EXERCISE BOOBY III
ASCENSION ISLAND, 30 JUN - 7 JUL 1992

By

Maj R.H.J.Nash, Maj B.J.Hughes, SSgt R.G.Thompson and J.G.Walmsley

GENERAL REPORT - SSgt R.G.Thompson

The nine members of the expedition Exercise Booby III gathered together at Brize Norton on 29 June prior to the departure for Ascension on an RAF Tristar. The flight departed around midnight and arrived on Ascension at 0710 hours the following morning. After a briefing at the airport by the local PTI Sgt (during which we were informed that the English Bay Camp was double booked), we collected our luggage and loaded it into the Sherpa van that was to be our transport for the duration of the expedition.

We were driven to English Bay via the scenic route - for the benefit of those members who had not been to Ascension before -pointing out various places of interest.

Unlike Exercise Booby II, (Nash *et al* 1991) when Ascension driving permits were issued free of charge at the Airhead MT office, permits had to be bought for £2.00 at the Georgetown Police Station this year. A couple of members went off to get driving permits, whilst the rest of us selected our bed -space and stowed our kit. I then took three of the members to look at Stacks 6, 7 and 8, which are within a twenty minute walk of English Bay Camp. As on Ex. Booby II, these three stacks were exclusively used by Brown Booby and Brown Noddy, and we counted 26 (including ten juveniles) and 110 respectively, before returning to the camp. Shortly afterwards, the now legal drivers returned with our first issue of rations. We had a snack then everyone went to the airfield fairs to look for signs of Sooty Terns.

We had discovered when we arrived that we were too early for the Sooty Tern breeding season but there was a chance that we could find evidence of their presence on the breeding grounds. The male terns return to the breeding "fairs" about a month before nesting begins and gather in ever increasing numbers in what has been called "Night club activity". The terns fly in from the sea after dark and leave again before dawn. The evidence we were looking for was tern corpses. (During the terns' absence, approximately three. months, between breeding seasons, the feral cats have a thin time, existing on other available prey such as rats, mice and possibly land birds, as well as foraging around dustbins and the rubbish tip. When the terns return, heralded by their clamorous calls, they are welcomed with open jaws by the starving cats. It would seem likely that the cats migrate to the tern fairs in tandem with the increasing numbers of terns).

John Walmsley's report "Feral Cat Predation on the Sooty Terns of Ascension Island" gives more details of this part of our activities.

On the breeding grounds we split into three groups to check out the known breeding sites adjacent to and east of the airfield but the only evidence of night club activity at this location was found on what had been named "Gez" Fair (8) on Booby II, where 13 freshly killed terns were collected. By coincidence it seemed that the terns had returned to Ascension the same night that we did.

John Hughes reports on the previous Sooty Tern breeding season (Sep 91 - Mar 92) below.

We returned to camp in time for an evening sea -watch, which was used to familiarise members with the species they were allocated and the procedure for the counts. Because of the large numbers of birds, each member of the expedition was allocated one or more species as their responsibility to count. Everyone retired early to catch up on the sleep that had been lost on the previous night on the Journey over.

A dawn count was conducted on the following morning, 1 July, and it was noticeable to those members who had been on Booby II that there were not as many birds moving out to their feeding grounds as had been counted on the previous expedition. In fact, quite a number of birds were feeding almost directly in front of our vantage point, the Klinker Club patio. Others, the Brown Boobies in particular, were either milling about or going the wrong way! Perhaps it was the time of year. A detailed report on sightings of Red -footed Boobies is given by John Hughes.

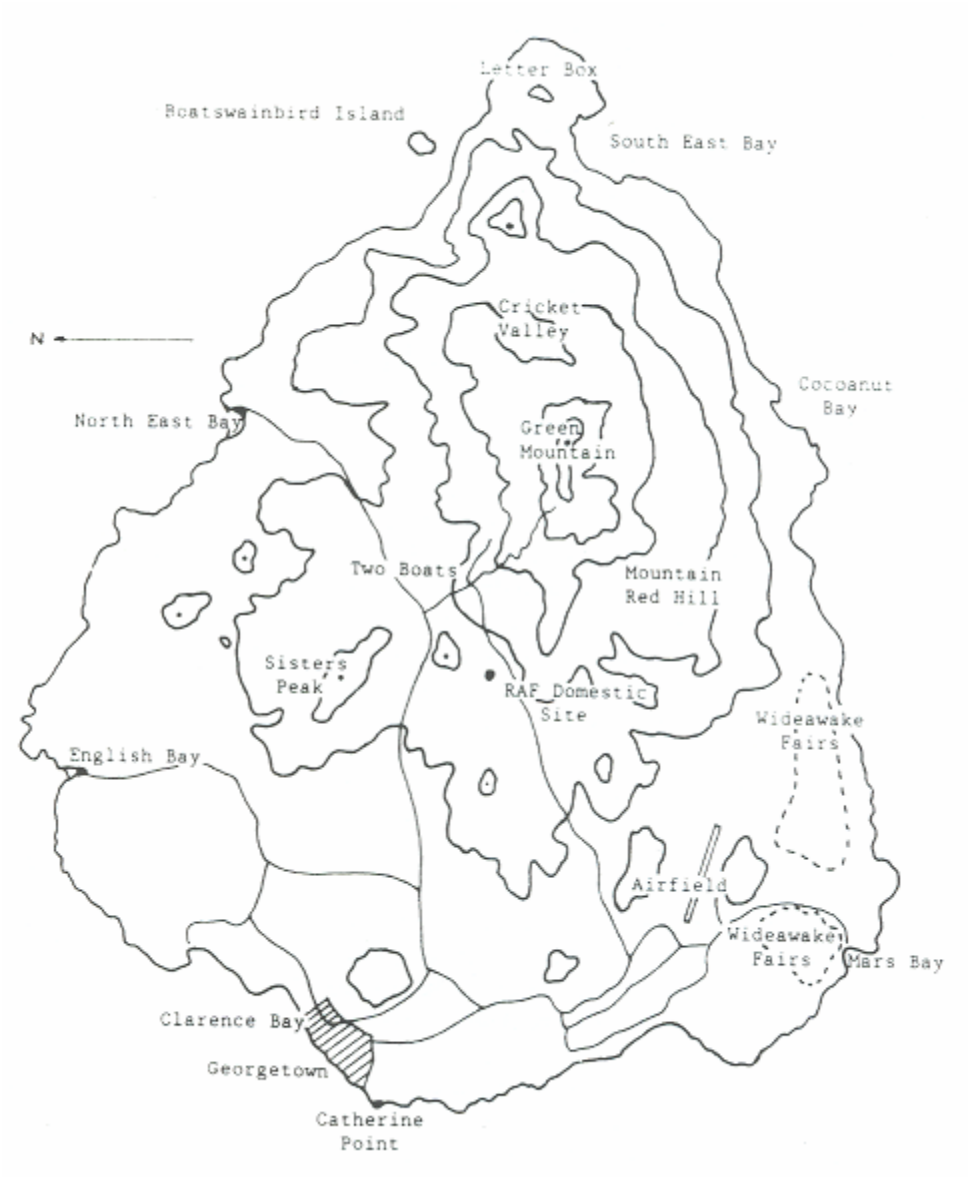

Figure 1: Ascension Island

After breakfast, we split into pairs and went off on different tasks; Mars Bay, to check for evidence of Sooty Terns; Letterbox, to survey the site for the possibility of erecting a cat-proof fence and also to see if there was evidence of cats using the area. One pair walked from Comfortless Cove to English Bay surveying Stacks 2 to 5 and another pair walked from English Bay to North East Bay surveying Stacks 6 to 8 and checking if any of the other off-shore stacks were being used. A separate reconnaissance report surveying a line for a cat -proof fence on Letterbox is below.

On the morning of 2 July the whole party boarded the USAF boat, the Range Rider, for a trip to Boatswain Bird Island (BBI). Three of the members were landed on BBI and the rest of the party circumnavigated the island, checking the birds on the cliffs before returning to English Bay. The three of us who were landed on BBI remained there until 4 July. It was the first time anyone had set foot on BBI since 1987, as evidenced by the thick layer of guano everywhere! We 'pitched' our tent on the guano covered landing platform prior to ascending the guano covered cliffs with the help of the guano covered rope. Hilary Nash gives a detailed account of our visit.

Meanwhile, members who returned to English Bay continued to monitor the light club activities at Mars Bay, whilst others walked to Letterbox and made visual contact with those on BBI. One of the party returned to UK on 3 July.

On Saturday morning 4 July, we were recovered from BBI and three other members landed briefly for a quick trip to the top and walk around before we all returned to English Bay. Showers were a priority for the three who had spent two nights on BBI.

That evening, four members visited the 'Volcano Club', on the American Base (it was the 4th July), whilst the other four spent the night at Mars Bay to try and , see the Sooty Terns coming in to their night club.

On Sunday 5th, four of us walked to the Dew Pond, at the summit of Green mountain, the highest point on Ascension, before walking down again in time to be collected and taken back to camp for a Bar-B-Q. Later that afternoon we again split into pairs, with one pair walking to Letterbox to see if the marked points on BBI could be seen, the other two pairs walking to Pillar Bay and cocoanut Bay respectively, to do an evening and morning count on the stacks in those bays. The remaining two checked Mars Bay for tern corpses.

