ISSUE 5

THE OSPREY

ARMED FORCES BIRD WATCHING & ORNITHOLOGICAL JOURNAL 2005

INCORPORATING THE ADJUTANT AND RAFOS JOURNAL
AND IN ASSOCIATION WITH THE RNBWS

Bird Gallery

A pair of **African Fish-eagles** *Haliaeetus vocifer* Ethiopia Jan 05 . Copyright John Hughes

Marabou Storks *Leptoptilos crumeniferus* and **Sacred Ibis** *Threskiornis aethiopica* Ethiopia Jan 05. Copyright John Hughes

THE OSPREY

ARMED FORCES BIRD WATCHING & ORNITHOLOGICAL JOURNAL

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Sqn Ldr (Ret'd) Mike Blair

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Through individual society Editors, almost any format and photo material acceptable but not PowerPoint. Articles should include bird names (in bold) followed by scientific name (not in bold but italics); for Europe, Middle East and North Africa, The Birds of the Western Palearctic, Cramp & Perrins. Photos should show scientific names, location, date, and the standardised phrase, 'copyright…'

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From the top: **White Tern** *Gygis alba* in a eucalyptus tree on west side of Green Mountain. Copyright R. Dickey Feb 04. **Crimson Chat** *Epthianura tricolor*. (By photography permit, Alice Springs Desert Park). Copyright Mike Blair and **Ladder-backed Woodpecker** *Picoides scalaris*. Copyright Keith Powrie.

Cover photograph

Salvin's Albatross *Thalassarche salvini*. Kaikoura. New Zealand 2004. Copyright Mike Blair.

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Chairmen's Foreword

It seems incredible that this is the fifth issue of *Osprey*. The journal has achieved considerable acclaim, and we already have a backlog of quality scientific articles for future publication. It is also serving to bring our two societies closer together which can only be for the better in the long term interests of the birds we all love. With that in mind, and our joint desire to pursue excellence in our bird study, there has been a recent initiative led by Roger Dickey of AOS, with the support of RAFOS and RNBWS, to re-energise the MOD Bird Count that was begun and run successfully for many years by the late Lieutenant Colonel Norman Clayden.

This has resulted in a new survey methodology and system of electronic recording, and the 2005 survey sheets and instructions have just been issued. The work is essential as the health of our bird population forms a Government key national environmental indicator. Our assistance, in support of the unit Conservation Group Chairperson or local Environmental Protection Officer, will ensure the production of a quality report on the breeding birds of the Defence Estate. This contribution will increase the profile of the three societies, which in turn can help us to maintain and may even lead to an increase in our membership. Thus, we would encourage you all, experts as well as novices, to assist with the MOD Bird Count at your nearest military unit. Your contribution will make a real difference.

So enjoy this edition of our journal, it is another bumper issue and includes some superb photographs to illustrate the articles and scientific reports. Best wishes to you all for the coming year and, above all, good birding.

Editorial

This year we have another superb set of articles from across the world, all adding to our knowledge and many representing important scientific work. The articles from Ascension are a particularly good read and thoroughly recommended, to me they are the next instalment of a long fascinating saga, especially as I once stopped off on the benighted spot. But here again we hear of questions about fish stocks that surely resonate with us all and appear to be a grave global catastrophe that hardly rates and certainly not in our election! The two articles from Cyprus are also quite excellent together with some superb photos. It is of great encouragement to us all to see the next generation doing such marvellous work in such a professional manner. The article from Australia is another excellent read and will hopefully be the precursor of further visits. The excellent Scottish articles are a reminder of what marvellous opportunities are available close to home and perhaps represent our real bread and butter, tremendous chances for beginners. Although it seems to me that we still have some way to go to really break through the individual Service identity.

We need to face up to the pressures of funding the Osprey, not its future that is surely not in doubt, but how we can afford it in the long term. This present Issue cost £2870 for 60 pages including the cover, with eight colour pages used as a central section for photos. The inside pages on the cover have also been utilised as 'Bird Gallery' pages as they too come in colour. Sadly advertising has completely fallen off hence the availability of the inside cover pages. The question of how we pay for the *Osprey* will be raised between the two Societies over the coming year. It would appear that without some sort of sponsorship we must rely on our own funds and investments. Sponsorship has been tried on a number of occasions but we have failed to attract even a one-off payment. We therefore come down to fixing the annual price by the number of pages, normally 48 or 52, although this year both Societies agreed to an extra 8 mono pages so we could publish all the articles. In the future this could prove to be a problem and could therefore raise the difficult issues of not publishing an article or of over-editing. Any member, who can offer any ideas on funding, particularly sponsorship is asked to write to the Editors.

Simon Strickland

Corrigenda

There were two omissions in Autumn on the Rock (*Osprey* 4:15-24) the account of GibEx03. Firstly, in the section, 'Seabird Counts', the phrase 'not before recorded' should have had 'by RAFOS expeditions or published by RAFOS' added to it. Secondly in Appendix 1, just after the 'Species Recorded in Gibraltar' heading, the phrase, '(Records are subject to confirmation by the GONHS rarities panel)' should have been inserted. The GONHS rarities panel rejected the record of Calandra Lark *Melanocorypha calandra* because the weight of evidence was insufficient.

Bird Gallery

Front Cover Photograph

Many members have excellent colour bird photographs, the best of which we wish to publish separately as part of a Bird Gallery. Please submit your colour photos by 15 January each year to your editor. Remember to give; name, scientific name. location, date and copyright. Prints, slides, tiffs, jpegs are all acceptable, as are digital images. Each year the editors will choose the best photo to grace the Front Cover. Sorry no fees.

White (Fairy) Tern Count on Ascension Island

Exercise Booby Dragon IX; 9th - 20th February 2004

Mark Easterbrook

Introduction

Exercise Booby Dragon IX was an Army led Tri-Service expedition to Ascension Island from 9th to 20th February 2004. Its members were drawn from the Royal Naval Birwatching Society (RNBS), Army Ornithological Society (AOS) and the Royal Air Force Ornithological Society (RAFOS).

Aims

One of the aims of the expedition was to survey the **White Tern** *Gygis alba* breeding population on the Island as accurately as possible using previously published references and count methodologies.

Participants

A. Bray - AOS
P. Carr - RNBS
R. Dickey - AOS
M. Easterbrook - AOS
D. Foley - AOS
C. Holcombe - AOS
J. Hughes - AOS
M. Vincent - AOS
C. Wearn - RAFOS

The White Tern

A small, delicate and inquisitive wholly white tern except for black upturned bill, black eyes and black orbital ring. It is circumequatorial, occurring throughout tropical and subtropical Atlantic, Indian and Pacific Oceans.

Count Methodology

Due to the dates of the expedition this time of year appeared to be the optimum time to count the White Tern nests (Ratcliffe, 1987). Only birds on the nest were counted but see Footnotes 1 and 2.

On all occasions either individual observers or groups of observers conducted all counts at least twice. In the event of the results being vastly different, another count was made by an independent observer.

For the count on and around Boatswain Bird Island, a boat was used to circumnavigate the island in order to record the number of birds on the Southern side of the island and the sea cliffs opposite the island (Ratcliffe, 1987).

As Blair did in 1987, we divided the cliffs on Boatswain Bird Island and the nearby sea cliffs into vertical sectors. Each observer had a different vertical sector to count. Once the initial count was made, observers swapped sectors and conducted another confirmatory count. If these counts differed vastly, an independent observer made another count in order that a mean average could be calculated.

The cliffs below Whale Point (Southern Cliffs) were inaccessible due to the prevailing wind conditions and single-engine boat (Blair, 1987)[1]. An attempt to monitor from the cliff top proved to be impossible, nor were any flying birds recorded at this location.

Exemptions

Only single or paired birds incubating or on nest sites were actually counted to ascertain the number of pairs breeding at the time. Flying birds paired or not are not included in the official count.[2] As White Terns are not present on the Island throughout the year, a roost count of 38 birds was also not included in line with conclusions drawn from a previous survey (Ratcliffe, 1987).

Table 1

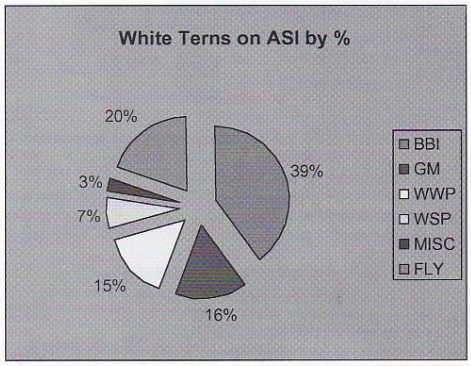
Count Tables - (Past and present)
Key: L = Low count
H = High Count

White Tern Surveys on Ascension Island - Nesting Pairs

Location Description	Grid Reference (GR)	1957 / 59	12/22 Feb 87	Mar 90	16 Apr 94	25 Jun 02	9/20 Feb 04
(a)	(b)	©	(d)	(e)	(f)	(g)	(h)
Cliffs on west side of Green Mountain	View from 05713 91210	50	50		14		110
Cliffs on west side of Green Mountain	View from 05713 91208						18
Cliffs on west side of Weatherpost	From 732230 To 734223	50	50	29	33	13 at GR 745219 6 at GR 752220	L = 105 H = 117
South eastE Face face of Weatherpost & Spire Beach	74 22	Scattered Pairs	50		7		50
Cliffs opposite BBI	755 223	Scattered Pairs	Large Nos 1/3 from top sector count	22 + 116			L = 57 H = 58
White Hill	753 217						7
Newlyn Bluff	752 223						6
North East Bay	727 251			21			0
Sea Cliffs of South East Head	776 213	Scattered Pairs	Not counted				Not counted
Port Moresby Fig Trees foot of W west face of Green Mountain	??	5					- Location not found
West face of Green Mountain Eucalyptus trees	05711 09212				6		12
Pillar Rock Cliffscliffs	716 177						2
BBI[2]	764 226	500	2425	L = 384 H = 398	C750 birds		L = 272-289 H = 316-322
TOTAL		700 - 1000	2650	Part Count 572 Pairs Min	Part Count 810 pairs??		L = 639 - 656 H = 696 - 713

Chart 1

Pie Chart showing % of White Terns on Ascension Island by Location and Mean Average



Key:-

BBI - Boatswain Bird Island and Opposite Cliffs
GM – Green Mountain
WWP - Cliffs W of Weatherpost
WSP - Weatherpost and Spires Beach cliffs
MISC - Miscellaneous
FLY- Flying birds 150 pairs approx.

Final Counts

During the period of the survey it was assessed that the nesting population of White Terns on Ascension Island as a result of counting the birds as accurately as was possible under prevailing conditions, fell between 647 and 704 pairs.

It was estimated by all members taking part in the count that the number of flying pairs of birds amounted to approximately 50% of the sitting birds at any time. The total number of birds estimated to be flying at any one time was therefore estimated to be between 323 and 352 pairs.

It is therefore the conclusion of this survey that the total estimated population of birds on the Island between 9th to the 20th February 2004 lay between 970 and 1014 pairs, using a mean average as the final total. Maximum and Minimum counts are detailed in Table 2 below.

Table 2

Maximum & Minimum Possible Range Counts for White Tern Pairs on ASI between 9th & 20th Feb 04			
	Sitting Pairs	Flying Pairs	**TOTAL**
Maximum	696 - 713	348 - 356	1044 - 1069
Minimum	639 - 656	319 - 328	958 - 984

Analytical Conclusion from Raw Data

Two possible conclusions can be drawn from the raw data collected during this survey period:

1. That the White Tern population on Ascension Island is stable and has increased slightly from 800 - 1000 breeding pairs (Dorwood, 1963).

Or

2. That the White Tern population on Ascension Island has decreased dramatically since
1987 from approximately 2500 pairs (Blair, 1989), to its present population.

3. It is suggested that another survey be undertaken during the next full expedition to Ascension Island in order to ascertain any future increases or reductions of the White Tern breeding population.

White Tern *Gygis alba* in a eucalyptus tree on west side of Green Mountain. (c) R. Dickey Feb 04.

References:

1. Blair M. 1989 - *The RAFOS Expedition to Ascension Island 1987.*
2.Dorwood D. F. 1963 - *The Fairy Tern at Ascension Island.*
3. Ratcliffe N. 1987 - *Proposals for the monitoring of Seabirds on Ascension Island.*
4. Harrison P. - *Seabirds an identification guide Revised edition 1985.*

Acknowledgements:
1.BJ. Hughes - Scientific guidance.
1. RC. Dickey - Proof reading & Photographs.
3.D. Foley - Photographs.

[1] During a visit to Letterbox approximately 10 White Terns were seen in this area adding another 5 pairs to the final estimate.

[2] An estimate of flying pairs was made at Boatswain Bird Island and other parts of the mainland and these are included for completeness in an estimate of the total population present on the Island at the time of the survey.

[3] The estimate of flying birds to seated birds around BBI and the remainder of the Island was considered by all boat trip members to be approximately 50%. Therefore accounting for another 150 pairs.

Editors' thoughts: Mark Easterbrook has contributed a valuable paper, but from the information presented above, we believe that there is another possible conclusion to be drawn by the author, and that is that the White Tern population on Ascension fluctuates. Our reasons are twofold; firstly, although the author mentions that White Terns are not present on Ascension Island throughout the year, he does not give the months that they are present, and secondly, he does not suggest when the peak breeding season is. This information may be in the references he cited, but its absence from this paper allows the conclusion to be drawn that between February and June (Table 1) bird numbers could also vary in-year as well as between years. Stonehouse (1960) included graphs of breeding periods of Ascension seabirds, some of which displayed two breeding peaks annually. We look forward to further discussion on this subject!

Reference

Stonehouse, B. 1960. *Wideawake Island. The story of the B.O.U. Expedition to Ascension.* Hutchinson London.

Changes in Predation Pressure by Feral Cats on Sooty Terns on Ascension

John Hughes

Feral Cats *Felis catus* have predated on the Ascension Island **Sooty Tern** *Sterna fuscata* for some 175 years. Each breeding season several thousand adult birds are killed but in February 2004, following the latest and most extensive cat cull on the island, no Sooty Tern kills by cats were found. Sooty Terns return to Ascension Island every 9.6 months to breed. They nest in two large dense sub-colonies on the SW corner of the island where adults and, later in the season, chicks are predated. Throughout the last decade the median population size of the colony has been 360,000 birds despite a population of about 800 Feral Cats. The Sooty Terns have been monitored and evidence of cat predation collected over 23 breeding seasons commencing in February 1987. Corpses of birds killed by cats have been counted, examined and where possible the sex determined. This study has revealed a number of factors that have assisted the colony of Sooty Terns to survive despite the high numbers of Feral Cats on the island. Very few cats live close to the two sub-colonies and both are protected on one side by the sea. The majority of Feral Cats on the island are scavengers, less than 10% habitually predate Sooty Terns and those that do prefer chicks to adults. There is strong evidence to suggest that there is no sex bias in the cat predation. The equal distribution of cat kills has sustained the natural balance between the two sexes in the colony, thus maximising the availability of breeding pairs. Sooty Terns defer breeding for six or seven seasons so there is a pool of young non-breeders from which to select a new partner. Cats on Ascension eat what they kill with < 2% of Sooty Terns killed not eaten. There is some evidence of immigration to the colony and this could be supporting the indigenous population.

Introduction

The seabirds of Ascension Island have been subjected to predation by Feral Cats for 175 years. During this time ten of the eleven breeding seabird populations have ceased to breed on the main island. The exception is the Sooty Tern. Cats became a problem on Ascension Island very shortly after their introduction in 1815. Dogs were introduced to control their numbers and on 8 November 1823 sixteen cats were killed in one day by these dogs. By the1830s the cats had become such a problem that a bounty was paid on each cat killed. Regular attempts to control cat numbers have continued to the present day. Darwin (1845) visited the island in 1836 and referred to these cats as a 'great plague' but despite the high numbers of Feral Cats the Sooty Tern population during the last decade has remained relatively static at around 360,000 birds (Radcliffe *et al.* 1999). A key question is why the population - though reduced in size - has survived the depredations of the Feral Cats, while the other ground-nesting seabirds have been eliminated from accessible places on the mainland. In 1942 the estimated Sooty Tern population was in the order of one million birds (Chapin 1954) and in 1957/9 the population was roughly estimated at 750,000 (Ashmole 1963) so a decline over the last half century is likely. Predation by Feral Cats on the breeding population of Sooty Terns is well documented. Ashmole (1963) has estimated that 3.5 % and Walmsley (1991) has estimated that 1% of the adult breeding population are killed each season by cats. Following the cat eradication programme started by the Ascension Island Government (AIG) in 2000 and completed by Wildlife Management International Ltd (WMI Ltd) in March 2004 this is no longer the case. Sooty Terns re-established themselves following the elimination of cats on Baker Island in the Pacific, indicating that removal of cats can have important conservation consequences (Moors and Atkinson 1984). During the breeding seasons in June 2002 and April 2003 cat predation was still occurring but was down to negligible levels. In the following season February 2004 no Sooty Terns killed by cats were found. Cats kill Sooty Terns at night, taking birds that are sitting on eggs close to the edge of the colony. Both male and female Sooty Terns share the duty of incubating the single egg and in the field it is difficult to distinguish between the sexes of adult Sooty Terns. The male tern is the slightly larger with an average wing length of 294mm while the female has an average wing length of 287mm (Cramp S & Simmons KEL1985). Both, however, are easy prey for cats. On Ascension predation of adult Sooty Terns by other species is insignificant. The case for a cat eradication programme to protect the Sooty Tern population appears obvious. Ashmole (1963) estimated that between ten and twenty thousand adults are killed each breeding season. Using this figure and multiplying it by the 59 breeding seasons that have passed since the BOU expedition to the island in 1957/59, cats may have killed between a half and one million adult terns. Visual evidence of cat predation is as dramatic as these figures. Visitors to the colony in the 1990s could not help but be moved by the sight of numerous corpses. The headless bodies of Sooty Terns with black and white splayed wings are conspicuous in the barren grey volcanic ash of the colony. However, high levels of predation by cats do not appear to correlate with the Sooty Tern breeding population which has remained stable over the last decade. The aim of this study is to use the quantifiable evidence that has been collected in the last 15 years to identify some of the reasons why the Sooty Tern colony has managed to survive.

Study Area And Methods

Ascension Island (07°57´S, 14°24´W) is an isolated volcanic island situated in the tropical South Atlantic Ocean, approximately midway between South America and Africa. The island is roughly triangular in shape and has an area of 97km^2 approximately. As part of their ongoing study into the colony of Sooty Terns on Ascension Island British military Ornithological Societies have regularly surveyed the breeding population and collected and counted the corpses of Sooty Terns killed by cats. This paper is based on data collected by ten expeditions. Eight surveys of the breeding population were completed **(Table 1)**. Although population size has varied from season to season there is no downward trend. The population increased from 352,000 adults in 1990 to 414,000 in 1998. The colony then crashed for two seasons but quickly returned to 350,000 birds. Many hundreds of the birds killed by cats were collected during the last 15 years by expedition members; in the 1990 season alone 2,924 corpses were collected. The method that was adopted was firstly to clear the colony of all corpses on arrival and then to revisit the colony every two days during the expedition and to collect and record the number of freshly killed birds. The nightly average number of birds killed at the sub-colonies in Mars Bay and Waterside Fair was calculated. The task of collecting and disposing of corpses is unpleasant and time consuming. The two sub-colonies at Waterside Fair and Mars Bay were completely cleared of corpses in 1990, 2000 and 2001 but only partially cleared in 1992 and 1994. Although many cat kills were seen, no data on the numbers of Sooty Terns killed by cats were recorded in 1996 or 1998. The daily average number of Sooty Terns killed by cats at Waterside Fair and Mars Bay was determined in 1990, 1992, 1994 (Mars Bay only), 2000, 2001, 2002, 2003 and 2004 **(Table 1)**. Despite the thorough nature of collection and disposal of corpses, some were surely missed hidden in crevasses or dens. Table 1 therefore is a record of the minimum number of terns killed but is not likely be a great under estimation.

Table 1. Seasonal census of the breeding colony on Ascension Island, minimum numbers of Sooty Terns killed by cats during the night clubbing and incubation period (initial clearance) and nightly averages of cat kills collected during a two week period immediately after the first chick has hatched.

Date	Colony size - adult breeding birds	Collected during initial clearance	Mars Bay nightly average	Waterside Fair nightly average	Source of data
Feb 1990	352,000 +/- 24,000	2924	10.5	21.4 Figure scaled up to whole colony	Nash et al 1991 5.0 per night at one Waterside sub-colony. Corpses collected after chicks have hatched.
July 1992	Not known	220*	11.0	19.0	Walmsley (1992) Corpses collected during night clubbing phase.
April 1994	Estimate 180,000	216*	6.0	No data	Walmsley (1994) Hughes (1994) Corpses collected during night clubbing phase.
Oct 1996	404,000 +/- 28,000	No data	No data	No data	Walmsley (1997). Many hundreds of dead Sooty Terns. Four un-eaten birds collected for sexing.
June 1998	414,000 +/- 21,000	No data	No data	No data	Many hundreds of dead Sooty Terns seen but no data collected. Six un-eaten birds were collected for sexing.
2000	AIG, RAF and USAF environmental health staff radically increased their cat control measures				
Nov 2000	150,000 +/- 10,000	352*	2.5	6.3	Hughes (2002) Corpses collected before and after chicks have hatched.
Sept 2001	300,000 +/- 8,000	491	3.3	3.6	Un-published report. Total of 582 corpses collected. Nightly averages recorded after chicks have hatched.
13 Feb 2002	WMI Ltd arrived to complete the feral cat eradication programme				
June 2002	370,000	+/- 10,000 10**	0.1	0.1	AOS report 12. One fresh corpse collected at the each sub colony.
Apr 2003	366,000 +/- 14,000	2	0	0	Un-published AOS report 13. Only 2 possible cat kill corpses collected in 2 weeks.
Feb 2004	340,000	None found	0	0	Un-published AOS report 14.

* Part clearance only. ** Colonies cleared by WMI Ltd prior to arrival of expedition.

On Ascension Sooty Terns have a sub-annual breeding season of some 295 days. Ashmole (1963) estimated that cats were killing 10,000 to 20,000 birds per season in 1957/59 but the numbers in the1990s were considerably less. During our study period cat predation levels varied greatly but were less than half of that estimated by Ashmole (1963). Sooty Terns are absent from the island for two months (Ashmole 1963). Each breeding season there are birds on the island that are susceptible to predation for about 234 days. The season begins with Sooty Terns circling and then landing on the breeding colony at night. This period lasts about two months and is called 'night clubbing'. In 1990 & 92 cats were killing about 60 birds per night towards the end of the 'night clubbing phase' and also during the incubation period and then about 30 adults a night once chicks had hatched. During the 2000 season nine terns were killed each night and in 2001 ten per night (Table 2). Action, by AIG, to reduce cat numbers in the vicinity of the colony was recorded by each expedition from 1990 to 2001. Following the arrival of WMI Ltd cat predation fell in 2002/03 to one bird per week and in 2004 to zero.

Table 2. Estimates of the number of Feral Cats predating Sooty Terns on Ascension Island and estimates of the number of adult Sooty Terns killed by cats.

Period	No of cats predating terns	Level of predation	Source
1990 - 1992	30 - 60	7,000 adult Sooty Terns 2% of 1990 breeding population	Minimum of 60 Sooty Terns killed nightly. Data collected by Hughes 1990, Walmsley 1990 and Hutchinson & Wearn 1990.
2000 - 2001	10 approx	2,000 adult Sooty Terns 0.67% of 2001 breeding population	Minimum of 491 birds killed during night clubbing phase.

During each visit to Ascension two or three cat traps were seen close to the colony but only on one occasion was a cat seen in the trap. Cat predation on Sooty Terns fell by more than 50% during the decade. WMI Ltd capitalised on this decline and in the following 18 months reduced the level of predation to zero. Raw data collected by expedition members on the number of cats on the island were limited to the April 1994 season when spotlight surveys were carried out at the island rubbish dump and at Mars Bay. The two visits to the rubbish dump on the nights 14 and 17 April 94 revealed counts of 30 and 28 cats respectively. On the night of 18 April two cats were picked up by the spotlight during two hours of observation at Mars Bay. The estimate of total population size was determined from literature research and conversations with those on the island involved in controlling cat numbers. The feral cat population on the island can be split into two categories "stray and scavenger" and "cats that have no association with man" (Bell 1995). The strays and scavengers are localised in areas of human habitation and at the rubbish dump some 5kms from the Sooty Tern breeding grounds. This group of cats was seen scavenging during the day and half a dozen or more cats were seen in one group at the rubbish dump (pers.obs.) The second cohort which may contain as many as 400 Feral Cats (**Table 3**) are potential predators of terns and are rarely seen. They live all over the island at an average density of roughly 6 cats per sq kilometre. These cats are more territorial than the strays/scavengers. However, concentrations occur at the Sooty Tern colonies. It is clear that only a small proportion of the Feral Cats predate Sooty Terns. The travelling distance prevents many from making the journey to the colonies.

Table 3. Summary of literature research and verbal accounts-estimates of the total Feral Cat population on Ascension 1958 to 2003.

Year	Number of cats	Source
1958/59	Hundreds	Ashmole (1963) writing about cat numbers "...I would reckon in hundreds rather than thousands."
16-20 July 1992	480 +/- 231	USAF (1992) "Although spotlight surveys provided a conservative estimate (480 +/- 231), it does indicate that no more than 750 cats inhabit the island.
1995	600 to 800 plus pets	Bell (1995) "If we add the estimated 300 pet cats it gives us a figure of 1000 to 1200 cats overall." 400 strays/scavengers and 200 - 400 that have no association with man.
1995 - 2003	1450 culled	This figure is based on verbal accounts from the various agencies that have been involved in eradication cats during recent years. No consolidated accurate record is held. Ascension Island Services 400-700 mainly strays/scavengers culled and also a few trapped on the breeding colony RAF Base 50 mainly strays/scavengers culled at Travellers US Base 250 mainly strays/scavengers culled at American Base WMI Ltd 600 cats that have no association with man also strays/scavengers and unfortunately a few pets culled from across the whole island.

Favourite eating sites exist around the colonies where cats devour their prey. In the morning clear-up it was common to find two or more dead Sooty Terns at each site suggesting that each cat devours more than one bird per night. As the clear-ups were done on alternate days this might just be an illusion. A domestic cat weighing 3 - 4kgs requires 175 to 225g of meat daily (Purina 2003). The meat available to cats from a Sooty Tern can be calculated by subtracting the weight of the eaten corpse from the live weight of the bird. Live wt 191.61 +/- 1.47g (N=170) - eaten corpse wt 105.25 +/- 4.37g (N=20) = 86.36g. The meat from two Sooty Terns would equal the daily requirement of a Domestic Cat. However, the Feral Cats on Ascension have other food sources and are about 1kg or 30% smaller than the Domestic Cat. These calculations and the visual evidence suggest that Feral Cats eat one possibly two Sooty Terns per night. Feral Cats prefer chicks whose remain are hard to locate in the field rather than adults birds which are much easier to find. The most reliable estimate of the number of cats feeding on the colony can best be obtained by using the data collected adult corpses killed prior to chicks hatched. The total number of Sooty Terns killed in a season is calculated from the formula:

Total kills = Sum of corpses killed prior to chicks hatching + (average no. kills per night x 145 days)

Ashmole (1963) monitored the Sooty Tern colonies on Ascension through two full seasons. His log was used to determine the length of time Sooty Terns remained on the island. The mean length of time between the first chick hatching and the last adult leaving the island was 145 days. In 1990 the total number of adult Sooty Terns killed by cats was 8,000 and in 2001 just before WMI Ltd started the final phase of the cat eradication programme 2,000 were killed.

The Ascension Sooty Tern is not highly sensitive to disturbance unlike other species of tern. In the 1850's the colony moved from Donkey Plain near the centre of the island westward and away from human habitation to a site now occupied by the airfield. During the Second World War the colony was forced to move again to accommodate the airfield Chapin (1942). The Sooty Terns moved to an established site at Waterside Fair and formed a new sub-colony in Mars Bay. One advantage of these two sites is that cat territories are limited. The ocean on the western side of the breeding ground prevents the colony from been encircled by cat territories. 'First Fair', where Ashmole (1963) completed his study in 1957/59, was further inland where cats could approach from all sides.

Sooty Terns are seasonally monogamous and any bias in cat kills towards one sex would have a direct and compounding impact on the number of breeding pairs in subsequent seasons. In many ground-nesting birds, the hen is often killed by predators, which leaves more males in the overall population (Newton 1998). Any sex bias in the birds killed by cats would accentuate the overall effect of predation on the colony. Both parents are needed to incubate and raise a chick to fledging. When one of a pair is taken the surviving partner is unlikely to rear the offspring from the current season. Cats kill and then eat the Sooty Tern and it is fairly unusual to find a dead bird where the breast, thorax and abdomen have not been devoured. Of the 352 corpses collected in November 2000 only 6 birds (2%) were found intact, a further 25 had ovaries or testis that had not been eaten. The majority of these corpses had been picked clean and little remained except wings, head and tail, so, obviously, nothing remained that could be used to identify the sex of the bird. The breast muscles and abdomen are first to be eaten. Cats also appear to have a particular liking for the reproductive organs of Sooty Terns and this makes the task of determining the sex by observation of the ovary or testis in the corpse impossible in the vast majority of cases. Very few birds collected each season were whole birds and these were sexed and biometrics recorded. The corpses were weighed and wing, tarsus, bill, gonys and tail were measured and recorded. The bird was then opened so that the urogenital system could be examined and the sex determined. Sight of partly formed eggs was also used to sex the bird. In the 1996, 1998, 2000, 2001 and 2002 seasons the corpses examined came from a colony that was in the late stage of incubation and some chicks had started to hatch. In 1992 and 1994 the birds examined came from a colony where the terns had just arrived and started to lay. Cats are particularly hungry at the start of the breeding season and appear to kill a few more birds than they can devour. Later in the season the cats generally eat all they kill and there is no evidence of needless killing. Immediately prior to the beginning of the Sooty Tern breeding season in June 2002 the cat eradication team from WMI Ltd examined the stomach contents of Feral Cats and found that they had been living mainly on Locust *Locusta migratoria migratorioides* & *Schistocerca gregaria*.

Table 4. Sex of Sooty Terns killed by cats on Ascension Island.

Expedition Date	Males Killed	Females Killed	Total Killed
July 1992	3	0	3
April 1994	18	24	42
Oct 1996	2	2	4
June 1998	6	4	10
Nov 2000	17	14	31
Sept 2001	3	10	13
Totals	49	54	103

Results

In1995 there were 800 Feral Cats on the island (Bell *et al.* 1995) but less than 10% of them fed on Sooty Terns. My calculations from counts of dead birds suggest that 30-60 cats were feeding on Sooty Terns during the period 1990 to 1992. In determining the number of cats feeding on Sooty Terns I have made the assumption that one group of the Feral Cat population is predating Sooty Terns, that the number of cats in the group remains constant throughout the breeding season and that there is no rotation of cats that form the group. Local efforts, prior to the arrival of WMI Ltd, had reduced the number of Feral Cats in the vicinity of the colonies and approximately 10 cats per night were feeding on Sooty Terns during the 2000 and 2001 breeding seasons. Small numbers of cats do have a devastating effect on the population. In the 1990 season 30-60 cats killed 8,000 adult terns as well as chicks and in the 2001 season ten cats killed 2,000 adults. Nightly predation by Feral Cats was non existent during the 2003 and 2004 seasons.

The sexes of 103 Sooty Terns killed by cats during the period June 1992 to September 2001 were positively identified. No corpses were sexed in 1990 and none could be sexed in 2002, 03 & 04. A summary of the data collected on the sex of Sooty Terns killed by cats in the six breeding seasons is shown in Table 4. Cats killed 54 female to 49 male a ratio of 1:0.91. The proportion of the total females killed is 1.02. The calculated test statistic t at 5d.f. does not exceed the value of 2.015 at P = 0.05 thus there is no significant difference between the mean numbers of female and male Sooty Terns killed.

Feral Cats predate Sooty Terns as soon as the latter return to breed. The birds start to arrive back about 60 days (Ashmole 1963) before the first egg of the season is laid. However, cat predation is minimal for the first 40 days. Hutchinson and Wearn (1990) systematically recorded the arrival of Sooty Terns and collected the corpses of birds killed by cats prior to the commencement of laying. On 23 Jan 1990 they collected 24 corpses and then on 27 Jan they collected all the remaining corpses. Their careful search revealed a total of 154 adult Sooty Tern corpses. It can be assumed from these records that little predation occurred prior to 23 Jan 1990. During the interval of 49 days between 23 Jan and 12 March when the first chick of the season hatched 2,924 adult Sooty Terns killed by cats were collected (Walmsley 1991). Thus during the period prior to chicks hatching cats were killing 60 terns a night compared with 32 a night after the chicks have hatched, a fall of 47%. A similar calculation was completed from data collected in Sept 2001 which reveals a decline in adult predation of 31%. Adult Sooty Terns are most susceptible to cat predation for a period of 20 days prior to the laying of the first egg and during the incubation period of 29 days, in total 49 days. The first 40 days of "night clubbing" is relatively predation free.

Discussion

A number of factors have helped to minimise the devastation that the entire cat population could have on the Sooty Tern colony. One obvious reason for the survival of the Sooty Terns on Ascension is their sheer numbers. During the last decade > 250,000 have been censused and during the last century >1,000,000 birds estimated. The breeding colony is highly synchronized and as a result less predation than otherwise might be the case occurs (Welty & Baptista 1990). The colony is protected on one side by the Atlantic from attack by Feral Cats. Over the years human disturbance has caused the colony to move progressively away from the centre of the island and areas of human habitation towards the SW corner of the island. An unexpected benefit of this relocation is that the majority of Feral Cats now have further to travel to find the colony. Cats rarely travel more than 7 or 8 km to hunt (Bell pers. comm.). About two thirds of the islands cat population now live too far away to predate on the colony. Predation on adult Sooty Tern reduces significantly as chicks begin to hatch. Further research is needed to determine whether this trend continues as chicks develop into juveniles. Stonehouse (1962) has suggested that Sooty Terns have managed to survive while other colonies of seabirds have been destroyed because of their periodical absence of about 2 months from the island. While the terns are away, the cats starve through want of food. One or two cat skulls were found on or near the colony on each expedition. In July 1992 five cat skulls were found in the Mars Bay area. This larger number of dead cats may be linked to the mass desertion of the Sooty Tern in the previous season. However, expeditions to the island over the last 15 years have turned up no other evidence to support Stonehouse's (1962) hypothesis that cat numbers on the island are controlled by periodic absences of Sooty Terns. No movement of the stray/scavenger group to the Sooty Tern breeding grounds has been observed. Indeed if the majority of the Feral Cats were to rely on the Sooty Terns for food the colony would have been destroyed many years ago. Our calculations suggest that if all 800 Feral Cats were to feed on Sooty Terns then it would take just two seasons for the cats to devour the entire population of adult Sooty Terns.

