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**WANDERING ALBATROSS
ON ADAMS ISLAND
FEBRUARY 1991**

by

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CONTENTS

ABSTRACT	1
INTRODUCTION	1
METHODS	3
Census	3
Banding Study	3
Previous Year's Breeding Success	4
RESULTS	4
Census	4
Previous Year's Breeding Success	4
DISCUSSION	4
ACKNOWLEDGEMENTS	7
REFERENCES	7

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FEBRUARY 1991

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ABSTRACT

During February 1991, most of Adams Island was searched for Wandering Albatross nests. About 4,050 nests were in use, with adult albatross on eggs. Thirty-one chicks from the previous season still had not fledged. A large number of breeding albatross was also present. Recommendations for future counts are made.

INTRODUCTION

Wandering Albatross are a circumpolar species which breeds largely on South Georgia and Gough Islands in the South Atlantic, Prince Edward, Crozet and Kerguelen Islands in the South Indian Ocean, and Antipodes Island and Adams Island in New Zealand's subantarctic region. A number of subspecies have been recognised, including one confined to the Auckland Island group (Robertson and Warham in press).

There is growing evidence of a significant albatross by-catch by the southern blue-fin tuna long-line fishery in the New Zealand region. Wandering Albatross appear to be one of the most commonly caught species, and population declines have been noted at many of their southern ocean breeding localities outside New Zealand (Weimerskirch & Jouventin 1987).

While Wandering Albatross population estimates in 1973 showed that Adams Island supported a large proportion of the total world population of this species, no accurate counts have been carried out there. Without a succession of yearly counts of breeding pairs on Adams Island, we have little idea how the fisheries by-catch has affected this population.

During the 1972/73 breeding season, Robertson (1975) estimated that there were 7,000 breeding albatross pairs on Adams Island, less than 500 pairs on other islands of the Auckland group, and that 13,500 breeding pairs used the archipelago over a two year period. No other assessments of this population were made until a chick count on Adams Island in November 1989 found at least 1,000 chicks (Buckingham *et al.* 1991). Though this 1989 count was extensive, the two densest areas of albatross nests on Adams Island (Astrolabe Basin -Mount Dick and Lake Turbott - Fly Harbour) were only briefly searched.

In 1991, concerns were raised at the scale of the albatross by-catch. This prompted the Department of Conservation to send a team of four people to establish baseline counts for future regular monitoring of the Wandering Albatross population on Adams Island. The authors were on Adams Island from 5-25 February 1991, largely working from a campsite at Magnetic Bay, but also spending four days fly camping south-west of Fly Harbour, and one night above Amherst Stream.