On 6 July, five of us spent some time in English Bay exploring the rock pools then, later on in the afternoon, three of us checked the airfield breeding sites Gez (8) and Fiona (3) for dead Sooty Terns. 120 were collected from Gez but Fiona was still not being used.

On Tuesday 7th, we did a final collection of tern corpses from Mars Bay then a bit of shopping before booking in at the Airhead at 1500 hours for our return to UK. We had an unexpected bonus at the end of the expedition, because we returned to the UK via Dakar (refuelling stop only) and Cyprus, where we spent a full day. We arrived back at Brize Norton on Thursday 9th July.

EXERCISE MEMBERS AND THEIR DUTIES

Maj Rill Nash	Leader	Black & Brown Noddies
Col WGC Bowles	Deputy Leader	Frigates & Masked Boobies
Maj BJ Hughes	Scientific Co-ordinator	Sooty Terns
Mr JG Walmsley		Cat Predation Studies
WO2 DM Morrison	Treasurer	White Terns & land birds
SSgt RG Thompson		Tropic Birds
SSgt JP Self		Expedition diary
Sgt DM Batterbough		Brown Boobies
Cpl C Wearn		Letterbox Survey

FERAL CAT PREDATION ON THE SOOTY TERNS *Sterna fuscata* - J.G.Walmsley

Introduction

The breeding cycle of Sooty Terns on Ascension Island in the South Atlantic is non-annual, egg laying commencing about every 9.6 months (Chapin 1954, Chapin & Wing 1959). On 30 June 1992 members of the Army Ornithological Society returned to Ascension Island for Exercise Booby III. Our visit coincided with the onset of the breeding season when Sooty Terns first return to the Island after being absent for a period of about three months.

The return is announced by hundreds or even thousands of terns which can be heard calling excitedly over the breeding area at night. This is known as the "Night Club" period which may last one to two months. During this period many adults settle on the breeding grounds at night and are killed by waiting feral Cats *Felis catus.* The cat population on the Island is unknown, but numbers may be extremely high if one considers that a total of 3000 adult Sooty Terns were killed by cats during the early stages of the 1990 breeding season (Nash *et al* 1991). Cat scats can be found even in the remotest parts of the Island (JGW pers obs.).

Breeding site surveys and results

On arrival at Ascension we immediately organised ourselves into teams and visited all known breeding areas of Sooty Terns south and east of the air- strip (Fig.2). The aim was to find out if the terns had begun establishing breeding colonies. Any occupied areas would be marked with fresh guano and freshly killed terns.

This exercise lasted approximately six hours, during which time I discovered that the former 1990 breeding sites situated south-east of the air-strip and east of the perimeter fence and track were practically devoid of tern corpses and eggs from the previous breeding season (October 1991 -March 1992). I had expected to find abandoned eggs and corpses of adults, chicks and juveniles scattered throughout the area. Instead all the sites were empty, as if someone had cleaned up before us. An indication as to what had happened became clear only after we arrived at the pre -arranged rendezvous with another team which had visited the breeding sites to the west of the fence and track.

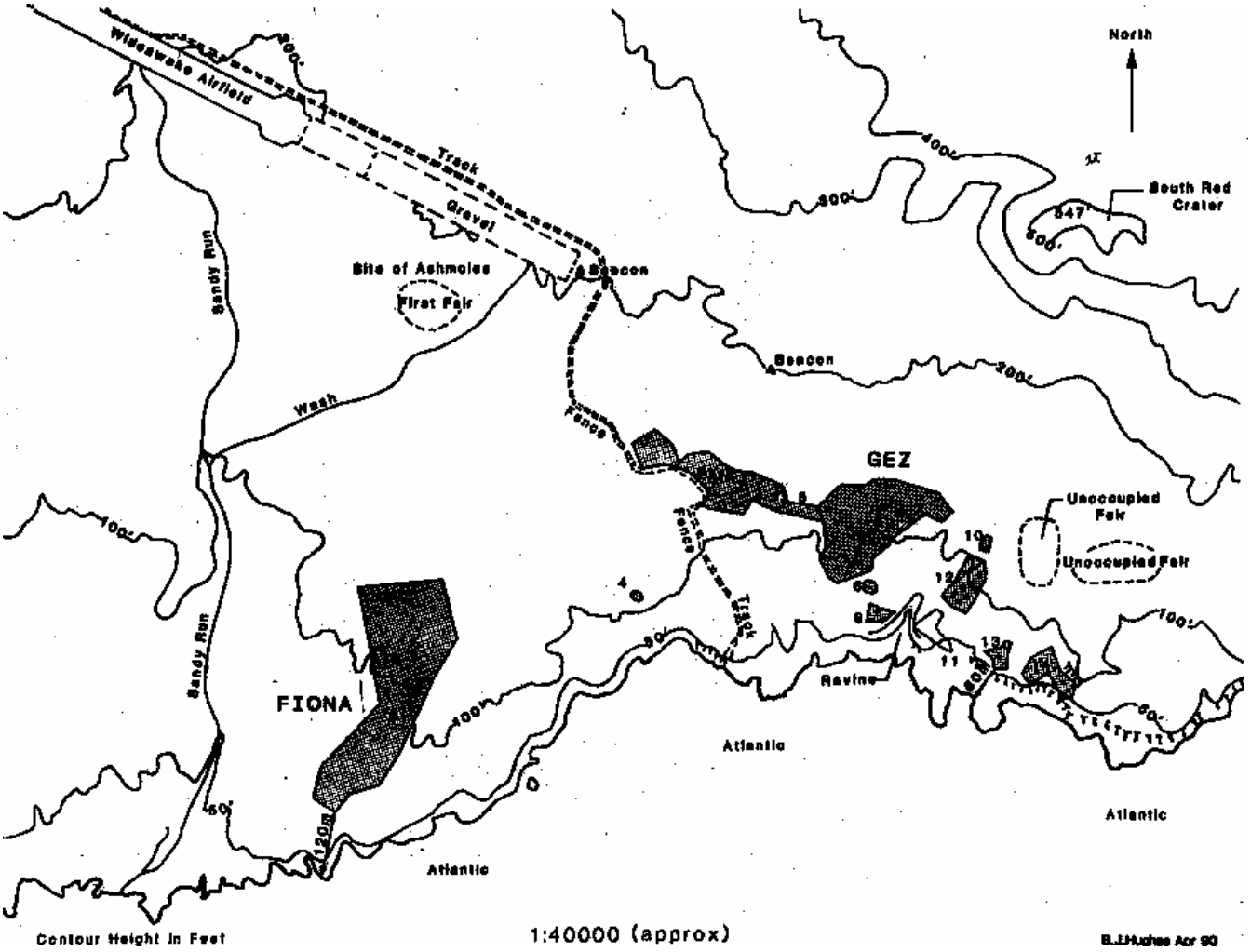

Figure 2: Location and Distribution of Sooty Tern breeding Colonies on Ascension Island in 1990.

Close by the fence and almost on the coast we found an area littered with hundreds of corpses of adult and young terns from the previous breeding season. John Hughes also reported that he had found thousands of abandoned eggs further east in the former Fiona (3) breeding site. We also heard from Newlyn Browne (BBC) that no terns had bred in the eastern sites during the last breeding period and that many thousands of terns had completely abandoned the colonies while still at the egg stage. This situation was confirmed later that day when we visited the Mars Bay site. Thousands of abandoned eggs from the previous season littered the whole area. Browne could give us no indication as to the cause for such a mass desertion.

Because of the extremely delicate situation of the Sooty Tern breeding population today, I feel that however fragmentary the information we receive, it should be published. Therefore a summary of events relating to the previous breeding season and reported by Browne is contained in the Annex to this part of the Report.

Meanwhile our own survey revealed no established breeding colonies, but we did discover two Night Club sites with freshly killed Sooty Tern corpses; one in the eastern sector in the south-west corner of Gez (8), the second on high ground in Mars Bay (Fig.3).

