

Monitoring Antipodean wandering albatross, 2000/01

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ABSTRACT

The Antipodean wandering albatross (*Diomedea antipodensis*) is endemic to the Antipodes Islands in the New Zealand subantarctic, and is caught as a bycatch of long-line fishing. In 1994 a study began to determine whether the bycatch levels were sustainable. This paper reports on progress made on this study between 1 July 2000 and 30 June 2001. Productivity for the 2000 breeding season was 75%, and the average for the last seven years was 74.7%. In 2000, 89 chicks were banded, making a total of 640 chicks banded since annual banding for assessment of recruitment began in 1995. Data on the return of banded adults to the study area enabled estimation of adult survival between 1994 and 1999 of 96%, with little difference between male and female survival. A total of 603 nests with eggs were counted in February 2001 in two representative blocks on Antipodes I. The average number of nests in these blocks for 1994–2001 is 623 (range 572–694). Satellite tracking of eight birds throughout 2000 showed the seas most frequently used by breeding birds were those to the north-east and south-east of the Chatham Islands. Some individual albatross have favoured foraging areas which means that large numbers of albatross need to be tracked to reliably assess patterns of ocean use.

Keywords: Antipodean wandering albatross, *Diomedea antipodensis*, breeding success, recruitment, adult survival, nest census, satellite tracking, at-sea distribution.

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1. Introduction

The great albatrosses (*Diomedea* spp.) are among the most spectacular sights of the Southern Ocean, with their huge wingspans (> 3 m) and graceful, soaring flight. Half of all the world's wandering albatross species nest in the New Zealand subantarctic on windswept islands far from human influence. However, most of their lives are spent at sea, and significant numbers have been killed as a bycatch of fishing activity since long-line fishing started in the Southern Ocean in the 1960s.

The well-studied South Atlantic and South Indian Ocean species of wandering albatross declined by more than 50% between 1964 and 1994 as a result of increased adult and juvenile mortality caused by fisheries bycatch (Croxall et al. 1990; de la Mare & Kerry 1994; Weimerskirch & Jouventin 1987; Weimerskirch et al. 1997). In New Zealand the endemic species of wandering albatross, Antipodean and Gibson's wandering albatrosses (*Diomedea antipodensis* and *D. gibsoni*) have been regularly observed as bycatch on both foreign and New Zealand southern bluefin tuna fishing boats (Murray et al. 1993), but there has been no information on whether the level of bycatch was having a significant impact on their populations.

In 1995, the New Zealand Government commissioned research on both Gibson's and Antipodean wandering albatrosses and levied the New Zealand tuna fishers (the Conservation Services Levy) to help pay for it. The main aim of the research was to determine whether the levels of bycatch were sustainable, and this required the collection of data on productivity, survival and recruitment. Wandering albatross are long-lived (> 40 years), mature late (> 10 years), and produce a chick only once every 2-3 years. These features not only make their populations particularly susceptible to increased mortality caused by fishing activity, but makes study of their population dynamics difficult and slow.

The second aim of the research was to identify ocean areas where albatross activity was concentrated and overlapped with fisheries.

From work on wandering albatrosses elsewhere, it was known in advance that it would take at least a decade to obtain reliable estimates of survival and productivity, and 15 years for recruitment. Similarly population trends would emerge only after many years of annual counts of nests, as the albatrosses' biennial breeding causes considerable inter-annual variation in the number of birds nesting.

This paper reports on progress made in studying the population dynamics and foraging distribution of Antipodean wandering albatrosses during the Department of Conservation's financial year 1 July 2000 to 30 June 2001. Albatross nesting takes a full year, and this paper describes the end of the breeding cycle for birds that started nesting in January 2000, and the beginning of the breeding cycle for birds that started nesting in January 2001.

It is one of a series of annual progress reports on this research (Amey et al. 1994; Hamilton et al. 2002; Walker & Elliott 2002a, 2002b, 2002c; Walker et al.

2002) and, like the earlier reports, it describes only the work carried out in the previous year. Comprehensive analysis is being carried out and published as sufficient data are collected.

2. Overview of the study

Ninety-nine percent of Antipodean wandering albatrosses nest on Antipodes I., which is about 730 km south-east of the New Zealand mainland (see map, Walker & Elliott 2002a, fig.1). The island is about 2025 ha, is treeless and covered in tussocks and ferns. Wandering albatross nest in relatively uniform densities all over the island, but avoid areas of tall vegetation and the bare exposed tops of hills and ridges (Walker & Elliott 2002a).

The survivorship and breeding history of about 750 individually marked birds that regularly nest in a 29 ha study area at the north-eastern end of Antipodes I. have been followed since 1994. Each year all birds visiting the study area are identified so that survivorship can be calculated. Each nest is mapped so that its success can be judged a year later, and any chicks produced are banded for later estimation of recruitment. The number of pairs nesting in the study area and two other parts of the island are counted annually to assess population trends.

In February 2000, satellite transmitters were attached to four male and four female Antipodean wandering albatrosses while they were incubating eggs on Antipodes I. These transmitted throughout 2000 and allowed tracking of the birds' movements while they foraged at sea.

3. Population dynamics

3.1 METHODS

3.1.1 Breeding success

To assess breeding success in 2000, we counted the chicks present in late December 2000 in three areas in which the number of nests with eggs had been counted the previous February. The three areas were in different parts of the island to assess spatial variation in breeding success, and two were less visited than the other to assess the possible impact of disturbance.

The three areas were our study area (29 ha) on the North Plains, Pipit Peak (18 ha) on the slopes of Mt Waterhouse near the centre of the island, and Block 32 (21 ha) near the south coast (Fig. 1). The chicks were counted in these three blocks on 20-22, 22 and 23 December 2000 respectively. Chicks at Pipit Peak and Block 32 were counted using our normal census 'sweep' technique (see Walker & Elliott 2002c), whereas nests in the study area had been mapped in the previous summer and were individually relocated.

