

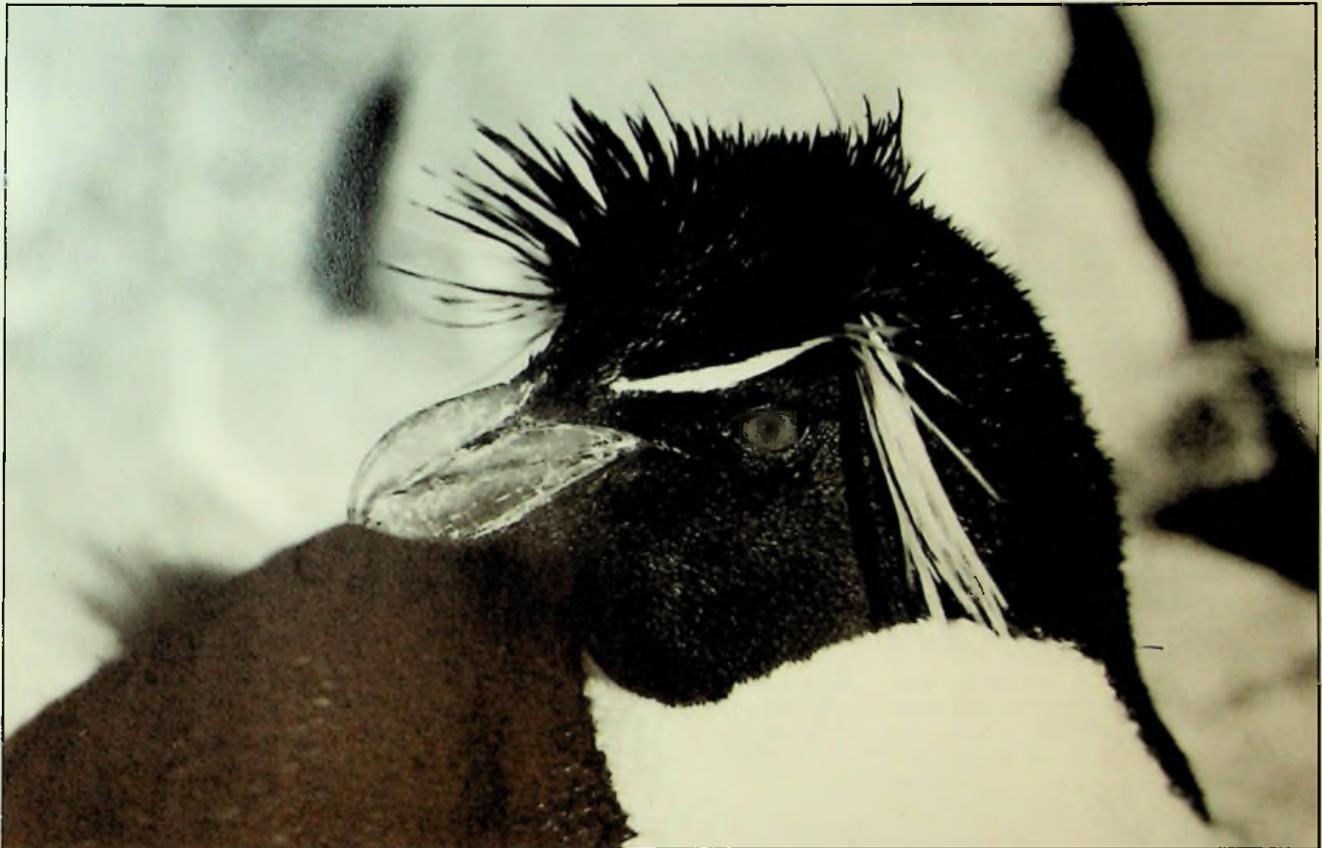


THE WARRAH

Newsletter of Falklands Conservation

NUMBER 1

NOVEMBER 1991



Rockhopper penguin - symbol of Falklands Conservation.

(Tui de Roy)

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Any opinions expressed in this publication are those of the authors and do not necessarily reflect those of Falklands Conservation.

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Falklands Conservation Launched!

Over 40 invited guests attended the formal launch of Falklands Conservation held at the Royal Geographical Society in London on 1st August 1991. Falklands Conservation's UK Secretary, Kate Thompson, describes the event and its significance for the future of conservation in the Falklands.

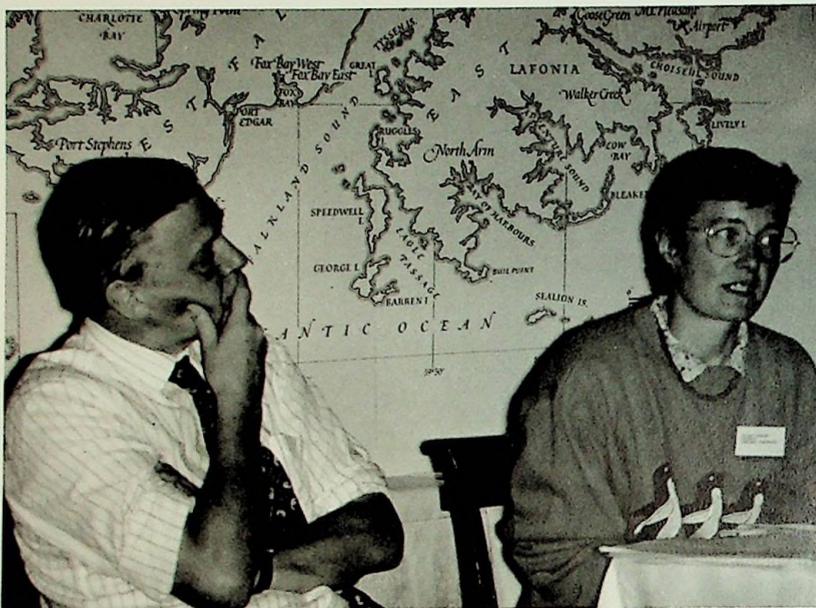
As big days go in my working life, this was certainly one to remember. Since the Falkland Islands Foundation and Falkland Islands Trust had agreed to merge earlier in the year, a lot of behind the scenes work had gone towards this event at which Falklands Conservation would emerge as the new standard bearer for conservation effort in the Falklands.

I cannot tell if my colleagues felt the same mix of excitement tinged with slight apprehension as myself while all the last minute preparations were being made in the Council Room at the Royal Geographical Society. Sir Rex Hunt, one of our Vice Presidents who was to chair the event, was busy comparing notes on possible questions with Cindy Buxton. Julian Fitter, our Treasurer, was making sure that the slides for Sir David Attenborough's talk were in the projector right side up and in the correct order.

On his arrival, safe but slightly delayed by some problems on the underground, Sir David took great care to check on the details of his presentation with Julian and myself. This professionalism certainly showed in his talk and we were extremely fortunate to have Sir David's support. I was delighted to find him as genuinely charming and unassuming in the flesh as he always appears on the box. I had, in fact, met him once before at a similar event and his autograph was a treasured possession for a youngster starting to take an interest in conservation. However, as the numerous intervening years had given us both rather more grey hairs than then, I thought it tactful not to mention our earlier meeting!

The journalists and other guests, including FCO and FIG officials and representatives from various conservation bodies, started to assemble for coffee shortly after 10 am. Sir David was photographed several times by the press and interviewed for BBC 1's *Newsround*. The excitement built up as Sir Rex, Lord Shackleton, Sir David, Cindy Buxton and myself took our seats at the top table. Our backdrop was an enormous map of the Falklands, framed on either side by striking colour photographs of the Islands' wildlife.

Finally, it was zero hour! Sir Rex started off by introducing the top table and



Sir David Attenborough and Kate Thompson at the launch of Falklands Conservation.
(Anna Fitter)

welcoming the guests. Sir David then gave an excellent slide presentation, which enabled the assembled guests to gain an appreciation of what makes the Falklands so very special. The need for conservation action was highlighted by reference to the alarming crash in the Islands' sea lion population. Finally, Sir Rex described the aims of Falklands Conservation and its need for support before opening the proceedings to questions from the floor.

After all the anticipation of the event, I found it quite a relief to be occupied in answering some of the pleasingly large number of questions asked. They came thick and fast and continued well after the formal event had ended and drinks were served.

The launch served to draw public attention to the formation of Falklands Conservation and to the conservation problems in the Islands which we exist to address. However, of course, such an event is not an end in itself. The task ahead is large, as the Falklands' natural and historic heritage is under ever increasing threat. We are working hard on developing our projects programme and on raising the funds required to support it, never an easy task for a small charity.

At times, the amount of effort required can seem endless, but, for me, the very fact of Falklands Conservation's existence is of the greatest possible encouragement. In particular, the merger of the Trust and Foundation offers much greater opportunities than were previously possible for direct local participation in conservation work, while still enabling inputs of expertise from outside the islands to continue where required. This combination is, surely, a keystone to the long term success of Falklands Conservation's work.

Already, we have appointed a part-time FI Secretary, Carol (Hay) Miller in Stanley. Her hard work enables Falklands Conservation to keep fully up to date with developments in the Islands and is also of enormous assistance to the logistics of running projects on the ground. We have also, for the first time, recruited a local person to assist with the fieldwork for the seabird programme.

So, safely launched, it is now full steam ahead for Falklands Conservation. However, Falklands Conservation can only achieve its full potential with the support of all who care about the future of the Falkland Islands. Many have already given generously and we look forward to welcoming more supporters in the coming months.

The Falklands Revisited

Following his visit to the Falklands in January of this year, Falklands Conservation's Chairman, Dr. Colin Phipps, describes his impressions of how the Islands have changed since he first saw them in 1976.

It had been fifteen years since my previous visit to the Falklands, during which time there had been the Conflict with Argentina, the establishment of the Mount Pleasant military base and the influx of income from fishing licences, now far outstripping revenue from wool. Accompanying these events had been a more than doubling of the population, albeit mainly due to short term military personnel. However, despite all of this, my overwhelming impression was of how little the Islands and Islanders had changed.

Changes, of course, there have been: many more consumer goods are available, there is a much greater choice of foodstuffs, especially fresh fruit and vegetables, television has arrived, new schools, hospitals and roads have been built, but, taken in the context of the Islands as a whole, these changes have made little impact. Stanley has grown, certainly, but remains a small town. Mount Pleasant is quite divorced from Stanley and the

presence of the Military is not obtrusive. Perhaps the biggest surprise is the almost complete obliteration of all signs of the Conflict, minefields excepted.

What has not changed is the nature of the Kelpers themselves. They remain a fiercely independent bunch, as resourceful as ever. Empty containers, redundant Portakabins, and other materials left after the airport construction boom, have all been pressed into a variety of uses. As ever, nothing is wasted.

Once out of Stanley, changes are less immediately evident but are more long-term and dangerous. There are fewer areas of Tussac grass, the sea lion population has fallen disastrously and the historic wrecks are deteriorating badly. There is much for Falklands Conservation to do. In this respect, however, there is good news to report. There is no doubt that awareness of the problems of conservation is growing in the Islands and that these

problems are being taken very seriously by the Government and Councillors. Everyone I met was in no doubt that they are custodians of a precious heritage, and the work of Falklands Conservation is valued.

One of the prime reasons for my visit was to meet with the Falkland Islands Trust, whose objectives were the same as the Falkland Islands Foundation, to discuss a merger of the two bodies. As everyone now knows, these discussions were successful and have led to the formation of Falklands Conservation. I have no doubt that this is a very positive move and that the combination of on-the-spot monitoring of conservation needs, combined with the expertise that can be made available from the UK, will greatly enhance all our objectives. I very much look forward to working together with our new colleagues and preserving everything in the Islands that makes them such a delight to visit.



David Eynon and Colin Phipps on board the Jhelum.

(Kate Thompson)

Peat: Patterns and Processes

Richard Clark, leader of the Cumbria and Lancashire Falklands Expedition, describes what the Falklands' peatlands can tell us of the past and speculates on the future of the Islands' bogs.

What is peat?

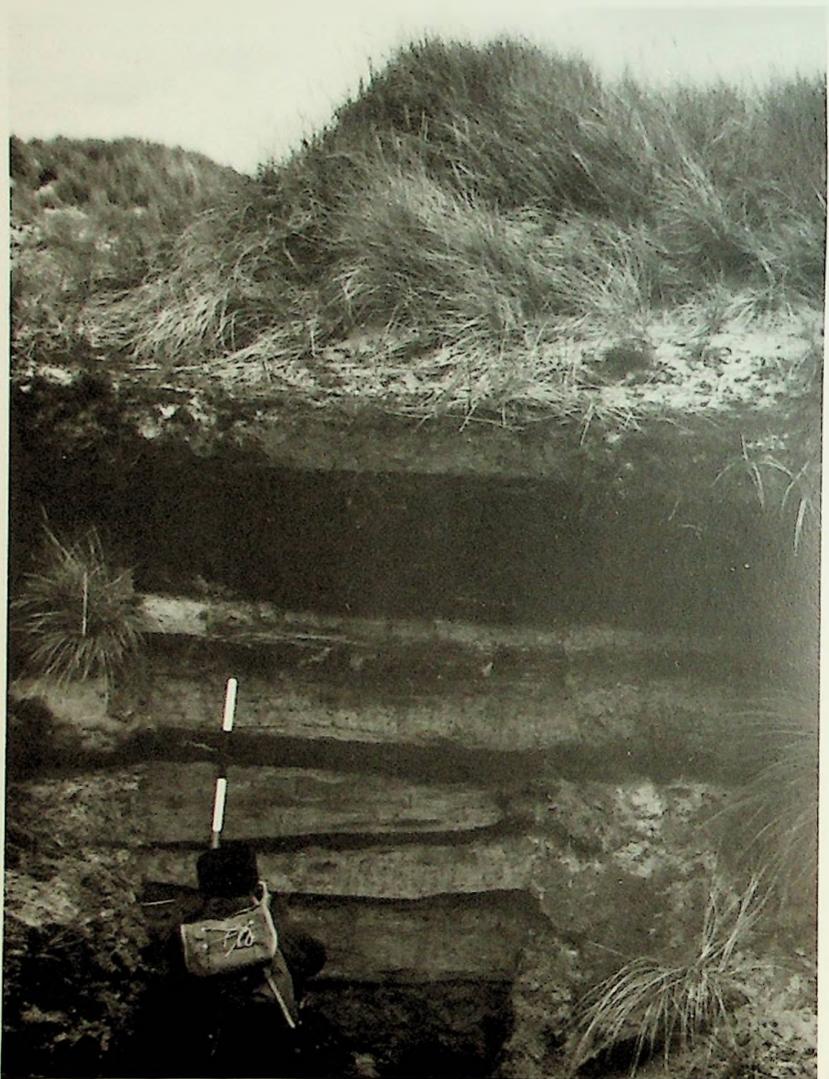
Peat deposits form where environmental conditions arrest the decay of dead plant material, so that the remains gradually accumulate with other plants continuing to grow on the surface. Often, peat formation is associated with high rainfall and water-logged conditions, but in the Falklands, low temperatures, inhibiting both decomposition and the formation of mineral soils, are regarded as a key factor in peat formation.

The study of peat deposits can tell us much of past environments. Being organic in composition, peat can be dated using carbon isotope techniques. It also preserves wind-borne particles such as pollen grains, insect fragments and volcanic dust deposited on its surface. Thus, peat records its own history and, to some extent, more distant events such as volcanic eruptions. Variations in pollen grains and insect types according to depth in the peat, and thus age, may reveal past environmental changes.

Peat in the Falklands

The late climatic history of the Falklands has been punctuated by a series of cold episodes interspersed by milder spells when conditions favoured peat accumulation. During these cold periods, rocks were shattered by ice and frost and in at least two 'ice ages' small glaciers formed in the highest hills. Masses of rock debris moved down even quite gentle slopes, spreading out in the lowlands. Such surface instability, together with the cold, diminished plant cover. Species richness was probably reduced, with the surviving fauna and flora being restricted to favoured refuge sites.

We do not yet know the number and duration of the cold episodes which have affected the Falklands. The study of peat deposits is a vital tool to unravelling the past. Peat layers sandwiched in mineral soils at Port Salvador indicate that one cold period began some 36,000 years ago. This may have continued uninterrupted for almost 10,000 years, as thin peat deposits in stony clays at San Carlos indicate a renewed period of peat deposition about 26,000 years ago. However, it is possible that there may have been one or more milder episodes during this period, with peats of intermediate age yet to be discovered.



Sequence of interbedded peat and sand, extending over a period in excess of 7000 years, below young sand dunes at Mount Doyle, West Falkland.

(Neil Simpson)

The pollen content of the San Carlos peats is much less than in more recent deposits and is nearly all from grasses with some from sedges. This suggests a very impoverished vegetation, perhaps due to harshness of climate or to lack of time between cold spells for more species to colonise from distant refuges.

Present peat deposits

The current extensive surface cover of peat in the Falklands has accumulated since the last ice age. Dates from samples collected near Lake Sullivan and at Eliza Cove indicate that the last

cold episode ended between 13 and 14 thousand years ago, with the climate remaining suitable for plant growth ever since. However, the rate of peat accumulation over this period has not been constant throughout the Islands. As well as the general cover of blanket peat, there are some localities particularly favourable for peat growth. These are the places where, in some combination, run-off and seepage water collects, and where run-off and infiltration of water into the ground has been slow. Such places include enclosed hollows in rubbly and stony clay ground. Some of these are occupied by pools and small lakes,

others by raised peat mires. These raised mires are round or oval in plan, with the peat surfaces like an upturned saucer. The enclosed hollows themselves are not easy to explain: it seems unlikely that they could all be due to the removal of fine materials by the wind, especially as many occur in places where the ground is stony or would tend to stay relatively damp. They are reminiscent of ground depressions in north-west Europe that are thought to have been formed by the growth of ice layers in accumulations of rock waste, followed by thawing out at the end of the most recent cold period. Raised mires are also found on wet valley floors, in shallow valley heads and on flat-topped ridges.

In parts of West Falkland, periods of plant growth and peat deposition have alternated with episodes in which sand was eroded, blown and deposited, inundating the peat deposits. In the interval from the decline of the last cold period to the present, especially in the first few thousand years, sea levels rose as glaciers and ice sheets melted. Over thousands of years the rising sea spread over the rock waste bringing masses of sand towards the shores. Where land lay downwind of the broad beaches and coastal sandhills, sand spread far inland. In such places vegetation was overwhelmed and peat accumulation halted. Such events have continued into present times. Fifteen dates are so far available for peat deposits sandwiched between layers of encroaching sand. They range from 13,600 BP at Lake Sullivan to one about a thousand years ago. It has not yet been possible to tell whether the occasions of sand deposition were of only local significance or were responses to generally stormy or dry periods.

Peat degradation

Field investigations show that Falklands peat cover was formerly more substantial and extensive than at present. Peat lay over hill tops more than 600m above sea level and covered steep slopes, such as the Wickham Heights. It extended over coarse, open rubble, including at least the margins of stone runs. It also covered flood alluvium on valley floors and, as noted above, sheets of blown sand.

The degree and extent of degradation of Falklands peat cover suggest a widespread change in conditions some time before the arrival of settlers from Europe. Many features of peat degradation are fairly fresh and indicate that this is a relatively recent process which continues in some places.



Wall of eroding blanket peat at Wineglass Ridge, Wickham Heights.

(Richard Clark)

Drying out of bog surfaces, which could increase the fragility of the vegetation cover, is one possible explanation. At many sties, degradation appears to be linked with mass flows and slides of peat, not unlike those which affected the Stanley peat banks in 1878 and 1886. Peat can thicken to such a point that, when heavily water-logged, the bogs lose stability, the vegetation ruptures and there are 'bog bursts'. Many such erosion sites are along the edges of broad raised mires on plateaux and ridges, where steeper marginal slopes give the unstable peat 'somewhere to go'. The main erosion forms are shallow semicircular basins and gullies leading back into the central part of the plateau bogs. Fretting of the bog margins may have speeded drainage of the peat. The mires on valley floors, in shallow saddles and on lowland plains seem less prone to burst.

In and near the centres of some plateau and ridge-top mires the bog surfaces are patterned by furrows and hollows, many with pools, separated by low ridges. These tend to be aligned across the very slight slopes, which suggests that the mat of vegetation may have stretched and cracked as the underlying wet peat spread. Such a process may have led to furrows and hollows linking up in some places to make the larger pools on the mires. New physical conditions are then introduced into the peat bog environment.

In view of the evidence of instabilities in bog surfaces, it would be interesting

to compare the distribution of vegetation dominated by *Astelia pumila* with sites where peat has been virtually fluidised by flooding of unstable bog surfaces. A high correlation might show that *Astelia* sites indicate locations of earlier instabilities.

Patterned bogs in the Falklands occur in areas where the rainfall may be less than 600mm annually. The driest parts of Scotland with similar features have 900-1000 mm yearly rainfall. Can Falklands raised bogs with central patterned areas flourish in the present rainfall and drainage regimes, or was their main period of growth one of greater rainfall? It may be that periods of marginal instability, erosion and accelerated drainage followed by renewed peat growth are a normal occurrence in plateau mires.

Editor's note: Dr. Jim McAdam points out that the Falklands peatlands represent a significant proportion of southern hemisphere cold temperate peats. As the above article indicates, much more yet remains to be discovered about these peatlands and their associated plant and invertebrate communities. The apparent drying trend in the Falklands plus increased grazing pressure adds urgency to the task of finding out more about these important habitats. Both author and editor would be interested in any information on past 'bogbursts' or peat flow events which readers can supply. Such information would be gratefully received at the editorial address appearing on the front of this newsletter.

Beauchêne Island

Mike Riddy, one of Falklands Conservation's Seabird Monitoring Programme workers, describes an unforgettable visit to Beauchêne Island. Beauchêne, which is situated in the main *Loligo* squid fishing grounds, is of crucial conservation significance due to its internationally important seabird colonies.

With an air of excited anticipation, we boarded a naval frigate at Mare Harbour early one day in late February. Callan Duck and I were to visit the offshore island of Beauchêne to undertake research into seabird diets.

After a friendly welcome our equipment was stowed safely away in the helicopter hangar and, with a few repairs to one of the antennae completed, we were ready to sail. Under the calm guidance of the commander we eased away from the quay and safely navigated the narrow channels out to sea.

Four hours into the voyage there was a marked increase in the numbers of black-browed albatross around the ship and soon the sheer east coast cliffs of Beauchêne were visible. A short flight in a Lynx helicopter followed, with the pilot putting us down expertly on an uneven rock shelf, far away from the main breeding areas.

Immature striated caracaras, nicknamed Johnny Rooks, immediately began investigating our arrival, pecking and pulling inquisitively at our equipment. Tussac birds were soon on the scene and we were delighted to see rock wrens searching for insects among the boulders. The presence of these two species usually indicates the absence of predatory rats. A large bull sea lion roared from the tussac nearby as we searched for an old wooden hut, built many years ago by Ian Strange, which was to be our base. Having found our home for the week, complete with a good layer of guano, we bade farewell to our bemused naval companions and put our provisions out of reach of the avian welcoming committee.

Before unpacking, we set off across the island towards the source of the incredible noise and evocative aroma unique to large seabird colonies. Escorted by Johnny Rooks, we pushed

slowly through the dense tussac, impatiently climbing onto a large bog to get a glimpse of our destination. The spectacle was breathtaking, thousands upon thousands of albatrosses and rockhopper penguins in a dense mixed colony stretching as far as the eye could see.

Further exploration revealed the island to be approximately three kilometres long and eight hundred metres wide at its widest point, shaped like an upturned cricket bat with a crooked handle. The southern "handle" comprises large angular boulder fields, dissected by deep fissures dropping down to the ocean; a large flat clay area where gentoos nest and thousands of taxiing albatrosses have created a runway; and tall quartzite stacks sculptured into amazing forms by the elements. Unlike the sparsely vegetated south, dense tussac, overlying deep peat, covers three quarters of the northern half of the



Black-browed Albatross and Rockhopper Penguin colony on Beauchêne Island.

(Mike Riddy)



Striated Caracaras feeding on Black-browed Albatross chick. (Mike Riddy)

island, which slopes gently from the eastern cliffs towards the western shore. This slope ends abruptly at a broad strip of boulder strewn ground running along the west coast. Although only about one hundred metres wide, this strip contains approximately seventy percent of the 150,000 pairs of albatrosses nesting on the island, as well as similar numbers of rockhoppers.

Bordering the tussac along the entire length of the colony was a distinct band of empty albatross nestss, usually five wide but, in one particularly barren area, stretching up to twenty-two nests across. Numerous skeletons of albatross chicks littered the ground, evidence that the nests had once been occupied. Groups of moulting rockhoppers stood huddled together amongst the empty nests. An occasional large albatross chick remained, looking vulnerable in its isolation. The reason for this "no-birds-land" soon became clear. Flocks of up to forty marauding caracaras, including adults and immatures, were preying on the large, well-feathered chicks, clearly an important and plentiful food source at this time of year. This rare raptor, found only in the Falklands and remote areas of Tierra del Fuego, breeds at a very high density on Beauchêne, with nests less than one hundred metres apart in the tussac bordering the seabird colony. Although food is plentiful in the breeding season, nutrition from other sources, such as sea lion faeces and carrion, becomes vitally important once the albatrosses, penguins and prions have dispersed to sea. As the competition for diminishing food supplies increases, many

immature caracaras must surely die from starvation, or migrate northwards to other islands to find food.

No peregrines or other birds of prey were encountered and the absence of turkey vultures was particularly noticeable. These scavengers would find it difficult to compete with the more aggressive caracaras for any available carrion.

Walking around the north-west corner we encountered about fifty sea lions, mostly immatures, hauled out on the flat rock shelves or lying amongst the tussac. Here the tussac bogs were smaller and well spaced, with large clearings, the result of seal movements over many years. The lack of evidence of breeding, at what appeared to be an ideal location, underlined how little we know about these mammals and the importance of the current research into their dramatic decline.