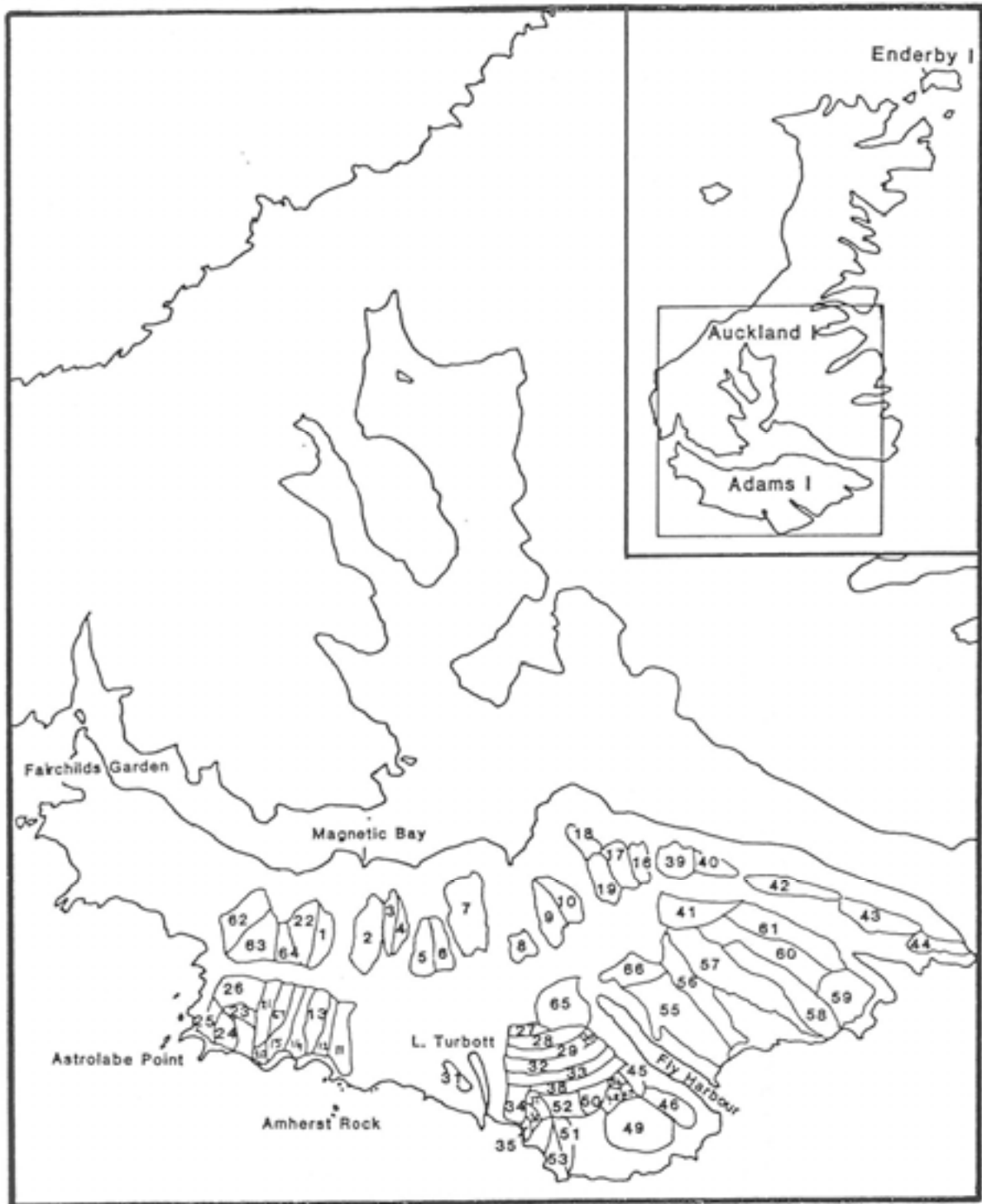


Figure 1: Map of the 67 units surveyed in the census of Wandering Albatross on Adams Island, February 1991.

METHODS

Census

Wandering Albatross nest on the open tussock slopes above the forest and scrub zone and almost all of this habitat on Adams Island was searched for Wandering Albatross nests between 23 February 1991.

A lack of time and dense fog prevented adequate searches of the tussock slopes between Fairchilds Garden and Fall Bay at the western end of Adams Island. However, only 12 chicks were present here in 1989.

Most of the Wandering Albatross population were breeding on the south-facing slopes of Adams Island (Figure 1) with the largest proportion of nests being found between Fly Harbour and Lake Turbott; and between Amherst Rock and Astrolabe Point. Here the nests were often impossible to see from vantage points due to the undulating terrain. In these two areas we worked as a team, walking four abreast either up and down the slope, or along the contours of the hill. We spaced ourselves 50-100 metres apart, within earshot of the observer on either side. The observer adjacent to uncounted territory marked the area counted by tying strips of brightly coloured tape to tussocks on the outer edge of the beat. On the next sweep this observer would take the beat immediately adjacent to his/her last one and retrieve all the tape, thus ensuring the team proceeded parallel to the previous sweep. Meanwhile, another observer would take the 'outer' beat and tie more tape marking the new edge of counted territory. Each observer zig-zagged across the slope within their defined beat. Where a nest occurred on a boundary between observers, the observers decided who would count it by calling to each other. All incubating albatross on nests were counted, and about 60% of these birds were checked for leg bands. In addition, non-breeding albatross on the ground were counted and about the same proportion checked for bands.

For the remainder of the island we worked either in pairs or singly, zig-zagging down wide ridges and counting albatross as we went, or using binoculars from vantage points. In some areas nests were counted by scanning with binoculars from an adjacent ridge.

Banding Study

To help determine causes of any gross changes in the Wandering Albatross population on Adams Island which we may detect, a banded study population was established. Recoveries of banded birds at their nests in subsequent years will enable estimates of mortality rates to be made.

On the slopes just west of Amherst Stream (from NZMS 260/886-745 to 882-744) 108 active nests were marked with small, individually numbered metal tags, covered with red plastic tape. Tags were attached to wire and stuck in the ground just out of pecking-reach of a sitting bird, generally in an area of low vegetation. The angle of the tag was recorded from the nest. Numbered metal bands were placed on the left leg of the breeding adults, their bill depth measured and the plumage of some birds described (Appendix 1). After nine days, during which time most birds had swapped incubation duties, several more visits were made to the study area to band the remaining birds. We managed to band both partners on 90 nests. Two of the 108 nests marked failed between visits.