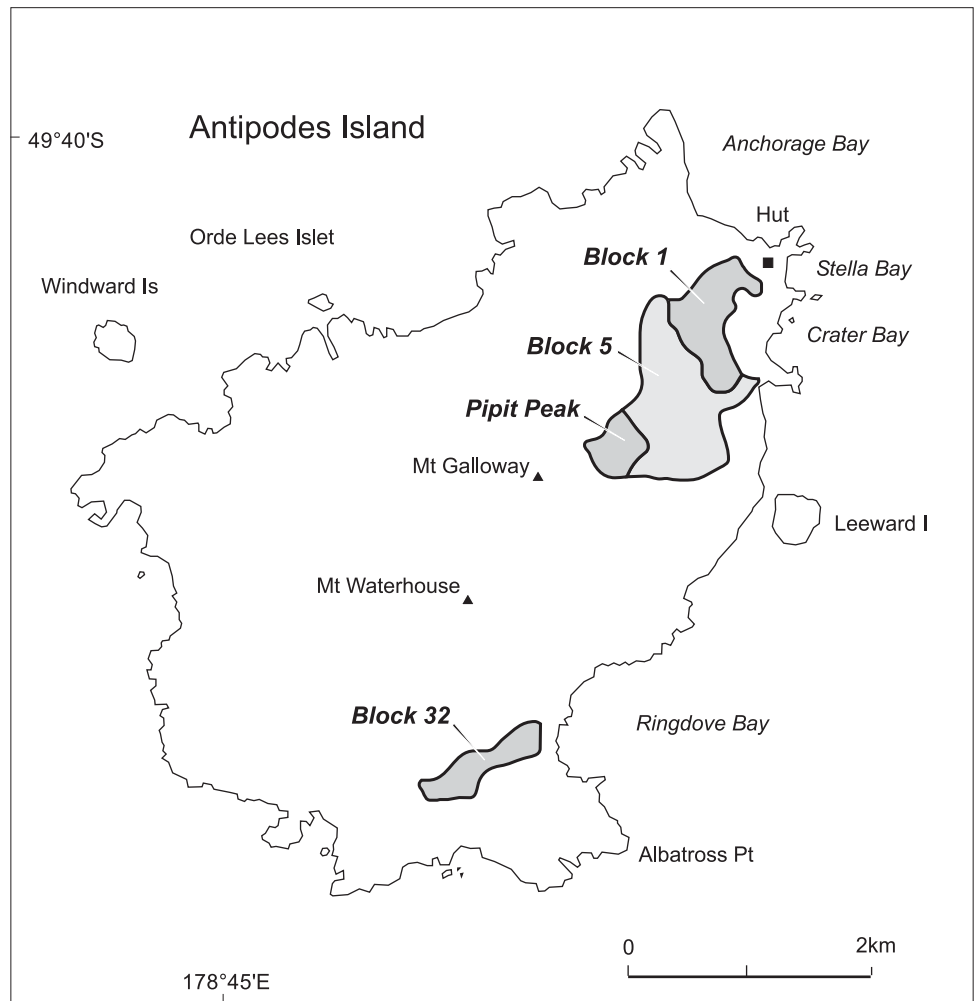


Figure 1. Location of main study area (Block 1) on Antipodes I. and two additional blocks used for assessing productivity.

To facilitate assessment of 2001 breeding success we counted the nests with eggs at Pipit Peak and Block 32 on 9 and 12 February 2001, respectively, and we mapped all the nests with eggs in our study area during repeated visits between 4 January and 13 February 2001 (Fig. 2).

3.1.2 Recruitment

To enable future assessment of recruitment, we banded all the chicks present in the study area on 20–22 Dec 2000 with both numbered metal and darvic bands.

3.1.3 Adult survival, productivity and incubation behaviour

Between 4 January and 13 February 2001 we visited the study area every second day and:

- read the bands of all birds encountered in or near the study area,
- marked nests with eggs and mapped their positions using GPS,
- measured and banded with numbered metal and darvic bands any unbanded birds nesting in the study area,
- repeatedly checked every nest and potential nest to determine laying dates and incubation shift lengths.

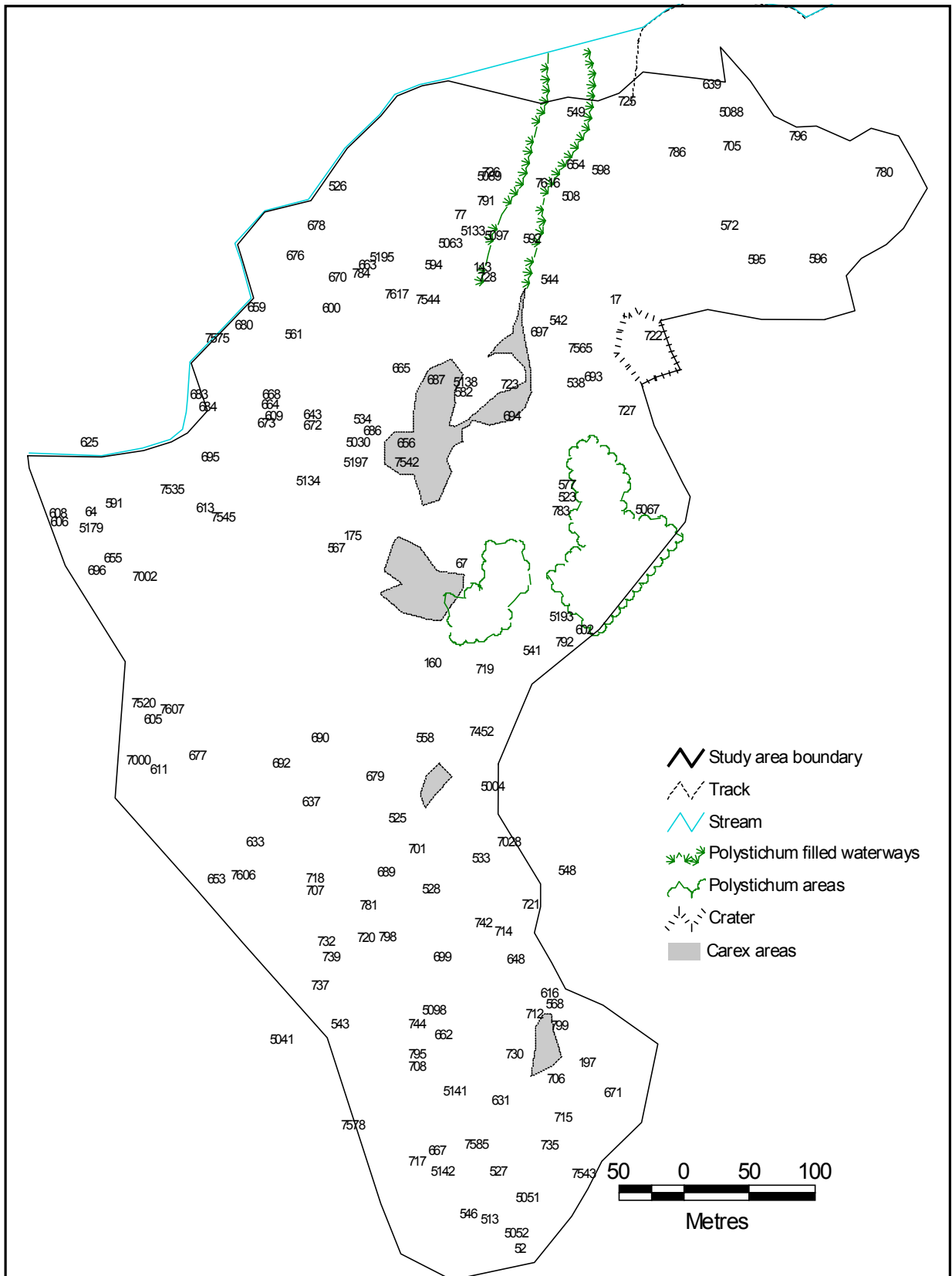


Figure 2. Antipodean wandering albatross nests in the study area on Antipodes Island, Jan and Feb 2001.

