are then air-dried, thoroughly cleaned by agitating in a suitable solvent (eg. methyl ethyl ketone) for 30 seconds and kept in labelled containers. Old 35mm plastic film containers hold a convenient quantity of bands.

3. LEG-FLAG ATTACHMENT

The most suitable adhesive has been found to be the type used by plumbers to glue PVC drainage fittings. This glue, which uses methyl ethyl ketone as a solvent, partially dissolves the plastic and, upon setting, forms an adherent bond. Super Glue is unsuitable as it does not work by solvent action and is not an effective adhesive for the hard, shiny Darvic surface. Additionally, Super Glue is more hazardous to use because of it's propensity to glue "anything" to "anything", including fingers and bird's legs to flags.

The most successful technique for attaching the flag is to, firstly, to open the flag portion just sufficiently to push over the bird's leg and then to place a drop of glue

between the flag sides, whilst they are still separated by the leg (see Fig 9). The flag is then pushed completely on to the leg and it should snap shut due to the inherent spring in the plastic. The flag sides are then clamped lightly with a pair of

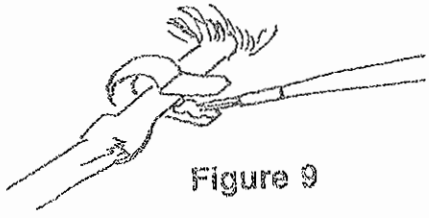

Figure 9

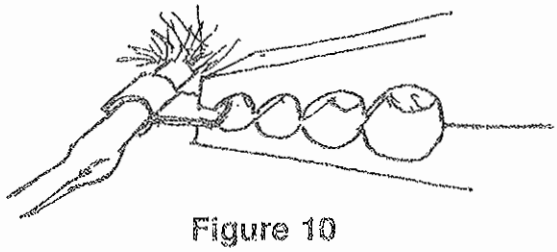

Figure 10

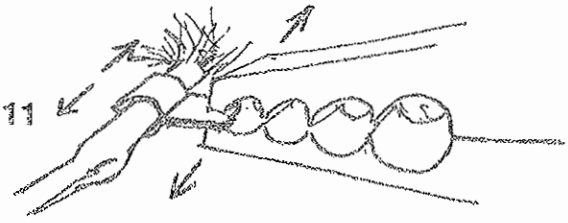

Figure 11

pliers for at least 20 seconds until the glue has set sufficiently to hold the two sides together (see Fig 10). It is important to only use just enough glue to cover the joint surface when the sides are clamped by the pliers. Excess glue will be squeezed out and may cause the flag to adhere to the bird's leg. It is good practice to continuously move the flag relative to the leg whilst the flag is clamped by the pliers. The solvent evaporates rapidly and a flag that is moving freely on the leg after 20 seconds will remain free thereafter (Fig 11).

Birds can then be released after checking that flags are properly glued and moving freely on the leg.

It is very important not to open the flag sides too much during application to the bird's leg or the flag will become permanently distorted and there will be a gap between the sides after the flag has been placed on the leg. This will make glueing more difficult as the flag sides will tend to separate after the glueing operation.

People or groups flagging for the first time may find it advantageous to hold the birds for a little longer, in keeping cages or bird bags, in order to check that the flags have remained glued and that they have the correct flag application technique.

4. PERFORMANCE

The orange leg flags used by the VWSG have been found to be highly visible in the field. In reasonable light conditions, the flags can be easily seen up to 100m with binoculars, and to 200m, or more, with a telescope. VWSG practice has been

to attach the flags to the tibia (upper leg) as they can be more easily seen when the birds are feeding in water (eg. Curlew Sandpipers). However, flags on the tarsus are more visible on roosting birds.

Flagging commenced in early 1990 and flags on birds recaptured in late 1991/early 1992 showed no fading, although the gloss on the plastic surface had been partly removed.

The early flags were fixed with Super Glue and some of these had fallen off within the first year. The use of the solvent-based glue commenced in late 1990 and checks of retrapped birds have shown that there has been almost 100% retention of flags during the following 12 months.

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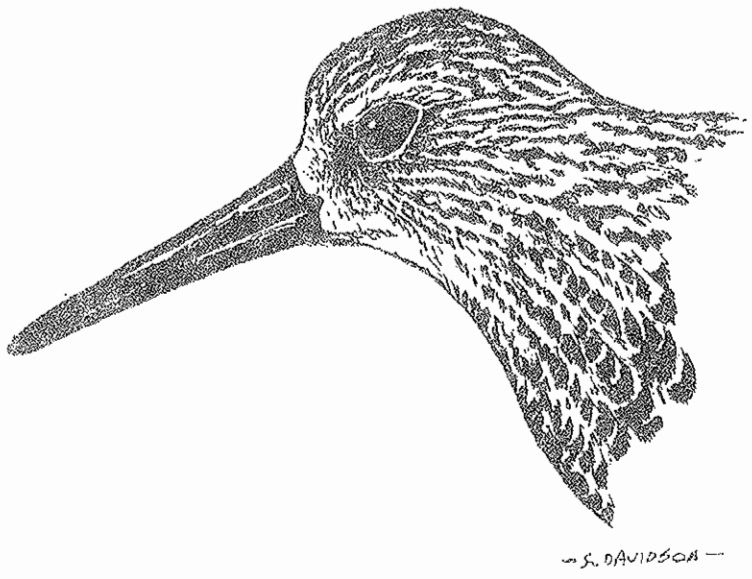


SONG OF THE SOOTY

Hugo Phillipps

There's an islet at the inlet where the oystercatchers sit,
Having gathered from the mudflats and the inundated sands;
When they've finished oyster-catching and are loafing on the spit,
They tell each other stories of just how they got their bands.

On a frosty August morning as the tide was surging high
Through the gutters and the channels with the mangrove leaves afloat,
The islet held some young birds, dim of bill and brown of eye,
And a single stately senior who stood up and cleared her throat.

Then that ancient oystercatcher with an eye as red as fire
Displayed her gaudy tarsi as she gazed around the flock,
Which clustered round her blackly as she started to inspire
Them with her wild adventures, cautionary and baroque.

'I was hatched within the Furneaux group, far out across the Strait
On a little sandy island where the mutton-birds abound,
And my parents were the monarchs of that little island 'state
Where the penguins and the petrels had riddled all the ground.

'Where the tussocks grow so lushly, guano-rich and rank,
My childhood was a happy, though a busy, one, and brief,
Learning how to catch crustaceans as they scuttled down the bank,
Then how to chisel mussels from the wave-washed outer reef.

'I had no surviving siblings in the year I was a chick
And my parents died when I had reached only one year old,
Their feathers soaked with oil from a small but deadly slick,
Poisoned by their preening, at the mercy of the cold.

'From being the princess of an avian fairy-story
I found myself inheritor, an orphaned virgin queen;
Though it wasn't hard to find a mate for such a territory,
Which was all the land that I had ever known or seen.

'Ah, well do I remember sitting tight on eggs when battered
Through days of driving storm-sleet and feeding in the lulls,
Returning but to find them broken, empty, scattered
By the vicious thieving beaks of the bold Pacific Gulls.

'But I still fledged many chicks there on an open shingle beach,
Amidst the wrack and jetsam, the driftwood and the shell;
And my spotted eggs beneath me, safe above the tidal reach,
Made motherhood a memory that time can not dispel.

'But one wild winter evening, with low clouds racing fast,
My mate near me on the shingle then exploded in my sight
As a bolt of lightning struck him. Blind and tumbled by the blast,
Dazed, the storm winds took me, threw me up into the night.

'By dawn I had been carried far across the heaving Strait;
Hungry, haggard, widowed, a sooty-feathered ghost;
Emaciated, tattered, quite bewildered by my fate,
Finding final friendly haven on the golden Gippsland coast.

'So here I have been resting, building strength to fly again
Across the restless billows to my island realm once more,
Where the green-cered geese will greet me, and their grunts
provide refrain
To the mutton-birds' mad moaning and the breakers on the shore.

'Then one afternoon last autumn, upon this very reach,
I was dozing with some others of the local landless flocks,
Aware of some strange humans, not so far along the beach,
Playing silly games inside a ragged hessian box.

'And as more birds walked up before the swiftly rising tide,
I heard the second thunderclap that I cannot forget.
We rose in fright, too late; the ruffians in the hide
Had fired and trapped us flat beneath a monstrous flying net.

'Oh! The indignities we suffered; disentangled and encaged,
Left awhile to ruminate, recuperate and preen;
Then measured and manhandled, rotated, weighed and aged,
Wondering what was in store and just what it could mean.

'Then they held me upside down and, in that lewd position,
They cramped these bands on to my legs and glued them good and
tight;
Black, red and blue upon my left my code of recognition,
And, for the place, two yellows with the metal on my right.

'But I had my revenge; I crapped into their Supa-Glue,
I crapped upon their clothing and I crapped upon their hands.
I crapped upon their data sheets; I braced myself and crapped into
A gumboot, hat, a vacuum flask and box of colour-bands.

'I saw the same folk later, on another roosting cay,
As they bustled with their shovels, pegs, cannons, nets and wire.
While I watched they hid it all and then they walked away
To lurk inside their sacking for another chance to fire.

'Then, when the feeding flock was full, I at once took wing
And led the birds to sit behind the line of hidden net.
Despite their frantic twinkling and their jiggling with some
string,
Not one single oystercatcher did those villains get.

'So, although I'm marked for life, this lesson I pass on to you:
Punish all such bandits, thugs, vandals and kidnappers!
With luck, I've given some a dose of psittacosis, wader-flu,
Or salmonella. Well may they call us oystercrappers!'

