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THREATS TO WILDLIFE IN GREENLAND

After only three decades of unrestricted-hunting of birds, fishes, and marine mammals, Greenland's great Arctic larder is being used up. Modern hunting techniques, including speedboats, larger vessels and sophisticated telecommunications and tracking devices, enable the professional hunters and fishermen of today to exploit an ever-larger quantity of wildlife. According to the Wildlife Institute of Greenland, almost all exploited species are endangered, except for Shrimp and Reindeer, for which strict quotas have been in place for a number of years.

Although only 2,704 professional and 8,317 amateur hunters are registered in Greenland, large numbers of animals are hunted. The most recent hunting statistics, from 1997, record the annual number of animals hunted as: 236,364 guillemots, 76,985 Eiders, 49,220 Little Auks, 53,086 Kittiwakes, 41,607 Ptarmigans, 160,000 Seals, 2,755 Reindeers, 563 Musk Oxen, 149 Polar Bears, 3,724 Hares, 794 Narwhales, 568 Belugas, 1,592 Porpoises and 317 Walruses. Research indicates that these figures probably represent only half of the actual numbers taken.

The majestic bird cliffs in Disko Bay and the southern part of Upernivik were once inhabited by hundreds of thousands of Brünnich's Guillemots. During the short Arctic summer, more than 100,000 Guillemots produced game in

abundance for the Greenlandic hunters year after year. Today only a few thousand birds cower up on the sheer mountain sides. The exploitation of the Brünnich's Guillemots at Upernivik has been researched and documented in detail. In 1974, the breeding population of this species in the area was reported to be *c*43,000. However, by 1998 this number had plummeted to *c*6,800 birds (Figure 1).

The Brünnich's Guillemot is the most important game bird in Greenland, despite having a life-history that renders it unsuitable for hunting.



Breeding is initiated at a minimum of five years of age, and each breeding pair produces no more than one fledgling a year; further, the birds use the same breeding area for life, which means that these colonies are extremely vulnerable to hunting and disturbance during the breeding season. Using small boats, hunters approach the colonies from under the sheer cliffs, and with rifles or shotguns, they shoot and kill nesting birds in great numbers.

Despite a ban on hunting Guillemots from June 1st to August 31st, and a ban on shooting from a distance closer than 5 km from the breeding colonies, illegal hunting in summer is considered to be the main cause of the decline of this species.

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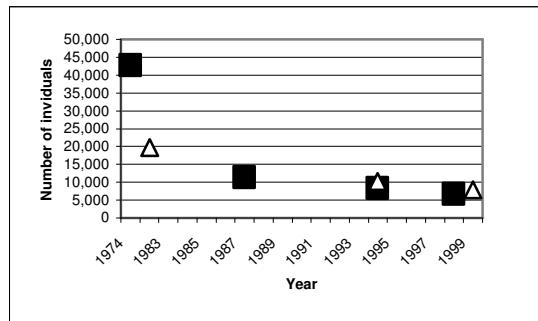


Figure 1 –
Changes in the numbers of Brünnich's Guillemots
in the district of Upernivik (squares), and the
numbers of Belugas (triangles) estimated to winter
off Western Greenland (Pinngortitaleriffik,
The Wildlife Institute of Greenland data)

In total, more than 250,000 Brünnich's Guillemots are shot annually in Greenland, including a large number of wintering birds from Canada, Svalbard, Iceland and Norway.

Due to large-scale collecting of eggs, Greenland has lost the world's largest colony of Arctic Terns. An estimated 50,000-80,000 birds once nested in the archipelago named Grønne Ejland. In 1996, the Wildlife Institute of Greenland carried out a survey of populations in the whole of the Disko Bay area and the count revealed that only c5,000 pairs were now breeding on Grønne Ejland. Since 1961, the Greenland hunting law has permitted people to gather Arctic Tern eggs before July 1st for private consumption only; resale is strictly prohibited. The Greenlandic Parliament, however, in the spring of 2000 unanimously agreed to allow professional hunters to take and sell eggs from two different species of gulls. This decision to open the market to commercial egg-collecting was taken in spite of warnings from the Wildlife Institute of Greenland that this would cause an increased pressure on the already depleted seabird colonies.

The same story applies to the formerly huge colonies of breeding Eiders in Greenland. The breeding population has been drastically reduced, and today only a few scattered breeding pairs can be found. For centuries, hunters have gathered eggs and killed brooding hens, but in the last decade this over-exploitation has escalated out of control. Officially c5,000 King Eiders are also shot annually in Greenland,

which corresponds to around 6-7% of the total number of Eiders hunted, but research suggests that the percentage of King Eiders is far greater. It is likely that the large number of wintering and moulting King Eiders killed in Greenland has affected the breeding populations in Canada, where the total number has declined drastically.