Whilst working during the day, we occasionally heard prion noises from beneath large boulders, but it wasn't until nightfall that the extent of the breeding areas became apparent. An hour after dark the air became alive with small birds flying in from the ocean, some disappearing into deep cracks high up in the sides of stacks and others scurrying below large boulders. We finally identified several birds as being fairy prions. Wilson's storm petrels and diving petrels are also known to breed on the island and Callan's sighting of a black-bellied storm petrel offshore poses the question as to whether they also breed on this remarkable island.

The days had gone by too quickly, but, with all our work completed, it was time to leave. During the voyage back there was time to reflect on the visit, which had really emphasised the immense wildlife value of the Falkland Islands. The productivity of the surrounding oceans play a crucial role in supporting these bird populations of world importance. Surely, every effort must be made to ensure the future conservation of the Islands and their fantastic wildlife.

Seabird Monitoring Programme Update

Since 1989, with financial support from the FIDC and WWF(UK), the Falkland Islands Foundation has been working to establish a Seabird Monitoring Programme (FISMP) to assess the impact of commercial fisheries on Falklands seabird populations. A number of long term study sites have been set up around the Islands. At these sites, breeding numbers, breeding success rates, diets and chick growth rates of penguins and albatrosses will be checked on each year. Studies have also been made of albatrosses' use of fisheries waste.

With the formation of Falklands Conservation, the FISMP has seen several exciting new developments. The FIG have agreed to provide 100% of the funding required to maintain the Programme in 1991/92. This is welcome recognition that this vital work, which contributes to our understanding of the South-West Atlantic marine ecosystem, should be funded from fisheries revenues. A young Falkland Islander has been recruited as the fieldwork assistant for 1991/92, heralding the start of what Falklands Conservation hopes will be an ongoing process of providing increased opportunities for local residents to participate directly in our work. In addition, a scheme which aims to collect information on gentoo penguin numbers, with the help of local volunteers, is being co-ordinated by our Falkland Islands Secretary.

Further information on the FISMP is available from Kate Thompson at 21 Regent Terrace, Edinburgh EH7 5BT.

Aspects of Falklands Freshwater Ecology

A significant proportion of the Falklands' land surface is covered by fresh water. Neil Simpson, MSc, MIBiol, CBiol, FLS, an ecologist who visited the Islands with the Cumbria and Lancashire Falklands Expedition, describes some of the fauna associated with freshwater habitats and discusses the threat posed to native freshwater fish by introduced trout.

A casual glance at some of the 1 in 50,000 maps of the Falklands gives the impression that the Department of Overseas Survey has had a mishap with their blue ink. Myriads of ponds, large and small, are scattered over much of the landscape, somewhat reminiscent of the Flow country in northern Scotland. In addition, small streams and rivers meander over and through the peat beds. The rivers of the Falklands are small when compared with many in the British isles, and most are shallow and sluggish. The longest, San Carlos River, is about 45 km from source to mouth. The extensive peat cover acts as a sponge, absorbing the precipitation and allowing it to be released steadily into the streams. Consequently, spate flows are rare and the gravel substratum of the stream and river beds is often undisturbed and compacted.

Both flowing and standing water bodies are generally somewhat acidic. In rivers and streams the pH ranges from 4.8 to 6.5. Most ponds have a pH of between 4.5 and 5.5, but a few were found to be as high as pH 6.8, approaching neutrality. Extremes of seasonal temperature are unusual: the summer temperature rarely exceeds 22°C, and in winter it seldom falls below -4.5°C. However, these figures conceal the fact that small, shallow ponds with a black peat substratum can develop quite high temperatures during the day in summer months. Even streams flowing over rocks can be significantly warmed by solar radiation.

Invertebrates

Sampling for invertebrates in November and December 1989 revealed a moderate abundance of animals at some sites, but a limited range of species (Table 1). In flowing water, a typical substratum of gravel and rocks, often covered by algae and aquatic mosses, provides food and shelter for these animals. The relative stability of the river beds is perhaps significant in this respect. Unfortunately, the paucity of previous studies precludes any analysis of possible changes over time or assessment of the impact of introduced species.

Identification of species in several groups may prove difficult, but



Stream near Chartres.

(Neil Simpson)

progress is being made with the amphipods (freshwater shrimps). A preliminary examination of specimens by Dr. E.L. Bousfield of British Columbia has revealed two, and possibly three, species of *Protohyalella*, a new genus of talitroidean amphipod. Amphipods are often very abundant in Falklands freshwaters, up to 250 per square metre of river bed, and are likely to form a significant proportion of the diet of the fish species.

Native fish

Until comparatively recently, the rivers supported thriving populations of the two indigenous fish species, namely native trout (*Aplochiton zebra* Jenyns) and "minnow" (*Galaxias maculatus* = *attenuatus* Jenyns), a form of smelt. One other indigenous species of fish has been recorded from the Islands (Regan, 1905). This is *Galaxias platei* (= *smithii*) which possibly lives among rocks on the river or lake beds. However, it has not been collected since it was first reported at the turn of the century.

The genus *Aplochiton* contains two species, both confined to the western side of the Patagonian Andes, from about 39°S to Tierra del Fuego. Only *A. zebra* is found in the Falklands, but

very little is known about its natural history. Examination of the stomach contents of three specimens of this fish from Chile revealed a diet of insect larvae (McDowall 1988), but in the Falklands it is likely that amphipods are its main prey.

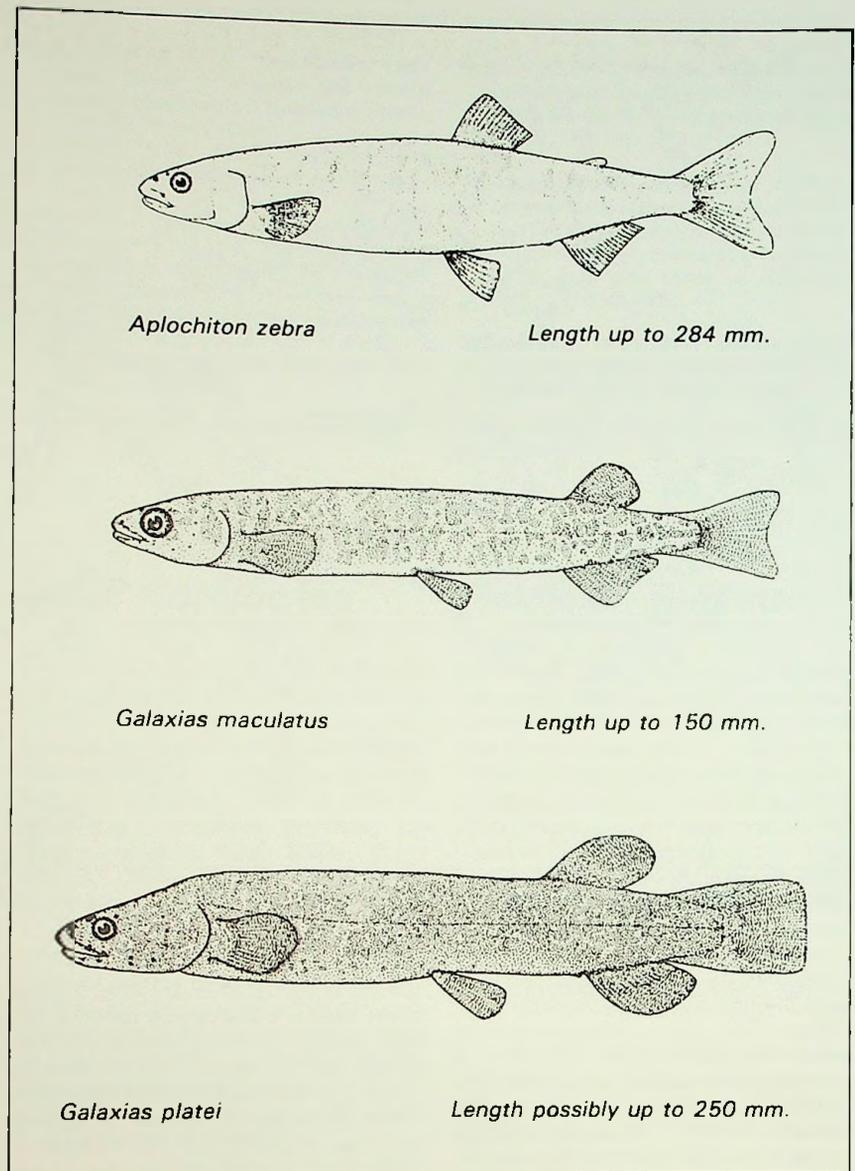
The life histories of both species of native Falkland fish involve diadromy, i.e. they carry out a specialised seasonal migration between freshwater and the sea. McDowall (1987) suggests that of the estimated 20,000 fish species in the world, only 0.8% (160) are diadromous. Three forms of diadromy are recognised.

Anadromous fish spend most of their lives in the sea and migrate to freshwater for breeding. In the northern hemisphere the salmonids are well known examples and some of the trout introduced to the Falklands practise this form of diadromy.

Catadromous species, such as eels, spend most of their lives in freshwater and migrate to the sea as mature adults for breeding. McDowall (1987) describes *Galaxias maculatus* as marginally catadromous. In New Zealand the eggs are deposited amongst stream-bank vegetation while it is covered by high spring tides. The

eggs start their development among the bases of the plants in the humid air and about two weeks later subsequent spring tides stimulate them to hatch. The larvae are swept out to sea where they form part of the marine plankton for about six months. In the following spring, the juveniles, by now about 50 mm long, penetrate into the river systems where they feed and grow for a further six months. The mature adults migrate downstream to spawn, thus completing the cycle (McDowall 1978 and 1987). Because all adults die after spawning they do not actually return to sea, hence the description of marginal catadromy (McDowall 1968). It is not known how closely the life history of the Falklands population follows that of the New Zealand fish.

Amphidromous fish migrate from freshwater to the sea, or vice versa, but the key feature is that the migration is not for the purpose of breeding. It is thought that both species of *Aplochiton* are probably amphidromous, although little is apparently known about the life history of *A. zebra*. Smitt (1901) and Eigemann (1928) have reported that spawning occurs in March in Patagonia. Small juveniles found in the sea off southern Chile were already well pigmented, suggesting that the larvae move out to sea after hatching (McDowall, 1969). However, it is possible that the species could be catadromous (McDowall 1971a, 1971b, 1988). There is no reliable information about the life cycle of the *A. zebra* population of the Falkland Islands. Near East Bay, West Falkland, where a population still exists, local people have observed that the adults disappear from the rivers in late summer.



Falklands freshwater fish.

(Based on McDowall 1971b & 1988)

Table 1. Invertebrates found in freshwaters by the Cumbria & Lancashire Falklands Expedition.
These lists are not exhaustive.

Phylum	Class	Flowing water	Ponds
Platyhelminthes:	Turbellaria (flat worms)	2 species	None
Annelida:	Oligochaeta ("earthworms")	Present	None
	Hirudinea (leeches)	Present	None
Mollusca:	Gastropods (snails)	1 species	1 species
Arthropoda:	Acarina (water mites)	Present	None
	Crustacea:		
	Anostraca (fairy shrimps)	None	Present
	Cladocera (water fleas)	Present	Present
	Ostracoda (seed shrimps)	None	Present
	Copepoda (water fleas)	Present	Present
	Amphipoda (shrimps)	Present	Present
Insecta:	Trichoptera (caddis larvae)	2 species	Present
	Diptera:		
	Culicidae (mosquito larvae)	Present	Present
	Chironomidae (midge larvae)	Present	Present
	Coleoptera (diving beetles)	None	Present
	Hemiptera (water boatmen)	None	Present

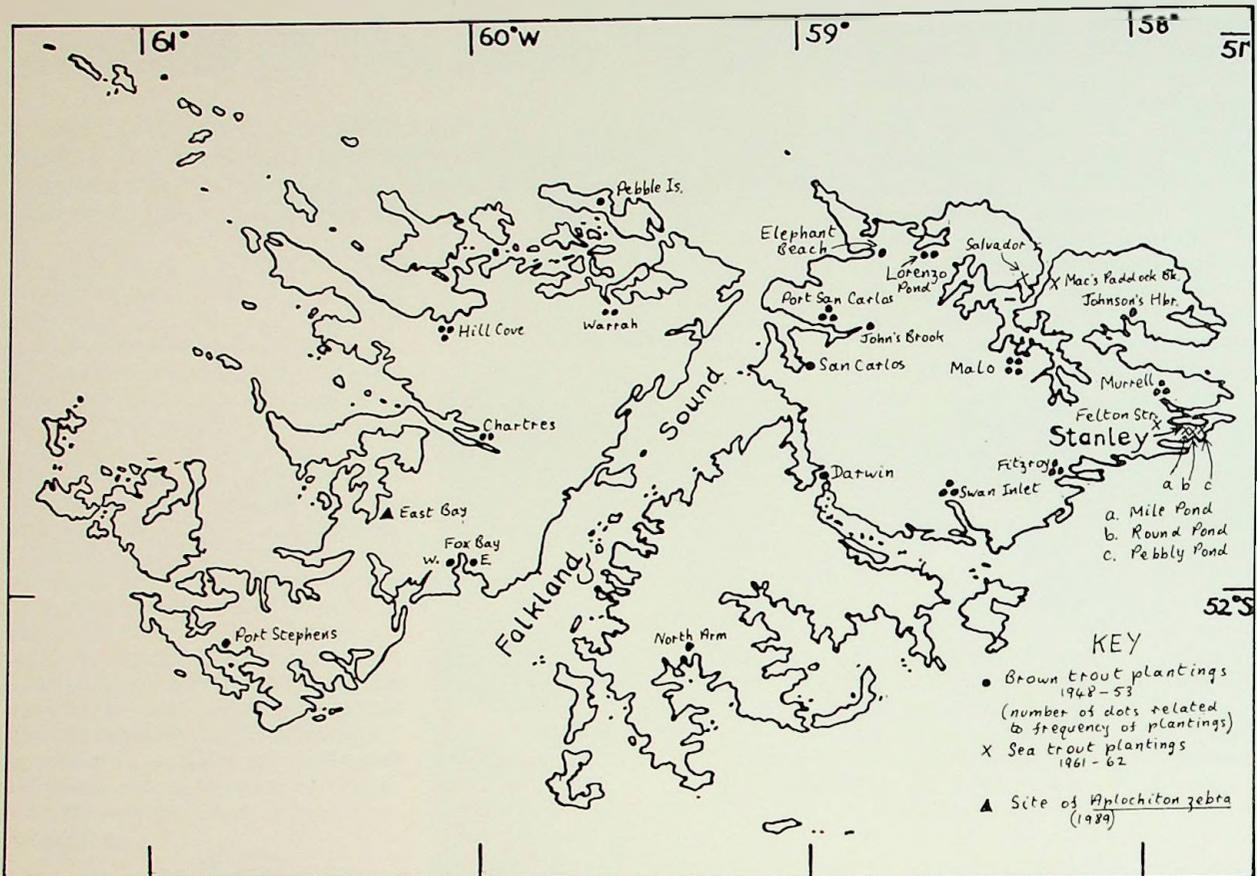


Figure 1. Sites of introductions of Brown Trout and Sea Trout.

(Based on information in Stewart 1980)

Threat from introduced species of fish

Since the 1950s there has been a reduction in the populations of both the Falklands' native freshwater fish species (Strange, 1987). This is related to the introduction of an exotic species, *Salmo trutta* (brown or sea trout). The sea trout is simply a migratory, anadromous, form of the brown trout.

The first plantings took place in August 1947 (Stewart 1980) when the Chilean Government donated 30,000 brown trout eggs. It is believed that most of these were placed in Moody Brook and the Murrell River. During the following five years, many more fry were put into various rivers, but accurate records were not kept and no freshwater biological surveys were carried out prior to these introductions. In 1961 and 1962 sea trout were introduced into some rivers and ponds in the vicinity of Stanley (Fig. 1). Attempts to introduce Atlantic salmon (*Salmo salar*) to the Falklands between 1961 and 1964 were unsuccessful, but recently the FIG have been investigating the feasibility of salmon farming.

In Europe, the sea trout lives from 1 to 5 years in freshwater and descends to

the sea when 15 to 25 cm long. It stays in the sea for between six months and five years, growing rapidly. In the winter adults return to the rivers to spawn. In the Falklands the migratory habit developed in introduced brown trout as long ago as the 1950s. In 1954 local anglers float-fishing with mutton for *Aplochiton zebra* began to catch brown trout in the rivers and in 1956 a trout weighing 1.6kg, near the maximum for brown trout, was caught in the Malo River. By 1980, specimens of sea trout weighing 9kg were being caught.

When Dr. Leslie Stewart, of the Lancashire Rivers Authority, surveyed Falklands rivers in 1973 he examined a number of migratory trout. However, it was not possible to determine whether these were descendants of the 1947-53 brown trout plantings or the 1961-62 sea trout importations. Stewart (1980) found the rate of growth of sea trout in the seas around the Falklands to be much greater than in Britain, an indication of the richness of the feeding grounds around the Falklands' coasts. Dr. Stewart's survey found that brown and sea trout were present in most of the rivers of the two main islands, often supplanting the native species.

By 1989, *Aplochiton zebra* had declined to such an extent that it now appears to be totally absent from East Falkland, and only hanging on by a thread in one or two river systems in West Falkland. Five specimens were caught in a small stream, with very little water flow, about one kilometre from the sea. The largest specimen was 28 cm in length, close to the maximum recorded (28.4 cm) in Chile (McDowall 1988), which suggests that the species is thriving in what little remains of its Falklands location. Although reduced in numbers, *Galaxias maculatus* is still common in many rivers and does not appear to be in danger of extinction.

It seems inevitable, unless conservation measures are taken soon, that the Falklands population of *Aplochiton zebra* will become extinct. The situation is to be brought to the attention of the appropriate section of the International Union for the Conservation of Nature (IUCN). It is hoped that anyone with information about the natural history of *Aplochiton zebra* in the Falklands or knowledge of sites where populations may still exist will pass this information on to me via Falklands Conservation.

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NEWS IN BRIEF

Breeding Bird Survey

Breeding Bird Survey records have so far been collected from almost 90% of the 10 km square grid squares on which the survey is based. However, some squares remain under-recorded and Falklands Conservation are seeking the assistance of volunteers, whether residents or visitors to the Islands, to fill the gaps. The data are being analysed by Robin Woods and it is intended to publish a distribution atlas as a baseline against which any future changes in bird distribution may be assessed.

As well as being of value to conservation, the survey is fun to work on. If you would like to volunteer, a full information pack can be obtained from: **Carol Miller, PO Box 31, Stanley (Tel. 21494).**

Local Committee

A new Local Committee of Falklands Conservation was elected at a meeting held in Stanley on 13th August 1991. The new Committee is chaired by Michael Morrison of Port Louis. David Eynon is the Vice Chairman and the remaining Committee members are Peggy Halliday, Sam Miller, Greta Skene, John Smith and Brian Summers.

Since its election, the new committee has held regular meetings and has been working on issues such as disturbance of penguins at Bertha's Beach, erosion on Cape Pembroke and Tussac cutting. They are also seeking premises to be used as a centre for Falklands Conservation in Stanley.

Falklands Secretary

Mrs Carol Miller, formerly of Keppel Island, has been appointed as Falklands Conservation's first Falkland Islands Secretary. Carol fills a vital role in Falklands Conservation and, thanks to the modern wonders of fax machine technology, works closely with the UK Secretary. The combination of local action with outside assistance, made available when required, is a corner stone of Falklands Conservation. Carol's hard work on the ground is enabling the development of exciting new initiatives in conservation action in the Falklands.

Carol Miller may be contacted at PO Box 31, Stanley or on telephone number 21494.

Conservation Video

Falklands Conservation and the Falkland Islands Tourist Board have recently launched a new conservation video, produced on their behalf by Media Natura. The video aims to put across the main points of the Falklands Country Code to military personnel and tourists visiting the Islands. Issues such as disturbance of wildlife, fire risk and litter are covered in a succinct script, narrated by Chay Blyth.

The video is being distributed to military units and tour operators and will be periodically broadcast in the Islands.



Tourists with King Penguins.

(Kate Thompson)

Sea Lion Project Update

Falklands Conservation's sea lion research project, funded by FIDC, WWF(UK) and Pifco Ltd., aims to investigate the possible reasons for the catastrophic 99% decline in sea lion numbers in the Falklands over the past sixty years. The population is now in the order of 3,000 animals, compared to over 300,000 in the mid-1930s.

Two highly experienced seal researchers, Callan Duck and David Thompson, from the Sea Mammal Research Unit of the UK's Natural Environmental Research Council, spent a month working in the Falklands during the 1991 pupping season. The Falklands were a new experience for David, but Callan is an old Falklands hand, delighted to have had an opportunity to return to the Islands after his days working on Bird Island for British Antarctic Survey.

The team's work in their first season concentrated on locating suitable study sites for the main part of the project in 1992. It was essential to identify breeding sites where the animals could be approached and observed without disturbance and where enough animals remain for study, not easy given the crash in numbers. Fortunately, several suitable sites were found.

An important aspect of the project is the study of the sea lions' diet and foraging behaviour. VHF radio transmitters will be used to follow the movements of individuals at sea and the SMRU team made effective use of their time in testing out equipment and techniques under Falklands conditions. This preliminary ground work will ensure that techniques are honed and perfected for the second field season.

Large quantities of faeces were collected for dietary analysis. Items such as fish otoliths (ear bones) and squid beaks (mouthparts) pass through the digestive system and provide

valuable clues as to the species of prey taken. Preliminary results indicate that the sea lions feed mainly on a variety of fish species. Small tissue samples were also collected for analysis to determine the degree of genetic diversity in the population, as declining populations can experience inbreeding problems.

The SMRU team will be returning to the Falklands early in 1992 to continue their work on foraging ecology, diets and pup growth rates. Some areas of coastline not previously checked will be censused. This hard won information is essential to our understanding of the ecology of these magnificent animals and, hence, to our hopes of conserving them.

NOTICES

Publications for Sale

The following publications are available by post from Falklands Conservation, 21 Regent Terrace, Edinburgh EH7 5BT. Prices are inclusive of surface post. Purchasers in the USA may remit payment in US\$ at a rate of \$2 per £1:

<i>Wildflowers of the Falkland Islands</i> (booklet) ...	UK £4.00	Overseas £4.50
<i>Those Were the Days</i> (booklet)	UK £4.00	Overseas £4.50
<i>Tussac Grass in the Falklands</i> (report)	UK £7.50	Overseas £8.50
<i>An Assessment of the Potential for Competition between Seabirds and Fisheries in the Falkland Islands</i> (report)	UK £6.00	Overseas £7.00
<i>Falkland Islands Foundation Newsletter</i>		
Back issues 5, 6, 7, 8, 9 & 10 only, each	UK £0.80	Overseas £1.00

The two booklets may also be purchased in Stanley at a number of retail outlets, price £3.50.

Support Falklands Conservation

Falklands Conservation needs the support of all those who care about the natural and historic heritage of the Falkland Islands. If you are not already a member, please help our vital work by joining now. Minimum subscription rates are:

Ordinary Membership	£15*	(\$30) per annum
Family Membership	£20*	(\$40) per annum
Benefactor Membership	£50	(\$100) per annum
Life Membership (under 65)	£500	(£1,000)
Life Membership (over 65)	£300	(\$600)

(* Minimum rates for Falklands residents are £10 Ordinary and £15 Family)

All members receive Falklands Conservation's newsletters. Benefactor members receive a certificate and a free booklet. Life members receive an engraved plaque, featuring our rockhopper penguin logo.

Further details may be obtained from:

Kate Thompson, Falklands Conservation, 21 Regent Terrace, Edinburgh EH7 5BT U.K.

Carol Miller, Falklands Conservation, PO Box 31, Stanley, Falkland Islands.



This newsletter has been produced with financial assistance from WWF United Kingdom.



Falklands Conservation is a member of the International Union for the Conservation of Nature and Natural Resources.



THE WARRAH

Newsletter of Falklands Conservation

NUMBER 2

MAY 1992



Ladies Slippers

(Kate Thompson)

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Any opinions expressed in this publication are those of the authors and do not necessarily reflect those of Falklands Conservation.

**Editor: Kate Thompson,
21 Regent Terrace
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United Kingdom**

An Archaeological Survey at Port Egmont, Saunders Island

Rob Philpott, Field Archaeologist at the Liverpool Museum, describes the results of his recent survey of Port Egmont which provide fascinating insights into the history of the Falklands' earliest British settlement.

As the first British settlement, Port Egmont on Saunders Island occupies a key position in the history of the Falkland Islands. The potential of the harbour was first discovered in 1765 by Commodore John Byron, who named it after the first Lord of the Admiralty, the Earl of Egmont. However it was not until the following year that a permanent settlement was established by Captain John MacBride. MacBride erected huts for stores plus a timber blockhouse, defended with carriage guns, and also planted gardens. This first British settlement was, however, shortlived. By 1764 the French had landed at Fort St Louis (now Port Louis) but soon afterwards sold their claim to Spain. Relations between the two colonies were tense, and in 1770, after much wrangling, the Spanish entered Port Egmont with a large force and ejected the British. A little over a year later, a diplomatic agreement was reached which returned the settlement to the British. During this period the settlement was expanded and developed. The British remained at Port Egmont until 1774 when the cost of maintaining the garrison was judged too great and the settlement was abandoned. Thereafter, the site remained the haunt of whalers, adventurers and pirates, and further buildings were erected. In view of the threat which it posed to them, the Spanish destroyed the remains of the settlement in 1780. The site continued to draw visitors through the remainder of the 18th and 19th centuries, but was never resettled, and the ruins were progressively overgrown and eroded.

In the past thirty years, a burgeoning interest in the history of the Falklands led to a brief survey at Port Egmont in the 1960s, followed by a small amateur dig in the 1970s. Yet, until this year, no professional archaeological survey of the settlement had been carried out. Increasing pressure from tourism and a growing concern for the historic sites in the Falklands combined to make a detailed study imperative. John Smith, Curator of the Falkland Islands Museum, took the initiative in commissioning the present survey. The fieldwork was made possible through generous funding from the Falkland Islands Government, Falklands Conservation, and the National Museums and Galleries on Merseyside,



A view of the interior of "Maltby's house", Port Egmont, showing slots in the wall for the timber floor and wood panelling. (Rob Philpott)

and was carried out over 12 days in January 1992 by the writer and David Barker, Keeper of Archaeology at the City of Stoke-on-Trent Art Gallery and Museum.