Male Sooty Terns share the burden of incubation of the egg equally with the females. This unusual devotion on the part of the male bird has prevented the development of an imbalance in the sexes due to cat predation. In ducks the proportion of females killed often reaches 70-80% (Newton 1998) and if this were the case on Ascension the effects would be disastrous. Unlike ducks, Sooty Terns are seasonally monogamous and it requires the efforts of both parents to incubate the single egg successfully. If a cat kills either partner then their egg or chick is doomed. Birds that lost partners in one season are likely to pair up with new partners in subsequent seasons. The lack of bias in the sex of birds killed is supported by separate data recordings (Walmsley 1994). During the 1994 season he sexed 58 tern corpses, 31 females and 27 males. The proportion of the females killed in his sample is 1.15. The agreement in the analysis of the two sets of cat kill data corroborates the conclusion that there is no evidence of significant bias in the sex ratio of the Sooty Tern kill by cats on Ascension.

Our ringing re-trap programme suggests that Sooty Terns do not start breeding until six or seven seasons have elapsed since they fledged. This would imply that there is a sizable pool of non-breeders from which to select a new partner. Klomp & Furness (1992) have shown that great skuas use non-breeders as a buffer against environmental stress. The ability to find a new young partner in turn maximises the number of breeding pairs in the following season, thus helping to sustain the Ascension Island colony.

Periodic effort by the authorities on Ascension to reduce cat numbers dating back to1823 has helped the colony to survive. In recent years, and prior to the arrival of WMI Ltd levels of predation have reduced from 3½% in 1958/59 (Ashmole 1963) to 1% in 1990 (Walmsley 1991). My calculations suggest that the level of predation in 1990 was nearer to 2% and to 0.7% in 2001. Fortunately, the cat eradication programme was completed well before a critical level of predation was reached. Feral Cat predation is density-dependent and if the Sooty Tern population had declined and the percentage of cat kills had increased then there would come a point when suddenly there are insufficient new recruits to offset mortality and a rapid decline in population would ensue. The size of the colony and the breeding dynamics of Sooty Terns have helped the bird to survive cat predation. This assumes that other factors such as food availability or levels of immigration remain constant. In recent years the decline in the number of adults taken by cats and the relocation

of the colony to the SW corner of the island has helped to sustain the breeding population.

The future of Sooty Terns on Ascension looks more promising as a result of the eradication programme but three uncertainties remain and are the subject of ongoing research. Little is know on the availability of food for the colony. Many chicks died of starvation in 2002 and feeding trips for the adult bird last five or six days. Our re-trap programme confirms that immigration does occur and emigration is a possibility. There are three major Sooty Tern colonies in the tropical Atlantic and the size of the Ascension colony could depend on the location of the source and sink colonies and movements between the communities. Finally cats were not the only introduced species to prey on Sooty Terns. Rats *Rattus rattus* and Indian Myna *Acridotheres trisis* also predate Sooty Terns.

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OzEx04: Part 1 - The Rhythm of the Red Heart

(The Royal Air Force Ornithological Society Bird Survey Expedition to the Birds Australia Newhaven Reserve, Northern Territory, Australia, 26 August to 1 October 2004)

Mike Blair and Dick Yates

Introduction

Birds Australia (BA) is the trading name of the Royal Australasian Ornithologists' Union. The rapid decline of a swathe of Australian native plant and animal species caused widespread concern across the country amongst scientist and the public alike. BA decided that one of their approaches would be the creation of bird reserves in areas that were large enough to contain typical Australian biomes and that were remote from centres of population, which could better support local reserves. It was originally decided that apart from the Reserve Managers, all tasks would be undertaken by volunteers. The first reserve, Gluepot, was in South Australia, and it quickly built a reputation for implementing a sound conservation philosophy. The second, Newhaven, was purchased in 2000; it lies 350km WNW of Alice Springs, Northern Territory, and is 145km from the nearest road (Map at **Appendix 1**).

The ornithological criterion for choosing to lease Newhaven was that it held nine species listed in the Australian Bird Action Plan. It also held several vegetation communities that were poorly represented in the country's National Reserve System. A small-scale botanical survey of randomly-selected small plots suggested that Newhaven was one of the richest desert environments on earth. Despite having been a cattle station since the 1950s, the vegetation is remarkably intact because cattle densities had been kept low. At 262 000ha (650 000 acres) and surrounded entirely by Aboriginal-managed land, Newhaven is at far less risk of deterioration through intensive farming, development and leisure activity than any other reserve. BA took great care to maintain constant dialogue with Aboriginal Traditional Owners, who through the guidance of the Alice Springs Central Land Council, and are subject to a covenant to ensure that conservation is the primary land use.

Of the around 4500 original donors who raised two-thirds of the initial $1.3 (Aus) million purchase price, 734 pledged a further $420 000. Current threats to Newhaven Reserve are large wildfires fuelled by imported grasses that burn too hot for the germination of fire-dependent native seeds, pest plants of which over 7000 have been identified in Australia, and pest animals such as feral cats (widespread at Newhaven), red foxes *Vulpes vulpes* and camels (released when they and their imported Afghan owners were no longer required to open up the interior). Effective management of these threats will be a formidable challenge, but in the case of the camels, which in late 2004 were estimated in the media to number 750 000 in Australia - they represent the only significant wild population left on Earth (Main source: Newhaven Management Plan).

In early 2002, as a result of an informal correspondence between Mike Blair (MB) and staff at BA on unrelated matters, MB accessed the BA website (via www.birdsaustralia.com.au) and followed the links to the then new 'Newhaven' section. In late 2001 the Royal Air Force Ornithological Society (RAFOS) had put Australia forward as a candidate destination for an expedition in 2004, and so discussions began between RAFOS and BA, which culminated in an invitation to RAFOS to conduct a large-scale bird survey in September, the start of the main breeding season in central Australia. OzEx04 was now in being.

Preliminary Activity

The early stages of planning were taken up with:

1. Determining the methodology to be adopted.
2. How the data were to be recorded.
3. How OzEx04 would function in the field and how it was to be equipped.
4. How OzEx04 would be organised prior to arrival in Australia.

Rainbow Bee-eater *Merops ornatus* on Honey Grevillea *Grevillea juncifolia*. (Newhaven)

5. Determining overall costs.

MB undertook planning the first two activities, Dick Yates (DY) the last two, and the third activity was a joint responsibility. Items 1 to 3 involved meeting BA criteria, which was quickly done thanks to BA's rapid responses, so that MB was able to establish the aims of OzEx04 at an early date. Although a useful sketch-map of Newhaven's tracks was available, it was not comprehensive, lacking any representation of firebreaks or tracks permanently closed. It was important to acquire a much better understanding of the geography on the reserve and of the essential outback safety procedures than could be obtained through correspondence. Accordingly, MB amalgamated a planned visit to Australia in 2003 with a reconnaissance visit to Newhaven (OzRecce03). MB visited Newhaven in September 2003 to be briefed by the then Manager, Ian Hamilton, on where the OzEx04 campsite would be, what the normal daily operating, radio and safety procedures were, which areas were out of bounds (sacred sites), what facilities OzEx04 could use and the need for formal compliance with emergency evacuation (in case of weather likely to close the reserve or of uncontrolled wildfire) and medical rescue (Royal Flying Doctor Service) procedures. MB also visited Centre Squadron, the Territorial Australian Army *Norforce* Unit in Alice Springs, and attended the BA annual conference at Coonabarabran, NSW.

In early 2004, a further possible complication arose when one of the Rangers who was to be at Newhaven during OzEx04, David Orchard (DO), revealed that existing official regional maps were inconsistent, sometimes placing prominent features several kilometres away from their actual location, often because they had been prepared from incompatible data-sets. Furthermore, Ground Positioning System (GPS) readings were subject to two deviations, one from incompatible base datum settings, and the other from the southern hemisphere 'wobble', at its maximum in Australia due to planetary bulge affecting satellite orbits.

Aims

The aims of OzEx04 were:

1. To carry out as many standard Australian Bird Atlas Survey plots (called BA 2ha and Area plots) as possible (qualitative data) on Newhaven, covering the main habitat types.

2. To combine standard BA 2ha plots into conventional European-style transects (quantitative data), where each species was counted throughout.
3. To record and count bird species in and around camp and en route to and from transect and Area plot locations.

See Methods section below and also **Appendix 2** for further details, including field proformae.

Prior preparation in UK

DY attended to all the administration, circulating advice, news and information regularly to all participants while MB prepared and distributed maps and bird species lists from BA web data and from the generally excellent Australian bird field guides, Slater, Slater & Slater (1989 & 2004), Simpson & Day (1999 & 2004), Pizzey & Knight (2002 & 2003) and Morcombe (2000 & 2003). MB also prepared and distributed field proformae and training sheets.

In-country Preparation

In-country preparation, mostly initiated from UK, covered:

1. Australian Services loan of equipment to OzEx04.
2. Purchase or rental of camping gear, kitchenware and hardware, and setting up camp..
3. OzEx04 transport.
4. Accommodation prior to and after deployment to Newhaven.
5. Setting up an OzEx04 bank account in Australia.
6. Organising food supply and resupply.

Essential details of in-country preparations are at **Appendix 3**

Sponsorship and Support

The overall costs of mounting an expedition in the 21st century almost inevitably require external funds, in this case sponsorship, and negotiating support arrangements where the expedition is taking place. RAFOS is most appreciative of the sponsorship that OzEx04 received from Air BP, for without that funding, the overall cost of transport, even at the rates negotiated, would probably have been too much for OzEx04 to be mounted. At **Appendix 3** are our statements of appreciation to the sponsor and our main supporters in Australia. However, pivotal to the mounting and success of OzEx04 was the continuous support of Birds Australia, in the form of Mike Weston, who as point of contact showed great sureness of touch for the 22 months for which MB and he were in communication.

Survey Effort and Availability of Participants

BA had recommended September as the best month for the widest range of migrant and resident species, most of the latter being at the start of the breeding season. The longer the period of survey effort, the better the sample size and the more comprehensive the coverage of range of desert habitats, but few participants, particularly serving personnel, would be available for longer than two weeks, including the days spent en route. DY and MB decided to divide the time spent by participants into three 10-day 'stints', neatly aligning with the 30 days of September. Stint 1 had an extra day tacked on to the beginning, allotted to pitching camp, a task that always takes longer in a strange environment. Participants arranged their own travel to Australia, including the internal flights to and from Alice Springs, but early booking would produce significant cost savings. On top of that, participants were asked for personal contributions of £600. All were urged to allow, if possible, for three days' acclimatisation in Australia before being driven to Newhaven. From the first announcement of OzEx04, a total of 74 people expressed their wish to participate; by the time that confirmation of participation was required, that reduced to 17, four of whom were from Australia. Sadly, several who had been early volunteers to remain for all three stints had to withdraw for health reasons. One participant who had reached Australia unfortunately had to return immediately for family reasons.

The general plan was that each group would assemble at Alice Springs and at 0700 on the first day of their stint would set off on the 5-hour drive to Newhaven, stopping at Tilmouth Well for breakfast. That afternoon would be spent on briefings on survey, safety, survival and GPS techniques, GPS exercises being carried out the next morning and the first surveys immediately afterwards within 5km of camp. At the end of the stint, a group would leave Newhaven around midday, reaching Alice Springs in time to meet the next group who would set off early the following morning. Timings of journeys between Alice Springs and Newhaven were governed by two main factors. Sunset provided a blinding low-angle light for drivers heading for Newhaven, and so departure from Tilmouth Well had to be before 1530, and preferably before 1500; likewise, departing from Newhaven around dawn led to the same problem from sunrise. The second factor was that driving in the dark is forbidden in vehicle rental agreements, mostly because kangaroos are so active nocturnally that the risk of hitting one is very high. Furthermore, the presence on the first half of the journey of large numbers of unfenced cattle and on the second half of high numbers of camels multiplied the risk. In the end, only MB (3 stints) and Andrew Leak (AL) (2) were able to participate for more than one stint. Participants and group details are at **Appendix 3**.

Methods

The *New Atlas of Australian Birds* (Barrett *et al* 2003) is an amazing achievement. It maps species' presence, and usually seasonal presence, over a vast continent that essentially is empty of people, for some 90% live in the main, coastal conurbations. The techniques used by hundreds of volunteers are straightforward, but well thought out. OzEx04 used these techniques to obtain data for BA on hundreds of plots. The two types of BA plots employed on OzEx04 were 2ha and Area plots.

2ha plots. The two hectares in the plot are linear and so the plot is 100m wide and 200m long. BA requires the GPS coordinates of the centre point of the plot to be recorded and also the heading of the plot (compass direction from start to finish). OzEx04 always took the start point and end point of each plot to be the mid-point of the 100m start and finish baselines. BA rules are that the centre points of successive plots should be at least 400m apart. The maximum time spent observing in a 2ha tetrad is 20 minutes. If the observers are walking in a straight line, this means that the end of one plot would be 200m or more from the start of the next. The bush was sometimes too dense to permit a straight track to be kept, and so elementary application of Pythagoras' theorem would indicate when that 400m had been achieved; in any case GPS could confirm that distance accurately to within 10m.

Area plots. OzEx04 undertook mostly '500m radius or less' Area plots, rather than the 5km diameter plots. The usual technique, using GPS, was to start at the plot centre, follow an outbound radius and course for 250m, follow the circumference in an arc for 90°, return to the centre on an inbound radius, continue on that course on a further outbound radius, follow the circumference in the opposite sense to the first arc for 90°, then follow an inbound radius to the centre. (See **Appendix 2, Figure 1**). The plotted result theoretically gave two opposite quarter-circles, but more often the density of the bush produced what was termed a 'butterfly' plot that approximated to the shape of a butterfly's wings. This technique allows for good coverage of an area plot, minimises double counting in quantitative work and permits to a useful degree a thorough scan of the area outside the chosen radius limit. The minimum time spent observing in an area plot is 20 minutes.

Implementing transects incorporating 2ha plots. MB is experienced in undertaking continuous line transects in quantitative European survey work. The 2ha plot concept could be incorporated into quantitative line transects in a straightforward manner by counting birds in carefully chosen distance bands, not only inside the 2ha plots, but also between them. The plots that alternated with 2ha plots in a continuous transect were called 'RAFOS' plots. Most of the continuous transects took the form of return loops starting at the vehicle where it was parked on a track. Generally, each loop comprised an outward leg, a transverse leg whose course differed by roughly 90°, an inward leg at roughly 180° to the outward leg, and a reverse-transverse leg back to the vehicle, often along the track on which the vehicle was parked.

RAFOS plots

In essence, RAFOS plots were identical to BA 2ha plots, but

occasionally were longer, either to round off a transect 'loop' or to allow the centres of successive 2ha plots to be at least 400m apart when the transect heading changed.

Data recording. All the qualitative data recorded for either type of BA plot were to be registered on the machine-readable BA Atlas forms, which are unsuitable for use in the field. In order to standardise data recording of bird species and numbers, proformae were designed for OzEx04, three field proformae (2ha, Area and RAFOS plots) and several summary proformae (to summarise the overall daily effort and to provide a data audit trail). Each evening in camp, the appropriate data were extracted from the field proformae to complete the summary proformae and the BA Atlas forms. Serendipity assisted OzEx04 greatly, in that DO was familiar with the ArcView mapping software that BA used, and that AL, who undertook the first two stints, used it daily in his County Council conservation work. ArcView is not a user-friendly system, but it enabled us to download directly on to computer all GPS readings. AL overcame many software apparent incompatibilities and deficiencies in a remarkably short time to enable us to see the transect routes on-screen, this facility enabling OzEx04 to send sample coverage maps, courtesy of DO, to the BA head office. More importantly, it enabled us to plan and locate future transect work accurately, and when superimposed on existing BA Newhaven habitat maps, enabled us to sample as many different habitats as possible. Transects usually were between 5 and 12km long. However, the volume of data obtained is such that the two main tasks of validating BA data sheets before sending them back to Australia and incorporating the quantitative data into interactive ArcView maps will require this paper to appear in two parts. Part 2 will be submitted for publication in *Osprey* 6. **Appendix 2** contains examples of the recording forms.

Operating Procedures and Outback Safety. Expertise in using GPS came in a day or two, as did familiarisation with the recording proformae, and so initially each group would split into teams of two or three to work within 5km of camp and usually in opposite directions from a common point, but the routines were quickly learnt. After discussion with DO of the day's results, the next day's survey area and location would be selected. The vegetation maps of course did not show where the fire regime had been implemented, and because covering the main habitat types was an OzEx04 aim, random selection of transect start points was not possible, although many transects included post-fire areas. All departures from the Reserve HQ area were logged on the board, identifying which location each team was going to and what time they expected to return. No deviation was permitted from the route. Radio communication from the vehicles was usually good to 20km, but fitful beyond that range, mostly depending on topography. At the beginning of a transect, the GPS coordinates were checked on at least two units and the result recorded on the forms. One GPS was switched off to act as backup. Every team member carried a fresh set of batteries for the GPS. Even if all data were lost on all GPS units, the start coordinates could be inserted manually and the 'Go to' feature activated; this gave course and distance to the start point and updated the information during detours. Every field proformae recorded the heading of the transect outward leg whose heading was cross-checked between GPS and the compasses each team carried; if necessary, a team could devise reciprocal courses to return to the start point. All team members carried ample water; each vehicle had at least two 20-litre water containers. A team would continue survey work, often completing several transects, until bird activity died away, a field proformae being raised for each 200m part of the transect. Each vehicle carried two spare wheels. All participants were briefed on Newhaven safety procedures, including evacuation if severe weather or wildfire demanded.

Climate and Weather

Typical of the centre of a large continent, the climate at Newhaven is largely arid, rainfall being erratic seasonally and from year to year, although winter usually is wetter (June- August) than at other times. A fuller description is at **Appendix 4**, but in 2004, significant rainfall in May and June had been followed by persistent overcasts, which had suppressed evaporation and allowed replenishment of the water table, which is only about 5m below ground level at most artificial bores. The upper soils had remained damp enough to initiate the germination process in trees, bushes and surface vegetation, which from late July had resulted in the greatest and most widespread display of blossom for 40 years. The desert was awash with colours of all kinds for hundreds of kilometres. The 'experts' had predicted that the display would last only six weeks, but much of it persisted into early October. Such irregular occurrences are the rhythm of the desert. Apart from passing thunderstorms on two days, the weather experienced during OzEx04 was dry, skies usually being clear, allowing unimpeded bird survey work.

Geology and Desert Habitats

Mount Doreen west of Newhaven contains glacial deposits from around 625 million years ago (Ma) and there is evidence of sea inundation before (650Ma) and after (from 550Ma onwards and around 325Ma. Erosion occurred on a large scale until 65Ma when the area was known from pollen studies to be marshy. Wet conditions suitable for Diprotodons, crocodiles and kangaroos existed up to 7Ma. Since then, central Australia became gradually warmer and drier. Aboriginal peoples arrived around 40 000BC or earlier. More frequent fires and accelerating erosion occurred, but the impacts of human presence and considerable climate change linked to increasing incidence of thunderstorms cannot be measured separately. Newhaven is largely flat alluvial plains, Lake Bennett in the south being a salt lake created by drainage systems that are no longer connected and the remainder being red, iron-rich, soils, the 'red heart' of Australia. The ridges to the north are a mixture of old quartzite, sandstone and pebble conglomerates, although granitic rocks are found in the southwest. Plant cover is normally sparse because of irregular rainfall, and when the often violently heavy rains do occur, they cause gully erosion. The dunes to the southeast are generally stable and well-vegetated, the spinifex-infested flats between them being based on semi-impermeable silt layers. The water table lies mostly within 20m and often within 5m of the surface, but accessible potable water exists only close to the Reserve HQ. Newhaven has at least 11 areas large enough and with a dominant vegetation type to be designated as usable map units (listed briefly at **Appendix 4**). It is likely that associated invertebrate and bird communities exhibit diversity because of the plant diversity. In 2004, many ephemeral ponds and lakes had formed, most of which had disappeared by late September.

Bird Activity

During MB's four visits to Newhaven in August prior to OzEx04, nocturnal air temperatures mostly remained above zero. Bird activity from an hour before dawn, judged from bird song and calls, was fairly intense. Bird movement from dawn (around 0630) to 0830 was patchy, but with outburst of activity. From 28 August, when DY and MB visited, to 6 September, nocturnal temperatures were sub-zero. Pre-dawn bird activity was limited to a few songs and calls and post-dawn movement was almost non-existent until 0930 or 1000. Until 18 September, bird activity tended not to die off until 1530 or later, but once diurnal temperatures consistently exceeded 32°C by 1130, on most days activity usually died off from around 1330. However, this was not invariable, especially in denser mixed habitat with mature ironbark or white gum trees.

Bird Densities

Very dense bush cover with open-forest clearings lying below hill scree slopes comprised habitat liable to hold good numbers of often skulking birds, possibly indicating good nesting sites, especially for thornbills. Otherwise, skulking was uncommon, although many species would opt for denser cover where they remained active. Flowering bushes and shrubs, such as Honey Grevillea *Grevillea juncifolia* attracted honeyeaters in numbers. Because blossom was so widespread, it is possible that territorial disputes were minimised, for we saw little antagonistic behaviour between species. Families were often encountered, indicating that some species had bred early. However, it was generally true that birds were scarce, but that small groups were not uncommon. Areas that had been burnt were almost bereft of birds, and in our estimation, only when low shrub or understorey had regenerated was there a reasonable chance of finding birds. Even areas that appeared to have been burnt four or more years previously held few birds. Of course, this probably has

much to do with the comparative richness of the flowering areas, but there did seem to be a correlation with the absence of foraging and roosting areas. See **Appendix 5** for further discussion.

Preliminary Results

Annotated Table of Bird Species Encountered at Newhaven

Nomenclature and taxonomy largely follow the BA published lists and Simpson & Day (2004), but the sequence is from the draft list of Birds of Australia and Australian Territories. That draft is based on Christidis and Boles (1994), but also includes all species accepted by the Birds Australia Rarities Committee (BARC) since 1994. Note that the genus of Major Mitchell's Cockatoo is *Cacatua* in Christidis & Boles (1994) but *Eolophus* in Higgins (1999). The list at **Table 1** is not necessarily complete, because the data obtained will take time to validate, nor is it final, because all records have to be submitted to Birds Australia for acceptance.

Table 1.

English Name	Scientific Name	Comments and Notes
Stubble Quail	*Coturnix pectoralis*	Quite common; flushed only when underfoot
Brown Quail	*Coturnix ypsilophora*	Unexpected; encountered once.
Pacific Black Duck	*Anas superciliosa*	Probably bred at Newhaven 2004.
Grey Teal	*Anas gracilis*	Two broods seen.
Pink-eared Duck	*Malacorhynchus membranaceus*	One brood seen.
Hardhead	*Aythya australis*	Likely non-breeders.
Australasian Grebe	*Tachybaptus novaehollandiae*	On ephemeral fresh waters until too shallow.
Hoary-headed Grebe	*Poliocephalus poliocephalus*	Very few.
Little Black Cormorant	*Phalacrocorax sulcirostris*	Once only during OzEx04; several earlier.
White-faced Heron	*Egretta novaehollandiae*	Persistently scavenged drying ponds.
White-necked Heron	*Ardea pacifica*	Scattered individuals.
Australian White Ibis	*Threskiornis molucca*	Occasional appearances.
Straw-necked Ibis	*Threskiornis spinicollis*	Resident until water vanished.
Yellow-billed Spoonbill	*Platalea flavipes*	A maximum of three.
Black-shouldered Kite	*Elanus axillaris*	Resident and territorial.
Black-breasted Buzzard	*Hamirostra melanosternon*	Two or three displaying birds.
Black Kite	*Milvus migrans*	A few prospecting individuals.
Whistling Kite	*Haliastur sphenurus*	From fairly common to absent some days.
Spotted Harrier	*Circus assimilis*	Encountered most areas, but irregularly.
Swamp Harrier	*Circus approximans*	Two records.
Brown Goshawk	*Accipiter fasciatus*	A few sporadic records.
Collared Sparrowhawk	*Accipiter cirrhocephalus*	Widespread. One attacked a Major Mitchell's Cockatoo
Wedge-tailed Eagle	*Aquila audax*	Perhaps 2 pairs; nest with fledgling found; it had flown 2 days later.
Little Eagle	*Hieraaetus morphnoides*	One record, of a ragged wary bird.
Brown Falcon	*Falco berigora*	Common.
Australian Hobby	*Falco longipennis*	Quite common; nest found, young being fed.
Grey Falcon	*Falco hypoleucos*	Very rare; one record.
Peregrine Falcon	*Falco peregrinus*	Perhaps more than two birds.
Nankeen Kestrel	*Falco cenchroides*	Pairs common.
Eurasian Coot	*Fulica atra*	Small flocks on diminishing ponds.
Australian Bustard	*Ardeotis australis*	Common.
Little Button-quail	*Turnix velox*	Common.
Common Greenshank	*Tringa nebularia*	Present on several days, stint 3, on last deep pond.
[Wood Sandpiper	*Tringa glareola*	One in poor light thought to be this species, stint 3.]
Common Sandpiper	*Actitis hypoleucos*	At least two, stint 3, on last deep pond.
Sharp-tailed Sandpiper	*Calidris acuminata*	Several small groups.
Curlew Sandpiper	*Calidris ferruginea*	Several, stint 3, on last deep pond.
Bush Stone-curlew	*Burhinus grallarius*	Surprisingly, only one record.
Black-winged Stilt	*Himantopus himantopus*	Usually present on last deep pond.
Red-capped Plover	*Charadrius ruficapillus*	Only along saline water inlet to Lake Bennett (dry).
Black-fronted Dotterel	*Elseyornis melanops*	Believed to have bred; reliably present around ponds.
Red-kneed Dotterel	*Erythrogonys cinctus*	On the margins of several diminishing ponds.
Banded Lapwing	*Vanellus tricolor*	Breeding site inadvertently found; finders attacked.
Australian Pratincole	*Stiltia isabella*	At least two birds appeared at several ponds.
Whiskered Tern	*Chlidonias hybridus*	One record; exemplary behaviour towards observers.
Common Bronzewing	*Phaps chalcoptera*	Surprisingly, only one record.
Crested Pigeon	*Ocyphaps lophotes*	Widespread and common; high numbers in dune woods.
Diamond Dove	*Geopelia cuneata*	Very common.
Galah	*Eolophus roseicapilla*	Only one record, of two birds.
Major Mitchell's Cockatoo	*Cacatua leadbeateri*	Widespread in small numbers; bright pink underparts.
Australian Ringneck	*Barnardius zonarius semitorquatus*	'28' Parrot (from call); intense courtship behaviour.
Mulga Parrot	*Psephotus varius*	Eventually found in stint 3. Scarce.
Budgerigar	*Melopsittacus undulatus*	Very common.

Bourke's Parrot	*Neosephotus bourkii*	Three records of pairs in different locations. Not shy.
Pallid Cuckoo	*Cuculus pallidus*	Sporadic.
Horsfield's Bronze-Cuckoo	*Chrysococcyx basalis*	Patchy distribution.
Southern Boobook	*Ninox novaeseelandiae*	Heard on several nights.
Barn Owl	*Tyto alba*	Heard several nights; nest found in tree-hollow in south.
Spotted Nightjar	*Eurostopodus argus*	Adult flushed; 1 chick found. Others at HQ night of 29th.
Red-backed Kingfisher	*Todiramphus pyrrhopygia*	Widespread in open forest. Nest-hole found.
Rainbow Bee-eater	*Merops ornatus*	Intermittently common.
White-browed Treecreeper	*Climacteris affinis*	One record in mature gum tree clump.
Splendid Fairy-wren	*Malurus splendens*	Uncommon.
Variegated Fairy-wren	*Malurus lamberti*	Patchily common.
White-winged Fairy-wren	*Malurus leucopterus*	Encountered quite often.
Rufous-crowned Emu-wren	*Stipiturus ruficeps*	Only one confirmed record; it took 30 minutes to show.
Red-browed Pardalote	*Pardalotus rubricatus*	Common. Nest-holes in many locations.
Weebill	*Smicrornis brevirostris*	Seemingly scarce; probably overlooked among the 5 species below.
Western Gerygone	*Gerygone fusca*	Scarce.
Inland Thornbill	*Acanthiza apicalis*	Patchily fairly common.
Chestnut-rumped Thornbill	*Acanthiza uropygialis*	Patchily present.
Slaty-backed Thornbill	*Acanthiza robustirostris*	Patchily present.
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*	Patchily present.
Southern Whiteface	*Aphelocephala leucopsis*	Seen patchily along reserve SE border.
Banded Whiteface	*Aphelocephala nigricincta*	Widespread in small numbers.
Spiny-cheeked Honeyeater	*Acanthagenys rufogularis*	Common to abundant; breeding.
Yellow-throated Miner	*Manorina flavigula*	Patchily common, surprisingly so in SE wooded dune slacks.
Singing Honeyeater	*Lichenostomus virescens*	Abundant and with large repertoire of calls; breeding.
Grey-headed Honeyeater	*Lichenostomus keartlandi*	Patchily common in reserve NE quadrant.
Grey-fronted Honeyeater	*Lichenostomus plumulus*	Uncommon in reserve NE quadrant.
White-plumed Honeyeater	*Lichenostomus penicillatus*	Scarce.
Black-chinned Honeyeater	*Melithreptus gularis laetior*	'Golden-backed' race; a few isolated prominent pairs.
Brown Honeyeater	*Lichmera indistincta*	Thinly widespread to patchily quite common; breeding.
White-fronted Honeyeater	*Phylidonyris albifrons*	Widespread but sporadic.
Grey Honeyeater	*Conopophila whitei*	Scarce.
Black Honeyeater	*Certhionyx niger*	Numerous near *Grevillea* spp blossom; breeding.
Pied Honeyeater	*Certhionyx variegatus*	Widespread; more numerous near *Grevillea* spp blossom; breeding.
Crimson Chat	*Epthianura tricolor*	Patchily numerous in arid areas with few trees; breeding.
Orange Chat	*Epthianura aurifrons*	Occasional pairs & groups in arid areas with few trees; breeding.
Jacky Winter	*Microeca leucophaea*	Thinly widespread.
Red-capped Robin	*Petroica goodenovii*	Very patchy.
Hooded Robin	*Melanodryas cucullata*	Widespread, numerous & breeding.
Grey-crowned Babbler	*Pomatostomus temporalis*	Patchy, fairly widespread.
White-browed Babbler	*Pomatostomus superciliosus*	Patchy, uncommon.
Chiming Wedgebill	*Psophodes occidentalis*	Possibly more numerous, but heard only twice.
Chestnut Quail-thrush	*Cinclosoma castanotum*	Unexpected, but seen by 6 observers at 25m range.
Varied Sittella	*Daphoenositta chrysoptera*	Thinly widespread.
Crested Bellbird	*Oreoica gutturalis*	Widespread; breeding.
Rufous Whistler	*Pachycephala rufiventris*	Widespread; breeding.
Grey Shrike-thrush	*Colluricincla harmonica*	Widespread and fairly common.
Magpie-Lark	*Grallina cyanoleuca*	Sporadic; absent early, common later.
Willie Wagtail	*Rhipidura leucophrys*	Abundant; breeding.
Black-faced Cuckoo-Shrike	*Coracina novaehollandiae*	Abundant; breeding.
White-winged Triller	*Lalage sueurii*	Common; breeding.
Masked Woodswallow	*Artamus personatus*	Common; breeding.
Black-faced Woodswallow	*Artamus cinereus*	Common; breeding.
Dusky Woodswallow	*Artamus cyanopterus*	Unexpected, seen early; white leading edge of outerwing
Little Woodswallow	*Artamus minor*	Seen close to; breeding on rock ridges.
Grey Butcherbird	*Cracticus torquatus*	Widespread but occasional.
Pied Butcherbird	*Cracticus nigrogularis*	Widespread; fairly common; breeding.
Australian Magpie	*Gymnorhina tibicen*	Widespread; patchily common.
Little Crow	*Corvus bennetti*	Large groups seen twice; separation from orru problematical.
Torresian Crow	*Corvus orru*	Widespread in small groups.
Australasian (Richard's) Pipit	*Anthus novaeseelandiae*	Abundant in grassland, short vegetation may obscure other 'LBJs'.
Yellow Wagtail	*Motacilla flava*	Unexpected and very rare; at pond edge amongst Zebra Finch flock.
Zebra Finch	*Taeniopygia guttata*	Abundant and confiding; breeding.

Painted Finch	*Emblema picta*	Mostly absent; favoured locations held small flocks in foothills.
Mistletoebird	*Dicaeum hirundinaceum*	Present but elusive in most suitable habitats.
White-backed Swallow	*Cheramoeca leucosternum*	Usually present close to rocky cliffs in some locations.
Tree Martin	*Hirundo nigricans*	Scarce but reliable in a very few locations downwind of cliffs.
Fairy Martin	*Hirundo ariel*	Occasional ones and twos.
Spinifexbird	*Eremiornis carteri*	Elusive, but found at intervals.
Rufous Songlark	*Cinclorhamphus mathewsi*	Mostly uncommon; but numbers in a few locations.
Brown Songlark	*Cinclorhamphus cruralis*	Common; much song.

NB Wood Sandpiper record treated as hypothetical, but included here to alert future visitors.

Discussion

The advantages of carrying out survey work after a rainy spring were firstly, that many species had been breeding over a wide area and so there were birds to count in most 2ha plots and secondly, that many species had been attracted to the area either to breed or in numbers which made detecting them more straightforward. There was also the privilege of experiencing a marvel of nature in the form of millions of flowers and blossoms of every hue. The disadvantage was that the widespread availability of food across a large area meant that there were very few concentrations of birds, unlike during MB's brief visit in 2003, when such concentrations were obvious, especially round boreholes. This dispersal phenomenon was perhaps the reason that two expected species (**Table 2**) were not encountered in the reserve, but were found quite close to it.

Table 2.

English Name	Scientific Name	Comments and Notes
Spinifex Pigeon	*Geophaps plumifera*	10km due east at the pass into Newhaven
Tawny Frogmouth	*Podargus strigoides*	0.75km north, on a nest

Table 3.

English Name	Scientific Name	Comments and Notes
Emu	*Dromaius novaehollandiae*	Adult and one young reported at Newhaven mid-September
Square-tailed Kite	*Lophoictinia isura*	160km due east at Tilmouth Well in mid-August
Princess Parrot	*Polytelis alexandrae*	Mid-August, seen 22km E of Reserve HQ, and 55km E beyond boundary

Three other expected species were not found by OzEx04 on Newhaven, one being reported by others at Newhaven and two occurring on and near Newhaven in mid-August (**Table 3**).