Previous Year's Breeding Success

For some areas we also attempted to measure the breeding success of the previous year. On the slopes west of Amherst Stream, we walked seven transects with three observers spaced 20-30 metres apart, counting all nests between us and all those within about five metres of the people on the outside beats. We recorded active nests (and very recently failed nests), and those that had been used the previous breeding season. With the previous season nests, we noted whether or not a chick had fledged successfully. Where a chick had been successfully reared, the nest site showed signs of recent heavy use with much trampled and dead vegetation and many albatross droppings.

RESULTS

Census

We counted a total of 4,000 nests: 1,056 were in the Astrolabe-Amherst block; 2,475 in the Fly Harbour-Lake Turbott block; and only 469 on all other spurs combined (Figure 2 and Appendix 2). There were probably about 50 nests at the western end of the island in the area we were unable to count.

Throughout our stay all nesting adults were incubating eggs. Thirty-one unfledged chicks from the previous season were observed, and 3,013 birds were counted on the ground, but off nests. In addition, many birds were seen flying above the colony.

Amongst the 3,000 (approximately) birds checked for bands, we found six birds which had been banded in Australian waters and 22 birds banded in New Zealand territory.

Previous Year's Breeding Success

We compared the number of active nests in 1991 with the number of nests from the previous year where obviously a chick had successfully fledged. Assuming that the same number of birds breed each year (though they probably don't), the average breeding success rate in the 1990 season for birds in part of the block was 64%. We attempted this very rough estimate in case census of the albatross population was not possible.

DISCUSSION

This is the first attempt to systematically count all the Wandering Albatross nesting on Adams Island in any one year. Our count of approximately 4,050 breeding pairs is not comparable with earlier, less comprehensive surveys. Robertson's (1975) estimate of 7,000 breeding pairs in 1972/3 was not based on a systematic count, and Buckingham *et al.*'s count of 1,000 nearly fledged chicks, missed important parts of the population and was done at a different stage of the breeding cycle.