3.2 RESULTS

3.2.1 Breeding success in the 2000 season

There were 123 nests in the study area in the 2000 season. However, at eight of these nests a satellite transmitter was attached to one of the parents, and since this may have affected their breeding success, such nests were excluded from breeding success estimates, as in previous seasons. Of the remaining 115 nests in the study area, 87 had chicks on 22 December and one chick had already fledged, giving a breeding success of 76.5% in 2000. None of the chicks banded in the study area in December 2000 had died before we left the island on 14 February, but three (Table 1) were small and undeveloped and might subsequently have died, thereby reducing fledging rate.

In January 2001 the remains of a chick (R54048, White-344) banded in the study area in 1999 were found in tall fern not far from its nest. The failure of this bird to fledge reduces our earlier estimate of breeding success in 1999. Breeding success since 1994 is presented in Table 2.

At Pipit Peak and in Block 32 we found no evidence that chicks had fledged before our count. Breeding success in these two blocks is presented in Table 3. Since the breeding success in the study area was similar to, or higher than the breeding success in the two other blocks which were visited much less often, it seems unlikely that visits by researchers has an impact on breeding success.

TABLE 1. ANTIPODEAN WANDERING ALBATROSS CHICKS BANDED IN THE STUDY AREA IN DECEMBER 2000, WHICH WERE SMALL AND UNLIKELY TO FLEDGE.

NEST NO.	METAL BAND	DARVIC BAND	COMMENTS
502	R55618	White-480	Downy and light on 9 Feb 01
501	R55615	White-476	Downy neck and belly, but big on 9 Feb 01
505	R55601	White-462	Downy, but healthy on 9 Feb 01, Tane's chick

TABLE 2. BREEDING SUCCESS OF ANTIPODEAN WANDERING ALBATROSSES NESTING IN THE STUDY AREA ON ANTIPODES ISLAND SINCE 1994.

YEAR	NO. OF NESTS MONITORED	BREEDING SUCCESS (%)
1994	110	74.8
1995	156	74.4
1996	149	78.5
1997	146	80.6
1998	163	74.8
1999	139	63.3
2000	115	76.5
Average		74.7

TABLE 3. BREEDING SUCCESS OF ANTIPODEAN WANDERING ALBATROSSES NESTING AT PIPIT PEAK AND IN BLOCK 32 IN 2000.

PLACE	NESTS COUNTED IN FEB 2000	BREEDING SUCCESS (%)
Pipit Peak	82	64.6
Block 32	130	76.9

3.2.2 Laying dates

Median laying dates and the laying dates of the first and last eggs during this and two previous breeding seasons are presented in Table 4. In both 1996 and 1999 the last eggs were laid on 15 February, so it is possible that eggs were laid in 2001 after our last check of the nests on 13 February 2001.

In January and February 2001, 164 new nests were tagged and mapped for assessment of their breeding success next summer (Fig. 2, Appendix 1). Of these, 161 were inside the study area and three were within 50 m of the study area but were laid by birds that had previously nested in the study area. Seven of the 164 nests had failed before our last check of the nests on 13 February 2001 (Appendix 1).

In Block 32 there were 141 nests with eggs and at least three nests that had already failed on 12 February 2001. At Pipit Peak there were 68 nests with eggs and at least one nest that had already failed on 9 February 2001.

TABLE 4. MEDIAN LAYING DATES AND THE DATES OF FIRST AND LAST EGGS OF ANTIPODEAN WANDERING ALBATROSSES NESTING IN THE STUDY AREA ON ANTIPODES ISLAND IN 1996-2001.

YEAR	DATE OF FIRST EGG	MEDIAN LAYING DATE	DATE OF LAST EGG
1996		26 Jan 1996	15 Feb 1996
1997	07 Jan 1997	23 Jan 1997	16 Feb 1997
1998		26 Jan 1998	11 Feb 1998
1999		26 Jan 1999	15 Feb 1999
2000	08 Jan 2000	25 Jan 2000	12 Feb 2000
2001	07 Jan 2001	23 Jan 2001	09 Feb 2001

3.2.3 Adult mortality

Between 20 December 2000 and 13 February 2001 we read the bands of 371 birds that had previously been banded while nesting in the study area. They included 251 birds nesting inside the study area, six birds nesting just outside it, 110 birds in the study area but not nesting, and four birds outside the study area and not nesting.

We banded 64 previously unbanded adults that were nesting in the study area for the first time (Appendix 2). There were nine nests in the study area at which

we read the bands of only one of the pair. Six of these nests failed before we were able to read both partners' bands, and three were laid very late in the season and only one bird had incubated before we left the island. Some of these nine birds were recorded as non-breeders in the study area before eggs were laid, and at least two of them were unbanded.

Of the 350 darvic-banded wandering albatrosses recorded between 20 December 2000 and 13 February 2001, 13 had either a broken darvic band or had lost the band entirely (Appendix 3).

Adult survival was estimated using the method of Cormack (1964 and 1972) incorporating the modifications suggested by Croxall et al. (1990) for biennially breeding albatrosses (Table 5).

TABLE 5. SURVIVAL OF ADULT ANTIPODEAN WANDERING ALBATROSSES THAT HAVE NESTED IN THE STUDY AREA ON ANTIPODES ISLAND SINCE 1994. STANDARD ERRORS IN BRACKETS.

YEAR	BOTH SEXES	MALES*	FEMALES*
1995	0.993 (0.006)		
1996	0.982 (0.006)		
1997	0.945 (0.013)	0.939 (0.019)	0.973 (0.013)
1998	0.946 (0.020)	0.955 (0.026)	0.946 (0.029)
1999	0.940 (0.022)	0.935 (0.030)	0.950 (0.030)
Average	0.961 (0.011)	0.943 (0.006)	0.956 (0.008)

* Males and females were not reliably distinguished until 1997.

3.2.4 Recruitment

During December 2000, 89 fledglings were banded in the study area. Table 6 shows the number of chicks banded since 1995 for assessment of recruitment.

TABLE 6. FLEDGLING ANTIPODEAN WANDERING ALBATROSSES BANDED ON ANTIPODES ISLAND SINCE 1995.

YEAR	STUDY AREA	OUTSIDE STUDY AREA
1995 ^a	116	1865
1996 ^b	98	402
1997 ^c	118	
1998 ^c	128	
1999 ^c	91	
2000 ^c	89	
Total	640	2267

^a banded with metal bands only. ^b banded with metal and orange darvic bands. ^c banded with metal and white darvic bands.