The talismanic Australian bird species, **Night Parrot** *Pezoporus occidentalis*, has been recorded at Newhaven, in the southeast at a borehole in the mid-1990s. However, that sighting was in a time of near-drought, and it is probable that the presence of water had attracted it. In 2004, water had been plentiful and widespread. It is reputed to favour spinifex *Trioda* spp seeds. Given the vast extent of spinifex on Newhaven, the **Night Parrot's** nocturnal habits, its believed preference for spending the day in a burrow, its reported tendency to run or walk to cover like its close relative **Ground Parrot** *P. wallicus* and its probable adaptation to extracting water from a large intake of seeds, no matter how dry the conditions, it could exist in numbers at Newhaven and never be seen except by chance disturbance. Despite carrying out in one month over 600 surveys, most of which involved crossing seas of spinifex, that chance did not materialise.

Conclusions

The aims of OzEx04 were achieved. Over 600 separate plots (around 300 BA and 300 RAFOS plots) were surveyed, representing around 1500 observer records in teams of two or three. The processes of data validation, initial analysis and production of derived maps (eg of species distributions and numbers related to transects) are ongoing and will take some time to produce. Qualitative data should be sent to Birds Australia by mid-2005, but the quantitative data analysis will involve a considerable workload; furthermore AL is subject to the demands of his job and will not be able to work continuously on OzEx04 material. However, all derived data will be copied to BA in due course. The field proformae designed in UK worked well enough in practice. The daily collation of data on to summary proformae enabled a working audit trail to be achieved so that individual records and dates can be cross-checked. The design of the transect system and its limits worked well in the field. Newhaven is so large that this kind of survey work could be maintained for a very long period before the area had been covered comprehensively. Provided that the kind of in-country support OzEx04 received remained available, a repeat expedition is feasible.

The logistics and planning required every one of the 22 months available, but that effort produced a well-structured expedition. The reduction in numbers below the planned maximum of 12 people on-site (for a long time there were surplus applicants) reduced overall costs but also reduced OzEx04 income. Having Plan B (rent and buy) available for in-country logistics when Plan A (loan kit from the RAAF) fell through worked well, but the sponsorship we received from Air BP made OzEx04 financially secure, including offset contingency funds. As it happened, a favourable exchange rate when UK funds were transferred to Australia, the success of negotiated discounts in-country and the lower than expected cost of expedition food and supermarket hardware in Alice Springs meant that actual costs were lower than expected, keeping OzEx04 within budget and leaving contingency funds unspent.

Acknowledgements

The positive attitude of Australians in Alice Springs was of enormous assistance to OzEx04, especially before the first group arrived. OzEx04 had an ideal campsite where work could continue uninterrupted, thanks to Ian Hamilton, the Reserve Manager. OzEx04 members are particularly grateful to David and Christine Orchard, who were the Rangers at that time, for their finely-judged involvement with and encouragement of our daily work, a splendid example of Birds Australia's recruitment of volunteers. MB expresses his personal thanks to Mike Weston, the OzEx04 point of contact at Birds Australia, for getting everything right. A fuller acknowledgement of the contributors to the success of OzEx04 is given at Appendix 3. DY and MB, while realising that it would be invidious to single out the contributions of any OzEx04 participants, all of whom worked very effectively indeed, nevertheless wish to thank specially: Merv Roberts and Viv Ogden, who drove all the way from Sydney to join us, and then used their vehicle as an OzEx04 resource; Tom and Marie Tarrant who joined us from Brisbane, picking up an expedition vehicle at Alice Springs airport, and contributed valued specialist field experience, and most of all Andrew Leak, who not only did his share ofl the trudging for two weeks, but hugely reduced our data management in the field by devising with David Orchard a means of viewing directly downloaded GPS data

Appendices

1. Map of Birds Australia Newhaven Reserve.
2. OzEx04 Field Methods and Documentation.
3. Sponsorship, Supporters, In-country Preparation and Participants.
4. Climate, Weather and Desert Habitats.
5. Burn Practice and Bird Numbers.

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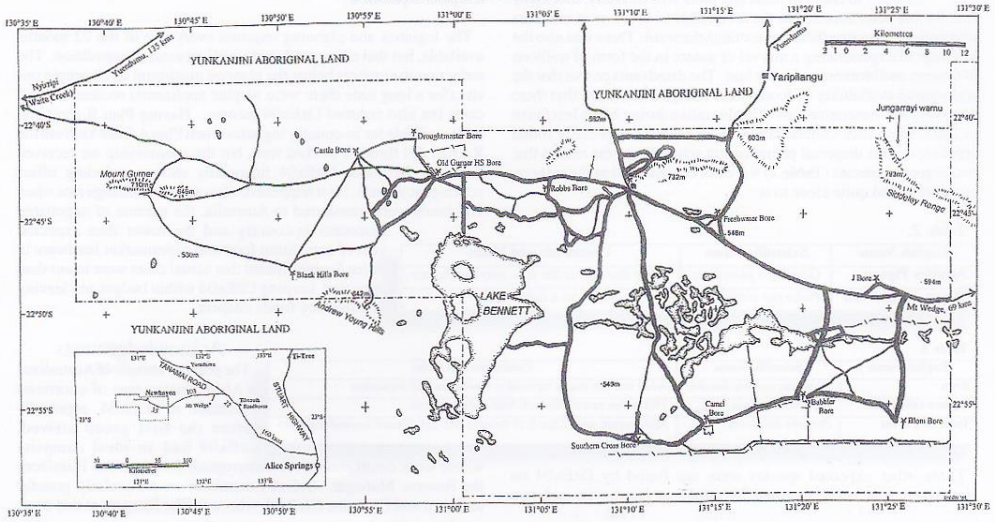
Secondary References (Correct as of March 2005)
Birds Australia website: www.birdsaustralia.com
Michael Morcombe websites: www.michaelmorecombe.com.au
www.mmbirds.com

Appendix 1

Birds Australia Newhaven Reserve



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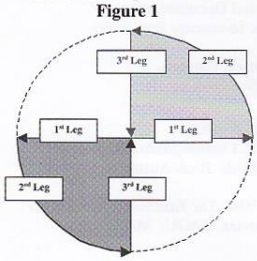
Appendix 2

OzEx04 Field Methods and Documentation

Opposite Quarter-circle ('Butterfly') Method of Surveying an Area Plot of '500m Radius or Less'

This method is a combination of point count and transect methods, normally usable only in relatively flat landscape lacking continuous high scrub, bush or tree cover. It is especially suited to grasslands, where many species remain skulking during standard point counts. Two observers can each work opposite 90° quadrants simultaneously, starting and finishing at the centre, or a single observer can work the opposite 90° quadrants consecutively, starting and finishing at the centre (**Figure 1**). Observers must agree beforehand which way to turn on to the arc; they must both turn in the same relative direction! The method is to walk each of the three legs of the quadrant slowly, via the outward radius, the quarter-circle arc and the inward radius, recording bird activity en route. For the BA 500m diameter **Area Plot**, the path would be 200m+310m+200m, allowing a 50m circular strip on the outside of the arc in which species would be counted; time per quadrant would be of the order of 10+15+10 minutes.

Figure 1



Field Documentation

Field (1st Phase) Proformae

There were two proformae designed for use in the field:

1. 2ha Plot and Sector Recording Proforma - P1. The same proforma could be used to record bird species identified and totals seen in a 2ha plot or in a RAFOS plot (sector). The only difference lay in which boxes were deleted, depending upon plot type. This method obviated the need for two different proformae arranged alternately on a clipboard.

2. Area Plot Recording Proforma - P2. A few Area Plot proformae were carried in the reverse pocket of the clipboard, for use when the observers deemed that suitable patches and arrangements of habitat would be better tackled as such (woodland, mulga scrub, ponds, mixed habitats). The proforma lacks the distance bands of the 2ha plot proforma.

3. A *Habitat Recording Proforma (P3)* was devised, but the BA habitat recording methods made it redundant.

Field (2nd Phase) Proformae

There were two proformae, completed after the end of the day's survey work, designed to collate the field records:

1. Individual Master Record Proforma - P4. This proforma was completed for each transect, where all plots completed had their GPS coordinates and times listed against the team that recorded them.

2. Master Lists of Completed Transects - P5. Details of the day's completed transects were recorded on this proforma.

Field (3rd Phase) Proforma

This proforma, the Master List of Plots Surveyed Independently of Transects, was a collated record of any 2ha, RAFOS or Area plots undertaken independently of any transect work, and covered small areas of interesting habitat, opportunistic surveys and casual records (*eg* species seen en route to or from transect work).

Appendix 3

Sponsorship, Supporters, In-country Preparation and Participants

Sponsorship

OzEx04 would not have been possible without the sponsorship of Air BP, whose generous donation let planning go forward with certainty and secured appropriate desert transportation with full support and insurance cover. RAFOS expresses its thanks, particularly because the data obtained from Newhaven is of a quality and amount that would not have been achieved without that funding.

Supporters

Thrifty Car Rental
Corner of Stott Terrace and Hartley Street, Alice Springs, NT 0870. Tel +61 (0) 8 8952 9999. thriftyalice@bigpond.com. Steve Shearer, who holds the Thrifty franchise in Alice Springs and Yulara (Uluru), made an early decision to support OzEx04 when contacted by DY. OzEx04 rented two 4×4 Toyota HiLux 5-seater pickups with drop-side and –rear platform, and a 2/3 seat Toyota 4×4 ute with a spacious freight platform; these were ideal for the Newhaven tracks, which had sandy or wet stretches. All vehicles had two spare wheels, two fuel jerricans and were radio-equipped. Steve also made available four accommodation tents. MB was thoroughly briefed at Thrifty prior to OzEx04, which benefited hugely from Steve's encyclopaedic knowledge of who could help or supply goods in Alice Springs. Steve's experience and bushcraft, his advice, encouragement, laid-back can-do approach and friendship were invaluable to its success. He recommended MB to visit Desert Dwellers.

Desert Dwellers
38 Elder Street, Alice Springs, NT 0871. Tel +61 (0) 8 8953 2240. John Herlaar, who runs Desert Dwellers, an Aladdin's Cave of outback camping and survival gear, is a shrewd, laid-back and extraordinarily helpful Alice Springs stalwart who gave OzEx04 tremendous advice, support and friendship. His bush experience and his advice on food storage and supply reduced the learning curve. MB spent many hours discussing camping problems and solutions with John, who seemed to be able to deal with a continuous stream of customers at the same time, while a new air-conditioning system was being installed.

Desert Rose Inn
15 Railway Terrace or PO Box 7885, Alice Springs, NT 0871. Tel +61 (0) 8 8952 1411. info@desertroseinn.com.au. DY contacted the Desert Rose Inn in Alice Springs several months before OzEx04 to negotiate arrangements. By coincidence, MB had stayed there in 2003. The staff at the Desert Rose, where most participants stayed before and after their stint, took in their stride the arrival of a bunch of Poms at irregular intervals over a period of two months. They passed on messages and remained unfailingly cheerful in solving any of our minor problems, even when stricken by colds that the participants managed to avoid!
We would urge anyone thinking of visiting Alice Springs and spending some time exploring the area to contact Steve Shearer at Thrifty, John Herlaar at Desert Dwellers and the staff at the Desert Rose beforehand for friendly service.

Centre Squadron, Norforce, Australian Army
Major Shane Northover and Warrant Officer Kevin Greaves of Centre Squadron in Alice Springs, despite having an immense workload due to increased internal security after the Bali bombing, nevertheless kindly loaned OzEx04 two 14×14 tents and modern Australian Army camp beds, thus solving the problems of kitchen and mess tents and how to ensure comfortable nights.

ANZ Bank
Our thanks go to the help given Mr Jason Wilson, Manager of the Wooloongabba Branch of the ANZ Bank, where DY has an account. As a consequence, OzEx04 had an expedition account at the Alice Springs branch (Corner of Todd Mall and Parsons Street), where the branch staff all were excellent. The account enabled most transactions to be on the 'chip and pin' system, which Australia has had for some time, greatly simplifying payments.

Tilmouth Well
OzEx04 members, and in particular MB, are grateful to Janet Chisholm, owner of Tilmouth Well Roadhouse, and to all her staff for providing the perfect oasis halfway between Alice Springs and Newhaven, and for collecting food resupplies from Alice Springs for us to collect at Tilmouth Well, thus saving us much time, fuel and expense.

Birds Australia
RAFOS in general and OzEx04 members in particular thank Birds Australia for agreeing to the expedition, for supporting MB and DY during the lengthy planning stage and for the privilege of living and working at Newhaven Reserve, in a desert environment that is one of the greatest experiences going. MB offers special thanks to Mike Weston for all-round support and to Andrew Silcocks who ensured we had sufficient Atlas Record Forms.

In-country preparation

The RAAF had helped greatly in 2003 on OzRecce03, the Warrant Officer at Mount Everard near Alice Springs combining a duty inspection visit to the Newhaven airstrip with driving MB to and from the reserve. MB, who had planned to enjoy in 2004 the environs of Alice Springs for a little while before OzEx04 began, had to organise his arrival in Alice Springs long enough before OzEx04 (26 days) deployed to Newhaven on 1 September so that he could negotiate the necessary purchases, rentals and loans of camping gear and ancillary equipment. DY had negotiated initial agreements with the Thrifty franchise for 4×4 vehicles, with the ANZ bank for an OzEx04 account and for accommodation in Alice Springs at the Desert Rose Motel. MB was able to confirm these arrangements in person; thanks to advice from Steve Shearer, MB also negotiated with John Herlaar of Desert Dwellers, specialist outback camping suppliers for a full range of essential gear, obtained and installed a freezer at Newhaven, and made arrangements to obtain vacuum-packed frozen meat in Alice Springs. Steve also made available four two-person accommodation tents and pointed MB in the direction of the Alice Springs Honda motorcycle agency, where MB purchased a modern quiet generator on a generous 'buy-back afer 6 weeks' basis. MB confirmed fuel and food resupply arrangements at Tilmouth Well, an excellent roadhouse 170km from Newhaven on the route from Alice Springs.
MB made four round trips to Newhaven prior to the first group's arrival at Alice Springs, transporting the tentage and other material obtained at a host of suppliers in Alice Springs; he laid out the campsite, erected the accommodation tents, stored the camping gear in them and liaised with Ian Hamilton, the Reserve Manager who had prepared the campsite and would lay 450m of water supply piping that OzEx04 had purchased. The mess tent would have dc lighting powered by the generator to that computers could be used and the day's work collated after sunset. The kitchen tent would have gas stoves and lighting. Once DY and Daphne Yates had arrived on 26 August, kitchenware and hardware were purchased and food supplies were planned. DY and MB made a round trip to Newhaven to erect the kitchen tent and store the purchases. The principle of food supplies from Alice Springs was that the afternoon before each group left for Newhaven, the pre-ordered, frozen and vacuum-packed perishables were purchased and put into Styrofoam boxes containing ice which would not melt for over four days if boxes remained unopened.
MB offers his personal thanks to Sergeant Robert Burgoyne of the NT Police, whose primary job deals with all the summary prosecutions in the southern half of the Northern Territory. His voluntary secondary task is as coordinator for all survey work for the Australian Bird Atlas work carried out in that area. RB met MB off the aircraft and showed him local bird hotspots in return for giving a talk on RAFOS to the Alice Springs Rotary Club.

Appendix 4

Climate, Weather and Desert Habitats

Climate

The climate at Newhaven Reserve is arid tropical. It is warm to hot in summer and cool to cold in winter. Temperatures are highest during November-February (mean daily maximum 33-36 °C, minimum 20-22.5 °C) and lowest during June-August (mean daily maximum 22-25 °C, minimum 7.5-8.5 °C), based on data from Yuendumu, the only regional site for which daily temperature records are kept. Winds are most often from the south-east. Annual rainfall within the region is low and irregular, averaging 340mm, though average years are exceptional. Rainfall data began at Newhaven in 1962, and there are some data from Babbler Bore 1986-89 and 1996-2001, all of which support the local phenomenon of rainfall being highly variable from year to year (annual range = 66-951 mm), as well as from place to place. Rainfall events can be patchy, especially during summer when the area receives about 70% of its rain. The early 1960s, 1970s and 1980s experienced runs of dry years, followed in each case by wetter periods. The record rainfall in 1974-75, the like of which was not seen again until 2000-01, was patchy regionally. That latter event followed a prolonged period of well below average rainfall during the early to mid-1990s (Newhaven Management Plan). The 2004 rains (also experienced by the region) had been followed by persistent overcast.

OzEx04 Weather

At night in early September, the temperature dropped to -5°C under clear skies, but in mid-afternoon in late September, it climbed to 39°C in the shade. Some rain fell on two nights, sufficient on one occasion amid passing thunderstorms to prove MB's tent was not leakproof. Typical for the centre of a continent, a breeze was not uncommon, strong winds (30 knots) being experienced twice at night, sporadic diurnal gusts occasionally suppressing bird activity. Humidity in late September was much higher than for the rest of the period. Wind direction was variable, but westerlies and northerlies were sustained for two- or three-day periods.

Desert Habitats

There are 11 main vegetation communities or types at Newhaven that are not well represented in the Northern Territory Reserve System:

1. Inland Teatree *Melaleuca glomerata* ***open shrubland***. Found in periodically flooded depressions and claypans and as minor components of relict drainage systems. The upper layer is usually an open to sparse shrubland, mostly dominated by *M. glomerata*. A sparse layer of tall shrubs or low trees such as *Acacia* spp may be present. The ground layer is variable, either absent or dominated by chenopod shrubs, tussock grasses and in areas intermixed with adjacent sandplains, hummock grasses such as *Triodia pungens* or *Plectrachne pungens*. This vegetation type is often found fringing salt lakes, either as described or in a complex mosaic with chenopod shrublands.

2. Ironwood *Acacia estrophiolata,* ***Whitewood*** *Atalya hemiglauca* ***low open woodland with open grassy understorey***. Common on deep sands on gentle undulating plains and alluvial fans and floodplains at the base of hills, but rare on Newhaven. *Acacia estrophiolata* is normally dominant in the upper stratum, although a mixture of other species including *Atalaya hemiglauca* and *Hakea* spp are common; the layer structure ranges from low open woodland to scattered trees, generally with an open shrub layer dominated by *Acacia* and *Cassia* spp. The ground layer is usually mixed-species sparse grassland with *Eragrostis* and *Aristida* common on sandier soils and *Chrysopogon fallax* and *Chloris pectinata* on wetter. Forbs and chenopods are often seasonally dominant.

3.Mulga *Acacia aneura* ***tall sparse shrubland with grassland understorey***. Occurs on gently undulating plains or broad shallow valleys surrounding the MacDonnell and other ranges. Soils are chiefly red earths to red clayey sands. Evidence of grazing or fire damage and reduced canopy cover is common. The upper layer is dominated by scattered *Acacia aneura* and *A. pruinocarpa*. Occasionally *Eremophila/Cassia* shrubland occurs although often sparse or absent. The ground layer is usually dominated by short grasses, *eg Eragrostis eriopoda*, areas of low chenopod shrub/herbland with such as *Salsola kali* and *Sclerolaena* spp. This vegetation type merges with the *A. aneura* tall open shrubland and may be a fire/grazing disclimax, floristically and structurally similar to *A. aneura* mixed sparse shrubland on hills, being differentiated mainly by ground cover.

4. Witchetty Bush *Acacia kempeana* ***sparse shrubland to tall sparse shrubland with grassland understorey***. Found mainly E, W and S of Alice Springs on plains and foothills, usually with shallow calcareous red earth soils, and some limestone outcrops. The ground layer often shows signs of heavy grazing. The upper layer is generally open shrubland dominated by *A. kempeana* usually co-occurring with *Cassia* and *Eremophila* species. There are generally scattered tall shrubs/low trees such as *A. aneura, A. estrophiolata* and *Hakea leucotricha*. The ground layer is variable and is comprised of chenopod shrubs mixed with short grasses and forbs. Floristically the community is related to the *A. kempeana* shrubland which occurs on hills.

5. Soft Spinifex *Triodia pungens* ***Curly Spinifex*** *Plectrachne schinzii* ***hummock grassland with*** *Acacia* ***tall sparse shrubland overstorey***. A very extensive community occurring on gently undulating plains with chiefly red earthy sand soils. *T. pungens* is the dominant ground layer species with *P. schinzii* often occurring as a subdominant but sometimes dominating in pure stands, especially south of 20°S. The shrub layer consists mainly of *Acacia* and *Hakea* spp such as *A. coricea, A. dictophleba* and *H. macrocarpa* and occasional low tree/mallee eucalypts such as *E. opaca* or *E. gamophylla*.

6. Spiked Flower Spinifex *Triodia spicata* ***hummock grassland with Holly Grevillea*** *Grevillea wickhamii,* ***Acacia sparse shrubland overstorey***. Occurs on rocky quartzite hills with skeletal soils. The ground layer is generally dominated by hummock grasses *T. spicata* or, on steep slopes, *T. hubbardii*. *G. wickhamii* dominates the sparse shrub layer, associating with *Acacia* shrubs; the density of the shrub layer typically decreases towards hill crests. Often with scattered Eucalypts: *E. eremaea, opaca, oxymitra* and *papuana*.

7. Hard Spinifex *Triodia basedowii* ***hummock grassland with*** *Acacia* ***tall sparse shrubland overstorey***. Found on gently undulating sand plains with some areas of dunes, mainly N. S and W of the MacDonnell Ranges, soils being mainly red earthy sands. *T. basedowii* is the most common hummock grass, although *Plectrachne schinzii* dominates in some areas. The tall sparse shrubland layer is dominated by *A. pruinocarpa*, other *Acacia* spp and mallee Eucalypts (*ie E. gamophylla*). Any sparse shrub layer is characterised by *Acacia* and *Cassia*.

8. Hard Spinifex *Triodia basedowii* ***hummock grassland with Mulga*** *Acacia aneura* ***tall sparse shrubland overstorey between dunes***. Occurs between irregular sand dunes in the south-west of the NT. *A. aneura* dominates the tall sparse shrub upper stratum, where typically a low open shrubland is present dominated by mixed species. The ground layer is often dominated by *T. basedowii*, although tussock grasses such as *Eragrostis eriopoda* are common and locally dominant.

9. Hard Spinifex *Triodia basedowii* ***hummock grassland with Desert Oak*** *Allocasuarina decaisneana* ***open woodland between dunes***. Found on generally infertile red siliceous and clayey sands, the upper layer dominated by *A. decaisneana* occurring as scattered trees or distinct groves at the base of sand dunes. Structure ranges from open woodland to low open woodland. The usual tall sparse shrubland mid-layer is characterised by *Acacia* spp such as *A. ligulata* and *A. dictyophleba*, although the layer can be virtually absent. The ground layer is typically a hummock grassland, most commonly dominated by *T. basedowii* and less often by *T pungens* or *Plectrachne schinzii*.

10. Samphire *Halosarcia indica* ***low open shrubland fringing bare salt pans***. Fringes salt pans throughout the sandplain/dune areas south of 18°S, these pans often being parts of remnant drainage systems and the soils being chiefly shallow loams or saline clays. This community is dominated by chenopods such as *H. indica*. Ephemeral tussock grasses and forbs are also a significant component. Spp such as *Melaleuca glomerata* and *T. pungens* fringe the samphire shrubland.

11. Bare salt pans. Large lakes in the arid zone such as Lake Amadeus and Lake Bennett are dry for long periods of time although periodically they fill with water. Vegetation is generally absent on the lake beds, although there is usually a fringe of *Halosarcia* shrubland.

These lakes are remnants of older drainage systems. They may have wind blown sand islands within their boundaries that support hummock grassland communities.

Appendix 5

Newhaven Burn Practice and Bird Numbers

Introduction

In September 2004, the Royal Air Force Ornithological Society (RAFOS) carried out an extensive bird survey (OzEx04) at the Birds Australia (BA) Newhaven Reserve, Northern Territory. BA leases the land, a former cattle station, from the traditional owners. During the survey work, which was carried out in all habitats that could be obviously differentiated, it was noticed on burnt areas that there appeared to be a non-linear relationship between the burn 'age' (the number of years since an area was burnt) and the numbers of birds identified and counted. Although Australian Bird Atlas Record Sheets require only presence or evidence (qualitative data) of breeding for each species to be recorded on each 2ha plot, on OzEx04 we incorporated all 2ha plots into a typical European continuous quantitative transect, while taking care to keep the 2ha plots at the BA-specified separation. European transects typically record the numbers of each species encountered on each transect, usually in distance bands. On OzEx04, each non-BA plot was sized either the same as the BA 2ha plot, or slightly longer (to accommodate the necessary BA separation). On OzEx04, most transects were closed circuits up to 9km in length of varying shapes, beginning and ending at a parked vehicle. All points were recorded on GPS using WSG 84 and UTM/UPS coordinates; each BA 2ha plot was recorded at start, mid- and end points, but each non-BA plot was recorded only at start and end points. We downloaded all GPS records directly and viewed the map of each day's work on-screen in ArcView mapping software. The views and conclusions below are based on limited but self-consistent observations, are intended as a basis for discussion, and were reached independently of any BA thinking on future fire policy for Newhaven.

Landscape and Habitat Burn Policy

Much of the Australian landscape is dependent on fire, but introduced plants carry a larger fuel load and burn hotter, jeopardising native seeds that require fire of a certain intensity to germinate. Much of the information obtained on apparent and actual burn policies in arid and desert areas came from informed verbal sources. It is not impossible of course that this information may well be partial, selective or even misinformed. However, there is no reason why the NSW NCC Bush Fire Policy (2000) should not act as a template; for example it makes clear that 'Broad Area Burning' (to reduce fuel loads) should not be applied on lands which may be have to be burnt for ecological purposes *following an appropriate professional assessment* (our italics). Their definitions seem clear and unambiguous, particularly these:

1.4 "Ecological processes" - processes which play an essential part in maintaining ecosystem integrity. Four fundamental processes are the cycling of water, the cycling of nutrients, the flow of energy and biological diversity (as an expression of the process of evolution).

1.5 "The principles of ecologically sustainable development (ESD)" - as defined in the NSW Protection of the Environment Administration Act 1991, summarised as:

- the precautionary principle;
- inter-generational equity;
- conservation of biodiversity and ecological integrity;
- the improved valuation and pricing of environmental resources.

1.6 "Ecosystem"- a dynamic complex of plant, animal, fungal and micro-organism communities and the associated non-living environment interacting as an ecological unit.

1.7 "Fire mitigation" - any activity that reduces damage or the risk of damage from fires.

'Bushfire Management in the Northern Territory' (now withdrawn from the Web) mentions 'protection of…the environment from the effects of uncontrolled fire', but the contents bears little relationship towards the NNC approach, which is one that will sustain the environment and habitats through wildfire prevention and through preventive burning based on knowledge and ecological understanding. The NT Policy conclusions seem aimed only at preventing large uncontrolled fires, a wholly admirable intent, but rather the approach of the fireman. The NT Bushfires Council's third objective is 'to achieve a balanced use of fire on natural, agricultural or pastoral lands to achieve specific management objectives' and their last of 7 monitoring or research activities is 'conservation management of fire-sensitive communities and species in particular' as part of supporting bodies such as the Cooperative Research Centre for Tropical Savannas. Fundamental to the difference in approach are the sheer size of NT, its tiny population and its very limited funds. However, the information on the NT Bushfires Council website (2005) is now much less specific.

It is understood that many areas in the general neighbourhood of Newhaven, even if they have an agreed bushfire policy, do not have any implementation programmes, nor do they have the wherewithal to build and maintain the necessary pattern of firebreaks. However, there appears to be a general intent in arid and desert areas of Australian States and Territories to maintain a managed environment through burning those areas that have not burnt naturally. Across Australia the problem of high fuel load due to hotter-burning introduced plants of course exacerbates burn management. On the scale of the Australian continent or Australian States, a repeat burn pattern of around 7 years seems to be about the highest acceptable rate. The NCC recommendation is that 100ha (1km×1km) is the maximum recommended burn area size in protected areas providing that does not exceed 10% of the area (1000ha [3.2km×3.2km] for 'managed lands' in such as national parks). Reading between the lines of the limited documentation obtained suggests (as does word of mouth) that 7km×7km (4970ha) might be considered typical as a minimum size of burn routinely applied on the scale of a State. Some disparity seems apparent. Burns, of course, affect all organisms, not just birds. We doubt that all planned burns take into account the NCC principle, 'Our understanding of fire effects on the Australian biota is incomplete and a cautious approach is essential. In land management zones the use of fire as a management tool should be restricted to those areas where the outcomes can be justified on the principles of ecological sustainability'.

Newhaven Burn Area Apparent Recovery Pattern

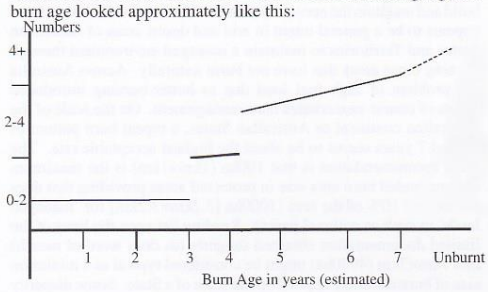
On OzEx04, the survey transect routes were selected to start in areas yet unsurveyed, but sometimes discriminatory selection of the start point allowed new or typical habitats to feature. However, the direction of the initial heading of a transect and its overall length inevitably took the observers through a wide range of burnt habitats of varying ages as well as unburnt habitats. Because a large number of survey plots occurred in the whole spectrum of burn ages, from 'this year' (2004) to full regeneration, we could identify a general relationship between burn age and the numbers of birds counted. The opportunity to record apparent burn age on each plot was missed, and so our conclusions must remain qualitative. Now, because the rainfall pattern in these arid areas is non-regular, the recovery and regeneration of burnt areas likewise may well be non-regular between years. Nevertheless, we were able from observation to identify burn age usually up to 4 years with confidence, and beyond that to 7 years in a reasonably consistent manner. When we matched the colour of burnt material (continuous sooty areas were largely 'this year', their erosion to an increasing patchwork through years 2 and 3 was accompanied by a greying) with the regeneration of dominant ground vegetation (usually one, or perhaps two species) in area and height, we found that the regeneration of bushes and scrub seldom started significantly before year 4. Quite often, we found areas where the dominant plant species (usually Spinifex *Triodia spp*) had been so successful that few other plant species had attained a foothold, skewing the plant community considerably. More important in regenerating areas was the near-absence of the understorey (of trees, bushes and shrubs) community until years 5 to 7 (although sometimes a single understorey species would regenerate quickly and vigorously); the corollary is that until the understorey community is restored or near-restored, birds have too few places to roost, nest and often feed.

Bird Numbers v Burn Pattern

On numerous occasions we recorded no birds at all on our plots. These plots were not necessarily lacking habitat and plant variety, but because we carried out around 275 BA plots (of which about 240 were 2ha plots; the remainder were Area plots) and about 340

linking or sequential non-BA plots in all of which we counted all birds, we could discern that plots occurring in burn areas aged up to 4 years (or in areas where the plant community apparently had not generated) held significantly fewer birds on average than burn areas older than that, or than unburnt areas. There is probably a recommended 'patchwork' pattern of burning and where burnt areas were adjacent, some might have been natural fires. Bird numbers tended to increase in mostly 5-7 year old burn area where there was good regeneration of the understorey, but usually were numerous only in areas that seemed older. This was not a neat and predictable relationship, for some older areas lacked birds during the visit.

The overall pattern of bird numbers against burn age (per 400m of transect across areas where there was evidence of burning) against burn age looked approximately like this:



Further work documenting known burn ages against bird numbers counted within the burnt areas is needed to produce reproducible results. However, on burn areas where the understorey plant community regeneration from year 3 onward was slow or absent, numbers tended to remain very low.

Implications of Persisting with the Present Burn Pattern

If there is a burn pattern that repeats or aims to repeat on or around the 7-year timescale, then only roughly one sixth or one seventh of the total area is holding anywhere near the presumed normal total of bird numbers at any one time (annual non-regular weather patterns permitting, of course). We would suggest that at any scale, this is a cause for concern, but especially in the case of a bird reserve. The effect is not much improved on a 10-year cycle. On a national or State scale, concern may be mollified by the sheer numbers involved, but at Newhaven it does seem to present a risk of isolating already fragmented populations, risking local extinctions. Even given the peripatetic nature of so many desert species, this risk requires analysis. At this point, there are other aspects of burning arid areas that need consideration.

Pattern and Scale of Natural Burns in Arid Areas

It seems from what information was available about the extent to which naturally-induced burns, primarily from lightning strikes, should be taken into account when formulating or implementing burn policies, that the underlying assumption is that their overall effect is small against accidental (including small intentional burns getting out of control) and deliberate (including fire-raising) burns. This impression may be completely wrong, but recent data from satellite detection indicates that the number of lightning flashes occurring is at least one order of magnitude greater than previously assumed. Even when cloud-to-cloud discharges are taken into account, the number of 'ground strikes' (actually the discharge initially goes, counter-intuitively, from ground to air) is very much greater, especially over continental areas. The case for amending any national, state, or as in this case, reserve burn policies should at least take into account any changed statistical impact of naturally-induced burns.

Should Burn Policies Relate to the Size of the Area?

Our understanding is that Newhaven burn policy and implementation (which may not have coincided at all times) are similar to, or variants of, State or national policies. We would argue that that the repeat burn pattern, the size of each burn and the timing of burns should be a function of the size of Newhaven, given that (we presume) the aim of Newhaven is to conserve birds in the long term. In our estimate, a 7-year cycle (or even a 10-year cycle) will not result in Newhaven holding significantly more birds than similar areas elsewhere.

Burn Pattern Management

There seems to be no tenable argument for a rigid burn cycle, given the non-regular annual weather pattern. Furthermore, it seems to be the only professional option that feedback from the year-on-year burn pattern must be incorporated after annual on-the-ground analysis of the results of previous years' burns (*ie* trend analysis); *eg* burns from, say, 3 years previously, may be exhibiting slower or faster regeneration than expected, possibly due to soil quality, hydrology or geology, so that future burns may be delayed or advanced in similar areas. Burn policy or cycle cannot be run exclusively on-site or from afar without feedback from previous years.