The fate of the Beluga (Figure 1) is similar to that of all marine mammals along the coast of western Greenland. The *mattak* (whale blubber) derived from the Beluga commands an extremely high price. It is sold in supermarkets and at the local outdoor markets or 'brættet' for prices in the range of 100 Danish kroner (c12 US\$) per kilo. In 1998, according to the Greenlandic Department of Statistics, c19,734 kilos of *mattak* were traded. The Beluga was extirpated from the fjords of Western Greenland some 70 years ago, and from the area around Nuuk in the 1920s. In the last 20 years, over-exploitation has increased and biologists estimate that the current population is half its 1980 size. Around 700 Belugas are killed annually. If this level continues, the species is likely to disappear from Greenland within the next 20 years. Similarly, Walruses have disappeared from most localities along the west coast and the wintering population is now as low as c500 animals. Polar Bears are also long-gone, and a number of fish species have stocks that are severely threatened.

The last 30 years of unregulated hunting have been very discouraging. If a large number of species disappear from Greenland's landscape, tourism is sure to suffer and professional hunters risk losing their own livelihoods. But the solution is not only about regulating hunting. It will also be necessary to gain more knowledge of the population status of, and hunting pressures on, these species, through detailed research, before effective action can be taken. The Greenland Government has also failed to initiate any kind of conservation action in the areas designated under the Ramsar Convention in 1987; at least one has already lost its original significance as a moulting area for King Eider because of uncontrolled hunting of the birds and a mussel fishery.

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THE SEYCHELLES SOOTY TERN PROJECT - past, present and future

In 1971 George Dunnet, then Professor of Zoology at the University of Aberdeen, obtained a NERC grant to enable a study of the biology of Seychelles Sooty Terns, whose populations were allegedly declining through over-exploitation of their eggs. These were considered by some to represent an important nutritional supplement for local people in June-July, when seas are rough and fish in short supply. I was the fortunate youngster to whom George offered the study, and during 1972 and 1973 I undertook basic studies of the birds' biology, little expecting to be still looking for ringed birds 30 years later!

The early 1970s study provided a basis on which the egg industry could be re-organised in an attempt to ensure that the annual harvest could be sustainable, but assumptions about some aspects of Sooty Tern life had to be made. For example, only longer-term studies could throw light on the birds' annual survival, age at first breeding, habitat needs and the extent of inter-colony movements of adult and young birds.

In 1993 the Seychelles Government decided to stimulate further research to test some of the assumptions made earlier. This stimulus did not extend to funding at that stage, however, and the initiation of this phase of the work was achieved through grants and other assistance from the Royal Society, Percy Sladen Memorial Fund, the Seabird Group, Air Seychelles, British Airways for Nature Conservation, the Islands Development Company and Bird Island Lodge. Bird Island hosts the large colony where most of the current work is undertaken, and the continuing support and interest from the owners is invaluable for the continuation of these long-term studies.

The early funding from these bodies allowed the purchase of large numbers of rings that were put on adults and pulli in the main colonies of the Seychelles and Amirantes. Subsequently, using finance from the Dutch Trust Fund, the Division of Environment of the Seychelles Ministry of Environment and Transport was able to support my visits, sometimes with an assistant, although our time was, and continues to be, volunteered.

The main thrust of my annual visits during the incubation phase of the nesting cycle is to search the Bird Island colony for ringed birds in order to collect data for the estimation of annual survival, age at first breeding and inter-colony movements of both young birds and established breeders. Each year, about 200 ringed birds are found (thought to represent about 10% of the ringed birds present in the colony), mainly from cohorts marked in 1993-1997 on Bird Island, but also including birds ringed during the 1972 and 1973 seasons, and birds ringed in other colonies. Unfortunately, it has not proved possible to search other colonies where large numbers of birds have been ringed. Nevertheless, the ringing of these birds, ring searches on Bird Island, and associated studies of movements of radio-tagged birds and of habitat requirements of nesting birds have enabled staff from the Division of Environment to be trained in many aspects of the practical studies and their theoretical background.



**Elvina Henriette, Division of Environment,
registering the ring number of a Sooty Tern
on Bird Island**

The current studies have now shown that established breeding adults sometimes switch colonies between breeding seasons, the most likely stimuli for these moves being human disturbance of nesting birds, associated with both legal and illegal harvesting of eggs, and changes in the distribution of food sources in the vicinity of large colonies. This suggests that colonies in the Seychelles and Amirantes form units of a metapopulation, but the geographical extent of this population over the western Indian Ocean, and thus the source of potential recruits to Seychelles colonies, remains to be established. The youngest ringed Sooty Tern found breeding is four years old, and the data available so far suggest that most birds first return to breed between 6 and 8 years old. This is similar to findings in colonies that have been

studied on the Dry Tortugas, Florida, and on Johnston Atoll, Hawaii, and suggests that the level of egg exploitation in the Seychelles is not leading to earlier breeding of young birds. Preliminary analyses of re-sighting data of ringed birds on Bird Island are indicating an annual survival approaching 90%, but the survival of juveniles between fledging and their return as breeding adults is unknown.

These findings approximate closely to the assumptions I made in 1973 when making suggestions for the re-organisation of the egg industry but, as knowledge increases, refinements to the calculations of permissible harvest will be made. During the course of the present studies, however, a change in policy was proposed in 1997.



