

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

11th Report

4 – 20 September 2001

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Wideawake Surveys

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Expedition Report - Monitoring Sooty Terns on Ascension - September 2001

Monitoring and surveys at the Sooty Tern *Sterna fuscata* breeding colony in September 2001 was undertaken by B. John Hughes a member of the RSPB Ascension Island expedition and also a member of the Army Ornithological Society (AOS). The aim of the expedition was to maintain the baseline surveys of seabirds prior to the eradication of cats. A census was completed of the Ascension Island Frigate Bird *Fregata aquila* and the three species of Booby *Sulidae* found on Boatswain Bird Islet and 14 offshore stacks details are at **Annex A**. A census was also completed of the tiny Sooty Terns colony on Boatswain Bird Islet and the two large colonies at Mars Bay and Waterside on the south west corner of the island. This report is focused on the baseline survey of Sooty Terns.

Timings

The first chick of the season probably hatched at Waterside on 23 August 2001 and the population survey was completed between 7 and 17 September 2001. The survey took place between 43 and 53 days after the first egg was laid. The peak of the breeding season is usually 40 - 60 days after the first egg is laid. The Sooty Terns on Ascension breeds sub-annually with a periodicity of ≈ 9.6 months. The colony began breeding two weeks early this season.

Mapping the Fairs

Identical survey techniques to those developed by Ashmole and Hughes in 1990 were used. Each sub-colony was surveyed separately. Cairns of lava rock approximately 0.6m high and circled with a strip of orange plastic mine tape were built around the perimeter of the sub-colonies. The cairns were built at intervals of approximately 30m and at each change of direction of the fair's perimeter. The Sooty Terns nested in many cases right up to the boundary marked by the cairns. However the edges of the fairs are not symmetrical and the cairns marked out the mean perimeter edge. A circular compass and pace traverse was run between the cairns and closed back on the starting point. Forward and reverse bearings were taken with a Mils prismatic compass. The traverses were then plotted on Chartwell 1mm squared graph paper at a scale of 1/1000. The closing errors were measured from the plot and an accuracy for each survey determined. The area of each fair was determined by counting the number of 1 mm squares. The total area occupied by the Sooty Terns on 17 September 2001 was 6.90 hectares (Table 1).

Estimating density

Densities of eggs in four sub-colonies were estimated using a quadrat/transect sampling system. Every effort was made to place quadrat randomly. Several transects were measured across each sub-colony. Prominent features were identified on the opposite side of the sub-colony and used as a marker to establish the transect lines. At regular intervals (normally every 20 paces) along the line counts of eggs were made in quadrats measuring 10 m². One person held a vertical pole, to which was attached a cord 1.784m long, the stretched string was then used to describe a circle, and the two observers separately counted the eggs as the string passed over them. Occasionally there was a small discrepancy between the observations both of which were recorded and the mean value accepted. The density this season varied between 2.00 and 2.38 and the mean was 2.16 AONs per m² ($n = 339$).

Table 1. The sub-colonies of nesting Sooty Terns *Sterna fuscata* found at Waterside and Mars Bay on Ascension Island, South Atlantic in September 2001. The location, number, area of sub-colonies and the number of quadrats, mean density of sub-colony and number of apparently occupied nests (AON) are listed. An estimate of the date when the first chick in the sub-colony hatched and the accuracy of the survey are provided.