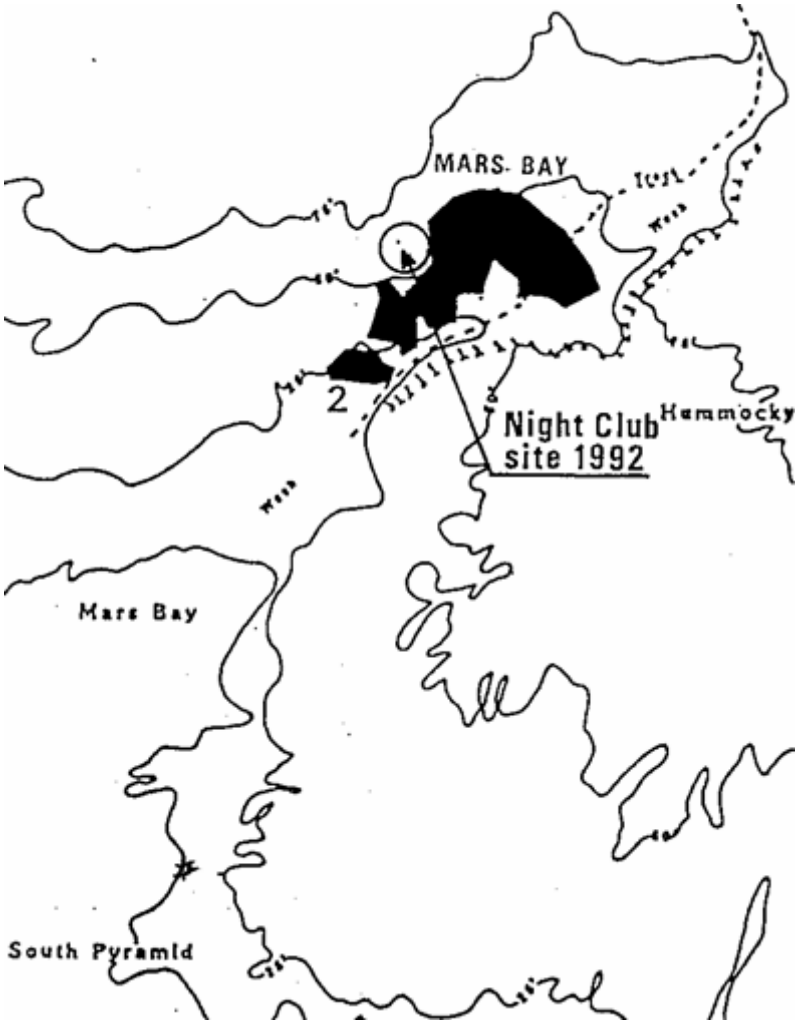

Figure 3: Sooty Tern Night Club Area (Mars Bay) at the start of the breeding season (June – July 1992)

In Gez, 14 adult corpses were collected from low lying ground within the former 1990 breeding site. The state of the corpses indicated that all the birds had been killed during the last two nights (28/29 & 29/30 June). At least two of the birds collected showed no signs of having been eaten and after dissection both were found to be males.

In Mars Bay 16 tern corpses were collected from high ground above the previous breeding sites. The cause of death was due to predation by cats and all birds had been killed during the last two nights, indicating that Night Club activities had only just begun.

Daily collections continued in Mars Bay until our departure on 7 July. During this period only two collections were made in Gez (on 30 June and 6 July). It was not possible to make daily collections in Gez due to other commitments.

The total number of Sooty Tern corpses collected during the eight day period was 220 (87 from Mars Bay, 133 from Gez). These figures gave an average of about 11 cat kills per night in Mars Bay and 19 per night in Gez. (Fig.4).

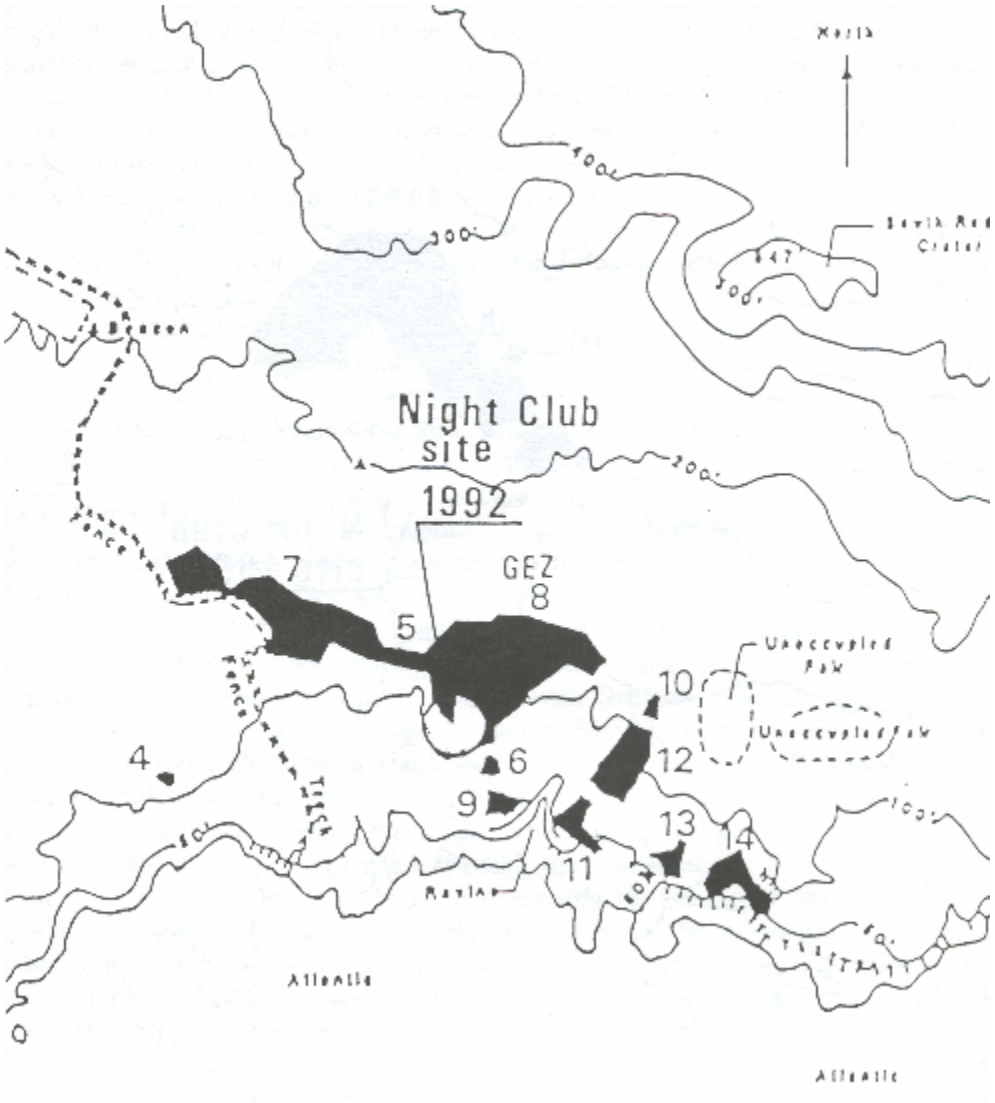

Figure 4: Sooty Tern Night Club Area (Gez) at the start of the breeding season (June – July 1992)

After our departure Browne made several visits to the Sooty Tern breeding areas. In Mars Bay he continued to find fresh tern corpses as a result of cat predation, besides confirming Night Club activities during the period 10 - 18 July.

10 Aug: There were still no signs of Sooty Terns on land east of the fence.
11 Aug: Approximately 2,500 terns with eggs had established a breeding colony east of the fence and close to the sea, probably in Frigate fairs 13 and 14 (Fig.2).
15 Sep: No sign of breeding in the Sandy run (Fiona) site.

The latest news from Ascension Island came from Mr J. Cant the replacement engineer to N.Browne:

30 Oct: Good numbers of terns on the ground west of the perimeter fence and smaller colonies seen in the broken lava in the eastern breeding areas.
4 Oct: The main breeding site in Mars Bay still deserted, but a large colony to the south-west closer to the sea. No attempt made to count the number of birds.

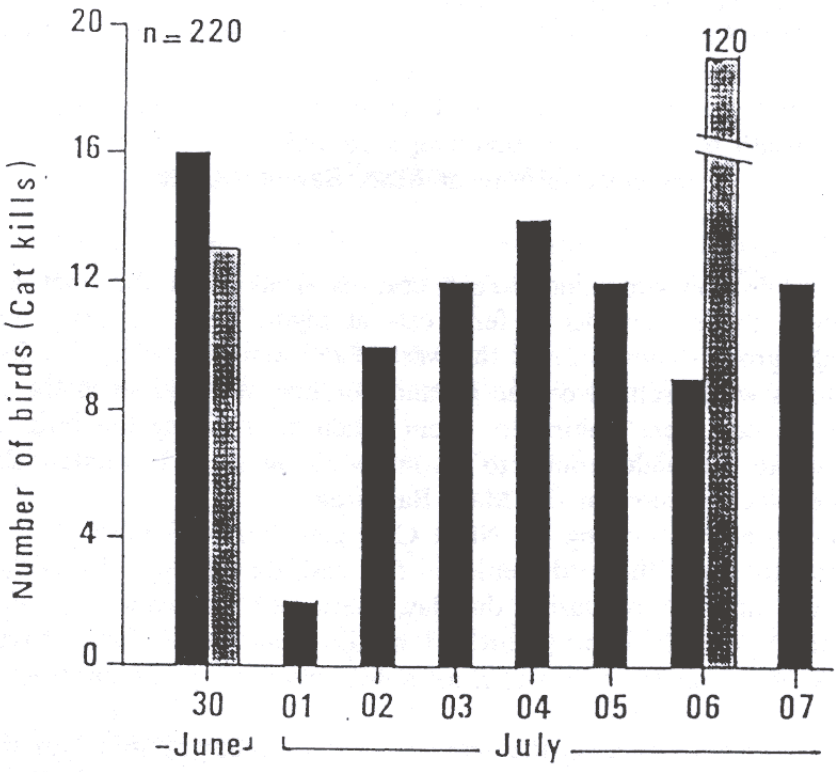

Figure 5: Daily collections of Sooty Tern corpses from the two Night Club areas on Ascension Island in 1992. Birds from Mars Bay in black. Gez in grey.