Cases of Sooty Tern eggs on the beach of Desnoeufs Island, awaiting transport to the markets on the central Seychelles islands. Each case contains 300 eggs, supported on egg trays and sealed in polythene to prevent seawater ingress.

In 1997, the price of Sooty Tern eggs was increased in order to more properly reflect the value of this resource to the Seychellois. At the same time, a levy of 15% was placed on egg sales, the funding so generated going to the Division of Environment to support monitoring of the egg harvest and of the size of exploited

colonies, and the protection from illegal cropping of otherwise unprotected colonies. The aim is to make the running of the egg industry by the Islands Development Company, and the administration and policing of associated conservation regulations by the Division of Environment, self-sustaining.

The presence of such a large number of ringed Sooty terns in Seychelles colonies represents a valuable resource, and annual searches for these birds will continue to be the main component of study until the pattern of return of pulli ringed in 1997 has been established. In addition, however, studies have begun on the potential for re-establishing Sooty Tern colonies on islands from which they formerly disappeared; these studies involve the management of appropriate habitats on these islands, including eradication of exotic predators, and the responses of adult birds to decoy models and broadcast calls. Further into the future, the tracking of birds away from their colonies, both when feeding and during dispersal/migration, will help to highlight any threats to the birds while at sea. Continued monitoring of populations and the egg harvest will identify any needs to modify harvest strategy in the light of such threats.

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AMMONIA EMISSIONS FROM SEABIRD COLONIES

Ammonia (NH_3) is an important agent of environmental perturbation owing to its potential to cause both eutrophication and acidification in ecosystems. Breeding seabird populations are likely to be significant emitters of NH_3 , not only because they occur in high densities, but also because they import large quantities of nitrogen from their offshore feeding grounds. The excretion of these nutrients may, under suitable meteorological conditions, result in large emissions of NH_3 into the atmosphere.

In a project funded under the NERC GANE (Global Nitrogen Enrichment) thematic programme, we have been studying NH_3 emissions from two seabird colonies in the Firth of Forth, SE Scotland – the Isle of May and Bass Rock. Various methods have been employed to measure atmospheric NH_3 concentrations both on and offshore from the colonies. Additionally, plant surveys have been undertaken to investigate the effect of ornithogenic nitrogen enrichment at the colonies.

The first method employed to measure atmospheric NH_3 concentrations involves

ALPHA (Adapted Low-cost Passive High Absorption) passive samplers, deployed on a monthly basis at the Isle of May from Mid April 2000 until the present time. The ALPHA sampler consists of a circular polyethylene tube with one open end, attached by Velcro to a support on a post approximately 0.75 m above the ground. The tube contains an acid-coated filter paper; this captures ammonia from the air, which diffuses through a PTFE membrane at the open end. As the diffusion path length and area are known, in addition to the length of the exposure period, it is possible to calculate the concentration of atmospheric NH_3 as an integrated average for the exposure period.



An NH_3 monitoring location with ALPHA samplers visible, at the top of cliffs

The passive sampler NH_3 monitoring campaign on the Isle of May was designed to give an idea of the variability in atmospheric NH_3 concentration near birds with differing nesting behaviour. Sites included those predominantly inhabited by Guillemots/Razorbills, Puffins, gulls, Kittiwakes, and Shags, in addition to sampling NH_3 in areas with few birds present or at significant distance from the ALPHA samplers (control sites).

The results observed so far support the hypothesis that most emissions of NH_3 on the Isle of May are from areas inhabited by breeding Guillemots/Razorbills, as a result of their nesting behaviour. As these species breed on bare-rock cliffs, the NH_3 content of the guano they deposit at the colony will remain available for volatilisation, even after their departure from the island at the end of the breeding season. Conversely, Puffins spend less time above ground at the colony and are therefore less likely

to deposit guano in a way that its NH₃ content may be readily volatilised.

Atmospheric NH₃ concentration near the Puffin colony was much lower than that observed above the Guillemot cliffs. This may also be a result of lower bird density in the Puffin colony (per unit space) and their smaller size.

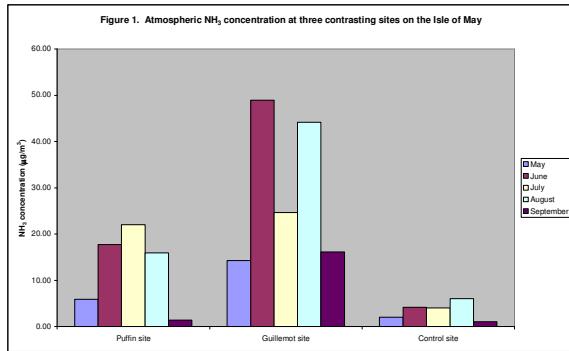


Figure 1 shows the variations in atmospheric NH₃ concentration at passive monitoring locations near Puffins, Guillemots and at a ‘control’ site. It is clear that emissions are higher from the Guillemot colony than from the Puffin colony. The decrease in atmospheric NH₃ concentration at the Guillemot site from June to July can be accounted for by wind direction. During July the wind direction was generally blowing emissions from the Guillemot cliffs out to sea rather than to the passive samplers, which were located at the top of the cliffs.