We found 16 non-breeding birds that had been banded as fledglings in previous years. One of these birds was 5 years old while the remaining 15 were 6 years old (Appendix 4) when we recovered them.

Wandering albatross start returning to Antipodes I. when about 5 years old but cannot be reliably detected until they breed at about 10 years old. We will not be able to estimate recruitment until about 2006.

4. Population trends

Collecting information on population size in a deferred breeding species such as the wandering albatross is slow since birds return to breed only once every two or three years. Between 1994 and 1997, a series of annual whole island counts were carried out. Results from these show that in those years an average of 5136 pairs breed on Antipodes I. (Walker & Elliott 2002b). Since 1998 counts of only a representative portion of the island have been undertaken to monitor population change.

4.1 METHODS

Between 4 and 9 February 2001, all albatross nests with eggs were counted within Marked Census Block A (MCBA; see Walker & Elliott 2002c), and on 12 February 2001 all the nests with eggs were counted in Block 32 near the mouth of Ringdove Stream (see Amey et al. 1994).

All counts were made using the standard 'sweep' technique (see Walker & Elliott 2002c).

Once an area had been counted we tested the precision of the census by walking straight transects along compass bearings at right angles to the census sweep lines and checking all nests within 5 m of the transect for paint marks which indicated that the nests had been counted.

Nests in the study area were counted between 7 January and 13 February 2001 by marking and mapping every nest during repeated visits.

4.2 RESULTS

Details of the counts are presented in Table 7. In the precision checks of the MCBA and Block 32, 102 and 32 nests, respectively, were recounted (23% of the total nests in both blocks), and one unpainted nest was found in each. This indicated we had underestimated the number of nests with eggs in our original counts of the MCBA by 0.97% and Block 32 by 3.1%.

TABLE 7. ANTIPODEAN WANDERING ALBATROSS NEST CENSUS RESULTS FROM TWO AREAS ON ANTIPODES ISLAND, FEBRUARY 2001.

Block	Date	Sweeps	Count time ¹	No. of chicks	Un- banded on eggs	Banded on eggs	Un- banded BOGs ²	Banded BOGs	Total BOGs	Total nests
MCBA	4, 9 Feb 01	24	15.2	74	422	21	252	17	269	443
Block 32	12 Feb 01	4	3.75	13	140	1	102	1	103	141

¹ Person hours. ² Birds on ground.

The number of nests with eggs counted in the two census blocks in 2001 are compared with those in earlier counts in Table 8 and Fig. 3. There is no obvious trend in the number of nests counted.

TABLE 8. NUMBERS OF ANTIPODEAN WANDERING ALBATROSS NESTS WITH EGGS IN THREE BLOCKS ON ANTIPODES ISLAND SINCE 1994.

YEAR	MCBA	STUDY AREA	MCBA + STUDY AREA	BLOCK 32	TOTAL
1994	544*	114	658	125	783
1995	482*	156	638	185	823
1996	418*	154	572	133	705
1997	464*	150	614		
1998	534	160	694		
1999	479	142	621		
2000	462	119	581	130	711
2001	443	160	603	141	744

* extrapolated (see Walker and Elliott 2002c).

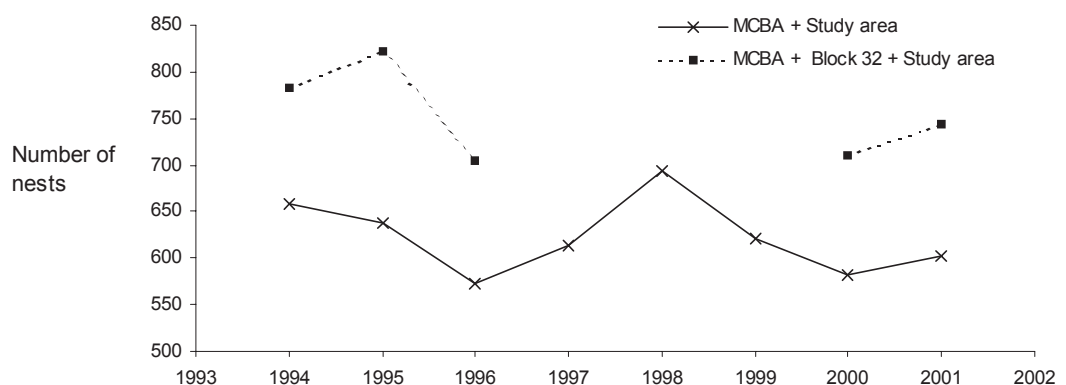


Figure 3. Number of Antipodean wandering albatross nests with eggs counted in February in three areas on Antipodes Island since 1994.

5. Monitoring at-sea distribution

5.1 METHODS

In February 2000 satellite transmitters were attached to four male and four female Antipodean wandering albatrosses nesting on Antipodes Island (see Hamilton et al. 2002). The flights of these birds were monitored throughout 2000 using the ARGOS satellite system, and we had hoped to check, and if necessary remove, the transmitters when the birds returned to bring the last few feeds to their nearly-fledged chicks between December 2000 and February 2001.

5.2 RESULTS

Four of the birds carried transmitters for approximately a year during which time they continued to incubate and raise their chicks, while the other four birds' transmitters stopped 2-8 months after attachment (Table 9). The flights we recorded demonstrated that some albatrosses had favoured foraging areas, and that the favoured areas varied between birds.

TABLE 9. HISTORIES AND DETAILS OF 8 ANTIPODEAN WANDERING ALBATROSSES TO WHICH TRANSMITTERS WERE ATTACHED IN FEBRUARY 2000.

NAME	METAL BAND	PTT NO.	SEX	PERIOD TRACKED	BREEDING OUTCOME	COMMENTS
Tane	R28624	6116	M	6 Feb 00-12 Feb 01	Success	PTT removed
Mercury	R47789	10075	M	5 Feb 00-3 Jan 01	Success	Bird washed up dead on Chatham Island
Millie	R47719	6118	F	10 Feb 00-26 Dec 00	Success	PTT removed
Mrs Harold	R47783	17394	F	5 Feb 00-16 Jan 01	Success	PTT removed
Martin	R52672	10107	M	5 Feb 00-5 Oct 00	Failed at large chick stage	Neither Martin nor his mate returned to Antipodes Island in Jan/Feb 2001
Mizzle	R47671	10037	F	5 Feb 00-21 May 00	Failed at large chick stage	Neither Mizzle nor her mate returned to Antipodes Island in Jan/Feb 2001
Anja	R47741	10031	F	5 Feb 00-6 Apr 00	Failed at egg stage	Anja deserted nest on 14 Feb 00. Did not return to Antipodes Island in Jan/Feb 2001 but her partner did
Numulgi	R47643	10119	M	6 Feb 00-14 May 00	Failed at hatching	Not seen on Antipodes Island in Jan/Feb 2001, though his partner laid an egg on 9 Jan 01 and deserted it the next day

One male characteristically foraged to the south of Antipodes I., spending many days at a time in a small area between 57° and 63°S and once visiting the Balleny Is off Antarctica at 67°S. In contrast, another male made 14 trips during incubation and chick rearing to an area between 25° and 30°S north of the Chatham Is. All of the females spent most of their time north of Antipodes I., mostly between 35° and 45°S. Despite these differences between sexes and individuals, the seas to the north-east and south-east of the Chatham Is are the areas most used by breeding Antipodean wandering albatrosses.