The main aim of the survey was to identify and record the surviving elements of the settlement. While some of the buildings are clearly visible on the ground as walls or overgrown mounds of rubble, other features survive as low earthworks, recognisable only to the trained eye. In the course of the survey we identified no fewer than 14 individual buildings, 10 probable gardens, four gun batteries and a cemetery, as well as the harbour, paths, and a number of other features which remain enigmatic. The use of highly accurate and very rapid electronic distance measuring equipment ensured that the location of almost all of these, together with their context in the landscape, was plotted to a high degree of accuracy. A photographic record, including a series of aerial pictures, forms an essential part of the archive.

Closely integrated with the fieldwork has been the evidence provided by the rich archive of contemporary plans and views of the site. During the brief Spanish occupation in 1770 and 1771, as well as after the abandonment of the settlement by the British, a number of

plans and views were drawn, which are preserved in archives in Spain and Latin America. Some are crude and highly schematic, but the best of these record the layout of buildings in fascinating detail. Often the function, and sometimes even the occupier, of a particular building are specified. This proved to be the critical link which enabled us to identify the purpose of the great majority of those features which might otherwise have remained anonymous earthworks.

The documentary evidence enables us to assign some elements of the settlement to a very narrow date range. Thus, we can see how the settlement grew and developed either side of the Spanish occupation. For example, the very large, well-preserved stone building, which measures nearly 40 m long and stands beside the dock, was not built until some years after 1771, at which time only the two stone moles (breakwaters) of the harbour complex had been completed. Furthermore, the best preserved house in the settlement, with its fine chimney and later extensions to east and west, is almost certainly a 19th-century construction. By contrast, virtually nothing remains of the building which all the contemporary views agree was the most prominent at Port Egmont, the timber tower or blockhouse, which had been constructed at Woolwich and shipped out for erection on site.

Overall, the broad outlines of the settlement layout with its storehouses, animal and bird house, forge and commandant's house, as recorded on the most detailed Spanish plans, were confirmed as accurate.

The plans also throw interesting light on the context of some minor details of construction. A small square building of stone, surprisingly, had a rather sophisticated suspended wooden floor and slots for timber uprights, which must originally have supported some sort of panelling. These refinements become more comprehensible in the light of the record that, in 1770, it served as the house of Captain Maltby, one of the senior officers at Port Egmont.

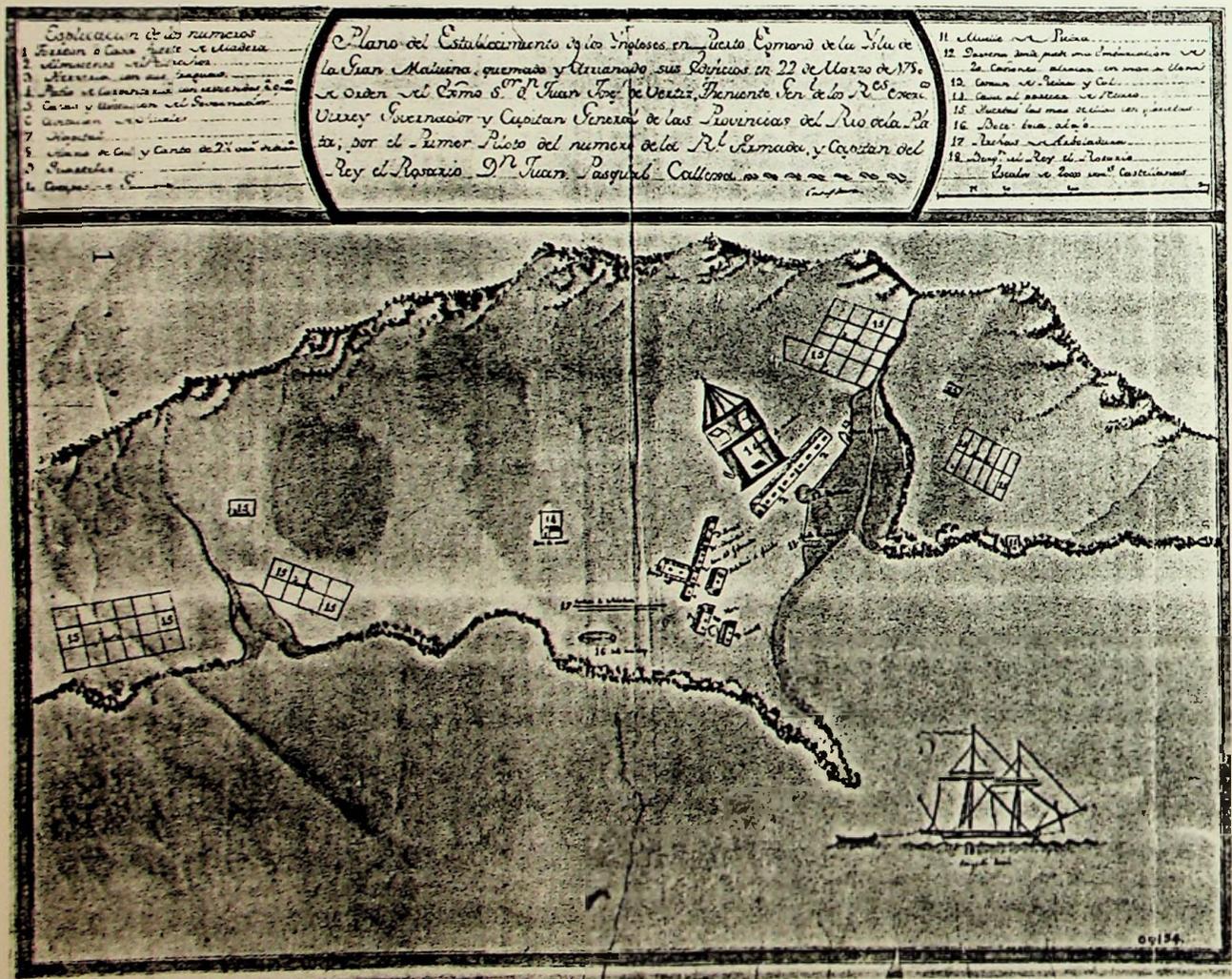
It was clear, both from the documents and from the evidence on the ground, that a major concern for the early settlers was to secure their food supply, especially fresh vegetables. By

the winter of 1766, MacBride had planted no fewer than six gardens but suffered great disappointment in the first season when the plants withered. This had clearly been reversed by 1772 when Penrose could describe the gardens as the 'glory of the colony'. The survey confirmed that many of the gardens had been positioned in sheltered valleys to take maximum advantage of the available water, further protection from the wind being provided by high boundary banks which remain readily visible today. Others lay up to 2 km from the site, as far away as Sealer Cove near the modern settlement on Saunders Island.

Defence too was an obvious preoccupation, and the batteries survive as major earthworks positioned to protect the harbour and also to defend the settlement from landward attack. A poignant reminder of the hazards of life in this remote colony was provided by the little cemetery on the slopes of Mount Egmont.

The work of processing the survey results is currently under way at Liverpool Museum and a published report will appear in due course. Copies of the archive will be lodged in the Falkland Islands Museum. Grateful thanks are due to David and Susan Pole-Evans and to all on Saunders Island for their kindness and warm hospitality as well as to John Smith, Kate Thompson and Mike Stammers, and their respective institutions, for their enthusiastic support of the project.

Note: Rob is keen to hear from anyone who may have early photographs or plans of Port Egmont or who has any information on the HMS Protector survey of the 1960s or the Royal Marines' excavation in 1973. His address is: Robert A. Philpott, (Field Archaeologist, Liverpool Museum, William Brown Street, Liverpool L3 8EN).



A panoramic view of Port Egmont by Juan Pasqual Calleja, dated March 1780, showing the blockhouse, main buildings, gardens and harbour.

Time to Act: a Replanting Strategy for Tussac Grass

Gerry Hoppé of the Falkland Islands Department of Agriculture outlines a developing strategy for the restoration of Tussac grass habitat in the Falklands which promises great benefits to both agriculture and conservation.

Tussac grass (*Paradiochloa fiabellata*) is a large, coastal tussock-forming grass, restricted in geographical distribution to Tierra del Fuego, Isla de los Estados, South Georgia and the Falkland Islands. Only in the Falkland Islands has it been used as a feed for domestic stock, generally with devastating results.

Tussac, which until the 19th century grew abundantly on the coastline of most of the Falkland Islands, is now severely limited in its distribution. In 1844, Governor Moody referred to Tussac grass as the 'Golden Glory of the Falkland Islands', an indication as to the esteem in which Tussac grass was held at that time. It is sad and somewhat alarming that the history of the Falkland Islands is one of almost continual exploitation of natural resources; particularly its wildlife and Tussac fringe. Without exception, all reviews of Tussac grass in the Falkland Islands confirm the continued decline. An estimated 81% of former Tussac habitat has disappeared and only approximately 5,000 ha remain. It is

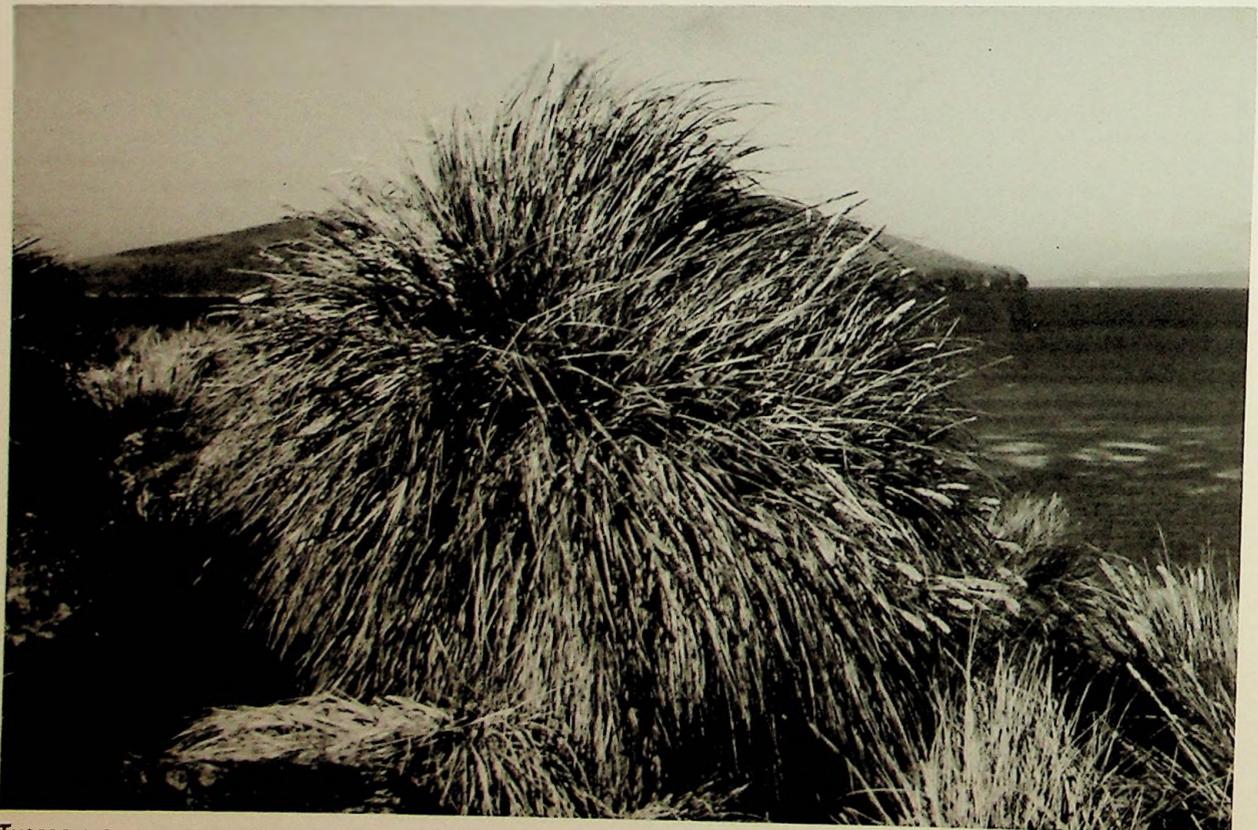
widely accepted that Tussac stands have been lost by the combined effect of fire and grazing by livestock. Fires were set by sealers to drive out their quarry, and accidental fires have also undoubtedly accelerated the decline of the coastal habitat. Overgrazing will easily destroy a plantation, as the stem bases are highly palatable to livestock.

Successful attempts at re-establishing Tussac in the Islands have been restricted, probably largely due to the labour intensity of the work, need for fencing and mis-management of newly established plantations. Farmers' interest in re-planting was further reduced in the mid-1960's when, for the first time, Tussac was found to be infected with the yellow rust (*Puccinia striiformis*). Although it does not kill mature plants, it reduces yield, causes unpalatability and may kill seedling plants.

With recent changes in land ownership and farming attitudes, there has been a greater recognition of the conservation value of Tussac grass.

Recommendations from various reports clearly indicate that the ecological and conservation value of Tussac is being given as much thought as is its potential use in the farming system. Tussac can, where suitably managed, provide highly nutritious winter feed and shelter for stock and at the same time be a wildlife haven for passerines, sea lions and penguins alike.

The restoration of Tussac grass provides the opportunity to ensure the survival of this possibly endangered coastal habitat at a time when such ecosystems are steadily decreasing throughout the world. The replanting of Tussac would benefit the agricultural sector and, at the same time, enhance the conservation value of the Falkland archipelago. Fears that the use of Tussac for agricultural use and conservation are incompatible need to be put to rest. A strategy for the restoration of Tussac grass is welcomed by those concerned with agriculture, wildlife conservation, tourism and education.



Tussac grass.

(Kate Thompson)



Tussac grass plantation on Sea Lion Island beside eroded former Tussac ground.

(Kate Thompson)

Replanting strategy

It is acknowledged at the outset that the restoration of a natural ecosystem on the scale envisaged for Tussac grass in the Falkland Islands requires long term investment of scientific, technical and financial resources. It is recognised that a well organised programme is required and that close collaboration must be maintained among all concerned.

The strategy adopted could be three fold. Phase 1, to identify the most appropriate practical method(s) for the re-establishment and maintenance of Tussac grass on both previous coastal and virgin inland sites. Phase 2, to identify primary, secondary and tertiary target sites most suitable for successful Tussac restoration. Phase 3, the transfer of appropriate technology to the commercial sector and implementation of the restoration programme developed from phases 1 and 2.

The site selection categories are defined as: primary sites – those areas

where replanting will lessen erosion not only at the site but also reduce the effects of wind blown peat soil into adjacent areas; secondary sites – areas not so prone to erosion through the effects of wind and sea, but which nevertheless require replanting; tertiary sites – areas with no erosion problems in which the aim is purely to increase the available Tussac acreage for grazing purposes. The priority for restoration will initially be primary, secondary and finally tertiary sites. However, circumstances may demand that this be reviewed as the programme develops.

Research

An integrated series of field trials have been designed, aimed at identifying practical and appropriate methods for Tussac establishment and maintenance. Joint funding (Department of Agriculture and Falkland Islands UK Trust) will enable the constraints imposed by the rust disease and insect pests on establishment and growth to be determined in order to devise biological and environmentally "safe" methods

of control. Further work is required to refine the preliminary results. However, it is envisaged that, when the practical and technological methods appropriate to the project are identified and field tested by the Department of Agriculture, the planting scheme would be turned over to the commercial sector for long term implementation. Serious thought is needed regarding the potentially major constraint imposed on the success of such a project by the cost of fencing materials.

The Future

The adoption of a strategy for the restoration of this endangered coastal habitat and its implementation are crucial to increasing the wildlife and conservation value of the Falkland Islands. The Islands can lead the world and demonstrate that they are committed to conservation in the broad sense, not just fish stocks. Tussac is a long term investment for the future. The threatened ecosystem (Tussac habitat) can be saved – surely the time is right to bring the decline of Tussac grass to an end!

Sea Lion Island

Kate Thompson, Falklands Conservation's Secretary, describes some wildlife encounters on Sea Lion Island and discusses the island's future prospects.

Sitting on a rocky beach in bright sunshine, with rock wrens and tussac birds checking me out for ticks and a group of moulting elephant seals snorting and grumbling nearby, the perils of winter and paperwork back home seemed even further than 8,000 miles away. Sea Lion Island (Fig. 1) may lack the scenic beauty of some parts of the Falklands, but this is more than compensated for by the variety and abundance of its wildlife. A visit provides a glimpse of what much of the Falklands' coastal habitats must have been like before Man destroyed the Tussac and introduced alien predators.

On leaving the tourist lodge shortly after my arrival that morning, I had first called in at the nearby gentoo colony, situated on a series of sandy mounds. A count revealed 860 chicks, standing around quietly in creches. In the afternoon, on the return of their parents from the sea, I knew that things would get much livelier. I particularly enjoy the "keystone cop" chases so characteristic of gentoo colonies, in which pairs of chicks eagerly pursue their harassed

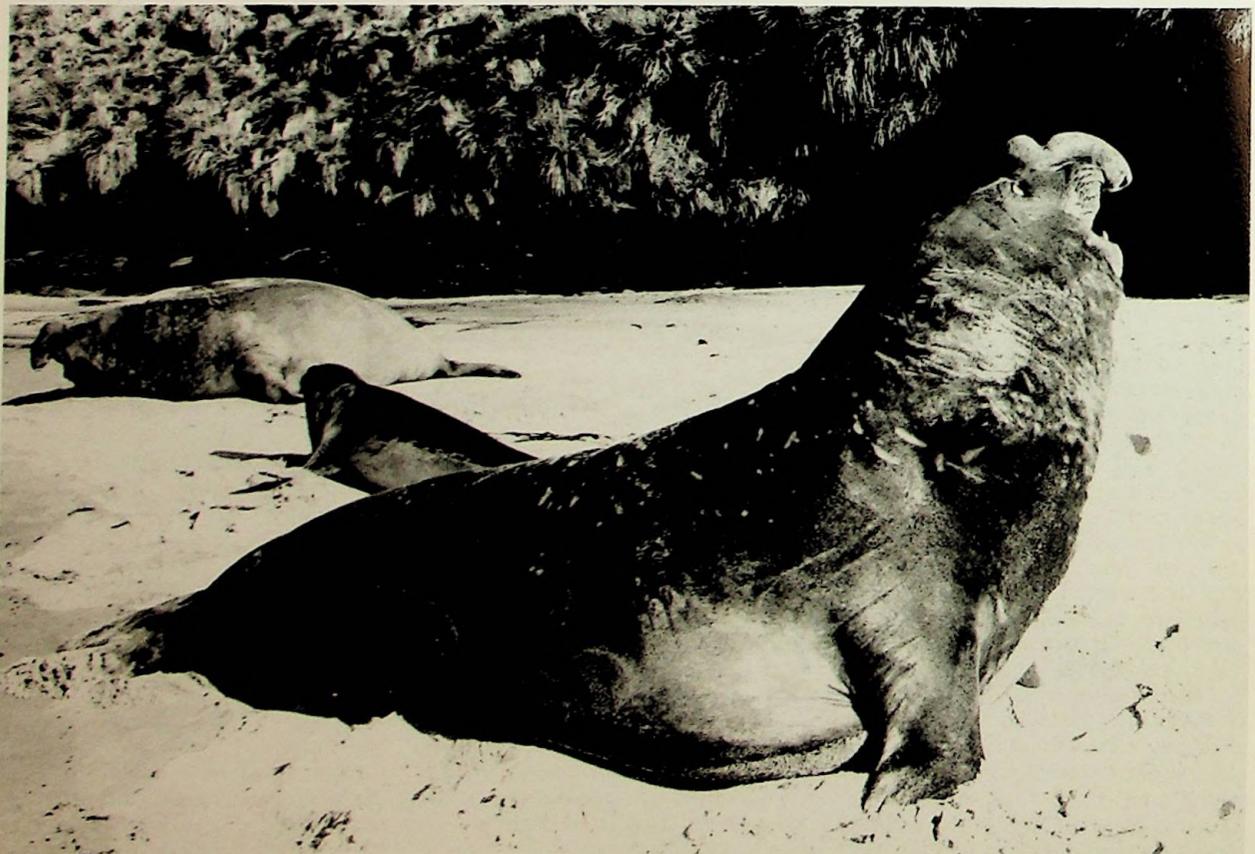
parents through the rookeries. Collisions are not infrequent and the whole scene can appear quite chaotic. This apparently somewhat exhausting way of arranging supper may provide a means of ensuring that both chicks receive adequate food, with the first one to be fed falling behind its leaner sibling when the chase resumes.

Walking down to the sandy beach, I saw my first elephant seals of the day, an untidy line of moulting males. Most were dozing placidly, but occasionally one would rear up briefly to complain about a neighbour. Their beach was shared by Magellanic oystercatchers, Falkland flightless steamer ducks ("loggers") and ruddy-headed geese. Moving on along the coast, I entered the first of the island's large Tussac paddocks, which was alive with thrushes, finches, tussac birds and Magellanic ("jackass") penguins. It was interesting to find the wings of a sooty shearwater, believed to breed on the island, and I made a mental note to make a night visit to the area on some longer future visit. A nearby pond held

breeding pairs of chiloie wigeon and the delightful silver grebe.

Beyond the pond, the path ascended to the top of some low cliffs. On the boulder beaches below were breeding sea lions with over 40 pups, sadly only a fraction of the numbers found just a few decades ago. The enormous neck girth and evident power of the males, combined with their ferocious looking teeth, make viewing from a distance the only sensible option. Other inhabitants of this part of the island include rock shags, ground tyrants and striated caracaras ("Johnny Rooks"). The crested caracara ("Carancho") also breeds on Sea Lion Island.

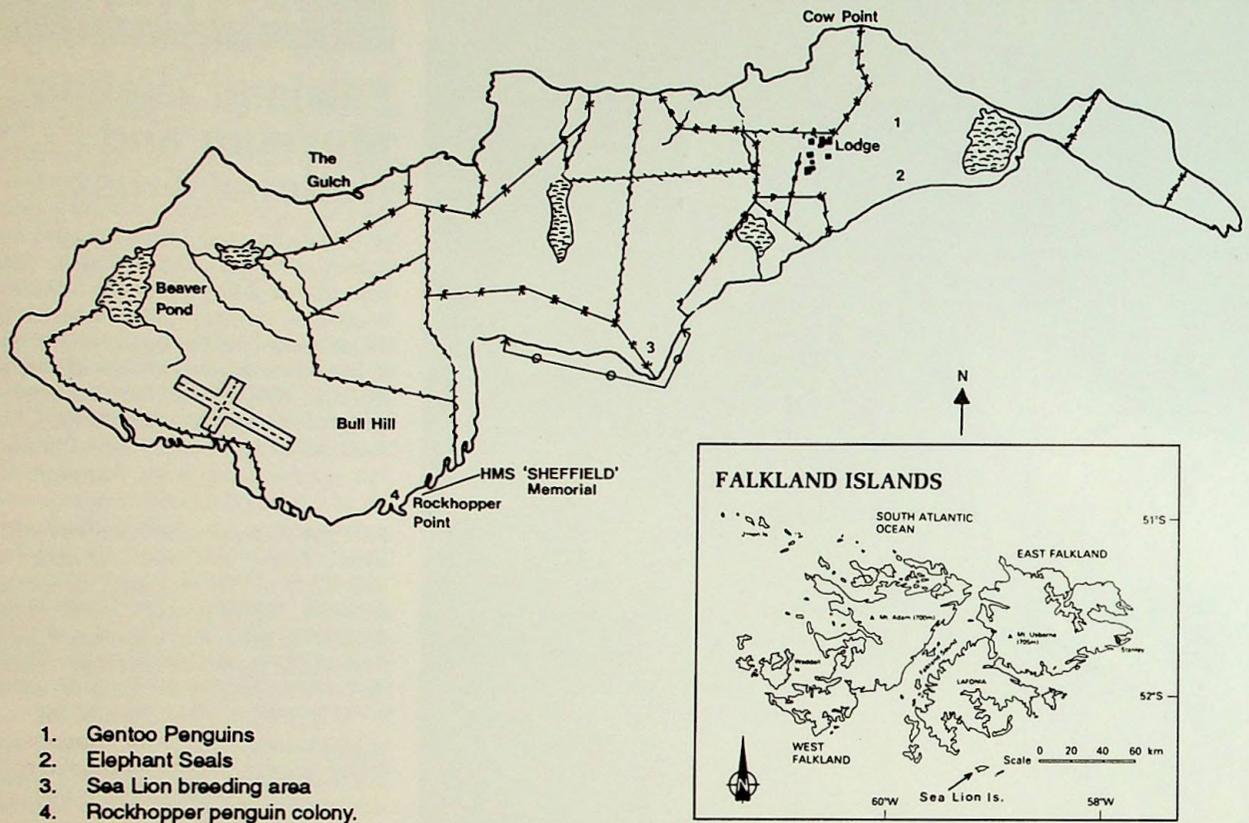
On the top of the highest cliff, adjacent to the Sheffied memorial cross, I came to the rockhopper colonies, with about 230 chicks in total. Observing the goings on in a rockhopper colony can never be dull and these feisty birds rate as my favourite penguin. Several hundred king shags were nesting amongst the rockhoppers, in typically squalid nests.



Elephant seals on Sea Lion Island.

(Stan da Prato)

FIGURE 1
SEA LION ISLAND



Walking back towards the lodge, along the centre of the island, I saw several rufous-chested dotterel bobbing about in the heath areas. The subtle beauty of the contrasting textures and shades of the ferns and diddle-dee bushes, set off by the low evening light, served well to round off a most enjoyable day. Having experienced Falklands' record breaking temperatures of 30°C, it was very pleasant to relax over a cold beer in the lodge's bar before an excellent dinner.