Guillemots below an atmospheric NH₃ monitoring location on the Isle of May

NH₃ concentrations were highest during the main period of bird occupancy at the colony (June/July) but still remained high for one month after the departure of the birds in mid-July. This suggests that guano deposited at the colony may retain its NH₃ content for some time until meteorological conditions are favourable for its volatilisation to the atmosphere. This ‘lag’ in NH₃ emissions is an interesting effect and one that requires further investigation.

Atmospheric NH₃ concentrations predicted from a model based on factors such as bird numbers, colony attendance and nesting behaviour. The results of the passive NH₃ sampling correlate well with the predictions based on population factors (highest predicted emissions being near Guillemot breeding cliffs).



The AMANDA NH₃ system set up on a boat - measurements were made along transects perpendicular to the wind, downwind of the colony

Real-time atmospheric NH₃ measurements were made offshore from the Isle of May and used in conjunction with a Gaussian plume dispersion model. This method gave NH₃ emission estimates for the Isle of May of 3 ± 0.8 tonnes NH₃ per year based on July 2000 data, and 6 ± 6 tonnes NH₃ per year based on May 2000 data. These figures correlate well with those produced using data on bird numbers, colony attendance and nesting behaviour (8.67 tonnes NH₃ per year for the Isle of May). These data may also be compared with those produced by Sutton *et al* (2000), which gives a figure of 48 tonnes NH₃ per year for the Isle of May. This estimate uses the same calculation method as the above estimate of 8.67 tonnes per year but without considering the effect of nesting behaviour, thus illuminating the importance of this factor to seabird NH₃ emissions.



Puffins near an atmospheric NH₃ monitoring location on the Isle of May

Work during the 2001 field season has concentrated on making offshore measurements of atmospheric NH₃ concentrations and using a tracer gas, sulphur hexafluoride (SF₆), to produce NH₃ emission estimates for the Isle of May and Bass Rock. Additionally, surveys have been undertaken on the Isle of May and Handa Island, Sutherland, to assess the impact of ornithogenic nitrogen inputs on plant communities. The ultimate aim of this project is to scale up what we learn at the Isle of May and Bass Rock to produce figures for seabird NH₃ emissions both in the UK and globally.

Reference:

Sutton, M.A., Dragosits, U., Tang, Y.S. & Fowler, D. (2000) Ammonia emissions from non-agricultural sources in the UK. *Atmospheric Environment* **34**, 855-869.

Trevor Blackall

This is a collaborative project involving Trevor Blackall, Sarah Wanless, Phil Bacon, Jenny Bull and Linda Wilson (CEH, Banchory), Mark Sutton, Celia Mundford, Sim Tang, Mark Theobald and Ken Hargreaves (CEH, Edinburgh) and Keith Hamer (University of Durham).

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MONITORING FRIGATEBIRDS ON ASCENSION ISLAND

A mere 200 years ago, the coastal plain of Ascension was covered with millions of seabirds that nested on the ash and basalt of this otherwise barren island. Among them were Ascension Frigatebirds, a species that is unique to the island. Now only ghosts of the colonies remain, the fading guano on the rocks a pale reminder of former seabird distribution.

This catastrophe was caused by the introduction of cats in 1812, which multiplied, became feral and inflicted massive mortality on the seabirds. Within decades, Ascension Frigatebirds were extirpated to the 1.2 ha plateau of Boatswain Bird Island (BBI). This island is separated from the mainland by 500 yards of sea that cats have never crossed. Competition for space is intense and the population is limited by nest site availability. The cliffs opposite BBI are littered with corpses of frigatebirds that have roosted on accessible ledges, so cats are preventing recolonisation of the main island.



A pair of courting Ascension Frigatebirds

The RSPB and the Foreign Office have initiated an ambitious project to restore Ascension's seabird colonies by removing feral cats from the main island. A team of New Zealanders, lead by Mike Bell, will initiate this work in January 2002 and it is scheduled to last for a year. Eradication will be achieved by trapping, shooting and poisoning. It is hoped that once cats have been removed, seabirds will rapidly recolonise the mainland, and reduced competition for nest sites will improve productivity, thus promoting population growth.

To establish the success of the project, the status and productivity of seabirds needs to be monitored.



Boatswain Bird Island

Counting seabirds in the tropics is not as straightforward as in Britain and Ireland, where counts of all species in mid-June will generally produce a reasonable population estimate. Frigatebirds on Ascension nest all year round, although there is a distinct peak of laying in autumn. Therefore, even at the peak of laying, only around 30% of the birds are present to be counted. To overcome this problem, we conduct counts of eggs every 50 days, over which period eggs that have previously been counted will have hatched or failed. These counts can be summed over the year to produce a total number of eggs for the year.

Nest failure rates are high on BBI, with only 40% of eggs hatching. Therefore, the egg censuses will be underestimates due to nests being initiated and failing between the censuses. Ten 100m² study plots have been set up in the colony, and are visited every 2 weeks. Any nests found in these are marked and their fates are monitored on subsequent visits. Daily nest survival rates can then be used to determine the number of eggs lost between the censuses. The nest survival studies are continued through the six-month fledging period to determine fledging success.