The transmitters on five birds had stopped transmitting by 3 January 2001. One of these birds and its transmitter was recovered dead on the Chatham Is, while the other four have not yet returned to Antipodes I. Three birds with transmitters were still feeding chicks when we got to Antipodes Island and we inspected their transmitters and removed them during their visits to the island. The transmitters and birds were in good condition, but because of the high loss rate of transmitters we removed all those still on (Table 9).

6. Acknowledgements

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Appendix 1

BIRDS AT NESTS IN OR NEAR THE STUDY AREA ON ANTIPODES I., FEB 2001

NEST	MALE		FEMALE		STUDY AREA	COMMENTS
	METAL	DARVIC	METAL	DARVIC		
17	R47937	Blue-647	R47815	Blue-617		
52	R47859	Blue-474	R47964	Blue-564		
64	R54000	Blue-658	R53786	Blue-374		
67	R47879	Blue-591	R48038	Blue-512		
77	R53603	Blue-827	R53632	Blue-396		
143	R52678	Blue-031	R52670	Blue-030		
160	R53792	Blue-395	R48001	Blue-239		
175	R55648	Blue-759	R55627	Blue-744		
197	R55632	Blue-765	R55623	Blue-739		
508	R52663	Blue-170	R52603	Blue-294		
513			R55679	Blue-824		
523	R55684	Blue-832	R55683	Blue-830		
525	R55674	Blue-815	R53616	Blue-545		
526			R53798	Blue-407		Failed by 6 Feb 01
527	R47683	Blue-105	R47791	Blue-107		
528			R55672	Blue-813		
533	R47951	Blue-829	R47837	Blue-615		
534	R47999	Blue-204	R48068	Blue-397		
538	R48024	Blue-254	R53993	Blue-620		
541	R47830	Blue-341	R47945	Blue-309		
542	R52649	Blue-244	R52638	Blue-329		
543			R53622	Blue-644		
544	R55686	Blue-836	R47888	Blue-821		
546			R47967	Blue-623		Failed by 27 Jan 01 just after laying
548	R47737	Blue-131	R53780	Blue-357	No	
549	R52736	Blue-022	R53602	Blue-326		
558	R53615	Blue-633	R52749	Blue-481		
561			R47726	Blue-053		Failed by 10 Jan 01. Male bird never seen.
567	R47913	Blue-625	R48051	Blue-651		
568	R53619	Blue-719	R53617	Blue-672		
572						Failed by 4 Feb 01, just after laying.
577	R52662	Blue-153	R52607	Blue-152		
582	R48041	Blue-554	R47886	Blue-655		
591	R55660	Blue-795	R55640	Blue-802		
592	R47616	Blue-167	R47715	Blue-250		
594	R47987	Blue-041	R55675	Blue-817		
595	R47713	Blue-007	R47607	Blue-340		
596	R55678	Blue-822	R55655	Blue-787		
598	R55671	Blue-796	R55656	Blue-788		
600	R55533	Blue-737	R55529	Blue-732		

NEST	MALE		FEMALE		STUDY AREA	COMMENTS
	METAL	DARVIC	METAL	DARVIC		
602	R55680	Blue-825	R55645	Blue-756		
605	R48059	Blue-799	R47703	Blue-421		
606	R52745	Blue-462	R53604	Blue-455		
608	R55639	Blue-774	R47701	Blue-746		
609	R53768	Blue-262	R53760	Blue-058		
611	R55638	Blue-773	R55646	Blue-757		
613	R47652	Blue-351	R47799	Blue-369		
616	R47676	Blue-790	R48035	Blue-766		
624	R55687	Blue-834	R55685	Blue-833		
625	R55661	Blue-803	R47978	Blue-823	No	
631	R28670	Blue-527	R47855	Blue-488		
633	R55637	Blue-772	R47869	Blue-447		
637	R48000	Blue-593	R48058	Blue-567		
639	R47930	Blue-520	R47808	Blue-314		
643	R53813	Blue-433	R53802	Blue-346		
648	R55658	Blue-791	R55644	Blue-755		
653	R55668	Blue-778	R55636	Blue-770		
654	R55657	Blue-789	R55665	Blue-808		
655	R48016	Blue-454	R47922	Blue-065		
656	R28626	Blue-202	R47894	Blue-293		
659	R48049	Blue-466	R47907	Blue-453		
662	R53828	Blue-451	R53828	Blue-451		
663	R52605	Blue-037	R52679	Blue-036		
664	R47641	Blue-057	R47677	Blue-227		
665	R53759	Blue-044	R55652	Blue-783		
667	R53769	Blue-271	R53764	Blue-095		
668	R47644	Blue-259	R47780	Blue-260		
670	R47995	Blue-516	R47902	Blue-464		
671	R47847	Blue-797	R47845	Blue-302		
672	R47909	Blue-501	R48007	Blue-458		
673	R53761	Blue-059	R53794	Blue-399		
676	R55649	Blue-760	R55677	Blue-820		
677	R52622	Blue-077	R52664	Blue-268		
678	R53805	Blue-417	R47718	Blue-763		
679	R52654	Blue-414	R52626	Blue-085		
680	R47906	Blue-595	R47906	Blue-595		
683	R47650	Blue-569	R47729	Blue-662		
684	R47927	Blue-631	R48019	Blue-537		
686	R53974	Blue-510	R53996	Blue-638		
687	R47630	Blue-049	R47624	Blue-200		
689			R47974	Blue-582		Failed by 29 Jan 01.
690	R53983	Blue-566	R53976	Blue-511		
692	R28664	Blue-214	R53824	Blue-446		
693	R55653	Blue-784	R53784	Blue-366		
694	R55682	Blue-828	R55651	Blue-782		
695	R48065	Blue-657	R47924	Blue-602		
696	R55525	Blue-727	R55524	Blue-724		
697	R47761	Blue-619	R47615	Blue-519		
699	R47745	Blue-384	R47692	Blue-218		
701	R47795	Blue-137	R35204	Blue-751		
705	R47812	Blue-489	R47934	Blue-572		
706	R53770	Blue-274	R53810	Blue-428		

