

**Sooty Terns on Ascension Island South Atlantic  
Integrated Population Monitoring Programme**

**15<sup>th</sup> Report**

**December 2004**

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**Wideawake Surveys**

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## **Population Dynamics of Sooty Terns – Long Term Monitoring Programme Background**

Wideawake Surveys in conjunction with British military ornithological societies have monitored the colony of Sooty Terns on Ascension Island in the South Atlantic since 1987. The first census was completed in 1990 ten years prior to the commencement of the RSPB cat eradication on the Island. Sooty Terns were closely monitored during the two year when cats were culled and now we continue the monitoring in the post eradication phase. This report contains the findings of the latest field trip and is the fifteenth in a series of expeditions that span twenty three Sooty Tern breeding seasons. The longitudinal study has concentrated on establishing trends in the breeding population, identifying and recording levels of predation and investigating nest and adult survival rates.

### **Terms of Reference**

The main aim of this long term monitoring programme is to facilitate the expansion of the breeding population by identifying and reducing threats to the Sooty Tern colony. The following process is carried out:

- Surveys of the breeding population are undertaken at regular intervals.
- The levels of predation in the colony are measured and recorded.
- A ringing and re-trap programme is maintained so that inter and intra colony movements can be monitored and survival rates determined.
- Perceived threats to the colony are investigated.
- Long term, quantifiable data that can be used as evidence for making conservation management decisions on Sooty Terns is collected and made available to interested parties.

### **Secondary Aims**

In addition to work on Sooty Terns the various military organisations maintain data bases on a wide variety of species on Ascension. Sixteen different databases exist. They including one maintained by Wideawake Surveys that has monitored bird breeding attempts at three precisely defined study sites on Ascension Island since 1990. The Royal Navy Bird Watching Society maintains a large data base of birds seen from ships.

### **Organisations**

The long term monitoring programme on Ascension was not planned and there is no lead organisation dictating the direction of the project. The programme has evolved over time and the focus now is on publishing the information that has already been gathered and to continue with the monitoring work. Over the years the lead role has changed hands a number of times, currently the project is steered by a group of retired military personnel collectively referred to as “Wideawake Surveys”. The organisations involved are:

- Royal Air Force Ornithological Society (RAFOS) who mounted the first expeditions in Feb 87 and Nov 88 and contributed to most of the other expeditions.
- Army Ornithological Society (AOS) the main contributor who mounted expeditions in 1990, 1991, 1994, 1996, 1998, 2000, 2002 and Jan 2004.
- Royal Navy Bird Watching Society (RNBWS) who contributed field workers and ringers.
- Wideawake Surveys (WS) a small group of retired military personnel largely self funded who have a strong interest in seabirds on Ascension. WS mounted expeditions to Ascension in March 03 and Nov 04 and also contributed to the RSPB expedition Aug 01.

## **Expedition Report 15 – November 2004**

**Summary:** *The expedition completed a full census of the Sooty Terns. The colony size on 30 Nov 04 was 123,000 AON. Predatory activities on our three study sites were recorded. A further 500 Sooty Terns were ringed and 162 were re-trapped.*

### **Aims of the November 2004 Expedition**

1. To repeat the Sooty Tern breeding population survey by calculating the number of nests using GPS to determine the area and quadrats to measure density.
2. To continue to monitor the threats to the Sooty Tern colony from cats, rats, Myna birds, Frigates and the spread of Mexican Thorn.
3. To continue with the ringing programme.
4. To carry out a re-trapping programme to quantify the time between successive attempts to breed.

### **Expedition Nov 04 - Participants**

John Hughes: Sooty Terns (AOS & Wideawake Surveys)

Colin Wearn: Ringer – (RAFOS & Wideawake Surveys )

David Vaughan AOS

Sarah Saunders RSPB and Tara George Ascension Conservation provided additional valuable support in the field.

### **Long Term Population Trends**

The population survey this season was carried out before the colony reached its peak, before any chicks had hatched and 23 days after the first egg of the season was laid. The colony on Ascension is at its greatest 42-60 days after the first egg of the season is laid.