Frigatebirds will relay after their nests fail, with the long breeding period giving them ample opportunities to do so. This will cause overestimates of population status and underestimates of productivity. Estimating relaying rates requires individual marking of birds, but the short, feathered tarsi of frigatebirds

make fitting and reading rings problematical. We have fitted birds with PIT tags instead, which are injected into the nape of the neck and can be read using a hand-held receiver. A blob of hair bleach is put on the head so that PIT-tagged birds can be picked out visually from unmarked birds. Searches for PIT-tagged birds are conducted each visit to determine renesting rates, which can then be used to adjust survey totals and give estimates of numbers of breeding females rather than numbers of nesting attempts.



The author scanning a PIT tag in the neck of an Ascension Frigatebird

Female frigatebirds invest remarkable degrees of post-fledging care of several months duration. This means that successful breeders can only breed biennially. Estimates of productivity and the monitoring of PIT-tagged individuals will enable estimation of the number of females that are not breeding in a year owing to success in the previous one.

Maybe in a few years time Ascension Frigatebirds will raise chicks successfully on the mainland of Ascension for the first time in 200 years, founding expanding populations that will once again carpet the coastal plain in the next century. It will be an astounding sight if we achieve this goal, and Ascension will enter history as a major conservation success.

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BREEDING GANNETS IN THE MEDITERRANEAN

The breeding range of the Northern Gannet (*Sula bassanus*) is centred on the North Atlantic, south to the coasts of Quebec and Norway and in Iceland and the UK. Gannets have bred since 1939 on Rouzic in the Sept Iles island group (Côte d'Armor), where in 2000 there were 15,122 breeding pairs (Gilles Bentz, pers. comm.). Until recently, this was the only breeding site for the species in France. Previously Gannets had only visited the Mediterranean in winter but recently they began to visit small coastal ports in the south of France regularly in the spring.



Gannets in the south of France

Gannets showed 'interest' in nesting on boats in Port-Frioul in 1993 and Pointe Rouge, Marseille in 1994. The first outline of a nest appeared at Sausset les Pins in 1995 but was quickly abandoned. In 1996, eight pairs frequented the port of Bandol regularly from mid-February and several pairs attempted to breed. The first nest, on a tarpaulin covering a boat, was destroyed by torrential rains in March. Then a pair built a nest on the beach in front of a large motor launch, the *Santa Manza* and, with the cooperation of the boat's owners and the port authorities, an egg was laid on 16 April and young hatched on 31 May. On 7 June, it was necessary to attempt to move the nest onto a raft but unfortunately the parents abandoned the nestling immediately; the chick was raised at a rescue centre and was later released at Bandol.

In 1997, Gannets were again observed around Bandol but none attempted to breed. In 1998, Bandol was regularly visited from mid-January and six individuals were seen regularly. Several

nests were built on a boat, *Le Sagittaire*, and matings were observed. On 15 April, nesting material was transferred successfully onto a different boat, named '*Bassanus*'. The birds accepted the new boat after only 45 minutes, and a large nest was constructed the same night. Mating was noted in mid-May on another boat but the owner quickly put out ropes to stop the birds from building a nest. On the *Bassanus*, a bird appeared to be incubating intensely, and a chick hatched on 25 June. The pair were observed two days later protecting and 'ventilating' the chick from stifling heat but on the morning of the 30 June the chick had disappeared from the nest, though the nest was intact. Even after examination of the nest, there was no sign of predation or vandalism and the cause of failure was never found.

Gannets constructed outline nests on three boats in 1999 but, once again, this provoked anger amongst some yachtsmen.



BTO-ringed Gannet in the south of France

Gilles Bentz kindly sent me some slides, which show that one of the Bandol Gannets is ringed with what is almost certainly a BTO ring. Unfortunately, we have so far been unable to accurately read the ring number but news will follow if we can work out from which colony the Gannet came. Further information on the French Gannets can be found in:-

Bouillot, M. (1999) Le fou de Bassan niche en Méditerranée. *L'Oiseau Magazine*, **54**, 17.

I am very grateful to Michel Bouillot for allowing me to reproduce some of his photographs in this article and to Gilles Bentz for initially sending me the story.

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A POOR BREEDING SEASON FOR SCOTTISH SEABIRDS IN 2001?

YET ANOTHER POOR BREEDING SEASON IN SHETLAND

No great gales this summer in Shetland, but an apparent scarcity of sandeels from mid-June onwards resulted in a very poor breeding season for many of Shetland's seabirds. Things were initially going quite well, but by late May there were warning signs, with a scarcity of Porpoises inshore and a cessation of feeding activity of seabirds off the east side of Sumburgh Head noted. By mid-June, Arctic Terns had begun deserting colonies in the south Mainland, there were some very low counts of Guillemots and Razorbills in population monitoring plots, and during the last week of June newly hatched Kittiwake chicks were dying in nests.