NEST	MALE		FEMALE		STUDY AREA	COMMENTS
	METAL	DARVIC	METAL	DARVIC		
707	R55673	Blue-814	R55667	Blue-776		
708	R47865	Blue-523	R47970	Blue-486		
712	R47955	Blue-581	R47843	Blue-500		
714	R55659	Blue-792	R55633	Blue-767		
715	R47806	Blue-113	R53972	Blue-473		
717	R55635	Blue-769	R47744	Blue-129		
718	R48069	Blue-551	R48066	Blue-514		
719	R47832	Blue-493	R47947	Blue-587		
720	R55519	Blue-711	R55508	Blue-685		
721	R47674	Blue-130	R47675	Blue-231		
722	R52610	Blue-324	R52661	Blue-164		
723	R47982	Blue-241	R47881	Blue-664		
725	R28607	Blue-000	R47892	Blue-747		
726	R28616	Blue-764	R47898	Blue-459		
727	R47722	Blue-255	R47613	Blue-786		
728	R28952	Blue-490	R47820	Blue-559		
730	R47961	Blue-122	R47854	Blue-301		
732	R52746	Blue-495	R53605	Blue-499		
735	R53999	Blue-642	R53990	Blue-607		
737	R53636	Blue-597	R53606	Blue-675		
739	R47697	Blue-080	R52623	Blue-383		
742	R47842	Blue-614	R47954	Blue-583		
744	R55643	Blue-754	R55625	Blue-742		
780	R47602	Blue-544	R47711	Blue-518		
781			R47969	Blue-793		Failed by 13 Feb 01.
783	R47944	Blue-330	R47828	Blue-477		
784	R48046	Blue-039	R55664	Blue-807		
786	R47933	Blue-574	R47810	Blue-509		Egg accidentally cracked. Taped up.
791	R47991	Blue-541	R53802	Blue-346		
792	R47635	Blue-150	R47723	Blue-831		
795	R55629	Blue-748	R55626	Blue-743		
796	R55666	Blue-812	R55631	Blue-762		Egg accidentally broken on 23 Jan 01.
798	R55641	Blue-750	R55630	Blue-749		
799	R48030	Blue-580	R47846	Blue-632		
5004	R55642	Blue-752	R55670	Blue-781		
5030	R48040	Blue-573	R47884	Blue-637		
5041	R28644	Blue-291	R52653	Blue-448	No	
5051	R55520	Blue-712	R55514	Blue-703		
5052	R48034	Blue-532	R35651	Blue-508		
5063	R52619	Blue-033	R52620	Blue-032		
5067	R55654	Blue-785	R53804	Blue-348		
5088	R53819	Blue-442	R53782	Blue-362		
5089	R55681	Blue-826	R52737	Blue-629		
5097	R53830	Blue-425	R53783	Blue-363		
5098	R53635	Blue-522	R52723	Blue-531		
5133	R54001	Blue-665	R53986	Blue-596		
5134	R28717	Blue-073	R55662	Blue-804		
5138	R52646	Blue-046	R55663	Blue-805		
5141	R55669	Blue-779	R55634	Blue-768		
5142	R47971	Blue-609	R28687	Blue-676		

NEST	MALE		FEMALE		STUDY AREA	COMMENTS
	METAL	DARVIC	METAL	DARVIC		
5179	R28948	Blue-553	R47709	Blue-636		
5193	R53611	Blue-794	R47721	Blue-045		
5195	R48048	Blue-452	R47905	Blue-753		
5197	R48009	Blue-628	R47912	Blue-534		
7000	R53822	Blue-445	R53807	Blue-420		
7002	R47800	Blue-624	R28736	Blue-469		
7028	R53833	Blue-780	R53801	Blue-345		
7452	R47953	Blue-543	R47841	Blue-456		
7520	R47798	Blue-353	R53607	Blue-578		
7535	R47782	Blue-063	R47653	Blue-548		
7542	R48039	Blue-671	R47880	Blue-645		
7543	R53800	Blue-413	R53795	Blue-339		
7544	R47900	Blue-570	R48045	Blue-539		
7545	R47923	Blue-775	R55647	Blue-758		
7565	R47941	Blue-740	R47822	Blue-621		
7575	R55628	Blue-745	R53766	Blue-197		
7578	R53826	Blue-423	R53831	Blue-798		
7585	R47972	Blue-654	R47867	Blue-504		
7606	R55676	Blue-818	R55688	Blue-835		
7607	R47660	Blue-652	R48037	Blue-563		
7616	R55650	Blue-761	R47809	Blue-741		
7617	R18989	Blue-463	R47993	Blue-468		

Appendix 2

ANTIPODEAN WANDERING ALBATROSS BANDED WITH NEW METAL 'R' BANDS AND/ OR NEW DARVIC BANDS ON ANTIPODES I., JAN-FEB 2001

DATE	NEW DARVIC	NEW METAL 'R' BAND	OLD DARVIC	OLD METAL 'R' BAND	SEX/AGE
20 Dec 00	White-395	55534			Chick
20 Dec 00	White-396	55535			Chick
20 Dec 00	White-397	55536			Chick
20 Dec 00	White-399	55537			Chick
20 Dec 00	White-400	55538			Chick
20 Dec 00	White-401	55539			Chick
20 Dec 00	White-402	55540			Chick
20 Dec 00	White-403	55541			Chick
20 Dec 00	White-404	55542			Chick
20 Dec 00	White-405	55543			Chick
20 Dec 00	White-406	55544			Chick
20 Dec 00	White-407	55545			Chick
20 Dec 00	White-408	55546			Chick
20 Dec 00	White-409	55547			Chick
20 Dec 00	White-410	55548			Chick
20 Dec 00	White-411	55549			Chick
20 Dec 00	White-412	55550			Chick
20 Dec 00	White-413	55551			Chick
20 Dec 00	White-414	55552			Chick
20 Dec 00	White-415	55553			Chick
20 Dec 00	White-416	55554			Chick
20 Dec 00	White-417	55555			Chick
20 Dec 00	White-418	55556			Chick
20 Dec 00	White-419	55557			Chick
20 Dec 00	White-420	55558			Chick
20 Dec 00	White-421	55559			Chick
20 Dec 00	White-422	55560			Chick
20 Dec 00	White-423	55561			Chick
20 Dec 00	White-424	55562			Chick
20 Dec 00	White-425	55563			Chick
20 Dec 00	White-426	55564			Chick
20 Dec 00	White-427	55565			Chick
20 Dec 00	White-428	55566			Chick
20 Dec 00	White-429	55567			Chick
21 Dec 00	White-430	55568			Chick
21 Dec 00	White-431	55569			Chick
21 Dec 00	White-432	55570			Chick
21 Dec 00	White-433	55571			Chick
21 Dec 00	White-434	55572			Chick
21 Dec 00	White-435	55573			Chick
21 Dec 00	White-436	55574			Chick
21 Dec 00	White-437	55575			Chick