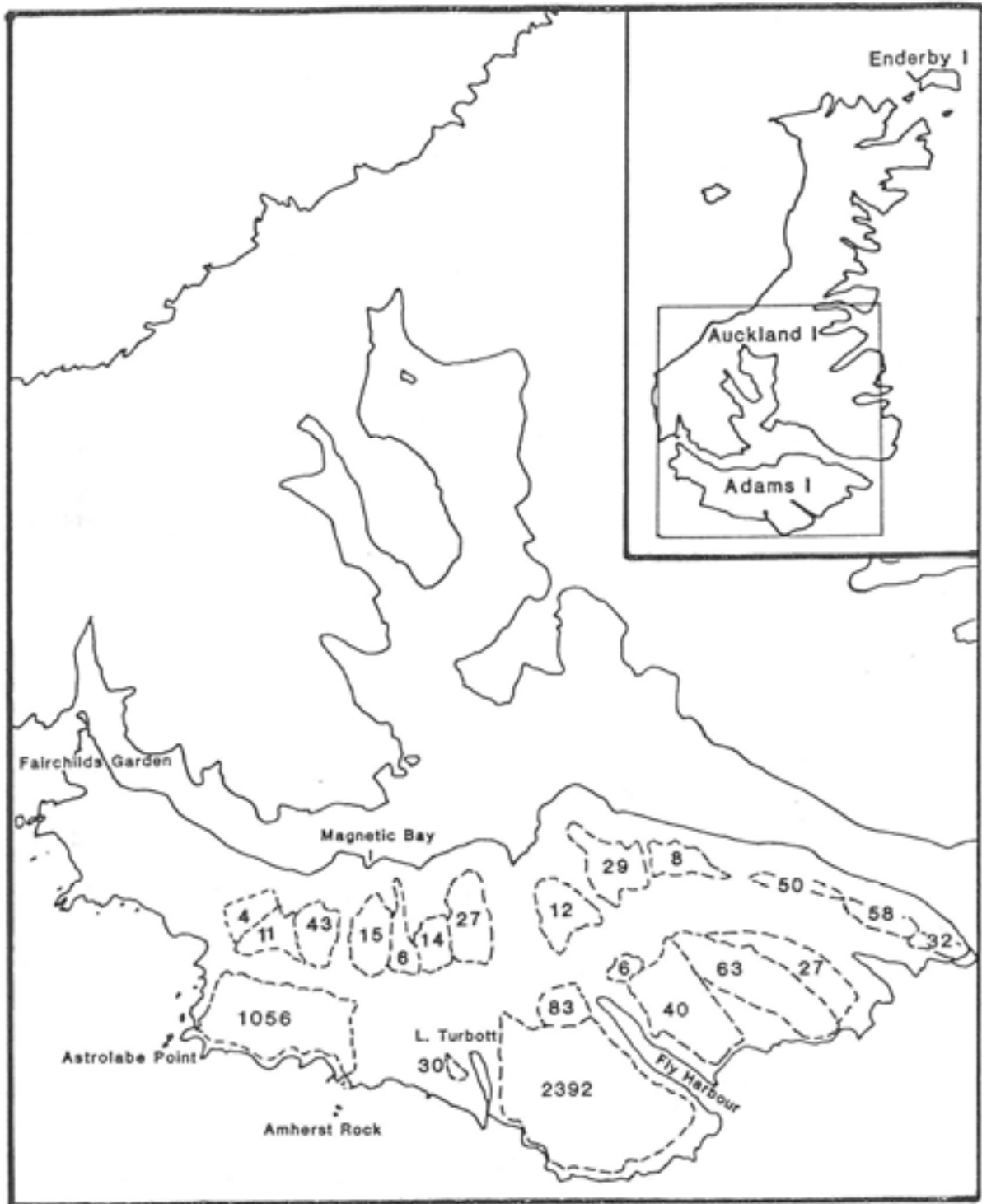


Figure 2: Numbers of Wandering Albatross (breeding pairs) on Adams Island, February 1991.

Furthermore, as Wandering Albatross are biennial breeders, the number of birds nesting on Adams Island will vary from year to year, depending on breeding success the previous year. Population monitoring of such species should be based on counts repeated two years in succession at similar stages of the breeding cycle.

Two consecutive whole island counts would give a good idea of the size of the Adams Island Wandering Albatross population. However, if insufficient time or personnel are available, future counts of Adams Island albatross should concentrate on the area between Rock and Astrolabe Point. This area contains the greatest concentration of nesting albatrosses - about quarter of the total population, and it is relatively accessible.

The accuracy of adult mortality assessments in the banded study population will be affected by our ability to relocate banded birds on their nests in future. Only 20% of Wandering Albatross at other breeding locations used the same nest in successive seasons; the remainder re-nested up to 23 metres away, and a very small percentage re-nested at distant sites (Voison 1968; Hunter 1984 cited in Marchant & Higgins 1990). Where banded birds are not recovered at marked nests, searches of nearby nests will also have to be carried out.

From rough estimates of breeding success in the previous year, it appeared that about 64% of nests successfully fledged young in the 1989/1990 season. This is within the normal range of breeding success found in other study colonies (Weimerskirch & Jouventin, 1987). This figure is only a very rough guide, however, as the calculation relies on the assumption that the same number of birds breed each year - and they probably don't.

Wandering Albatross have a low reproductive rate, high survival and delayed sexual maturity. They are particularly sensitive to decreases in adult survivorship and a decrease of only 1 % in the normal (94-96% in stable populations) could have a dramatic effect on the species (Weimerskirch & Jouventin, 1987). Small drops in survivorship on Adams Island will be difficult to detect given that normal survivorship varies on average by 2% (with considerable seasonal variation) and that a few birds will move nest site. However, any large changes in adult survival due to fishing, or other factors, should be detectable.

In 1991, it took 48 person-days to cover almost all the albatross breeding grounds on Adams Island. Six (33%) of the 18 days spent on the island were lost to bad weather, with dense mist making counts impossible. Plans for future trips should probably incorporate even more 'down' time, as February 1991 was the 'finest' (everything is relative!) for 20 years (Martin pers. comm.).

The pristine nature of Adams Island makes it important to limit party size and camp sites to the minimum compatible with safety and the collection of important conservation management data. Previous parties have all camped on the same site at Magnetic Bay and a track of sorts has been marked from the eastern end of the beach through the forest and scrub to the shorter tussock. Unfortunately the Magnetic Bay camp site involves a 2,000 foot climb every morning before dropping down on the southern side of the island to begin the days transects in the main albatross breeding grounds. Though we fly-camped for short periods on the southern side, it is extremely exposed and difficult to camp in during many weather conditions.

It is important that this population monitoring of Wandering Albatross on Adams Island should continue in some form. If an expedition was to visit Adams Island during the summer of 1992 and 1993, it would contribute greatly to our knowledge of Wandering Albatross if the whole of Adams Island could be re-counted. This is a big task and would need a team of four fit people based there for two or three weeks. However, if the whole island cannot be counted, at least the area between Amherst Rock and Astrolabe Point should be recounted, and the 'study colony' re-checked for banded birds. As before, the party should be based at Magnetic Bay, with provision for fly camping if weather permits.