Burn Size

Typical burn sizes at Newhaven so far have been quite large, burn areas being selected at least partly because of the presence of firebreaks or tracks acting as firebreaks. In relation to basic population dynamics, a burn of this size provides two major concerns. Birds at least can fly away from burns, although some species are immediately attracted to the prospect of fleeing or flambéed prey. However, the survival rates of creatures caught in a burn are likely to be quite low in the long term for a number of reasons. Firstly, there are those than cannot escape the flames, whether by fleeing or by taking refuge underground; the larger the area, obviously the higher the total fatalities, but it is suggested disproportionately so. The further creatures have to go to attain safety in an unburnt area, the greater the fatality rate. The second impact on survival rate is probably proportionate to the size of the burn, when large numbers of survivors move into unburnt areas in territories that are already occupied at around the maximum density achievable.

Supposing a large burn is undertaken at a slow, controlled rate to permit maximum survival of the burn area's inhabitants in neighbouring areas; these areas will then contain disproportionately high numbers, and dispersal further is subject to constant harassment. Most of the incomers will not survive in the longer term because the occupants will fight to retain territory; it is a general rule that occupants survive at a far higher rate than would-be incomers when population pressure is high. However, if burn areas are smaller, the total density of survivors 'invading' the margins of unburnt territory will be much lower in any one location, and therefore they would have a distinctly better chance of long-term survival. Although there is much merit in considering a much smaller maximum burn size for Newhaven, it would bring with it the need for many more firebreaks, whose environmental impact would have to be assessed and whose management would be more costly to implement.

Burn Timing

Presumably burn timing is largely dependent on periods when wind speeds remain low, circumstances that are probably seasonally driven. It will also be dependent on the immediate and subsequent effects of rainfall, when wet or fresh growth may be more reluctant to burn. However, it seems self-evident that burning at the peak of the breeding season poses a significant threat to population stability, but that may be proved wrong by research. Are there data to show when these peaks occur?

Lastly, the NCC gives unequivocal advice in its Policy 2000:

'12.5 Bush Fire Risk Management Plans should clearly identify their aims especially with regard to managing the effects of fire on all ecosystem elements including:

•threatened species, populations and ecological communities;
• fire-sensitive fauna; • invertebrates, fungi and micro-organisms;
• vegetation communities (including fire interval thresholds);
• wildlife habitats; • wildlife corridors; • soil stability; • water quality; • air quality and smoke'

The Birds Australia Fire Risk Management Plan for Newhaven may very well fully meet these requirements, but its implementation requires a very fine balance between an effective fire regime for the birds and one that is not expensive in resources and management effort, a very difficult task.

Secondary References

NCC Bush Fire Policy. (2000).http://nccnsw.org.au/bushfire/reference/policy

NT Bushfire Council (2004). http://www.ipe.nt.gov.au/whatwedo/bushfires/management.html

The 2004 Survey of Eleonora's Falcon Breeding Sites in Cyprus

Hosted by The WSBA Conservation Group,
On Friday 10 September 2004, From 0700 - 1300hrs

By LCpl Jason Wilson

Introduction

The **Eleonora's Falcon** *Falco eleonorae* is classified as rare in Europe (Tucker and Heath 1994). It is included in Annex 1 of the European Union's Wild Bird Directive, Appendix II of the Bern Convention, Appendix II of the Bonn Convention, and Appendix II of CITIES (Convention on International Trade in Endangered Species).

It is a slender, long-winged, long tailed medium sized falcon that falls in size between Hobby and Peregrine, that occurs in two colour morphs: light and dark (Forsman 1999). The Falcon breeds entirely in the Mediterranean and along the North West coast of Africa, in colonies on sea cliffs and islands. The entire population migrates during autumn to their wintering grounds on Madagascar and other islands located along the coast of Eastern Africa (Clark 1999).

In Cyprus, the Eleonora's Falcon breeds in colonies on the sea-cliffs along the Southern coast, (Kourtellarides, 1998) from Cape Aspro near Paphos to the cliffs at Akrotiri. They make use of sandy ledges or potholes on the sea cliffs for which to nest.

Since 2002, the WSBA Conservation Group, has been organising and hosting the Survey of Eleonora's Falcon Breeding Sites in Cyprus, as recommended by the International Species Action Plan for Eleonora's Falcon (Ristow 1999) to monitor the population. Representatives from the Sovereign Base Area Administration (SBAA), Birdlife Cyprus, Republic of Cyprus Game Fund and the Republic of Cyprus Forestry Department are invited to help with conducting the survey.

Location

The locations that hold nesting Eleonora's Falcon in Cyprus are collectively known as Akrotiri Cliffs, Episkopi Cliffs and Cape Aspro Cliffs. They are to be found on Southern coast between Paphos in the West to Akrotiri in the East. These areas have been designated Important Bird Areas (IBA's) since 1988. Akrotiri and Episkopi Cliffs are within the U.K. Sovereign Base Area and are Permanent Game Reserves. Cape Aspro Cliffs, which are not designated as an IBA, are naturally protected due to their inaccessibility from land (Ristow 1999).

These three areas are further broken down into eleven smaller sites, one of these sites being recorded for the first time on this survey due to the presence of falcons. With the use of Global Positioning System (GPS) coordinates, previously recorded by 417 Maritime Troop, Cyprus Services Support Unit (CSSU), at RAF Akrotiri on the 2003 survey, these eleven sites can be clearly identified.

Survey Methodology

The same methodology, that was first published in the 2000 Annual Report of the Cyprus Ornithological Society (1957), (Warne 2000) has been used to conduct the survey. The WSBA Conservation Officer, who helped conduct the previous two surveys (2002 and 2003), was on hand to explain the methods used on the previous surveys.

The Eleonora's Falcon nests late in the season. This is to coincide with the autumn migration of small passerines, which form the main diet for the chicks. Ideally, this is why the survey date should fall sometime during the first two weeks of September. Adult falcons will still be feeding chicks that are at the nest sites. There will also be possible guano staining on the cliffs below a probable nest site.

417 Maritime Troop were approached to assist with logistical support (transport) to conduct the survey. This was due to the falcons nesting on ledges and in holes on the sea-cliffs that can only be observed from the sea. 417 Maritime Troop was approached well before the intended proposed dates for the survey by a representative from the WSBA Conservation Group, who helped organise a time and date appropriate to all. Friday, 10 September 04 was the date chosen for the day of the survey.

Invites were sent to the SBAA, Birdlife Cyprus, Republic of Cyprus Game Fund and Republic of Cyprus Forestry Department, requesting representation and assistance with conducting the survey. Due to limited space, the team was no more than six persons, consisting of representatives from the previous mentioned organisations.

A description and summary of the day's weather state is included in the final report.

Procedure

It was agreed that the survey would follow the following procedure;

a. Before departing, the survey team will split into two groups, with one or two people allocated to record the figures.

b. The boat/vessel will make its way West to the first location, close to Cape Aspro Cliffs using the GPS coordinates provided.

c. On arrival at first location, the boat/vessel will get reasonably close to the cliffs, safety and depth of water permitting, and start to make its way East, at slow speed. Each location can be identified by using the GPS coordinates.

d. The two independent teams, which have previously been identified at the start of the survey, will start counting falcons that are present on the cliffs by means of binoculars (it is impossible to use scopes due to the rocking movement of the boat/vessel twined with using high magnification). The teams will identify possible nest sites, represented either by adults near to a crevice, ledge or pothole, or by the presence of guano on the cliff below the afore mentioned areas indicating probable long term usage.

e. After each section of the survey has been completed, the two teams will compare their figures of falcons counted, either present on the cliffs or flying. They will also identify and record possible nest sites. This is to see if the two teams' are obtaining roughly the same figures.

f. The time at start and end of each section is to be recorded.

g. After two or three sections have been completed the two teams will form one team. This is to account for the possibility of one or two members getting motion sickness.

h. The team is also to identify and record any other information about the falcons' e.g. unusual behaviour.

i. At the end of the survey a small discussion between the team is encouraged to 'compare notes'.

Weather

The weather forecast for the day, supplied by the Met Office at RAF Akrotiri, indicated that there would be light north west winds, becoming moderate south west in the afternoon with gusts no higher than 15 knots. Visibility on the day was excellent, being 10km or more. Cloud base 3000 to 5000ft with the highest temperature 28C to lowest 21C.

Results

On the day of the survey, 228 Eleonora's Falcon was recorded by the team. The main concentrations being located at Cape Aspro and Akrotiri Cliffs. This figure is a total of falcons present on or near the sea cliffs, either resting or flying.

On the survey area, a possible 151 nests were identified. The majority of nests were clearly visible because of the presence of an adult near to or on a nest site as well as the presence of guano on the cliffs.

A new site has been identified and added to the list of areas because of the presence of falcons on the cliffs and possible nests. This was a joint decision made by those present.

Discussion

The survey started at 0730hrs and was completed at 1300hrs.

The survey team was Mr Thomas Hadjikyriakou (SBAA), Mr Michael Miltiadous (Birdlife Cyprus), Mr Minas Stavrinides and Mr Minas Papadopoulos (ROC Game Fund) and Jason Wilson (WSBA Conservation Officer).

Once we got past the headland of Cape Gata, at RAF Akrotiri, the sea started to get a bit rough. A couple of representatives from the team voiced their concerns about the possible difficulty we might encounter whilst conducting the survey and that we should cancel until a later date. But after consultation with the skipper, the WSBA Conservation Officer informed the team that the sea should be a lot calmer once we get out of deep water and got closer to the cliffs. On arriving at the first location this seemed to be the case.

On the journey to Cape Aspro Cliffs a lone adult Eleonora's Falcon was seen hunting about 40 metres above the sea about 4km South of Pissouri Jetty. The majority of falcons were still present on the sea cliffs, with only a small amount flying around.

The sea cliffs are predominately made up of Limestone, this being light in colour. The majority of the falcons, that appear dark against their background, could be clearly seen and counted at the various locations. Others were very tricky to locate, being tucked away in cracks and crevices in the shade. All falcons observed were counted.

Visibility was excellent, with the sun being behind us and to the right the whole time. It quickly became apparent that due to these conditions the two independent teams were recording roughly the same figures for the first locations. Thereafter, one team was formed.

At the Zapallo Fishing Station a single falcon was observed lying flat on a ledge on the cliffs. It was motionless, with wings outstretched, tail-feathers fanned and head pointing forward. Because it wasn't moving we presumed that the falcon had probably collided with the cliff face and was either stunned or dead. After a couple of minutes we looked back and the falcon was gone. Shortly afterwards another one turned up and did exactly the same, lying flat and motionless. It stayed there for about 2 to 3 minutes, stud up, raised its wings vertical as if to stretch, then took off. We came to the conclusion that they were performing one of three possibilities;

a. They could have been anting (where a bird allows ants to crawl over its body to remove parasites).

b. Dust bathing (to relieve the irritation caused either from parasites or sheaths on new feathers from their latest moult).

c. Or simply basking in the sun.

All the falcons that were seen resting on the sea cliffs were positioned on the bottom third of the cliff. Never near the top. This could possibly be attributed to temperature; possibly the lower part of the cliffs could be cooled by sea breezes adding to favourable conditions.

At Akrotiri, East of the Radar Station, groups of falcons were located very close together. We believe that this area, even though it had the presence of nests, could be a non-breeding area for adults and youngsters.

With the exception of one site, possible nest sites were positioned between 5 and 30 metres above sea level on cliffs directly overlooking the sea. The Quarry Cliffs site is an area that overlooks the ground. These nests were between 20 and 40 metres above the ground.

All nests were sited in cracks, pot holes, crevices or on ledges, either in shade, semi-shade or in a couple of instances direct sunlight.

Conclusions

A breeding pair of falcons, one on the nest incubating and the other perched nearby could have been counted as possibly two pairs.

Falcons could have been missed during counting.

Although visibility was good, at three of the sites we could only get to within 150 metres of the cliffs, making it difficult to locate nests.

The location of possible nests was based on the knowledge of the survey team.

As with previous surveys this methodology is the only viable option currently available due to the inaccessibility of the sites surveyed, enabling us to acquire a more accurate count.

It was agreed that the 2004 survey was a great success due to the date of the survey falling earlier in September, enabling the team to count falcons still at possible nest sites.

Going by the figures gained it appears that the Eleonora's Falcon that breed along the Southern coast of Cyprus, show numbers have remained stable.

Recommendations

Future surveys should include what percentage of the population are either dark or light morphs.

There should be continued cooperation, participation and suggestions from the various organisations on improving or changing the current methodology used.

Acknowledgements

On behalf of the survey team, thanks once again to 417 Maritime Troop CSSU, based at RAF Akrotiri for providing us with the resources to be able to conduct the survey, and thanks to the crew of the Sir William Roe, Sgt Rogers, Cpl Winzor, Theo Constantino and Savvas Nicolaou.

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Comparison of Numbers of Eleonora's Falcons and Nests between 2002 and 2004

Location	2002 Birds	2002 Nests	2003 Birds	2003 Nests	2004 Birds	2004 Nests	Time
Cliffs West of Cape Aspro (East of Petra tou Romiou)	28	23	32	16	14	7	0900hrs - 0922hrs
Cape Aspro	48	37	52	13	83	73	0922hrs - 0948hrs
East of Cape Aspro	11	8	12	2	1	1	0948hrs - 1006hrs
Bloodhound Camp (Evdhimou Bay cliffs)	17[1]	12	23	9	19	12	1013hrs - 1025hrs
Tunnel Beach	6	3	1	1	8	5	1030hrs - 1043hrs
Zapallo Fishing Station	18	14	30	11	15	8	1045hrs - 1055hrs
Quarry Cliffs	23	18	0	0	19	15	1055hrs - 1105hrs
Kourion Cliffs[2]					20	17	1105hrs - 1115hrs
Akrotiri East of TPMH to Radar Station	27	22	5	0	0	0	1146hrs - 1200hrs
Akrotiri East of main Radar Station	17	14	41	13	31	7	1205hrs - 1225hrs
Akrotiri Lighthouse	22	18	30	10	18	6	1230hrs - 1245hrs
Totals	**215**	**169**	**226**	**75**	**228**	**151**	

1 Includes 2 nestlings.
2 New site discovered on the 2004 survey.

Review

BirdLife Cyprus Annual Report 2003. Edited by Jeff Gordon. BirdLife Cyprus.
Price not available. Enquiries to birdlifecy@cytanet.com.cy.

This, the very first Annual report from BirdLife Cyprus, which has subsumed the two previous competing organisations, is an encouraging promise of many fine things to come. After a brief history and a helpful list of officers of BirdLife Cyprus, there follows a comprehensive systematic list of species' occurrence in 2003. Current status is given for each species. I would imagine that the commoner and more abundant species will be treated in less detail in subsequent issues, but for this first issue, their treatment is acceptable. Liberal use is made of Tables, not always for obvious reasons. Numerous locations are mentioned, but even for those who know and love Cyprus, the absence of a map naming them is a barrier to understanding. A useful ringing report is included (almost 40 000 birds ringed since 1957), but the most important item is a fine essay by Derek Pomeroy on monitoring results at 40 sites - monitoring requires systematic observations to strict guidelines, and it is the best way of assessing the health of an environment by analysis of species' trends. The good news is that most species seem relatively stable at present, the 2003 rains apparently helping, and on present information there appear to be no alarming trends. Of course, many factors could reduce this optimism, such as better data and future droughts, but much sound work has been done recently and there is now no reason to suppose that it will not continue. The 2003 Report comprises 140 pages in A5 softback format. The relatively low-quality reproduction fails to reduce the impact of the pages of excellent colour photographs. In summary, this is a necessary item for anyone with a genuine interest in Cyprus birds. I am enormously encouraged by the positive and energetic approach adopted by BirdLife Cyprus, as demonstrated in this report, but surely by far the most important consequence of the organisation's formation is its inclusive approach to matters ornithological - it is quite evident that under Melis Charalambides' guidance, BirdLife Cyprus has every chance of persuading all conservation bodies and interests to develop a coherent approach in the very near future across the island.

Mike Blair

The Akrotiri Peninsula Raptor Survey 2004

Conducted by The WSBA Conservation Officer from August to November 2004

By LCpl Jason Wilson

Introduction

Birdlife Cyprus asked the WSBA Conservation Officer for assistance with gathering information on raptor (birds of prey) movements through the Akrotiri Peninsula during the autumn. The information will be used by Birdlife Cyprus as part of their raptor count for the Republic of Cyprus.

The aims of the project are to document numerical counts of species and their populations using the Cyprus flyways. It is also to discover their movements along land sites, and to improve information regarding Important Bird Areas (IBAs) and designated Special Protected Areas (SPAs), that either cater for 'bottleneck' sites or serve as stop-over resting sites for raptors.

Location

The Akrotiri Peninsula forms the southernmost part of the island, extending over a total area of around 70 km^2. Its centre is occupied by the natural depression of the Akrotiri Salt Lake, which covers around 10 km^2, which is surrounded by salt marshes. Also included in the area are the freshwater habitats to the northwest of the salt lake, known as Phasouri Reed Beds. A forest of eucalyptus trees can be found to the north of the salt lake.

The coastline of the peninsular comprises flat areas to the east and west with an elevated plateau to the south with steep sea-cliffs from Cape Gata in the east to Cape Zevgari in the west. The eastern coast includes sand flats and coastal lagoons, while the west shows signs of previous extensive quarrying.

Survey Methodology

Between 26 August 04 and 14 November 04, the WSBA Conservation Officer carried out fifteen surveys to monitor raptor movement through the Akrotiri Peninsula from various locations in the area. Once raptors were observed the following was recorded;

a. Location and date.
b. Weather.
c. Species identified and numbers, including where possible sex, age and colour form, subspecies.
d. Time for each sighting, flight direction and height.

A map of the peninsula was produced to show areas of interest; Appendix A

A Akrotiri Salt Lake
B Akrotiri Reed Beds
C Phasouri Reed Beds
D Akrotiri Gravel Pits
E Cape Zevgari
F Cape Gata

Observations and Weather

Individual daily observations of raptors and the weather can be found at Appendix B.

Results

The following is a list of all species recorded with total figures for the survey period;

a.	**Honey Buzzard** *Pernis aviporus*	c1495
b.	**Black Kite** *Milvus migrans*	3
c.	**Marsh Harrier** *Circus aeruginosus*	31
d.	**Hen Harrier** *Circus cyaneus*	2
e.	**Pallid Harrier** *Circus macrourus*	2
f.	**Montagu's Harrier** *Circus pygargus*	19
g.	**Steppe Buzzard** *Buteo buteo vulpinus*	11
h.	**Osprey** *Pandion haliaetus*	6
i.	**Kestrel** *Falco tinnunculus*	3
j.	**Red-footed Falcon** *Falco vespertinus*	2
k.	**Hobby** *Falco subbuteo*	7
l.	**Eleonora's Falcon** *Falco eleonorae*	1
m.	**Peregrine** *Falco peregrinus*	2

Total: c1584

Discussion

From the 26 August 04 to the 11 November 04, an estimated total of 1584 raptors were recorded using the Akrotiri Peninsula. A total of fifteen days was used for the survey.

The majority of raptor movement occurred during two periods of the day, in the morning between 0930hrs and 1100hrs and then in the afternoon at about 1500hrs.

Larger raptors, like the Honey Buzzard, appeared to use the eucalyptus forest located along the northern edge of the Akrotiri Salt Lake to roost. Four species of Harrier (Marsh, Hen, Pallid and Montagu's) use the Akrotiri Reed Beds (Raptor Roost) to roost with large numbers seen there during the middle two weeks of September. These Harriers, due to their vulnerable status and conservation value are recognised on Annex 1 of the EU Birds Directive.

Raptors using the peninsula arrived from the north along three flight paths, either along the east or west coast, or straight through the middle. All birds observed either left over the southeast near Cape Gata or southwest near Cape Zevgari.

The Akrotiri Salt Lake still contained a large amount of water during the survey period. In previous years, when the Akrotiri Salt Lake was dry, this was the main area used by the birds to catch thermals. This year, because of the water that was present, birds were struggling to gain height so would either move east, between the salt lake and the coast, or move west towards the Akrotiri Gravel Pits to gain height.

The main raptor movement occurred on Tuesday 7 September, with twelve large flocks observed passing through at great height. These flocks were predominately Honey Buzzard. They arrived along all three flight paths, with the majority arriving through the centre of the Akrotiri Salt Lake. These birds were trying to thermal over the salt lake with little success, so all moved east, gained height, and then headed southeast. From personal observations of raptor movements from previous years, the majority all departed over the southwest. This year's movements were mainly over the southeast. The wind direction was also mainly from the south, giving the birds a head wind.

Conclusions

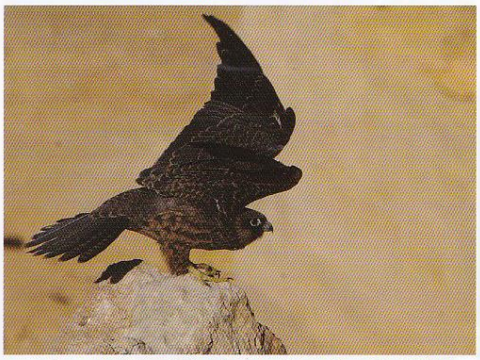
It is clear from the results of the survey that the Akrotiri Peninsula plays a major role in the movements of raptors through Cyprus during the autumn. They use the area to feed, drink, roost or to gain height on thermals created in the area.

The survey has identified key areas that are important to migrating raptors. Areas like the Akrotiri Reed Beds (Raptor Roost) appear to be the only location in the area that provides ideal conditions for roosting Harriers. It also appears that if Harriers arrived during late afternoon, they would stay in the area to feed before moving to the Akrotiri Reed Beds to roost. It is not known if they leave the next morning or stay in the area for a short time.

Raptors that left during the morning appeared to have been roosting in the Eucalyptus Forest, the Akrotiri Reed Beds or Phasouri Reed Beds. Others that came through early afternoon seemed to be passing through the area having just arrived.

Birdlife Cyprus survey methodology was to record raptors moving

Brown Noddy *Anous stolidus.* A nesting pair recolonising Ascension following the cat eradication programme. Copyright Mike Vincent.



Eleonora's Falcon *Falco eleonorae,* Cyprus September 2004. Copyright J Wilson.

Montagu's Harrier *Circus pygargus*, Cyprus Nov 2004. Copyright J Wilson.

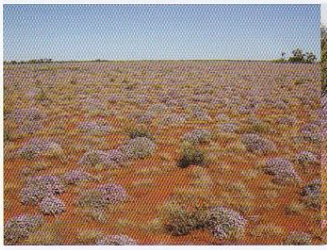
Montagu's Harrier *Circus pygargus*, Cyprus Nov 2004. Copyright J Wilson.

Honey Buzzard *Pernis aviporus,* Cyprus Nov 2004. Copyright J Wilson.

The 'Red Heart' of Australia (Newhaven). Copyright Mike Blair.

Red-capped Robin *Petroica goodenovii*. (By photography permit, Alice Springs Desert Park). Copyright Mike Blair.

Princess Parrot *Polytelis alexandrae*. (By photography permit, Alice Springs Desert Park). Copyright Mike Blair.



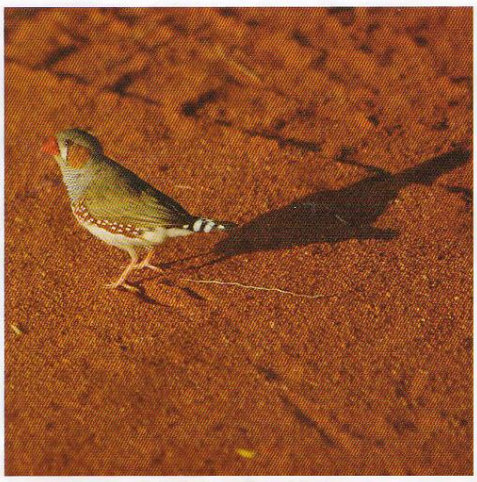
Desert purple succulent carpet. (Newhaven). Copyright Mike Blair

Desert blue flower carpet. (Newhaven). Copyright Mike Blair.

Desert red flower carpet. (Newhaven). Copyright Mike Blair.

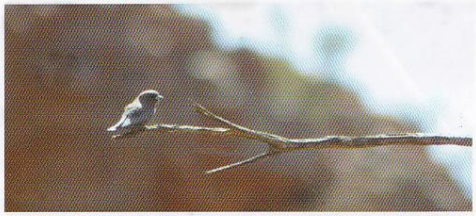
Bourke's Parrot *Neosephotus bourkii*. (By photography permit, Alice Springs Desert Park). Copyright Mike Blair.

Wedge-tailed Eagle *Aquila audax* pair. (East of Tilmouth Well). Copyright Mike Blair.

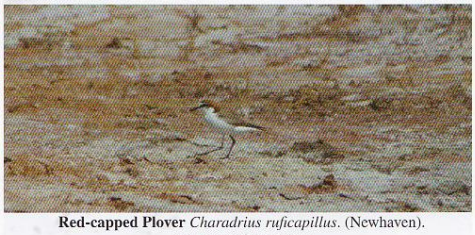


Zebra Finch *Taeniopygia guttata*. (Newhaven). Copyright Mike Blair.

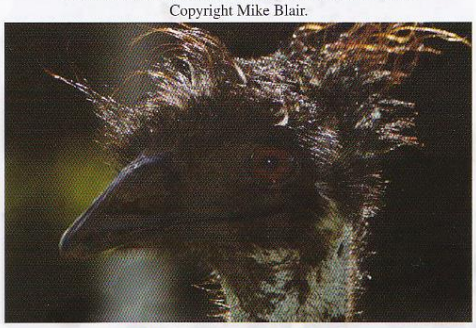
Hooded Robin *Melanodryas cucullata*. (By photography permit, Alice Springs Desert Park). Copyright Mike Blair.



Little Woodswallow *Artamus minor*. (E of Newhaven). Copyright Mike Blair.



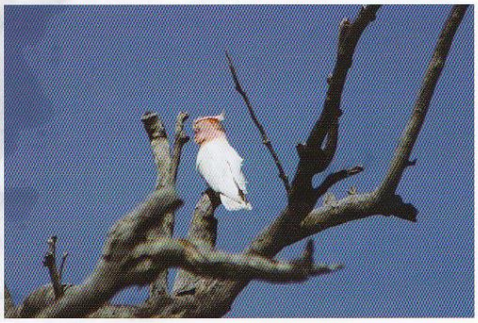
Red-capped Plover *Charadrius ruficapillus*. (Newhaven). Copyright Mike Blair.



Emu *Dromaius novaehollandiae*. (Tilmouth Well). Copyright Mike Blair.

Tawny Frogmouth *Podargus strigoides* on its nest. (Just north of Newhaven). Copyright Mike Blair.

Crimson Chat *Epthianura tricolor*. (By photography permit, Alice Springs Desert Park). Copyright Mike Blair.



Major Mitchell's Cockatoo *Cacatua leadbeateri*. (Newhaven). Copyright Mike Blair.

Eastern Screech-Owl *Otus asio.* Texas, April 2004. Copyright Keith Powrie.

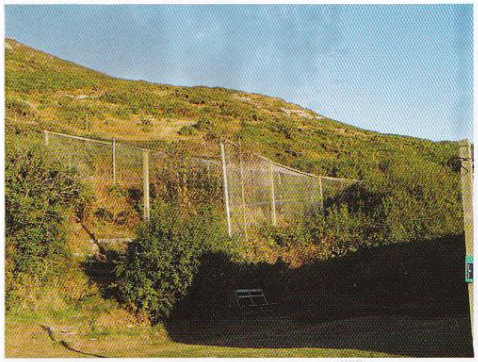
Magnolia Warbler *Dendroica magnolia.*
Texas, April 2004. Copyright Keith Powrie.

Northern Bobwhite *Colinus virginianus.* Texas, April 2004.
Copyright Keith Powrie.

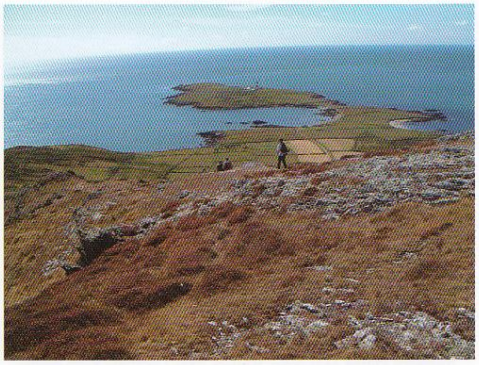
Orchard Oriole *Icterus spurius.* Texas, April 2004.
Copyright Tim Hallchurch.

Royal Tern *Sterna maxima,* Texas 2004. Copyright Tim Hallchurch.

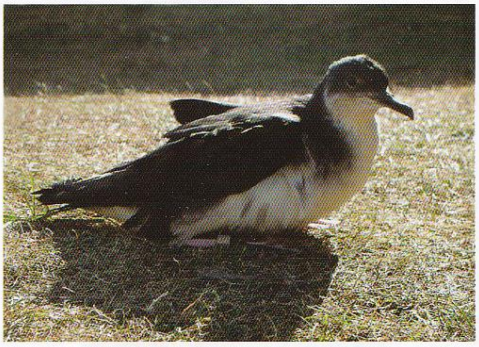
Philadelphia Vireo *Vireo philadelphicus.*
Texas, April 2004. Copyright Keith Powrie.



Heligoland Trap on Bardsey. Copyright Keith Powrie.



The Lighthouse, looking south. (Bardsey) Copyright Ian Drake.



Manx Shearwater *Puffinus puffinus*. (Bardsey).
Copyright George. Candelin.

Sandwich Terns *Sterna sandvicensis* and **Common Terns** *S. hirundo*.
(Bardsey). Copyright Keith Powrie.

Red-billed Chough *Pyrrhocorax pyrrhocorax*. (Bardsey).
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Icterine Warbler *Hippolais icterinus*. (Bardsey).
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Goldcrest *Regulus regulus*. (Bardsey).
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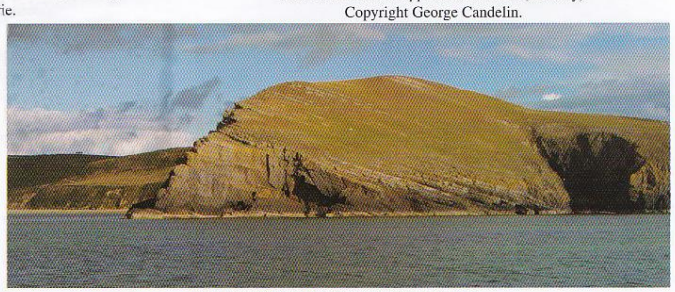


Bardsey from the sea. Copyright Keith Powrie.

Northern Pintail *Anas acuta.* Bardsey 2003. Copyright Keith Powrie.

Common Snipe *Gallinago gallinago.* Bardsey 2003. Copyright Keith Powrie.

Eurasian Coot *Fulica atra.* Bardsey 2003. Copyright Keith Powrie.

Northern Lapwing *Vanellus vanellus.* Bardsey 2003. Copyright Keith Powrie.

European Goldfinch *Carduelis carduelis.* Bardsey 2003. Copyright Keith Powrie.

Common Tern *Sterna hirundo.* Bardsey 2003. Copyright Keith Powrie.

Greater Scaup *Aythya marila.* Bardsey 2003. Copyright Keith Powrie.

Northern Long-eared Owl *Asio otus.* Bardsey 2003. Copyright Keith Powrie.

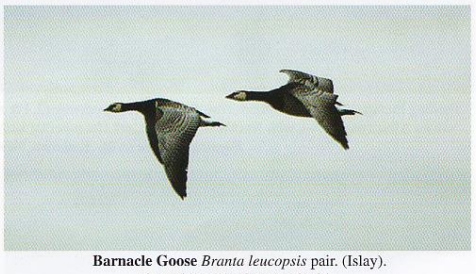
Red-breasted Merganser *Mergus serrator*. (Islay). Copyright John Stewart-Smith.

Eurasian Curlew *Numenius arquata*. (Islay). **Bohemian Waxwing** *Bombycilla garrulus*. (Islay).Copyright John Stewart-Smith.

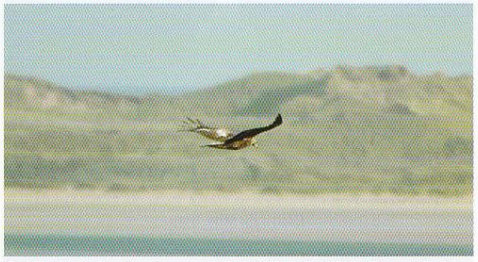
Bohemian Waxwing *Bombycilla garrulus*. (Islay). Copyright John Stewart-Smith

Rock Pipit *Anthus petrosus*. (Islay). Copyright John Stewart-Smith.

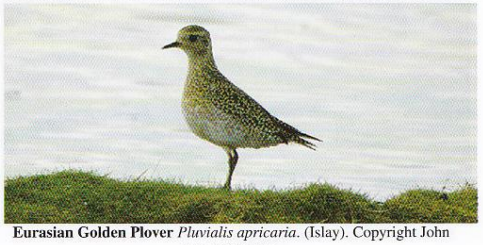
Whooper Swan *Cygnus cygnus*. (Islay). Copyright John Stewart-Smith.



Barnacle Goose *Branta leucopsis* pair. (Islay). Copyright John Stewart-Smith.



Golden Eagle *Aquila chrysaetos*. (Islay). Copyright John Stewart-Smith.



Eurasian Golden Plover *Pluvialis apricaria*. (Islay). Copyright John Stewart-Smith.

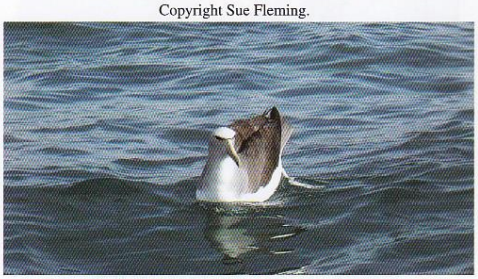
Bird Gallery

Feeding Frenzy. **Antipodes Wandering** *Diomedea antipodensis* (2, l & r), **Auckland Shy** *Thalassarche steadi* (2, yellow tips to bill) and **Salvin's** *T. salvini* **Albatrosses** (7+), with **Northern Giant Petrel** *Macronectes halli* (l & r) (2), **Sooty Shearwaters** *Puffinus griseus* (3, top) and **Cape Petrels** *Daption capense* (r, 2). Kaikoura, New Zealand 2004. Copyright Sue Fleming.

Pied Cormorant *Phalacrocorax varius.* Kaikoura SI-NZ Oct 04. Copyright Mike Blair.

Antipodes Wandering Albatross *Diomedea antipodensis* and **Northern Giant Petrel** *Macronectes halli*. Kaikoura, New Zealand 2004. Copyright Sue Fleming.

Southern Fulmar *Fulmarus glacialoides* and **Cape Petrel** *Daption capense.* Kaikoura, New Zealand 2004. Copyright Sue Fleming.