Night Club activities

Two nights were devoted to the Sooty Tern Night Club activities. The first team spent the night of 4/5 July on the Mars Bay site and reported Sooty Terns coming in from the sea at about 2200 hrs. A rough estimate of the number of birds involved was 1,000 calling excitedly over the breeding ground. By 0300 hrs Hughes reported birds leaving and heading back to sea.

A second team visited Mars Bay during the night of 5/6 July. At 2100 hrs an estimated 200 + birds could be seen flying over high ground and calling all the time. On several occasions this group of birds moved in over the breeding site but each time drifted back to the south-west. I put this behaviour down to our presence in the area.

13 Jul:	Night Club activities increasing over the Mars Bay breeding sites (2000hrs) (Information from N.Browne).
18 Jul:	2,500 Sooty Terns flying over Mars Bay and heading east along the coast between 1850 - 1950 hrs.
29 Jul:	500 + terns seen milling about over the sea close inshore and south of the eastern breeding sites 1830 -1900 his.
21 Jul:	400+ terns close inshore at Mars Bay at 1830hrs.

Feral Cats

It was while collecting Sooty Tern corpses from Mars Bay that I became intrigued about the movements of feral cats at night. Tern corpses were always found on high ground above and to the west of the main breeding site. I assumed that those terns which settled on the ground automatically did so in the breeding area where the cats were waiting for them. Then after killing the birds the cats took them up to the high ground to favourite eating sites. I counted about ten regularly used feeding sites in the Mars Bay area.

It was only after observing the Night Club activities (4/5 July) that I realised the cats move to where the birds settle, in this case on high ground. Although no cats were seen at night or during the day, there were indications (holes in the lava) that they probably went to ground in the same area. These observations should be kept in mind when preparing a live trapping programme for cats in future.

One last remark concerns the number of cat skulls (5) found in the Mars Bay area, one of them a complete skeleton. The number of cat deaths may be linked to the mass desertion of the Sooty Tern breeding population of the previous season. If we consider this in terms of food resources then the absence of the terns would surely have affected the resident cat population.

Conclusion

Despite the fact that our visit to Ascension Island was earlier than we would have wished, it did give us the opportunity of investigating the situation at the start of the Night Club activities, prior to the next breeding period of Sooty Terns.

The results of this survey also provide valuable information about the breeding failure of the previous season (1991- 1992) when a mass desertion of thousands of birds was reported. See Annex to this report below.

The onset of the Night Club activities confirms the presence of important number of feral cats on the breeding grounds. Daily collections of terns killed by feral cats in sample areas also show that the time has come when a more intensive and thorough control of the cat population, particularly in the breeding areas, is necessary if we are to save this important population from destruction.

It should be emphasised here that because of its geographical position in the South Atlantic, Ascension Island is one of the most important seabird breeding stations in the world and every effort should be made to protect it. A well managed cat eradication programme will not only ensure the future survival of the Sooty Tern breeding population, it will also protect the endemic Ascension Island Frigate Bird *Frigata aquila.*

Annex A: .The Sooty Tern breeding season October 1991 -March 1992

Notes compiled by Newlyn S. Browne have been summarised here. They relate to the previous Sooty Tern breeding period October 1991 -March 1992.

The first Night Clubs began in late October 1991, when birds were recorded in Mars Bay and the eastern breeding grounds.

In November the terns came ashore to breed and eggs were recorded in December

2 Jan:	Although many adult birds and eggs were seen in Mars Bay there were no chicks.
11 Jan:	The seaward end of the Mars Bay colony was abandoned.
18 Jan:	Mars Bay virtually deserted, abandoned eggs everywhere and only two adults and 50 chicks seen. A dumper truck was also seen moving through the breeding area.
23 Jan:	A breeding colony situated at the end of the track and immediately west of the perimeter fence appeared to be thriving. Adults, chicks and juveniles in profusion.
31 Jan:	N.Browne and B.Rowlands found that the eastern colony had contracted, but chicks were growing; most had white -tipped dark -brown juvenile feathers.
9 Feb:	A further contraction of the eastern colony. The first chick flying with others exercising their wings.
17/18 Feb:	Many more flying young. A Frigate Bird seen taking one in flight.

Further east in the direction of Pillar Bay, birds were numerous but this area was not visited.

10 Mar: All young in eastern colony now capable of flight.

A walk from Mars Bay eastwards. No breeding in Sandy run, nor to the east of the fence. The only colonies are one immediately west of the fence, a smaller colony slightly north of this and one probably on the eastern skyline towards Pillar Bay.

28 Mar: The colony close to and west of the fence visited. 100 birds in this area, but out numbered by corpses.

11 Apr: The skyline colony visited. No birds seen except a few egg-shells and corpses.

Closing remarks by N.S.Browne:

There has obviously been a dramatic decline in the breeding population of Sooty Terns on Ascension Island this season. The cause of the failure of the Mars Bay colony is not known, however intensive activities and excavating north of Mars Bay may have affected the breeding colony.

Cats were responsible for taking many adults and chicks. Frigates were ever present in the colonies and were observed taking chicks and juveniles. Mynahs were also present in the colonies. I doubt very much that the Army Ornithological Society team will find anything like the 350,000 birds they recorded in 1990.

Much of this information was taken from published notes by N.S.Browne in the "The Islander", and from unpublished notes and correspondence. On behalf of the members of the AOS teams I would like to thank Newlyn for all his bird notes from Ascension over the years and wish him and his wife a very happy retirement in England.

THE SOOTY TERNS OF ASCENSION ISLAND SEP 91 - MAR 92 - Maj B.J .Hughes

Introduction

Sooty Terns (Wideawakes) are the only sea birds that breed in any numbers on the main Island of Ascension. Their status in the past has caused some concern (Nash 1991). These concerns have been heightened by new fears arising from a poor breeding season during the period Sep 91 - Mar 92.

Two separate pieces of evidence point to an unproductive breeding season. The first is the eye witness account by N.S.Browne. For the first time in recent history no successful breeding took place at a favoured location in Mars Bay. This contrasts sharply with the Feb - Aug 90 breeding season when 22,000 pairs of Sooty Terns occupied the site. The second piece of evidence was tern corpses and tens of thousands of deserted eggs which were still very much in evidence when Booby III visited the Island.

Sooty Terns Breeding Cycle

Sooty Terns do not breed annually. As a result there is a need to clearly identify the dates of past and future breeding seasons if the status of these birds is to be accurately recorded. Their breeding cycle has been variably reported as being 42 weeks, nine and a half months, 9.6 months and 10 lunar months. The most accurate figures for the length of the breeding cycle were determined as being 293 days (Chapin 1954) and 297 days (Ashmole 1963). The mean of these two figures (295 days) has been used in this report to determine previous and predict future start dates for laying.

In recent years the most reliable date for the start of laying by Sooty Terns on Ascension Island was identified by Ashmole and the Army Ornithological Society as being 9 Feb 90. This date was used as a datum to calculate the start of laying for five breeding cycles on either side of the datum.(Table 1)

A typical breeding cycle for Sooty Terns follows a particular pattern; initially, small groups of terns arrive in the middle of the night and mill about over the breeding grounds; some may even land for a short period. These "night -clubbing" activities last for approximately two months; the numbers of birds participating increases, and more and more birds land at night. The activities culminate in a mass landing of birds during the day. Within the next two days a single egg is laid and incubated for a period of 28 -30 days. From hatching to fledging of young

takes a further two months. This is followed by a gradual departure to the ocean where the terns remain for the next four to five months until the start of the next breeding season. This means that the total breeding period from the time the first eggs are laid and the last fledged young have departed is approximately six months. Thus, in anyone breeding period of 9.6 months some Sooty Terns are present on the ground for all except two or three months. During this period of absence, feral cats have difficulty in finding enough food once they have cleared up and eaten the remaining tern corpses.

TABLE 1: Wideawake Calendar

ALL TERNS ABSENT FROM ISLANDS	FIRST EGGS LAID	FIRST CHICK HATCHED	FIELD OBSERVATIONS TO CONFIRM CALCULATED DATES
Aug - Oct 86	18 Nov 86	17 Dec 86	9 -25 Feb 87 RAFOS estimates 100,000 terns on fairs
May - Jul 87	09 Sep 87	08 Oct 87	
Mar - May 88	30 Jun 88	28 Jul 88	Booby 1: 2,500 terns at Mars Bay 11 Nov. Nos declining daily
Jan - Mar 89	20 Apr 89	21 May 89	
Nov - Dec 89	09 Feb 90 DATUM	12 Mar 90	Field obs by Ashmole and Booby II confirm these dates
Aug - Oct 90	01 Dec 90	30 Dec 90	3 Feb large thriving fairs at Mars Bay & Waterside. Browne
Jun - Aug 91	22 Sep 91	21 Oct 91	Terns present in Oct. Browne
Apr - Jun 92	13 Jul 92	10 Aug 92	2,500 terns with eggs found at Waterside Fair 11 Aug. Browne
Jan -Mar 93	04 May 93	02 Jun 93	
Nov 93 – Jan 94	23 Feb 94	24 Mar 94	
Aug - Oct 94	15 Dec 94	20 Jan 95	

Successful Fairs

When Ex Booby III visited the Island at the end of Jun 92 the Sooty Terns had only recently returned and were at the night club stage. During the day the birds were away at sea and it was impossible to estimate their numbers at night so the expedition focused its attention on the sad remains of the previous breeding season.