### **Timings**

The optimum time for the survey this season fell over the Christmas period when it was impossible to obtain flights and leave passes from our spouses. On 24 November we found Sooty Terns with eggs at both the Waterside and Mars Bay fairs. Laying at Mars Bay usually starts about two weeks after the start of egg laying at Waterside and as the previous season had been late starting we had every expectation to see chicks before our departure on 30 November. In the event the first chick did not hatch until 5 December 2004. I am grateful to Mike Bell who saw chicks a week after our departure and Dawn Osborn who saw chicks on 8 Dec. for information so that this date could be established. The first chick of the previous season hatched on 8 February 2004. The duration between the last two breeding seasons was 301 days six days longer than the average of 295 days.

### **Survey**

The area of the colony was determined from GPS observations and then plotted to scale onto Chartwell graph paper. The area was surveyed using similar techniques to those used on the previous seasons. Co-ordinates around the perimeter of each sub-colony at intervals of about 20 m were recorded and plotted to determine the area of the colony. The colony, this season, was made up of 11 sub-colonies and as in previous years a “Fair Description Sheet” was completed for each sub-colony. The total area occupied in November 2004 was 7.07ha.

### **Nest Density**

Nest densities were measured by counting all eggs that were passed over by a string, 1.784m long, rotating 360 degrees around a stick at random points within the sub-colonies. In total 3,464 AONs (Table 1) were counted in 199 quadrats giving an average density of 1.7407 AONs per sq metre. Two of the nests contained double clutches.

### **Population Size**

The breeding population in November 2004 was 123,000 pairs and the colony was still expanding. As in previous years the quadrat data was given to Dr Norman Ratcliffe at the RSPB to calculate the status of the colony. The statistics were calculated using a bootstrap method and the results were "The status for the Nov 04 season was 123,068 (LCI = 112,512; UCI = 133,372), so a PRP of 8.5% which is good." The highest breeding population (202,000 pairs) was measured in Oct 1996 and the lowest (75,000 pairs) in Nov 2000. The RSPB population survey in Sept 1997 was conducted at a similar stage in the breeding cycle and the population was 151,000 pairs.

**Table 1.** Breeding Population of Sooty Terns November 2004 – Raw Data

<b>Sub Colony</b>	<b>Area Hectares</b>	<b>No of Quadrats</b>	<b>No of Nests Counted</b>	<b>Av. Density Per sq. m</b>	<b>Population Size Pairs</b>
Waterside	4.74	108			
Mars Bay	2.33	91			
<b>Total</b>	<b>7.07</b>	<b>199</b>	<b>3464</b>	<b>1.7407</b>	<b>123,000</b>

### **Life History - Survival Rates**

A further 500 adult Sooty Terns were ringed by Colin Wearn this season bringing his total to 5,450 (Annex A). When this figure is added to the ringing completed by the RSPB and Dr Gale in Nov 1975 the overall total of ringed Sooty Terns on Ascension is 6,224. This season colour rings were not fitted and biometric data was not recorded.

### **Re-trap Adults**

In total 162 Sooty Terns (2.6% of the total ringed) were re-trapped this season none of these were controls. Time allocation to re-trapping this season was 32 hours.

### **Natural Limiting Factors - Breeding Success**

Exposure to predation and habitat studies were conducted to help ascertain breeding success.

### **Cat Predation**

Two dead Sooty Terns were found on Waterside fair, it is pleasing to report that the same number of long dead cats was also found. No signs of any cat predation were found at any of our three study area during this field trip.

### **Rat Index**

Unusually high level of rat activity was observed at Waterside. Rat footprints in the dust were seen as we entered the fairs early in the morning and footprints inside the fair were still visible at mid-day. Eggs predated by rats (inside of egg licked clean) and other predated eggs found under low rock outcrops, thus not attributed to predation by Myna, were seen. There was insufficient time for us to complete a rat index but one is clearly needed at Waterside. No

evidence of predation by rats was found at Mars Bay or at Letterbox. The Environmental Health Department put down poison in the Mars Bay area during November 2004.