Southern Buller's Albatross *Thalassarche bulleri.* Kaikoura, New Zealand 2004. Copyright Sue Fleming.

through the area from a static position on every Saturday from 21 August 04 to 6 November 04, but because of commitments the WBA Conservation Officer could not fulfil this requirement. All observations for the peninsular were made during field trips through the area on various dates and times or when raptors were observed. The WSBA Conservation Officer wanted to record all observations of raptors moving through the area from various locations to get a better understanding of flight paths used and numbers for the whole area.

Recommendations

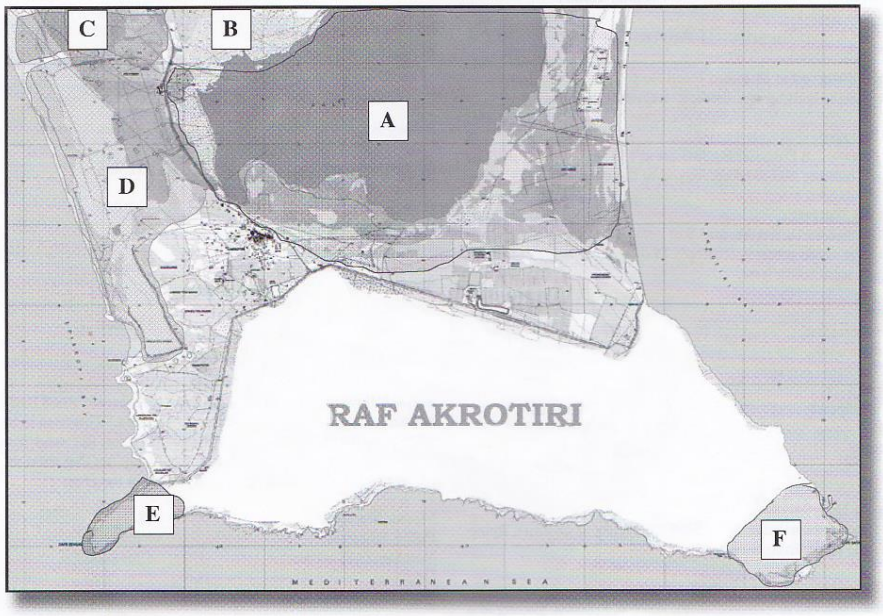
The possibility of additional observers to be located at key areas identified by the WSBA Conservation Officer, following the methodology set by Birdlife Cyprus.
During September, there should be 'afternoon' field meetings to the area of the Akrotiri Reed Beds, organised by Birdlife Cyprus and/or the WSBA Conservation Group.

Appendices

Appendix A. Map of the Akrotiri Peninsula with key areas highlighted. Map produced with permission of DGLA (UK), Crown Copyright, Series GSGS 5801, 1:10,000.

Appendix B. Individual daily observations of raptors and the weather.

Appendix A. Map of the Akrotiri Peninsula with key areas highlighted.



Appendix B. Raptor observations and Weather

The following are the results obtained on the respective dates;

Thursday, 26 August 04

Honey Buzzard
5 Observed at the Akrotiri Salt Lake at 1500hrs, flying west at a height of about 40m, just above the Eucalyptus trees.

Hobby
1 Juvenile observed at Phasouri Reed Beds at 1456hrs, flying low over the marsh, hunting and feeding, stayed in the area.

Weather:

Max Temperature	87 °F / 31 °C
Min Temperature	73 °F / 23 °C
Wind Direction (average)	West South West
Wind Speed	5 mph / 10 km/h
Max Wind Speed	17 mph / 28 km/h
Visibility	7.0 miles / 10.0 kilometres
Cloud Cover	Clear to partly cloudy

Sunday, 29 August 04

Montagu's Harrier
1 Young adult male observed at the Akrotiri Gravel Pits at 1505hrs, flying south low over the scrub hunting. Caught locust, landed on ground and after eight minutes took off low towards Cape Zevgari.

Weather:

Max Temperature	82 °F / 28 °C
Min Temperature	71 °F / 22 °C
Wind Direction (average)	West
Wind Speed	8 mph / 15 km/h
Max Wind Speed	18 mph / 30 km/h
Visibility	7.0 miles / 10.0 kilometres
Cloud cover	Partly cloudy

Monday, 30 August 04

Honey Buzzard
1 Observed at the Akrotiri Salt Lake at 1020hrs, flying across the Salt Lake at a height of about 60m, caught thermal and spiralled to about 150m then went south west.

Montagu's Harrier
1 Juvenile observed at the Akrotiri Salt Lake at 1035hrs, hunting low over the scrub moving from west to east.

Weather:

Max Temperature	84 °F / 29 °C
Min Temperature	71 °F / 22 °C
Wind Direction (average)	East North East
Wind Speed	2 mph / 4 km/h
Max Wind Speed	13 mph / 20 km/h
Visibility	7.1 miles /10.4 kilometres
Cloud cover	Partly cloudy

Tuesday, 31 August 04

Hobby
1 Juvenile observed at Phasouri Reed Beds at 1030hrs, flying low over the marsh, hunting and feeding, stayed in the area.

Marsh Harrier
1 Male observed at Phasouri Reed Beds at 1538hrs, flying low over the marsh, hunting and feeding, stayed in the area.

Montagu's Harrier
2 Juvenile observed at the Akrotiri Salt Lake at 1415hrs, flying south low over the scrub towards Bishop's Pool, gained height to about 150m then went south west.

Weather:

Max Temperature	84 °F / 29 °C
Min Temperature	71 °F / 22 °C
Wind Direction (average)	South West
Wind Speed	1 mph / 5 km/h
Max Wind Speed	13 mph / 20 km/h
Visibility	7.0 miles /10.0 kilometres
Cloud cover	Partly cloudy

Saturday, 4 September 04

Montagu's Harrier
1 Adult female observed at the Akrotiri Salt Lake at 0846hrs, flying low over the scrub from west to east.

Marsh Harrier
1 Juvenile observed at Phasouri Reed Beds at 1130hrs, gliding at a height of about 100m slowly heading south over the marsh. When they arrived at the Eucalyptus trees they had risen to about 150m then went south west.

Hobby
1 Adult observed at Phasouri Reed Beds at 1144hrs, flying low over the marsh, hunting and feeding, stayed in the area.

Montagu's Harrier
1 Adult female observed at Phasouri Reed Beds at 1210hrs, gliding south at about 100m over the Eucalyptus trees.

Weather:

Max Temperature	86 °F / 30 °C
Min Temperature	73 °F / 23 °C
Wind Direction (average)	South West
Wind Speed	3 mph / 6 km/h
Max Wind Speed	13 mph / 20 km/h
Visibility	6.0 miles / 8.8 kilometres
Cloud cover	Partly cloudy

Tuesday, 7 September 04

a. The following observations are from the Akrotiri Salt Lake area from 0930hrs to 1205hrs. A total of 12 large flocks were observed moving through the area at a height of about 200m. The observations were made from two locations; one location was from the track between Sylvana Restaurant and The Monastery of St Nicholas of the Cats at Grid ref. 983 289, looking north from 0930hrs to 1130hrs. The second location was from the main Akrotiri road on the junction at Grid ref. 949 312, looking north from 1150hrs to 1205hrs.

Location 1

Honey Buzzard,	c600	0930hrs to 1030hrs
Black Kite,	3	
Osprey,	2	
Honey Buzzard,	9	1043hrs
Marsh Harrier,	2	
Honey Buzzard,	37	1052hrs
Osprey,	1	
Honey Buzzard,	c250	1056hrs
Marsh Harrier,	4	
Eleonora's Falcon,	1	
Honey Buzzard,	c250	1110hrs
Honey Buzzard,	c170	1117hrs
Honey Buzzard,	c60	1125hrs
Honey Buzzard,	c40	1130hrs

Location 2

Honey Buzzard,	21	1150hrs
Steppe Buzzard,	2	
Steppe Buzzard,	9	1155hrs
Honey Buzzard,	13	1205hrs

b. The following observations are from the Akrotiri Reed Beds, also known as the Roost from 1645hrs to 1803hrs. This area is located on the northern edge of the salt lake between the sand flats and Eucalyptus trees. All observations are of raptors that used the area for roosting and/or feeding, which stayed in the area.

Marsh Harrier,	18
Pallid Harrier,	1 juvenile
Montagu's Harrier,	4 juvenile
Osprey,	1 juvenile
Kestrel,	3

Weather:

Max Temperature	91 °F / 33 °C
Min Temperature	71 °F / 22 °C
Wind Direction (average)	South South East
Wind Speed	1 mph / 2 km/h
Max Wind Speed	9 mph / 15 km/h
Visibility	7.0 miles / 10.0 kilometres
Cloud cover	Partly cloudy

Saturday, 11 September 04

The following observations are from the area of scrub to the west of Phasouri Reed Beds between the reeds and coastline. All raptors that were seen were all hunting low over the scrub at 1730hrs.

Marsh Harrier,	3, (1 adult female + 2 juvenile)
Pallid Harrier,	1 juvenile
Montagu's Harrier,	8, (2 adult female + 6 juvenile)

Weather:

Max Temperature	83 °F / 28 °C
Min Temperature	69 °F / 21 °C
Wind Direction (average)	East North East
Wind Speed	1 mph / 4 km/h
Max Wind Speed	14 mph / 22 km/h

Visibility	7.5 miles / 10.7 kilometres
Cloud cover	Scattered clouds

Sunday, 12 September 04

Honey Buzzard
2 Observed at the Akrotiri Gravel Pits at 1510hrs, flying at a height of about 50m, heading northeast towards Eucalyptus trees.

Weather:

Max Temperature	82 °F / 28 °C
Min Temperature	69 °F / 21 °C
Wind Direction (average)	West South West
Wind Speed	2 mph / 7 km/h
Max Wind Speed	14 mph / 22 km/h
Visibility	7.0 miles / 10.0 kilometres
Cloud cover	Partly cloudy

Monday, 13 September 04

Marsh Harrier
3 Juveniles observed at Cape Gata at 1720hrs, gliding low over the cliffs heading south east.

Weather:

Max Temperature	84 °F / 29 °C
Min Temperature	62 °F / 17 °C
Wind Direction (average)	West South West
Wind Speed	2 mph / 6 km/h
Max Wind Speed	16 mph / 26 km/h
Visibility	7.0 miles / 10.0 kilometres
Cloud cover	Clear

Sunday, 19 September 04

Honey Buzzard
34 Observed at the Akrotiri Gravel Pits at 1038hrs, thermaling at a height of about 100m, coming from the direction of the western edge of the Eucalyptus trees, then heading south along a ridge line.

Osprey
1 Adult observed at the Akrotiri Gravel Pits at 1056hrs, gliding at a height of about 60m, coming from the direction of the western edge of the Eucalyptus trees, then heading south along a ridge line.

Weather:

Max Temperature	86 °F / 30 °C
Min Temperature	68 °F / 20 °C
Wind Direction (average)	East North East
Wind Speed	2 mph / 4 km/h
Max Wind Speed	13 mph / 20 km/h
Cloud cover	Clear

Saturday, 16 October 04

The following observations are from Cape Gata between 1241hrs to 1315hrs. All raptors were gliding south low over the cliffs, apart from the Osprey that headed west along the coast just above the cliffs.

Honey Buzzard,	1 juvenile light phase
Montagu's Harrier,	1 juvenile
Osprey,	1 adult
Hobby,	1 adult

Honey Buzzard
2 Adults observed at Phasouri Reed Beds at 1518hrs, gliding south at a height of about 150m.

Weather:

Max Temperature	84 °F / 29 °C
Min Temperature	66 °F / 19 °C
Wind Direction (average)	South South West
Wind Speed	2 mph / 4 km/h
Max Wind Speed	8 mph / 13 km/h
Visibility	7.0 miles / 10.0 kilometres
Cloud cover	Scattered clouds

Sunday, 17 October 04

Hobby
2 Juvenile observed at the Akrotiri Reed Beds at 1622hrs, hunting low over the scrub, stayed in the area.

Weather:

Max Temperature	87 °F / 31 °C
Min Temperature	64 °F / 18 °C
Wind Direction (average)	South West
Wind Speed	1 mph / 2 km/h
Max Wind Speed	8 mph / 13 km/h
Visibility	6.1 miles / 9.4 kilometres
Cloud cover	Haze

Wednesday, 27 October 04

Hobby
1 Juvenile observed at the Phasouri Reed Beds at 0928hrs, hunting low over the marsh, stayed in the area.

Red-footed Falcon
2, (1 adult male and 1 juvenile) observed at the Akrotiri Salt Lake at 1050hrs, hunting low over the scrub heading south towards Bishops Pool.

Weather:

Max Temperature	86 °F / 30 °C
Min Temperature	68 °F / 20 °C
Wind Direction (average)	
Wind Speed	2 mph / 4 km/h
Max Wind Speed	8 mph / 13 km/h
Visibility	5.5 miles / 8.6 kilometres
Events	Rain, Thunderstorm
Cloud cover	Scattered clouds

Thursday, 11 November 04

Peregrine
2 Adults observed at Cape Gata at 1420hrs, hunting over the cliffs and out to sea. These are resident breeding birds.

Weather:

Max Temperature	77 °F / 25 °C
Min Temperature	59 °F / 15 °C
Wind Direction (average)	East
Wind Speed	3 mph / 8 km/h
Max Wind Speed	14 mph / 22 km/h
Visibility	6.7 miles / 9.7 kilometres
Events	Rain, Thunderstorm
Cloud cover	Scattered clouds

Sunday, 14 November 04

Hen Harrier
1 Adult male observed at the Akrotiri Salt Lake at 1112hrs, hunting low over the scrub heading south east.

Hen Harrier
1 Adult female observed at Phasouri Reed Beds at 1510 hrs, hunting low over the scrub, heading south east.

Weather:

Max Temperature	77 °F / 25 °C
Min Temperature	57 °F / 14 °C
Wind Direction (average)	East
Wind Speed	5 mph / 9 km/h
Max Wind Speed	16 mph / 26 km/h
Cloud cover	Clear

Exercise 'GRAY HAWK'

The AOS TEXAS Expedition in April 2004

Keith Powrie and Tim Hallchurch

The 2004 spring expedition was to Texas, USA from 17th April to 1st May. The members flew to Houston on 17th April with two non-member, experienced birders. Brigadier Rodney Walker joined us at Houston, flying via South America (The scenic route).

The following took part:
Brigadier Rodney Walker
Col Tom & Mrs Judy Walcot
Lt Col Derek Sherrard-Smith
Lt Col Gwen Staines
Lt Col Tim Hallchurch
Mr Keith and Mrs Ann Powrie
Martin Gostling
Brian Clews

We were joined at Winnie by David Sarkozi, a well known Texan birder and now Chairman of the Texas Ornithological Society.

17th April - Houston & Winnie

As soon as we all had arrived at Houston and picked up two seven seater Recreation Vehicles (RVs), we set off for the two hour drive to Winnie about 3pm local time for four nights accommodation at the Best Western Gulf Coast Inn. Here we met up with David Sarkosi.
We identified a few species on route including **House Sparrow** *Passer domesticus* in the airport building; **Red-winged Blackbird** *Agelaius phoeniceus;* **White Ibis** *Eudocimus albus*; **American Rock Pigeon** *Columba livia;* **Mourning Dove** *Zenaida macroura*; **Loggerhead Shrike** *Lanius ludovicianus;* **American Crow** *Corvus brachyrhynchos;* **Northern Mockingbird** *Mimus polyglottos* and **European Starling** *Sturnus vulgaris.*
We met up with David Sarkozi at the hotel where we immediately identified a few more species and later on, a short evening walk revealed: **Golden-Plover** *Pluvialis dominica;* **Northern Rough-winged Swallow** *Stelgidopteryx serripennis;* **Scarlet Tanager** *Piranga olivacea;* **Barn Owl** *Tyto alba;* **Eastern Screech-Owl** *Megascops asio* and **Chimney Swift** *Chaetura pelagica.*

18 April - Anahuac

7o'clock saw us heading towards the coast and the Anahuac National Wildlife Refuge. This coastal, marshy wetland is home to many species of rails. Among them, **Black Rail** *Laterallus jamaicensis* and **Yellow Rail** *Coturnicops noveboracensis* are very secretive and can be seen only if flushed from their hiding place in the long grass.
A brief glimpse was also all that we had of a **Virginia Rail** *Rallus limicola,* but a family of **King Rails** *Rallus elegans,* were more cooperative, as 2 adults escorted their brood of 9 young across the road behind our vehicles, at the same time as we were watching a **Purple Gallinule** *Porphyrula martinica,* in the roadside vegetation.
Other species favouring this habitat included: **Fulvous Whistling-duck** *Dendrocygna bicolor;* **Mottled Duck** *Anas fulvigula;* **American Bittern** *Botaurus lentiginosus;* a very obliging **Least Bittern** *Ixobrychus exilis;* 9 species of heron including both Night-herons, 3 species of Ibis: **White Ibis** *Eudocimus albus;* **White-faced Ibis** *Plegadis chichi* and **Glossy Ibis** *Plegadis falcinellus* and a group **Stilt Sandpipers** *Calidris himantopus,* feeding in one of the nearby rice fields.
Among the Passerines in the area were **Eastern Meadowlark** *Sturnella magna;* **Sedge Wren** *Cistothorus platensis,* in good voice and **Great-tailed** *Quiscalus mexicanus* and **Boat-tailed Grackles** *Quiscalus major.*
Reptiles present included: Alligator; Red-eared and Mississippi Mud Turtles and Bullfrog.
An afternoon visit to Boy Scout Woods, High Island added less new birds than expected from a normally very productive mixed habitat: **Summer Tanager** *Piranga rubra* and **Rose-breasted Grosbeak** *Pheucticus ludovicianus* were two species of note.
The party then moved on to Rollover Pass where we discovered birds more familiar to us in the form of **Red-breasted Merganser** *Mergus serrator;* **Sanderling** *Calidris alba* and **Ruddy Turnstone** *Arenaria interpres.* Among the species new to most of us were both **Brown Pelican** *Pelecanus occidentalis* and **American White Pelicans** *Pelecanus erythrorhynchos;* **American Oystercatcher** *Haematopus palliatus;* **American Avocet** *Recurvirostra americana;* **Willet** *Catoptrophorus semipalmatus*; **Semi-palmated Plover** *Charadrius semipalmatus* and **Black Skimmer** *Rhyncops niger.* Close views were to be had of **Ring-billed** *Larus delawarensis* and **Laughing Gulls** *Larus atricilla.*

19 April - Tyrrell

The day started with a very relaxing walk around the Lake Charlotte with its excellent board walk over the lake. The area produced a fine adult **Bald Eagle** *Haliaeetus leucocephalus* flying over the lake. We were also shown an area of the shore where the indigenous population before the coming of the Europeans had left a huge pile of shells of crustacions taken from the lake over the centuries.
We then drove to Tyrrell Park and on the way we had an opportunity to observe at close range, a pair of **Black Vultures** *Coragyps atratus* resting in a tree. Also at this halt were a pair of **Eastern Bluebirds** *Sialia sialis* perched on the overhead wires.
At Tyrrell Park, that is maily a sporting recreation area, we were treated to a breathtaking display from several birds of prey. **Red-shouldered Hawks** *Buteo lineatus* flew fast and low all around us, hawking and displaying. Next up was a pair of **Mississippi Kites** *Ictinia mississippiensis* who flew leisurely across the clear blue sky. But the stars of the day were a pair of **Swallow-tailed Kites** *Elanoides forficatus* who performed their aerial ballet right over our heads.
Our interest was also drawn to a group of **Cattle Egrets** *Bubulcus ibis,* following the motorised grass mower, foraging for casualties. Also the enormous holes made in wooden poles by **Red-headed Woodpeckers** *Sphyrapicus ruber,* despite the wire-mesh cladding.
The next stop, the fish ponds at Liberty Park housed hundreds of **Blue-winged Teal** *Anas discors.* At one end of the lake was an enormous raft of Water Hyacinth on which were feeding numerous **White-faced Ibis** *Plegadis chichi,* and **Purple Gallinule** *Porphyrula martinica* as well as many other water birds.
As we were about to depart, a pair of **Fish Crows** *Corvus ossifragus* announced their presence in the car park.

20 April - Anahuac & Sabine Woods

As we headed back to the Anahuac area again we discovered thousands of hirundines, mainly **Tree Swallows** *Tachycineta bicolor,* hawking for insects above the roadside hedgerows. The activity lasted for miles but on one side of the road only. Also en route we observed a **White-tailed Kite** *Elanus leucurus* demonstrating its hunting skills.
In the rice fields on the outskirts of the Anahuac NWR there was an abundance of waders, (or 'Peeps' as they are called in the USA.) They included: **Black-necked Stilt** *Himantopus mexicanus;* **Long-billed Dowitcher** *Limnodromus scolopaceus;* **Greater Yellowlegs***Tringa melanoleuca* and among these larger waders

a rare **Hudsonian Godwit** *Limosa haemastica*. Smaller waders included **Semi-palmated Plover** *Charadrius semipalmatus;* **Least Sandpiper** *Calidris minutilla;* **Western Sandpiper** *Calidris mauri* and **Pectoral Sandpiper** *Calidris melanotos*.

The afternoon included a visit to the Texas Ornithological reserve of Sabine Woods. A gentle stroll around the various habitats produced: **Summer Tanager** *Piranga rubra,* **Scarlet Tanager***Piranga olivacea*; **Great Crested Flycatcher** *Myiarchus crinitus;* **Yellow-billed Cuckoo** *Coccyzus americanus* and **Indigo Bunting** *Passerina cyanea*. A watering hole, complete with wash basin attracted: **Northern Waterthrush** *Seiurus novaboracensis;* **Common Yellowthroat** *Geothlypis trychas;* the secretive **Hooded Warbler** *Wilsonia citrina* and the even less often seen **Worm-eating Warbler** *Helmitheros vermivora.*

Mammals seen here included a very confiding Rice Rat.

21 April - Bolivar Flats & Coastal Trail

We left the Best Western at Winnie with overflowing lavatories as the sewage pumping station packed up and after a do it yourself continental breakfast in the crowded small breakfast room. Before moving on to Corpus Christi the group took a drive along the Bolivar Flats and Coastal Trail. Here we saw a number of Tern species including: a single **Caspian Tern** *Sterna caspia;* many **Royal Tern** *Sterna maxima*; **Sandwich Tern** *Sterna sandvicensis*; **Forster's Tern** *Sterna forsteri* and several obligingly close **Least Terns** *Sterna antillarum.*

Good views were also to be had of **Wilson's Plover** *Charadrius wilsonia*, **Snowy Plover** *Charadrius alexandrinus* and the rare **Piping Plover** *Charadrius melodus.* A small group of **Horned Larks** *Eremophila alpestris* were spotted feeding in the flotsam on the tide-line.

We then investigated the mudflats, scanning the tops of the tall reeds. We discovered several **Seaside Sparrows** *Ammodramus maritimus* and a few **Nelson's Sharp-tailed Sparrows** *Ammodramus nelsoni,* rising to the reed heads to sing.

A roadside pool held a group of **Short-billed Dowitchers** *Limnodromus griseus* and the Intra-Coastal Waterway produced **Osprey** *Pandion haliaetus* and **Black Tern** *Childonius niger* following the huge barges that ply the waters along the Texas coast. Walking casually along the opposite shore a Coyote, which David Sarkosi pointed out as being a Wolf/Coyote hybrid because the beast in question had a whitish muzzle.

Upon our arrival at Corpus Christi we were kept amused by an unusual sighting of piracy on one of the bays. A young **Brown Pelican** *Pelecanus occidentalis* was fishing in the lake and every time he put his head under the water, out of the sky came an adult **Laughing Gull** *Larus atricilla* who then perched on the back of the pelican's head, poised ready to pick off any fish that escaped from his pouch as he re-surfaced. Our Motel at Corpus was at the north end of Padre Island accessable via a long high bridge from the mainland. The Motel had good view over the mud flats and interesting walking amongst the up-market houses on the island. We probably found our best restaurant that was built on stilts over the inland waterway and we were able to watch the seabirds as it got dark while waiting for the meal to be served. Texas food is not the best in the world but thay do have excellent sea food especially crayfish that is farmed along the coast.

22 April - Oso Bay & Choke Canyon

In the morning we visited Oso Bay, a haven for many species of waterbird. Both **Brown Pelican** *Pelecanus occidentalis* and **American White Pelican** *Pelecanus erythrorhynchos* were present along with nearly all of the American heron family. They included: **Great Blue Heron** *Ardea herodias*; **Little Blue Heron** *Egretta caerulea;* **Great White Egret** *Ardea alba;* **Tricolored Heron** *Egretta tricolor* and this time, as we were further south, **Reddish Egret** *Egretta rufescens*.

Also present were: **Roseate Spoonbill** *Ajaia ajaja*; **Whimbrel** *Numenius phaeopus* and **Long-billed Dowitcher** *Limnodromus scolopaceous.*

Roadside birds spotted on our way to Choke Canyon included **Purple Martin** *Progne subis* and **Northern Caracara** *Caracara cheriway*, on their favourite perches, telegraph poles. Choke Canyon is about 40 miles inland from Corpus and much higher in the hills and hence different habitat.

At Choke Canyon we were greeted with a view of a **Wild Turkey** *Meleagris gallopavo*. Our attention was then diverted to flycatchers. A striking male **Vermilion Flycatcher** *Pyrocephalus rubinus* not only dazzled us with his brilliant colours but added to the 'Wow and gosh' factor with an energetic display flight! The quiet, sedentary song of a nearby **Ash-throated Flycatcher** *Myiarchus cinerascens* seemed very subdued by comparison. However, not to be outdone, the spectacular **Scissor-tailed Flycatcher** *Tyrranus forficatus* treated us to a display of his aerial flycatching skills. **Lark Sparrows** *Chondestes grammacus* fed on the ground by the roadside, whilst in the trees a **Yellow-headed Blackbird** *Xanthocephalus xanthocephalus* was found beside the more common **Red-winged Blackbird** *Agelaius phoeniceus* along with an unexpected **Northern Bobwhite Quail** *Colinus virginianus* that sat serenely in a tree so that we could take photographs.

23 April - Blucher Park & Mustang Island

An early morning walk around Blucher Park revealed: **Black-chinned Humming bird** *Archilochus alexandri*; **Ruby-throated Humming bird** *Archilochus colubris;* **Golden-fronted Woodpecker** *Melanerpes aurifrons;* **Bewick's Wren** *Thryomanes bewickii*; **Orchard Oriole** *Icterus spurius* and the daytime roost of a **Common Nighthawk** *Chordeiles minor.*

On the way to Mustang Island we encountered a group of **Wild Turkey** *Meleagris gallopavo;* **Cliff Swallow** *Petrochelidon pyhrronata* and another daytime roost, this time of a **Whip-poor-will** *Caprimulgus vociferus.*

A drive around Mustang Island and along its shoreline allowed close views of: **Reddish Egret** *Egretta rufescens*, **American Oystercatcher** *Haematopus palliatus* and over 40 of the supposedly rare **Piping Plover** *Charadrius melodus.*

Our next stop was Paradise Pond. Here we discovered: **Blue-winged Teal** *Anas discors;* **Common Yellowthroat** *Geothlypis trichus;* several restless **Blackpoll Warbler** *Dendroica striata* in the trees and a very confiding **Sora Rail** *Porzana carolina* feeding less than 10 feet away! Again the site had excellent board walk for birders.

From another excellent boardwalk and elevated observation platforms alongside a lagoon on the oustskirts of the Aransas National Wildlife Refuge we had good views of: more **Roseate Spoonbill** *Ajaia ajaja*; **Tricolored Heron** *Egretta tricolor*; **Black Skimmer** *Rynchops niger* actually skimming; **Forster's Tern** *Sterna forsteri* hovering and even flying backwards, searching for fish and two male **Pied-billed Grebes** *Podylimbus podiceps,* locked in a belligerent fracas over some female, while an **American Coot** *Fulica americana* egged them on!

24 April - Rio Grande Valley

The majority of the day was spent travelling to Brownsville in the Rio Grande Valley.

The Brownsville Rubbish Dump was attended by thousands of gulls, swarming over the area like flies.

The majority were **Laughing Gulls** *Larus atricilla* but resting in the fields adjacent to the dump were several hundred **Franklin's Gull** *Larus pipixcan*. On a brief visit to the now abandoned zoo, **Vesper Sparrows** *Pooecetes gramineus* were found perching on the wire fencing. Driving around the area we encountered several more species, including: **Canvasback** *Aythya valisineria*; **Golden Plover** *Pluvialis dominica,* for those who had missed it previously; **Roadrunner** *Geococcyx californianus*; a **Bewick's Wren** *Thryomanes bewickii* displaying to his mate; **Chihuahuan Raven** *Corvus cryptoleucus* and the re-introduced, after its extirpation early last century, **Aplomado Falcon** *Falco femoralis.*

25 April - Sabal Palms & South Padre

The morning was spent investigating the Sabal Palms Grove Sanctuary, where we added many new species to our trip list. The bird made most obvious by its strident, repetitive call was the **Plain Chachalaca** *Ortalis vetula*, which could be heard all over the reserve. Being the size of a small turkey did not prevent these birds from making use of the hanging bird feeders! Other species seen on our walk around the area included: the elusive **Least Grebe** *Tachybaptus dominicus*; the brilliantly coloured **Altimira Oriole** *Icterus gularis;* the vocal **Great Kiskadee** *Pitangus sulphuratus;* **Black-bellied Whistling-Duck** *Dendrocygna autumnalis*; **Mottled Duck** *Anas fulvigula;* **Neotropic Cormorant** *Phalacrocorax brasilianus;* **Green Heron** *Butorides virescens*; **White-tipped Dove** *Leptotila verrauxi*; **Inca Dove** *Columbina inca*; **Long-billed Thrasher** *Toxostoma longirostre*; **Olive Sparrow** *Arremonops rufivirgatus*; **Black-crested Titmouse** *Baeolopus atricristatus*; **Ladder-backed Woodpecker** *Picoides scalaris* and **Golden-fronted Woodpecker** *Melanerpes aurifrons* and the ostentatious **Green Jay** *Cyanocorax yncas*.

A waterside walk added the following to our list: **Groove-billed Ani** *Crotophaga sulcirostris*; **Lesser Yellowlegs** *Tringa flavipes*; **Brown-crested Flycatcher** *Myiarchus tyrannulus* and **Buff-bellied Hummingbird** *Amazilia yucatanensis*.

A decision had to be made at a 'T' junction as to whether we turned left to our next destination, where we might pick up some more rails and crakes, or right, in the hopes that a 'fall' of migrants had made their way across the Gulf of Mexico that morning. We left it in the hands of our host David Sarkozi. He felt that the weather had been ideal for a migration and so we turned right and headed, fingers crossed, for downtown South Padre Island. We arrived in the middle of town, at a building complex in the car park of which there were about a hundred or more **Franklin's Gulls** *Larus pipixcan*.

In front of the building was a relatively small ornamental garden surrounded by dozens of birdwatchers. When we raised our binoculars, we could not believe our eyes. Hundreds of birds were flying in, straight off the Gulf and resting in the few small shrubs and bushes. Well done, David!

The majority of them were **Baltimore Orioles** *Icterus galbula*, with half a dozen or more in almost every tree. A few **Orchard Orioles** *Icterus spurious* were present too. Warblers were numerous and varied with: Black and **White Warbler** *Mniotilta varia*; **Chestnut-sided Warbler** *Dendroica pensylvanica*; **Tennessee Warbler** *Vermivora peregrina*; **Magnolia Warbler** *Dendroica magnolia*; **Golden-winged Warbler** *Vermivora chrysoptera*; **Yellow Warbler** *Dendroica petechia*; **Cerulean Warbler** *Dendroica cerulea* and **American Redstart** *Setophaga ruticilla*.

Other species included: **Western Kingbird** *Tyrranus verticalis*; **Swainson's Thrush** *Catharus ustulatus*; buntings in the form of **Dickcissel** *Spiza americana*; the attractive **Indigo Bunting** *Passerina cyanea* and the gaudy **Painted Bunting** *Passerina ciris*.

A nearby shaded pool yielded more warblers with: **Blackpoll Warbler** *Dendroica striata*; **Blackburnian Warbler** *Dendroica fusca*; **Hooded Warbler** *Wisonis citrina*; **Kentucky Warbler** *Oporornis formosus* and **Philadelphia Vireo** *Vireo philadelphicus*.

Word then reached us of even more warblers to be found in a nearby back garden. We arrived to find dozens of birders witnessing the 9th recorded appearance in Texas of the secretive and very seldom seen **Connecticut Warbler** *Orporornis agilis*. When this bird was out of sight we could take time to observe another uncommon bird, a **Cape May Warbler** *Dendroica tigrina*.

26 April - Santa Ana & Anzalduas

In contrast, the Santa Ana National Wildlife Refuge had very little in the way of bird life.

There were a few more **Groove-billed Ani** *Crotophaga sulcirostris* and a **Ladder-backed Woodpecker** *Picoides scalaris*, although the **Lesser Goldfinch** *Carduelis psaltria* and a **Common Paraque** *Nyctidromus albicollis* at its daytime roost were new.

At the Anzalduas Country Park we finally encountered the expedition namesake with a **Gray Hawk** *Asturina nitida* on the nest. We also discovered the elusive **Tropical Parula** *Parula pitiayumi*.

Other birds around the area were: **White-tailed Kite** *Elanus leucurus*; **Mississippi Kite** *Ictinia mississippiensis*; **Eastern Meadowlark** *Sturnella magna;* **Eastern Wood Pewee** *Contopus virens* and **Ringed Kingfisher** *Ceryle torquata*.

27 April - Bentsen

Exploring the Bentsen State Park uncovered: **Long-billed Thrasher** *Toxostoma longirostre*; **Clay-coloured Robin** *Turdus grayi*; **White-winged Dove** *Zenaida asiatica* and a **Hook-billed Kite** *Chondrohierax uncinatus* soaring overhead on the thermals. The Park is on the Rio Grande river and at one point, as the river meanders one can look north into Mexico from the US side.

From the banks of the Rio Grande at the Franton River Crossing we observed: **Spotted Sandpiper** *Actitis macularia*; **Green Kingfisher** *Chloroceryle Americana* and some very distant **Cinnamon Teal** *Anas cyanoptera*. We also saw Mexicans crossing the river by small boat without hindrance from the authorities.

28th April - Zapata

A tour of the Zapata area enabled us to find a few more species, with: **Bullock's Oriole** *Icterus bullockii*; **Pyrrhuloxia** *Cardinalis sinuatus*; **American Kestrel** *Falco sparverius* and an extremely bold **Scaled Quail** *Callipepla squamata* who perched on his fence post 5 m. away and gave out his rasping song. **Clay-colored Sparrow** *Spizella pallida* was added to our list at Falcon Dam.