Then that Sooty Oystercatcher winked an eye of crimson flame
At one of her admirers who seemed brighter than the rest.
'Come fly with me, you mussel-man!' And straight to her he came.
'Come be my consort, give me chicks and help me tend the nest!'

And a watcher at the Promontory looking at the sky,
Above the shoals and sandbars of the Inlet's curving mouth
Late that winter morning, would have seen there, flying high,
A pair of Sooty Oystercatchers heading to the south.

SOME ASPECTS OF THE ROOSTING BEHAVIOUR OF PIED OYSTERCATCHERS, *Haematopus longirostris*.

Michael A. Weston, 28 Craig Rd. Donvale, 3111.

"The Oystercatcher, so full of vitality and excitement.."
Nethersole-Thompson (1988) P.3

Intertidally foraging migratory waders require a wintering habitat to provide both feeding and roosting opportunities. Resident waders have additional summer habitat requirements associated with breeding. Consequently an understanding of roosting behaviour is essential when planning alternative habitat or assessing the impact of habitat destruction or disturbance. In addition, because cannon-netting takes advantage of mass high water roosting, insights into roosting behaviour are of special interest to banders. Generally the roosting behaviour of wading birds has been neglected (although there are notable exceptions e.g. Jones 1985). This paper examines some of the less well explored aspects of the roosting behaviour of the Pied Oystercatcher, *Haematopus longirostris*.

Methods.

All data were collected as part of research into the behavioural ecology of Oystercatchers at *The Spit* on the Werribee Treatment Complex. Detailed methodology is set out in Weston (1991) and only a brief account is provided here. The study period began in late February and ended in early August, 1991. Basically, every five minutes a count was made of the number of Oystercatchers involved in various activities. The locations of roosting oystercatchers were noted, along with any other relevant observations. The data were analysed using SYSTAT Version 4.0 (Wilkinson 1988).

Postures.

Roosting involves a variety of postures detailed in Weston & Rush (in prep.). A roosting bird may stand on one or both legs, if standing on one leg the other is folded and typically tucked into the belly. The leg is either out of view or the foot may hang slightly downward. The leg may also be partially folded with the foot only just above the substrate. Birds were observed to change legs periodically and often moved short distances by hopping. Birds occasionally sat on dry substrates with both legs out of view. Eyes were usually open but sometimes closed. The head and bill either remained forward with the neck unextended or the bill was tucked beneath the scapulars. Oystercatchers always roosted chest-first into the wind (although incorrectly positioned decoys have resulted in birds roosting away from the wind causing considerable displacement of feathers). If approached while roosting, birds with the bill forwards turned their heads to view potential danger. Birds with bills beneath their scapulars either rapidly removed the bill and behaved as the former birds,

or twisted their bodies using one or both legs so that an eye faced any potential threats.

Roosting in leg injured birds.
Leg injuries are common in European Oystercatchers *Haematopus ostralegus* (Briggs 1988). Leg damage varies from a malformed or swollen foot to portions of the leg below the tibia missing. One case of both legs missing below the knees has been recorded for *H.longirostris* (C.D.T. Minton pers. comm.). Birds with damaged legs never roosted on the injured limb and usually stood on the undamaged leg. The stump of damaged legs was either folded into the belly or hung down.

Time Budgeting.
The results of Weston (1991) reveal two broad categories of roosting. Firstly, mass roosting during the high water period and secondly limited roosting during the ebb, flow and low water stages of the tide. The former division (henceforth Category 1.) involves the majority of roosting (both in terms of numbers of birds and amount of time) and was interspersed by other activities primarily those concerned with feather maintenance e.g. preening. The second form of roosting (Category 2.) tended to be interspersed by foraging behaviour. For no period of time was the average percentage of roosting oystercatchers 100%. Both categories of roosting occurred at night.

Location.
Oystercatchers used several alternative roosting sites on *The Spit*. These sites are shown in Figure 1. (mapped by G. Mihan in September, 1991). A further site exists towards the North however this site appears to be disused (D. Williams pers. comm.).

Description of sites.
All Category 1. sites on *The Spit* were either on shell grit or firm mud substrate. Oystercatchers roosted in water up to their bellies but usually in shallow or dry areas. They usually roosted on ridges of shellgrit which were particularly well formed at Cuts 1, 2 & 3. Islands were also a favoured location. Roosting (and foraging) were occasionally observed in the low coastal salt-marsh (including *Atroplex* sp., *Sarcocornia* sp., *Frankenia* sp.).

Category 2. sites were close to the mud or sand flat that the oystercatcher was foraging on. The area of the flat used for roosting tended to be the drier, longer exposed areas of the littoral zone and were consequently lower than roost sites used during Category 1. roosting. These sites were sometimes near driftwood, rubbish and seaweed. Basalt rocks were often used by birds foraging for rock-bound limpets and mussels, these sites were often separated from the coast by substantial stretches of water (e.g. c.500 m). Henceforth all roosting referred to is Category 1. (high water) roosting.