### **Myna Predation**

Mynas predate on Sooty Tern eggs. Mynas prick and destroy many more eggs than they devour. Nests were marked and egg survival rates measured. Mynas were seen on the breed colony each day we visited. Nest survival rate this season was 32.6% but only 2 out of the 15 eggs that failed could be positively attributed to Myna predation.

### **Mexican Thorn**

The spread of Mexican Thorn *Prosopis juliflora* to the edge of the Sooty Terns colonies was first recorded in 1998. Since that date the steady but relentless progress of encroachment by this plant onto the nesting ground has been mapped using GPS. The height, spread and co-ordinates of nine thorn bushes in the close vicinity of the colonies were measured. No change in the availability of nest sites for Sooty Terns was recorded this season.

### **Study Sites**

Once again all bird species attempting to breed on the three study sites established in 1990 were noted (Table 2). Only Sooty Terns were breeding at the Mars Bay study site. At Waterside 17 pairs of Brown Noddy were prospecting inside the Sooty Tern colony and the first Brown Noddy egg of the season was laid on 30 Nov 04. November & December is one of the two peak laying periods for Brown Noddy (Dorward & Ashmole 1993). Mike Bell saw Brown Noddy chicks on the site in Dec 04. The Ascension Island Conservation office found six Brown Noddy nests on 3 April 05. It is not know if any chicks fledged this season. We search Letterbox for nests of all sea and land birds. Four AONs of Masked Booby were found in the study area on 29 Nov 04. Fresh Guano suggests that Masked Booby were also roosting in the study site. In the region of 50 juvenile Frigates were roosting close to the top of the cliffs overlooking BBI. No other nests were found.

**Table 2.** Summary of Breeding Pairs in Study Areas – Nov 2004

Species	Waterside	Mars Bay	Letterbox
Sooty Terns	© 80,000	© 40,000	Nil
Masked Booby	Nil	Nil	4xAONs. One with a fledged juvenile.
Tropicbirds	Nil	Nil	Nil
Brown Noddy	17 Pairs prospecting First egg laid 30 Nov 04	Nil	Nil
Frigates	Nil	Nil	Nil
Myna	Nil	Nil	Nil
Others	Nil	Nil	Nil

### **Egg Survival Rate & Fledging Success**

Egg survival rates were monitored using the Mayfield Technique 396 egg days were recorded and the survival rate for the season calculated at 32.6%. No systematic attempts have been made to measure fledging success on the island. There is, however, some anecdotal evidence in the form of reported visits to the colony towards the end of the season that indicates fledging success. These reports (a line or two in a letter or e-mail) were collated and source/sink seasons identified. At this stage of the programme a source season is one where it

is believed that more than 20,000 juvenile Sooty Terns (10% of the maximum number of breeding pairs) fledged annex B refers.

### **Other Activities**

The corpse of a Brown Booby *Anous stolidus* entangled in plastic was collected and forwards to the Natural History Museum at Tring. The curator supplied labels for use on future expeditions. The museum has requested samples of dead Sooty Terns (Annex C).

A Fair Tern *Gygis alba* was caught on Letterbox Study area and a blood sample collected for DNA purposes. The sample was forwarded to the Tissue Collection Coordinator at the Zoological Museum Copenhagen (Annex C).

### **Survey Effort**

Long term monitoring programmes are an expensive business. We are fortunate to have a dedicate team that has been willing to self fund to ensure continuation of the project. The majority of the funding has come from the MoD largely through their adventure training budget. Expedition costs are calculated using standard cost figures. Food and accommodation on Ascension is costed at £26.43 per person per day, vehicle hire or use on Ascension at £20 per day, travel costs including flights to and from Ascension at £900 per person and daily field work at £250 per day. The survey effort of this expedition was 21 man days at a cost £8,785. The breakdown of the costs are self funded £4,770, RSPB £1,800 and the remainder from the MoD. Wideawake surveys are very grateful to the RSPB for their continuous support for this programme. The total survey effort of this long term monitoring programme now stands at 1153 man days at a total cost of £414,966.