At a local smallholding, the owners had many feeding stations dispersed throughout the farmland. Attracted to these were: **Altimira Oriole** *Icterus gularis*; **Brown Jay** *Cyanocorax morio*; **Common Ground Doves** *Columbina passerina*; **Brown-headed Cowbird** *Molothrus ater* and a **Golden-fronted Woodpecker** *Melanerpes aurifrons* that took only the largest Pecan nuts to hide away and store.

In the trees nearby, the daytime roost of an **Eastern Screech Owl** *Megascops asio* was discovered.

Back at our hotel in Zapata, we sallied forth on an evening walk in search of **Lesser Nighthawk** *Chordeiles acutipennis*. Our efforts proved fruitless and so we returned, only to find half a dozen of them hawking insects attracted to the security lights around the hotel!

Zapata is what one could call a one-horse town. There were two restaurants open but neither served alcohol, but they were happy for us to buy beer from a local shop and take it into the restaurant. The hotel was plagued by power cuts and rooms full of mosquitoes when the doors or windows had been left open before we arrived. Breakfast was a help yourself toast and jam in a freezing room with the air conditioning full on despite it being cool outside.

29 April - Lost Maples

The day was taken up with the drive to and a leisurely amble around the stunningly beautiful scenery that is Lost Maples State Natural Area in the hills of mid Texas. The feeders at the field centre enabled us to observe Hummingbirds at close range, along with: **Carolina Chickadee** *Poecile carolinensis*; **House Finch** *Carpodacus mexicanus* and **Northern Cardinal** *Cardinalis cardinalis*.

Whilst eating our picnic lunch we were able to watch **Chipping Sparrows** *Spizella passerina* in the nearby trees, **Common Ravens** *Corvus corax* calling as they circled overhead and a **Western Scrub-Jay** *Aphelocom californica* carrying in his beak so many discarded crusts from our sandwiches that he could not possibly have seen where he was flying!

It was not long into our walk before we discovered the area's speciality, **Golden-cheeked Warbler** *Dendroica chrysoparia* with a pair avidly hunting for food for their young. Another speciality of the area was **Rufous-crowned Sparrow** *Aimophila ruficeps*, very similar to the previously seen Chipping Sparrow - distinguished by the malar stripe and wider head marking of the Rufous-crowned.

Upon reaching the lake we discovered: **Lincoln's Sparrow** *Melospiza*

lincolnii; **Eastern Phoebe** *Sayornis phoebe*; **Black Phoebe** *Sayornis nigricans* and **Blue Grosbeak** *Guiraca caerulea*.

30 April - Alamo Mission

The return trip to Houston was broken twice, once when we played 'Tourists' with a visit to the Alamo Mission and museum at San Antonio and again with a wander round the Susan Schertz Ranch. The garden (probably near 100 acres) is mainly devoted to birds. Susan obligingly supplied us with a map showing all the important spots for particular birds. There were many **White-eyed Vireos** *Vireo griseus* singing in the bushes. New birds for the trip list were now becoming hard to find but we managed to add: White-crowned Sparrow, *Zonotrichia leucophrys*; **American Goldfinch** *Carduelis tristis* and a brilliant bit of detective work by Brian, put us on to a young **Great Horned Owl** *Bubo virginianus*, roosting-up, deep in the woods.

1 May - Return to UK

Prior to making our way to the airport for our return flight home, we decided to try for **Red-cockaded Woodpecker** *Picoides borealis* at the W.G. Jones State Park. However, halfway to our destination, the skies blackened and 4 inches of rain fell in 2 hours and play was abandoned for the day.

After what seemed an interminable wait in the hotel lobby we finally set off for Houston Airport and dear old 'Blighty' once again.

The trip was excellent for birding with 302 species seen, and the largest list achieved on any AOS trip. The accommodation in Best Western Hotels was adequate despite sewage leaks and power cuts. Eating out was not exciting but the sea food was good where we could get it. The mosquitoes that we had been warned about were not as bad as expected and although some got bitten many of us escaped their attention.

Exercise Grey Hawk AOS Expedition to Texas 17th April to 1 May 2004

The following is the official list of bird species accepted for Texas by the Texas Bird Records Committee (TBRC) of the Texas Ornithological Society (Reproduced with permission).

	ORDER ANSERIFORMES: SWANS, GEESE, AND DUCKS															
1	Black-bellied Whistling-Duck	*Dendrocygna autumnalis*		2	2	16	10	2	10	4	20	40	2	2	2	3
2	Fulvous Whistling-Duck	*Dendrocygna bicolor*		20	20	1	4			2						
3	Wood Duck	*Aix sponsa*			6											
4	Gadwall	*Anas strepera*		2				2	4	50			4			
5	Mallard	*Anas platyrhynchos*				2							1	3		
6	Mottled Duck	*Anas fulvigula*		10			2	2	20	20	2		1			
7	Blue-winged Teal	*Anas discors*		50	400	4	30	4	20	50	20	30	12	10		1
8	Cinnamon Teal	*Anas cyanoptera*											2			
9	Northern Shoveler	*Anas clypeata*		10				2	12	20	1					
10	Green-winged Teal	*Anas crecca*		4	1											
11	Canvasback	*Aythya valisineria*								1						
12	Redhead	*Aythya americana*						1								
13	Ring-necked Duck	*Aythya collaris*						1								
14	Lesser Scaup	*Aythya affinis*								1						
15	White-winged Scoter	*Melanitta fusca*				30										
16	Red-breasted Merganser	*Mergus serrator*		4			1									
17	Ruddy Duck	*Oxyura jamaicensis*							1	4						
	ORDER GALLIFORMES: GUANS															
18	Plain Chachalaca	*Ortalis vetula*									20	6	20			
	ORDER GALLIFORMES: PARTRIDGES, GROUSE, AND TURKEYS															
19	Wild Turkey	*Meleagris gallopavo*						12			1				2	
	ORDER GALLIFORMES: QUAIL															
20	Scaled Quail	*Callipepla squamata*											1	3	1	
21	Northern Bobwhite	*Colinus virginianus*						1		2	6		h		2	
	ORDER PODICIPEDIFORMES: GREBES															
22	Least Grebe	*Tachybaptus dominicus*									3					
23	Pied-billed Grebe	*Podilymbus podiceps*			3	3	2	1	5	24	6	3		5		
	ORDER PELECANIFORMES: PELICANS															
24	American White Pelican	*Pelecanus erythrorhynchos*		15			30	150	50	50	40	40				
25	Brown Pelican	*Pelecanus occidentalis*		100		40	150	10	300	60	40					
	ORDER PELECANIFORMES: CORMORANTS															
26	Neotropic Cormorant	*Phalacrocorax brasilianus*		12		1	12	50	12	20	10	2	8	150	2	
27	Double-crested Cormorant	*Phalacrocorax auritus*			1	2	1		12							
	ORDER PELECANIFORMES: DARTERS															
28	Anhinga	*Anhinga anhinga*		1	3						1		1			
	ORDER CICONIIFORMES: BITTERNS AND HERONS															
29	American Bittern	*Botaurus lentiginosus*		3		1										
30	Least Bittern	*Ixobrychus exilis*		4												
31	Great Blue Heron	*Ardea herodias*		7	12	10	30	30	30	6	4	1	4			
32	Great Egret	*Ardea alba*		40	24	10	80	10	12	10	10	6	2	360	2	
33	Snowy Egret	*Egretta thula*		4	2	3	20	200	80	20	40	5	50		3	1
34	Little Blue Heron	*Egretta caerulea*		12	3	5	3	1			4	1				25
35	Tricolored Heron	*Egretta tricolor*		15	1	6	20	3	6		3	1				
36	Reddish Egret	*Egretta rufescens*					1	1	2	2	1					
37	Cattle Egret	*Bubulcus ibis*		p	25	30	p	10	6	30	20	20	60	20		30
38	Green Heron	*Butorides virescens*		3	2	2	4	3	5	2	2	1	2	2		2
39	Black-crowned Night-Heron	*Nycticorax nycticorax*		1		1		1	2				1	1		
40	Yellow-crowned Night-Heron	*Nyctanassa violacea*		4	4				1			1	1			1
	ORDER CICONIIFORMES: IBISES AND SPOONBILLS															
41	White Ibis	*Eudocimus albus*	1	15	12	100	60	200	1	10	5			2		6
42	Glossy Ibis	*Plegadis falcinellus*		3	1							1				1
43	White-faced Ibis	*Plegadis chihi*		2	300	50	70		1					10		
44	Roseate Spoonbill	*Platalea ajaja*		6	2	3	50	80	60	10	4					
	ORDER CICONIIFORMES: AMERICAN VULTURES															
45	Black Vulture	*Coragyps atratus*			50	3	50	4		2	1	10	20	30	20	40
46	Turkey Vulture	*Cathartes aura*		12	10	50	80	200	6	100	3	50	100	50	100	30
	ORDER FALCONIFORMES: KITES, HAWKS, EAGLES, AND ALLIES															
47	Osprey	*Pandion haliaetus*			1		2	6		2	1	1	1			
48	Hook-billed Kite	*Chondrohierax uncinatus*			1						1	2		1		
49	Swallow-tailed Kite	*Elanoides forficatus*			5											
50	White-tailed Kite	*Elanus leucurus*					2			3	1	3	1		1	
51	Mississippi Kite	*Ictinia mississippiensis*			4							12	42	2		
52	Bald Eagle	*Haliaeetus leucocephalus*			1											
53	Northern Harrier	*Circus cyaneus*		3		1			1							
54	Sharp-shinned Hawk	*Accipiter striatus*						1		1			1		1	
55	Cooper's Hawk	*Accipiter cooperii*											4		1	
56	Gray Hawk	*Asturina nitida*										2				
57	Harris's Hawk	*Parabuteo unicinctus*								5	3	1	5	10	30	2
58	Red-shouldered Hawk	*Buteo lineatus*			5		2	1								1
59	Broad-winged Hawk	*Buteo platypterus*			20							3	120			
60	Short-tailed Hawk	*Buteo brachyurus*											1			
61	Swainson's Hawk (photo - winter)	*Buteo swainsoni*					6	10	8	3	4	50	20	3	8	

62	White-tailed Hawk	*Buteo albicaudatus*					1			15				2			
63	Red-tailed Hawk	*Buteo jamaicensis*						1	2	1		2	1	20			
	ORDER FALCONIFORMES: CARACARAS AND FALCONS																
64	Crested Caracara	*Caracara cheriway*		1		2	3	2	1	10	1		3	6	8	4	
65	American Kestrel	*Falco sparverius*												4	1		
66	Merlin	*Falco columbarius*		1													
67	Aplomado Falcon	*Falco femoralis*								1							
68	Peregrine Falcon	*Falco peregrinus*		1				1	1								
	ORDER GRUIFORMES: RAILS, GALLINULES, AND COOTS																
69	Yellow Rail	*Coturnicops noveboracensis*		2													
70	Clapper Rail	*Rallus longirostris*		6		h	10				4						
71	King Rail	*Rallus elegans*		11													
72	Virginia Rail	*Rallus limicola*		1													
73	Sora	*Porzana carolina*		1	1	h	3		6	1							
74	Purple Gallinule	*Porphyrio martinica*		5	7					4	3						
75	Common Moorhen	*Gallinula chloropus*		12	15		2	10	20	6	12						
76	American Coot	*Fulica americana*		60	15	1	25	70	30	100				4			
	ORDER CHARADRIIFORMES: PLOVERS																
77	Black-bellied Plover	*Pluvialis squatarola*		6		12	300	12	100								
78	American Golden-Plover	*Pluvialis dominica*	50				1	1	10	3							
79	Snowy Plover	*Charadrius alexandrinus*					12										
80	Wilson's Plover	*Charadrius wilsonia*					25										
81	Semipalmated Plover	*Charadrius semipalmatus*		3		5	30	12	6	6			1				
82	Piping Plover	*Charadrius melodus*					30	2	45	1							
83	Killdeer	*Charadrius vociferus*		20	10	6	12	2	4	6	3	1	4	6	3		
	ORDER CHARADRIIFORMES: OYSTERCATCHERS																
85	American Oystercatcher	*Haematopus palliatus*		3					1								
	ORDER CHARADRIIFORMES: STILTS AND AVOCETS																
86	Black-necked Stilt	*Himantopus mexicanus*		40		60	25	30	30	40	20	20	6		2		
87	American Avocet	*Recurvirostra americana*		15		1	2	2	10								
	ORDER CHARADRIIFORMES: SANDPIPERS, PHALAROPES, AND ALLIES																
88	Greater Yellowlegs	*Tringa melanoleuca*		2		3	1	1		1	6	2					
89	Lesser Yellowlegs	*Tringa flavipes*		1	2	20	20	6	20	12	10	10					
90	Solitary Sandpiper	*Tringa solitaria*			1												
91	Willet	*Catoptrophorus semipalmatus*		50	1	20	100	15	250	200	20	1	1				
92	Spotted Sandpiper	*Actitis macularia*			1		1					2	8				
93	Upland Sandpiper	*Bartramia longicauda*					20				4			7			
94	Whimbrel	*Numenius phaeopus*		1			6	2	2	40							
95	Long-billed Curlew	*Numenius americanus*		2		2	4	1									
96	Hudsonian Godwit	*Limosa haemastica*				1											
97	Marbled Godwit	*Limosa fedoa*		6			1	1									
98	Ruddy Turnstone	*Arenaria interpres*		4		4	20	6	250								
99	Sanderling	*Calidris alba*		3		500	500	50			2						
100	Semipalmated Sandpiper	*Calidris pusilla*			3	100		12									
101	Western Sandpiper	*Calidris mauri*		75	50	20		2									
102	Least Sandpiper	*Calidris minutilla*			20	30	50	1			1			7			
103	Pectoral Sandpiper	*Calidris melanotos*			5	35	24	2		10							
104	Dunlin	*Calidris alpina*		50		1	400	300	50		1						
105	Stilt Sandpiper	*Calidris himantopus*		6				2									
106	Buff-breasted Sandpiper	*Tryngites subruficollis*								1							
107	Short-billed Dowitcher	*Limnodromus griseus*		2			300			1							
108	Long-billed Dowitcher	*Limnodromus scolopaceus*		20		30	6	50	100	2	1						
109	Wilson's Snipe	*Gallinago delicata*		1	1	2				1	1						
110	Wilson's Phalarope	*Phalaropus tricolor*		20		1				1		10					
	ORDER CHARADRIIFORMES: SKUAS, GULLS, TERNS, AND SKIMMERS																
111	Laughing Gull	*Larus atricilla*		p	1	6	p	p	p	p	p	2	10	1	1		
112	Franklin's Gull	*Larus pipixcan*								200	50						
113	Bonaparte's Gull	*Larus philadelphia*								1							
114	Ring-billed Gull	*Larus delawarensis*		2			12	10	12	20	1						
115	Herring Gull	*Larus argentatus*		1		4	12		22				2				
116	Gull-billed Tern	*Sterna nilotica*		1				1						1			
117	Caspian Tern	*Sterna caspia*		4			1	1	1					1			
118	Royal Tern	*Sterna maxima*		100		37	100	50	100					1			
119	Sandwich Tern	*Sterna sandvicensis*		12		9	20	10	5	10							
120	Common Tern	*Sterna hirundo*						1									
121	Forster's Tern	*Sterna forsteri*		20		12	100	p	100	6	2	2					
122	Least Tern	*Sterna antillarum*		12		3	50	10	20								
123	Black Tern	*Chlidonias niger*		2	1		50										
124	Black Skimmer	*Rynchops niger*		200			50	22	10	50							
	ORDER COLUMBIFORMES: PIGEONS AND DOVES																
125	Rock Pigeon (I)	*Columba livia*	12	12	12	34	24	6	10	50	20	60	12	10	50	60	2
126	Red-billed Pigeon	*Patagioenas flavirostris*												2			
127	Eurasian Collared-Dove (I)	*Streptopelia decaocto*		1			2	2	20	1		1	2	2	4	2	
128	White-winged Dove	*Zenaida asiatica*					3	4	6	2	6	1	20	30	100	40	
129	Mourning Dove	*Zenaida macroura*	p	p	20	p	p	p	p	p	p	p	p	10	100	20	
130	Inca Dove	*Columbina inca*		3	4			10	20	20	6	2	18	10	6	3	
131	Common Ground-Dove	*Columbina passerina*						1		1		1		15	20	2	
132	White-tipped Dove	*Leptotila verreauxi*									10	1	6	1			
	ORDER CUCULIFORMES: CUCKOOS, ROADRUNNERS, AND ANIS																
133	Black-billed Cuckoo	*Coccyzus erythrophthalmus*		17													
134	Yellow-billed Cuckoo	*Coccyzus americanus*			h	1					2	6	2	1	1		
135	Greater Roadrunner	*Geococcyx californianus*								1		1	5	2	1	1	
136	Groove-billed Ani	*Crotophaga sulcirostris*						h			2	3	2	1			
	ORDER STRIGIFORMES: BARN OWLS																
137	Barn Owl	*Tyto alba*	1														
	ORDER STRIGIFORMES: TYPICAL OWLS																
138	Eastern Screech-Owl	*Megascops asio*	2											1			
139	Great Horned Owl	*Bubo virginianus*														1	
	ORDER CAPRIMULGIFORMES: GOATSUCKERS																
140	Lesser Nighthawk	*Chordeiles acutipennis*												12	6		
141	Common Nighthawk	*Chordeiles minor*						5	3	10			1				
142	Common Pauraque	*Nyctidromus albicollis*										1			h		
143	Chuck-will's-widow	*Caprimulgus carolinensis*							2		1						
	ORDER APODIFORMES: SWIFTS																
144	Chimney Swift	*Chaetura pelagica*	1	5	2	1	2		50	50	p	3	6		6	6	
	ORDER APODIFORMES: HUMMINGBIRDS																
145	Buff-bellied Hummingbird	*Amazilia yucatanensis*									4						
146	Ruby-throated Hummingbird	*Archilochus colubris*		1	3	4			2								
147	Black-chinned Hummingbird	*Archilochus alexandri*						1	1		1				10	4	
	ORDER CORACIIFORMES: KINGFISHERS																
148	Ringed Kingfisher	*Ceryle torquata*									2	1	5	2			
149	Belted Kingfisher	*Ceryle alcyon*		2	2	1	1										
150	Green Kingfisher	*Chloroceryle americana*									2		1	1			
	ORDER PICIFORMES: WOODPECKERS AND ALLIES																
151	Red-headed Woodpecker	*Melanerpes erythrocephalus*				2											
152	Golden-fronted Woodpecker	*Melanerpes aurifrons*						6	4	1	10	20	10	20	15	2	
153	Red-bellied Woodpecker	*Melanerpes carolinus*				4					1						
154	Ladder-backed Woodpecker	*Picoides scalaris*						1			6	10	6	1	1		
155	Downy Woodpecker	*Picoides pubescens*		1	2	4											
156	Northern Flicker	*Colaptes auratus*									poss						
157	Pileated Woodpecker	*Dryocopus pileatus*			1		2	2									
	ORDER PASSERIFORMES:	**PASSERINES**															
	FAMILY TYRANNIDAE: TYRANT FLYCATCHERS																
158	Northern Beardless-Tyrannulet	*Camptostoma imberbe*											h				
159	Greater Pewee	*Contopus pertinax*				1											
160	Eastern Wood-Pewee	*Contopus virens*								1	6	2			6		
161	Acadian Flycatcher	*Empidonax virescens*									1						
162	Alder Flycatcher	*Empidonax alnorum*											poss				
163	Least Flycatcher	*Empidonax minimus*									1						
164	Black Phoebe	*Sayornis nigricans*										1			2		
165	Eastern Phoebe	*Sayornis phoebe*													20	1	
166	Vermilion Flycatcher	*Pyrocephalus rubinus*						12						1			
167	Ash-throated Flycatcher	*Myiarchus cinerascens*						4	1	1	1	2		2	2	2	
168	Great Crested Flycatcher	*Myiarchus crinitus*				2									2	2	
169	Brown-crested Flycatcher	*Myiarchus tyrannulus*		1							2	1	4				
170	Great Kiskadee	*Pitangus sulphuratus*						2			6	2	20	15	2		
171	Tropical Kingbird	*Tyrannus melancholicus*										1		1			
172	Couch's Kingbird	*Tyrannus couchii*						6	2		1	2	25	6	10		
173	Cassin's Kingbird	*Tyrannus vociferans*									1						
174	Western Kingbird	*Tyrannus verticalis*						6	1	1	4	1		1	7		
175	Eastern Kingbird	*Tyrannus tyrannus*		20		2				1	12	1					
176	Scissor-tailed Flycatcher	*Tyrannus forficatus*		1	3	2	6	20		30	12	1	30	25	25	10	1
	FAMILY LANIIDAE: SHRIKES																

177	Loggerhead Shrike	*Lanius ludovicianus*	5	20	12	10	20	6	1	12	1		1				
	FAMILY VIREONIDAE: VIREOS																
178	White-eyed Vireo	*Vireo griseus*			2	2		2					1		2	6	
179	Yellow-Throated Vireo	*Vireo flavifrons*													2		
180	Warbling Vireo	*Vireo gilvus*										2					
181	Philadelphia Vireo	*Vireo philadelphicus*										4					
182	Red-eyed Vireo	*Vireo olivaceus*		2		2									1		
	FAMILY CORVIDAE: JAYS, MAGPIES, AND CROWS																
183	Blue Jay	*Cyanocitta cristata*		2		2											
184	Green Jay	*Cyanocorax yncas*										6	2	6	1		
185	Brown Jay	*Cyanocorax morio*													3		
186	Western Scrub-Jay	*Aphelocoma californica*														2	
187	American Crow	*Corvus brachyrhynchos*	4		10	4	6									2	
188	Fish Crow	*Corvus ossifragus*			2												
189	Chihuahuan Raven	*Corvus cryptoleucus*								2			6	6	2		
190	Common Raven	*Corvus corax*													12		
	FAMILY ALAUDIDAE: LARKS																
191	Horned Lark	*Eremophila alpestris*					2			6	1	2	1		1		
	FAMILY HIRUNDINIDAE: SWALLOWS																
192	Purple Martin	*Progne subis*		100	50	6	25	30	50	12	5		2		20	3	
193	Tree Swallow	*Tachycineta bicolor*		30	20		20		10	1	50	2	50		100	10	
194	Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	2		20	100			1		2	12	1	2	6		
195	Bank Swallow	*Riparia riparia*				2						6	200	2			
196	Cliff Swallow	*Petrochelidon pyrrhonota*				5				1		1		1			
197	Cave Swallow	*Petrochelidon fulva*						200				2		50	100		
198	Barn Swallow	*Hirundo rustica*		p	p	20	p	p	p	p	50	60	p		30	50	
	FAMILY PARIDAE: TITMICE AND CHICKADEES																
199	Carolina Chickadee	*Poecile carolinensis*			2										2		
200	Tufted Titmouse	*Baeolophus bicolor*			1										1		
201	Black-crested Titmouse	*Baeolophus atricristatus*									4		8	6	1	1	
	FAMILY REMIZIDAE: VERDINS																
202	Verdin	*Auriparus flaviceps*												2			
	FAMILY TROGLODYTIDAE: WRENS												3	2	1		
203	Cactus Wren	*Campylorhynchus brunneicapillus*													4		
204	Canyon Wren	*Catherpes mexicanus*															
205	Carolina Wren	*Thryothorus ludovicianus*		1	1						1				4	1	
206	Bewick's Wren	*Thryomanes bewickii*					1			4					1	1	
207	Sedge Wren	*Cistothorus platensis*		3		A			b		b						
208	Marsh Wren	*Cistothorus palustris*		1													
	FAMILY REGULIDAE: KINGLETS																
209	Ruby-crowned Kinglet	*Regulus calendula*				1								1	3	2	
	FAMILY SYLVIIDAE: GNATCATCHERS																
210	Blue-gray Gnatcatcher	*Polioptila caerulea*									4				5		
	FAMILY TURDIDAE: SOLITAIRES, THRUSHES, AND ALLIES																
211	Eastern Bluebird	*Sialia sialis*			2										3		
212	Gray-cheeked Thrush	*Catharus minimus*									1						
213	Swainson's Thrush	*Catharus ustulatus*		1					1		2						
214	Wood Thrush	*Hylocichla mustelina*		1		2											
215	Clay-colored Robin	*Turdus grayi*										2	4				
	FAMILY MIMIDAE: MOCKINGBIRDS, THRASHERS, AND ALLIES																
216	Gray Catbird	*Dumetella carolinensis*		3	1	10			1		1		1				
217	Northern Mockingbird	*Mimus polyglottos*	p	p	p	p	p	p	p	p	p	p	p	p	p	p	
218	Brown Thrasher	*Toxostoma rufum*		2		1									2		
219	Long-billed Thrasher	*Toxostoma longirostre*									3		2	2	1		
220	Curve-billed Thrasher	*Toxostoma curvirostre*						1		2			4	4	2		
	FAMILY STURNIDAE: STARLINGS																
221	European Starling (I)	*Sturnus vulgaris*	p	p	p	p	p	p	20	6	2		10	20	25	15	4
	FAMILY MOTACILLIDAE: PIPITS																
222	American Pipit	*Anthus rubescens*		2													
	FAMILY PARULIDAE: WOOD-WARBLERS																
223	Blue-winged Warbler	*Vermivora pinus*									1						
224	Golden-winged Warbler	*Vermivora chrysoptera*									2	1					
225	Tennessee Warbler	*Vermivora peregrina*		1	1	1			2		20					1	
226	Nashville Warbler	*Vermivora ruficapilla*							1		1						
227	Virginia's Warbler	*Vermivora virginiae*														2	
228	Northern Parula	*Parula americana*			6	1			1		2						
229	Tropical Parula	*Parula pitiayumi*										1					
230	Yellow Warbler	*Dendroica petechia*				1		1			10	1				1	
231	Chestnut-sided Warbler	*Dendroica pensylvanica*									4						
232	Magnolia Warbler	*Dendroica magnolia*									10	1					
233	Cape May Warbler	*Dendroica tigrina*									2						
234	Yellow-rumped Warbler	*Dendroica coronata*									1						
235	Black-throated Gray Warbler	*Dendroica nigrescens*									1	4					
236	Golden-cheeked Warbler	*Dendroica chrysoparia*													4		
237	Black-throated Green Warbler	*Dendroica virens*									4	1	2		1		
238	Blackburnian Warbler	*Dendroica fusca*									3						
239	Yellow-throated Warbler	*Dendroica dominica*			1												
240	Prairie Warbler	*Dendroica discolor*				1											
241	Blackpoll Warbler	*Dendroica striata*				3			6		4						
242	Cerulean Warbler	*Dendroica cerulea*									2						
243	Black-and-white Warbler	*Mniotilta varia*									20				1	1	
244	American Redstart	*Setophaga ruticilla*		1		1					10		1			1	
245	Prothonotary Warbler	*Protonotaria citrea*		1	10						1						
246	Worm-eating Warbler	*Helmitheros vermivorus*		1		1											
247	Ovenbird	*Seiurus aurocapilla*		1							2						
248	Northern Waterthrush	*Seiurus noveboracensis*				1			2		4						
249	Louisiana Waterthrush	*Seiurus motacilla*									1						
250	Kentucky Warbler	*Oporornis formosus*									1						
251	Connecticut Warbler	*Oporornis agilis*									1						
252	MacGillivray's Warbler	*Oporornis tolmiei*							1		1						
253	Common Yellowthroat	*Geothlypis trichas*		3		2			2	10	6			1			
254	Hooded Warbler	*Wilsonia citrina*		1		2					6						
255	Wilson's Warbler	*Wilsonia pusilla*									2						
256	Canada Warbler	*Wilsonia canadensis*									6						
257	Yellow-breasted Chat	*Icteria virens*				1			1								
	FAMILY THRAUPIDAE: TANAGERS																
258	Summer Tanager	*Piranga rubra*		5	1	4			2		2			1	2		
259	Scarlet Tanager	*Piranga olivacea*	1	1		4			1								
	FAMILY EMBERIZIDAE: NEW WORLD SPARROWS AND ALLIES																
260	White-collared Seedeater	*Sporophila torqueola*												1	1		
261	Olive Sparrow	*Arremonops rufivirgatus*									6	2	8	1	1		
262	Cassin's Sparrow	*Aimophila cassinii*							2					6			
263	Rufous-crowned Sparrow	*Aimophila ruficeps*													4		
264	American Tree Sparrow	*Spizella arborea*												4			
265	Chipping Sparrow	*Spizella passerina*												1	20		
266	Clay-colored Sparrow	*Spizella pallida*												30			
267	Vesper Sparrow	*Pooecetes gramineus*								10							
268	Lark Sparrow	*Chondestes grammacus*						6		10			2	10		2	
269	Black-throated Sparrow	*Amphispiza bilineata*												8			
270	Savannah Sparrow	*Passerculus sandwichensis*		20		2	20	2			1						
271	Le Conte's Sparrow	*Ammodramus leconteii*		1													
272	Nelson's Sharp-tailed Sparrow	*Ammodramus nelsoni*					3										
273	Seaside Sparrow	*Ammodramus maritimus*		100			20										
274	Song Sparrow	*Melospiza melodia*													1		
275	Lincoln's Sparrow	*Melospiza lincolnii*				1									4		
276	Swamp Sparrow	*Melospiza georgiana*		1													
277	White-crowned Sparrow	*Zonotrichia leucophrys*														1	
	FAMILY CARDINALIDAE: CARDINALS, NEW WORLD GROSBEAKS AND BUNTINGS																
278	Northern Cardinal	*Cardinalis cardinalis*			20	4	2	4	1	5	5		2	2	5	20	
279	Pyrrhuloxia	*Cardinalis sinuatus*											2	4	2		
280	Rose-breasted Grosbeak	*Pheucticus ludovicianus*		3	1	6			2	10					1		

I = Introduced (6)
E = Extinct (2)
u = uncertain origin (stable to increasing populations of introduced/native origin) (2)
e = extirpated (1)

Bardsey 03

(The RAFOS expedition to Bardsey 29 Aug-5 Sep 2003)

Wg Cdr Clive Watson and George Candelin

Introduction

Bardsey Island, or to give it its original Welsh name, Ynys Enlli, lies 3km off the Llyn Peninsula in Gwynedd, North Wales. Lying along a north-south axis, it comprises a sizeable (168m) hill, Myndydd Enlli that tops the sea-cliffs to the west and overlooks a flattish patchwork plain of drystone-walled fields that descend to the west and the south, where an isthmus connects to the small rocky peninsula on which the lighthouse stands; the total land area is 180ha. Access to the island, owned by the Bardsey Island Trust, is by prior arrangement, whether staying at the Observatory (the only one in Wales), in the holiday cottages or simply visiting for the day. The Observatory lies about three-quarters of the way north along the island's only road. Bardsey's harbour was constructed almost a century ago by blasting the surrounding rocks until there was sufficient depth for vessels to approach a short pier. It is a designated National Nature Reserve, comprising the larger part of the UK's Important Bird Area 088, *Glannau Aberdaron and Ynys Enlli* (Fisher *et al* 2000), a total of 505ha. Bardsey's maritime heathland is dominated by heather *Calluna vulgaris* and gorse *Ulex spp* and the island possesses a rich fern and bryophyte flora (BirdLife International 2003a). The Ringing Station at the Observatory was established in 1953. Like many Observatories that are in remote and difficult to reach locations, it depends very heavily on volunteers to fulfil ringing and observation tasks. However, the maximum number that can be accommodated is 12. The Bardsey 03 expedition, a typical RAFOS 'island' activity, was planned to provide 6 days' intensive effort as directed by the Observatory Warden, Steve Stansfield.

Aims

The main aim of Bardsey 03 was to:
Augment the Observatory bird observation effort for 6 days during the autumn migration period.

Secondary aims were to:
Develop members' ornithological skills.
Introduce ringing to unqualified individuals.
Act as an introduction to more arduous RAFOS expeditions.
Prove the concept and assess the benefits of commercial sponsorship.
Assess the value of Night Vision Goggles (NVG) as an aid to bird observation.

Methods and Procedures

A prime function of any RAFOS expedition is to introduce beginners to birds in a way that generates enthusiasm. Political and military events in the Middle East almost put paid to Bardsey 03 when many intending participants had to cancel. The expedition was reconstructed at short notice by approaching other RAFOS 'island enthusiast' members and a member of AOS known to have wide-ranging ornithological and biological skills, via e-mail and telephone. Fortunately, the revised crew (see **Appendix 1**) also had a good mix of experience and included some expedition neophytes. The team assembled at Pwllheli on 29 Aug and sailed with their kit on the small *Highlander II* ferry the next morning, the crossing taking only 45 minutes in calm conditions.

Ringing

The team's A-class ringer, George Candelin, could not use his own equipment on a National Nature Reserve, but instead, once assessed by the Warden as competent, became an integral part of the Observatory ringing team. Although there are a number of ringing sites around the island, usually located in stands of trees and bushes, not all were used during Bardsey 03, most ringing activity (including use of a Heligoland trap) taking place within the grounds of the Observatory. In addition, the Warden and his team took expedition members out twice at night, mostly when the team were catching young **Manx Shearwater** *Puffinus puffinus*; these emerge from the burrow at night to exercise their wings. This activity began after 2200 and involves a line of people walking quietly along linear features such as old dry-stone walls where the birds have their burrows. Here the birds were picked up beside their burrow entrances before they could either fly away or go underground. The ringing team take biometric measurements and assess the bird's condition and age before placing a ring on a leg. Each bird is then replaced at its burrow entrance. On one nocturnal excursion, the Warden displayed his prowess at netting roosting waders in a small cove. Once again the tiny size of a bird in the hand contrasted sharply with the apparent size that telescope views had imprinted on the mind, as experienced with **Dunlin** *Calidris alpina* (with its complement of parasitic flat flies) and **Ringed Plover** *Charadrius hiaticula*; this latter enabled George Candelin to add another species to his ringing list.

Ringing Summary

Bardsey Island is an important stopover point on the west coast. Ringing using mist nets was possible only on some days due to the exposed nature of the island, for the expedition was subject to frequent windy conditions. Moonlight precluded the night-time tape luring of adult Manx Shearwater and **European Storm Petrel** *Hydrobates pelagicus*, both of which come ashore only when it is pitch black. During the windy days, the Heligoland trap proved useful at times, as did the use of spring-traps for **Stonechat** *Saxicola torquatus*. However, the main ringing effort was directed at the young **Manx Shearwaters**, which can be picked up at night when they emerge from their burrows and sit on the stony earth banks that divide up the fields on the island. The Bardsey 03 Ringing Report is at **Appendix 2**.