ACKNOWLEDGEMENTS

Thanks to Alison Davis for practical support and encouragement, and to her, Lou Sanson and Janice Molloy for getting the project off the ground. Thanks also to Peter Willems and other Southland Department of Conservation staff and Trish Bollom (Auckland Department of Conservation) for logistical support.

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APPENDIX 1 - Wandering Albatross Banded On Adams Island, February 1991

NEST NO.	ANGLE TO TAG	ANGLE NEXT NEST	DISTANCE NEXT NEST	BIRD 1			BIRD 2		
				DATE BANDING	BAND NO./SEX	BILL DEPTH	DATE BANDING	BAND NO./SEX	BILL DEPTH
FS 15025 495m a.s.l. GR 885-747 Calms above & to left of nest	304°	163°	234 metres	11.2.91	R 42601 M	40.3	23.2.91	R 42779 F	34.7
FS 15026	79°	130°	210 metres	11.2.91	R 42602 M	36.1	23.2.91	R 42780 F	34.8
FS 15027	340°	212°	53 metres	11.2.91	R 42603 F	31.9	23.2.91	R 42781 M	35.6
FS 15028	70°	264°	25 metres	11.2.91	R 42604 M	34.3	20.2.91	R 42713 F	31.4
FS 15029	312°	28°	20 metres	11.2.91	R 42605 F	31.9	23.2.91	R 42782 M	33.9
FS 15030	232°	292°	33 metres	11.2.91	R 42606 M	42.6	20.2.91	R 42714 F	32.4
FS 15031	350°	228°	18 metres	11.2.91	R 42607 F	33.8	20.2.91	R 42715 M	36.0
FS 15032	70°	284°	47 metres	11.2.91	R 42608 M	35.9	23.2.91	R 42783 F	33.7
FS 15033	265°	200°	28 metres	11.2.91	R 42609 F	33.5	11.2.91	R 42610 M	34.7
FS 15034	67°	136°	80 metres	11.2.91	R 42611 M	37.1	11.2.91	R 42612 F	31.1
FS 15035	330°	232°	21 metres	11.2.91	R 42613	32.9			
FS 15036	302°	62°	125 metres	11.2.91	R 42614	32.3			
FS 15037	80°	118°	81 metres	11.2.91	R 42615 M	34.9	20.2.91	R 42716 F	31.8
FS 15038	240°	242°	8 metres	11.2.91	R 42616 F	33.5	20.2.91	R 42717 M	34.9
FS 15039	58°	230°	100 metres	11.2.91	R 42617	30.5			
FS 15040	260°	194°	130 metres	11.2.91	R 42618 M	35.6	20.2.91	R 42718 F	32.1
FS 15041	30°	118°	66 metres	11.2.91	R 42619	37.2			
FS 15042	247°	87°	38 metres	11.2.91	R 42620 F	32.3	20.2.91	R 42719 M	35.8
FS 15043	312°	126°	35 metres	11.2.91	R 42621 F	30.7	20.2.91	R 42720 M	35.3
FS 15044	293°	214°	24 metres	11.2.91	R 42622 M	35.9	20.2.91	R 42721 F	30.8
FS 15045	304°	201°	90 metres	11.2.91	R 42623 M	35.0	20.2.91	R 42722 F	34.6
FS 15046	60°	203°	14 metres	11.2.91	R 42624 M	36.6	20.2.91	R 42723 F	34.0