### **Future Work**

The date of the next expedition which will be mounted by the Army Ornithological Society expedition is scheduled for 16-28 October 2005. The expedition lead by Major Andrew Bray will consist of 8 to 10 members. The main aims are to monitor predation, evaluate the success of the cat eradication programme, to repeat the population survey, complete a land bird and stack survey and to ring 2,000 Sooty Terns.

Long term aims are to record the data collected onto a Geographical Information System (GIS) and to provide access for interested parties. In addition the aim is to making the information collected more available by collating all the reports and papers that have been written onto one CD and distribute it to interested parties and also to publish the more important findings in peer review publications.

### **Acknowledgements**

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**Summary of Sooty Tern ringing effort - Nov 2004**

<b>Date</b>	<b>No Ringed</b>	<b>Ring Numbers</b>	<b>Location of file</b>	<b>Age</b>	<b>Colour Code</b>	<b>Colony</b>	<b>Catch Method</b>	<b>Remarks</b>
24 Nov 2004	100	DD52501 – DD52600	No File	Adults	Nil	Waterside	Birds on Nest	Ring and fling GPS E0569697 N9117387
25 Nov 2004	100	DD52601 – DD52700	No File	Adults	Nil	Waterside	Birds on Nest	Ring and fling GPS E0569663 N9117485
26 Nov 2004	100	DD52701 – DD52800	No File	Adults	Nil	Mars Bay	Birds on Nest	Ring and fling GPS E0566187 N9117348
28 Nov 2004	50	DD52801 – DD52850	No File	Adults	Nil	Mars Bay	Birds on Nest	Ring and fling GPS E0566325 N9117480
28 Nov 2004	50	DD52851 – DD52900	No File	Adults	Nil	Mars Bay	Birds on Nest	Ring and fling GPS E0566326 N9117469
30 Nov 2004	100	DD52901 – DD53000	No File	Adults	Nil	Waterside	Birds on Nest	Ring and fling GPS E0569712 N9117435

### Sooty Tern – Ascension Island - Long Term Monitoring Programme – Fledging Success

Date First Chick Hatched Waterside	Reference	Field Observations and breeding population estimate (Pairs)	Reference to Fledging success	Remarks	Overall Success Source or Sink
?? Dec 86	Blair 1987 Report 1	9 - 25 Feb 87 RAFOS estimates 50,000 pairs	Blair 1987 Report 1	No record of chicks starving or mass desertion but low numbers	Possible Sink
?? Oct 87		No field records			??
?? Jul 88	Osborn 1994 Report 2	Ex Booby I 2,500 terns at Mars Bay 11 Nov. Numbers reducing daily.	Osborn 1994 Report 2	No record of chicks starving or mass desertion	Possible Source
?? May 89		No field records			
<b>12 Mar 90</b>	Hughes 1991 Report 3	Field Obs by EX Booby 2 and P. Ashmole. <b>Population 176,000 pairs</b>	Letter from Newlyn Browne June 1990	“Enormous fair full range eggs to adults”	Possible source year
?? Dec 90		3 Feb large thriving fairs at Mars Bay & Waterside N.S-B	Letter from Newlyn Browne	“Large fairs not as big as some years”	Possible Source
?? Oct 91 Eggs but no chicks at Mars Bay 2 Jan	Walmsley 1992 Hughes 1992 Report 4 & 4a	Terns about in Oct N.S-B <b>44,300 abandoned eggs</b> recorded by Booby 3 Field Notes by Newlyn Browne - First egg 22 Sept Bill Bourne	Newlyn Browne	Hundreds of corpses 28 Mar 92	Sink
9 Sept 92	Field Notes by Newlyn Browne	30 June – 8 July 92 Booby 3 2,500 tern and eggs found at Waterside Fair 11 Aug. N.S-B Incubating period of 29 days added			
02 Jun 93	K. Simmons	Simmons visited in 1993 Estimate Sept /Oct 93 Simmons 110,000 chicks & sitting adults Simmons Letter 14 Dec 93 & 10 May 95 Ibis 136 258-259	K. Simmons	A very successful season with numerous fledged and fledging K.Simmons	Source
<b>15 May 94</b>	Hughes 1994 Report 5	Booby 4 12-23 April 94 First egg of season <b>16</b> April 94 at Little John Waterside Estimate 90,000 pairs			
?? Jan 95		No field records			
<b>23 Jan 96</b>	Letter Simmons 22 Mar 96	Simmons visited in 3 -31 Jan 96 5 Jan 96 first eggs at Mars Bay 5 Jan new-hatched chicks Waterside Fair 23 Jan 96 Ibis 139 433-434 Simmons on Ascension close to time of Maximum number of breeding Terns One growing fair at Mars Bay and at least 3 fairs with many thousands of eggs at Waterside.			
<b>28 Oct 96</b>	Hughes 1997 Report 6	Booby 5 28 Oct – 9 Nov 96 <b>Population 202,000 pairs</b>	Fair Description Sheet 4/96	7 Nov 96 “Large fat chicks seen hiding”	Possibly a source year