Sea Lion Island must be given high marks for the quality of the experience which it can offer visitors. The lodge manager, Dave Grey, is a knowledgeable and enthusiastic guide, whose own love of, and concern for, the wildlife is heartening. However, the island is not free of problems. Because the wildlife is so incredibly tame, it can be difficult for visitors to remember that they are privileged intruders in a natural ecosystem, not visitors to a zoo. The temptation to go that one step closer is always there, particularly in aid of getting the "ultimate" photograph.

In 1991/92 occupied bednights at the lodge exceeded 1,000 and further visitor pressure is generated by daytrips from groups of up to 40 military personnel. Steps have been taken to reduce the possible impact of visitors on the island's wildlife through the erection of hides, fences and footpath signs. In addition, the Tourist Board have published a free "Guide to Responsible Behaviour". However, there is currently no system in place to monitor the effectiveness of these measures.

Of even greater concern is the severe erosion evident at the west end of the island, caused by loss of Tussac cover. Much of the western coastal fringe is "black ground", derelict areas consisting of loose peat soil with scattered mounds marking the location of former Tussac bogs. Wind erosion of the loose surface material leads eventually to the development of bare clay patches and smothers vegetation downwind. Inland from these former Tussac areas is a flat plain, the surface of which is covered with a sparse

growth of sorrel, a coloniser of bare ground. Such eroded areas are a familiar site around much of the Falklands' coastline. The contrast between them and the vibrant wildlife communities associated with living Tussac habitats provides a starkly depressing example of the consequences of the misuse of natural resources.

Tussac is the key to the future of both wildlife conservation and agriculture on Sea Lion Island. It provides a key habitat for many native species and its carefully controlled use as a winter forage has yielded some of highest unit wool yields in the Falklands. The island's former owner, Terry Clifton, put an enormous amount of effort into replanting eroded Tussac ground, with excellent success over some areas, but much more remains to be done. Staff at the Department of Agriculture are developing a Tussac replanting strategy for Sea Lion Island (cf. Gerry Hoppé's article), but it remains to be seen whether or not the necessary resources will be allocated to implement this.

NEWS IN BRIEF

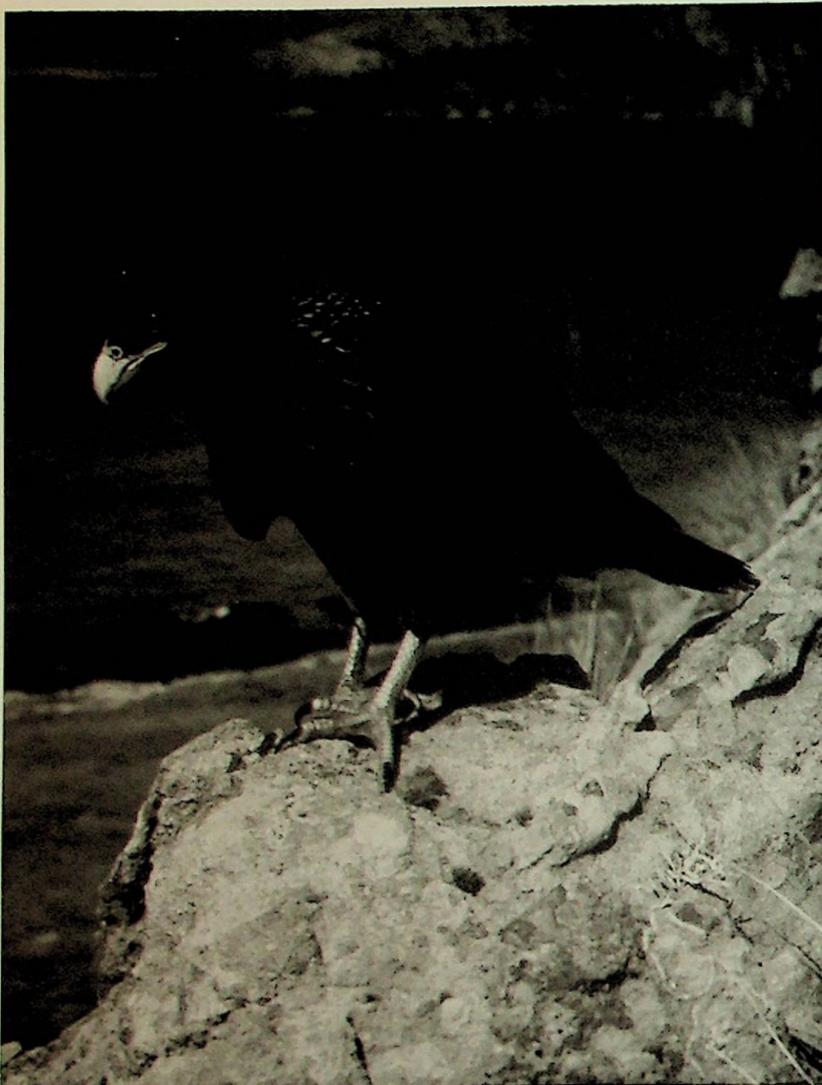
Falkland Islands Museum and National Trust

A Falkland Islands Museum and National Trust has recently been formed, largely due to the efforts of museum curator, John Smith. The Trust is constituted by local ordinance in the Falklands and is chaired by Joan Spruce. The other members of its governing body are John Smith, Mike Rendell, Shirley Hirtle, Jane Cameron, Pat Luxton and Brian Aldridge. The Trust will be principally concerned with safeguarding the historic heritage of the Falklands and its main functions will be to operate the museum and national archive. The Trust is also empowered to hold ancient monuments, archaeological objects and sites of interest and to advise Government on related matters.

Falklands Conservation and the Trust are maintaining good liaison to prevent any duplication of effort and to enable co-operation on key issues of concern to both organisations. We wish the new National Trust every success in its endeavours.

Sea Lion Research Project

The Sea Mammal Research Unit sea lion team have recently completed their second field season in the Falklands. Their work this year concentrated on studying the foraging behaviour of sea lions using sophisticated VHF radio tracking equipment, automatic time-depth dive recorders and satellite tags. Satellite tags are a recently developed and very powerful tool in such studies and provide continuous information on the precise location of tagged individuals. Most dramatically to date they have been used to track the movements of wandering albatrosses foraging over distances of up to 10,000 kilometres from their breeding grounds. The Falklands sea lions do not go quite so far, but one female tagged at Beaver Island embarked on a 5 day foraging trip of over 200 miles, travelling 70 miles south before returning to her pup via Falkland Sound and the south coast of West Falkland. A full report on the sea lion project will appear in the next newsletter.



Striated caracara or "Johnny Rook".

(Kate Thompson)

In 1990 Sea Lion Island was purchased by the Falkland Islands Development Corporation (FIDC), the lodge owners, who were concerned to protect the island's conservation and tourist interest upon its sale by Terry Clifton. The potential for Sea Lion Island to become a showcase for other similar sites in the Falklands, through the successful integration of tourism and sheep farming with conservation, is excellent. Unfortunately, to date, no long term management plan has been prepared to bring this about.

Following a series of policy changes, Sea Lion Island is currently being used as a quarantine station for the recently imported National Stud Flock. This is being managed on behalf of the FIDC by Falklands Landholdings Ltd, with advisory input from the previous owner and the Department of Agriculture. However, there is no systematic co-ordination of management policies and practice among those now variously responsible for the island and no

provision for monitoring the impact of the changes in grazing regimes upon the island's pastures.

Falklands Conservation is lobbying the FIDC to commission the preparation of a full management plan, which would pool together all the existing information and expertise, develop long term management objectives, and set detailed prescriptions to achieve the desired goals. The cost of preparing and implementing such a plan would be modest in relation to the funds already expended on purchasing the site. It must surely be well worth committing these resources in order to ensure the future well being of such a very special island.

Readers may be interested to note that the author will be returning to Sea Lion Island in the coming austral summer to lead a group of tourists, on behalf of Island Holidays. If you would like to join her there are still a few places available. Please see page 11 for further details.

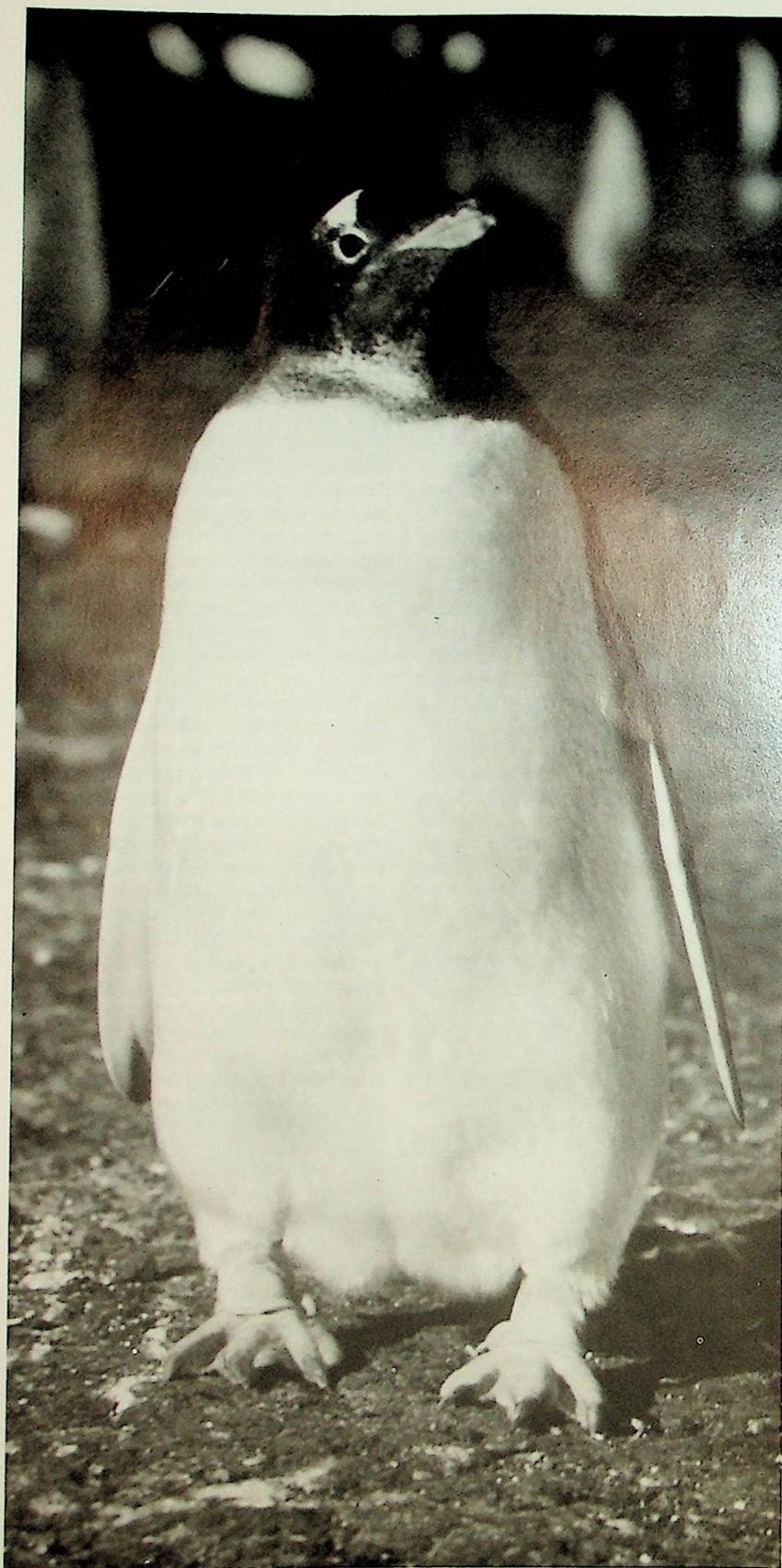
Gentoo Penguin Census Scheme

As part of the Seabird Monitoring Programme (FISMP), a voluntary gentoo penguin census scheme has been set up. The aim is to gather information on gentoo penguin numbers and breeding success from as many sites around the Falklands each year as possible. Gentoo penguins show tremendous variation in their diets and breeding ecology between sites and years. In order to gain an overall picture of any trends in the Falklands gentoo population, and to assess the possible effects of fisheries, it is essential to gather information from as wide a range of colonies as possible.

A band of keen volunteers, stretching from Bertha's Beach to Beaver Island and from Cape Dolphin to Ajax Bay, visited their local gentoo rookeries during incubation and close to fledging to count numbers of breeding pairs and chicks respectively. Each volunteer was supplied with a full set of instructions, forms on which to enter the data collected and a map on which to indicate colony locations.

Counts have now been sent in from over 20 colonies, holding almost 8,000 breeding pairs, and many volunteers have included very useful additional information on the history of the rookeries visited. These range from colonies established within the past few years to those which are known to have existed for over 100 years. The results have served to highlight the extreme variation between sites which makes the scheme necessary. In the 1991/92 season, peak laying dates ranged from mid-October to mid-November. Some colonies experienced complete breeding failure while others fledged up to 0.8 young per pair.

In combination with the studies of diets, chick growth and survival rates conducted each year by the FISMP's field team of two seabird biologists, these counts will greatly assist our understanding of gentoo penguins in the Falklands. Heartiest thanks go out to all the willing volunteers who took the time to count their rookeries and to fill in all the data forms. A news sheet and fresh forms will be sent out to everyone prior to next season and we hope that more campers with a concern for their penguins will assist in 1992/93.



Gentoo penguin, subject of the census scheme (Kate Thompson). More volunteers are needed for this scheme in the 1992/93 breeding season. If you are able to help, and have not already participated in 1991/92, please contact our Falklands Secretary, Mrs. Carol Miller, at PO Box 31, Stanley (Tel. 22247) for further details.

Lord Shackleton II Sinking — Concern for Beauchêne Island

On March 14th, the trawler Lord Shackleton II sank in 70 metres of water just off Beauchêne Island. Fortunately no lives were lost, but the incident poses major threats to the Island's wildlife.

Oil spilling from a ruptured fuel tank generated a slick around the shore of Beauchêne, with patches extending up to 20 miles away. The heaviest concentrations of oil were in the vicinity of the Island's globally significant seabird colonies, which hold almost half a million pairs of black-browed albatrosses and rockhopper penguins. The slick, which was monitored by the Fisheries Directorate's patrol aircraft, persisted for several days before dispersing naturally.

Ten days after the sinking, Beauchêne was visited briefly by Mike Riddy of Falklands Conservation's seabird monitoring programme team (*Warrah 1*, p. 6-7) and Dr. Conor Nolan of the Fisheries Directorate. They found no evidence of oiled birds ashore or of contamination on the shoreline. First indications are, therefore, that the slick may not have caused as much damage as was at first feared. However, there is a risk that adult rockhopper penguins departing from Beauchêne on completion of their post-breeding moult could have been caught up in the slick.

It will not be possible to assess this until the birds return for the 1992/93 breeding season. A continuing hazard is posed by the remaining fuel aboard the ship, estimated at just under 600 tonnes, which will inevitably escape at some point in the future.

A second potentially catastrophic consequence of the sinking lies in the possibility that rats could have been introduced to Beauchêne on the liferafts, rope and other substantial pieces of wreckage which were washed ashore. If there were any rats on the ship, the implications for the Island's breeding petrels and passerines, as well as its unique invertebrate fauna and even the Tussac itself, could be disastrous. Within the Falklands, the fauna of many offshore islands has already been severely impoverished by rats and other alien predators. On a global scale, the spread of commensal rat species to oceanic islands, often from ship wrecks, has been an ecological disaster of mammoth proportions.

In the aftermath of this latest incident, Falkands Conservation has submitted detailed recommendations to the Falkland Islands Government on monitoring Beauchêne for rats and on dealing with the remaining oil pollution threat. However, the sinking of the Lord Shackleton II, together with the earlier grounding of another fishing vessel on the north coast of East Falkand, highlights the need for a review and strengthening of the provisions relating to the operation of shipping in Falkands waters. It is to be hoped that a major ecological disaster will have been averted on this occasion, but action must be taken to minimise future risks.

Queen of the Falklands Butterfly

In the 1990 issue (vol 5, part 4) of the Falkland Islands Journal, I wrote a review of the occurrence of the fritillary butterfly (*Issoria cytheris cytheris*), known in the Islands as the Queen of The Falklands. My article was based on written records and reports of the butterfly from its first discovery in the late 1890's to the most recent available information, up to the end of 1989. On the basis of this rather scant data, the picture that emerged of *Issoria* was one of thin but quite widespread distribution throughout the Falklands.

Since that article appeared, I have received new information. Although the picture of the butterfly is not substantially different to that of a year or so ago, a number of interesting details have come to light. Up to September 1991, substantiated sightings of the butterfly were known for 14 localities, in 13 ten kilometre squares. These include all known records, historical and contemporary. They further divide into sightings from ten localities on West Falkland and only four from the East. Records were spread from November to February, with the majority (21%) reported in December. Both altitude and habitat preferences appear to be wide, with butterflies being recorded to 1000 feet above sea level and over a variety of site types: diddle dee camp, white grass, re-seeded grassland and boulder fields amongst them. As might be expected of a butterfly whose relatives occur in sub-polar regions, *Issoria* appears equally tolerant of exposed and windy conditions. However as recent observations suggest, it seems to prefer flying in sunny conditions, sheltering amongst low vegetation and rocks during the more inclement periods.

The response to my article was encouraging. I would particularly like to thank the following for sending their records, a synthesis of which has produced this update: Jim McAdam, Robin Woods, Neil Simpson, Nigel Milius and John Love.

There is still much to learn of the mysterious ways of this Falkland Islands butterfly. Should anyone have any information and is willing to share it, I would be very pleased to hear from them.

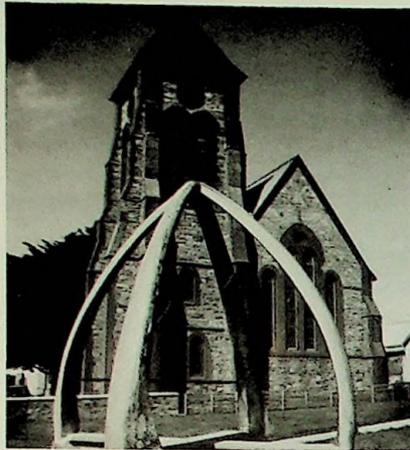
David Carstairs, 5 Rowan Park, Carrbridge, Inverness-shire, PH23 2AD.



Queen of the Falklands Fritillary.

Whalebone Arch

Stanley's famous whalebone arch has now been restored and returned to its original position in the FIC Centenary Plot next to the cathedral. The restoration work on the arch was carried out by Tim and Pauline Carr. The plot has also received considerable attention from Stanley Nurseries and now boasts a colourful floral display. The cathedral is also looking at its best, following extensive restoration work financed by the centenary appeal.



Restored whalebone arch in Stanley.
(Kate Thompson)

Vehicle Appeal

Falklands Conservation has launched an appeal for funds to purchase a replacement vehicle for use in project work and by the Stanley Secretary. The current vehicle, an elderly Series III Land Rover, has done sterling service with a lot of Camp use, particularly for the seabird project, since it was purchased in 1989. However, this vehicle is now becoming very expensive to maintain and we hope to be able to buy a rather newer model.

The appeal target is £6,000 of which £2,000 have already been raised from Turners Diesel, Gordon Forbes Construction, Standard Chartered Bank and Cable and Wireless PLC. Any members wishing to contribute to this fund should please send a cheque (payable to "Falklands Conservation - vehicle appeal") to either Kate Thompson or Carol Miller. All donations very gratefully received!

Trout Survey

Dr. Conor Nolan, Senior Fisheries Scientist in the Fisheries Directorate is organising a Falklands gamefish survey, concentrating particularly on introduced brown trout. The survey aims to find out more about the distribution, age structure, growth rate and reproductive potential of local stocks. A programme of tagging, scale analysis and otolith (earbone) reading is being complemented by a survey of anglers, who are being asked to record information on the numbers, sizes, sex and stomach contents of their catch. The survey should also provide useful information on the status and distribution of stocks of the native freshwater fish, *Aplochiton zebra* and *Galaxias maculatus*, the plight of which was described in the previous Warrah (No. 1 p.8-11).

Pollution in Stanley Harbour

For some time now, Stanley residents have been expressing concern about pollution caused by the growing amounts of sewage entering Stanley harbour as the town expands. At times, the smell is quite unpleasant and local divers have noticed poor underwater visibility and an increased growth of thick algae on the harbour floor.

Bacteria and fungi colony counts on water samples collected from Stanley harbour were recently performed by staff of the KEMH pathology laboratory on behalf of Falklands Conservation. These indicated total bacteria levels in the vicinity of Stanley to be in the order of 10 times that found in Port William. It was not possible to ascertain what proportion of these may have been pathogenic bacteria associated with sewage pollution and it is likely that there would naturally be higher numbers of micro-organisms present in the relatively sheltered waters of the harbour. However, the figures do give cause for concern and highlight the need for a much more rigorous investigation. The Conservation Committee have recommended a study of pollution levels in the Harbour to the FIG.

NOTICES

Island Holidays Tour

A limited number of places are still available on the special Christmas Wildlife and Conservation Tour of the Falklands run by Falklands Conservation and Island Holidays. The tour will be led by Kate Thompson, and will last for 14 days from 21st December 1992. The tour will visit Stanley and surrounding areas, Saunders Island, Pebble Island, Sea Lion Island and Volunteer Point. The emphasis will be on conservation in the Falklands and the tour will include illustrated lectures and opportunities to see research work in action, as well as plenty of time simply to enjoy the beauty of the Islands' scenery and wildlife.

For further information, please contact: Island Holidays, Ardross, Comrie, Perthshire PH6 2JU (Tel 0764 70107).



Landrover in the camp.

(Kate Thompson)

Membership Contact Scheme

Enclosed with this newsletter is a list of those members who have indicated that they wish to participate in our contact scheme. This scheme was suggested by Robin Woods and is designed to enable members with similar interests to make direct contact with each other. If your name does not already appear in the list and you would like to be included in future please contact Kate Thompson giving details of your particular interests. Any feedback on the scheme including suggestions for improvements would be welcome.

Data Protection Act

Under the terms of the Data Protection Act, the Secretary would be grateful if any members who do not wish their membership records to be held on computer would advise her of this. Falklands Conservation do not give out details of membership records to any other person or organisation without the written consent of individual members. The Secretary is happy to supply any member with full details of their own records upon written request.

New Office Premises in Stanley

Our Stanley Secretary, Carol Miller, is now based in a portacabin office, instead of having to work from her home. The office is number 4 in the complex situated on the north side of Fitzroy Road, above FIC's warehouses and Homecare shop. Visitors are welcome to call in between 09.00 and 12.00 from Monday to Friday. Postal enquiries should continue to be addressed to PO Box 31, Stanley. Carol's new office phone/fax number is Stanley 22247.

Request for Photographs

Falklands Conservation holds a small library of photographs for use in our newsletters and other publicity material. However, we could make use of a wider range of pictures, particularly of wildflowers, inver-

tebrates, wildfowl, passerines and cetaceans. If any readers have spare black and white prints or colour transparencies of any of these subjects which they would like to donate to our library we would be very grateful. Full credit will be given to photographers when their pictures are published. Please send any such material to Kate Thompson at 21 Regent Terrace, Edinburgh EH7 5BT.

Publications for Sale

The following publications are available by post from Falklands Conservation, 21 Regent Terrace, Edinburgh EH7 5BT. Prices are inclusive of packing and surface post. Payment may be remitted in \$US at a rate of \$2 per £1. Please make cheques payable to "Falklands Conservation".

<i>Wildflowers of the Falkland Islands</i> (booklet) ...	UK £4.00	Overseas £4.50
<i>Those Were the Days</i> (booklet)	UK £4.00	Overseas £4.50
<i>Tussac Grass in the Falklands</i> (report)	UK £7.50	Overseas £8.50
<i>An Assessment of the Potential for Competition between Seabirds and Fisheries in the Falkland Islands</i> (report)	UK £6.00	Overseas £7.00
<i>Falkland Islands Foundation Newsletter</i> Back issues 5, 6, 7, 8, 9 & 10 only, each	UK £0.80	Overseas £1.00

The two booklets may also be purchased from a number of retail outlets in Stanley and at MPA for £3.50.

Support Falklands Conservation

Falklands Conservation needs the support of all those who care about the natural and historic heritage of the Falkland Islands. If you are not already a member, please help our vital work by joining now. Minimum subscription rates are:

Ordinary Membership	£15*	(\$30) per annum
Family Membership	£20*	(\$40) per annum
Benefactor Membership	£50	(\$100) per annum
Life Membership (under 65)	£500	(£1,000)
Life Membership (over 65)	£300	(\$600)
Corporate Membership	£200	(\$400) per annum

(* Minimum rates for Falklands residents are £10 Ordinary and £15 Family)

All members receive Falklands Conservation's newsletters. On joining, Benefactor members receive a certificate and a free booklet. Life and Corporate members receive an engraved plaque, featuring our rockhopper penguin logo.

Further details may be obtained from:

Kate Thompson, Falklands Conservation, 21 Regent Terrace, Edinburgh EH7 5BT U.K.

Carol Miller, Falklands Conservation, PO Box 31, Stanley, Falkland Islands.



This newsletter has been produced with financial assistance from WWF United Kingdom.



Falklands Conservation is a member of the International Union for the Conservation of Nature and Natural Resources.