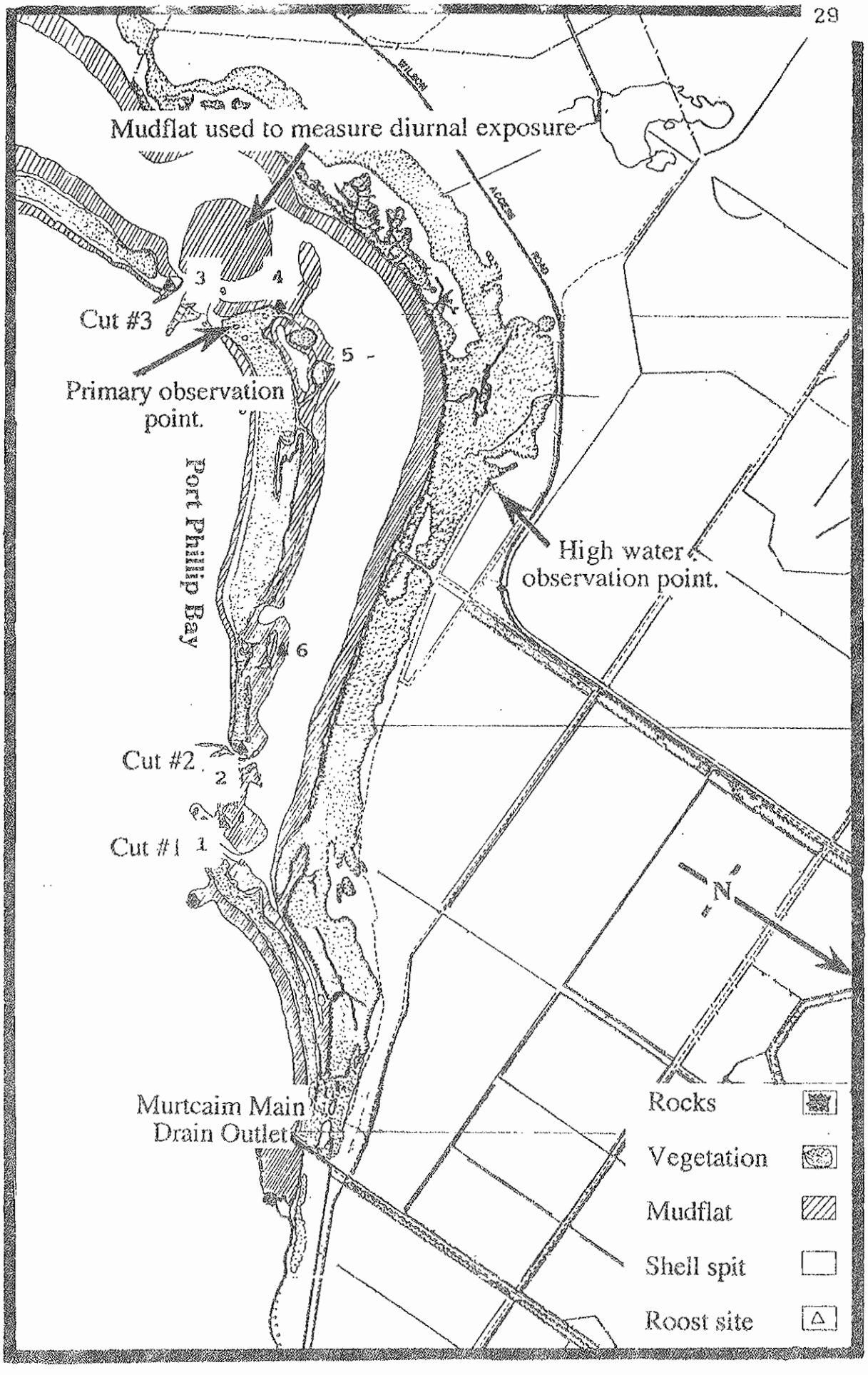


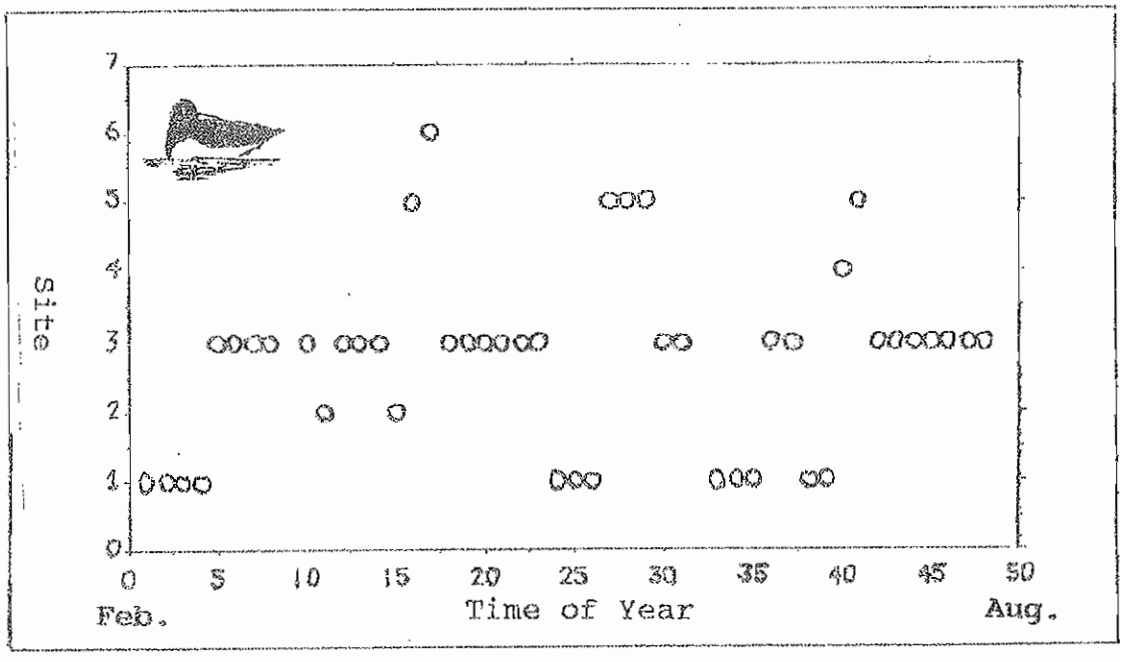
Figure 1. The location of high water roost sites (1-6) on *The Spit*.

The high water roosting site located by D. Williams is c.10 m away from a sewage pond, some 500 odd metres from the coast. It is located in a muddy hollow below an embankment. In the past this site is reported to have been used by significant numbers of *Calidris* Sandpipers most notably Sharp-tailed Sandpipers *C. acuminata*. This unusual site has been disused for a number of years.

Changes of Sites.
Oystercatchers moved from one site to another when disturbed by raptors (particularly Swamp Harriers *Circus approximans*), aircraft and people. Foxes *Vulpes vulpes* never caused a change in roost site. When moving between sites Oystercatchers generally flew as a single low flock and often wheeled around several times before settling. One change in site usage occurred after a cannon-netting exercise, however this may have been coincidental.

Usage of Sites.
Figure 2. illustrates the usage pattern of roosts during the study period. The favoured sites are at cuts 1 & 3. The birds also displayed a tendency to use a particular site for a number of days before switching to another location (i.e. short term roost site fidelity).

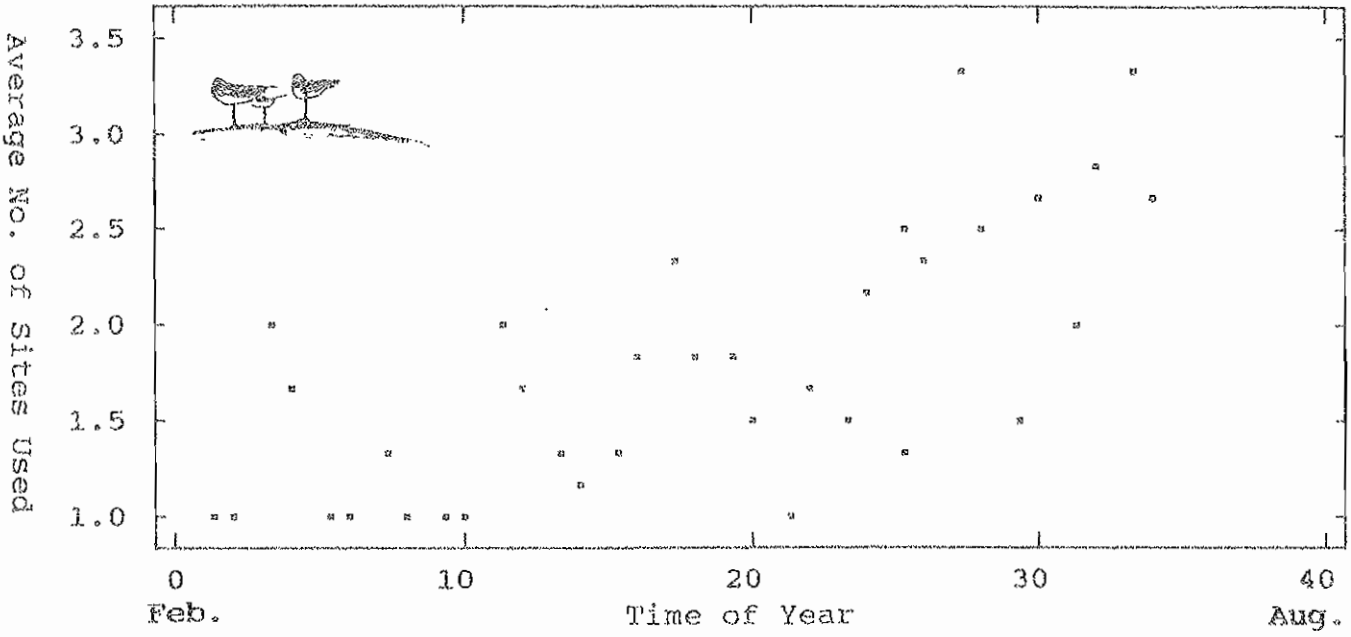
Figure 2. The usage of each site during the study period.



Seasonal Changes in Roosting.
Figure 3. displays the average number of roost sites used by the flocks throughout the study period. There is an increase in the average number of roost sites used as the winter progresses (simple linear regression: TIME OF YEAR = 10.459 X AV.NO.SITES - 0.062; R squared = 0.506, that is the variance explained by the model is about 50.6%,

$F_{1,33}$ = 33.821, $p < 0.05$). This trend is in line with flock fragmentation because of increasing aggressiveness of Oystercatchers related to pair formation and the approaching breeding season (Weston 1991).

Figure 3. The average number of roost sites used during the study period.

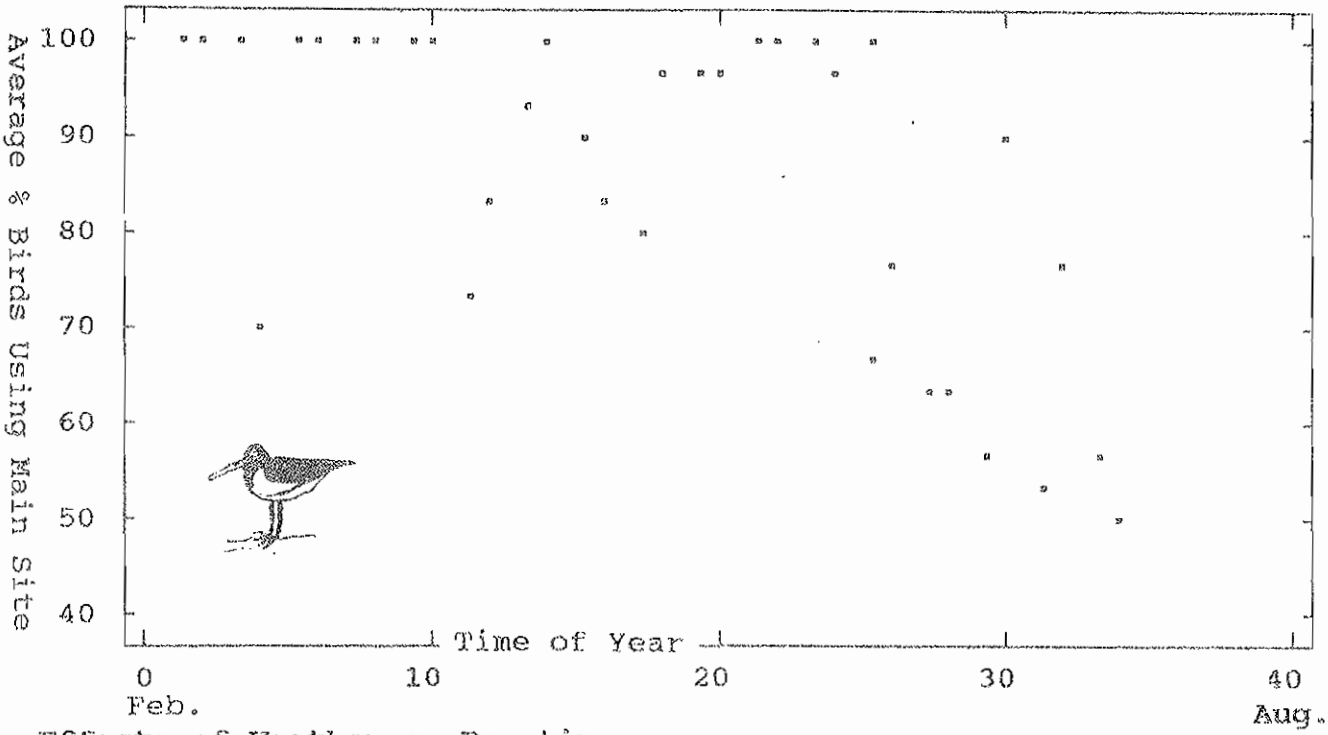


An additional consideration is that the number of birds present in the area decreases towards the breeding season (Weston 1991). In essence as the year passes, there are progressively more, smaller groups of Oystercatchers at high water. The greatest concentrations of Oystercatchers thus occur in late February when high numbers present combine with a low average number of sites used (presumably the ideal time for cannon-netting operations).