Observations

The team spent the afternoon of the 29th familiarising themselves with the island and helping the tyros learn the local avifauna. A sighting of four **Curlew Sandpiper** *Calidris ferruginea*, the first record since 1995, resulted in the first of many written reports of unusual records for submission to the Warden. Although the Observatory was not running a formal programme of observations on the island at the time, Bardsey 03 adopted a regular routine. Typically, this would start at 0530 with the early sea watch shift, led by Gerry Bilbao, leaving the accommodation to take post in one of the 3 hides situated at strategic points on the island. Following breakfast at 0715 and the return of the sea-watchers, various groups then formed and departed the Observatory to cover the rest of the island until supper at 1830. Throughout the day individuals, especially the novices, would observe at times the ringing activities centred around the Observatory. The day finished with the Bardsey 03 callover at 1930 prior to attending that of the Warden and his small resident team. In this way George Candelin was the expedition 'voice', having ensured that all RAFOS submissions had been agreed and that likelihood of double-counting had been minimised beforehand. The RAFOS team thus were able to develop quickly an understanding of the island's bird community and of local site names; the team soon gained the Warden's confidence, particularly because it was their policy to alert him to share unusual sightings, such as **Sooty Shearwater** *Puffinus griseus* and **Barn Owl** *Tyto alba*. Other important records were of **Great Northern Diver** (**Common Loon**) *Gavia immer* and a dragonfly, a newly-emerged (teneral) **Keeled Skimmer** *Orthetrum coerulescens*, the first reported sighting for Gwynedd. The Bird Species List is at **Appendix 3** and the Summary List of Flora and Fauna is at **Appendix 4**. The sequence adopted in **Appendix 3** is that of the European Ringing (Euring) organisation; it approximates to the sequence of the old Voous order. A short Annotated Systematic List of selected bird species is given below.

Birds and Weather

A glance at the map of North Wales shows the Llyn Peninsula curving south past Anglesey to point into Cardigan (Ceredigion) Bay. Bardsey essentially is a continuation of the landform, but being slightly further out in the Irish Sea, it acts as a concentration point for migrant landbirds, especially for the return migration. **Red-billed Chough** *Pyrrhocorax pyrrhocorax*, a species with an unfavourable conservation status in Europe, is a resident breeder (6-7bp); the continued presence of the species may be because there is a supply of beetles such as *Nicrophorus vespilloides* (a sexton beetle: it buries carcasses) and *Geotrupes sp* (Dor beetle sp; dung beetles) as food sources for much of the year. Migrant seabirds, too, may pass close to the island on either side, but Bardsey holds some 7000bp of **Manx Shearwaters**; this represents over 3% of the global population, qualifying the area as an IBA (Heath & Evans 2000), that come to roost or to the nests at night from spring to autumn. The lighthouse acts as an attractant for migrants, especially when visibility is poor. Migrant casualties at the lighthouse have been much reduced by the provision of a false lighthouse, in the form of a mast with lights, nearby. As a result of all these factors, Bardsey's species list is long. Other principal breeding seabird species are **Northern Fulmar** *Fulmarus glacialis*, **Lesser Black-backed** and **Herring** Gulls *Larus fuscus* and *argentatus*, **Kittiwake** *Rissa tridactyla*, **Guillemot** *Uria aalge* and **Razorbill** *Alca torda*. Bardsey's position has brought many American vagrants seeking refuge as they transit the Irish sea or are persuaded to leave the ship they landed on in the Atlantic, but rather more surprisingly many eastern Palaearctic passerines have visited. Of the southern rarities, the expedition had the good fortune of encountering **Icterine Warbler** *Hippolais icterina*, which is almost regular in occurrence at this time of year.

The weather has a major effect not only on passage migrants, but also on human visitors and residents, for the ferry sailings are often affected by bad weather. Indeed, a previous RAFOS expedition to the island was fortunate in being able to take advantage of a Search and Rescue helicopter training flight to escape; in the same vein, Bardsey 03 had to be curtailed by a day due to impending gales. The bonus was that the return passage to Pwllheli was accompanied by considerable numbers of **Northern Gannet** *Morus bassanus*, and **Manx Shearwater** and encountered a raft of **Black (Common) Scoter** *Melanitta nigra*.

Sponsorship

Since it was founded, RAFOS has financed its expeditions from its own funds, from participants' contributions and from sources of Service funds that the nature of expeditions allowed, subject to entitlement and approval of applications. This last source not only has diminished with a shrinking Service, but it has also become a bureaucratic nightmare, especially when trying to integrate the participation of professional specialists and retired (and very experienced) members of the Society. Reliance on such an uncertain source of funding is likely to reduce RAFOS survey work significantly. Bardsey 03 became the first RAFOS expedition for which sponsorship was sought and received.

Air BP sponsorship covered the costs of such as:

- One night's accommodation in Pwllheli, obviating the need for camping equipment (personal, hired or Service-provided).
- Ferry charges for participants and kit to and from the island.

Accommodation in the Observatory (camping is forbidden on the island).

- Food for the island stay.
- Hiring a cook, enabling maximum use of the birding day for each participant.
- Insurance to cover mainland accommodation costs accruing through bad weather delaying the ferry crossing.
- Essential purchases such as a large-scale island map, film and film processing.

Air BP's generous sponsorship of £2000 enabled much of these costs to be covered, the remainder being financed by participants' personal contributions and by a RAFOS grant. The case submitted to Air BP detailed the proposed spending and included all other planned sources of funding. Participants had also to pay individual costs of travel to and from Pwllheli. Sponsorship is an inevitable requirement if RAFOS is to maintain the quality and quantity of survey work, and it does allow expeditions to concentrate on ornithological rigour and to negotiate discounts through early booking of facilities.

Annotated Systematic List of Selected Bird Species

The avifauna of the Irish Sea is Western Palearctic in nature (as defined in *The Birds of the Western Palearctic Concise Edition* [Snow & Perrins 1998]), many migratory species occurring, especially sub-Arctic and Arctic breeders. The Irish Sea is a bottleneck for seabird migrants that winter in temperate and subtropical waters of the Atlantic. Nomenclature and taxonomy generally follow *Birds of the World: a Checklist, 5th edn.* (Clements 2000), which in turn follows *Handbook of Birds of the World, Vols 1-9* (del Hoyo *et al* 1996-2004). Current nomenclature usage in the field is also recognised. The sequence adopted follows Euring for convenience.

The European status of each species is given after each species' scientific name, and is taken from Heath *et al* (2000). It includes the species' SPEC (Species of European Concern) category, its European threat assessment (such as 'Endangered'). Population figures and trends are cited for UK, Europe or regionally where appropriate and are from several sources, *European Bird Populations, Estimates and Trends* (Heath *et al* 2000), from Heath and Evans (2000), Delany & Scott (2002) (Wetlands International population estimates) or from BirdLife International (BLI) website www.birdlife.net (2003) whose ***Data Zone*** species factsheets were cited as (2004) at the date of access. IUCN threat status citations are from these species factsheets.

Briefly, SPEC categories are:

1. Species that are Globally Threatened (Category in Bold in the annotated list).
2. European species that have Unfavourable Conservation Status.
3. Global Species that have Unfavourable Conservation Status in Europe.
4. Species that have Favourable Conservation Status in Europe, but whose populations are mainly in Europe.

NB Non-SPEC generally means that a species has Favourable Conservation Status in Europe, and it may have the majority of its population outside Europe. The suffix 'W' added to any status term refers to the wintering population. Any status term in brackets, *eg* (Vulnerable), indicates that more extensive studies are required to confirm the term required, although the bulk of the evidence available supports the designation. 'Localized' means that the threat applies in only parts of the species' range. Other conventions adopted are:
bp = breeding pairs; kbp = thousand bp, Mbp = million bp
ind = individuals
BLI = BirdLife International
Wet Int = Wetlands International

Great Northern Diver *Gavia immer* Non-SPEC/(Secure) 500-2300bp (Greenland and Iceland), 0.58M ind (Delany & Scott 2002a [Wet Int]). Rather scarce in the Irish Sea, although individuals can wander widely; those in British waters are thought to come from mostly from the Iceland and Greenland populations.

Northern Fulmar *Fulmarus glacialis* Non-SPEC/Secure >0.5Mbp (UK), up to 32M ind (Global) (BLI 2004a). After decades of range extension, the species' fairly recent colonisation of Bardsey may not be long-term, for two reasons; first, the collapse of sand-eel and similar prey populations that has changed the food chain, and second, the great reduction in offal disposal from the downsized fishing fleets. Whether the overall North Sea population will soon show a declining trend is uncertain.

Sooty Shearwater *Puffinus griseus* Non-SPEC/Secure, but IUCN near-threatened. 20M ind (Global). In northern waters, on passage or dispersal only. Found in every ocean, this species wanders widely, and is probably commoner in British and Irish waters than reports suggest; persistent signs of large-scale decline in southern hemisphere (BLI 2004b).

Manx Shearwater *Puffinus puffinus* SPEC 2/(Localized) 220-250kbp (UK), up to 0.6M ind (Global) (BLI 2004c). The number of breeding birds (4300bp, BLI 2003) on Bardsey meets the criteria for the island being an Important Bird Area in global terms. Apart from *c*100bp in the Canary Islands, this species breeds on N Atlantic islets. Because it visits colonies only in darkness, it is still likely

that yet undiscovered colonies exist.

Mediterranean (Yelkouan) Shearwater *Puffinus yelkouan* SPEC 4/Secure Up to 52kbp (BLI 2004d). Non-breeding individuals wander quite widely out into the Atlantic from the breeding grounds in the eastern Mediterranean. Its western Mediterranean congener, **Balearic Shearwater** *P. (yelkouan) mauretanicus* (provisionally **SPEC 1/ Critically Endangered**), cannot safely be separated by eye because variation on the underside markings is so wide. Balearic Shearwater may be in terminal decline (probably fewer than 2000bp in 2003) (BLI 2004e) through a multiplicity of threats, including long-line casualties and the damaged food chain in the western Mediterranean. Recognition of the two forms as full species remains the subject of reasonable debate, but because the differences between them have been enumerated only since the early 1990s, the swift decline of *mauretanicus* has been documented only in the 21st century.

Peregrine Falcon *Falco peregrinus* SPEC 3/Rare *c*1300bp (UK) 7.6-11kbp (Europe) Until **Rock Dove** *Columba livia* and **Feral Pigeon** *C.l.* **forma** *domestica* began breeding on Bardsey in any numbers, **Peregrine** was merely a regular visitor; up to 19 birds use the island during the year (BLI 2003). Although the species is declining slightly in some European countries, it is increasing in others, particularly where persecution and nest raiding have declined, but often through colonising cities, a worldwide phenomenon.

(Red) Knot *Calidris canutus* SPEC 3W/Localized W 250-300k ind (W, UK) 11M ind (Delany and Scott 2002b). This species belongs to the true long-range migrants, for the birds encountered twice a year in the British Isles fly non-stop on migration to and from their breeding areas in Greenland and Canada. Theunis Piersma established that the energy required for these flights is greater than pre-migration body fat and muscle fat can provide, and so the energy equation is solved by the bird consuming most of its own gut, which has to be regenerated during 2-3 days' intensive feeding, or the bird will succumb. This explains why this species can be encountered on almost any of our beaches in autumn, although there are many favoured gathering-places. A recently discovered subspecies was named *piersmai* (Delany & Scott 2002b). Many, probably first-year birds unlikely to breed in the next season, reach South Africa, where some remain for 8-10 months. A tiny population (<10bp) breeds some years in Svalbard (Spitzbergen).

Sanderling *Calidris alba* Non-SPEC/Secure Up to 0.6M ind (Delany & Scott 2002c). This species is very adaptable in its choice of shoreline feeding grounds, but also often associates with larger waders to take occasional advantage of their more specialised foraging. Longer-billed species probe deeper and often scatter morsels, but species such as (**Red**) **Turnstone** *Arenaria interpres* and **Purple Sandpiper** *Calidris maritima* on tide-exposed reefs often may unwittingly benefit the swift-raiding **Sanderling**. Bardsey's experience of irregular visits by this species is typical of many locations.

Sabine's Gull Xema (*Larus*) *sabini* Non-SPEC/Secure Up to 300Kbp (Nearctic), 700Kbp (Global) (Delany & Scott 2002d). Until it was realised that this species, long associated with waters of the Arctic ice pack, actually wintered in large numbers south of Senegal, its rare appearances close to British and Irish shores had been attributed to individuals wandering south of their northern wintering ground. Now, such events clearly comprise individuals that have wandered off the beaten migration track. Pelagic trips encounter it quite frequently further offshore, but perhaps the mid-Irish Sea is a minor migration route! A very few breed some years on Svalbard (BLI 2004f).

Lesser Black-backed Gull *Larus fuscus* SPEC 4/Secure *c*85kbp (UK), >225kbp (Global) (Delany & Scott 2002e). The continuing presence of this species as a breeder on Bardsey may be threatened by the reduction in a guaranteed food supply from fish-gut disposal as the fishing fleets decline. It has shown a recent inclination to join the **Herring Gull** *L. argentatus* as an urban nester, but this is not an option on the island. Up to now, it has displayed a strongly increasing trend overall.

(Black-legged) Kittiwake *Rissa tridactyla* Non-SPEC/Secure *c*0.5Mbp (UK), 2.8Mbp (Europe) >16Mbp (Global) (Delany & Scott 2002f). Like the preceding species, the continuing presence of the Kittiwake as a breeder on Bardsey is vulnerable to the reduced by-products of local net- fishing. Its local overall trend to increase in numbers may come to an end soon.

White Wagtail *Motacilla alba alba* Non-SPEC/Secure *c*0.4M ind (BLI 2004g). It is likely that this, the principal European subspecies, is a commoner breeder in UK than its north of Scotland range would suggest. Although mixed pairs are known where the two subspecies meet, both in Scotland and along the Channel and North Sea coasts of the Low Countries, the overlaps seem stable. It is easy to overlook, but it may be *M.a. alba* pairs breed irregularly in many areas; for example, in some parts of the UK it is not difficult to find individuals outside the main migration periods.

Black Redstart *Phoenicurus ochrurus* Non-SPEC/Secure *c*25-75bp (UK), 7.9-18Mbp (Europe) (BLI 2004h). The British Isles are on the northern limit of the species' breeding range, but it does seem characteristic of the species that isolated pairs are found quite widely at the range limits, general locations often being used regularly, even if nest-site selection shows little site faithfulness.

Icterine Warbler *Hippolais icterina* SPEC 4/Secure 0-1bp (UK), up to 14Mbp (Europe) (BLI 2004i). Males of this species seem to be prone to overshooting on the return migration to end up in UK, but females do not, and so breeding records are few and far between. However, breeding pairs in UK may be under-reported because of their liking for dense and thorny shrubland away from the coasts.

(Black-billed) Magpie *Pica pica* Non-SPEC/Secure *c*650kbp (UK), up to 3.4Mbp (Global) (BLI 2004j). A recent coloniser on Bardsey, the island seems much to this generalist species' liking. It would be a wise precautionary move to initiate a study there of its effect on the next species, **Red-billed Chough** *Pyrrhocorax pyrrhocorax*, which is very much a habitat specialist in the British Isles (less so in some parts of its European range).

Red-billed Chough *Pyrrhocorax pyrrhocorax* SPEC 3/Vulnerable *c*300bp (UK), 86-210kbp (Europe) (BLI 2004k). Bardsey holds up to19 birds (BLI 2003). This species' population range and numbers continue to decline slowly, although conservation measures seem to reduce the rate. No clear cause for the decline has emerged, but seasonal food preferences and requirements may be significant.

Lesser Redpoll *Carduelis flammea cabaret* <90kbp (UK) (Knox *et al* 1997) *c*20kbp (Europe) (All ssp; Europe up to 390kbp [BLI 2004l], global up to 90Mbp). *C.f. cabaret* was once confined mostly to UK, but has expanded throughout Central Europe, probably through adaptability to agricultural changes (Knox *et al* 1997). The sharp decline in the UK of population numbers may now be extending to range-limit populations associated with regions of industrial agriculture.

Night Vision Goggles

The NVG on loan from Tactical Supply Wing were trialled on each of the night-time excursions, but the results were mixed. Users were unable to locate and identify birds without using a torch as well, and so one could not stand quietly equipped only with this model of NVG and easily outperform anyone in detecting bird movement without NVG, even at quite close ranges. However, with the use of a torch to illuminate targets, NVG users were able to locate, identify and track birds at far greater distances than anyone without NVG. NVG were therefore used with torches in reconnaissance of linear ground features prior to approaching them to see if they held any birds, up to a range of 100m. However, the skilled Observatory teams were used to operating without NVG; using a set of NVG on only a couple of occasions did not confer any clear benefit on them, but might do so if used with increasing familiarity. Because there was no nocturnal mist-netting, it was not possible to test the NVG as a means of confirming quickly that a bird had been caught.

Nevertheless, NVG technology has advanced considerably, and it is likely that recent more sensitive equipment may allow worthwhile nocturnal observation of seabird movement at night, whether at roosts, breeding colonies or at sea

Conclusions

Once again, the RAFOS system of concentrated effort over a short period made Bardsey 03 successful, for it augmented the Observatory's fauna observation effort significantly (see **Appendices**). Inexperienced and tyro participants gained enormously from the experience. The basic facilities and the relative isolation of Bardsey is an excellent and financially viable location to use to introduce people to more arduous RAFOS expeditions, but it will always be a satisfying birding challenge for the experienced. Any island-based expedition carries a degree of additional risk in that

it is vulnerable to vagaries of weather; leaders must take this and other contingencies into account in the planning stage. Commercial sponsorship was hugely beneficial; RAFOS thanks Air BP for its generous support.

Appendices

1. Bardsey 03 Team Members.
2. Bardsey 03 Ringing Report.
3. Bardsey 03 Bird Species List.
4. Bardsey 03 Summary Flora and Fauna List

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2002c. *Calidris alba*. Sanderling P179.
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2002f. *Rissa tridactyla*. Black-legged Kittiwake. P195.

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2004a. *Fulmarus glacialis.*
2004b. *Puffinus griseus.*
2004c. *Puffinus puffinus.*
2004d. *Puffinus yelkouan.*
2004e. *Puffinus mauretanicus.*
2004f. *Xema (Larus) sabini.*
2004g. *Motacilla alba alba*
2004h. *Phoenicurus ochruros*
2004i. *Hippolais icterina.*
2004j. *Pica pica.*
2004k. *Pyrrhocorax pyrrhocorax.*
2004l. *Carduelis flammea cabaret.*

Appendix 1

Bardsey 03 Team Members

Name	Role	Remarks
Gerry Bilbao	Seawatch Leader	Experienced ornithologist, gull specialist.
George Candelin	Ringing Coord, Recorder	'A' Class Ringer.
Sqn Ldr Ian Drake		Relatively inexperienced ornithologist, 1st RAFOS expedition.
Brian Eke		Experienced ornithologist. 1st RAFOS exped.
Sgt Dave Hine		Relatively inexperienced. 1st RAFOS exped.
Flt Lt Sarah Kinloch		Novice. First RAFOS exped.
John Le Gassick		Experienced RAFOS veteran; previous Bardsey visit.
Andrew Leak		Experienced. First RAFOS exped.
Tony Marter	Survey Coord	Experienced RAFOS 'island' veteran & former exped Leader; previous Bardsey expeds.
Keith Powrie		Experienced ornithologist & entomologist. First RAFOS exped.
Wg Cdr Clive Watson	Expedition Leader	Relatively inexperienced ornithologist.

Appendix 2

Bardsey 03 Ringing Report

(Being the Observer ringing record of George Candelin on Bardsey 03)

Species	Full-grown	Pulli	Retraps	Total per row
Manx Shearwater *Puffinus puffinus*	7	9	1	17
Ringed Plover *Charadrius hiaticula*	1	0	0	1
Dunlin *Calidris alpina*	1	0	0	1
Barn Swallow *Hirundo rustica*	1	0	0	1
(Winter) Wren *Troglodytes troglodytes*	0	0	3	3
Dunnock *Prunella modularis*	1	0	2	3
European Robin *Erithacus rubecula*	10	0	10	20
Stonechat *Saxicola torquatus*	1	0	0	1
Song Thrush *Turdus philomelos*	0	0	2	2
Icterine Warbler *Hippolais icterina*	0	0	1	1
Common Whitethroat *Sylvia communis*	1	0	0	1
Blackcap *Sylvia atricapilla*	1	0	0	1
Common Chiffchaff *Phylloscopus collybita*	2	0	0	2
Willow Warbler *Phylloscopus trochilus*	2	0	2	4
Goldcrest *Regulus regulus*	10	0	6	16
Spotted Flycatcher *Muscicapa striata*	0	0	1	1
European Pied Flycatcher *Ficedula hypoleuca*	2	0	0	2
Lesser Redpoll *Carduelis flammea cabaret*	0	0	1	1
Grand Total	40	9	29	78
Species per column	13	1	10	18

Appendix 3

Euring	Species	Taxonomic Name	30/8/03	31/8/03	1/9/03	2/9/03	3/9/03	4/9/03	5/9/03
00040	Great Northern Diver (Common Loon)	*Gavia immer*					1		
00220	(Northern) Fulmar	*Fulmarus glacialis*	17	45	67	65	132	118	46
00430	Sooty Shearwater	*Puffinus griseus*			1				
00460	Manx Shearwater	*Puffinus puffinus*		33	57	534	243	664	392
00462	Mediterranean Shearwater[4]	*Puffinus yelkouan*	1	3	7			1	1
00520	(European) Storm Petrel	*Hydrobates pelagicus*							1
00710	(Northern) Gannet	*Morus bassanus*	4	111	143	283	987	673	564
00720	(Great) Cormorant	*Phalacrocorax carbo*	11		51	23	14	9	4
00800	(European) Shag	*Phalacrocorax aristotelis*	5	6	59	85	33	40	17
01220	Grey Heron	*Ardea cinerea*	2		2	4	2	3	7
01840	Eurasian (Common) Teal	*Anas crecca*					3	1	
01860	Mallard	*Anas platyrhynchos*	1		3	1	3	1	
02030	Tufted Duck	*Aythya fuligula*					3		
02130	Black (Common) Scoter	*Melanitta nigra*			3	8	18	14	2
02690	(Eurasian) Sparrowhawk	*Accipiter nisus*	1m		1		1	1	1
03040	Eurasian (Common) Kestrel	*Falco tinnunculus*	1m1f	1	2	1	2		1
03200	Peregrine Falcon	*Falco peregrinus*				1	1	1	
04240	(Common) Moorhen	*Gallinula chloropus*	1		2	2	2	3	1
04500	Eurasian Oystercatcher	*Haematopus ostralegus*	30	28	22	26	22	20	15
04700	(Common) Ringed Plover	*Charadrius hiaticula*	6	1	5	4		2	
04960	(Red) Knot	*Calidris canutus*		1	2				
04970	Sanderling	*Calidris alba*	3	1	4				
05090	Curlew Sandpiper	*Calidris ferruginea*	4						
05120	Dunlin	*Calidris alpina*	10	1	8	7		6	1
05190	Common Snipe	*Gallinago gallinago*					3		
05380	Whimbrel	*Numenius phaeopus*	9		9	10	1	5	6
05410	Eurasian Curlew	*Numenius arquata*	1	35	39	41	30	20	41
05460	(Common) Redshank	*Tringa totanus*	9	1	17	11	5	13	10
05610	(Ruddy) Turnstone	*Arenaria interpres*	31	20	173?	17	5	9	25
05660	Pomarine Skua	*Stercorarius pomarinus*				1			
05670	Arctic (Parasitic) Skua	*Stercorarius parasiticus*			3				
05690	Great Skua	*Catharacta (Stercorarius) skua*					1	3	3
05790	Sabine's Gull	*Xema (Larus) sabini*		1					
05820	Black-headed Gull	*Larus ridibundus*	1	1	3	3	2	5	14
05900	Common Gull?	*Larus canus*			1				
05910	Lesser Black-backed Gull	*Larus fuscus*	1	1	16	21	10	13	6
05920	Herring Gull	*Larus argentatus*	20	2	19	26	26	30	24
06000	Great Black-backed Gull	*Larus marinus*	1	1	5	8	11	8	2
06020	(Black-legged) Kittiwake	*Rissa tridactyla*		23	250	146	333	260	622
06110	Sandwich Tern	*Sterna sandvicensis*			20	2	13	16	5
06150	Common Tern	*Sterna hirundo*						1	
06340	(Common) Guillemot (Murre)	*Uria aalge*		3	4	2	3	1	
063XX	Auk sp	*Alcidae sp*					2	1	
06360	Razorbill	*Alca torda*			4	3	3	4	1
0665X	Feral/Racing Pigeon	*Columba livia forma domestica*	6		1	1	1	1	1
06700	(Common) Woodpigeon	*Columba palumbus*	2	2	4	3	4	4	6
06840	(Eurasian) Collared Dove	*Streptopelia decaocto*				1		1	
07350	Barn Owl	*Tyto alba*							1
07570	Little Owl	*Athene noctua*			1	1	1		
07670	(Northern) Long-eared Owl	*Asio otus*					1		
09760	(Common) Skylark	*Alauda arvensis*			1	1			
09810	Sand Martin (Bank Swallow)	*Riparia riparia*			1		16	2	
09920	(Barn) Swallow	*Hirundo rustica*	16	6	62	86	68	803	7
10010	(Common) House Martin	*Delichon urbicum*						1	
10110	Meadow Pipit	*Anthus pratensis*	8	14	14	42	30	20	26
10142	Rock Pipit	*Anthus petrosus*	8	2	9	12	8	7	6
10201	Pied Wagtail	*Motacilla alba yarrelli*	20	3	17	33	12	11	6
10202	White Wagtail	*Motacilla alba alba*	1	1	3	1		1	
10660	(Winter) Wren	*Troglodytes troglodytes*	4	2	8	12	21	14	16
10840	Dunnock	*Prunella modularis*	3	1	2	10	5	8	9
10990	European Robin	*Erithacus rubecula*	6		5	12	7	11	8
11210	Black Redstart	*Phoenicurus ochruros*						1	1
11220	(Common) Redstart	*Phoenicurus phoenicurus*					1		
11370	Whinchat	*Saxicola rubetra*	2	1	1	1	1	5	3
11390	(Common) Stonechat	*Saxicola torquatus*	10	16	18	11	26	14	15
11460	(Northern) Wheatear	*Oenanthe oenanthe*	4	2	5	10	6	6	1
11870	Eurasian (Common) Blackbird	*Turdus merula*	1		1		1		
12000	Song Thrush	*Turdus philomelos*				1			
12430	Sedge Warbler	*Acrocephalus schoenobaenus*						4	
12590	Icterine Warbler	*Hippolais icterina*				1			
12750	(Common) Whitethroat	*Sylvia communis*	1			1		3	1
12770	Blackcap	*Sylvia atricapilla*	1						
13110	Common Chiffchaff	*Phylloscopus collybita*				2	1	2	2
13120	Willow Warbler	*Phylloscopus trochilus*	1	1	4	2	5	3	5
131XX	Willow Warbler/Chiffchaff	*Phylloscopus sp*			1				
13140	Goldcrest	*Regulus regulus*	12	6	10	10	3	4	6
13350	Spotted Flycatcher	*Muscicapa striata*					3	1	2
13490	(European) Pied Flycatcher	*Ficedula hypoleuca*				1	1	1	1
15490	(Black-billed) Magpie	*Pica pica*	4	5	11	14	10	13	10
15590	(Red-billed) Chough	*Pyrrhocorax pyrrhocorax*	4	6	12	6	11	8	6
15600	(Eurasian) Jackdaw	*Corvus monedula*					1		
15670	Carrion Crow[3]	*Corvus corone*	**4**	**4**	**6**	**9**	**9**	**8**	**5**

15720	(Common) Raven	*Corvus corax*	2	4	5	1	3	4	3
16360	(Common) Chaffinch	*Fringilla coelebs*		1	1	1	2	3	3
16490	(European) Greenfinch	*Carduelis chloris*						1	1
16600	Eurasian (Common) Linnet	*Carduelis cannabina*	40	24	160	100	120	138	30
16634	Lesser (Common) Redpoll	*Carduelis flammea cabaret*				1			

Footnotes: 1. The name Balearic Shearwater now applies to *P. (yelkouan) mauretanicus* that has not been seen in UK waters. 2. Mew Gull is now recognised as a separate form, *L. brachyrhyncus*. 3. Hooded Crow *C. cornix*, is now recognised as separate from Carrion Crow.

Appendix 4

Lepidoptera									
0	micro sp	*(To be identified)*					2		
0873	a micro moth	*Blastobasis lignea*					1		
0998	Light-brown Apple Moth	*E. postvittana*					1		
1305	a grass moth	*Agriphila tristella*		2		3	2		
1309	a grass moth	*Agriphila geniculea*				1			
1398	Rush Veneer	*Nomophila noctuella*			1				
1520x	Plume sp	*Pterophoridae sp*		1	1				
1549	Large White	*Pieris brassicae*	2	2	8		6	5	3
1550	Small White	*Pieris rapae*	1	4	6		3	5	
1551	Green-veined White	*Pieris napi*	1	1		16			
1552x	White sp	*Pieris sp*						30	
1561	Small Copper	*Lycaena phlaes*	1		5	3	3		
1574	Common Blue	*Polyommatus icarus*	1		2	4	5	2	
1590	Red Admiral	*Vanessa atalanta*	3	1	20	32	27	24	7
1591	Painted Lady	*Cynthia cardui*	5	12	18	24	21	14	4
1593	Small Tortoiseshell	*Aglais urticae*	5	12		28	18	2	1
1597	Peacock	*Inachis io*			1				
1615	Wall Brown	*Lasiommata megera*			1				
1621	Grayling	*Hipparchia semele*			10		21		
1626	Meadow Brown	*Maniola jurtina*			4				
1689	Mullein Wave	*Scopula marginepunctata*					2		
1738	Common Carpet	*Catarhoe alternata*					1		
1862	Double-striped Pug	*Gymnoscelis rufifasciata*					3		
1884	Magpie Moth	*Abraxas grossulariata*	1		1	1			
1906	Brimstone Moth	*Opisthograptis luteolata*				1			
1937	Willow Beauty	*Peribatodes rhomboidaria*					1		
1984	Humming-bird Hawkmoth	*Macroglossum stellatarum*			1	2	2	1	2
2107	Large Yellow-underwing	*Noctua pronuba*					12		
2123	Small Square-spot	*Diarsia rubi*			1		1		
2134	Square-spot Rustic	*Xestia xanthographa*					17		
2147	Shears	*Hada nana*					1		
2255	Feathered Ranunculus	*Eumitchis litchenea*					1		
2299	Mouse	*Amphipyra tragoponis*					2		
2306	Angle Shades	*Phlogophora meticulosa*		1	1				
2321	Dark Arches	*Apamea monoglypha*					1		
2331	Small Clouded-brindle	*Apamea unanimis*					1		
2353	Flounced Rustic	*Luperina testacea*					2		
2441	Silver Y	*Autographa gamma*	20	20+	4			100+	

2444	Gold Spangle	*Autographa bractea*	1						
2469	Herald	*Scoliopteryx libatrix*					2		
Odonata									
o01	Migrant Hawker	*Aeshna mixta*	1	1	1				
o02	Keeled Skimmer	*Orthetrum coerulescens*			1				
o03	Common Darter	*Sympetrum striolatum*			1		1		
Misc Insectivora									
i1	Hawthorn Shield-bug	*Acanthosoma haemorrhoidale*				1		2	1
i2	Carrion-burying beetle	*Nicrophorus vespilloides*					1		
i3	Devils Coach-horse	*Ocypus olens*			1		1		
Mammalia									
m001	Wood Mouse	*Apodemus sylvaticus*	1		1				
m002	Grey Seal	*Halichoerus grypus*	53	11	65	30	17+	100+	10
m003	Medium Bat sp	*Chiroptera sp*	1		2				
m004	Harbour Porpoise	*Phocoena phocoena*						1	
m005	Bottle-nosed Dolphin	*Tursiops truncatus*					8	1	
m006	Risso's Dolphin	*Grampus griseus*					2	1	
m007	Dolphin sp	*Cetacea sp*			2		1	1	
Flora									
Plants	Autumn Hawkbit	*Leonodon autumnalis*							
	Autumn Lady's-tresses	*Spiranthes spiralis*							
	Birdsfoot Trefoil	*Lotus corniculatus*							
	Bog Pimpernel	*Anagallis tenella*							
	Brooklime	*Veronica beccabunga*							
	Buckshorn Plantain	*Plantago coronopus*							
	Cats Ear	*Hypochoeris radicata*							
	Fleabane	*Pulicaria dysenterica*							
	Greater Spearwort	*Ranunculus lingua*							
	Knapweed	*Centaurea nigra*							
	Lady's Bedstraw	*Galium verum*							
	Meadowsweet	*Filipendula ulmaria*							
	Pellitory of the Wall	*Parietaria judaica*							
	Scarlet Pimpernel	*Anagallis arvensis*							
	Sea (Rock) Samphire	*Crithmum maritimum*							
	Thrift	*Armeria maritima*							
	Tormentil	*Potentilla erecta*							
	Wood Sage	*Teucrium scorodonia*							
	Yarrow	*Achillea millefolium*							
Primitives	Common Horsetail	*Equisetum arvense*							
	Grey-green Lichen	*Lecanora conizaeioides*							
	Orange Lichen	*Xanthoria parietina*							
	Maidenhair Spleenwort	*Asplenium trichomanes*							

Islay Mist 04

RAFOS on Islay, 23-30 October 2004

Wg Cdr Bill Francis

Introduction

Islay, 615 km² in area, is the most southerly island of the Inner Hebrides, lying below Jura, some 24 km from Kintyre on the Scottish mainland and 32 km from Rathlin Island off the coast of Northern Ireland. Islay has 220 km of coast and about 250 km of roads, much of which is single track with passing places. The coastline is deeply indented, two major sheltered sea lochs, Indaal and Gruinart, both being Important Bird Areas (IBAs), almost dividing the island in two. The coast is mainly rocky, indented by small bays and bastioned by high sea cliffs, particularly on the southern Oa peninsula (another IBA), but there are extensive sand dunes at Ardnave Point and other locations on the north coast. Of special importance to bird life are the saltings and sand flats, particularly at the heads of Lochs Gruinart and Indaal, and these are used as roosts by large numbers of **Barnacle Geese** *Branta leucopsis*, **Whooper Swans** *Cygnus cygnus*, **Northern Shelduck** *Tadorna tadorna*, **Eurasian Wigeon** *Anas penelope*, **Eurasian Teal** *Anas crecca*, **Mallard** *Anas platyrhynchos*, **Common Eider** *Somateria mollissima* and **Red-breasted Merganser** *Mergus serrator*. The island holds several freshwater lochs; other habitats include rivers and streams, open moorland studded with peat bogs, broadleaved, mixed and coniferous woodland, improved grazing and arable farmland. This wide variety of habitats permits at least 100 species of birds to be present on Islay on any day of the year. Two of the IBAs are RSPB reserves, Loch Gruinart in the north and the Oa, on the south coast. The former includes a year-round habitat for a wide variety of wildfowl and other water birds, whilst the latter, with its high cliffs and moorland, provides a home for **Red-billed Chough** *Pyrrhocorax pyrrhocorax*, **Peregrine Falcon** *Falco peregrinus* and **Golden Eagle** *Aquila chrysaetos*. Islay contains six IBAs, (Fisher *et al* 2000), a concentration rarely equalled and a powerful reason to visit (the IBA descriptions are at **Appendix 1**): briefly, they are; IBA 135 Eilean na Muice Dhuib, 169 Laggan, 172 Loch Gruinart, 173 Loch Indaal and Bridgend Flats, 221 The Oa and 230 Rinns (BirdLife International 2003). Three RAFOS members had visited Islay in May 2002; their endorsement and enthusiastic appreciation of the superb birding locations led to RAFOS mounting a lengthy field trip in 2004. A full species list is at **Appendix 2** and the team list is at **Appendix 3**.