NEST				BIRD 1			BIRD 2		
NEST NO.	ANGLE TO TAG	ANGLE NEXT NEST	DISTANCE NEXT NEST	DATE BANDING	BAND NO./SEX	BILL DEPTH	DATE BANDING	BAND NO./SEX	BILL DEPTH
FS 15047	135°	240°	4 metres	11.2.91	R42625	36.9			
FS 15048	262°	139°	70 metres	11.2.91	R42626	36.5	23.2.91	R42784	35.7
FS 15049	51°	171°	23 metres	11.2.91	R42627	37.4	11.2.91	R42628	32.8
FS 15050	343°	23°	27 metres	11.2.91	R42629	34.1	20.2.91	R42724	32.9
FS 15051	77°	30°	17 metres	11.2.91	R42630	34.4	20.2.91	R42725	36.1
FS 15052	293°	355°	82 metres	11.2.91	R42631	35.9	20.2.91	R42726	36.6
FS 15053	78°	48°	55 metres	11.2.91	R42632	37.2	20.2.91	R42727	33.7
FS 15054	245°	64°	57 metres	11.2.91	R42633	35.9			
FS 15055	28°	44°	52 metres	11.2.91	R42634	35.5	20.2.91	R42728	32.0
FS 15056	20°	94°	23 metres	11.2.91	R42635	33.7	20.2.91	R42729	36.2
FS 15057	230°	195°	12 metres	11.2.91	R42636	35.2	11.2.91	R42637	31.8
FS 15058	314°	192°	42 metres	11.2.91	R42638	31.5	20.2.91	R42730	35.8
FS 15059	360°	113°	37 metres	11.2.91	R42639	35.4			
FS 15060	220°	164°	36 metres	11.2.91	R42640	36.5	20.2.91	R42731	31.3
FS 15061	40°	157°	8 metres	11.2.91	R42641	34.1	23.2.91	R42705	32.3
FS 15062	68°	48°	21 metres	11.2.91	R42642	33.5	20.2.91	R42732	36.7
FS 15063	103°	190°	81 metres	11.2.91	R42643	32.6	20.2.91	R42733	36.4
FS 15064	284°	80°	17 metres	11.2.91	R42644	33.0	20.2.91 Egg lost 20.2.91	R42734	33.7
FS 15065	117°	81°	32 metres	11.2.91	R42645	34.0	Egg lost 20.2.91		
FS 15066	286°	171°	61 metres	11.2.91	R42646	37.5			
FS 15067	291°	101°	20 metres	11.2.91	R42647	33.6	21.2.91	R42735	35.9
FS 15069	223°	142°	16 metres	11.2.91	R42648	35.3			
FS 15068	267°	204°	31 metres	11.2.91	R42649	33.3	21.2.91	R42736	37.7
FS 16400	39°	149°	22 metres	11.2.91	R42650	35.5	21.2.91	R42737	33.9

NEST				BIRD 1			BIRD 2		
NEST NO.	ANGLE TO TAG	ANGLE NEXT NEST	DISTANCE NEXT NEST	DATE BANDING	BAND NO./SEX	BELL DEPTH	DATE BANDING	BAND NO./SEX	BILL DEPTH
FS 16401	81*	159*	6 metres	11.2.91	R42651 M	35.6	21.2.91	R42738 F	34.7
FS 16402	135*	245*	5 metres	11.2.91	R42652 F	31.8	21.2.91	R42739 M	36.8
FS 16403	239*	145*	31 metres	11.2.91	R42653 M	35.2	21.2.91	R42740 F	32.0
FS 16404	111*	163*	5 metres	11.2.91	R42654 M	36.1	21.2.91	R42741 F	34.3
FS 16405	137*	97*	30 metres	11.2.91	R42655 F	32.2	21.2.91	R42742 M	35.1
FS 16406	291*	193*	41 metres	11.2.91	R42656 M	34.2	21.2.91	R42743 F	33.1
FS 16407	222*	184*	13 metres	11.2.91	R42657 F	30.8	21.2.91	R42744 M	36.5
FS 16408	97*	157*	36 metres	11.2.91	R42658 M	35.0	21.2.91	R42745 F	33.3
FS 16409	110*	325*	57 metres	11.2.91	R42659 M	36.3	21.2.91	R42746 F	32.3
FS 16410	341*	290*	33 metres	11.2.91	R42660 M	34.6	23.2.91	R42786 F	32.1
FS 16411	101*	349*	42 metres	11.2.91	R42661 F	31.9	21.2.91	R42747 M	35.9
FS 16412	89*	267*	75 metres	11.2.91	R42662 F	31.7	21.2.91	R42748 M	37.7
FS 16413	36*	250*	23 metres	11.2.91	R42663 F	29.8	21.2.91	R42749 M	37.1
FS 16414	110*	336*	26 metres	11.2.91	R42664 M	34.4	21.2.91	R42750 F	32.7
FS 16415	241*	219*	41 metres	11.2.91	R42665 M	38.8	21.2.91	R42751 F	33.2
FS 16416	105*	300*	12 metres	11.2.91	R42666 M	34.5	23.2.91	R42787 F	33.1
FS 16417	60*	297*	19 metres	11.2.91	R42667 F	31.7	21.2.91	R42752 M	35.9
FS 16418	7*	289*	16 metres	11.2.91	R42668	36.5			
FS 16419	117*	301*	23 metres	11.2.91	R42669 F	32.7	21.2.91	R42753 M	34.9
FS 16420	351*	15*	5 metres	11.2.91	R42670 M	35.8	23.2.91	R42788 F	32.2
FS 16421	243*	41*	9 metres	11.2.91	R42671	31.8			
FS 16422	50*	178*	74 metres	11.2.91	R42672 F	32.7	21.2.91	R42754 M	35.8
FS 16423	262*	324*	21 metres	11.2.91	R42673 M	36.4	23.2.91	R42789 F	34.3
FS 16424	196*	306*	44 metres	11.2.91	R42674 F?	34.0	21.2.91	R42755 M?	34.3