Young Sooty Terns were reared in smaller numbers during the Sep 91 - Mar 92 season than during the Feb - Aug 90 breeding season. So -called successful colonies where breeding did take place were surrounded by the remains of half eaten adult corpses and were easy to identify.

Expedition members visited all the known breeding sites occupied during the Feb -Aug 90 breeding season. The sites situated east of the runway and the perimeter fence showed little evidence of occupation since. However further investigations west of the fence revealed two new sites occupied during the 91 - 92 season. .Their location and size are given in Table 2.

One of these sites Fence End (16) was visited by Browne on several occasions. On 31 Jan 92 and again on 9 Feb he noted that the colony was declining; by 28 Mar there were only about 100 birds present and hundreds of tern corpses were everywhere. The other new site New Fair (15) situated further west was not visited by Browne.
He did however record a thriving colony at a known breeding site Frigate (13 and 14) on 31 Jan and again on 11 Apr but considered them to be smaller than the Fence End (16) colony. In 1990 the two Frigate colonies covered a total area of 0.55 ha. Further correspondence with Browne suggests that another known breeding site Big

John (7) was also occupied (probably for a short period) on 22 Jan 92. There is uncertainty whether any other sites were occupied.

Table 2: New Sooty Tern breeding sites occupied during the breeding season Sep 91 -Mar 92

NAME & NUMBER	LOCAL GRID REF	AREA IN HECTARES
New Fair (15)	687 176	0.288
Fence End (16)	689 175	1.037

Unsuccessful Fairs

Two large breeding sites which had been regularly occupied in the past, Mars Bay (1 and 2) and Fiona (3), were littered with large numbers of abandoned eggs. Sooty Terns had attempted without success to breed at these two sites. It is a common occurrence for them to abandon their eggs and to move to other sections of the colony. What is unusual is for a large fair to be deserted completely. A similar phenomenon occurred in Mars Bay in 1963 when a rain storm washed away the colony.

Techniques developed on Booby II were used to calculate the number of abandoned eggs. Firstly the area in which eggs were abandoned was calculated by survey methods. A compass, pace and pedometer traverse of the perimeter of each area was completed and from this the area was determined.

Sample density counts were taken at 17 randomly spaced points at the Mars Bay colony and the average number of abandoned eggs per square metre was calculated. The maximum number in any single ten square metre quadrat was 35 eggs and the minimum (at the bottom of a very rocky hole) zero. The mean number of eggs laid on Mars Bay fair was 1.412 eggs per sq metre, a figure remarkably close to that obtained in Feb 90 which was 1.495 per sq metre.

No density counts were taken at Fiona Fair (3) but the density of eggs appeared very similar to that of Mars Bay (1) and the figure of 1.412 eggs per sq metre was used to calculate the number of abandoned eggs on this site. The results are shown in Table 3.

Table 3: Numbers of Abandoned Eggs Sep 91 -Mar 92 Season

NAME & NUMBER	AREA IN HECTARES	EGGS ABANDONED
Mars Bay (1)	1.6704	23,600
Fiona Fair (3)	1.4688	20,700

The total number of eggs abandoned at these two sites was 44,300. This compared with Mar - Aug 90 when 50,000 pairs occupied the sites. It is interesting to note the similarity in size of these two populations. The two fairs hold approximately one third of the breeding population of Ascension Island Sooty Terns.

Many of these abandoned eggs were still whole, some containing liquid and others completely formed chicks. The majority however were broken or had some form of predatory damage. 106 eggs selected at random were examined. 11 were found to be whole, 13 contained chicks, 26 had a single hole in the egg, 28 were completely smashed and a further 28 were split in half generally in a longitudinal direction.

The fresh guano on these sites was unusually pink in colour indicating that shrimps had formed a large part of the Sooty Terns' diet.

Possible Causes of Desertion

Walmsley's report clearly identifies predation by feral cats as a major factor influencing the breeding success of Sooty Terns on Ascension Island. However, the us Bird Air Strike Hazard (BASH) team which visited the island shortly after our departure indicated other sources of disruption. For example, the weather might have been the cause; a rare storm with thunder and lightning hit the islands on 16 Jan 92.

As part of a comprehensive environmental "clean up" effort, United States contractors were operating heavy machinery in the immediate vicinity of the Mars Bay colony during the nesting period.

Although illegal, egg collecting may still occur periodically. Human disturbance, particularly in the Mars Bay area, is very much in evidence.

Conclusion

It is interesting to note that the two abandoned colonies were the closest to human habitation. A drift eastward away from the developed areas appears to have taken place during the Sep 91 -Mar 92 breeding season.

There is evidence to show that Sooty Terns occupied at least 4 hectares of nesting grounds and it is possible but unlikely that an area up to 8 hectares could have been occupied. In Mar 90 a total of 13.5 hectares were occupied. Clearly the Sep 91 - Mar 92 season was 30 - 50% less successful than the 1990 breeding season.

THE RED -FOOTED BOOBY *Sula sula* OF ASCENSION ISLAND - Maj B.J .Hughes

Service Ornithological expeditions have visited Ascension Island, in the middle of the Atlantic Ocean and just south of the equator approximately every two years since Feb 1987.

The Royal Air Force Ornithological Society team led by Sqn Ldr Mike Blair was the first of these expeditions to visit the Island. The next was the Army Ornithological Society with Ex Booby I in November 1988, followed by Ex Booby II in March 1990 and the latest expedition Ex Booby III in July 1992, all under the leadership of Maj Hilary Nash. The data on Red -footed Boobies recorded by each expedition was small but when combined they are sufficient to give a good picture of the current status of the species.

The Island is the home of three pan-tropical boobies. The Brown Booby *Sula leucogaster* and the Masked Booby *Sula dactylatra* both breed in good numbers but the status of *S.sula* has been uncertain. In the early 1980s the species was believed to be on the point of extinction.

All three species have been severely affected by predation from feral cats on the main Island. Today Boobies survive only on a few stacks and on a small cat free island, Boatswain Bird Island (BBI), off the north east coast where competition for nest sites is very fierce. Masked Boobies occupy the flatter tops, while Brown Boobies nest on ledges and the steeper areas of the rocks.

Elsewhere in their breeding range *S.sula* nest in trees but on Ascension Island they nest on inaccessible cliffs. No nests, eggs or chicks were found by any of the four expeditions. However roosting birds were sighted in the same approximate locations on each visit.

S.sula occupy the western cliffs on BBI in a band above the high water mark and below the area occupied by Brown Boobies. They roost well down the cliffs in an area nearly impossible to observe from above but some birds can be seen with a telescope from the mainland. Ex Booby III was on Ascension in June when young should have been seen. None however were identified though this may be due to the difficulty of spotting the birds through binoculars from a bobbing boat. Each team visiting BBI by boat saw birds perched on the western cliffs of the island. A record of all these sightings is at Table 3.

Ten pairs of white morph and three or four pairs of brown morph occupy sites on the western side of BBI. A pair of white morph roost on Stack 5 in English Bay and it is also probable that there is another pair on the cliffs at Letterbox. A further pair of brown morph *S.sula* occupy Stack 11 or 12 in Cocoanut Bay. White morph birds outnumber brown morphs by a ratio of 3:1.

The largest number at anyone location was seen by each expedition on BBI usually during the middle of the morning. Blair (1989) on one occasion spotted three flying westwards out to sea from Georgetown at dusk. The feeding area for Ascension boobies lies west or north west. of the Island many miles out to sea. These facts could indicate that the group of birds roosting during the day on BBI are nocturnal feeders. *S.sula* are known to feed at night elsewhere in their range.