Figure 4. shows the average percentage of birds using the main roost site (which by definition must be greater than 50%). The pattern is unclear (TIME OF YEAR = -0.358 X AV.% MAIN ROOST + 10.459, R squared = 0.381; $F_{1,33}$ = 20.292, $p < 0.05$). There may be a trend for a seasonal decrease (although the gradient is significantly different from zero, not much of the variance is explained). It seems that this parameter remains roughly constant throughout the wintering period (albeit with high variance). If the average percentage of birds at the main roost does remain constant, and we assume that its composition (members) is constant then the birds roosting away from the main site may be fragmenting further as the season continues and may account for the increase in the average number of sites used. These birds may be establishing pair bonds and consequently may be highly aggressive. Such behaviour appears to manifest itself

earlier in some birds than others resulting in decreasing gregariousness in individual Oystercatchers.

Figure 4. The average percentage of birds using the main roost site.



Effects of Weather on Roosting.
The effects of weather are analysed in Figure 5. and no relationships are significant (the significance level for correlation coefficients is taken as 0.8). The lack of significance may be due to the general nature of recording the roosting location. No measurements were made of exact topographical locations e.g. whether the birds were on the leeward side of the shellgrit or otherwise.

Figure 5. Correlation matrix showing the effect of wind strength, direction and temperature on the main roosting site used.

	Wind strength	Wind direction	Temp.
Main site used.	0.210	-0.160	-0.307

Interspecific Roosting Associations.
Oystercatchers roosted near Silver Gulls *Larus novaehollandiae*, Pacific Gulls *Larus pacificus*, Swans *Cygnus atratus*, Teal *Anas* sp., Cormorants particularly Small and Large Pied Cormorants *Phalacrocorax melanoleucos* and *P. varius*, and numerous small Sandpiper (*Calidris* sp.) and Plover (*Charadrius* sp.) species. At other locations Pied Oystercatchers roost with Sooty Oystercatchers *Haematopus fuliginosis*.

Conclusions.

Oystercatchers at Werribee use various roost sites. They use more sites as the breeding season approaches probably because of increasing aggressiveness associated with breeding. It is possible that some birds become more aggressive earlier than others and these birds may roost apart from the main roost site and then fragment further. This is supported by an increasing frequency of pairs roosting together and copulating at sites away from the main roosting sites.

Not only do Oystercatchers use more sites as the winter continues, they also switch roost sites if disturbed. This emphasises the importance of preserving marginal sites as well as those more frequently used. Oystercatchers at Werribee disperse from *The Spit* to forage to the North and South. Disrupting roosting sites at this location would be likely to effect a large section of coastline with regards to Oystercatcher usage.

Acknowledgments.

All analysis was performed on data gathered during an honours project supervised by Dr. Mark Elgar. Megan Rush was a great help and adviser as usual. Thanks to all VWSG members for their help and enthusiasm. What wonderful birds!

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AGONISTIC BEHAVIOUR OF THE CURLEW SANDPIPER.

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The following observations were made of intraspecific aggressive behaviour of Curlew Sandpipers *Calidris ferruginea* during April 1992 at the Lake Borrie main drain (Werribee Treatment Complex). The flock under observation was primarily engaged in foraging activities on an ebbing tide and consisted of birds with a continuum of moult ranging from non-breeding to almost full breeding plumage.

One Sandpiper in breeding plumage roosted amid other birds with both legs on the ground; the head was turned and the bill was beneath the scapulars. The bird remained in this posture and pivoted its body by twisting its legs, first directing one eye, then the other, behind and\or in front of itself. The roosting posture was held only for a few seconds, this posture would then be relinquished and the bird would run several steps and once again assume the roosting posture. It became apparent that the bird was fleeing from short charges made by *C. ferruginea* individuals in non-breeding plumage. This most likely also accounts for the vigilant aspect of the roosting posture. After several repetitions of the roost-run-roost sequence the breeding plumage bird turned and faced a charging bird in non-breeding plumage. Both birds bent their legs so that the angle between tibia and tarsus was *c*.90 degrees, the bills were angled at *c*. 15 degrees below horizontal. From this posture both birds pushed each others bills sideways several times. Within seconds other birds in non-breeding plumage approached and the breeding plumage bird turned and ran, pursued by about three other *C. ferruginea*. All birds took to the wing (the pursued bird flew first) and made several passes over the flock and seemed to follow the water's edge. Finally the birds involved in the chase were lost in the aerial activity of other small waders.

This behaviour is considerably different in detail from the description of aggressive behaviour on the breeding grounds given by Holmes & Pitelka (1964). Their description does however recognise aerial components of aggression. Behaviour such as this does raise interesting questions about the spacing mechanisms in small waders, and how they might change seasonally (some of the implications of non-uniform spacial distribution are discussed in Weston 1992).

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WADER THESES 2
compiled by Hugo Phillipps

This is a supplementary list of theses relating to the waders of Australasia and the East Asian/West Pacific Flyway. Also included are theses from other areas which may be of interest because they concern the same or similar species or have relevance to general wader studies and conservation. As before, additions and corrections are solicited and will be gratefully received.

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FIELD NOTE

KLEPTOPARASITISM BY AN IMMATURE PACIFIC GULL TOWARDS A YELLOW-BILLED SPOONBILL.

Megan Rush, 24 Fulton Cres., East Burwood.

While at North Spit, Werribee treatment Complex, an interesting incidence of kleptoparasitism (or food piracy) by an immature Pacific Gull *Larus pacificus* toward a Yellow-billed Spoonbill *Platalea flavipes* occurred.

The prey item involved was an unidentified crab (with a carapace width of c.3-5 cm), this was held in the Spoonbill's bill. The Gull was pursuing the Spoonbill in flight.

The attempt to steal the crab was unsuccessful, and the Spoonbill flew off with the crab still in its bill, leaving the Gull behind.

BIBLIOGRAPHY OF PAPERS EMPLOYING BANDING AND COUNT DATA COLLECTED BY VWSG MEMBERS

Counting and catching birds can be great fun. With the VWSG it certainly is! The ability of Clive Minton to get experienced teams out on a fortnightly basis, even with full allowance for his persuasive charm, is testimony to how much members enjoy participating in field work.

Ultimately, though, the *raison d'etre* of the VWSG is not to provide interesting entertainment to "while away" weekends, but to obtain data that can be used for the conservation and management of waders. So the true test of the VWSG's success must lie in the quantity and quality of data collected and, very importantly, the extent to which it has been analysed so that it can be readily used for conservation purposes and also to help refine counting and catching objectives. The list of papers, publications and articles detailed below is impressive confirmation of the extent to which the VWSG has achieved those twin aims of gathering information and writing up the results.

The list is dominated by the annual reviews of banding highlights, recoveries and sightings of colour-marked birds. Analyses of biometrics and wing moult have been published for most species for which there is adequate data. The exceptions are Red-necked Stint, Sharp-tailed Sandpiper, Pied Oystercatcher and Greenshank. The analyses are being used in the preparation of species accounts for the next two volumes of The Handbook of Australian, New Zealand and Antarctic Birds.

Not included in the list is the detailed catch data (annual, site and species) prepared by Clive Minton and published each year in the VWSG Bulletin.

Please advise Mark Barter of any errors in, or omissions from, this list.

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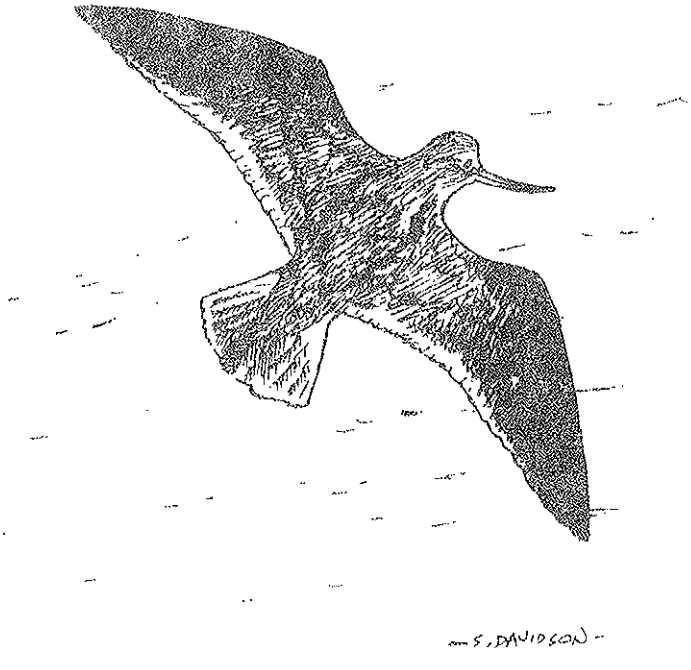
Mark Barter



TERN BANDING

The tern components of the VWSG programme were continued during 1991.

At Mud Islands, Port Phillip Bay, 1318 Crested Tern chicks were banded on 14 December. The colony was estimated at 1650 pairs. Further vegetation clearing was carried out in August before the breeding season, and there is now plenty of room for potential expansion of the colony. Breeding success seems to be consistently high each year - guesstimated at 80-90%

The Crested Terns at Corner Inlet changed to a new nesting location in 1991 - near the McLoughlin's Beach entrance - after their failure at the usual site on Box Bank in 1990. 420 pairs nested and 300 chicks were banded.

The Caspian Terns also moved from Box Bank to a new site on Clonmel Island, close to the Port Albert entrance. The population was at the usual level - 55 pairs - and 29 chicks were banded on 21 December (when there were still 37 unhatched eggs). 19 Caspian Tern chicks were also banded at Mud Islands where there was a slight increase in the number of pairs (to 30 pairs).