In previous seasons when this sandeel shortage has kicked in, seabird colonies furthest south in Shetland have often fared better, but not in 2001. On Fair Isle, a record 2,800 pairs of Arctic Terns fledged fewer than 10 chicks, Kittiwake productivity was only 0.06 per pair, and Arctic and Great Skua productivity was 0.16 and 0.66 respectively. Shags had a reasonable season at 1.63 chicks/nest, but Fulmar productivity will be relatively low. Puffins did poorly at 0.31 chicks per occupied burrow, and although Guillemots and Razorbills fledged 0.63 and 0.65 respectively, chicks were severely underweight (by up to 50%) and their survival may have been relatively low.

On Foula, Bob Furness reported the breeding season as "the worst since the depth of the 'sandeel crisis' in 1990". Kittiwakes fledged no young, adult body weights were low and, most unusually, a small sample of regurgitates contained Herring. Although Arctic Tern numbers were similar to 2000 (c.800 pairs) and quite a number of nests contained three eggs in late May, they had all abandoned breeding by late June. Although Arctic Skuas raised about 0.6 chicks per pair to ringing age, many were subsequently killed by Bonxies, and ultimate breeding success was low. Many dozens of dead, emaciated Puffin chicks were found at burrow entrances in early July and very few adults were seen carrying fish then.

[A copy of Bob's report, '*Seabird Studies in Foula, 2001*' may be obtained by contacting: r.furness@bio.gla.ac.uk . Ed.]

Elsewhere in Shetland, the Shetland Ringing Group reported only a handful of Arctic Tern chicks fledged around the Scalloway Islands, and probably the most successful colony was a recently established one on waste ground at the Sullom Voe Oil Terminal, where at least 30 chicks fledged. Red-throated Divers, also sandeel-feeders, didn't have a great season, with a lot of failures and broods of one chick recorded. On the cliffs, SOTEAG recorded complete Kittiwake breeding failures at Sumburgh Head, Westerwick and Noness, with just 4 assumed fledged from 130 nests at a colony on Burra. Numbers of Fulmar chicks were also low, with 43% fewer at standard plots at Troswick Ness (349) than in 2000 (615).

Time will tell what another bad breeding season means for Shetland's seabird populations, with the surface feeders likely to be most severely hit by yet another missing cohort of young. On the Kittiwake front, things are not looking good. At the Ramna Stacks, which held 1,350 Kittiwake nests in 1981, we recorded just 51 nests on 24th June, while at Sumburgh Head, which had been relatively stable at 1,160-1,270 nests during the 1990s, there were only 736 nests on 10th June, a decrease of 14% per annum since 1998. With minimal recruitment, the breeding population trend for Kittiwakes at least can only continue in one direction.

Thanks to Deryk Shaw (FIBOT), Dave Okill (Shetland Ringing Group), Sheila Gear (Foula), Bob Furness (University of Glasgow) and Mick Mellor (SOTEAG).

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SMALL ISLES SHAGS SUFFER

The Isle of Canna contains four large Shag colonies, which have been counted annually since 1969; breeding success has been monitored by studying nests since 1977. The birds nest amongst large boulders on a raised wave cut platform below steep cliffs.

2001 turned out to be one of the worst breeding seasons recorded for Canna Shags. In 2001, the colonies were first visited in late May when all appeared well. Average clutch size in the marked study nests was 2.97 ($n=37$), slightly higher than that recorded in 1999 and 2000. Occupancy looked very high, with most nests containing eggs or newly hatched young.

On our return in July, things had altered markedly. At the Garrisdale colony, of the 49 occupied study nests all bar 3 had failed and only 5 young had been reared (0.09 per nest). In the colony as a whole, we estimated that only 88 young had been reared from 214 nests (0.4 chicks per nest). At the Nunnery, things were equally as bad. Of 12 study nests occupied in late May, only one contained young (0.17 chicks per nest) in early July. Again for the colony as a whole, we estimated that only 19 young were raised from 63 nests (0.3 per nest). Even worse was the colony at Lamasgor. We have no study nests in this colony but we estimated that only 11 young were reared from 139 nests (0.08 chicks per nest). The large colony at Geugasgor on the north side of the island was, thankfully, much as normal. Here we estimated 582 young reared from 334 nests (roughly 1.7 per nest) and probably a fairly typical figure.

On the neighbouring island of Rum, Sean Morris checked five colonies in late April, and again in mid June and mid July. In a boulder beach between Harris and A'Bridneach, he had over 50 nests, all of which appeared to have failed. Only four nests higher up in cracks in the cliff were occupied. At Sgor Mor, only 7 young fledged from 5 successful nests, the other 20 all failed (0.28 per nest). At Wreck Bay, only 2 young fledged from 10 nests (0.2 per nest). Sron na Iolaire was more successful, with six nests each producing 2 young, although five others failed (1.1 per nest). At Dibidil, however, 49 young fledged from 32 nests (1.5 per nest).

Why was it then that many colonies were doing very badly and others doing OK? Food shortage appears an unlikely explanation, as we would expect all colonies to be equally affected in such a small area. Occasionally severe gales have affected breeding success at Canna seabird colonies but, in this instance, there was no link between unsuccessful colonies and aspect.