TABLE 3: Sightings of red -footed booby by service expeditions

LOCATION	RAFOS FEB 87	BOOBY I NOV 88	BOOBY II MAR 90	BOOBY III JUL 92
Boatswain Bird Island (BBI)	15 + Ad 1st visit 12 Ad 2nd visit & 3 downy young	2 Ad White morph& 1 Juv 19 Nov	9 Ad White morph 4 Ad Brown morph from boat 16 Mar. 1 Ad from Powers Peak 18 Mar	10 Ad White 3 Ad Brown from boat 2 Jul 1 Ad White morph from top of Island 3 & 4 Jul
Klinka Club, English Bay Dawn & Dusk Sea Watches	12 unspecified sightings at various times	1 Ad White morph 15/18/29 Nov 2 Ad White morph 16/22/27/29 Nov 3 Ad White morph 23/24 Nov 4 Ad White morph 21 Nov 2 Ad White morph & 1 Juv 17/20 Nov 1 Ad Brown morph 19/21/22/23/25/26 Nov	2 Ad unspecified12 Mar & 1 Ad unspecified 10 Mar2 Brown & 2 White morph on 13 Mar	2 Ad White morph and3 Ad Brown morph 2 Jul
N.East Bay & N.East Point	2 Unspecified	No Observations	6 unspecified 13 Mar 1 Ad Brown & 2 White morph dusk 10 Mar	No Observations
Hummock Point	No Observations	No Observations	1 unspecified 15 Mar	No Observations
Stack 5 (English Bay)	1 Unspecified	1 Ad White morph16/18 Nov	1 Juv 16 Mar	1 Ad White morph 1 Jul
Stack 11 (Cocoanut Bay)	No Observations	No Observations	No Observations	1 Juv Brown Ad size 6 Jul
Stack 12 (Pillar Bay)	No Observations	1 Ad Brown morph 27 Nov	No Observations	No Observations
Cliffs of Letterbox	No Observations	No Observations	1 unspecified flying 17 Mar & 1 roosting unspecified 11 Mar	1 Ad White morph roosting 3 Jul
Mars Bay	No Observations	1 Ad White morph flying by 14 Nov	No Observations	No Observations
GeorgeTown Area	2 Ad White morph 1 Juv or Brown morph	No Observations	No Observations	No Observations
Total Sightings	48	39	34	23
Sightings Less Duplicates	23	10	22	19
Total Juvs & Young Seen	4	3	2	1
Ratio White:Black Morph	Mainly White	4:1	2:1	2:1

Note: Ad = Adult; Juv = Juvenile

All four expeditions recorded *S.sula* flying north-west during dawn watches from a site at the Klinka Club in English Bay. During evening watches at English Bay *S.sula* were seen heading back to BBI flying alone or singly in skeins of Masked Boobies. These birds were obviously diurnal feeders. The minimum number of *S.sula* on Ascension would therefore be the sum of the birds seen roosting during the day plus the number returning from the feeding grounds at dusk.

At least one juvenile was identified by each expedition and Blair was confident in his identification of three downy young, thus providing some proof that successful breeding in very small numbers had taken place.

The steady decline in sightings during the four expeditions is not significant, as some groups did more sea watches than others and the count of *S.sula* on BBI was repeated by the first expedition.

Summary

144 separate sightings of Red -footed Boobies were recorded by over 21 different individuals. There can be no doubt that a small group of Red -footed Boobies still survives on Ascension Island.

RECONNAISSANCE FOR A CAT - PROOF FENCE ON LETTERBOX - SUMMARY -Maj B.J.Hughes and J.G. Walmsley

Introduction

Cats were first introduced to Ascension Island in 1815 to control the increasing number of rats *Rattus rattus.* At that time there were reports of large breeding populations of seabirds: Boobies, Frigate Birds, Tropic Birds, Noddies and Terns. The cats were largely responsible for the decline and destruction of the mainland seabird colonies. Today the only indication which bears witness to the former wealth of seabirds on Ascension are large areas of guano and phosphate deposits in many parts of the Island and a declining Sooty Tern population, confined to the south -western part of the Island.

Conservation Proposals

The recent concern about the wildlife of Ascension Island by private individuals, ornithological groups and international organisations has led to a number of conservation measures being presented. Everyone agrees that feral cats should be eradicated, or drastically reduced, in order to redress the balance on Ascension.

Various proposals have been suggested to try and stop the continued decline and destruction of the Sooty Tern population, the last remaining seabird species breeding in any number on the main Island. Each year thousands die as a result of predation by feral cats. All other species are confined to inaccessible cliffs, inshore stacks and Boatswain Bird Island (BBI), approximately 300 metres off the north- eastern shore and where the majority of species breed today. One of these is the endemic Ascension Frigate Bird whose population may not be more than 3,000 individuals (Nash *et al* 1991).

In 1987 an expedition organised by the Royal Air Force Ornithological Society (RAFOS) suggested that "if the Letterbox peninsula were fenced off and the cats inside were eliminated, re-colonisation could be induced" (Blair 1989). Letterbox is the extreme eastern part of Ascension Island. The Army Ornithological Society (AOS) expedition (Exercise BOOBY II) in 1990 supported this proposal, hence during the next AOS expedition (Exercise BOOBY III) in June -July 1992, a reconnaissance survey was made of Letterbox.

The AOS further suggested that the Letterbox peninsula could be isolated from the rest of the Island by erecting a "Solar -powered" cat -proof fence across the narrowest point along the western side, east of Wig Hill. An intensive control of all animal predators (cats and rats) within the Letterbox area would then be launched with the aim with the aim of establishing a sanctuary for roosting and breeding seabirds.

Another suggestion is to fence off the existing Sooty Tern breeding sites south and east of the air -strip (see Nash *et al* 1991). This would considerably reduce the logistic problems and allow relatively easy access of material to the breeding sites, regular maintenance of electrified fences and a more systematic control of predators (live trapping) within these areas.

The only other option which merits further investigation and which has the strongest support, is a total eradication of feral cats on the island. While this has been fully approved in the UK this proposal is not acceptable to the residents of Ascension, therefore alternative methods of reducing the cat population are being sought.

The 1992 Letterbox survey and results

A careful study of the maps of Ascension Island reveals few suitable sites which can be isolated effectively. Letterbox is a natural site and the only peninsula of any size suitable for such a project.

The minimum size of any proposed reserve would need a maximum number of hectares to be of any value. Also fencing off such a large area would be too expensive unless it had high cliffs and the sea as natural barriers. Letterbox has all these possibilities, besides having a natural bottle -neck along which a fence can be erected. It

is also situated in close proximity to BBI where inter-specific competition for nest sites is a problem among the breeding seabirds.

Two large scale maps (scale 1.2,400) were obtained and a suitable line for a cat fence was selected, using the natural contours as a guide to prepare a trial profile.

Fieldwork was carried out by two teams during two visits to Letterbox, the first on 1 July by J.G.Walmsley, C.Wearn and BJ.Hughes, the second on 3 July by D.M.Morrison, J.P.Self and BJ.Hughes. In the field we:

- established the shortest route for the fence which would isolate Letterbox from the rest of the Island
- determined the length and profile of the fence route and erected cairns along the chosen fence line
- noted the geography and nature of the terrain for use in preparing a feasibility study
- and compiled a photographic record of the fence line and the plateau of Letterbox.

The first team walked the proposed trial profile line beginning in the north at approximately the 200m contour line and headed south in the direction of South East Bay. It was not feasible to produce a direct line between the two terminal points as the terrain in many places was too rough. Both ends of the line ended at sheer cliffs which provided natural cat barriers, therefore we did not consider it necessary to extend the proposed fence line into the sea as originally planned.

Returning along the original fence line S -N the route begins at the base of high overhanging cliffs in South East Bay, 26 metres above sea level and climbs steadily upwards to the highest point 100m and continues due north for 918m. From there the line slopes downwards to cairn 9 (Big Rock), before angling north-east for the final 304m descent down to a cliff face above the boulder beach north of Letterbox. Eleven cairns built of lava rock were numbered and strips of orange plastic tape was wrapped around each one. From cairn 7 to 10 a thin telephone cable marks the route. The cliff faces at both ends of the line were not marked. The total slope distance of the line is 1,222m, and the horizontal distance is 1,005m. On completion of the survey the proposed fence line together with the different physical aspects of the terrain was drawn up and is shown in Fig. 6. A complete description of the terrain along the fence route indicated by sections was prepared.

Letterbox peninsula has sheer cliffs rising over 100m from the sea in the north and extends east and south-east to Bottle Point. The cliffs and the sea continue to form a natural barrier south to Whale Point and round to south East Bay. The northern half of Letterbox comprises a featureless plateau of sand, gravel and cinders with broken lava rocks and a number of bomb craters. The southern half slopes downwards towards the sea. Here the ground is very rough and covered with numerous lava flows. Walking in this area is extremely difficult.

The plateau itself is approximately 120 hectares in size and has no vegetation. It lies more than 3 km in a direct line from the nearest vehicle track and about 12 km from the nearest human habitation. The only access is by foot along a rough goat track from the old NASA site. The track then winds across the hillside for a distance of about 5 kms and the journey takes approximately 2 hours each way. A description of the route can be found in the booklet "Ascension Island Walking Maps".

In favourable weather conditions however, it would be possible to land from the sea at South East Bay and also at the boulder- strewn beach on the northern shore. Unloading material, stores and equipment from boats at these two locations and getting them to the fence line may prove a hazardous task.

Other disadvantages beside the difficulty of access to Letterbox will be the regular maintenance and inspection of the fence and the lack of fresh water.

If that fails good helicopter landing sites do exist on the northern part of the Letterbox plateau, but unfortunately there are no helicopters on the island at the moment.

Letterbox also has some advantages. It is close to Boatswain Bird Island where the major seabird colonies are found and where there is a shortage of nest sites. There are also small seabird colonies (Boobies, Frigates and Noddies) on the inaccessible cliffs of Letterbox and old guano deposits on the top indicate that seabirds once bred there.

A solar -powered fence of 1.2 km would isolate this area of 120 hectares. Predator control would be far more effective within this area compared to a complete eradication of cats from the whole island and disturbance by humans would be minimal. The probability of Letterbox being re-colonised by seabirds could be enhanced by one or two practical field experiments.