The Caspian Tern breeding success is noticeably lower than that of the Crested Terns, mainly due to the predation of eggs and small chicks by Silver Gulls. Crested Terns are fearless defenders of their nests and this is facilitated by the highly packed nesting colonies. Caspian Tern colonies are much smaller and more open. Also the adults are more easily disturbed and less agile in resisting attentive gulls.

As in 1990-91, no Fairy Terns are known to have nested at any of the traditional sites in Port Phillip Bay (or in Westernport) during the 1991-92 summer. It seems that the majority of the Victorian breeding population has moved to Gippsland to the new nesting habitats created by the Department of Conservation and Environment. There are now several recoveries of banded birds supporting this explanation.

Fairy Terns again tried to nest at Corner Inlet - this time at the McLoughlins Entrance end of Dream Island. There were 31 nests on 8 February 1992 - and seven chicks were banded - but a later visit suggested almost all nests had failed. In the 13 years over which visits have been made to Corner Inlet, the Fairy Terns have never been known to fledge more than a handful of chicks - in spite of repeated attempts - due to the high incidences of windblown sand and the periodic wind-assisted high tides. In most years there have been total breeding failures, even after several attempts.

A summary of the number of terns banded as chicks by the VWSG in each year is given below.

	Crested Tern		Caspian Tern		Fairy Tern	
Summer	Mud Island	Corner Inlet	Mud Island	Corner Inlet	Werribee S.F.	Corner Inlet
91-92	1318	300	19	29	–	7
90-91	1647	–	6	2	–	–
89-90	1212	397	5	62	–	25
88-89	1050	448	13	54	–	–
87-88	451	208	3	40	–	–
86-87	484	–	–	23	–	–
85-86	–	–	–	17	9	–
84-85	–	–	–	–	56	–
83-84	–	–	–	11	48	–
82-83	–	–	–	–	–	–
81-82	–	12	–	20	31	–
80-81	–	–	–	–	–	–
79-80	–	173	–	–	–	–
	6162	1538	46	258	144	32
	7700		304		176*	

* *Plus 5 at Rams Island, Westernport in Jan 82 and 2 at Swan Island, Queenscliff in Jan 88.*

The programme of banding adult Terns at Spermwhale Head, Gippsland Lakes National Park, has continued. The 1991 results were reported in the last VWSG Bulletin.

On 25-27 January 1992, four catches were made totalling:

	Newly Banded	Retraps	TOTAL
Common Tern	185	26	211
Little Tern	66	3	69
Crested Tern	2	–	2
Fairy Tern	–	1	1
	253	30	283

This was a better result than in 1991. Particularly pleasing was the larger number of Little Terns (69) caught and the number of Common Tern retraps (26) from previous years.

A Gull-billed Tern was caught at Yallock Creek on 12 January, the first by the VWSG.

There has been a further interesting collection of recoveries and controls and those are detailed in the recoveries section. A separate paper analyses accumulated Crested Tern recoveries, a map showing Caspian Tern recoveries is included in this article. Recoveries of other tern species will be analysed in future VWSG Bulletins.

Caspian Terns from the Corner Inlet colony show a strong tendency to move to the northern New South Wales and Southern Queensland coasts in winter and to remain there during their first summer (2 out of the 6 recoveries). There have been no recoveries so far of birds in their second or later years.

Clive Minton

OTHER BANDING

During the course of 1991 the following birds were banded when captured incidentally during wader catching.

Grey Teal	24	
Mountain Duck	8	
Chestnut Teal	6	
Australian Shoveler	2	
Silver Gull		7 (+ 2 controls)

Clive Minton

Analysis of recoveries of Crested Terns banded as chicks in Victoria

Introduction

The Victorian Wader Study Group has had an interest in terns, in parallel with its wader studies, since its formal inception in 1979. Terns and waders principally occupy the same coastal habitats in S.E. Australia and the investigation of both groups simultaneously is desirable and logistically compatible.

The intensity of tern studies has gradually increased over the years. From 1986 there has been a more formal and comprehensive programme of banding chicks and, since 1989, of cannon netting adult birds.

Tern banding activities and recoveries of banded birds have been reported on an ongoing basis in past VWSG Bulletins. Sufficient data has now accumulated from the banding of Crested Tern chicks for an initial analysis to be feasible and meaningful.

Objectives

This analysis investigates, for Crested Terns banded as chicks,

a) movements in relation to natal colony, by season and age
b) circumstances of recovery
c) mortality/survival rates
d) future needs

Methods

Crested Tern chicks were banded at the major colonies in Victoria at Mud Islands, Port Philip Bay, and on Box Bank, off Mann's Beach, "Corner Inlet". Smaller colonies near Mallacoota and off the western coast of Victoria were not visited.

Usually only one visit was made to a colony in a season. This was timed to coincide with the maximum number of chicks available for banding, ie. before the oldest chicks were able to fly and when most eggs had hatched. At Mud Islands, eggs were generally laid in November, chicks were usually banded between 13 - 17 December (5 out of 6 years), and chicks fledged in late December to mid January. The season was normally around two weeks later at Corner Inlet and most chicks were banded between 21 December and 10 January.

The recoveries analysed are only those reported via the Banding Office of the Australian National Parks and Wildlife Service in Canberra. These are, as near as it is possible to get, a representative random sample of movement and longevity information. The considerable number of sightings (band numbers read with telescope on live bird) obtained by Thomas Putt at Brighton Beach and by Clive Minton at Ricketts' Point, Beaumaris, have therefore been omitted from the numerical analysis and maps of recoveries, though they are referred to in the text.

Results

a) **Banding.** A total of 7700 Crested Tern chicks have been banded in the two colonies, as detailed below:-

Summer	Mud Islands	Corner Inlet
91-92	1318	300
90-91	1647	-
89-90	1212	397
88-89	1050	448
87-88	451	208
86-87	484	-
81-82	-	12
79-80	-	173
	6162	1538

b) **Colony Size.** The colony at Mud Islands has grown over the years of the study whilst that at Corner Inlet has varied widely. The number of nesting pairs has been estimated each year, as detailed below:-

Summer	Mud Islands	Corner Inlet
91-92	1650	420
90-91	1860	290
89-90	1550	600
88-89	1500	700
87-88	700	300
86-87	1000	-
81-82	-	40
79-80	-	200

The increase in the number of pairs at Mud Island has, at least in part, been facilitated by the clearance of vegetation adjacent to the colony in order to create a larger area for the birds to nest in.

The fluctuation in the number of pairs at Corner Inlet has been in part caused by habitat changes due to blown sand and storm tides. In some years no birds attempted to nest. After two complete nesting failures in the 90-91 summer near the usual site on Box Bank, the colony moved to a more sheltered site near McLoughlin's Entrance in 91-92. It is to be hoped that they continue to use this site in the future, though some habitat clearance and maintenance will be required in order to assist this.

c) **Breeding Success.** No detailed observations of hatching and fledging success have been made. However some data have been collected and this is summarised below.

At both sites the Crested Terns nest in a single dense colony laying their single egg on the sand, often in short

grass or other vegetation. Nests are usually only about 40-50 cm apart.

At Mud Island it appears that hatching and fledging success is consistently high - guesstimated at 80-90% of eggs laid producing fledged young - with almost no evidence of egg or chick losses due to predation, blown sand or storm tides. This high productivity has probably assisted colony growth once extra nesting space was made available by the clearance of tall vegetation adjacent to the colony (in 1988 and 1991).

At Corner Inlet heavy loss of eggs occurred in some years due to storm tides and windblown sand. Better success was achieved in the period 1987-88 to 1989-90 when the terns used a new grassy dune safe from tidal surges. However the vegetation on this became too rank (in part due to fertilisation by bird droppings!) and the terns were forced to nest on a lower sandy hillock in 1990-91. Both the initial laying and a subsequent renesting attempt failed. Annual breeding success at Corner Inlet thus probably varies between 0% and 80-90%.

d) **Recovery Rate.** Up to the end of May 1992 a total of 92 recoveries of Crested Terns banded as chicks had been reported. This represents a recovery rate of 1.2%. However, many banded birds are still alive and some of these will subsequently be recovered, so the rate will ultimately increase slightly.

If recoveries in the first twelve months only are considered, and if the 91-92 summer cohort are excluded as they are not yet a year old, then the recovery rates are 1.15% for birds from Mud Island (65 out of 4844 banded) and 0.9% for birds from Corner Inlet (13 out of 1238). The difference presumably results from the greater chance of a dead bird being found around the more populated areas of Port Phillip Bay, Westernport Bay and Phillip Island.

e) **Mode of Recovery.** The mode of recovery, as reported by the finder to the Banding Office, is detailed below:-

Found dead		48
Found dying	- later died	19
Found sick/injured	- later recovered	4
Found tangled in fishing gear	- dead	3
	- alive, released	10
Alive-recaptures, band number read as live bird, etc.		8
	Total recoveries	92

Over 50% were birds found dead in the sea or on the shore, with the cause of death being unknown. Another 20% were found dying and either subsequently died or were mercy killed.

A surprising feature of the recoveries was the high number reported as being associated with birds becoming entangled

in fishing gear (13 birds, 14% of recoveries). Fortunately the majority of these were subsequently released, apparently unharmed.

f) **Mortality/Survival.** Tables I and II show the period elapsed between banding and recovery for chicks from the Mud Islands and Corner Inlet colonies respectively.

Recovery rates were very much higher in the first year (86% of recoveries reported to date - excluding 1992 part year recoveries) than in the second (10%) or later years. This suggests Crested Terns suffer an unusually high mortality rate in their first year.

It is normal for first year birds in most species to have higher mortality rates. It is probable that young Crested Terns are particularly vulnerable to factors such as food shortage (due to lesser feeding skills) and storms, and rather naive in relation to accidents (such as entanglement in fishing gear).