The main reason for the high failure rates appears to be linked to high levels of predation. At Lamasgor on Canna, most nests had failed at the egg stage. Numerous predated eggs were found with a groove all along the long axis of the egg. Predation by gulls appears to have been a likely cause. Gulls were also probably involved in predation at the other colonies (including small patches at Geugasgor), but the remains of eaten chicks suggested that some mammalian predation was also involved.

Why should gull predation have been so heavy in 2001? Of 704 Herring Gull nests checked in early July on Canna, only 10% appeared to produce chicks, indicating one of the worst breeding seasons ever recorded. There was an almost total failure at all colonies on the west side of the island. The large colonies on Sanday and at Rhu Langanis were more successful but, even in these colonies, the bulk of the birds failed. At one Sanday study colony, the number of fledged chicks was estimated by capture-recapture methods. This gave a total of only 9 chicks fledging from 90 nests, giving an average of only 0.1 chicks fledged per nest. This was the lowest figure we have recorded in this colony. The very poor breeding success appears to be related to a large reduction in commercial fishing activity (mainly for prawns) around Canna in the early part of the summer, resulting in a major food shortage for these gulls. Probably as a result, the hungry gulls began preying upon the Shag nests as an alternative food source. It was obvious in many of the colonies that only the more inaccessible nests were managing to produce chicks.

This gull breeding failure may have been quite widespread up the northwest coast of Scotland this summer. For instance, Hugh Insley reports that all gulls on Priest Island failed to rear chicks. If this phenomenon continues in forthcoming summers it could have quite an effect on local Shag populations.

Bob Swann (bob.swann@freeuk.com)

JOURNAL REVIEWS & 'BITS' **BY MARK TASKER**

From *WORLD BIRDWATCH* Vol 23(2)

The numbers of Zino's petrels on Madeira continue to increase slowly, thanks to intensive efforts to control cats and rats near the nesting site. Numbers of fledged young have been in double figures for the past two years.

A Falklands Conservation survey of Black-browed Albatrosses has found a dramatic decrease in numbers nesting in the archipelago - from 468,000 pairs in 1995 to 382,000 in 2000. It seems likely that this decline has been driven, at least in part, by by-catch in toothfish and tuna long-line fisheries. The Falkland Islands Government have introduced compulsory observers on all long-liners working in their waters.

Small-scale long-lining in Peruvian waters is also thought to pose a significant threat to Chatham Albatrosses that spend their winters in these waters.

The UK Government is to spend just under half a million pounds on the restoration of Ascension Island. A key part of this restoration will be the removal of the c800 feral cats, whose ancestors devastated the large seabird populations that used to breed on the island.

Studies in the North Pacific estimate that about 35,000 albatrosses are being killed in pelagic long-line fisheries each year. Roughly equal numbers of Laysan and Black-footed Albatrosses are caught, indicating that the impact on the much rarer Black-footed population is much higher. Only the US has taken any substantial action to combat the by-catch. Actions include the distribution of free streamer lines and the mandatory use of several other measures. Marine turtles are also caught on long-lines, and measures to prevent this by-catch as well as that of albatrosses may lead to the closure of some fisheries in the US. Unfortunately, other nations are likely to increase their fisheries to compensate - but without mitigation measures.

The majority of seabirds in the Cape Verde islands are classified as 'Endangered' or

'Vulnerable'. The majority of the world's population of Fea's Petrel nests in the group but is subject to human predation for medicinal and culinary purposes. The Cape Verde Petrel is endemic, however, and is also subject to human persecution, with about half the annual production of chicks being sold in local meat markets. Similarly, colonies of Brown Boobies and Red-billed Tropicbirds have been massively reduced, while the only pairs of Magnificent Frigatebird that nested in the eastern Atlantic may already have disappeared. Conservation measures to control human activities and reduce the numbers of introduced predators are needed urgently.

From *BIRDLIFE IN EUROPE*

BirdLife International has launched a campaign to speed up and tighten proposed EU legislation on 'Environmental Liability'. This legislation comes in the wake of several large-scale pollution incidents, including the *Erika* and *Baltic Carrier* oilspills, where no-one has yet been found liable for the damages caused by them.

From *SEEVÖGEL* Vol. 22 (2)

There is little on seabirds in this issue beyond the annual publication of seabird monitoring data from the German Wadden Sea colonies.

From *WWF ARCTIC BULLETIN*, Nos 1.01 and 2.01

The US Fish and Wildlife Service has designated critical habitat areas for both Spectacled and Steller's Eider. These areas total some 67,000 km² in order to help protect these threatened species.

Following concern about the collapse of some of Greenland's auk colonies through over-hunting (see cover story), it is encouraging to note that Greenland's Environment Minister wants to bring in regulations to control the hunt. However, this may not be before time. Iceland has placed Brunnich's Guillemot on its red list of endangered species - and it seems likely that the dramatic collapse in Icelandic populations has been caused by hunting pressure off Greenland in winter.

From WATERBIRDS No. 24 (1)

This is the journal of the Waterbird Society and usually has several good articles on seabirds. Professional members of the Seabird Group are likely to have access directly to the journal, and therefore it has not normally been included in this abstract section. However, for the benefit of those unable to see a copy of the journal, I shall selectively chose a paper or two from each issue in future.