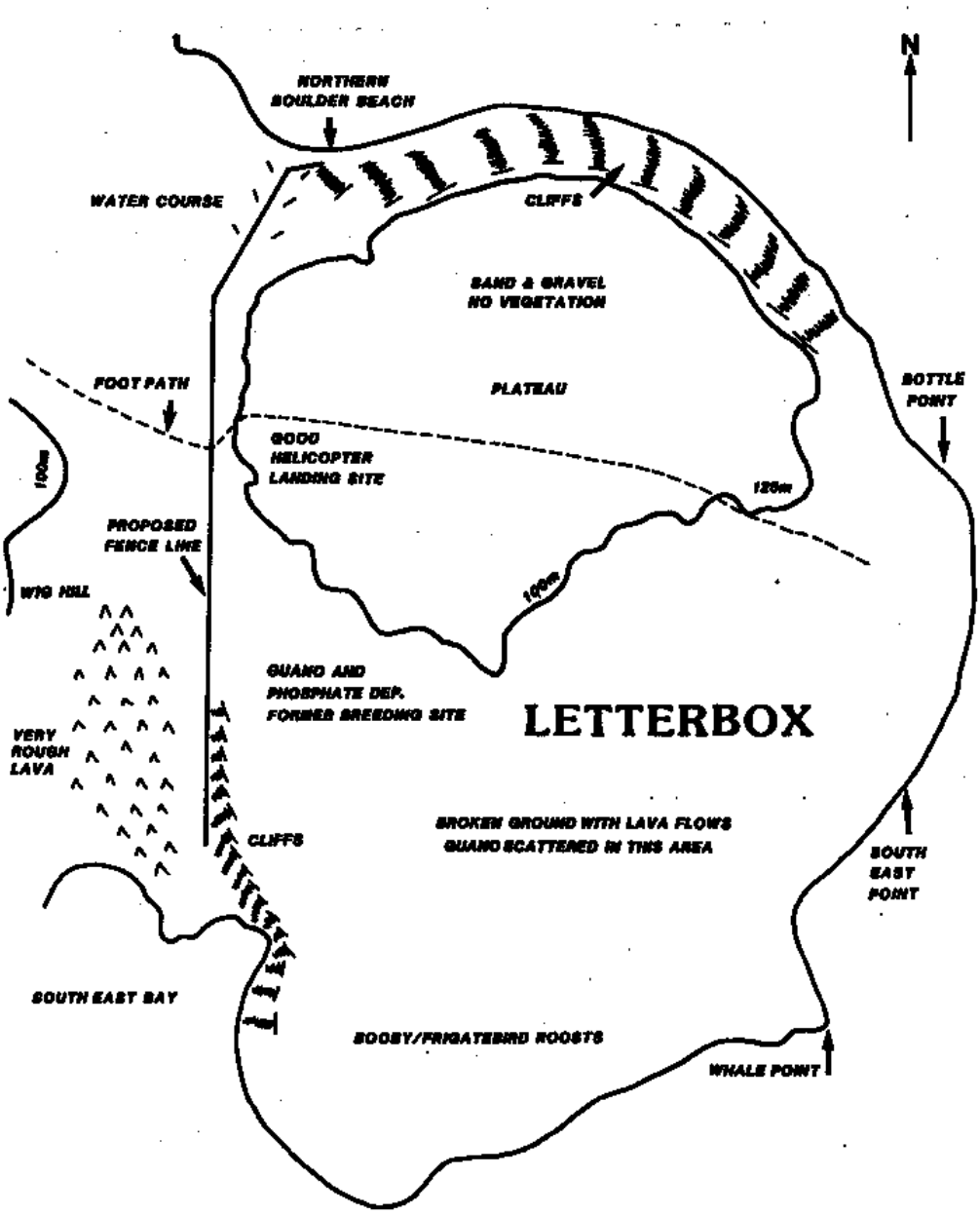

Figure 6: A Sketch of Letterbox peninsular showing the proposed fence line and the different habitats and structure

Conclusion

If we consider that Letterbox is the only peninsula or headland of suitable size where a solar -powered fence can be sited the logistics appear formidable at first (the length of fence needed would be just over 1 km supported by about 250 posts). However we believe that with sound planning and the proper financial backing, these difficulties can be overcome.

The feral cats which have decimated the seabird populations of Ascension Island and thousands of square kilometres of ocean, were introduced indirectly by HM Marines. It is therefore logical that HM Forces should play a leading and active role in the restoration and. conservation of the wildlife of Ascension Island.

Any further progress at this stage will require engineering support and the full support of the St. Helena and Ascension Island Dependencies.

Meanwhile there are other possibilities which need to be investigated before any final decisions are taken. One of these is the fencing off of all the Sooty Tern breeding sites in the south -west comer of the Island, from Mars Bay east to South Red Crater and Pillar Bay. There already exists an unused electric fence around the air- strip perimeter, designed to keep out sheep and donkeys. This would provide an excellent opportunity and starting point for any further surveys.

The realisation and short term benefits of this alternative project would favour the Sooty Tern population by improving the breeding success and lowering the mortality rate. The long term benefits would concern all species which at present are restricted to breeding on BBI. The Red -footed Booby and Frigate Bird populations could also recover and breed more successfully. The seabirds of Ascension would then have the opportunity of re-colonising the main Island, thus relieving the pressure on BBI and the air- strip breeding sites.

REPORT ON THE CENSUS ON BOATSWAIN BIRD ISLAND - Maj R.HJ.Nash.

Exercise BOOBY III visited Ascension Island from 30 June to 7 July 1992. The Expedition was granted permission to land a party of three people on Boatswain Bird Island (BBI) for two nights in order to survey the breeding birds. This visit was made from 3 to 5 July. This report covers the observations made during those three days.

Introduction

The party landed with a sufficient reserve of food and water, as unpredictable sea conditions can delay recovery. Water was no problem, as we had ample 20 litre water containers, but food was less easy because the RAP could not provide composite rations. In the end the party had to get its supplies from the NAAFI club, and survived on a diet of corned beef, oatmeal blocks and tinned peaches, flavoured with guano dust. We were glad there was no hitch to the recovery plan!

The base Camp was set up on the landing jetty, the same site as the BOU Centenary Expedition used for their hut. (Stonehouse 1922). This site caused the least disruption to the breeding birds, though there was a partially fledged Brown Booby who did not fully approve of his? new neighbours.

Bird Studies

The primary purpose of the visit was to assess the numbers of breeding Ascension Frigate Birds and Masked Boobies that use the flat(ish) top of BBI. We also planned to find out as much information as possible about the other species breeding there.

The original plan was to set out and mark permanently a transect line from the Guano Workers Hut on the south side of BBI, to Wideawake Gully on the north -east corner. This would have been 240 metres long, and all nests in a strip 5 metres either side of it would have been counted. It was hoped that this same line could be used in future studies.

It was clear on arrival on BBI that if this line was used, very few if any Frigate Bird nests would be included. It was therefore decided to take representative samples of the breeding areas, using point counts based on 100 sq m circles. 20 such samples were taken and the results are given in table 4. Each site was given a number, which was painted on a suitable rock in large yellow figures, so it could be read with a telescope from Powers Peak on the main Island. A bearing and distance was also taken from a stone cairn built as a datum at the northern end of the 'wall'. It is hoped that the counts can be replicated in future, and also that changes in the pattern of territories can be observed from the mainland. Annex B is a sketch map of BBI showing the location of the centre point of the census plots. Figure 7 is a reproduction of the sketch map drawn by the BOU Expedition of 1957-1959.

Booby and Frigate Bird Observations

Masked Booby

There was an area at the top of Wideawake Gully where non-breeding birds congregated. Up to 80 were counted including 10 in immature plumage.

Ascension Frigate Bird

Breeding Birds. c350 nests were counted on BBI plus c100 fully fledged juveniles. The latter could fly but did not seem to leave the top of the islet.

Food Items. Food remains were mainly fish, (Flying fish were identified), squid and one turtle hatchling. The latter was an old item.

Disturbance. A few juveniles would regurgitate their last meal if disturbed. Presumably they assumed that if we were presented with a gift of semi-digested fish, we would leave them alone. They made no attempt to recover the meal when left alone.

Other Species

Counts on other species were based on what could be observed from positions that were safely accessible. This excluded most of the cliff nesting sites, so no full count could be made of Red-footed Boobies, Brown Boobies, Black Noddies *Anous tenuirostris,* White Terns *Gygis alba* and Maderian Storm Petrels *Oceanodroma castro.*

Tropic Birds

A count was made of the nests of both species of Tropic Bird. The Red-billed Tropic Bird *Phaeton aethereus* tends to nest in holes under the basalt cap that forms the top of BBI, and is more readily accessible. A total of 119 nests were found. The Yellow -billed Tropic Bird *Phaeton lepturus* is in this general area, but it also uses cliffs more widely. A total of c75 nests were found, but this figure is not a complete count.

Red -billed Tropic Bird

There was obviously intense competition for nest sites, as we observed several fights over them. On one occasion we observed two birds, both bloodied, locked in combat for a good minute. They took no notice of us, though we were less than a metre away.

Maderian Storm Petrel

Several birds were seen inspecting holes on the north face of BBI just below the basalt cap, and more were seen by the 'wall' near the guano workers' hut.