Location	Sub-	Area	Number	Mean	Date first	Number	Remarks
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	colony Number	(ha)	of Quadrats	Density	chick in sub-colony hatched	of AON's	
Waterside Fair	2001/1	2.38	112	2.08	1 Sept 2001	50,000	Closing accuracy 1/70
Waterside Fair	2001/2				23 Aug 2001	500	Small colony with chicks up to a month old
Waterside Fair	2001/3a 2001/3b 2001/3c	1.08 0.40 0.24	102	2.38	15 Sept 2001	41,000	Closing accuracy 1/49
Waterside Fair	2001/4	0.99	25	2.25	3 Sept 2001	22,000	Closing accuracy 1/40
Mars Bay	2001/5a 2001/5b 2001/5c	1.75 0.06	100	2.00	6 Sept 2001	37,000	Closing accuracy 1/28
Waterside Fair Deserted eggs	2001/6	0.73					2/3 deserted on 15 Sept 2001 Closing accuracy 1/38
Total		6.90	339	2.16		150,000	

Comparison with previous years

The size of the Sooty Tern colony on 17 September 2001 was estimated at 150,000 breeding pairs. The recent decline in the population has reversed and the number of breeding pairs has doubled from the November 2000 low of 75,000 pairs. However the population is some 50,000 pairs less than the census of 1990, 1996 and 1998 (Table 2). At Waterside 17,000 eggs were deserted in one abandoned sub-colony.

Table 2. Comparison of the Sooty Tern breeding population and nesting area on Ascension Island across three seasons 1998 - 2001

Date	Population (Pairs)	Nesting Area (ha)	Remarks
Mar 1990	176,000	13.50	AOS Survey
Oct 1996	202,000	9.67	AOS Survey
Jan 1998	207,000	10.33	AOS Survey
Nov 2000	75,000	3.63	AOS Survey
Sept 2001	150,000	6.90	Wideawake Surveys

Boatswain Bird Islet (BBI) Sub-colony

A tiny colony (20 AONs in 1957-1959) of Sooty Terns has nested on BBI for more than 100 years. A search of the islet was made on 10 September 2001 and a one AON was found. The bird was incubating a single egg in the shadow of a 0.6 m high rock. The nest was situated on the N.E. side of the islet some 50 m from Wideawake Gully.

Myna frequency of occurrence

On each visit to the tern colonies at Mars Bay and Waterside sightings of Mynas were recorded. The maximum flock size was 10. At Mars Bay, Mynas were recorded on every visit during the

morning and every visit in the afternoon. At Waterside, Mynas were sighted on 75% of occasions during the morning and 83% of afternoon visits.

Egg Monitoring

109 nests within seven metres of the edge of the colony were marked and monitored for a total of 610 nest days. 70 nests failed giving an egg survival rate on the edge of the colony in September 2001 of 3%.

Ringling and Re-trapping

The programme of ringing Sooty Terns started by Colin Wearn in 1996 continued and 52 incubating adults were ringed with ring numbers DD07000 – DD07051. Seventeen birds DD07024 – DD 07040 were ringed at Waterside the remainder at Mars Bay. Colin Wearn caught the first re-trap on the island in 1998 the bird was ringed in 1996. In September 2001 one bird DB57485 was recovered (killed by a cat) and a second bird DD00070 was re-trapped.

Parasites

Lice infested sections of the Waterside tern colony in 2001. On 17 September 2001 close to “Frigate fair” at GPS 0569714, 9117263 BJH while sitting on a rock close to fair 2001/2 got covered in mites.

On 11 September 2001 while the rest of the world was glue to the TV watching the attack on the Twin Tower we were on Letterbox searching for Masked Booby nests, we found none. Looking to the future, the first chick of the next season is likely to hatch on or about 14 June 2002.

Annexes

Annex A RSPB Expedition to Ascension Island 4-20 September.

Annex B Re-survey of the September 2001 sub-colonies at Waterside using GPS in June 2002.

Follow on survey work

The cairns marked with orange plastic mine tape were clearly identifiable the following season in June 2002 and the sub-colonies at Waterside were surveyed for a second time using GPS instruments. This enables the compass and pace traverses of September 2001 to be tied in to the island grid and WGS 84 (Annex B).

Four of the cairns that surrounded the September 2001 sub-colony at Mars Bay were located in February 2004 and fixed using GPS. The cairns were again located in November 2005 and again fixed using GPS (Table 3).