There are insufficient recoveries as yet (only 5 relating to birds in their third year or older) for construction of a survival table and accurate calculation of first year and adult mortality relates. Banding of chicks in South Australia has shown that Crested Terns can live for over 20 years and it will take a number of years before the survival rate of Victorian birds can be calculated.

g) **Movements.** The 77 recoveries of birds from Mud Island and the 15 from Corner Inlet have been plotted on maps (Figs 1 - 4). These have been differentiated to show:-

i) the immediate post-fledging dispersal (January to March)
ii) the 'wintering' area (April to September in the first year and March to September in subsequent years).
iii) the 'summering' area (October to the following February, by year).

The analysis of these movements is given below.

i) <u>Post fledging dispersal</u>

There were 25 recoveries of birds within the first three months after fledging (Figs 1 & 4).

Nineteen were within 100 km of the natal colony. There were also over 50 sightings of live birds from Mud Islands which were still within Port Phillip Bay, but these are not included in the maps or tables.

However, a few birds had made significant movements. Most notable were two birds from Mud Islands, one of which had reached Port Macquarie (1062 km NE direct, longer via the coast) by the 9th February (only 7 weeks after being banded and probably only 5 weeks after fledging) and another which was at Manning River

(1014 km NE) by the 5th March.

Four birds had shown dispersal in a westerly direction, the opposite direction to the normal migratory movements (see later). Two birds from Corner Inlet were spotted in a flock at Beaumaris (174 km WNW) on 5th February, only 6 weeks after banding. Another from Corner Inlet crossed Bass Strait to Wynyard, Tasmania (284 km S). One from Mud Island was found near Port Fairy (211 km W). Some initial post fledging dispersal in the opposite direction to the normal migration has been reported for other species.

ii) The 'wintering' area

There were 41 recoveries of birds in the non-breeding season, defined as the period from March (April in first year) to September (Figs 2 & 4).

These were widely spread, ranging from close to the natal colony, to along the coast eastwards in Victoria and right up the New South Wales coast into southern Queensland. The furthest movement was of a bird from Mud Islands reported at Burrum Heads (just north of Fraser Island, 1632 km NNE). The movements from Mud Islands and Corner Inlet appear to be similar but more recoveries from the latter are needed to be sure of this.

Eighteen of the 32 recoveries of Mud Islands birds were from Port Phillip Bay, Westernport Bay and Phillip Island. Whilst some of these were at the beginning and end of the Mar/Apr to Sept period, and may therefore have moved further afield for part of this period, others were undoubtedly overwintering. The Crested Terns of Victoria can thus be classed as "partial migrants" with part of the population remaining close to the natal area throughout the year, whilst other segments migrate up to 1600 km.

Most recoveries were of birds in their first year. There are too few recoveries in subsequent years (8) to establish whether the wintering areas of adult birds are the same or are different (eg. remaining closer to the breeding colony). However, the recoveries so far seem to suggest that adult and immature wintering areas may be similar.

There were two recoveries showing westerly movements including a bird recovered near Adelaide (674 km W of Mud Island) in late March when it was 1 years old. This may have just been an unusually long westerly wandering or the bird may possibly have been caught up earlier in a cohort of birds from the South Australian colonies, which also migrate along the Victorian coast.

iii) The 'summering' area

There were 26 recoveries of birds in the breeding season, defined as the period from October to the following February (Figs 3 & 4).

Some birds in their first summer clearly remained on their "wintering" grounds, with recoveries from Mud Island still spread out up the coast of New South Wales. Ten out of 22 first year recoveries from Mud Island were however in or near Port Phillip Bay and there were a further 6 recoveries on the Gippsland coast, suggesting a tendency for birds to move back closer to their natal area in their first summer. There were also two movements in a westerly direction along the coast past the natal area.

There are so far only 3 recoveries in summer of birds two or more years old. They are all within 100 km of the natal area and suggest that birds do return from distant wintering areas at this age (when it is probable most breed for the first time). More data is needed.

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

The main Victorian Crested Tern populations appear to be in a reasonably healthy state at present, especially those breeding at Mud Islands. High breeding success and a probable low adult mortality rate compensate for a high mortality rate in the first year after fledging.

Habitat maintenance has been demonstrated to aid breeding success and should be continued and extended if necessary to other colonies in the future. Ongoing monitoring of breeding colony numbers and breeding success are also required.

Crested Terns utilise the Victorian coast to the east of Port Phillip Bay, the whole of the New South Wales coast and parts of the southern Queensland coast outside the breeding season. A small number of birds also move westwards along the Victorian coast in the first few months after fledging, and occasionally later.

Further banding (and the elapse of time) is still necessary to establish:-

a) the specific mortality rate of first year and adult birds
b) the 'wintering' areas of birds more than two years old
c) the 'summering' areas of birds more than two years old (? do they normally return to breed at their natal colony).

TABLE I

AGE AT RECOVERY OF CRESTED TERN CHICKS BANDED AT MUD ISLAND

Summer	Number Banded	Recoveries Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Total
91-92	1318	(7)						7
90-91	1647	24	(4)					28
89-90	1212	9	2	(-)				11
88-89	1050	11	3	2	(-)			16
87-88	451	3	-	-	-	(1)		4
86-87	484	9	1	-	-	1	(-)	11
	6162	**63**	**10**	**2**	**-**	**2**	**-**	**77**

Figures in brackets relate to 1992 part year only (Jan - May)

Year of recovery is calendar year - assumes Jan 1st average fledging date.

TABLE II

AGE AT RECOVERY OF CRESTED TERN CHICKS BANDED AT CORNER INLET

Summer	Number Banded	Recoveries Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Total
91-92	300	(2)						2
90-91	-							-
89-90	397	2	-	(-)				2
88-89	448	5	-	1	(-)			6
87-88	208	1	1	-	-			2
81-82	12	-	-	-	-			-
79-80	173	3	-	-	-			3
	1538	**13**	**1**	**1**	**-**			**15**

Figures in brackets relate to 1992 part year only (Jan-May).

Year of recovery is calendar year - assumes Jan 1st average fledging date.

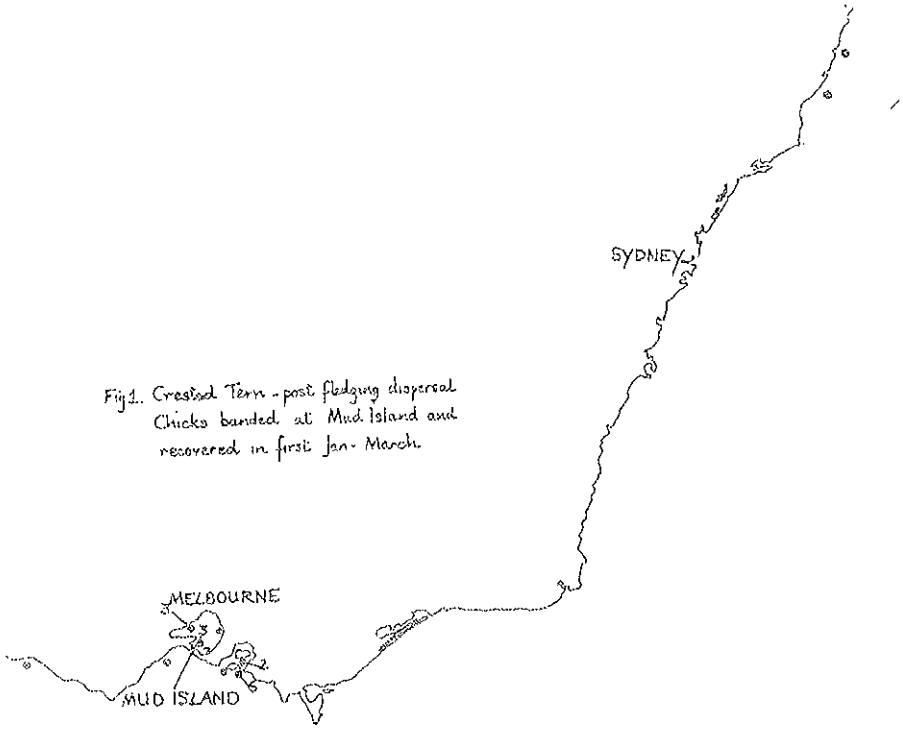


Fig 1. Crested Tern - post fledging dispersal
Chicks banded at Mud Island and recovered in first Jan - March.