E. Stienen and co-authors studied the kleptoparasitism by Black-headed Gulls on Sandwich Terns in the Wadden Sea. The gulls took about 30% of all the prey items destined for the colony and tended to take the larger and more obvious items. As a consequence, a higher proportion was taken as the chicks got older, due to the terns bringing in larger items at this time. Robbery was high around 0900 and at dusk; was higher at high tide and increased with increasing wind strength. Since food was more difficult for terns to catch at higher wind strengths, this last feature had a marked effect on tern chick growth. Laura Mauco and co-authors studied the diet of Common Terns in the non-breeding season in Argentina. The greatest part of their diet was fish (anchovy species) but a further 12 species of fish and quite a number of insects also featured. This is one of the few known studies of diet outside the breeding season.

From WATERBIRDS No. 24 (2)

Brian Palestis and Joanna Burger found that Common Tern chicks return much better to their nests if siblings are present in the nest than if they are not - indicating that chicks can recognise each other. Stefan Garthe and Bob Furness found that a fulmar could dive to around 2.4m for a short period (up to 8 seconds), usually in mid to late afternoon. The bird was assumed to be feeding on fish swimming near the surface.

Rehabilitation & Post-release Survival Rates of Guillemots

South Devon Seabird Trust report.

This report, published by one of the group's that treat oiled seabirds in the western English Channel, examines six years of information on the survival of Guillemots released following

cleaning. The report considers that it is impossible to fully evaluate the survival of guillemots unless at least ten years worth of data are available; nevertheless they have records indicating that about 30% of their released birds have survived at least a year, while just over 14% have survived for at least three years. This difference in survival, compared to previous studies, is attributed to improved cleaning techniques and, in particular, to post-cleaning care allowing full water-proofing to be restored. They also recommend that handling should be kept to a minimum. The report argues that it is worthwhile trying to rescue as many oiled guillemots as possible, and that the data that the report is based on do not support the idea that light-weight birds are necessarily more likely to die than those in better condition.

It is encouraging to see progress in cleaning techniques and good to see results being analysed and learned from. No doubt this is not the last word on this topic. The report is available from the South Devon Seabird Trust, who no doubt would appreciate a donation towards the postage and cost of the report (email: info@seabirdtrust.co.uk).

EDITORIAL

Welcome to Newsletter No. 89! This issue contains both worrying news of threats to seabird populations in Greenland and closer to home, and thankfully also news that extremely positive conservation efforts are going on in Ascension and the Seychelles to enhance seabird populations there. I am grateful to Mark Tasker for continuing to provide the excellent reviews section and other interesting snippets of news. If you are connected to the internet, check out - www.tct.org.ac/jumper.htm - for a bit more positive conservation by the Tasmanian Conservation Trust, which will also give you a giggle (for those not connected, I'll try to include a summary in the next issue!). **Ed.**

SEABIRD 2000

The next issue of the *SEABIRD 2000 Biannual Review* is currently being prepared and will be available shortly. There will be a full update on the project in the February 2002 *Seabird Group Newsletter*. **For further information contact:** ian.mitchell@jncc.gov.uk.



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The Newsletter is published three times a year. The editor welcomes articles from members and others on issues relating to seabird research and conservation. These should be received by 15 May (for June edition), 15 September (for October edition) or 15 January (for February edition).

The Seabird Group promotes and helps co-ordinate the study and conservation of seabirds. Members also receive the journal *Atlantic Seabirds*, containing papers on current research. The Group organises regular conferences and also provides small grants towards seabird research. Current 2001 membership rates are:-

Ordinary £10.00
Standing Order £9.00
Concession £5.00
Institution £15.00

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GROUP NEWS

SEABIRD GROUP WEBSITE

www.seabirdgroup.org.uk

Jeff Stratford has done a great deal of work this summer preparing the site, with help from Executive Committee Members. Most of the site is now ready, and we hope that it will be live by the end of October. So check the address regularly from now on! Many thanks again to Jeff for all his hard work.

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Steve Hunter; Alan Leitch

36TH SEABIRD GROUP AGM 2001

The 36th Annual General Meeting of the Seabird Group will be held at 1500 hours on Saturday 8th December 2001 at the Hayes Conference Centre, Swanwick, Derbyshire, England (at the BTO Annual Conference).

PROVISIONAL AGENDA

1. Minutes of the 35th Annual General Meeting held on Saturday 18th November 2000 during the Scottish Ringers' Conference at Braemar, Grampian, Scotland.
2. Matters arising from this meeting.
3. The 36th Annual Report.
4. Accounts and Treasurer's Report.
5. Election of new officers.
Andy Douse retires from the Executive Committee at this AGM. Nominations are sought for his replacement. Proposals should be sent to the Chairman (address opposite).
6. Members' views on the Newsletter.
7. Update on the website and other publicity initiatives.
8. Progress with SEABIRD 2000.
9. Plans for the next conference to be held in Aberdeen on 2-4 April 2004.
10. Any other business (please notify the Chairman before the meeting).

Bob Swann
Honorary Secretary