Aims

The aims of Islay Mist 04 were:

1.To give RAFOS members the opportunity of developing and improving ornithological skills by intensive daily bird recording on a relatively small island whose wide variety of habitats were ideal for a wide range of birds.

2. To monitor **Barnacle Goose** *Branta leucopsis* flocks for Darvic rings and to provide the RSPB warden with their numbers.

Travel and Accommodation

Apart from two members who were already on Islay, the team assembled at the Kennacraig ferry terminal at the northern end of the Mull of Kintyre. Travel between the Scottish mainland and Islay was by Caledonian MacBrayne vehicle ferry between Kennacraig and Port Ellen on Islay. Team members had reached Kennacraig by private cars, which were taken to Islay, although a 4WD vehicle would have been an advantage in some areas. On Islay, the team rented two self-catering cottages, more than adequate for the 8-strong team, at Kilchoman, towards the northwest coast. The cottage owners, being keen birders and also volunteers at the Loch Gruinart RSPB reserve, were of great assistance.

Daily Routine

Each day work began before sunrise, with team members investigating the Kilchoman local area, which includes a ruined church, a wooded stream in a valley, an extensive reedbed and the shingle beach at Machir Bay. Immediately to landward of the wooded valley, about 0.5 km from the coast, is a high cliff, which was also checked regularly. After breakfast, the team usually split into three parties to visit different localities on Islay each day, but the adjacent shores of the freshwater Loch Gorm were checked daily. The three parties were able to cover most of the road-accessible parts of the island in the time available. Our hosts' advice was invaluable in our choice of locations to be visited. The lack of public roads in northeast Islay meant that the peninsula between Loch Gruinart and Bunnahabhain had to be left unexplored. However, this area would be ideal for a subsequent expedition to tackle. On 27 Oct the team had divided into two parties to survey an area of woodland between Ballygrant and Port Askaig from opposing directions; the parties walked from one parked car to the other, passing en route. This enabled them to record different species at different times in a single area, and to return in different vehicles. We found that Richard E. Elliot's 1989 *Birds of Islay* and Malcolm Ogilvie's 2003 revision of his book of the same title to be very useful. In October each year, large flocks of **Barnacle Geese** and **Greenland White-fronted Geese** *Anser albifrons flavirostris* migrate to Islay from Greenland. During Islay Mist 04, the RSPB warden estimated that there were 26 000 of the former and 14 000 of the latter on the island; we found them grazing in all suitable locations.

Selected Annotated Systematic List of Bird Species

The avifauna of the Hebrides is Western Palearctic in nature, as defined in *The Birds of the Western Palearctic Concise Edition* (Snow & Perrins 1998), many migratory species occurring, especially sub-Arctic and Arctic breeders. The Inner Hebridean Islands provide a haven for waterbirds, because the climate allows a long growing season for grasslands and the topography provides sheltered freshwater and sea lochs for roosting and feeding. Nomenclature and taxonomy generally follow *Birds of the World: a Checklist, 5th edn* (Clements 2000), which in turn follows *Handbook of Birds of the World, Vols 1-9* (del Hoyo *et al* 1996-2004). However, sequence follows recent BOU decisions (Helbig *et al* 2002).

The European status of each species is given after each species' scientific name, and is taken from Heath *et al* (2000). It includes the species' SPEC (Species of European Concern) category, its European threat assessment (such as 'Endangered'). Population figures and trends are cited for UK, Europe or regionally where appropriate and are from several sources, *European Bird Populations, Estimates and Trends* (Heath *et al* 2000), from Heath and Evans (2000), Wetlands International (2002); edited by Delany & Scott (2002) (waterbirds population estimates) or from BirdLife International (2004) *Threatened birds of the world 2004* CD-ROM as updated from the BirdLife International website www.birdlife.net (2005) *Data Zone* species factsheets. IUCN threat status citations are from these species factsheets.

Briefly, SPEC categories are:

1.Species that are Globally Threatened (Category in Bold in the annotated list).

2. European species that have Unfavourable Conservation Status.

3. Global Species that have Unfavourable Conservation Status in Europe.

4. Species that have Favourable Conservation Status in Europe, but whose populations are mainly in Europe.

NB Non-SPEC generally means that a species has Favourable Conservation Status in Europe, and it may have the majority of its population outside Europe. The suffix 'W' added to any status term refers to the wintering population. Any status term in brackets, *eg* (Vulnerable), indicates that more extensive studies are required to confirm the term required, although the bulk of the evidence available

supports the designation. 'Localized' means that the threat applies in only parts of the species' range. IUCN Red List (2004) status is also given. Other abbreviations adopted are:
bp = breeding pairs; kbp = thousand bp, Mbp = million bp; ind = individuals; BLI = BirdLife International; Wet Int = Wetlands International; LC = Least Concern (IUCN Red List status worldwide); ww = worldwide

The worldwide status of a species has been taken from BLI 2004.

Whooper Swan *Cygnus cygnus.* SPEC 4, Secure, LC (BLI 2004). 180k ind ww (Wet Int 2002a). Recorded on Lochs Gorm, Indaal and Gruinart. Group of 50 was max count.
Greenland White-fronted Goose *Anser albifrons flavirostris.* SPEC 4, Secure, LC (BLI 2004). *c*3M ind (all ssp) ww, 27k *flavirostris*, (Wet Int 2002b). Up to 10 000 throughout Islay.
Barnacle Goose *Branta leucopsis.* SPEC 4B & 2W, Localised W, LC (BLI 2004). 440k ind ww, 54k Greenland popn

Darvic colour rings noted			
Left leg	*Right leg*	*Left leg*	*Right leg*
White	White BA1 (up leg)	White	TFS
White	White V1N (up leg)	BTO below Green	DIN
VJ2	White		

(Wet Int 2002c). Flocks of up to 10 000 were spread throughout Islay. Flock size significantly larger than White-fronted Goose *Anser albifrons.*

(Greater) Scaup *Aythya marila.* SPEC 3W, Localised W, LC (BLI 2004). *c*1.4M ind ww (Wet Int 2002d). 300 Loch Indaal 28th & 29th.
Long-tailed Duck *Clangula hyemalis.* Non-SPEC, Secure, LC (BLI 2004). *c*7.5M ind ww (Wet Int 2002e). Two Bowmore Harbour, two on Loch Gorm throughout period.
Red-throated Diver (Loon) *Gavia stellata.* SPEC 3, Vulnerable, LC (BLI 2004). 0.49-1.5M ind ww (Wet Int 2002f). Two on 25th.
Black-throated Diver (Arctic Loon) *Gavia arctica.* SPEC 3, Vulnerable, LC (BLI 2004). 0.13-2M ind ww (Wet Int 2002g). One 25th, one juvenile Bruchladdich 8th, 6 between Port Ellen & Kennacraig 30th.
Great Northern Diver (Common Loon) *Gavia immer.* Non-SPEC, Secure, LC (BLI 2004). 580k ind ww (Wet Int 2002h). Five Loch Indaal 25th, with singles 27th & 29th & one near Ardbeg on 29th.
Hen Harrier *Circus cyaneus.* SPEC 3, Vulnerable, LC, 1.3M ind ww (BLI 2004). Ringtail RSPB Loch Gruinart 24th, four 27th & a pair Loch Gorm 28th.
Common Buzzard *Buteo buteo.* Non-SPEC, Secure, LC, 4M ind ww (BLI 2004). Common all over Islay.
Golden Eagle *Aquila chrysaetos.* SPEC 3, Rare, LC, 250 000 ind ww (BLI 2004). Two soaring above cliff behind our accommodation 25th. Three 25th (two Kilchoman), one over Sunderland Farm & two between RSPB and Ardnave 27th.
Merlin *Falco columbarius.* Non-SPEC, Secure, LC, 0.1M-1M ind ww (BLI 2004). 24th at Coull Farm, two 26th, One Loch Indaal 27th & one Loch Gruinart 28th.
Peregrine *Falco peregrinus.* SPEC 3, Rare, LC, 10k-100k ind ww (BLI 2004). One Kilchoman 25th, four 26th.
Black Guillemot *Cepphus grylle.* SPEC 2, Declining, LC 400k-700k ind ww (BLI 2004). Recorded near Islay only from the ferry.
Stock Dove *Columba oenas.* SPEC 4, Secure, LC, 1.2M-1.6M ind Europe (BLI 2004). Locally uncommon; only record 45 Portnahaven 28th.
Barn Owl *Tyto alba.* SPEC 3, Declining, LC, 4.9M ind ww. (BLI 2004). Three on roadside (B8018) fence posts at 2200 on our return from RSPB visitor centre 25th.
Great Spotted Woodpecker *Dendrocopos major.* Non-Spec, Secure, LC, 24M-37M ind Europe (BLI 2004). Near the River Sorn by the Woollen Mill, Bridgend Woods 27th.
(Bohemian) Waxwing *Bombycilla garrulus.* Non-SPEC, (Secure), LC, 2.8M ind ww (BLI 2004). A flock of 26 were at Port Charlotte 25th.
(White-bellied) Dipper *Cinclus cinclus.* Non-SPEC, (Secure), LC, 330k-660k ind Europe (BLI 2004) The River Sorn in Bridgend Woods is a regular haunt.
Fieldfare *Turdus pilaris.* SPEC 4W, Secure, LC, 28M-48M ind Europe (BLI 2004). At least 1000 throughout the period.
Redwing *Turdus iliacus.* SPEC 4W, Secure, LC, 31M-42M ind Europe (BLI 2004). At least 1000 throughout the period.
Red-billed Chough *Pyrrhocorax pyrrhocorax.* SPEC 3, Vulnerable, LC, 86k-210k ind Europe (BLI 2004). Over 100 present. 30 at Ardnave Point 28th. Breeding on cliff behind our accommodation. *Colour ring:* Left leg red over green, right leg white over BTO ring.
Hooded Crow *Corvus cornix.* Not differentiated from Carrion Crow *C. corone* in SPEC category or IUCN Red List status. Non-SPEC, Secure, LC, 14M-34M ind Europe (BLI 2004). Not difficult to find. Included here following the recent BOU decision that it is now a full species on the impeccable grounds that the hybrid zone between it and **Carrion Crow** *C. corone* does not vary in size, although it has often shifted gradually in one direction or another.
Eurasian Siskin *Carduelis spinus.* SPEC 4, Secure, LC, 20M-36M Europe (BLI 2004). One only, in the woods between Ballygrant and Port Askaig.
Twite *Carduelis flavirostris.* Non-SPEC, Secure, LC, 340k- 1.5M Europe (BLI 2004). 20 on 24th, two 25th & 20 on 26th.

Weather

During Islay Mist 04, the weather was generally mild for the time of year, rainfall being limited to overnight showers. Apart from a strong easterly wind on 27 Oct, winds were generally light and the weather relatively fine. On both ferry crossings the sea was flat calm. As a result, we noted no particular effects of weather on the presence and behaviour of birds.

Conclusions

As with the RAFOS expedition to Bardsey in 2003 (this issue), our system of concentrated effort over a short period made Islay Mist 04 successful. Team members did develop and improve their ornithological skills. Participants gained enormously from the experience. We passed a full list of observations to the Islay Wildlife Information Centre (at their request) and to the RSPB at Loch Gruinart. The latter had particularly asked that leg rings on Barnacle Geese should be reported. Islay, being a relatively large island, has good modern facilities, and so the arduous aspect of the expedition was limited to the fieldwork. That said, the weather during our visit was unseasonably good, and we were extremely lucky to experience a flat calm sea state on both ferry trips. Poorer weather conditions would have made Islay Mist 04 much more testing. Islay Mist 04 had been scheduled to observe autumn migrants and winter visitors to the island, but Islay also has an interesting variety of spring and summer migrants and breeding birds. RAFOS intends to mount Islay Mist 06 in May 2006 to observe these species, which include breeding waders. RAFOS will also explore the possibility of carrying out work for conservation agencies associated with Islay, perhaps on one or more of the IBAs.

Appendices

1. Islay Important Bird Areas
2. Islay Mist 04 Species Lists
3. Islay Mist 04 Team Members

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2002a. *Cygnus cygnus* Whooper Swan, p70.
2002b. *Anser albifrons* (Greater) White-fronted Goose, p72.
2002c. *Branta leucopsis* Barnacle Goose, p74.
2002d. *Aythya marila* (Greater) Scaup, p95.
2002e. *Clangula hyemalis* Long-tailed Duck, p97.
2002f. *Gavia immer* Great Northern Diver (Common Loon). p22.
2002g. *Gavia stellata* Red-throated Diver (Loon). p22.
2002h. *Gavia arctica* Black-throated Diver (Arctic Loon). p22.

Secondary Reference

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Appendix I

Islay Important Bird Areas

IBA 135: Eilean na Muice Dhuib

Central coordinates: 6.2667°W, 55.7°N. ***Area:*** 574ha. ***Altitude:*** 15-30m asl. ***Criteria:*** B1i, B2, C2, C3, C6. (For definitions of these criteria, see Secondary Reference given above.)

Site description: The site is bounded by the Rivers Duich and Laggan and two roads, and comprises a relatively undisturbed expanse of patterned mire with scattered peaty pools and lochs. These include deep watershed pools, a feature normally associated with more northerly blanket mires. In some areas the vegetation is modified by the trampling and nutrient input of gulls.

Habitats	
Grassland	Humid grasslands
Shrubland	Heathland
Wetlands (inland)	Standing freshwater
	Fens, transition mires and springs

Land-use
Nature conservation and research

Birds: The IBA is important as a roost especially in winter, and as a night feeding area for *Anser albifrons flavirostris*. *Branta leucopsis* are from the Greenland breeding population.
Protection status: *National*, High; *International*, High. IBA partly or wholly overlaps with the following national designated areas. *National Nature Reserve:* Duich Moss. *Site of Special Scientific Interest:* Islay - Eilean na Muice Duibh (Duich Moss). Overlaps with international designated areas: 574 ha of IBA covered by Ramsar Site and by Special Protection Area.

Threats	Rating
Abandonment of land management	Medium
Reduction of land management	Medium
Consequences of animal/plant introductions	Unknown
Disturbance to birds	Unknown
Drainage	High
Extraction industry	High
Infrastructure	Medium

Conservation issues: The spread of *Rhododendron ponticum* poses a threat to the site, as does the possibility of bird strikes caused by a proposed wind power development on adjacent ground. SNH lease part of the IBA and hold management agreements over other areas, enabling them to operate a management plan for the whole site. They have also undertaken positive remedial management, including the damming of drains and restoration of high water-tables.

IBA 169: Laggan

Central coordinates: 6.3°W, 55.7167°N. ***Area:*** 1230ha. ***Altitude:*** 0 - 39m asl. ***Criteria:*** A4i, B1i, B2, C2, C3, C6.

Site description: The IBA includes the rocky headland of Laggan Point, the broad, sandy sweep of Laggan Bay and adjacent *Juncus*-rich grassland.

Habitats	
Grassland	Dry siliceous grassland
	Humid grasslands
Wetlands (inland)	Sand dunes and beaches
	Blanket bogs

Land-use and percentage cover	
Agriculture	95
Forestry	5

Birds: The IBA is important for wintering geese, which come from Eilean na Muice Duibh (135) to feed. *Anser albifrons* are the *flavirostris* subspecies, and *Branta leucopsis* are from the Greenland breeding population. Breeding species of global conservation concern that do not meet IBA criteria: *Crex crex* (2 pairs, 1995, although none present in 1997/98).

Protection status: *National*, High; *International*, High. IBA partly or wholly overlaps the following national designated areas. *Site of Special Scientific Interest:* Laggan Peninsula and Bay.

Species	Season	Year	Min	Max	Quality	Criteria
Greater White-fronted Goose *(Anser albifrons)*	Non-breeding	1997	330	330	Good	B1i, C2, C3
Barnacle Goose *(Branta leucopsis)*	Non-breeding	1997	2760	2760	Good	A4i, B1i, B2, C2, C6
Red-billed Chough *(Pyrrhocorax pyrrhocorax)*	Resident	1988	3	0	Good	C6

Threats and importance	
Agricultural intensification/expansion	Medium
Recreation/tourism	Medium

Overlaps with international designated areas: 1230 ha of IBA covered by Special Protection Area. ***Conservation issues:*** Disturbance caused to waders and terns by visitors is a problem.

IBA 172: Loch Gruinart

Central coordinates: 6.3333°W, 55.8°N. ***Area:*** 3261ha. ***Altitude:*** 0-60m asl. ***Criteria:*** A4i, A4iii, B1i, B2, B3, C2, C3, C4, C6.

Site description The IBA comprises a north-facing sea loch over 5 km in length, and adjacent grassland, heathland, saltmarsh, mudflat and sand-dune habitats.

Habitats	
Artificial landscapes (terrestrial)	Arable land
Forest	Mixed woodland
Grassland	Humid grasslands
	Mesophile grasslands
Sea	Sea inlets and coastal features
Shrubland	Heathland
Wetlands (inland)	Mud flats and sand flats
	Salt marshes
	Sand dunes and beaches
	Standing freshwater
	Rivers and streams
	Blanket bogs

Land-use and percentage cover	
Agriculture	30
Nature conservation and research	30

Birds The site holds 23,200 wintering waterbirds on a regular basis, and is also nationally important for breeding *Crex crex* (globally threatened: 10 pairs, 1995, 2%). *Anser albifrons* are the *flavirostris* subspecies, while *Branta leucopsis* are from the Greenland breeding population.

Species	Season	Year	Min	Max	Quality	Criteria
Whooper Swan *(Cygnus cygnus)*	Non-breeding	1995	135	135	Good	B3
Greater White-fronted Goose *(Anser albifrons)*	Non-breeding	1997	940	940	Good	B1i, C2, C3
Barnacle Goose *(Branta leucopsis)*	Non-breeding	1997	11800	11800	Good	A4i, B1i, B2, C2, C6

Protection status: *National,* High; *International.* High. IBA partly or wholly overlaps with the following national designated areas.

Threats and importance	
Agricultural intensification/expansion	Medium
Aquaculture/fisheries	Unknown
Disturbance to birds	Medium

Reserve: Loch Gruinart-Islay. *Site of Special Scientific Interest:* Gruinart Flats. Overlaps with international designated areas: 3261ha of IBA covered by Special Protection Area and by Ramsar Site. ***Conservation issues:*** The RSPB Reserve has a management plan, with SNH management agreements at Ardnave and Craigens.

IBA 173: Loch Indaal and Bridgend Flats

Central coordinates: 6.25, 55.7667. ***Area:*** 3750ha. ***Altitude:*** 0-15m asl. ***Criteria:*** A4i, B1i, B2, C2, C6.
Site description: The site includes large sea loch of Indaal and the sheltered Bridgend Flats. Saltmarsh and mudflat communities occur that are scarce within the Inner Hebrides.

Habitats and percentage cover		
Sea	87	Sea inlets and coastal features
Wetlands (inland)	13	Mud flats and sand flats Salt marshes

Land-use and percentage cover	
Agriculture	5

Birds: The IBA is important for wintering geese and other wildfowl, and is also nationally important for wintering *Mergus serrator* (160 birds, 2%). *Branta leucopsis* are from the Greenland breeding population.

Species	Season	Year	Min	Max	Quality	Criteria
Barnacle Goose *(Branta leucopsis)*	Non-breeding	1997	10000	10000	Good	A4i, B1i, B2, C2, C6
Greater Scaup *(Aythya marila)*	Non-breeding	1995	975	975	Good	B2

Threats and importance	
Aquaculture/fisheries	Unknown
Infrastructure	High
Other (oil spills)	High

Protection status: *National,* Partial; *International;* Low. IBA partly or wholly overlaps with the following national designated areas. *Sites of Special Scientific Interest:* Islay-Bridgend Flats, Laggan Peninsula and Bay. Overlaps with international designated areas: 331 ha of IBA covered by Special Protection Area and by Ramsar Site (Bridgend Flats, Islay, 331 ha). ***Conservation issues:*** An oil spill in 1996 caused little long-term damage but a recurrence would pose a threat.

IBA 221: The Oa

Central coordinates: 6.2833°W, 55.6167°N. ***Area:*** 4380ha. ***Altitude:*** 0-200m asl. ***Criteria:*** B1i, C2, C3, C6.
Site description: A peninsula in the south-west of Islay, exposed to the prevailing south-westerly weather. This results in a highly oceanic climate with closer ecological affinities to western Ireland than to the rest of Britain. The IBA includes rocky shore, blanket mire, heathland and farmland habitats.

Habitats	
Artificial landscapes (terrestrial)	Arable land
Coastline	Sea cliffs and rocky shores
Shrubland	Heathland
Wetlands (inland)	Blanket bogs

Land-use and percentage cover	
Agriculture	95
Forestry	5

Birds: The site is also important for breeding raptors and other upland species. *Anser albifrons* are the *flavirostris* subspecies.

Species	Season	Year	Min	Max	Quality	Criteria
Greater White-fronted Goose *(Anser albifrons)*	Non-breeding	1989	1490	1490	Good	B1i, C2, C3, C6
Red-billed Chough *(Pyrrhocorax pyrrhocorax)*	Resident	1996	7	7	Good	C6

Threats and importance	
Abandonment or reduction of land management	Unknown to medium
Disturbance to birds	Unknown

Protection status: *National,* None; *International,* None. ***Conservation issues:*** *Pyrrhocorax pyrrhocorax* is vulnerable to disturbance at its nesting and roosting sites, and has been adversely affected by a decline in cattle-grazing levels. The area is a candidate SPA.

IBA 230: Rinns.

Central coordinates: 6.4°W, 55.7667°W. ***Area:*** 12084ha. ***Altitude:*** 0-232m asl. ***Criteria:*** A4i, B1i, B2, C2, C3, C6.
Site description: A mosaic of natural and semi-natural habitats, exposed to the prevailing south-westerly weather and experiencing an oceanic climate. The site consists of low hills running down to a rocky coastline. This area includes three sites that were treated as separate IBAs in the previous international IBA inventory (Grimmett and Jones 1989): 'Islay: Rinns' (former site GB090), 'Islay: Glac na Criche' (former site GB091) and 'Islay: Feur Lochain' (former site GB092).

Habitats and percentage cover	
Artificial landscapes (terrestrial)	Arable land
Coastline	Sea cliffs and rocky shores
Forest	Mixed woodland
Grassland	Humid grasslands Machair
Shrubland	Heathland
Wetlands (inland)	Standing freshwater Blanket bogs

Land-use and percentage cover	
Agriculture	90
urban/industrial/transport	5
Water management	5

Birds: The IBA supports breeding raptors and waders, and wintering geese which come from roosts in other Islay IBAs to feed here. *Anser albifrons* are the *flavirostris* subspecies, and *Branta leucopsis* are from the Greenland breeding population. The site is also nationally important for breeding *Anas crecca* (16bp, 1994, 1%), *Melanitta nigra* (20bp, 1995, 26%) and *Crex crex* (globally threatened: 6bp, 1995, 1%).

Species	Season	Year	Min	Max	Quality	Criteria
Greater White-fronted Goose *(Anser albifrons)*	Non-breeding	1997	2590	2590	Good	B1i, C2, C3, C6
Barnacle Goose *(Branta leucopsis)*	Non-breeding	1997	3640	3640	Good	A4i, B1i, B2, C2, C6
Red-billed Chough *(Pyrrhocorax pyrrhocorax)*	Resident	1994	21	21	Good	B2, C6

Threats and importance	
Abandonment/reduction of land management	Medium
Afforestation	Medium
Agricultural intensification/expansion	Medium
Drainage	Medium
Recreation/tourism	Medium

Protection status: *National,* Partial; *International,* Partial. IBA partly or wholly overlaps with the following national designated areas. *Reserves:* Loch Gruinart, Islay. *Sites of Special Scientific Interest:* Islay - Feur Lochain, Islay - Glac na Criche, Islay - Rinns of Islay. Overlaps with international designated areas: 9407ha of IBA covered by Special Protection Area (Rinns of Islay, 9407ha) and 3586ha of IBA covered by Ramsar Site (Rinns of Islay, 3586ha). ***Conservation issues:*** High-intensity agricultural management and recreational disturbance pose threats to the IBA.

Secondary Reference
(for all the above Islay IBA descriptions)

BirdLife International. 2003. *BirdLife's online World Bird Database: the site for bird conservation.* Version 2.0. Cambridge, UK: BirdLife International: www.birdlife.net (accessed 25/1/2005)

Appendix 2

Islay Mist 04 Species Lists

Bird Species List

The list of bird species mainly covers the period 24-30 October 2004, when all 8 members of Islay Mist 04 were present. Records of sightings for 17-29 October are marked * and are from Fran Eggby and John Stewart-Smith who arrived on Islay on 17 October. Team members are listed at **Appendix 3**. Species sequence follows recent BOU changes (Helbig *et al* 2002).

English Name	Scientific Name
Mute Swan	*Cygnus olor*
Whooper Swan	*Cygnus cygnus*
Pink-footed Goose*	*Anser brachyrhynchus*
Greenland White-fronted Goose	*Anser albifrons flavirostris*
Greylag Goose	*Anser anser*
Canada Goose	*Branta canadensis*
Barnacle Goose	*Branta leucopsis*
Brent Goose	*Branta bernicla*
Northern Shelduck	*Tadorna tadorna*
Eurasian Wigeon	*Anas penelope*
Eurasian Teal	*Anas crecca*
Mallard	*Anas platyrhynchos*
Northern Pintail	*Anas acuta*
Northern Shoveler	*Anas clypeata*
Common Pochard	*Aythya ferina*
Tufted Duck	*Aythya fuligula*
(Greater) Scaup	*Aythya marila*
Common Eider	*Somateria mollissima*
Long-tailed Duck	*Clangula hyemalis*
Common Scoter*	*Melanitta nigra*
Common Goldeneye	*Bucephala clangula*
Red-breasted Merganser	*Mergus serrator*
Ring-necked Pheasant	*Phasianus colchicus*
Red-throated Diver	*Gavia stellata*
Black-throated Diver	*Gavia arctica*
Great Northern Diver	*Gavia immer*
Little Grebe	*Tachybaptus ruficollis*
Great Crested Grebe	*Podiceps cristatus*
Slavonian Grebe	*Podiceps auritus*
Manx Shearwater*	*Puffinus puffinus*
Northern Gannet	*Morus bassanus*
Great Cormorant	*Phalacrocorax carbo*
European Shag	*Phalacrocorax aristotelis*
Grey Heron	*Ardea cinerea*
Hen Harrier	*Circus cyaneus*
Eurasian Sparrowhawk	*Accipiter nisus*
Common Buzzard	*Buteo buteo*
Golden Eagle	*Aquila chrysaetos*
European Kestrel	*Falco tinnunculus*
Merlin	*Falco columbarius*
Peregrine Falcon	*Falco peregrinus*
European Oystercatcher	*Haematopus ostralegus*
Ringed Plover	*Charadrius hiaticula*
Eurasian Golden Plover	*Pluvialis apricaria*
Grey Plover	*Pluvialis squatarola*
Northern Lapwing	*Vanellus vanellus*
(Red) Knot	*Calidris canutus*
Sanderling	*Calidris alba*
Purple Sandpiper	*Calidris maritima*
Dunlin	*Calidris alpina*
Common Snipe	*Gallinago gallinago*
Eurasian Woodcock*	*Scolopax rusticola*
Bar-tailed Godwit	*Limosa lapponica*
Whimbrel*	*Numenius phaeopus*
Eurasian Curlew	*Numenius arquata*
Common Redshank	*Tringa totanus*
(Ruddy) Turnstone	*Arenaria interpres*
Black-headed Gull	*Larus ridibundus*
Common Gull	*Larus canus*
Lesser Black-backed Gull	*Larus fuscus*
Herring Gull	*Larus argentatus argenteus*
Great Black-backed Gull	*Larus marinus*
(Black-legged) Kittiwake	*Rissa tridactyla*
Arctic Tern*	*Sterna paradisaea*
Common Guillemot (Murre)	*Uria aalge*
Razorbill	*Alca torda*
Black Guillemot	*Cepphus grylle*
Little Auk	*Alle alle*
(Atlantic) Puffin	*Fratercula arctica*
Rock Dove	*Columba livia*
Stock Dove	*Columba oenas*
Woodpigeon	*Columba palumbus*
Collared Dove	*Streptopelia decaocto*
Barn Owl	*Tyto alba*
Great Spotted Woodpecker	*Dendrocopos major*
Skylark	*Alauda arvensis*
Barn Swallow	*Hirundo rustica*
Meadow Pipit	*Anthus pratensis*
Rock Pipit	*Anthus petrosus*
Grey Wagtail	*Motacilla cinerea*
Pied Wagtail	*Motacilla alba yarrelli*
(Bohemian) Waxwing	*Bombycilla garrulus*
(White-bellied) Dipper	*Cinclus cinclus*
(Winter) Wren	*Troglodytes troglodytes*
Dunnock	*Prunella modularis*
European Robin	*Erithacus rubecula*
Common Stonechat	*Saxicola torquatus*
Northern Wheatear	*Oenanthe oenanthe*
Eurasian Blackbird	*Turdus merula*
Fieldfare	*Turdus pilaris*
Song Thrush	*Turdus philomelos*
Redwing	*Turdus iliacus*
Mistle Thrush	*Turdus viscivorus*
Blackcap	*Sylvia atricapilla*
Common Chiffchaff*	*Phylloscopus collybita*
Goldcrest	*Regulus regulus*
Long-tailed Tit	*Aegithalos caudatus*
Coal Tit	*Periparus ater*
Blue Tit	*Cyanistes caeruleus*
Great Tit	*Parus major*
Eurasian Treecreeper	*Certhia familiaris*
Red-billed Chough	*Pyrrhocorax pyrrhocorax*
Eurasian Jackdaw	*Corvus monedula*
Rook	*Corvus frugilegus*
Carrion Crow	*Corvus corone*
Hooded Crow	*Corvus cornix*
Common Raven	*Corvus corax*
European Starling	*Sturnus vulgaris*
House Sparrow	*Passer domesticus*
European Chaffinch	*Fringilla coelebs*
Brambling	*Fringilla montifringilla*
European Greenfinch	*Carduelis chloris*
European Goldfinch	*Carduelis carduelis*
Eurasian Siskin	*Carduelis spinus*
Eurasian Linnet	*Carduelis cannabina*
Twite	*Carduelis flavirostris*
Lesser Redpoll	*Carduelis flammea cabaret*
Eurasian Bullfinch	*Pyrrhula pyrrhula*
Snow Bunting	*Plectrophenax nivalis*
Yellowhammer	*Emberiza citrinella*
Reed Bunting	*Emberiza schoeniclus*

Mammal Species List (Names and taxonomy from Macdonald, 2001).

English Name	Scientific Name	Comments
European River otter	*Lutra lutra*	Two sightings in sea off Port Ellen and Loch Gruinart
Atlantic Grey Seal	*Halicherus grypus*	On most offshore rocks; 60 between Ardbeg and Claggain Bay on 29th
Red deer	*Cervus elephus*	Up to seven seen daily
Roe deer	*Capreolus capreolus*	Two, and a herd of seven
Feral Goat	*Capra aegargus hircus*	One on the Oa
Norway (Brown) Rat	*Rattus norvegicus*	Seen twice
European (Brown) hare	*Lepus europaeus*	Present in good numbers all over Islay
European rabbit	*Oryctolagus cuniculus*	Busy warren above Machir bay
Notable Insect Species		
Peacock Butterfly	*Inachis io*	One on 26th

Appendix 3

Team members (all RAFOS) on Islay Mist 04 from 23 to 30 Oct 04

Sqn Ldr Ian Drake
Ms Fran Eggby
Wg Cdr (Ret'd) Bill Francis - Team Leader
Sqn Ldr (Ret'd) Dick Knight
Mrs Jan Knight
Mr John Le Gassick
Sqn Ldr (Ret'd) Tony Marter
Sqn Ldr (Ret'd) John Stewart-Smith

John Stewart-Smith and Fran Eggby were on Islay from 17-30 Oct 04.

List of Contacts

AOS President Field Marshal Sir John Chapple

AOS Contacts
The Committee of The Army Ornithological Society

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Conservation Member	Maj (Retd) RHJ Nash
Nest Box Scheme	Mr KJ Powrie
RNBWS Secretary	Frank Ward

RAFOS President Air Chief Marshal Sir Joe French

RAFOS Contacts

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Field Activities Liaison Officer (FALO)	Sqn Ldr I P Drake BA RAF (Ian)
Journal Editor *(Osprey)*	Sqn Ldr (Ret'd) M J Blair BSc (Mike)
Publicity Member	FS J N Wells MISTC (John)
Librarian	Mr P R Leaver BSc, Dip Poll Con, MMS (Peter)
Production Manager	Sqn Ldr (Ret'd) R Yates (Dick)
Webmaster (Nov 03)	Mr G Candelin (George)
Scientific Adviser **Dr A G Gosler (Andy)**	
Ringing Co-ordinator	Mr C P Wearn (Colin)

Bird Gallery

Morepork *Ninox novaeseelandiae*. Kaikoura, New Zealand, October 2004.Copyright Mike Blair.

Lesser Golden Plover *Pluvialis dominica fulva*, Cyprus 2004. Copyright J Wilson.

Saddleback *Creadion carunculata*. Endemic. Tiritiri-Matangi NI-NZ Oct 04. Copyright Mike Blair.

Takahe *Porphyrio mantelli*. Tiritiri-Matangi Island, New Zealand 2004. Copyright Mike Blair.

Wild Turkey *Meleagris gallopavo*. Texas, April 2004. Copyright Tim Hallchurch.