NEST NO.	NEST			BIRD 1			BIRD 2		
	ANGLE TO TAG	ANGLE NEXT NEST	DISTANCE NEXT NEST	DATE BANDING	BAND NO./SEX	BILL DEPTH	DATE BANDING	BAND NO./SEX	BILL DEPTH
FS 16425	51°	327°	44 metres	11.2.91	R42675	28.9			
FS 16426	296°	276°	32 metres	11.2.91	R42676	34.5	21.2.91	R42756	F 32.5
FS 16427	90°	69°	31 metres	11.2.91	R42677	31.7	21.2.91	R42757	M 35.5
FS 16428	161°	353°	6 metres	11.2.91	R42678	34.2	23.2.91	R42798	M --
FS 16429	173°	14°	21 metres	11.2.91	R42679	34.9	21.2.91	R42758	F 33.6
FS 16430	86°	292°	9 metres	11.2.91	R42680	35.0	21.2.91	R42759	F 33.0
FS 16431	114°	36°	22 metres	11.2.91	R42681	35.0	23.2.91	R42790	F 32.8
FS 16432	59°	70°	7 metres	11.2.91	R42682	34.2	23.2.91	R42791	F 33.7
FS 16433	55°	296°	53 metres	11.2.91	R42683	30.8	23.2.91	R42792	M 37.3
FS 16434	5°	202°	111 metres	11.2.91	R42684	37.3	21.2.91	R42760	F 31.3
FS 16435	96°	237°	28 metres	11.2.91	R42685	35.5	21.2.91	R42761	F 32.4
FS 16436	167°	247°	42 metres	11.2.91	R42686	34.1	21.2.91	R42762	F 32.7
FS 16437	29°	270°	153 metres	11.2.91	R42687	34.6	23.2.91	R42793	F 32.7
FS 16438	243°	255°	66 metres	11.2.91	R42688	37.3	21.2.91	R42763	F 33.6
FS 16439	114°	327°	22 metres	11.2.91	R42689	33.1	23.2.91	R42794	F? 33.2
FS 16440	120°	343°	15 metres	11.2.91	R42690	32.6			
FS 20121	97°	303°	24 metres	12.2.91	R42692	32.7			
FS 20122	105°	227°	62 metres	12.2.91	R42693	31.2	21.2.91	R42764	M 36.6
FS 20123		245°	40 metres	12.2.91	R42694	35.5	21.2.91	R42765	F 32.7
FS 20124	209°	30°	29 metres	12.2.91	R42695	35.7	21.2.91	R42766	F 32.3
FS 20125	101°	357°	28 metres	12.2.91	R42696	39.4	21.2.91	R42767	F 33.6
FS 20126	57°	35°	17 metres	12.2.91	R42697	34.9	23.2.91	R42795	M 38.0
FS 20127	43°	59°	31 metres	12.2.91	R42698	33.2	21.2.91	R42768	M 35.9
FS 20128	9°	352°	10 metres	12.2.91	R42699	33.7	23.2.91	R42796	M 35.0

5

NEST				BIRD 1			BIRD 2		
NEST NO.	ANGLE TO TAG	ANGLE NEXT NEST	DISTANCE NEXT NEST	DATE BANDING	BAND NO./SEX	BILL DEPTH	DATE BANDING	BAND NO./SEX	BILL DEPTH
FS 20129	89°	267°	29 metres	12.2.91	R42700 M	37.3	21.2.91	R42769 F	35.0
FS 20130	231°	304°	34 metres	12.2.91	R42701 M	34.2	21.2.91	R42770 F	31.7
FS 20131	51°	52°	16 metres	12.2.91	R42702 M	36.6	21.2.91	R42771 F	34.3
FS 20132	104°	110°	8 metres	12.2.91	R42703	33.9			
FS 20133	17°	81°	46 metres	12.2.91	R42704 F	32.8	21.2.91	R42772 M	36.5
FS 20134	115°	337°	8 metres	12.2.91	R42705 F	29.7	21.2.91	R42773 M	35.6
FS 20135	69°	28°	29 metres	12.2.91	R42706 M?	35.5	21.2.91	R42774 F?	35.3
FS 20136	39°	51°	54 metres	12.2.91	R42707 F	32.0	21.2.91	R42775 M	35.2
FS 20137	119°	327°	12 metres	12.2.91	R42708 M	36.6	21.2.91	R42776 F	30.5
FS 20138	357°	15°	45 metres	12.2.91	R42709	34.5			
FS 20139	173°	25°	64 metres	12.2.91	R42710 M	36.9	21.2.91	R42777 F	31.5
FS 20140	6°	75°	65 metres	12.2.91	R42711 F	33.1	23.2.91	R42797 M	36.0
FS 20143	9°			12.2.91	R42712 M	37.9	21.2.91	R42778 F	33.4
FS 20144	On Magnetic Bay - tops track Grid Ref. = 892-772		Already banded	12.2.91	829131 F		12.2.91	R42691 M	