Date First Chick Hatched Waterside	Reference	Field Observations and breeding population estimate (Pairs)	Reference to Fledging success	Remarks	Overall Success Source or Sink
7 Sept 97	Ratcliffe et al 1999 Report 7	RSPB Expedition <b>Population 151,000 pairs</b> First Chick waterside Fair 7 Sept 97	Simmons Expedition 6 Oct – 5 Nov 97 Simmons 1998 ENSO conditions	Severe chick loss due to starvation 400 chicks surviving at Mars Bay. 67,000 abandoned eggs but 13,500 surviving chicks doing well	Sink
1 June 98	Hughes 1999 Report 8	Booby 6 22 Jun – 5 July 98 <b>Population 207,000 pairs</b>	Fair description sheet 6/98	25 Jun 98 “large crèche of big chicks everywhere”	Possibly a source year
23 March 99	Nash 2000 AOS Bulletin 1/2000		Neil Mc Falls letter 06 Jan 2001	“ ... April 1999 ... n o where near as many as in 1998”  RHJ Nash saw juvenile Sooty Terns off Portland Point July 99	Possibly a sink year?
19 Jan 00 at 1000 hrs	R. Dickey Report 9 Unpub	Recce R. Dickey 18/19 Jan 00 Estimate 90,000 pairs			
19 Nov 00	Hughes 2002 Report 10	Booby 7 7 – 22 Nov 2000 <b>Population 75,000 pairs</b>	Neil Mc Falls letter 06 Jan 2001	23 Dec 00 “No birds at Mars Bay.. no juveniles seen in flight” Met office “ very few birds have nested”	Sink
23 Aug 01	Hughes Report 11 Unpub.	RSPB expedition 4 -21 Sept 01 <b>Population 150,000 pairs</b>		Juveniles ringed by Tara George at Mars Bay on 9 Nov 2001	Probably a source year
12 June 02	Hughes Report 12 Unpub.	Booby 8 16 – 27 June 2002 <b>Population 185,000 pairs</b>	E-mail Boyle 24Aug 03	Poor breeding season 150 freshly dead chicks per week	Definitely a sink year
27 March 03	Hughes Report 13 Unpub.	RSPB sponsored expedition <b>Population 183,000 pairs</b>	E-mail Boyle 24 Aug 03	Excellent breeding season less than 20 corpses found	Definitely a source year
8 Feb 04	Hughes Report 14 Unpub.	Booby 9 8-20 Feb 04 <b>Population 175,000 pairs</b>	E-mail Conservation Office 09 June 04	..The Sooty Terns are still here there are still some birds not yet fledged in both fairs	Likely source year
5 Dec 04	Hughes Report 15 Unpub.	Population 123,000 pairs	Conservation Office Status report 102	3 March 05 - 30-50 near fledged chicks found dead in one area	Probably a sink year

Collecting a DNA Sample from a Fairy Tern



Ringling Masked Booby on Letterbox Study Site



NB Dates on photos should read 29.11.2004