DATE	NEW DARVIC	NEW METAL 'R' BAND	OLD DARVIC	OLD METAL 'R' BAND	SEX/AGE
21 Dec 00	White-438	55576			Chick
21 Dec 00	White-439	55577			Chick
21 Dec 00	White-440	55578			Chick
21 Dec 00	White-441	55579			Chick
21 Dec 00	White-442	55580			Chick
21 Dec 00	White-444	55582			Chick
21 Dec 00	White-443	55581			Chick
21 Dec 00	White-445	55583			Chick
21 Dec 00	White-446	55584			Chick
21 Dec 00	White-447	55585			Chick
21 Dec 00	White-448	55586			Chick
21 Dec 00	White-449	55587			Chick
21 Dec 00	White-450	55588			Chick
21 Dec 00	White-482	55620			Chick
21 Dec 00	White-483	55621			Chick
21 Dec 00	White-451	55589			Chick
21 Dec 00	White-452	55590			Chick
21 Dec 00	White-453	55591			Chick
21 Dec 00	White-454	55592			Chick
21 Dec 00	White-455	55593			Chick
21 Dec 00	White-456	55594			Chick
21 Dec 00	White-458	55596			Chick
21 Dec 00	White-457	55595			Chick
21 Dec 00	White-459	55597			Chick
21 Dec 00	White-460	55598			Chick
21 Dec 00	White-461	55599			Chick
21 Dec 00	White-462	55600			Chick
21 Dec 00	White-463	55601			Chick
21 Dec 00	White-464	55602			Chick
22 Dec 00	White-466	55604			Chick
22 Dec 00	White-467	55605			Chick
22 Dec 00	White-469	55607			Chick
22 Dec 00	White-470	55608			Chick
22 Dec 00	White-471	55609			Chick
22 Dec 00	White-472	55610			Chick
22 Dec 00	White-473	55611			Chick
22 Dec 00	White-474	55612			Chick
22 Dec 00		55613			Chick
22 Dec 00	White-475	55614			Chick
22 Dec 00	White-476	55615			Chick
22 Dec 00	White-478	55616			Chick
22 Dec 00	White-480	55618			Chick
22 Dec 00	White-479	55617			Chick
22 Dec 00	White-481	55619			Chick
22 Dec 00	White-465	55603			Chick
29 Dec 00	White-484	55622			Chick
09 Jan 01	Blue-739	55623			F
13 Jan 01	Blue-740		Blue-513	47941	M
13 Jan 01		55624	Blue-533	53981	M
13 Jan 01	Blue-743	55626			F
13 Jan 01	Blue-742	55625			F
13 Jan 01	Blue-741			47809	F
15 Jan 01	Blue-745	55628			M

DATE	NEW DARVIC	NEW METAL 'R' BAND	OLD DARVIC	OLD METAL 'R' BAND	SEX/AGE
15 Jan 01	Blue-746		Blue-139	47701	F
15 Jan 01	Blue-744	55627			F
15 Jan 01	Blue-747			47892	F
17 Jan 01	Blue-748	55629			M
17 Jan 01	Blue-749	55630			F
17 Jan 01	Blue-750	55641			M
17 Jan 01	Blue-751			35204	F
17 Jan 01	Blue-752	55642			M
19 Jan 01	Blue-753		Blue-549	47905	F
19 Jan 01	Blue-758	55647			F
19 Jan 01	Blue-760	55649			M
19 Jan 01	Blue-754	55643			M
19 Jan 01	Blue-755	55644			F
19 Jan 01	Blue-756	55645			F
19 Jan 01	Blue-762	55631			F
19 Jan 01	Blue-759	55648			M
19 Jan 01	Blue-761	55650			M
19 Jan 01	Blue-757	55646			F
21 Jan 01	Blue-763			47718	F
23 Jan 01	Blue-808	55665			F
23 Jan 01	Blue-764			28616	M
23 Jan 01	Blue-807	55664			F
23 Jan 01	Blue-805	55663			F
23 Jan 01	Blue-804	55662			F
23 Jan 01	Blue-772	55637			M
23 Jan 01	Blue-770	55636			F
23 Jan 01	Blue-773	55638			M
23 Jan 01	Blue-774	55639			M
23 Jan 01	Blue-803	55661			M
23 Jan 01	Blue-802	55640			F
23 Jan 01	Blue-769	55635			M
23 Jan 01	Blue-768	55634			F
23 Jan 01	Blue-766			48035	F
23 Jan 01	Blue-767	55633			F
23 Jan 01	Blue-765	55632			M
23 Jan 01	Blue-812	55666			M
25 Jan 01	Blue-775			47923	M
25 Jan 01	Blue-778	55668			M
25 Jan 01	Blue-783	55652			F
25 Jan 01	Blue-789	55657			M
25 Jan 01	Blue-780			53833	M
25 Jan 01	Blue-776	55667			F
25 Jan 01	Blue-781	55670			F
25 Jan 01	Blue-786		Blue-157	47613	F
25 Jan 01	Blue-784	55653			M
25 Jan 01	Blue-787	55655			F
25 Jan 01	Blue-782	55651			F
25 Jan 01	Blue-779	55669			M
25 Jan 01	Blue-785	55654			M
25 Jan 01	Blue-788	55656			F
27 Jan 01	Blue-795	55660			M
27 Jan 01	Blue-796	55671			M
27 Jan 01	Blue-790		Blue-127	47676	M

DATE	NEW DARVIC	NEW METAL 'R' BAND	OLD DARVIC	OLD METAL 'R' BAND	SEX/AGE
27 Jan 01	Blue-792	55659			M
27 Jan 01	Blue-793			47969	F
27 Jan 01	Blue-794			53611	M
27 Jan 01	Blue-791	55658			M
29 Jan 01	Blue-797			47847	M
29 Jan 01	Blue-798			53831	F
31 Jan 01	Blue-813	55672			F
31 Jan 01	Blue-814	55673			M
31 Jan 01	Blue-815	55674			M
31 Jan 01	Blue-817	55675			F
31 Jan 01	Blue-799			48059	M
02 Feb 01	Blue-821			47888	F
02 Feb 01	Blue-822	55678			M
02 Feb 01	Blue-818	55676			M
02 Feb 01	Blue-820	55677			F
04 Feb 01	Blue-826	55681			M
04 Feb 01	Blue-823			47978	F
04 Feb 01	Blue-825	55680			M
04 Feb 01	Blue-824	55679			F
06 Feb 01	Blue-828	55682			M
06 Feb 01	Blue-827		Blue-183	53603	M
09 Feb 01	Blue-829		Blue-634	47951	M
09 Feb 01	Blue-831			47723	F
09 Feb 01	Blue-830	55683			F
11 Feb 01	Blue-832	55684			M
11 Feb 01	Blue-833	55685			F
13 Feb 01	Blue-836	55686			M
13 Feb 01	Blue-834	55687			M
13 Feb 01	Blue-835	55688			F