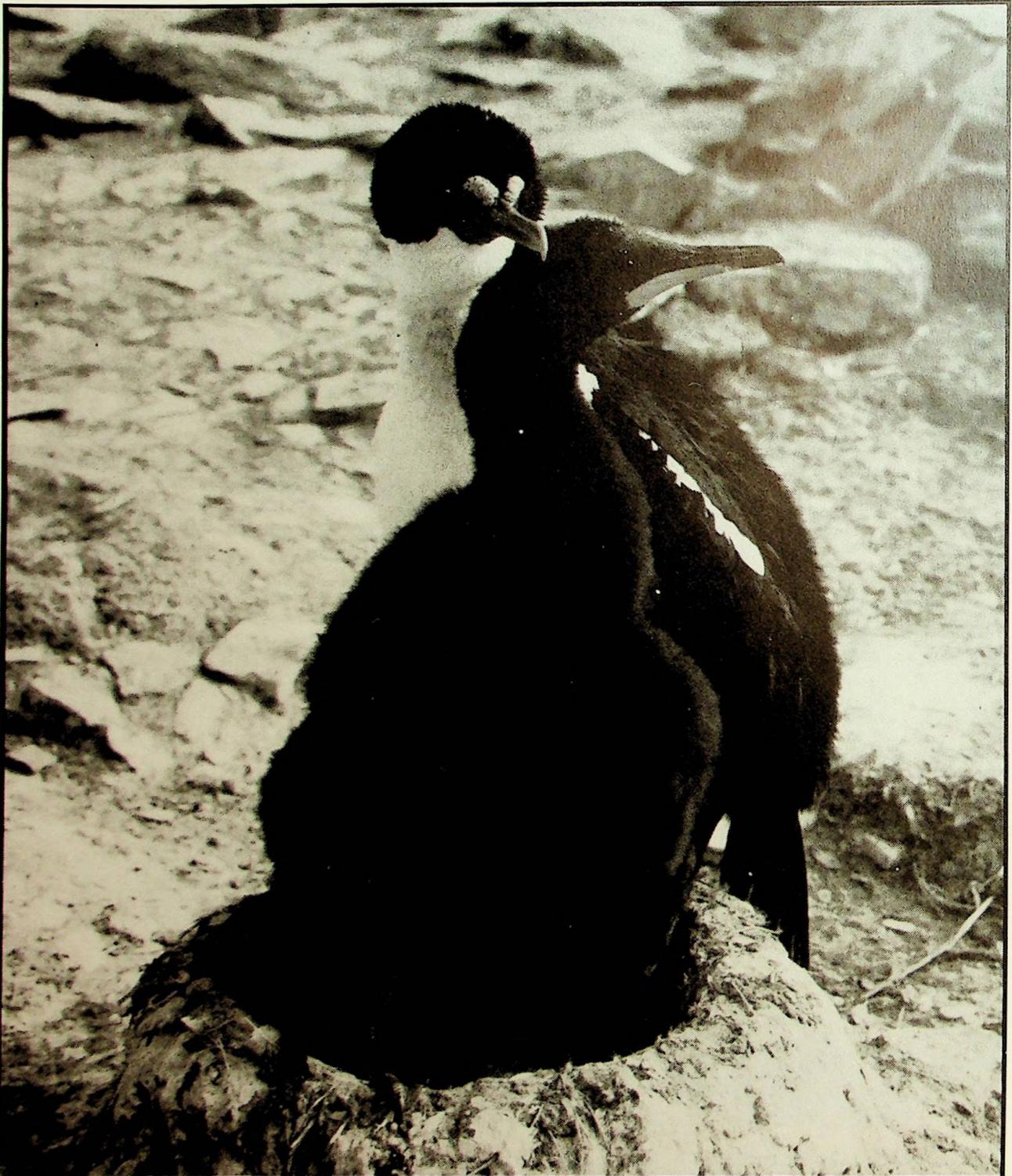


THE WARRAH

Newsletter of
Falklands Conservation

NUMBER 3

DEC 1992



Imperial Shag with chick, Sea Lion Island

Photo: E.Lawson

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Southern sea lions in the Falkland Islands:

A study of their foraging behaviour, diet, population size and distribution

This study, which is administered jointly by Falklands Conservation and the Sea Mammal Research Unit with funding provided by the Falkland Islands Development Service (FIDC) and WWF (UK) (through sponsorship by PIFCO), was instigated to account for the dramatic decline in the numbers of Southern sea lions (*Otaria byronia*) in the Falkland Islands over the past 60 years. Previous censuses of this population revealed approximately 390,000 animals (80,500 pups) in the mid 1930s; 30,000 animals (6,000 pups) in 1965, and only 3,500 animals (600 pups) in 1990. The current population estimate represents a decline of 99% since the 1930's.

The aims of the study are:

a) to obtain a detailed description of the foraging ecology and diet of Southern sea lions in the Falkland Islands.

b) to determine the degree of movement of sea lions between haulout or breeding sites.

c) to establish the current size, productivity and distribution of the sea lion herd in the Islands.

d) to assess the extent of competition between sea lions, commercial fisheries and other predators of fish, cephalopods and crustaceans.

In the summer of 1991, we worked at two sites: at Seal Bay, on the north coast of East Falkland, and at Stick-in-the-Mud Islet, a small tussock island off the west coast of Weddell Island. At Seal Bay, sea lions breed on a boulder beach at the foot of a cliff. On Stick-in-the-Mud they breed on shingle beaches, moving into the tussock as the season progresses. In 1992, we worked with the Stick-in-the-Mud colony.

We collected about 220 faecal and regurgitate samples for dietary analysis. These are currently being analysed, but in summary it appears that lobster krill, fish and squid form



Southern sea lion with satellite transmitter attached

Photo: Callan Duck



Southern Sea Lion pup

Photo: Tui de Roy

the greater part of the sea lions' diet. Surprisingly, most fish consumed appear to be fairly small, although we have seen sea lions eating large mullet. Cephalopod remains appear to be mostly of *Loligo gahi*, with occasional *Martiala* sp., *Ilex* sp. and some larger unidentified octopod species. Only three samples contained penguin feathers.

To find out about sea lions' foraging and diving behaviour, we used three types of electronic gadget. We attached Time-Depth Recorders to two females, satellite transmitters to two others and VHF transmitters to these four plus an additional three animals. We immobilised the females and glued the devices on to their fur with quick-set epoxy resin. This means the devices will fall off when the animals next moult (in March or April).

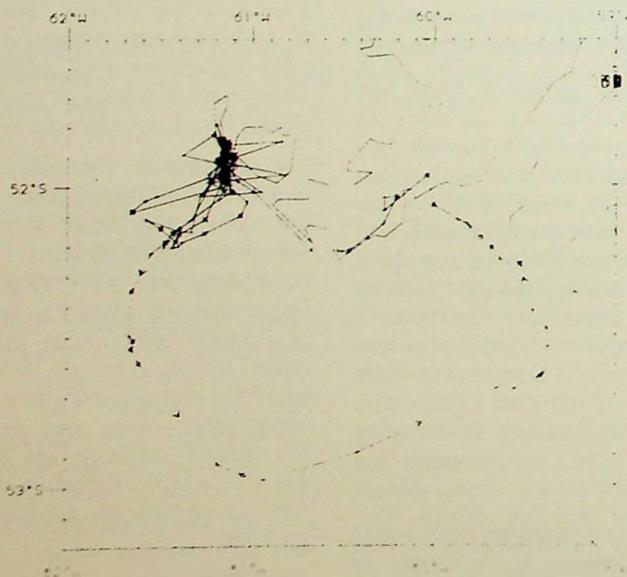
The data obtained show that lactating Southern sea lion females are fairly shallow divers which forage fairly close inshore. Most dives were to a depth of 20 to 30 metres with an apparent maximum of around 60 metres. Their foraging trips were fairly short, most females returning to their pups every one or two days. This implies they do not venture far out to sea, a point reinforced by data from the two seals tracked by satellite. However, one of these females did make one 7 day trip of about 250 miles (see Fig 1). All her subsequent trips were about 20 miles to the south of Beaver Island. Some females moved, with their pups, up to a distance of 7km from their breeding site. These pups would have been between 5 and 8 weeks old. We frequently watched mothers carrying their pups into the sea for short

'swimming lessons'.

Although we still do not know the reasons for the decline of the Falkland's sea lions, we do know that Southern sea lions have been harvested over much of their range for their skins and for their blubber. Commercial harvesting began in the late 1700's and still continues under license in certain areas. There may also be some illegal exploitation of sea lions in some South American countries. In southern Chile, for example, fishermen are reported to use sea lion flesh to bait their crab pots. However, scientists studying Southern sea lions in Patagonia have recently provided us with an important clue. They have documented evidence of extensive exploitation of this species in Patagonia between 1910 and 1960, with well over 250,000 animals killed. They believe the number may even be as high as 500,000. It seems unlikely that the Patagonian population would have been able to withstand this degree of harvesting on its own. If there is any movement of sea lions between the Falklands and Patagonia, this harvesting may have accounted for at least the early part of the decline. The distance involved is in the region of 250 miles and we know that Southern elephant seals regularly migrate between the two areas.

We are seeking additional funding which will allow us to investigate this lead further and to carry out a full census of Southern sea lions in the Falkland Islands.

Callan Duck



Satellite tracking map showing movement of female Southern Sea Lion over 29 day period

Wetlands Conservation in the Falklands

Much of the Falklands is dominated by wetland habitats and the Islands hold internationally important populations of a number of associated species. Recent developments in relation to wetlands conservation in the Falklands and possibilities for the future are described below

In 1971, an international meeting at Ramsar in Iran, adopted the Convention on Wetlands of International Importance especially as Waterfowl Habitats, often known as the Ramsar Convention. This aims to stem the loss of wetland habitats worldwide and requires Contracting Parties to designate wetlands of international importance within their territories.

Designation as a Ramsar site imposes no automatic controls upon a site's use or management, but it does provide international recognition of conservation significance and places a duty on the territory's government to promote the site's conservation. Any ecological changes must be notified to the Ramsar Bureau which holds details of all designated sites. Contracting parties to the Ramsar Convention are also obliged to "promote as far as possible the wise use of wetlands" in their territories.

The criteria used to identify qualifying sites are based upon their usage by internationally significant populations of waterfowl and consideration of the presence of other fauna and flora, particularly endangered or endemic species, and of overall biodiversity of the site.

The majority of the UK's Dependent Territories, including the Falklands, were included in the UK's ratification of the Ramsar Convention in 1976. Although 57 Ramsar sites have now been designated within the UK, only one, in the Turks and Caicos Islands, has been designated within the Dependent Territories. Ramsar designations in these countries have proved difficult due to lack of published information about potential sites, uncertainty about adequacy of legislation to protect these sites and as a result of the inter-acting responsibilities of the Dependent Territory's government, the Foreign Office and UK Department of the Environment (DoE).

In recognition of these past difficulties, the DoE have recently commissioned a study of the application of the

Ramsar Convention to the Dependent Territories. This study has been undertaken jointly by the International Waterfowl and Wetlands Research Bureau (IWRB) and the NGO Forum for the UK Dependent Territories, with the Falkland Islands section being subcontracted to Falklands Conservation. The scope of the study was threefold:-

- to review published information and more readily accessible unpublished sources in order to identify both potential Ramsar sites and those areas for which further research will be necessary.
- to review and assess relevant administrative and legislative provisions for the protection of any designated sites and associated species.
- to draft recommendations for further action.

The study highlighted the pre-dominance and conservation significance of wetland sites in the Falklands. Over 80% of the land area is covered in blanket peat with bog, fen or wet whitegrass comprising one third of the total vegetation cover. There are numerous freshwater bodies ranging from tiny peat ridge pools to substantial coastal barrier lakes. The coastline includes many sheltered bays and creeks.

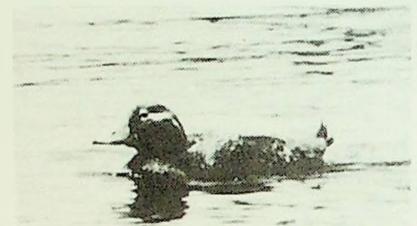
These diverse wetland habitats support 27 breeding species of waterfowl (grebes, cormorants, herons, swans, ducks, geese, waders, skuas, gulls and terns) including endemic species such as the Falklands Flightless Steamer Duck and Falklands races of the Upland and Kelp Geese. In addition, the Falklands are of international conservation significance to species such as the Ruddy-headed Goose, now classed as "vulnerable" to extinction due to the drastic reduction in the large Tierra del Fuego population.

In addition to numerous birds, the Islands' wetlands also support two species of native freshwater fish (see Warrarrah 1) plus several endemic invertebrates. Of the twelve endemic vascular plants, three are associated with wetland habitats. Detailed ecological information about wetland habitats and their associated species is generally sparse. Comprehensive data about specific sites is even more limited, although records collected on behalf of the Breeding Bird Survey were very useful in compiling the Ramsar report.

While Falkland's wetlands have not as yet been subject to the scale of destruction and damage commonly

seen elsewhere in the world, threats to both these habitats and their dependent species do exist. These include hunting, peatland erosion and the introduction of non-native species. Of perhaps greater concern, any major expansion of the human population and infrastructure, with, for example, an associated increase in oil exploration or extraction, would greatly increase the pressure on Falklands wetlands.

In this era of rapid development of the Falklands economy, the Ramsar Convention is of particular relevance, offering a means by which key wetlands may be given international recognition to aid their long-term protection. Several sites apparently meet the ecological criteria for designation and others merit further study in this context. However, there are a number of constraints to the application of the Ramsar Convention to the Falklands. Most notably, existing conser-



Falklands flightless steamer duck

vation legislation does not confer full protection to protected areas and makes no specific provision for the conservation of fish, invertebrates or plants. The classification of the Ruddy-headed Goose as a pest which may be shot at any time is an anomaly in this context. The absence of a conservation officer or department within the FIG administration also means it is unclear where responsibility for conservation matters lie.

The Dependent Territories Ramsar report has been completed. The DoE are considering how to take the recommendations forward. It is to be hoped they may take further steps to encourage and assist the designation of Ramsar sites within these territories. In the Falklands, this process must go hand-in-hand with a review of conservation policy and legislation if the Islands' wetlands are to receive the international recognition required if their future is to be adequately safeguarded.

Kate Thompson

Beauchene Island Update

As reported in May's *Warrah*, Falklands Conservation is very concerned that rats could have been introduced to Beauchene Island from the fishing trawler, Lord Shackleton II, which sank just offshore in March.

Detailed recommendations on this were submitted by Falklands Conservation to the FIG shortly after the incident. These recommendations were based upon rat detection programmes implemented by the New Zealand Department of Conservation following similar events there. New Zealand leads the world in the development of rat detection and eradication programmes on islands. A recent paper by their top experts in this field states that "invasions of rats or mice are emergencies in island conservation and should be treated as urgently as a fire".

Sadly, the need for swift action was not widely appreciated within the FIG. The recommendations for a rat detection programme on Beauchene were not implemented until early September following growing pressure from conservationists. However, a series of 200 oil-soaked wooden sticks have been laid out on the shore and nearby Tussac edge in the vicinity of the wreckage from the ship.

These sticks were checked for signs of gnawing on a second visit to the island a month later and none had been chewed. This result is encouraging, but does not mean that no rats have been introduced. Any rats which did come ashore on wreckage have had nearly six months in which to disperse through the tussac for the winter, making their detection much more difficult.

Falklands Conservation are recommending that the baiting programme should be maintained over the coming summer with fresh oily sticks being laid out periodically. If a breeding population of rats has become established on the island, their detection should be easiest towards the end of the summer when young disperse and numbers peak.

This incident highlights the dangers posed to unspoilt offshore islands in the Falklands by increased shipping activity associated with fisheries and other economic developments. Falklands Conservation is urging the Falklands' authorities to adopt much more stringent regulations in relation to the control of vermin on vessels operating in Falklands' waters.



Magellanic penguins

Photo: Tui de Roy

Falklands Conservation at Penguin Conference

In August, I was fortunate to be able to represent Falklands Conservation at the Second International Penguin Conference held at Phillip Island, Australia. Over 100 delegates heard over 50 talks on subjects as diverse as feather structure in emperor penguins, haematology of African penguins, foraging ecology of Fairy penguins and behaviour of Humboldt penguins. One of the most impressive presentations described a high-tech data logging system developed by French scientists at the Crozet Islands where King penguins are automatically individually identified and weighed as they enter or leave their breeding colony.

Increasingly sophisticated electronic devices are now also being applied to studies of penguins at sea and are providing highly detailed information on foraging behaviour, including the locations, duration and depth profiles of feeding dives. My own talk concerned a much lower tech study of dietary variation among sites and years of Falklands Magellanic penguins which generated considerable interest and useful discussion. Indeed, as is generally the case at such events, informal conversations with fellow researchers were at least as useful as the formal presentations

and provided many useful ideas and contacts for future work in the Falklands. Many delegates expressed interest in the Falklands and one Japanese lady politely insisted on taking a photograph of our new Falklands Conservation sweatshirt complete with rockhopper penguin logo!

Conference goers were also taken to view the famous Penguin Parade, now the third largest tourist attraction in Australia, where little penguins return nightly to their burrows watched by up to 3800 tourists seated on stands behind the floodlit beach. A boardwalk between the beach and car park protects the birds' nesting habitat and there is a very impressive interpretative centre. All a very far cry from penguin tourism in the Falklands!

After the conference I visited the Tasmanian Parks and Wildlife Department and Australian Antarctic Division in Hobart which, among their many other concerns, are jointly responsible for conservation management and research on sub-Antarctic Macquarie Island. The regulation and management of cruise ship tourist visits to this site was of particular interest in relation to the Falklands where this form of tourism is expanding very rapidly.

I am most grateful to all those who assisted me during my stay in Australia and to the Royal Society who funded my visit.

Kate Thompson

FALKLANDS CONSERVATION

invite you to

EXPLORE THE FALKLAND ISLANDS AND ANTARTICA

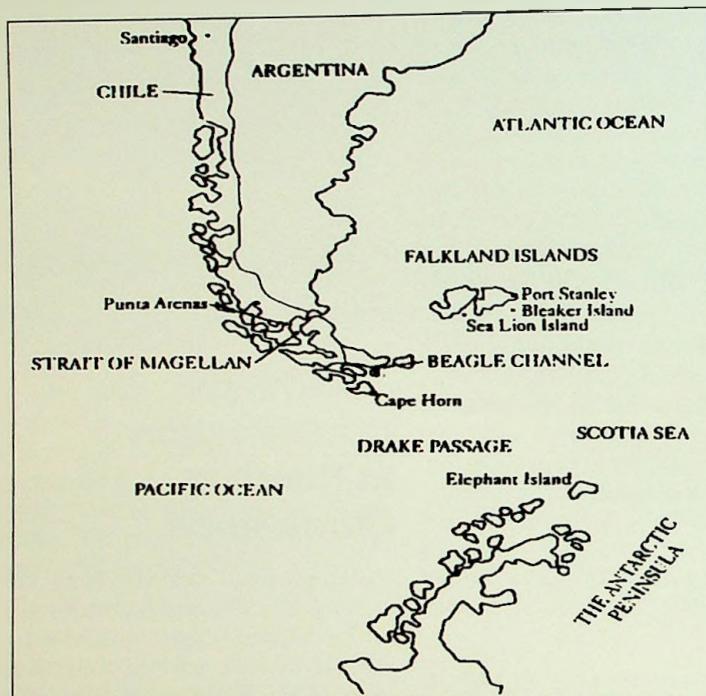
Clipper, sailing into their second decade, offer meaningful travel, using small, shallow-drafted ships, to capture the spirit and essence of a destination, making us see things in a fresh way, adapting our minds to new insights and realities.

Our voyage to the Falkland Islands, and Antarctica, affectionately known as "the bottom of the world", takes place on **WORLD DISCOVERER** during the austral summer, when the sun emerges after the long winter night and nature on the "white continent" bursts into exuberant life.

The windswept Falkland Islands, lie 300 miles east of South America and 1,000 miles north of Antarctica. The islands boast a stark beauty: vast, rolling moorlands dotted by lakes and ponds; sheer cliffs plunging to the sea; velvety surf-brushed beaches; and "stone" rivers carving parallel lines down a hillside.

Below 60 degrees S latitude lies the immense white continent of Antarctica, a land like no other in the geography and history of the world. Regarded by scientists and world travellers as one of the last truly pristine regions in the world, it is a place of ethereal landscapes and abundant wildlife. Tireless glaciers churn up gravelly paths on the shoulders of high, unknowable peaks; blue-green icebergs, some as tall as ten-storey buildings, rise out of the placid waters; delicately balanced ecosystems cradle the world's food chain.

WORLD DISCOVERER has an ice-hardened, double-bottomed hull that permits safe exploration in ice-clad waters, not accessible to conventional cruise ships. She carries 138 passengers in considerable comfort, and with her fleet of sturdy zodiac landing craft takes you to deserted beaches where few before us have ever landed. With a select team of naturalists along as guides, we will come face to face with seals, penguins, petrels, shags and albatrosses.



ITINERARY

Day 1 LONDON

Depart London on the overnight flight to Santiago via Rio de Janeiro.

Day 2 SANTIAGO (CHILE)

We arrive in Santiago this afternoon, and transfer to a deluxe hotel. The rest of the day at leisure. Overnight at the hotel.

Day 3 PORT STANLEY & VOLUNTEER POINT, FALKLAND ISLANDS

Fly to Port Stanley, capital of the Falkland Islands this morning and explore this charming town which blends old-world Victorian charm with the energetic spirit of the frontier, and embark **WORLD DISCOVERER**. In the afternoon, we anchor off the narrow channel leading to Volunteer Point, which is home to the only rookery of magnificent king penguins in the entire Falkland Islands.

Day 4 SEA LION ISLAND

WORLD DISCOVERER will make a stop at this remote and rarely visited island. Here, we view colonies of rockhopper penguins and king cormorants, and have an opportunity to observe the nesting sites of the striated caracara.

BLEAKER ISLAND (Bleaker Island North is a Sanctuary)

The northern part of this island to the south of East Falkland has been declared a sanctuary. The island has been stock with sheep for many years and has lost much of its tussock grass fringe. It is a valuable area for various species of ducks, geese and several colonies of gentoo and some rockhopper penguins.

Day 5 CRUISING THE SCOTIA SEA

Day 6 ELEPHANT ISLAND

Awesome glaciers, speckled with pink algae, create a dramatic backdrop as we approach Cape

Lookout. Landing by zodiac, we are welcomed by chinstrap penguins who resemble nothing more than an army of chaplains. Gentoo and macaroni penguins, plus fur seals, also populate the Cape.

Days 7-11 **ANTARCTIC EXPLORATION**

Sailing the waters of the Antarctic Peninsula and its adjacent islands, we shall make several landings each day. Zodiacs take us ashore to observe and explore this vast and mysterious continent.

Our lecturers are on hand to identify penguins and other wildlife and explain their habits and habitats on site. Visit some of the multi-nationality research stations that have been established in Antarctica and witness the scientific work being performed. Weather and ice conditions will determine our daily schedules, but we plan to visit the following places: King George Island, Deception Island, Torgeson and Anvers Islands, Port Lockroy, Neumeyer Channel and Paradise Bay on the Antarctic Peninsula.

Day 12 **DRAKE PASSAGE**

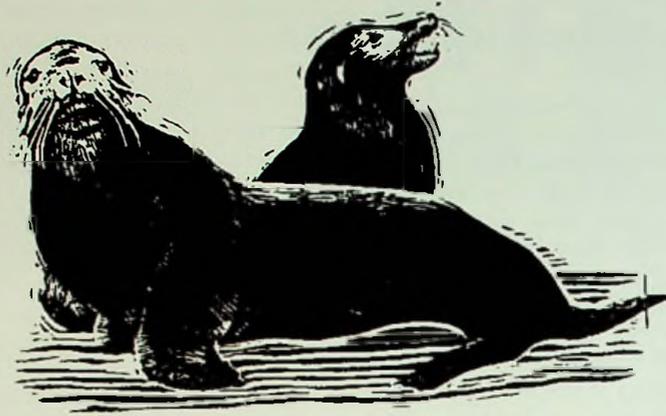
Named after the 16th century English seafarer, Drake Passage is a deep waterway spanning 600 miles from the South Shetland Islands to the tip of South America.

Day 13 **CAPE HORN**

The famed Cape Horn is a steep, rocky place from whose summit we can look out over Drake Passage and see the Pacific Ocean to our right, and the Atlantic to our left.

Day 14 **BEAGLE CHANNEL**

Aboard our zodiacs, we venture along the glacier-carved slopes of one of the most beautiful fjords in the world. Weather permitting, we land on Tierra del Fuego, the "Land of Fire".



Day 15 **PUNTA ARENAS, CHILE**

We arrive in Punta Arenas, disembark the **WORLD DISCOVERER** and join our flight to Santiago. Transfer to a deluxe hotel for overnight stay.

Day 16 **SANTIAGO**

Transfer to the airport for our overnight flight back to London via Rio de Janeiro.

Day 17 **LONDON**

We arrive in London.

Prices start at £4,972 per person in a twin-bedded cabin with facilities. Price includes: International and internal flights, overnight hotel in Santiago, accommodation on board **WORLD DISCOVERER**, and comprehensive travel insurance.

DONATION

For each passenger who books this voyage, Clipper will make a substantial donation to **Falklands Conservation**.

For a copy of the special colour brochure, please telephone **Clipper** on 071 436 2931, or send the coupon below to:

Clipper,

Suite 301, Albany House,
324-326, Regents Street,
London W1R 5AA.