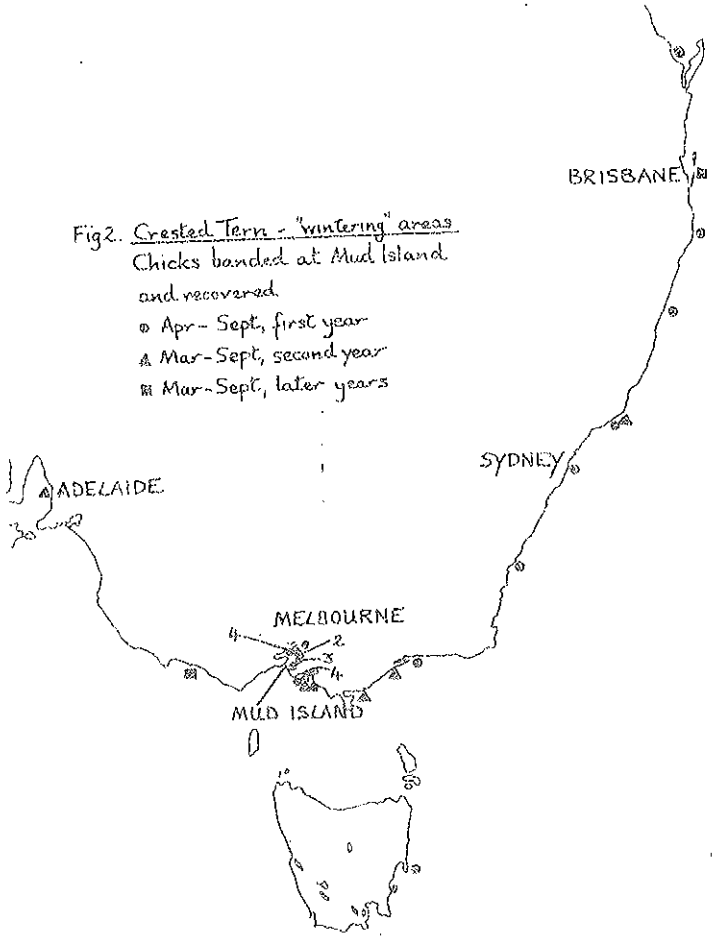


Fig 2. Crested Tern - "wintering" areas
Chicks banded at Mud Island and recovered
- Apr - Sept, first year
- Mar - Sept, second year
- Mar - Sept, later years

Fig 3. Crested Tern - "summering" areas
Chicks banded at Mud Island and recovered
● Oct, first year - Feb, second year
▲ Oct, second year - Feb, third year
■ Oct - Feb, later years

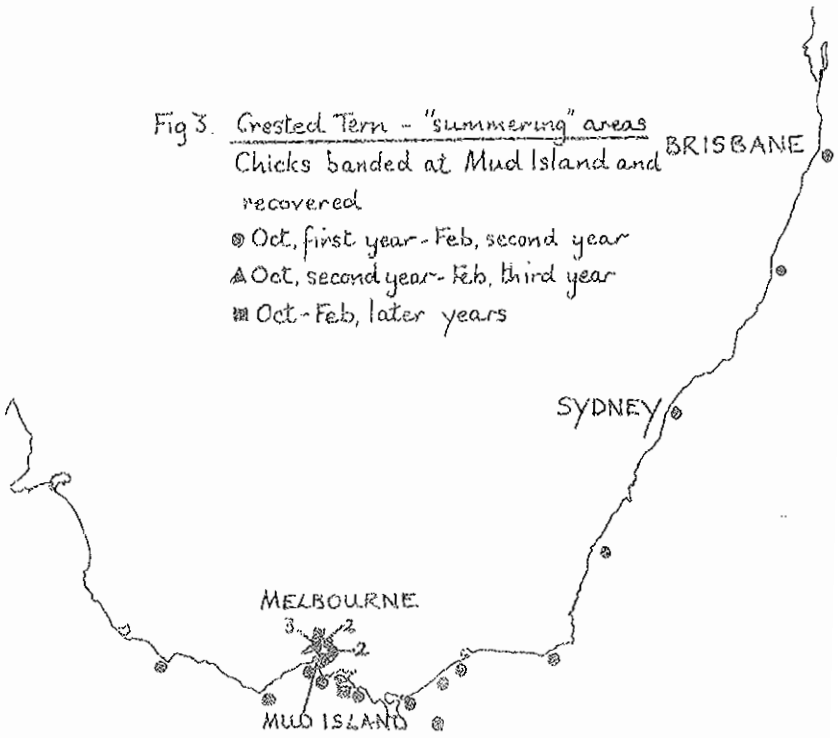
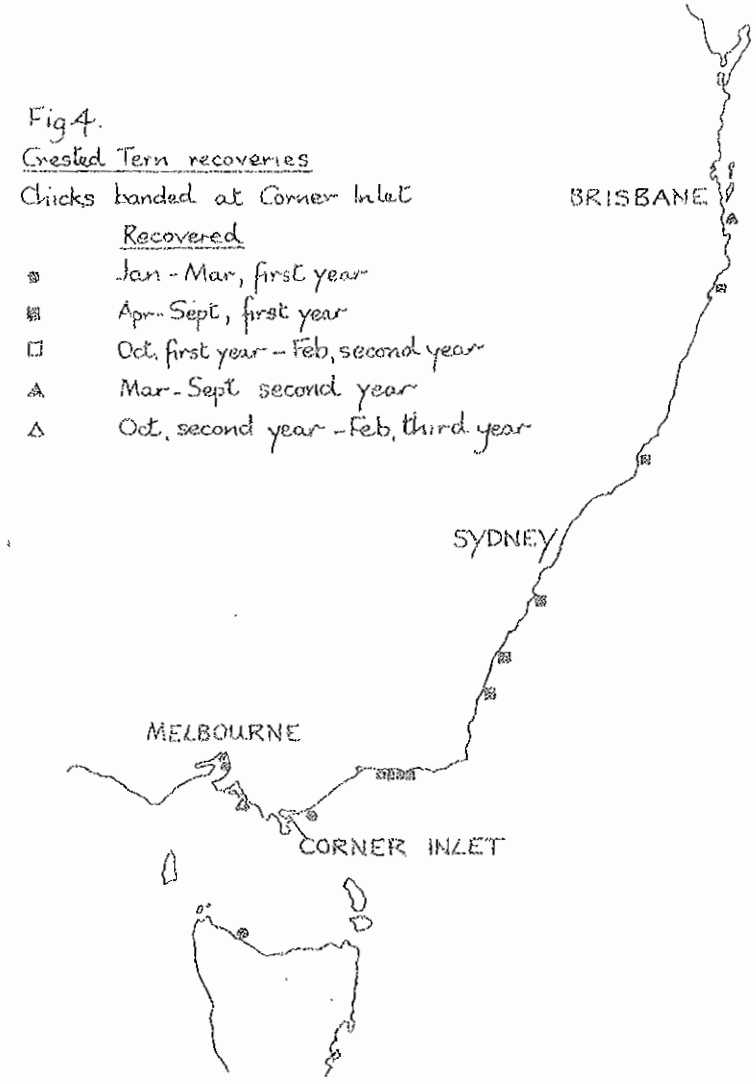


Fig 4.
Crested Tern recoveries
Chicks banded at Corner Inlet

Recovered
- ● Jan - Mar, first year
- ■ Apr - Sept, first year
- □ Oct, first year - Feb, second year
- ▲ Mar - Sept second year
- △ Oct, second year - Feb, third year



TERN THESES
Compiled by Hugo Phillipps

This is a preliminary list of tern theses relating broadly to the Australasian Region, but including one title from North America that concerns a species also occurring here. Additions and corrections are solicited.

Congdon, Bradley C. (1984). Factors influencing the ability of the Black Noddy, *Anous minutus*, to raise an enlarged brood. Hons Thesis, Griffith University: Nathan, QLD.

Cuthbert, F.J. (1981). Caspian Tern colonies of the Great Lakes: responses to an unpredictable environment. PhD dissertation, University of Minnesota: MN, U.S.A.

Dunlop, J.N. (1986). The comparative breeding biology of sympatric Crested Terns, *Sterna bergii* (Lichtenstein), and Silver Gulls, *Larus novaehollandiae* (Stephens), in south-western Australia. PhD Thesis, Murdoch University: Perth, WA.

Hulsman, Cornelis. (1977). Feeding and breeding biology of six sympatric species of tern (Laridae) at One Tree Island, Great Barrier Reef. PhD Thesis, University of Queensland: St Lucia, QLD. [pp.158.]

Lalas, C. (1977). Food and feeding behaviour of the Black-fronted Tern, *Chlidonias hybrida albostriatus*. MSc Thesis, University of Otago: Dunedin, N.Z.

Mathers, Ross. (1987). The effect of aircraft noise on the behaviour of Crested Terns, *Sterna bergii*, in their late incubation phase. BSc Hons Thesis, Griffith University: Brisbane, QLD.

Smith, Geoffrey C. (1989). Relationships between feeding and breeding of Black-naped (*Sterna sumatrana* Raffles) and Crested (*Sterna bergii* Lichtenstein) Terns in a tropical reef environment. PhD Thesis, Griffith University: Brisbane, QLD.

THE AUSTRALASIAN WADER STUDIES GROUP

Jeff Campbell

It has become apparent that quite a few members of the Victorian Wader Study Group are either not aware of the existence of the Australasian Wader Studies Group (AWSG) or ignorant of its national role in wader studies. The AWSG (which is quite distinct from the VWSG even though it shares many members)is a special interest group within the Royal Australasian Ornithologists Union and was formed in 1981. The objectives of the group are:

a) To develop,or to assist other interested bodies with the development of,plans for wader research in Australasia;

b) To coordinate and encourage counting,banding,feeding studies and other scientific studies involving amateur and professional skills;

c) To encourage and assist with the publication of results;

d) To maintain effective communication within Australasia and with similar groups in other regions;

e) To formulate and promote policies for the conservation and management of waders and their habitats.

The AWSG runs a number of cooperative projects including :

Population Monitoring. A series of twice yearly (summer and winter) counts at sites throughout Australia to monitor numbers of individual species and fluctuations of numbers at each site. In conjunction with various banding activities provides a method of monitoring breeding sucess and mortality. The Population Monitoring project began in 1986 and followed on from the RAOU National Wader Counts which ran from 1981 to 1985.

Hooded Plover Survey. Held every two years this survey counts the numbers of this vulnerable species on ocean beaches. Some surveys have covered Victoria,New South Wales and South Australia however others have only covered the Victorian coastline.

Anderson's Inlet Survey. Begun in 1991 this series of regular counts of waders in Anderson's Inlet,Inverloch(Vic) aims to determine the effect,if any,of the introduced weed Spartina on the numbers of birds using the inlet.