Appendix 3

WANDERING ALBATROSS WITH LOST OR BROKEN DARVIC BANDS JAN-FEB 2001

METAL BAND	LOST DARVIC	NEW DARVIC	COMMENTS
R47701	Blue-139	Blue-746	Seen with darvic in Jan 2000
R47951	Blue-634	Blue-829	
R47941	Blue-513	Blue-740	Old band broken and replaced
R47676	Blue-127	Blue-790	
R47905	Blue-549	Blue-753	
R47613	Blue-157	Blue-786	
R53603	Blue-183	Blue-827	
R47851	Blue-104		Not nesting and darvic not replaced
R47920	Blue-211		Not nesting and darvic not replaced
R53804	Blue-348		Not nesting and darvic not replaced
R47836	Blue-277		Not nesting and darvic not replaced
R53603	Blue-183		Not nesting and darvic not replaced
R47688	Blue-225		Not nesting and darvic not replaced

Appendix 4

NON-STUDY AREA BANDED ANTIPODEAN WANDERING ALBATROSS RECOVERED ON ANTIPODES I. IN 2001

Band	Date	Location	Grid ref.	Activity	Head	Back	Wing	Tail	Sex	Date banded	Where banded	Status at banding
18805	04 Feb 01	Block 5	11500, 8700	BOG								
18978	04 Jan 01	Block 5		BOG								
19245	04 Feb 01	Block 5	11050, 9157	Nesting	4	3.75	3	2				
19422	07 Feb 01	Block 5	11073, 8242	Nesting	4	4	2	2	M			
19487	07 Jan 00	SA		BOG								
28646	04 Feb 01	Block 5	11700, 8700	Nesting								
28708	04 Feb 01	Block 5	10994, 9279	Nesting	4	4	2	1.75	M			
28712	04 Feb 01	Block 5	11179, 9015	Nesting	2	2	1	1				
28727	05 Feb 01	Block 5.	10987, 9047	Nesting	2	4	2	1.5	M			
28730	04 Feb 01	Block 5	11063, 8944	Nesting	3	3	2	1.25	M			
28735	05 Feb 01	Block 5	10976, 9062	Nesting	2	1.75	1	1.5	M			
28742	05 Feb 01	Block 5	10903, 9095	Nesting	4	4	2	1.5	M			
28747	25 Jan 01	Block 5	11297, 8963	Nesting								
28753	05 Feb 01	Block 5	10852, 8862	BOG	2.5	2.75	2	1.75	M			
28766	04 Feb 01	Block 5	11158, 8808	Nesting	4	4	1	2				
28803	07 Feb 01	Block 5	10891, 8560	Nesting	3	2.75	2	1.5	M			
28805	07 Feb 01	Block 5	10827, 8495	BOG	4	4	2.5	2	M			
28807	07 Feb 01	Block 5	10991, 8384	Nesting	2.75	3	2	1.5	M			
28867	04 Feb 01	block 5	11466, 8745	BOG	1.75	2	1	1				
28879	09 Feb 01	Block 5	11297, 8963	Nesting								
28922	09 Feb 01	Block 5	10818, 8492	BOG	2.75	2	1	1				
28947	04 Feb 01	Block 5	11028, 9372	BOG	2.5	3	1.5	1.5				
29047	09 Feb 01	Block 5	10828, 8148	Nesting	1.75	1.75	1	1				
35310	05 Feb 01	Block 5	11188, 8402	Nesting	2	1.25	1	1	F			
35335	07 Feb 01	Block 5	11129, 8364	Nesting					F			
35338	05 Feb 01	Block 5	11466, 8292	BOG	3	3	1	1.25	M			
35662	07 Feb 01	Block 5	11285, 8029	BOG	3	3	2	1.5	M			
35672	05 Feb 01	block 5	11203, 8564	Nesting	1.75	1.75	1.25	1	F			
35700	07 Feb 01	Block 5	11121, 8256	Nesting	2	1.75	1	1	F			
35707	07 Feb 01	Block 5	11589, 8224	Nesting	2	2	1	1	F			
35889	05 Feb 01	Block 5	11342, 8486	Nesting	1.75	1.75	1.25	1	F			
51412	15 Jan 01	SA		BOG						02 Nov 95	SA	Chick
51452	29 Jan 01	SA		BOG						03 Nov 95	Block 5	Chick
51717	13 Feb 01	SA	11364, 8970	BOG						07 Nov 95	SA	Chick
51721	05 Feb 01	Block 5	11221, 8501	BOG	2	1.25	1	1	F	07 Nov 95	SA	Chick
51773	06 Feb 01	SA		BOG	2	1.25	1	1				
51813	09 Feb 01	Block 5	11363, 8723	BOG	2	1.5	1	1				
51891	05 Feb 01	Block 5	11134, 8454	BOG	2.5	1.25	1	1	F	21 Nov 95	Block 5	Chick
51977	31 Jan 01	SA	11395, 8955	BOG	2.75	2.75	2	1				
52128	11 Feb 01	SA	11400, 9413	BOG	2	1.75	1	1		08 Nov 95	Block 4	Chick
52683	05 Feb 01	Block 5	11377, 8449	BOG	2.5	3	1	1.25	M	07 Jan 97	Block 4	Chick
52727	09 Jan 01	West bank	11251, 9468	BOG						18 Jan 97	West bank	Nesting

Band	Date	Location	Grid ref.	Activity	Head	Back	Wing	Tail	Sex	Date banded	Where banded	Status at banding
52729	25 Jan 01	West bank		Nesting					M	18 Jan 97	West bank	Nesting
52875	05 Feb 01	Block 5	11298, 8373	BOG	1.25	1.25	1	1	F	17 Nov 95	Block 16	Chick
52916	05 Feb 01	Block 5	11001, 8881	BOG	2	2	1	1	M	09 Nov 95	Block 3	Chick
52923	23 Jan 01	SA		BOG	1.25	1	1	1		09 Nov 95	Block 3	Chick
53052	31 Jan 01	SA	11381, 9132	BOG	3	3				12 Nov 95	Block 17	Chick
53211	09 Feb 01	SA	11390, 9567	BOG						10 Nov 95	Block 5	Chick
53309	05 Feb 01	Block 5	11293, 8564	BOG						03 Nov 95	Block 5	Chick
53343	13 Jan 01	SA	11400, 8700	BOG						03 Nov 95	Block 5	Chick
53985	11 Feb 01	West bank		Nesting						02 Feb 99	West bank	Nesting
54048	27 Jan 01	SA		dead						05 Jan 00	SA	Chick