APPENDIX 2 - Wandering Albatross Counted Within Arbitrary Units

UNIT NUMBER	DATE SURVEYED	NUMBER OF NESTS BEING USED	NON-BREEDING BIRDS ON THE GROUND (BOGS)	FLEDGLINGS FROM THE PREVIOUS BREEDING SEASON	COMMENTS
1		20			
2		15			
3		1			
4		5	8		
5		7			
6		7			
7		27	11		
8		-			
9		11			
10	10.2.91	1			
11	7.2.91	140	43	1	
12	7.2.91	29	20		
13	7.2.91	46	18		
14	7.2.91	123	109	2	
15	7.2.91	135	176	3	
16	10.2.91	3			
17	10.2.91	7			
18	10.2.91	10			
19	10.2.91	9			
20	12.2.91	46	24	1	
21	12.2.91	126	123	1	About 40 flying non-breeders.
22	12.2.91	23			
23	15.2.91	166	51	2	
24	15.2.91	72	32		
25	15.2.91	48	55	1	} About 40 flying non-breeders.
26	15.2.91	103	143		
27	16.2.91	94	135	1	
28	16.2.91	368	308	2	
29	17.2.91	322	109	2	
30	17.2.91	31	6		
31	16.2.91	30	32		Counted using binoculars.
32	17.2.91	471	281	3	
33	17.2.91	312	247	4	
34	17.2.91	89	125	1	
35	17.2.91	28	11		Below lowest bluff was counted from GR 924-724 using binoculars.
36	17.2.91	65	38		Between two lines of bluffs counted from GR 924-724 using binoculars.

UNIT NUMBER	DATE SURVEYED	NUMBER OF NESTS BEING USED	NON-BREEDING BIRDS ON THE GROUND (BOGS)	FLEDGLINGS FROM THE PREVIOUS BREEDING SEASON	COMMENTS
37	17.2.91	22	42		Top row of bluffs to skyline counted by binoculars from GR 924-724.
38	17.2.91	236	220	1	
39	19.2.91	3			Binoc'd from top of ridge.
40	18.2.91	5	2		Binoc'd from top of ridge.
41	18.2.91	-			Binoc'd from opposite ridge.
42	18.2.91	50	38		
43	18.2.91	58	55		
44	18.2.91	32	30		Also 11 Royal Albatross nests. 15 Royal Albatross bogs. 4 Royal Albatross flying.
45	19.2.91	63	76		
46	19.2.91	2	3		Binoc'd from GR 952-729.
47	19.2.91	24	40		
48	19.2.91	39	44		Binoc'd from GR 947-728 and ground walk.
49	19.2.91	50	21	1	Binoc'd and walked GR 945724-953724.
50	19.2.91	28	7	1	Binoc'd from GR 943726.
51	19.2.91	34	14		Binoc'd from GR 943-722.
52	19.2.91	46	55	3	
53	19.2.91	15	12		Binoc'd from GR 932-723.
54	19.2.91	53	46		
55	19.2.91	25	32		Binoc'd from GR 948-735.
56	18.2.91	15	10		Binoc'd from GR 975-764.
57	18.2.91	16	8		Walked/counted top; binoc'd down slope.
58	18.2.91	47	46		Walked/counted top; binoc'd down slope. Also Royal Albatross: 1 nest (2-3 day hatchling; 6 bogs (5 immature).
59	18.2.91	8	15		Binoc'd from 993765.
60	18.2.91	19	24		
61	18.2.91	46	14		Ground count and binoc'd from top down.
62	14.2.91	4			Counted using binoculars.
63	14.2.91	7			Counted using binoculars.
64	14.2.91	4			Counted using binoculars.
65	16.2.91	83			Counted using binoculars.
66	18.2.91	6	5		Counted using binoculars.
67	12.2.91	19	33	1	