I would like to receive a copy of

The Falkland Islands & Antarctic brochure

Mr / Mrs / Ms _____

Address _____

Postcode _____



CLIPPER

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PSA Bonded Member



The Charles Cooper

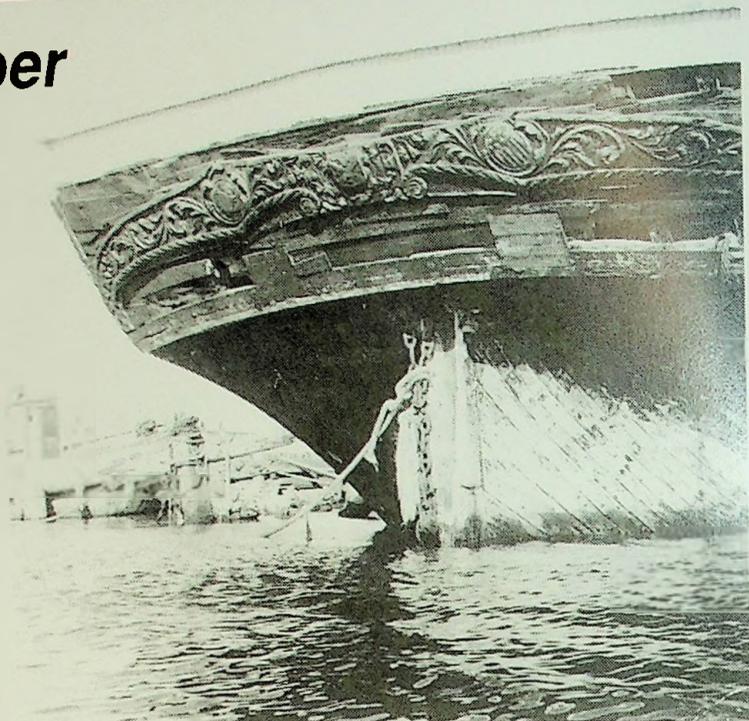
Last of the packet ships

Of the many fine ships beaten into submission on the anvil of Cape Horn, and whose remains now dot Falkland shores, there is none finer than the *Charles Cooper*. She was built in 1856 at Black Rock, Connecticut, by William Hall, and has a length of 166 feet, a beam of 35 feet, and a gross tonnage of 977 tonnes. The importance of the *Cooper* is that she is the finest surviving example of American deep-water, wooden, merchant ship-building and the only extant, intact example of a true North Atlantic packet ship. For America, Europe and the Falklands she is an historic relic of outstanding value.

The packets were vessels which in the second decade of the nineteenth century revolutionised oceanic seafaring by promising to sail to a fixed schedule. Before ships usually only sailed when full, which meant cargoes, mail and passengers frequently, and at great expense, had to wait many days before departing. It was the packets which carried the 'huddled masses' to new lives in America. The *Cooper*, more than any other hulk in the Falklands is about people, and one has a sense of this when one treads her 'tween decks and sees the beaded mouldings and finely turned stanchions; this was a ship that was meant to be seen.

Today her full-lined hull, roofed over with corrugated sheeting, can be found in Port Stanley opposite the FIC slipway. Seen from the harbour, she is, as it were, the frontispiece to the town.

To those who love ships and the sea, she is a magnificent if somewhat sad



The sternboard across the transom

Photo: Peter Throckmorton

spectacle. To the untrained eye it is hard to believe that she is perhaps the finest surviving expression of deep-water wooden shipbuilding before the world turned to iron and steam, thus ending a tradition in sail that stretched back into deepest prehistory. In her fully-painted prime with all her sails bellied out, she would have been an inspiring sight. A figurehead with trail boards on either side gave focus to the bow, and across her broad transom was an arched sternboard decorated with carved tendrils and heraldic shields, one of which sported the stars and stripes. Her capacious oak-built hull, which would have held some 3,500 barrels of cargo and over 250 passengers, would have been driven along by tier upon tier of canvas supplemented by jib and studding sails, all of which would have been expertly tended by a crew of between 25 to 38. She was not a flier; rather than slice along, her great bluff

bows would have shoved and bludgeoned their way through the water at an average speed of about five or six knots.

The *Cooper* began her career as one of the Layton and Hurlbut fleet, a line of packets that had been founded by Elisha Hurlbut in 1825. Her first voyage was New York - Antwerp - New York between January and June 1857, under Captain George N. Lamb. Her cargo to Belgium included tobacco, flour, cotton, rice, resin, coffee, lard, codfish, beeswax, mahogany and logwood. The crossing took six weeks. Four more transatlantic voyages followed under Rufus Coffin, then, in March, 1860, 13 of her 16 shares (including three owned by Charles Cooper, a merchant at South Street, New York) were sold to Alonzo Hamilton of Boston.

Under her new ownership and a new skipper, George V. Jordan of Saco, Maine, she began to sail even farther afield, including one voyage, between February and September 1864, which took her right around the world. Fortunately for us one of the voyages under George Jordan was fully chronicled by his 19 year old nephew, Franklin Jordan, who was serving as third, and later second mate. In 1860 they sailed from Liverpool to Calcutta with a cargo of salt. The passage took about 120 days. Franklin described both the voyage and the ports of call in compelling detail. At Calcutta, for instance, he was much saddened by the sight of the discarded human bodies in the river:



A packet-immigrant ship of similar type to the *Charles Cooper*

"Some castes throw their dead into the Ganges, while others burn theirs upon the funeral pile. It was a common sight to see dead bodies floating in all stages of decomposition with vultures and carrion birds setting thereon. The spectacle was sickening to behold and the air full of pestilential gases. Often a body drifted ashore, where the horrid jackals would surround it, quarrelling and filling the air with their cries resembling the laugh of a maniac. Almost every morning we had to clear away the dead bodies which had accumulated under the ship's bows during the night and push them off into the stream with bamboo poles."

While threading their way down river from Calcutta the *Cooper* was almost lost:

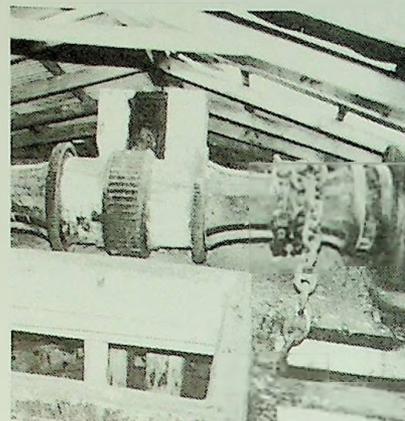
"In passing a sharp bend near James and Mary Shoal we struck the edge of a quicksand bar. Both hawsers were parted and the ship turned nearly over, but swinging off with the swift current we let go the sheet anchor with 20 fathoms of chain (120 feet) which checked us for a moment. The strain was so great, however, that the whole cable chain, 90 fathoms (540 feet), was torn over the windlass and the ship set on fire; and when the chain was all out it tore out the hawse pipe, and the enormous iron links snapped asunder. The situation was most critical, but the pilot did not lose his presence of mind, quietly remark-

began to roll in over the deck, when, to the great relief of all, she gradually righted, falling off the main channel into deep water, "Let go the starboard anchor," said the pilot unconcernedly as if nothing unusual had occurred. The ship swung head to the current, and we were saved. The day before, a large fine ship, homeward bound, had struck on the same quicksand and gone down losing all on board."

On 1st June, 1866, the *Cooper* left Philadelphia with a cargo of coal for San Francisco. Her captain was W. R. Dawson. We are not sure exactly what happened, but it seems safe to assume that she ran into trouble off Cape Horn, for on 25 September, 1866, she limped into Port Stanley in a leaking condition. There she was condemned as unseaworthy and was sold for use as a floating storage hulk. Later she was grounded in her present location and where she continued in service as a warehouse until the 1960s.

In November, 1968, she was bought by the South Street seaport Museum of New York which carried out essential stabilising work. In 1990 she was returned to Falklands ownership. She has in recent decades, been surveyed by several people including Peter Throckmorton, and later, after the conflict with Argentina and at the request of FIG, by the present writer.

Thanks to her heavy construction and



Windlass still with studlink anchor chain

ing components that one can study along the 'tween decks were the work of master craftsmen. Situated in the bows is the great barrel the windless, still wrapped with a few fathoms of studlink chain.

After 136 years the *Cooper* is in an imminent state of collapse. The accessway cut through her at midships ruptured many of her key longitudinal timbers; decay has done the rest. Falklands Conservation, together with the World Ship Trust and the Falklands Museum have attempted to find the money for further stabilising work, but so far without success. In the meantime the present writer has, for several summers, been carrying out a programme of survey and research, with the principal purpose of preparing technical drawings of her every detail, so that when she does collapse, which now seems inevitable, there will be an accurate record of her construction.

Mensun Bound

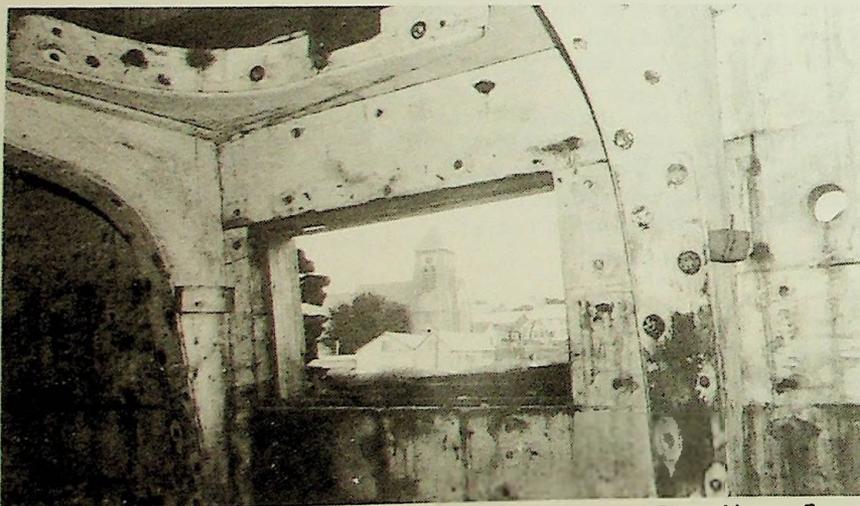
Further Reading

Mensun Bound & David McLeod, 1992. The *Charles Cooper* in India, in *Archaeological Papers presented to S. R. Rao*, Bangalore, India.

Suzanne Boorsh, 1970, *Charles Cooper*, *Seaport Magazine*, IV, 2,3.

Alfred T. Hill, 1977. *Voyages*, New York.

Mensun Bound, is a trustee of Falklands Conservation and Director of Archaeology of Oxford University MARE. He has directed excavations and surveys on numerous wrecks around the world. Currently he is working with his team on sites in the Caribbean, India, Gibraltar, Greece and Italy. He has just had a book published entitled *The Maritime Archaeology of the Aeolian Islands*.



Interior of *Charles Cooper* showing knee and beam assembly

Photo: Mensun Bound

ing, "If she turns over, keep on the weather side and when she goes to keel up we shall be on the bottom until a boat from the *Vulcan* can come to our aid." The ship rapidly drifted against another shoal, lying over on her beam ends, yardarms in the water. It seemed as if our time had come, and the slimy, yellow water

roofing (which has helped preserve the timbers) it is still possible to look along her flush weather deck and tread the 'tween decks where the immigrants were accommodated and which at one time would have reeked with the smell of unwashed bodies, oil lamps and damp oilskins. The massive timber knees and other interlock-

BOOK REVIEWS

Falkland People

by Angela Wigglesworth

It's incredible just how many visitors to the remote Falkland Islands go back to their homes far in the Northern Hemisphere vowing that - one day - they will return.

What is the magnetism? Certainly the remoteness, the stunning coastal scenery and the spectacular and accessible wildlife are far and beyond what most people have experienced. But it's more than that. For a place to have such a strong appeal it takes people. At the end of the day it's the people that make the place.

That's why Angela Wigglesworth's new book, simply entitled "Falklands People", finds its place amongst the history books, the war books and the natural history books, filling a gap and finding the heart of the Falkland Islands.

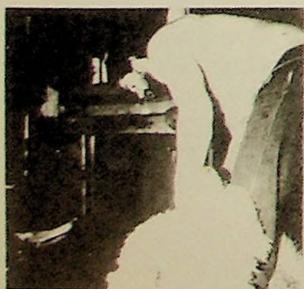
Through interviews with a wide range of people both in Stanley and in "Camp" we not only get to know the folk but we get an insight into what living in the Falkland Islands is about - its tradition, its future, its difficulties and its delights. We learn of the rapid change since the 1982 Conflict, how the introduction of direct dial telephone has detracted from the openness of the community caused by open radio telephones, how serious crime is practically non-existent and how the government works.

The author's love of the Islands and their people shines through the pages as she reflects, in her choice of what they said, her understanding and her empathy.

"Falkland People" is a good read. If you've been to the islands you know half the folk anyway and dipping into the pages brings back happy memories and stirs again that need to return. If you're a stranger it will give you an insight into the islands for which so many young British men gave their lives only ten years ago.

Libby Weir-Breen

"Falkland People" Peter Owen £14.95



Falklands sheep shearer

A Field Guide to the Wildlife of the Falkland Islands and South Georgia

by Ian Strange

This book is an essential pocket-sized field guide for any naturalist or interested layperson contemplating a visit to the Falklands, as it represents the first guide to the islands wildlife in a single handy volume. Written by Ian Strange, the Falklands' resident naturalist since 1959, the book draws on Ian's experiences from observing wildlife at first hand over many years.

A general introduction is provided which puts the wildlife in context. This introductory section covers the geography and climate of the Falklands, the marine environment, the land environment and habitats, the history of the adaptation of these habitats at the hands of man, and conservation issues. The latter includes a legal and country code section and a list of protected areas.

The main body of the book is devoted to the species accounts. As stated in the book's introduction, it is the birds and mammals which receive the most detailed treatment, but fish, marine and terrestrial invertebrates and plants are also covered. The text of each species account comprises notes concerning the species status, a general description of the species in question and behavioural notes. Checklists are provided for bird and mammal species recorded on the islands.

An interesting aspect concerning cetacean identification is the line drawings depicting fins and spouts of the commoner cetaceans - a helpful tool for the ocean traveller.

The book is packed with Ian Strange's illustrations throughout. The variety of illustrations in the book provides a testament to Ian's skills as a wildlife artist. Sixteen colour plates illustrate the birds, mammals and commoner plants and invertebrates of the islands, with a further three black and white plates devoted to cetaceans. In addition to these, line drawings enhance the text throughout, ranging from distinctive flight and swimming silhouettes of birds and cetaceans through to anatomical illustrations of the species groups in question. Twelve black and white photographs give a sample of the Falklands unique wildlife atmosphere.

This book will serve as informative reference source for many years to come, and will surely find a ready market amongst Falklands wildlife enthusiasts.

Tony Stones

"Wildlife of the Falkland Islands & S.Georgia" Harper Collins. £14.95.

Wings Over Ice

by Peter Mott

Wings Over Ice is an account of an unusual expedition which, during the years 1955-57, carried out aerial photography and land surveys in the Antarctic peninsula.

The expedition, led by the author, completed photography of an area of 35,000 square miles of hitherto unmapped territory, along with total coverage of the Falkland Islands. The story is one of a close-knit team of flyers and surveyors facing the daily problems and hazards of working and living in a land of unbroken severity, yet possessing the enchantment that holds a lasting appeal for all who venture there.

Copies may be purchased from P G Mott, Upton Bridge Cottage, Long Sutton, Langport, Somerset TA10 9NQ. Price is £6.50 (including postage and packing within the UK). For each copy purchased through Falklands Conservation, a donation will be made to conservation. Please mention Falklands Conservation when ordering

Tony Stones

Falklands: White Horse Of Hanover

by Arthur Chatham

The White Horse of Hanover was the regimental insignia of the Eleventh West Yorkshire Regiment, stationed in the Falklands during World War II. This book deals with journeys to and from the Falklands and the stay of the regiment on the islands. Hardback, 187 pages, 8 photographs.

Copies may be purchased from Mr. Arthur Chatham, 11, Merton Drive, Farsley, Pudsey, West Yorkshire. Price is £6.20 (including postage and packing within the UK). For each copy purchased through Falklands Conservation, a donation will be made to conservation. Please mention Falklands Conservation when ordering.

Tony Stones

NEWS IN BRIEF

Falklands Conservation Sweatshirts and Tee-shirts

A consignment of sweatshirts and tee-shirts featuring the Falklands Conservation rockhopper penguin logo have recently been shipped to Stanley for sale to Falklands residents and tourists. The tee-shirts are white in one extra large size retailing at £5.00 while the sweatshirts are green or red in medium, large or extra large sizes and cost £15.00. These may at present be purchased only in person from Falkland Conservation's Stanley office. However, if demand is sufficient, we hope to be able to supply these goods to members outside the Islands by mail order at a later date. If you would like to purchase any of these garments, please notify your interest to our UK Secretary, Tony Stones.

Penguin Leaflet

A leaflet entitled "Penguins and their conservation" has been produced jointly by Falklands Conservation and Edinburgh Zoo. The leaflet, which is illustrated by line drawings, outlines past and current threats posed by humans to penguins and describes the work of Falkland Conservation. In addition to use by the zoo's education centre, the leaflet is being used to attract donations and new members from among visitors to the zoo's new penguin enclosure which features a large pool, underwater viewing area and nesting "beach."

Reduced Subscriptions

A reduced subscription rate has been introduced to encourage young Falklands residents who wish to join Falklands Conservation. The reduced annual subscription of £5.00 per annum for those aged under 16 takes immediate effect.

Corrals and Gauchos

This booklet is in the same format as Wildflowers of the Falklands and Those Were The Days. It is written by Joan Spruce, an island resident, and tells of the history of the people and places involved in the cattle industry. The booklet is illustrated with black and white photographs and photographs of the Dale watercolours, which give a real sense of atmosphere. Copies may be obtained from either the Stanley or UK office. The booklet retails at £4.00 in the UK and £3.50 in Stanley.

New Vehicle

Falklands Conservation has purchased a replacement land rover for use on Falklands Conservation business. The purchase (a 1984 Series 110) was helped by generous financial contributions from Turners Diesel, Gordon Forbes, Standard Chartered Bank and Cable and Wireless PLC. It was bought in the UK and shipped out to the Falklands freight free, courtesy of Hogg Robinson Ltd. An official launch was held in Stanley. Rockhopper penguin logo stickers on the doors of the vehicle should make it easy to spot.

Falklands Conservation \ Clipper Voyages Deal

Falklands Conservation are pleased to announce a collaborative effort with Clipper Holidays which will benefit conservation. As part of their Winter 1993 Cruise to Antarctica and the Falkland Islands, Clipper Holidays have kindly offered to donate some of the proceeds from this venture to Falklands Conservation. For every person who books this holiday with Clipper through Falklands Conservation, Clipper will make a generous donation direct to Falklands Conservation. If you intend travelling to the Falklands and Antarctica, this offers an excellent opportunity to do so, and to benefit conservation at the same time.

However, please remember to quote your Falklands Conservation membership number when replying to the advertisement, and/or mention that you responded to this advertisement after reading about it in Warrack 3. This will ensure (at no extra cost to yourself) that additional money is channelled directly to the Falklands for conservation purposes. For further details of this once in a lifetime opportunity, please turn to pages 6-7.

Royal Patronage

HRH The Duke of York has agreed to Falklands Conservation's invitation to become Patron. HRH The Duke of York's name will now feature on Falklands Conservation's literature. We are grateful to HRH for his support.

Death of Sir Edwin Arrowsmith

Sir Edwin Arrowsmith, a former Governor of the Falklands during the late 1950's died during the summer. The funeral was held at All Saints Church, Fulham, London. Frank Mitchell, a trustee of Falklands Conservation attended the funeral on behalf of the organisation. Sir Edwin was originally a Vice-President of the Falkland Islands Foundation, and continued in this capacity following the formation of Falklands Conservation.



The adaptable 'aquatic' Landrover.

Membership Contact Scheme

Enclosed with this newsletter is the revised list of those members who have indicated that they wish to participate in our contact scheme. This scheme, originally suggested by Robin Woods is designed to enable members with similar interests to make direct contact with each other. If your name does not already appear in the list and you would like to be included in future please contact Tony Stones giving details of your particular interests. Any feedback on the scheme including suggestions for improvements would be welcome.

Data Protection Act

Under the terms of the Data Protection Act, the Secretary would be grateful if any members who do not wish their membership records to be held on computer would advise him of this. Falklands Conservation do not give out details of membership records to any other persons or organisations without the written consent of individual members. The Secretary is happy to supply any member with full details of their own records upon written request.

New UK Secretary

There has been some restructuring of Falklands Conservation during the past six months.

Kate Thompson relinquished her position as UK Secretary during the summer in order to devote more of her time to seabird research work. Tony Stones, an ecologist and teacher was appointed to replace Kate. Tony is working for Falklands Conservation on a part-time basis, and is currently working from his home in Norwich. **Correspondence should be addressed to Tony Stones, UK Secretary, Falklands Conservation, 9 Albany Road, Norwich NR3 1EE. Telephone/Fax: 0603 487726.**

Kate Thompson and Carol Miller are job-sharing a full-time secretarial post in Stanley, and Kate is devoting the remainder of her time to seabird research.

Request for Photographs

Falklands Conservation holds a small library of photographs for use in our newsletters and other publicity material. However, we could make use of a wider range of pictures, particularly of wildflowers, invertebrates, wildfowl, passerines and cetaceans. If any readers have spare black and white prints or colour transparencies of any of these subjects which they would like to donate to our library we would be very grateful. Full credit will be given to photographers when their pictures are published. Please send any such material to Tony Stones at 9 Albany Road, Norwich NR3 1EE. This month's cover picture was kindly donated by Mr E.Lawson for such a purpose.

Publications for Sale

The following publications are available by post from Falklands Conservation, 9 Albany Road, Norwich NR3 1EE. Prices are inclusive of packing and surface post. Payment may be remitted in \$US at a rate of \$2 per £1. Please make cheques payable to "Falklands Conservation."

Wildflowers of the Falkland Islands (booklet)UK £4.00 Overseas £4.50
Those Were the Days (booklet)UK £4.00 Overseas £4.50
Corrals and Gauchos (booklet)UK £4.00 Overseas £4.50
Tussac Grass in the Falklands (report)UK £7.50 Overseas £8.50

An Assessment of the Potential for Competition between

Seabirds and Fisheries in the Falklands (report) - UK £6.00 Overseas £7.00

Falkland Islands Foundation Newsletters

Nos. 5, 6,7,8,9 & 10 only, each ----- UK £0.80 Overseas £1.00

The three booklets may also be purchased from a number of retail outlets in Stanley and at MPA for £3.50.

Support Falklands Conservation

Falklands Conservation needs the support of all those who care about the natural and historic heritage of the Falkland Islands. If you are not already a member, please assist our vital work by joining now. Minimum subscription rates are:

Ordinary Membership	£15*	(\$25) per annum
Family Membership	£20*	(\$30) per annum
Benefactor Membership	£50	(\$75) per annum
Life Membership (under 65)	£500	(\$750)
Life Membership (over 65)	£300	(\$450)
Corporate Membership	£200	(\$300) per annum

(* Minimum rates for Falklands residents are £10 Ordinary, £15 Family Membership and £5 Under Sixteens)

All members receive Falklands Conservation's newsletter. On joining, Benefactor members receive a certificate and a free booklet. Life and Corporate members receive an engraved plaque, featuring our rockhopper penguin logo.

Further details may be obtained from:

Tony Stones, Falklands Conservation, 9 Albany Road, Norwich NR3 1EE

Carol Miller, Falklands Conservation, PO Box 31, Stanley, Falkland Islands



This newsletter has been produced with financial assistance from WWF U.K.

Falklands Conservation is a member of the International Union for the Conservation of Nature and Natural Resources.

Member of
IUCN
The World Conservation Union

Designed and Typeset by Password Publishing (0603) 761507 and printed on recycled paper by Imprint (0508) 32222



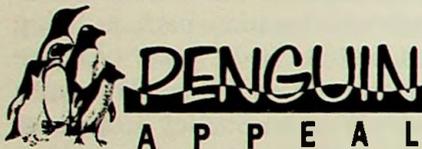
the WARRAH

Newsletter of Falklands Conservation

July 1993 - Number 4

Editor Tony Stones

Falklands Conservation Penguin Appeal



The need for financial independence for Falklands Conservation has been enhanced in recent years by the growth of the fishing industry in the South Atlantic and the Government's declared strategy towards the economic development of mineral and other natural resources around the islands. Previously, we have relied heavily for financial support from the Falkland Islands Government and the Worldwide Fund for Nature, and are still grateful for

their financial support during the current financial year.

With this in mind, Penguin Appeal will be launched later this year and will reach its public phase in May 1994. The Appeal aims to raise an endowment of £750,000, income from which will help meet operating costs in perpetuity.

The Appeal Director is Chris Page, a fundraising consultant who also works for the Multiple Sclerosis Society, and who was instrumental in raising more than £20 million for the RAF Benevolent Fund's Battle of Britain Appeal in 1990.

Penguin Appeal needs to attract the general public if it is

to succeed, so the strategy is distinctly upbeat. Penguin Biscuits (McVities UK) is the principal sponsor, and a major fundraising programme is under development with them and other commercial partners. All members of Falklands Conservation will be asked to take part in the Appeal next year. Further information will follow this Autumn

(Interested members are welcome to contact Christopher Page at the Appeal office now: 46a Collingbourne Road, London W12 0JQ. Telephone and Fax 081-740 4501).




BirdLife
INTERNATIONAL
WORLD
BIRDWATCH
9-10 OCT 1993

World Birdwatch 1993

On 9-10 October 1993, Birdlife International are to hold a world birdwatch to highlight the threats to the world's birds. The aim is to compile a world species list, including bird specialities from the Falkland Islands.

Any Falkland Islanders, or other members who will be on the Islands during October, are welcome to participate.

Please contact Carol Miller at the Stanley office for further details of this vital project.

Departure of Dr Kate Thompson

At the end of June, Kate Thompson flew back from Port Stanley to the UK after working as Falklands Conservation's Conservation Officer on the islands for one year. Through her lengthy involvement with Falklands Conservation, both on the islands and from within the UK, Kate has raised the conservation profile of the islands, and it is a testimony to her hard work and initiative that the charity has continued to flourish. Kate's knowledge and experience will be sorely missed and her successor will indeed have a difficult act to follow. It is to be hoped that Kate will continue as an active member of Falklands Conservation and play an advisory role in shaping the future of the organisation. We wish Kate all the best for the future.

Falklands Islands Association Annual Reception

Falklands Conservation recently had a display stand at the FIG and Falkland Islands Association Annual Reception, held at Lincoln's Inn, London on June 8th 1993. The display attracted a lot of interest, with visitors keen to hear of the recent work of Falklands Conservation. Chris Page, Julian Fitter and Tony Stones attended on behalf of Falklands Conservation. Thanks are due to Graham Bound (member) for helping to assemble the display.