Table 3. Data to tie in fair 2001/05 from November 2001 at Mars Bay into WGS 84

Date	February 2004		November 2005		
Station	Eastings	Northings	Eastings	Northings	Remarks
			0565827	9117242	Probably not ours cairn. Possibly a WWI ltd cairn
7	0565820	9117271	0565822	9117278	
8	0565832	9117317	0565832	9117320	
9	0565851	9117354	0565853	9117355	
10	0565873	9117365	0565873	9117366	
Gills Observatory	0565936	9117260			

The area occupied by breeding Sooty Terns in September 2001 was obtained from conventional survey methods and from GPS. The two surveys provided virtually identical results.

Parasites

In June 2002 a small sub-colony 2002/07 of newly arrived birds occupied the site were parasites were recorded in 2001. It is not known if the sub-colony was successful but the small size is indicative of low success.

RSPB EXPEDITION TO ASCENSION ISLAND: 4 - 20 Sept 2001

AIMS

The aim of the expedition was to maintain the baseline surveys of seabird population status in the absence of the Conservation Officers, who will be appointed in October. The species that needed to be surveyed were Sooty Tern, Masked Booby, whose breeding seasons were predicted to peak in September, and Ascension Frigate bird, for which the year long monitoring effort needed to be maintained.

PARTICIPANTS

Norman Ratcliffe: Senior Research Biologist and expedition leader
John Hughes: Volunteer Research Assistant and Sooty Tern census leader
Alan Bull: Volunteer Research Assistant
Robin Curtis: Volunteer Research Assistant
Tony Loxton: Professional Climbing Instructor and Volunteer Research Assistant

HEALTH AND SAFETY AND COMMUNICATIONS

The landing on BBI was easier than in July owing to calmer sea conditions, and three visits were made to the island. The landing is still risky as the boat has to approach perilously close to the rocks for people to get on and off it, and there is the risk of wave action crushing a climber between the boat and the rock face.

Rebuilding a gantry with a rope-ladder on the end that projects 6 feet out from the landing face is likely to be the only way of assuring a safe landing in most sea conditions. There are concerns about the condition of the concrete on the gantry and whether this would be adequate to provide a firm anchor for a gantry.

Following concerns that they were not working properly in July, the four marine-band radios that transmit on Channel 35 were tested by a radio engineer at Merlin Communications and were found to work perfectly.

No progress has been made with establishing a fail-safe radio communication system to allow help to be notified in case of an emergency or with forming a mountain rescue team to evacuate casualties. These will need to be dealt with by the Conservation Officers during the first month of their appointment.

Research and Monitoring

Ascension Frigate birds

A complete census of all eggs on the plateau of BBI was conducted on 7.9.01. The census counted 843 eggs, bringing this years total to 1481.

The fates of nesting attempts that were marked in the study plots during the July expedition were determined, and new nests were marked. Analysis to calculate the number of birds lost between the censuses will be conducted at the end of the census in April 2002.

Thirty six incubating females were marked with PIT tags and had their heads bleached. The bleach mark was indistinct on many birds when they returned an hour later. In future birds will be visually marked by clipping the left tail streamer in half, which will provide a mark that will last until moult and will be a cleaner and easier to apply than the bleach. Problems were experienced allocating chicks to nest sites after they were a few weeks old owing to them wandering a few feet from their scrapes. Twenty nine large chicks were PIT tagged so their fates to fledging could be followed.

Masked Boobies

The majority of Masked Boobies were breeding during the expedition, with most birds on eggs or hatchlings and some with larger chicks. This suggests the majority of laying occurred in early to mid August. Counts were conducted from the cliffs below Powers peak, and these averaged 2,500 AOTs. This is very similar to the total recorded by Dorward (1963) during the BOU expedition in 1957. Photographs of the colony were taken too, and counts will be taken from these if the resolution is adequate to allow AOTs to be visible. The totals were higher than counts in July which averaged 1900 AOTs, probably because territorial attendance was higher when birds are breeding.