Feeding Movements

It was hoped to count the dawn and dusk feeding movements, but this proved impossible. It was very difficult to detect the birds arriving, and once over BBI they stacked in a circling column several hundred metres high. It was a most impressive sight, which provided good photographs, but was completely uncountable-

Predation

There are numerous Spotted Shore Crabs on the lower part of BBI, and they reach up to the 40m contour. We saw none on the top. These are voracious scavengers which will readily take small chicks if they are left unattended. One chick, probably Black Noddy, was seen being carried off alive by a crab, and a group were seen circling the nest of a Brown Booby, but keeping out of beak range. These crabs avoided the sea at all costs, and we discovered why when we threw one in. It was instantly devoured by Blackfish *Balistes sp.*

Summary

Three members of Exercise BOOBY III spent three days on BBI. The aim of the visit was to census the breeding populations of Ascension Frigate Birds and Masked Boobies. 20 random census plots were surveyed covering a total of 2000 sq m. The results of these counts are at tables 4 and 5. These census plots were marked and recorded so counts can be replicated in future. Other species were counted, but those nesting on the cliffs could not be seen from the top of BBI, so the counts are not complete.

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Table 4: Exercise BOOBY III -Visit to Boatswain Bird Island 3 to 5 July 1992
Breeding densities of Ascension Frigate Birds[1]

Species & Breeding Stage	Census Plot Number																				Totals
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Egg[2]	3	2	4			1			6						2			3	2		23
Stage A																					0
Stage B									1	1								1			3
Stage C																					0
Stage D	1								3									1			5
Stage E							2												1		3
Stage F	1								1												2
Stage G							3		3									1			7
Stage H				1					1						1			1			4
Totals	5	2	0	5	0	0	6	0	15	1	0	0	0	0	3	0	0	7	3	0	47

[1] Stages A to H are Growth Categories for Ascension Frigate Bird defind by B&S Stone House. See table 7.
[2] Males and 15 Females sitting.

Table 5: Exercise BOOBY III -Visit to Boatswain Bird Island 3 to 5 July 1992
Breeding densities of Masked Boobies[1]

Species & Breeding Stage	Census Plot Number																				Totals
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Egg[2]	1	2	5		3	17		4	1		7	10	2	23		8	1				84
Stage A																					0
Stage B[3]					1																1
Stage C																					0
Stage D[4]						1															1
Stage E[5]						2						1									3
Stage F																				1	0
Stage G[6]								1													2
Stage H					1																1
Totals	1	2	5	0	5	20	0	5	1	0	7	11	2	23	0	8	1	0	0	1	92

Table 6: Notes on breeding bird densities on Boatswain Bird Island

1	Plot 4, Stage I -The juvenile Frigate Bird had a broken wing.
2	Plot 5, Stage C -This Masked Booby nest also contained 1 egg.
3	Plot 5, also contained a Brown Booby nest with 2 chicks.
4	Plot 6 contained a Yellow -billed Tropic Bird nesting under a cairn built by an earlier expedition. (The BOU ?)
5	Plot 10, Stage C -This Frigate Bird chick was attended by an adult male.
6	Plot 10 contained: - 3 Red -billed Tropic Bird nests, 1 with young. 1 Brown Booby almost fully grown.
7	Plot 11, 1 Yellow- billed Tropic Bird nest, but no eggs yet.
8	Plot 13 contained 1 juvenile Brown Booby.
9	Plot 14, Stage A -A Masked Booby laid a second egg whilst the census was in progress. This plot held the highest density of birds with 27 Masked Boobies and 7 Brown Boobies.

Table 7: Growth Categories – Ascension Island Frigate Bird

Category	Description	Mean Age in Days
Egg	Egg Single white thin -shelled easily broken	
Stage A	Chicks naked of all down cover	8
Stage B	Down covers head and body. Scapulars less than 3cm	23
Stage C	Scapulars more than 3cm. No quills	38
Stage D	Quills erupted; rectrices less than 3cm	53
Stage E	Rectrices more than 3cm. Less than half down cleared from head and wings	80
Stage F	More than half down cleared from head and wings	108
Stage G	Down on throat and breast only	142
Stage H	Down remaining in traces only	172

[1] Stages A to H are Growth Categories for Masked Boobies defined by Gibson – Hill (1947) an DF Dorword (1962) See 8.
NB: In the following notes 1 Egg = 1 (means there was 1 nest containing 1 egg). 1 Chick = 3 (means 3 nests with 1 chick each)
[2] 1 Egg = 32; 2 Eggs = 51; 3 Eggs = 1 [3] 1 Chick = 1;2 Chicks = 0 [4] 1 Chick = 0;2 Chicks = 1
[5] 1 Chick = 3;2 Chicks = 0 [6] 1 Chick = 2;2 Chicks = 0

Table 8: Growth Categories – Masked Booby

Category	Description	Mean Age in Days
Egg	Eggs chalky white with a hard blue surface underneath clutch. Normally two eggs per clutch	
Stage A	Chicks naked	1 – 8
Stage B	Down appearing on back	9 – 13
Stage C	Down beginning to cover the whole body, the chick thus becoming white	14 – 26
Stage D	Completely covered with down, but the down not yet fully grown and the chick about half the size of parent	27 – 36
Stage E	Entirely covered by down of the full length and almost as big as parents, beak full grown; primaries and rectrices not yet visible. Primaries erupted at 37- 40 days but hidden beneath down initially	37 – 46
Stage F	Primaries and rectrices visible to a gradually increasing extent	47 – 60
Stage G	Down remaining only on head, neck and flanks	c 85
Stage H	Fully feathered, down all gone, but chick, not yet flying to sea (determinable from cleanliness of legs and feet)	c 105

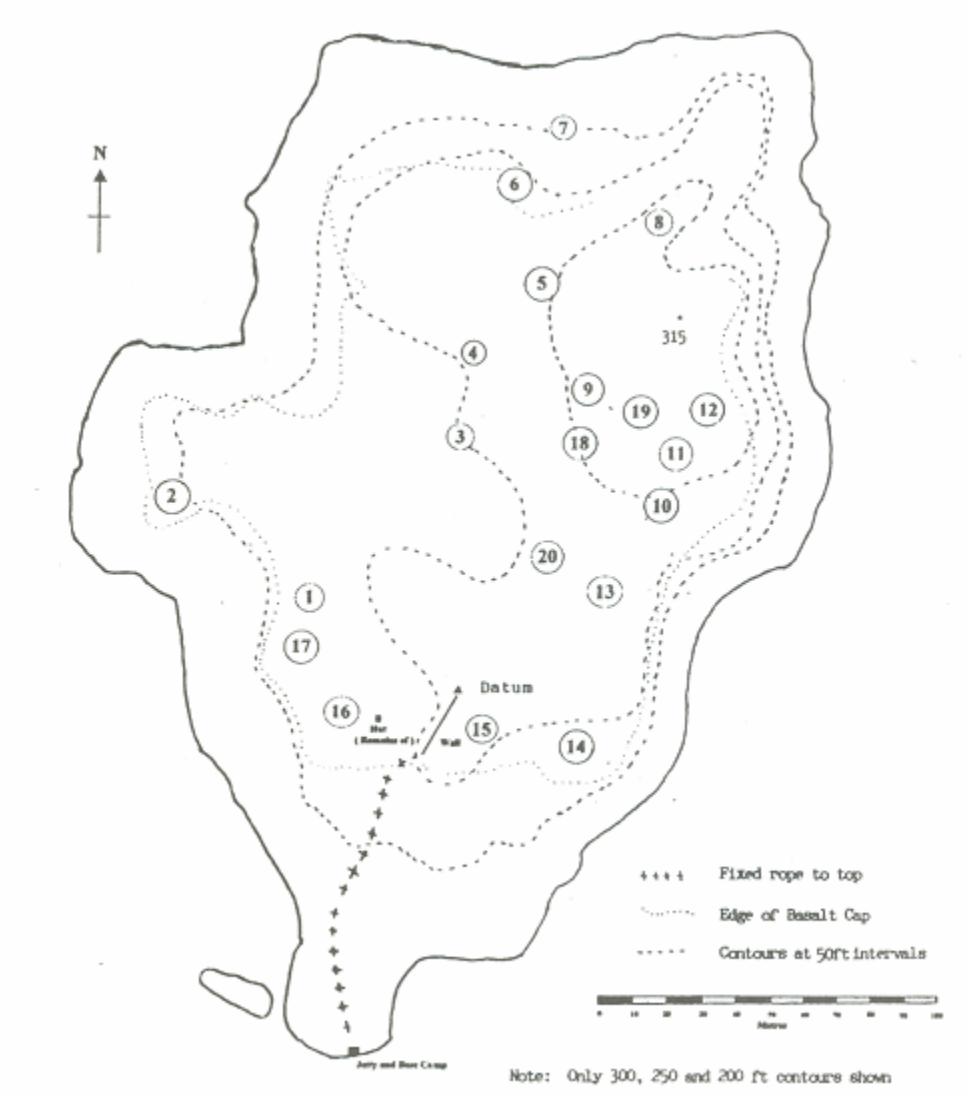

Figure 7: A Sketch of BBI showing the location of census spots