CABLE & WIRELESS
FALKLAND ISLANDS

Education Packs

Falklands Conservation is keen to encourage an increased awareness of the wildlife value of the Islands, and recognises the role that young people can play in conservation. With this in mind, a junior school education pack is being produced, aimed at the 10-11 year old age group at the Stanley primary school. The work includes a half-day visit to Stanley Common, offering the children the opportunity to familiarise themselves with the wildlife and ecology of the common. The schools pack has been generously funded by Cable and Wireless. If the education pack proves successful, it is hoped to develop a senior school project pack, again based around Stanley Common. Discussions have already taken place with some of the senior school staff who have expressed interest in the idea.



From Left to Right: Chris Page, Julian Fitter and Tony Stones pictured at the reception

Recent Bird Records From The Islands



Photo: George Male

1993 has proved to be an exciting year so far in terms of rare and unusual bird species on the Islands. Foremost amongst these species are two potential new bird species for the Islands. These are an Aplomado Falcon on Sea Lion Island on February 21-22 and a Tufted Tit-Tyrant on Beaver Island on May 16.

A Chinstrap Penguin was seen amongst Gentoo Penguins on Saunders Island on February 10th. Cattle Egrets have been present in some numbers around the islands during March and April, with a maximum number of up to 100 in Stanley on April 25. Twenty two birds were present on Sea Lion Island on April 22. A healthy, albeit very late, bird was present in Stanley on July 7. Egrets and herons were further represented by records of Snowy Egret in Kidney Cove in February and on April 2 at East Jetty, Stanley and a Cocoli Heron in Island Harbour, seen on May 12 and again on May 16.

A Buff-Necked Ibis was seen in Stanley and on Stanley Common on February 23 and March 27 respectively, with a further sighting coming from Pebble Island on April 15.

A female Cinnamon Teal was noted on Pebble Island on February 25. This may well have been one of a pair of this species which had previously been present on Pebble.

Amongst smaller vagrants seen were good numbers of Chilean Swallows in February, with 17 reported from Sea Lion Island, increasing to up to 50 on February 16, although most birds quickly moved on thereafter. Barn Swallows were reported from Pebble Island on February 17, and Stanley Common on April 9. Interesting records of Rufous-Collared Sparrow came from West Point Island (4) on April 2 and from Beaver Island (3) on May 19. Two White-Crested Elaenias were present on Sea Lion Island on February 16. This constitutes the second record of this species from the Falkland Islands.

A Ruddy Ground Dove was present at Falkland Desire on February 12 and a Violet Eared Dove was present at the sand quarry on April 4 and at the market garden on the following day. Finally, a female American Kestrel has taken up temporary residence in the vicinity of the east end

of Stanley, being initially seen on May 22 and still present up until at least July 13.

Thank you to all observers who contributed to this birdlog, particularly to Alan Henry, who collated all the records. It is intended to make recent bird sightings a regular feature. Would contributors please forward any details of recent sightings, giving numbers of birds involved, location, dates and behavioural notes to Alan, c/o the Stanley office. Sketches and photographs would also be gratefully received. In addition to this, Alan is collecting bird records (counts, unusual sightings, etc.) from the Falkland Islands for the last few years. Many interested observers have visited the islands over the course of the years, including past and present members of Falklands Conservation but, previously, bird sightings have not always been collated in a systematic fashion. If this scheme proves successful, it is intended to publish a selection of records in future issues of the Warrah.



A Chinstrap Penguin

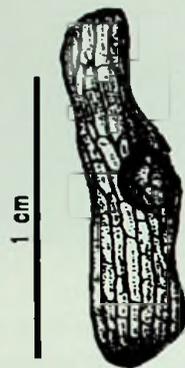
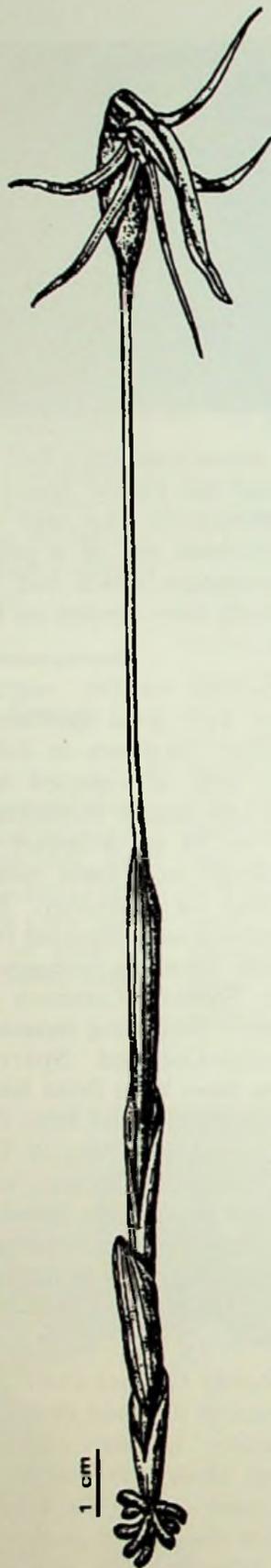
The Spider Flower - A new plant record for the Falkland Islands

Dr. Jim McAdam

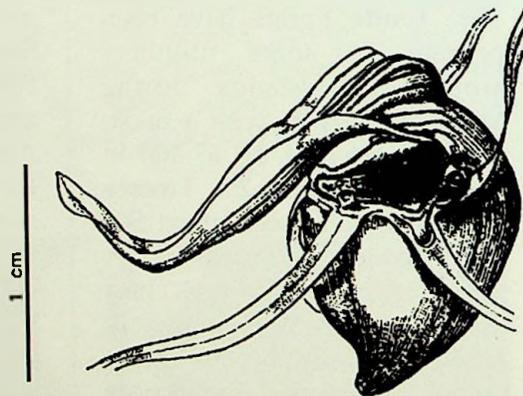
Over the past season, more records have been coming in for the wild-flower survey of the Falkland Islands. Of particular interest has been the thorough coverage of Saunders Island by Ragnhild Brannstrom which has thrown up numerous new records for the Islands. Ragnhild also found a new plant species for the Falkland Islands growing locally and abundantly on Cape Pembroke. The plant is *Arachnitis uniflora* a member of the *Corsiaceae* family. This is a small family consisting of just two genera. One genus, *Corsia*, of nine species is confined to New Guinea and the other genus, *Arachnitis*, consists of only one species and was previously confined to Patagonia. The family is very closely related to the Orchids, as can be seen from the sketch, and is a saprophyte, ie it can take in plant nutrients in a complex form from other dead plant material. The seeds are minute and could well have blown across from the coast. In Patagonia it is known locally as the spider flower (*flor de la arana*).

Jim McAdam

After graduating in Botany and Agricultural Botany, Jim spent three years on the Falkland Islands where he studied the ecology and agronomy of Falkland Island pastures. He has visited the islands annually since 1983, and has published numerous scientific and popular papers on many aspects of the Falkland Islands agricultural vegetation. In 1989, he collaborated with Tom Davis to produce the first colour guide to the wild flowers of the Falkland Islands. Jim is at present collecting information to map the distribution and status of wild flowers in the Falkland Islands



Seed



Detail of flowering parts

Illustrations from 'Flora Patagonica Part II Ed.M.N.Corrae, Instituto Nacional de Tecnologia Agropecuaria (INTA) Buenos Aires, 1969 p 1 185.

Tourism - A Cause of Conflict ?

Graham Bound

Graham Bound was manager of the Falkland Islands Tourist Board until July 1992. He is currently deputy representative for Falkland Islands Government in London

Tourism can be self-consuming; as capable as any industry of destroying the resource upon which it is based. When the raw material of this industry happens to be natural habitat and wildlife of rare beauty and international scientific importance, then the responsibility placed upon those developing tourism is very great indeed.

The Falkland Islands' isolation has been a mixed blessing in the development of wildlife tourism. Some eight thousand miles away from the main markets of Europe and North America, they are not an easy or cheap destination to reach. Cost and distance have until recently acted as a brake on development. Were it not for the energetic efforts of the Tourist Board, operators, and others from the commercial world, the brake may have become a dead hand, but the Falkland Islands are now

known, and the steadily increasing flow of visitors is benefitting the economy.

Tourism development since 1982 has been directed at three main sectors: overseas wildlife and game fishing enthusiasts, flying to the Islands and using the infrastructure to explore at length; the local civilian and military communities; and cruise ships. By far the largest proportion of funds and active efforts have occurred in this area since the late 1960s, and, while welcomed, were thought to need little support.

The development of land-based overseas tourism has always been the most difficult challenge but, per capita, such visitors contribute far more to the economy than any other type. Potential clients are only too aware that, at around £3,000, the cost of a two-week Falkland Islands package is high, and competition from other countries with wild-life 'product' is stiff. There are still only in the region of two hundred such visitors arriving in the Falkland Islands each summer. Locally, it was hard to convince the servicemen and women that the negative publicity was ill-founded, and that they could enhance their time in the Islands by making use of the tourist facilities. Now the military community is a major source of business. Among local civilians too, the idea of wildlife holidays in small hotels, within their own islands, was slow to get off the ground. But now, some 1,300 two or four-day holidays are sold to local military and civilian resi-



A young elephant seal experiences tourism

dents every summer. In addition, the growing network of roads has meant a rapid increase in independent day trips, statistics for which are not maintained.

Cruise-ship tourism has grown dramatically, as it has the world over. The assumption that the sector needed little encouragement was certainly correct. During the 1990/91 summer season, there were just eleven visits by cruise ships, carrying a total of 1,587 visitors. During the 1992/93 season, the figures had increased to thirty visits by ships, and 6,005 visitors. A detailed study of the international cruise ship business carried out by the Economist Intelligence Unit, indicates that the number of cruise visitors could increase to 10,000 by the year 2000.

To the unscientific, occasional visitor, there is little sign of damage to delicate wildlife centres. But, with no objective and systematic monitoring of the few sites receiving the bulk of visits, there is no way of knowing what impact, if any, is being sustained. It is, however, a fact that the tourist season coincides with the breeding season, when birds and sea mammals are most vulnerable, and this intense activity is the very thing which most people want to see as closely as possible.

Voluntary adhoc precautions are taken by both hosts and visitors. Most cruise ships have a self-imposed code of behaviour, which, among other measures, limits the number of passengers visiting a site at any time. However there are conflicting arguments about whether frequent smaller-scale

visits which may cause continued disturbance over prolonged periods, are any better than large-scale but brief visits. Furthermore, there is no guarantee that concern for sites will take precedence over commercial considerations.

Largely independent, land-based visitors are trusted to exercise common sense and voluntary restraint to avoid disturbance. Only on one island are

**The worthy phrase
'eco-tourism' has now
become little more
than marketing jargon
for operators wishing
to display green
credentials, sometimes
spuriously'**

any restrictive fences or interpretative devices, such as signs and marked trails, used to control the flow of visitors.

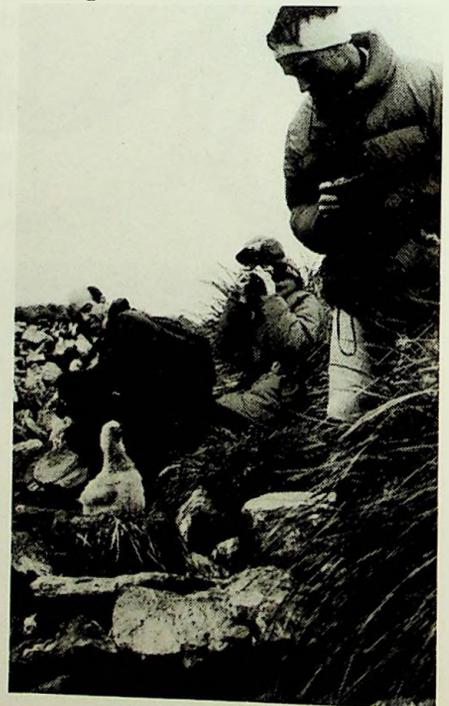
Worthwhile efforts have been made to educate visitors by both the Tourist Board and Falklands Conservation. The two organisations have cooperated to produce a video about desirable behaviour in sensitive areas, and a country code leaflet. A recent guiding course concentrated heavily on conservation principles.

The worthy phrase "eco-tourism" has now become little more than marketing jargon for operators wishing to display green credentials, sometimes spuriously. True eco-tourism is a symbiotic relationship, whereby tourism actively contributes to conservation, and creates a self-sustaining indus-

try. The concept, which involves coordinated strategy, monitoring and control, could have been invented for the Falkland Islands, but cannot yet be applied there. Indeed, because of trends which were never truly foreseen, it is no longer possible to assume that the Falkland Islands will not go the way of other sadly-damaged tourist destinations.

Fortunately, however, there are few, if any, Falkland Islands residents who do not care about the natural beauty of their islands. Private ownership of so much land, and the natural reluctance to see government become involved in otherwise private business, can make the issue emotive, but controls which will lead to a self-sustaining industry are in everyone's interest.

The principle of control and monitoring has already been applied to the fishing industry with a degree of success which has achieved international respect. Tourism may require similar management.



A young Black-Browed Albatross, still on the nest, is the centre of attention for 'eco-tourists'

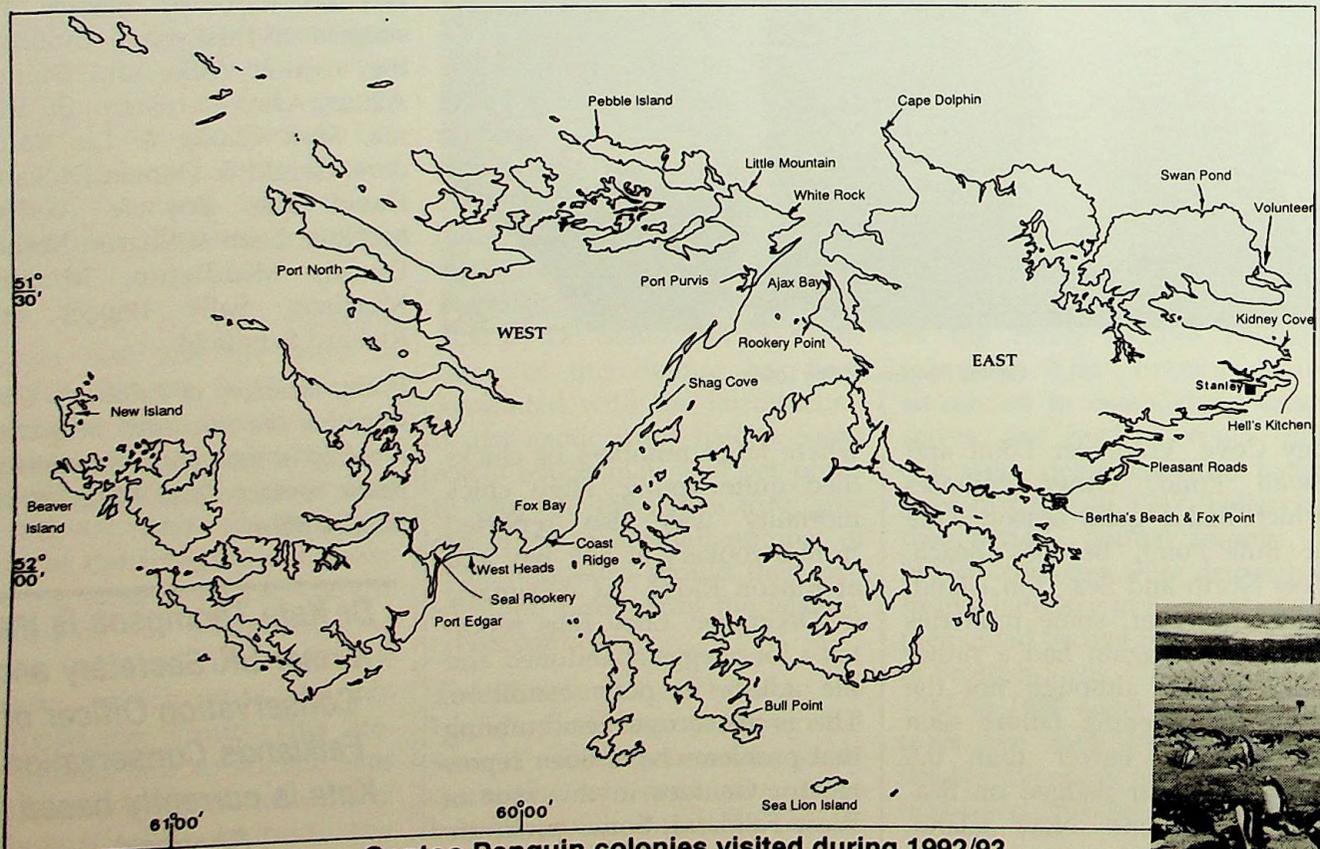
Gentoo Penguin Monitoring Project

Dr. Kate Thompson

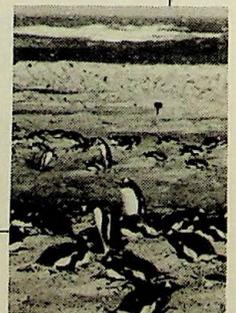
A total of twenty-four Gentoo Penguin colonies were counted this year, thanks to a tremendous response and effort from volunteers

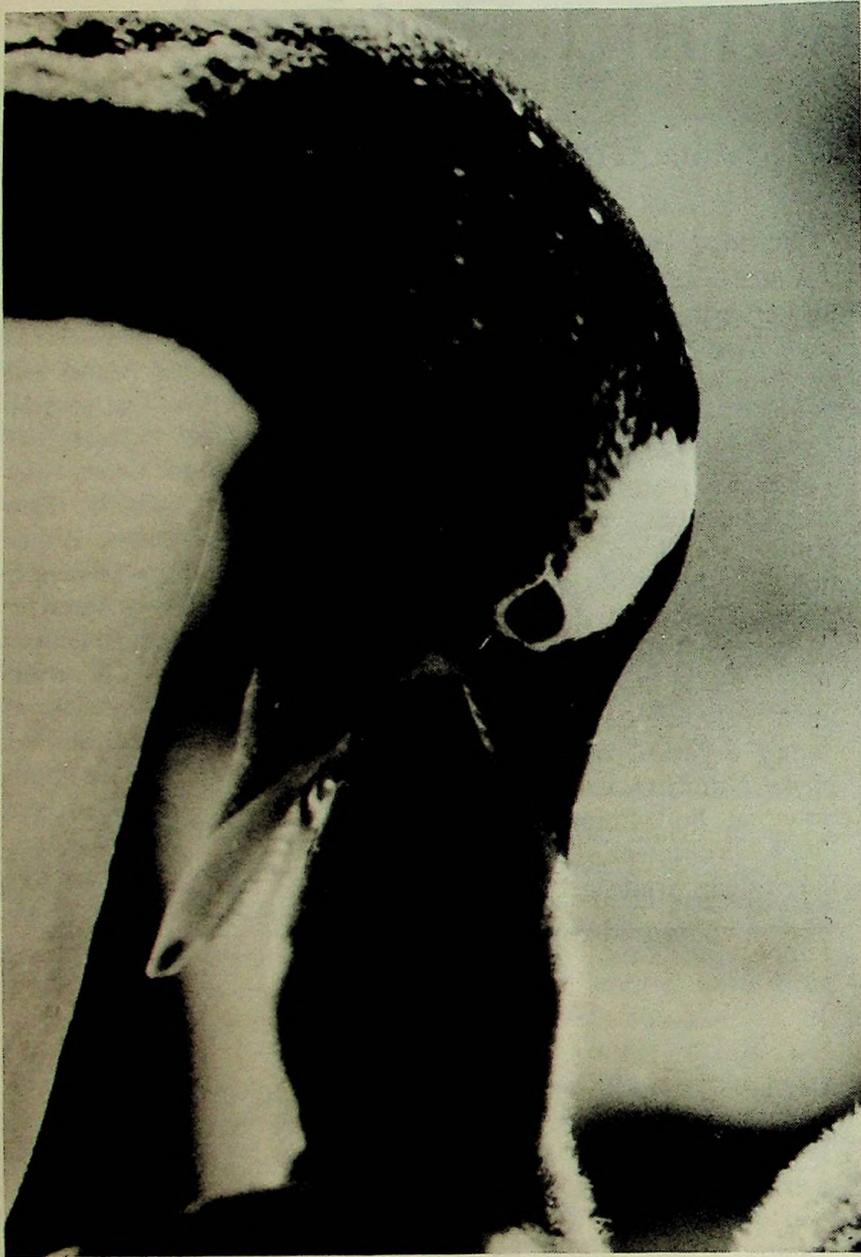
The total number of pairs counted was over 23,500, with some volunteers recording well over 1,000 pairs. In contrast to the very late season of 1991/92, the birds nested very early this year, and many volunteers were faced with trying to count well-feathered chicks, mixed up with adults and scattered all over the place. The total number of pairs settling down to breed in 1992 was similar to the previous year, although numbers varied a little from place to place. Numbers were slightly down at Bull Point, Bertha's Beach, Volunteer Point and Port Edgar, while a couple of

sites in the Port Howard area were not used at all by breeding birds this season. However, there were more birds breeding at Beaver Island and Rincon Ridge than last season. It will be a few years before we can hope to detect any genuine trends which ~~there~~ might be in numbers, rather than just fluctuations from season to season. As was found in 1991/92, breeding success rates varied markedly from place to place this season. Interestingly, the pattern of results was similar in both seasons, with highest success rates in parts of East Falkland. On average, over one chick per breeding pair fledged at Kid-



Gentoo Penguin colonies visited during 1992/93





Gentoo Penguin feeding young

ney Cove, Volunteer Point and Swan Pond. Other colonies which had a good season were at Bull Point, Bertha's Beach, Port North and Sea Lion Island. Sadly however, some rookeries in the West again had a rather poor season, although not the complete breeding failure seen in 1991/92. Fewer than 0.5 chicks per pair fledged on Beaver Island and New Island,

where large numbers of chicks died quite young. High chick mortality was also reported from a rookery at Fox Bay and at Rincon Ridge. At Albemarle in December, Lucy Ellis reported a lot of eggs abandoned and the adults in poor condition. This is the second year running that problems have been reported for Gentoos in this part of West Falkland. Some prelimin-

ary tests on tissues from a dead chick at Fox Bay suggested that the bird could have died of a disease called IBD. However, subsequent antibody tests on blood samples collected from Fox Bay and Volunteer Point in February failed to find any sign of IBD or a number of other diseases. Falklands Conservation is very grateful to Michael Reichel in arranging these investigations. Hopefully the situation will improve next season, but if any rookeries are found to have similar problems, it would be useful to have some fresh corpses examined by a veterinary pathologist. Next seasons' volunteers have been asked to look out for any signs of an unusually high death rate among adults or chicks. In addition, the overall condition of birds is of interest. Falklands Conservation would like to thank the volunteers who worked so hard to ensure the success of this years' monitoring, namely Mike and Mandy Alazia, Arina Bernstein, Su Binnie, Fred Clarke & Liz Saunders, Gerald & Doreen Dickson, David Lee, Roy & Audrey McGhie, Leon & Sharon Marsh, Dennis Middleton, Michael Morrison, Sally Poncet and Richard Schofield.

If any members of Falklands Conservation are interested in getting involved in next years' monitoring, please contact Carol Miller at the Stanley office.

Dr Kate Thompson is the former UK Secretary and Conservation Officer of Falklands Conservation. Kate is currently based in Scotland.

The History of Falkland Islands Trout

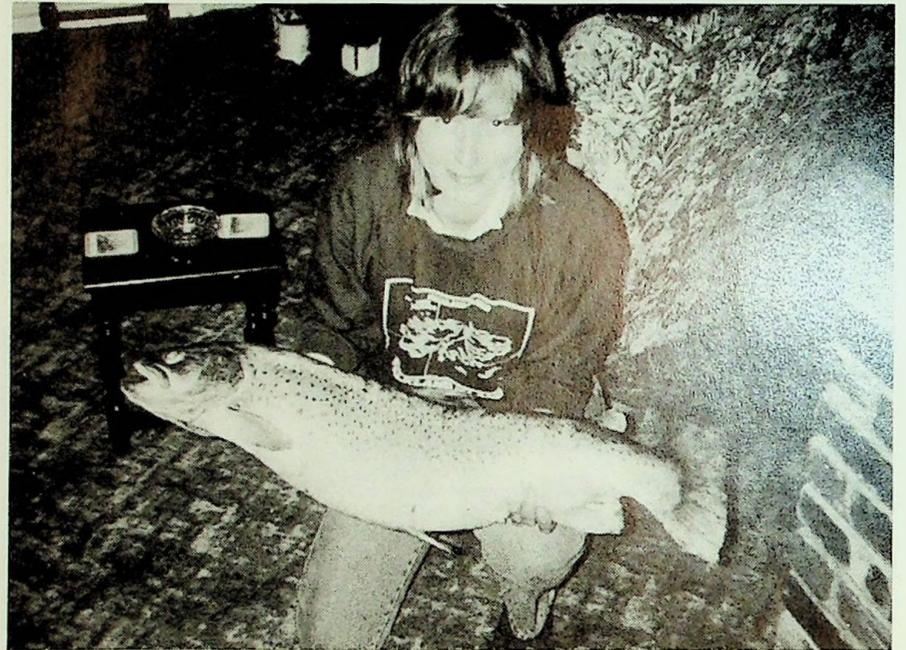
Conor Nolan

'As the establishment of sea trout and brown trout is a fait accompli, every effort should be made, in the next ten to twenty years, to improve their river habitat and thereby obtain the greatest economic advantage from their presence'

So wrote Dr. Leslie Stewart in 1973, in conclusion to a period spent investigating the distribution of the introduced trout species *Salmo tructo* throughout the Islands rivers.

The foresight of Dr. Stewart, with regard to the economic potential of the introduced species, has in recent years been realised, with tourist groups travelling from all parts to fish for heavy, well fed, sea-run trout - a quarry which local anglers have stalked for many years.