A thorough search was conducted of those areas on Letterbox where Masked Boobies bred in 1996 and 1998. No birds were seen and so it seems this nascent colony has been extirpated.

A hundred Masked Boobies were ringed on BBI, with the aim of studying the status of birds that move to the mainland following eradication. It is anticipated that current territory holders will remain on BBI and mature birds without territories will move. Ringing birds on territories and non-breeding club sites will allow this hypothesis to be tested. More birds will be ringed in October.

Red-footed Boobies

A complete census of all stacks and cliffs was conducted for Red-footed Boobies. On Stack 5 one of the two nests found in July contained a small downy chick but the other had failed. The chick was brooded by a dark morph adult and a light morph birds was off duty nearby. A pale bird was seen incubating a nest on Stack 10 in Cocoanut Bay. Twelve AOTs were plotted onto sketch maps of the north cliff of BBI, two more than in May. All birds seen on BBI were pale morphs, in contrast to July when three of the ten seen were dark morphs. One of the nest sites contained a half-grown chick. The status of Red-footed Booby on Ascension is 20 AOTs, which is similar to previous estimates.

Brown Boobies

Brown Boobies generally breed synchronously at a sub-annual periodicity, with the interval between breeding varying in response to local food availability. Obtaining peak breeding counts therefore demands careful monitoring of the nesting phenology to ensure surveys are correctly timed.

The number of breeding Brown Boobies was higher in September than in July, and nesting seemed more synchronised throughout the island. There appeared to be an early wave of nesting in July confined to the NE stacks between Georgetown and Porpoise Point that did not occur elsewhere on the island. During September, the number of birds was higher than in July almost all colonies on the island, including those on the NE stacks. A second census of Brown Boobies was therefore conducted in September that will replace the totals presented in the July report.

The total number of Brown Boobies on Ascension was 680 AOTs. This is substantially lower than the 1400 pairs estimated by the BOU expedition. These counts were of nests rather than AOTs and so are not comparable, but nest counts would tend to produce lower counts than those of AOTs due to birds failing prior to counts and birds laying afterwards. It is therefore plausible that Brown Boobies have declined over the last four decades. This hypothesis is supported by trends on stacks 1 and 2, where 98 established adults bred in 1962-64. The total has declined steadily since then to around 10 adults in 2001.

Sooty Terns

The number of Sooty Terns was estimated by plotting the perimeter of the colony to estimate its area and sampling densities of clutches within a 10m² area. The population size was the product of the average density and the colony area. The colonies covered 6.9 ha, and the average density was 2.16 pairs per m². The population was therefore 149,160 pairs. A small colony that had hatched and was not censused was estimated to contain approximately 500 pairs, bringing the total to 149,660 pairs. The percentage relative precision of the population estimate was 3%. This population estimate is lower than that in 1990, 1996 and 1998 estimates of c 200,000 pairs, similar to the 1997 estimate of 150,000 pairs but higher than the 2000 total of 75,000 pairs. These fluctuations probably reflect changes in the proportion of mature birds that breed. A single pair of Sooty Terns nested on the summit of BBI.

Collections of cat-killed corpses were conducted around the colonies throughout the expedition, and 582 were found. Fifty adult birds were ringed, and two were recovered that were ringed in previous years (one killed by a cat and one alive). More eggs were abandoned around the periphery of the colony than in previous years, and egg predation by mynahs has increased. Mexican thorn is starting to encroach onto the colonies, and is likely to flourish in the guano rich ash. Thorn trees near the colonies need to be removed before this happens.

The Sooty Tern research will be described in more detail in a report being prepared by John Hughes.

Future work

The next expedition will be from 21 October to 1 November. The UK conservation officer, Richard White, will be accompanying this expedition, with NR and TL providing training in seabird monitoring methods and health and safety procedures. Danae Stevens will be providing ringing training for Richard between 7 and 15 Nov. Richard should be in a position to pass this knowledge on to the Ascension CO once they are appointed; interviews are being held on 19 Oct.