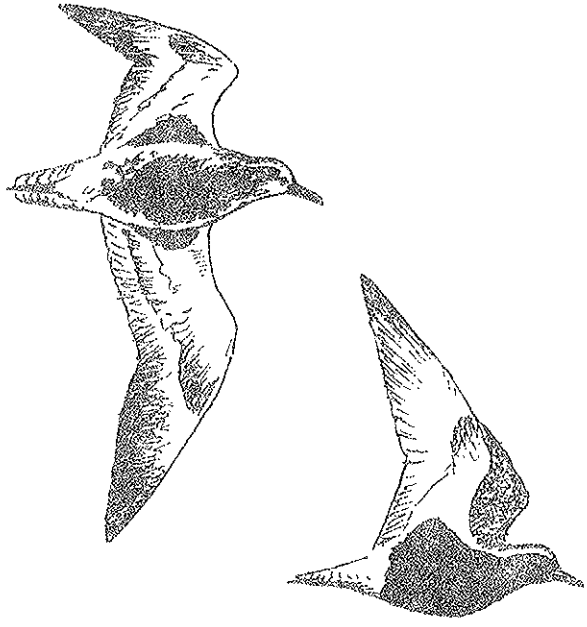
North-west Australia Wader Expeditions. To date twelve expeditions

to North-west Australia have been organised. These expeditions concentrate on banding but also include counts and the study of migration by radar observation.Some 750,000 waders use the area during the October/November period,making this the most important region for waders in Australia.

The AWSG is also engaged in many other activities including an active involvement in the conservation of waders and their habitat,responding to management and planning issues as and when they arise.In addition the group is coordinating the preparation of a management plan for waders and their habitats in Australia,by way of a grant from WWF Australia and assisting in the training of Asian ornithologists in wader study techniques whilst undertaking data collection expeditions to various Asian countries.

Much of the data collected during the above projects,plus a great deal of other interesting material from all parts of the Australasia/East Asia flyway,is published in The Stilt,which is issued twice yearly,in April and October,and is sent to all AWSG members.

For information regarding subscriptions,etc. to the AWSG please contact the AWSG Administrative Secretary,Brenda Murlis,34 Centre Road,Vermont,Vic.,3133.



—S. DAVIDSON—

HOODED PLOVER/PIED OYSTERCATCHER SURVEY REVISITED.

"Obviously, within any area, the best method to determine where major concentrations of shorebirds are located is to go to the area and look."... J. Howes & D. Bakewell. 1989.

This year the Australasian Wader Study Group (AWSG) is conducting another of its two-yearly wading bird surveys. The survey forms part of a long-term study of Australia's resident waders. The focal species of this years census are the Hooded Plover *Charadrius rubricollis* as well as the Pied Oystercatcher *Haematopus longirostris*. Both species are beach nesters and are suspected to be suffering from disturbance due to increasing recreational usage of the coastal environment. The conservation and status of the Hooded Plover, in particular, appears to require attention.

The surveys have traditionally targeted the entire Victorian coastline with varying degrees of success. This year we are aiming at 100% coverage of the Victorian coastline plus any other potential habitat we are able to cover. The survey will take place on the weekend of 7 & 8th November. Regional representatives will be appointed to administer each region. Any involvement would be welcomed. If you are interested please do not hesitate to call me during business hours on 370-1422 (RAOU) or after hours on 870-1586.

Michael Weston

VICTORIAN ORNITHOLOGICAL RESEARCH GROUP
Conference - 1992

VORG is holding a conference in the lecture theatre at Royal Children's Hospital over the weekend 9/11 October 1992 on the theme

"VORG - Thirty Years On - The Role Of The Amateur Today"

It is proposed to review the research activities of VORG over the past thirty years and to explore the possible areas of investigation which part-time workers are likely to find attractive in the future.

All interested persons are invited to attend the Conference. Further details may be obtained by writing to:

VORG CONFERENCE SECRETARIAT, PO Box 34, Balnarring Vic 3926
Gordon Cameron, Secretary (059) 83 1602

VICTORIAN WADER STUDY GROUP

FIELDWORK PROGRAMME - 1992

DATE	PLACE & OBJECTIVE	HIGH TIDE TIME	HEIGHT
Sat Jan 11	Yallock Creek Small waders	1800	2.5
Sat Jan 18	Werribee SF Small waders	1216	0.8
Sat Jan 25 - Mon Jan 27	Queenscliff/Swan Bay Small/large waders/Pd Oystercatchers	1712 to 0556	1.5 to 1.6
AND (two separate teams)			
Sat Jan 25 - Mon Jan 27	Spermwhale Head/Lakes National Park Common & Little Terns	-	-
Sun Feb 9	Stockyard Point Pied Oystercatchers	1746	2.7
Sat Feb 22- Sun Feb 23	Inverloch Small waders/Eastern Curlew	1609 1659	1.6 1.6
Sat Feb 29- Sun Mar 1	Werribee SF Pied Oystercatchers	1100 1155	0.8 0.7
Sat Mar 7- Mon Mar 9	French Island Greenshank/Pied Oystercatchers	1511 1551 1630	2.7 2.8 2.9
Thur Mar 19- Tue Mar 24	Corner Inlet Departing migrant waders/Pd & Sooty Oystercatchers	1139 to 1705	2.2 to 2.5
Sat Apr 4	Stockyard Point Pied Oystercatchers	1400	2.7
Sun Apr 5	Long Island, Hastings Pied Oystercatchers	1446	2.8
Sat May 2	Fairhaven,French Island Pied Oystercatchers	1230	2.6
Sun May 3	Werribee SF Pied Oystercatchers	1606	0.9
Sat May 16- Mon May 18	Corner Inlet & Barry Beach Pied & Sooty Oystercatchers	1143- 1352	2.3 to 2.5
Sun May 31	Queenscliff Pied Oystercatchers	1104	1.4

DATE	PLACE & OBJECTIVE	HIGH TIDE TIME	HEIGHT
Sun Jun 14	Rhyll Pied Oystercatchers	1202	2.9
Sat Jun 20	Barry Beach Pied & Sooty Oystercatchers	1602	2,3
Sat Jul 4	The Gurdies Eastern Curlew	1600	3.1
Sat Jul 11	Annual General Meeting Clive and Pat Minton's House	1030am-1030pm	
Sat Aug 1	The Gurdies Eastern Curlew	1447	3.0
Sun Aug 2	Barry Beach Pied & Sooty Oystercatchers	1440	2.5
Sun Aug 30	The Gurdies or Yallock Creek Eastern Curlew	1418	2.9
Sun Sept 27	The Gurdies or Yallock Creek Eastern Curlew	1251	2.7
Sat Oct 31	Queenscliff Red Knot and other med/large waders	1510	1.4
Sat Nov 14	Queenscliff Turnstones and small waders	1512	1.3
Sun Nov 15	Werribee S.F. Golden Plover	0730	0.9
Sat Nov 28- Sun Nov 29	Inverloch Small waders & Eastern Curlew	1508 0415	1.4 1.6
Sat Dec 13	Yallock Creek Small waders	1554	2.6
Sat Dec 19	Mud Island Crested Tern chicks	(1323 Low Tide)	
Sun Dec 27- Mon Dec 28	Werribee S.F. Small waders	1747 0700	0.8 0.9

VICTORIAN WADER STUDY GROUP INC

Financial Statement - July 1st 1991 to May 20th 1992

INCOME	$		EXPENDITURE	$	
Subscriptions	1125.00	(1170.00)	Printing	320.00	(360.00)
Donations (inc $700 for new Trailer)	727.00	(80.00)	Postage and Fax	137.58	(153.58)
Sale of Bulletins	3.00	(10.00)	Stationery & File	36.95	(23.00)
Refund for unused Colour Bands	84.00	(60.00)	Colour Bands	23.00	(548.96)
Proceeds of Trading Table	46.60	(40.00)	Incorporation Fee	27.50	(25.50)
Sale of Cannon Net & Consumables	1765.00		New Trailer & repairs	656.33	(249.92)
Income from Waterbird Count	2575.00		Waterbird Count (labour)	1909.25	
Bank Interest	46.87	(71.96)	Firing Box	195.00	
			Repairs: radio boat, firing box etc	173.91	
Cash at bank 1/7/91	513.70		Two Tarpaulins	119.90	
Cash in hand 1/7/91	122.50		Materials to make net	1134.52	
			Black Powder	544.00	
			Equipment: glue screwdrivers balances,	191.14	
			Bank charges	20.20	
			Cash at bank - 20/5/92	1437.94	
			Cash in hand - 20/5/92	81.45	
	7008.67			7008.67	

Brenda Murlis, Hon Treasurer

VICTORIAN WADER STUDY GROUP INC.
OFFICE BEARERS

Chairman :	Dr Clive Minton, 165-167 Dalgetty Road, Beaumaris, 3193 Tel. (home) 589 4901,
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Assistant Editor :	Mark Barter, 21 Chivalry Avenue, Glen Waverley, 3150 Tel. (home) 803 3330 (office) 607 1965
Committee :	The above officers and Angela Jessop Brett Lane

Subscriptions - payable to the Hon Treasurer annually in advance by 30th June.

Full Member :	$15.00
Student, Associate, Country or Interstate Member	$10.00

Paid up members receive the VWSG Bulletin free of charge

Contributions :

Original papers and those which may be reprinted, field notes and other suitable contributions are welcome. If possible they should be printed by wordprocessor or typed, using A4, with generous margins ready for direct reproduction. Preferably the lines should be single spaced with double spaces between paragraphs. Paragraphs should start at the left-hand margin. There should be two spaces at the end of each sentence. Pages should not be numbered but papers should be stapled or clipped at the top left-hand corner.

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