Re-survey of the September 2001 sub-colonies at Waterside using GPS in June 2002

Fair No	Name	Eastings	Northings
2001/01	Jez	569319	9117365
2001/01	Jez	569298	9117401
2001/01	Jez	569322	9117437
2001/01	Jez	569320	9117436
2001/01	Jez	569357	9117510
2001/01	Jez	569346	9117522
2001/01	Jez	569393	9117573
2001/01	Jez	569410	9117604
2001/01	Jez	569406	9117617
2001/01	Jez	569412	9117640
2001/01	Jez	569434	9117664
2001/01	Jez	569436	9117698
2001/01	Jez	569454	9117705
2001/01	Jez	569478	9117750
2001/01	Jez	569509	9117735
2001/01	Jez	569514	9117737
2001/01	Jez	569522	9117722
2001/01	Jez	569528	9117666
2001/01	Jez	569486	9117657
2001/01	Jez	569492	9117633
2001/01	Jez	569475	9117589
2001/01	Jez	569424	9117574
2001/01	Jez	569430	9117542
2001/01	Jez	569433	9117541
2001/01	Jez	569396	9117510
2001/01	Jez	569402	9117442
2001/01	Jez	569394	9117436
2001/01	Jez	569366	9117430
2001/01	Jez	569362	9117403
2001/01	Jez	569333	9117374
2001/01	Jez	569319	9117366
2001/03		569903	9117605
2001/03		569871	9117587
2001/03		569866	9117608
2001/03		569848	9117601
2001/03		569836	9117589
2001/03		569828	9117614
2001/03		569831	9117645
2001/03		569826	9117656
2001/03		569851	9117650
2001/03		569854	9117665
2001/03		569886	9117651
2001/03		569891	9117629
2001/03		569802	9117685
2001/03		569774	9117694
2001/03		569745	9117641
2001/03		569752	9117602
2001/03		569708	9117598
2001/03		569660	9117600
2001/03		569675	9117544
2001/03		569686	9117537
2001/03		569705	9117551
2001/03		569745	9117504
2001/03		569740	9117539
2001/03		569764	9117539
2001/03		569785	9117581
2001/03		569782	9117577
2001/04	Doc	569371	9117373
2001/04	Doc	569387	9117389
2001/04	Doc	569400	9117388
2001/04	Doc	569415	9117414
2001/04	Doc	569419	9117391
2001/04	Doc	569450	9117418
2001/04	Doc	569473	9117438
2001/04	Doc	569515	9117471
2001/04	Doc	569549	9117471
2001/04	Doc	569526	9117436
2001/04	Doc	569545	9117417
2001/04	Doc	569486	9117354
2001/04	Doc	569498	9117362
2001/04	Doc	569459	9117374
2001/04	Doc	569430	9117350
2001/04	Doc	569402	9117313
2001/04	Doc	569379	9117345
2001/04	Doc	569372	9117368
2001/04	Doc	569370	9117363
2001/04	Doc	569606	9117279
2001/04	Doc	569606	9117252
2001/04	Doc	569625	9117251
2001/04	Doc	569628	9117264
2001/04	Doc	569631	9117265
2001/04	Doc	569637	9117266
2001/04	Doc	569659	9117236
2001/04	Doc	569674	9117260
2001/04	Doc	569662	9117262
2001/04	Doc	569655	9117271
2001/04	Doc	569656	9117293
2001/04	Doc	569661	9117299
2001/06	Deserted	569675	9117544
2001/06	Deserted	569686	9117537
2001/06	Deserted	569705	9117551
2001/06	Deserted	569745	9117504
2001/06	Deserted	569758	9117494
2001/06	Deserted	569711	9117429
2001/06	Deserted	569688	9117467
2001/06	Deserted	569658	9117487
2001/06	Deserted	569643	9117553