The rivers of the Falkland Islands first wet the boots of Charles Darwin in 1833 and, although the weather was gloomy and disheartening, the streams produced a great deal to interest and gladden the heart of the foraging naturalist. Visiting again in 1834 Darwin described a salmoniforme native to the rivers of the islands which was known locally as the 'Trout'. This species proved new to science, was named *Aplochiton zebra* and euphemistically termed the



'zebra trout' due to the dark bands gracing its flanks. Initially reported as being very common throughout the rivers of both East and West Falkland the home range of the species was much reduced when the major rivers of the Islands were sampled by Dr. Stewart in 1973. The cause of this demise has been associated with the introduction of the exotic trout species *Salmo tructo* which may well yet prove to supplant the native trout species from their small number of remaining sites should their distribution throughout the Islands' rivers continue.

The introduction of trout to the Islands first began during the second world war when small quantities of eyed ova from brown trout, American brook

trout and rainbow trout were introduced to Moody Brook after a sea-voyage from Chile in 1937. Similar introductions had succeeded in Tierra del Fuego and hopes were high that an esteemed sporting and eating fish could be introduced and survive in the rivers of the Falkland Islands. The brown trout succeeded in establishing themselves, and further brown trout ova were delivered from hatcheries in Chile in 1947. Following this period, annual supply of brown trout ova were dispatched from a hatchery in England, supplemented by ova from a number of Scottish lochs. Over the period 1847 to 1952 some 85,000 brown trout ova were received in the Islands although the sites of introduction and the survival rates

are, unfortunately, unknown.

Ova from the sea-running form of the brown trout, the sea-trout, were introduced in 1961 and 1962 although it is estimated that of a total of 28,000 ova only 3,000 were viable at release. The rate of survival after this period is, however, unknown.

As no sea-trout ova were introduced into the Falkland Islands prior to 1961, the catching of an 11 lb sea-trout on the Malo in 1963 can only be explained by a fish spawned from the original brown trout stock, which originated from areas with no access to the sea, reverting to a sea going form.

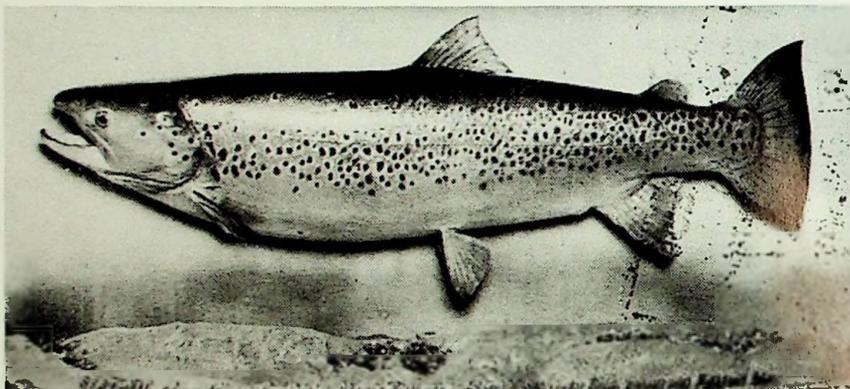
This major physiological and behavioural change is largely dependent on vagaries in riverine production and the stock density of fish. The controlling factors in the life of a trout are dominated by the ability of the individual to successfully compete with its siblings and obtain enough food for survival. Hatching in the spring, the fry shoal together and feed on minute river borne life. As the fish grow, the energy requirement of the individuals becomes greater, and the fish begin to stake out and defend small territories, usually commanding an exclusive view of a section of the river from a regularly used lie. Food and its availability regulates the growth pattern of all fish in the river and this directly dictates the behaviour and subsequent development of the trout in their

early years. Should sufficient resources be available to the fish, maturation will proceed, leading to spawning and propagation of the species. Should insufficient food be available to members of the same spawned group, due to inability to compete for good foraging areas, normal growth and maturation is retarded. The physiological reaction of the fish to remedy this livery and direction is to head out of the river as a silver smolt for a period of one to two years. Smolting at this stage inhibits the development of

the majority of these sea-run trout return to the sea following spawning, returning thereafter on an annual basis to satisfy their reproductive urge.

It is this annual run of sea-trout which attracts both the local and visiting anglers attention. In an effort to record the amount of pressure fishing placed on the rivers and the number of fish taken and returned, the fisheries department introduced a voluntary data collection scheme in 1992

for anglers to record details of their catches. Logbooks were issued along with the statutory fishing licence and were requested to be returned at the end of the season.



A championship size trout dreams of fast flowing rivers

the reproductive organs and allows the fish to concentrate its efforts on building up body mass before returning to its place of birth.

Following a period at sea feeding close inshore on lobster krill and other marine life, the fish return to the river, the majority in March and April, to spawn in the shallows over areas of clean loose gravel known as redds. In their travels they are likely to meet those fish which remained in the river rather than going to sea. The weakling, returned now as a fish of between 1kg and 2kg, dwarfs its siblings in both size and stature as it passes through the river reaches. Due to the lack of substantial feed in the rivers,

Data was received from a very small number of interested anglers, and was unfortunately biased in that the information came from only 5 locations with 70% of the fish being taken on the fly. Analysis of the data shows that 72% of the fish retained by anglers were female, ranging in weight from 85g (damaged) to 10.34kg. This large fish caught during March, following a spate, broke the Island's record, and from scale-readings proved to be 10 years of age - a true heritage year fish. The mean weight of retained fish was reported as 1.23kg with a mean total length of 43.25cm.

Of those fish returned, the vast majority were small brown trout with a mean size of 19.3cm total length. The catch and release policy operated by conservation minded anglers was evident in the returns for sea-trout to the river. These fish ranged in size from 8.0cm to 87.5cm with a mean total length of 43.6cm. Further information on the sex, maturity and age was collected on a number of these fish, and more detailed data collection and analysis will be carried out by the department throughout forthcoming seasons.

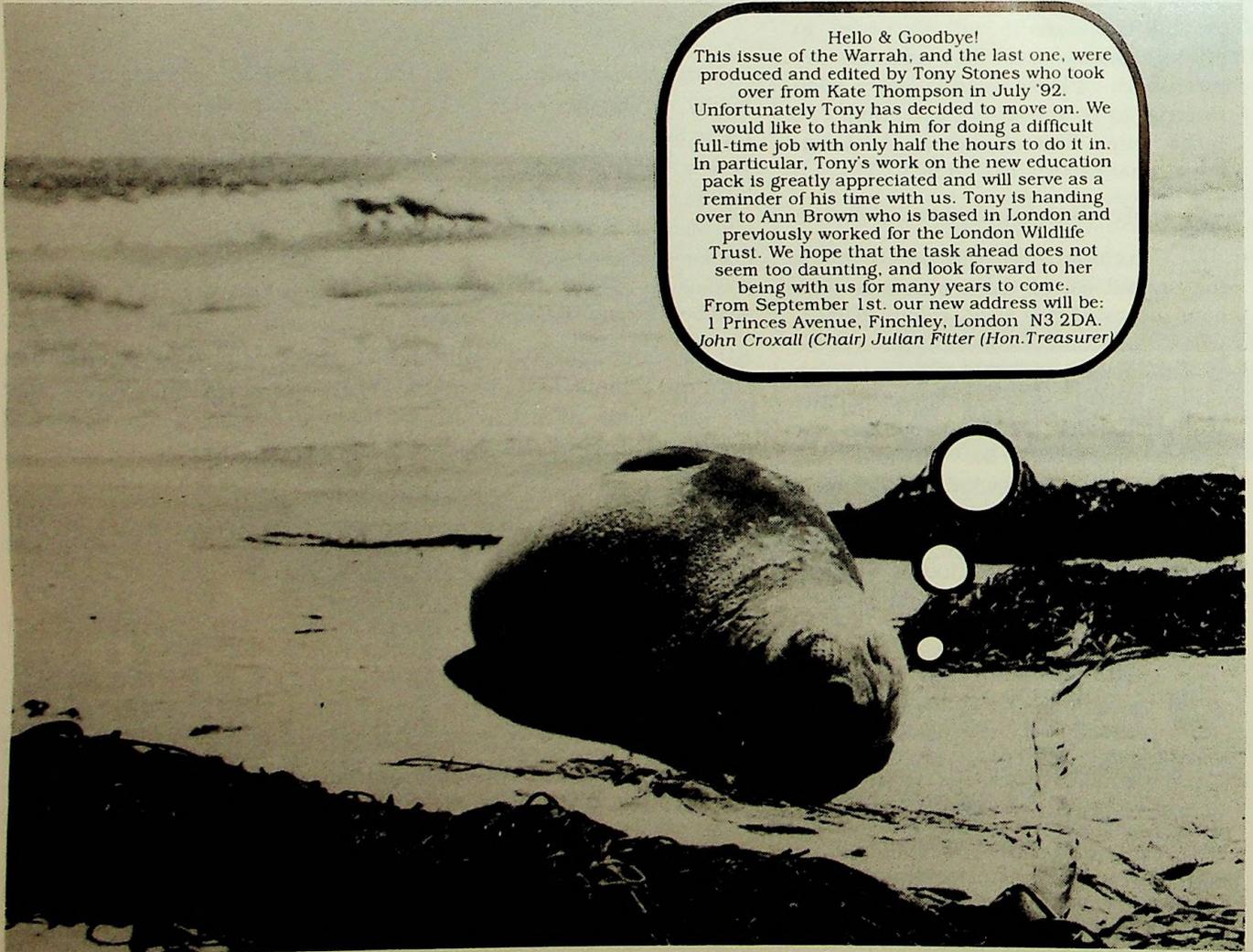
The collection of basic biological information on the growth and behaviour of the introduced species may initially give an indica-

tion of the potential of the species to outgrow and oust the native 'trout', and may provide an explanation of the disappearance of this species from some of the rivers on East and West Falkland. A fish-tagging programme is also planned to determine whether returning fish stray from their natural source and spawn in new areas. This is, by far, one of the most important issues if the remaining populations of the native 'trout' are to survive.

It is necessary to accept that the introduced species is now well established and resident, and that it provides entertainment and revenue both to those resident on the Islands and to the

visiting angler. Little is known of the biology of the native 'trout', and much more information is necessary if the interactions with the introduced species are to be understood. Biological information is currently being collected by the fisheries department, and in time should provide an important insight into the behaviour and ecology of this near-endangered native species.

Dr Conor Nolan has worked on the Falkland Islands for two years, and is Senior Scientist at the Fisheries Department, Port Stanley. Prior to this, Conor worked for British Antarctic Survey in Antarctica.



Hello & Goodbye!
This issue of the Warrah, and the last one, were produced and edited by Tony Stones who took over from Kate Thompson in July '92. Unfortunately Tony has decided to move on. We would like to thank him for doing a difficult full-time job with only half the hours to do it in. In particular, Tony's work on the new education pack is greatly appreciated and will serve as a reminder of his time with us. Tony is handing over to Ann Brown who is based in London and previously worked for the London Wildlife Trust. We hope that the task ahead does not seem too daunting, and look forward to her being with us for many years to come.
From September 1st. our new address will be:
1 Princes Avenue, Finchley, London N3 2DA.
John Croxall (Chair) Julian Fitter (Hon. Treasurer)

An Elephant Seal sleeps peacefully on a quiet beach

Photo: George Male



Falklands Conservation Sweatshirts and Tee-shirts

Sweatshirts and tee-shirts featuring the Falklands Conservation rockhopper penguin logo can be purchased from Falkland Conservation's Stanley office. The tee-shirts are white in one extra large size retailing at £5.00, while the sweatshirts are green or red in medium, large or extra large sizes and cost £15.00. We hope to be able to supply these goods to members outside the Islands by mail order at a later date. If you would like to purchase any of these garments, please notify your interest via Falklands Conservation, c/o Julian Fitter, Butt of Sherry, The Commons, Shaftesbury, Dorset SP8 7JU.



Request for Photographs

Falklands Conservation holds a small library of photographs for use in our newsletters and other publicity material. However, we could make use of a wider range of pictures, particularly of wildflowers, invertebrates, wild-fowl, passerines and cetaceans. If any readers have spare black and white prints or colour transparencies of any of these subjects which they would like to donate to our library we would be very grateful. Full credit will be given to photographers when their pictures are published. Please send any such material to Falklands Conservation, c/o Julian Fitter, Butt of Sherry, The Commons, Shaftesbury, Dorset SP8 7JU.



Membership Contact Scheme

Enclosed with this newsletter is the revised list of those members who have indicated that they wish to participate in our contact scheme. This scheme is designed to enable members with similar interests to make direct contact with each other. If your name does not already appear in the list and you would like to be included in future, please contact Julian Fitter giving details of your particular interests. Any feedback on the scheme, including suggestions for improvements, would be welcome.



Data Protection Act

Under the terms of the Data Protection Act, Falklands Conservation would be grateful if any members who do not wish their membership records to be held on computer would advise of this. Falklands Conservation do not give out details of membership records to any other persons or organisations without the written consent of individual members. Any member can be provided with full details of their own records upon written request.

Publications for Sale

The following publications are available by post from Falklands Conservation, c/o Julian Fitter, Butt of Sherry, The Commons, Shaftesbury, Dorset SP8 7JU. Prices are inclusive of packing and surface post. Payment may be remitted in \$US at a rate of \$2 per £1. Please make cheques payable to 'Falklands Conservation.'

Wildflowers of the Falkland Islands (booklet)	UK	£4.00
	Overseas	£4.50
Those Were the Days (booklet)	UK	£4.00
	Overseas	£4.50
Corrals and Gauchos (booklet)	UK	£4.00
	Overseas	£4.50
Tussac Grass in the Falklands (report)	UK	£7.50
	Overseas	£8.50
An Assessment of the Potential for Competition between Seabirds and Fisheries in the Falklands (report)	UK	£6.00
	Overseas	£7.00
Falkland Islands Foundation Newsletters (Nos. 5, 6, 7, 8, 9 & 10 only),		
each	UK	80p
	Overseas	£1.00

The three booklets may also be purchased from a number of retail outlets in Stanley and at MPA for £3.50.

Support Falklands Conservation

Falklands Conservation needs the support of all those who care about the natural and historic heritage of the Falkland Islands. If you are not already a member, please assist our vital work by joining now.

Minimum subscription rates are:

Ordinary Membership	*£15 (\$30) per annum
Family Membership	*£20 (\$40) per annum
Under Sixteens	*£5 (\$10) per annum
Benefactor Membership	£50 (\$100) per annum
Life Membership (under 65)	£500 (\$1000)
Life Membership (over 65)	£300 (\$600)
Corporate Membership	£200 (\$400) per annum

(* Minimum rates for Falklands residents are £10 Ordinary, £15 Family Membership and £5 Under Sixteens)

All members receive Falklands Conservation's newsletter. On joining, Benefactor members receive a certificate and a free booklet. Life and Corporate members receive an engraved plaque, featuring our rockhopper penguin logo.

Further details may be obtained from:

Falklands Conservation, c/o Julian Fitter, Butt of Sherry, The Commons, Shaftesbury, Dorset SP8 7JU.

Carol Miller, Falklands Conservation, PO Box 31, Stanley, Falkland Islands

Design & Typesetting by *Password Publishing & Design* (0603) 761507

Printed by *Imprint* (0508) 32222



This Newsletter has been produced with financial assistance from WWF U.K.



Falklands Conservation is a member of the International Union for the Conservation of Natural Resources





Rockhopper Penguin

the **WARRAH**

Newsletter of Falklands Conservation

April 1994 - Number 5

Editor Ann Brown

OIL PROBLEMS IN PROSPECT FOR FALKLANDS WILDLIFE

With the first steps to development of an offshore hydrocarbon industry now being taken in the Falklands, a new threat to its unique wildlife is in prospect.

Initial extensive seismic surveys have already taken place: licences to the two seismic companies, Spectrum and Geco Prakla, have just been extended for another year. The Islands' Executive Council has now agreed to an Impact Study, which is being undertaken by the London based company Environmental Resources Management. Falklands Conservation have already provided them with information on wildlife matters.

We are urging the Government to im-

pose the most stringent conditions on oil companies to minimise the risk of oil pollution and any other effects which would have a detrimental, if not catastrophic, effect on marine life.

The lack of basic background information on the Islands' ecosystem must be resolved if appropriate environmental safeguards are to be made. A major part of our Penguin Appeal fundraising is aimed at undertaking an Environmental Impact Assessment Programme which includes:

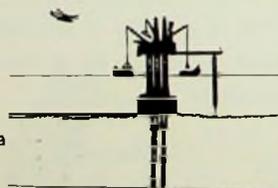
- A detailed survey of the breeding distribution of seabirds and sea mammals to enable environmentally sensitive sites

to be identified prior to development.

- A survey of the feeding distribution of penguins and other seabirds and seals at sea throughout the year to determine marine areas which would be particularly at risk in the event of oil spills. This information is fundamental to decisions on tanker routing.
- A study of inshore and intertidal zone ecosystems which are particularly vulnerable to oil spillage.
- Studies of terrestrial habitats to monitor the impact of human population growth and infrastructure development.

Falkland Factfile

Area:	50% bigger than the UK North Sea
Geology:	Comparable to that found in the North Sea
Environment:	Similar to the west of Shetland
Infrastructure:	International airport, deep water ports & access to S.America
Scientific Data:	New Surveys in progress
Exploration:	Same stage now as North Sea circa 1960
Oil Companies:	Attracted by the geology and hydrocarbon potential
Prognosis:	Potentially huge reserves



To implement this programme will cost £585,000 over the next ten years (when commercial oil production is likely to begin). It is an enormous challenge. Our Penguin Appeal is aimed at achieving this - read about it on the next page and decide how best you can contribute.

In this Issue: Penguin Appeal - The Greater Hooked Squid - Penguins on the Falklands Today - International Wildlife Agreements - Gentoo Penguin Population Trends - Conservation Officers Report



PENGUIN APPEAL GOES PUBLIC

The public phase of Penguin Appeal will be launched by Bill Oddie at London Zoo on 28th April. Its success is of crucial importance to the future of Falklands Conservation. The launch will be followed by a series of promotions and special events. Please support these, and join in with your own fundraising effort.

Art Exhibition 'Wildlife of the Southern Oceans'

27 September - 8 October
(10am - 6pm, not Sunday)

at London Ecology Centre, Shelton Street,
Covent Garden, London WC2. Original
pictures by well known wildlife artists for
sale. Offers of help in manning the
Exhibition would be gratefully received:
please contact Ann Brown at the UK office.

Penguin Biscuits Appeal Promotion: May



For one proof of purchase you will be able to buy up to four penguin beakers and a poster. Every purchase will bring in a donation to the Appeal There will be extra biscuits in each pack, with penguin trivia question\answers. This is not the time for slimming!

What FC Members can do:

- At your home or workplace have a collecting box for people to donate 5p pieces. It takes 5p to save one penguin! Remember though, it is illegal to collect on the streets or in a public place without a licence.
- Organise a sponsored event, such as swimming, ice skating, or walking, between two appropriately named places -if related to penguins and the Falklands all the better.
- Hold a coffee morning with associated bric-a-brac, plant, or lucky dip sales - and lots of Penguins biscuits. Or, Have a "penguin suit" dinner party.
- Use the Appeal leaflet (enclosed) to raise donations. Try friends and relations, and local shops who sell Penguin Biscuits. More leaflets are available from UK Office if needed.
- Involve a local school in the Appeal. Get them to run a visit to a Penguin Zoo, organise a collection, run a stall at their summer fete, or arrange for a speaker on penguins (followed by a collection).

Please send money raised by cheque payable to "Penguin Appeal", PO Box - 2040, London W12 0ZJ. Remember to mention our registered charity number: - 279347.

Penguin Week is 30 May - 5 June

Watch out for the Mail on Sunday (29th May) with a voucher for one child's free admission (with accompanying paying adult) to visit penguin Zoos where there may be special events, and information on penguins and Falklands Conservation. The following Zoos have agreed to take part:

Banham, Norfolk
Belfast Zoo
Birdworld, Farnham, Surrey
Bristol Zoo
Chester Zoo
Colchester Zoo
Cotswold Wildlife Park, Glos.
Drusillas, Alfriston, E Sussex
Dudley Zoo, West Midlands
Edinburgh Zoo
Exmoor Animal & Bird Gardens, Devon
Gatwick Zoo, Charlwood, Surrey

Harewood, West Yorkshire
London Zoo
Newquay Animal World, Cornwall
Paignton Zoo
Paradise Park, Hayle, Cornwall
Pencynor Wildlife Park, Neath
Natureland, Skegness
Rode Bird Gardens, Bath
Twycross Zoo
Welsh Mountain Zoo, Colwyn Bay
Whipsnade Zoo, Dunstable, Beds

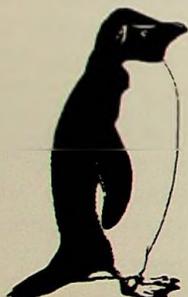
PENGUINS ON THE FALKLANDS TODAY

Amongst birds, penguins are the group most likely to suffer the greatest potential impact from oil. This is principally because they cannot fly and because most species depend on inshore and continental shelf water at least during their breeding seasons. Problems facing the different species of penguin found in the Islands are outlined below.



King Penguin

This species has the lowest reproductive rate and is therefore slow to recover. It has the largest breeding season foraging range and therefore is potentially affected by adverse changes in the marine environment. Because it has the longest period of chick rearing, the offspring are most vulnerable to problems affecting their parents. It is the only penguin in the region unequivocally still increasing in numbers.



Rockhopper Penguin

Rockhoppers have declined very significantly in the Falklands where populations now may be only about 30% of those in the 1930s. There is no known cause of this decline at present. Nevertheless the Falkland Islands probably still contain over half the world population of the species. In proportion to their population size, Rockhoppers breed at relatively few sites putting the population at risk to the impact of local events in the breeding season.



Macaroni Penguin

Together with the Rockhopper, Macaronis are examples of the most extreme group of penguins in terms of delayed attainment of sexual maturity (they don't breed until at least 6-7 years old), have a low reproductive rate (effectively one egg per year) and alternate habitat use, foraging medium-distance offshore in the breeding season and being highly pelagic (and absent from the breeding colonies) in the nonbreeding season. Their delayed sexual maturity makes them especially vulnerable to adverse effects during their juvenile life and their use of inshore, offshore and pelagic water maximises their potential vulnerability at sea. Macaronis are rare and local in the Falklands, where they are on the edge of their range and therefore especially vulnerable to any environmental change whether directly (disturbance, fishing) or indirectly (global warming) caused by man's activities.



Gentoo Penguin

The Falkland Islands are the single most important breeding centre in the world (circa 35% of global population) for this species, which is resident

year round and restricted to close inshore at all times. This makes it vulnerable to pollution in coastal and inshore waters. Gentoos breed at the earliest age of any penguin and with 2 eggs per year can recover fairly quickly from catastrophes. They are widely distributed in the Falkland Islands, which offer some protection. However, the species is rather shy and particularly sensitive to disturbance. Breeding habitat may well bring Gentoos into conflict with grazing and land use practice. At present Gentoo penguins appear to be facing mixed fortunes with population decline, high mortality and low breeding success in some parts of the Islands.



Magellanic Penguin

This species breeds in burrows and is therefore particularly susceptible to erosion arising from poor land management practice. Populations of burrowing species are very difficult to assess but the Falkland Islands are certainly one of the most important breeding sites in the world and, given the problems faced by some of the well-known colonies of this species in Chile and Argentina, the survival of healthy Falklands populations may be disproportionately important to the health of the species generally. The species is migratory, departing probably towards the South American part of the Patagonian Shelf in winter, possibly even north to Brazil. It is therefore very vulnerable to the multitude of problems occurring in the marine environment in this region.

Illustrations reproduced by kind permission of Robert Gillmor

CONSERVATION OFFICER'S REPORT

Michael Bingham arrived in Stanley last October, to begin his full time job as our Conservation Officer. He reports here on his background and first months working in the Islands



Michael Bingham (right) with Ian Stewart, General Manager of Cable and Wireless plc (sponsor) and Jean Smith, Head Teacher of the Junior School, at the launch of Falklands Conservation Education Packs.

My arrival in the Falklands felt like the end of a journey in more ways than one, representing as it did the kind of post I had sought and worked towards for many years. From a boyhood dream to conserve wildlife, I went instead into managerial work, motorcycle racing and saloon car racing. I took fifth place in the 1984 British Road Saloon Car Championship, racing a Jaguar, whilst working for Tom Talkinshaw Racing (TWR). The following year TWR Jaguar moved away from saloon car racing, whilst I moved back into the career for which I was destined.

After several years of conservation work in the UK I was offered work to save the Hawaiian Hawksbill Turtle. A combination of predation by introduced mongoose and disturbance from tourism had reduced the population to 10-15 pairs. Within three years we reduced the hatchling mortality from 96% to just 5%, giving renewed hope that this species may yet be snatched from the jaws of extinction. I also assisted with the nene captive breeding programme, another species which was saved at the eleventh hour.

Such programmes have been invaluable in helping me to become

established as Conservation Officer for Falklands Conservation. Arriving as I did in early October I was plunged head-first into the work including pressing visits to monitoring sites I was helped enormously by Carol Miller as Secretary, and by Tim Stenning and Jeremy Smith whose knowledge of the Islands greatly assisted with the fieldwork. Mike Riddy also accompanied us on our first trip to give essential guidance on field techniques.

It is important for people to see that conservation is not for science, it is for people

I felt it important to concentrate on establishing baseline data on population sizes and trends rather than to research detailed aspects of behaviour. To this end a gentoo survey of East Falkland was undertaken, followed by censuses of black-browed albatross and rockhopper penguins for the whole of West Point Island. Initial surveys were also undertaken at numerous locations around the coast. Such data is essential if we

are to monitor changes which may occur as a result of oil, fishing, tourism or natural factors. It should also enable us to identify those key areas especially rich in wildlife or susceptible to disturbance.

With Conor Nolan of the Fisheries I have been surveying distributions of the local zebra trout (*Aplochiton zebra*) and minnow (*Galaxias* sp.). Contrary to some reports, the minnow is abundant throughout East Falkland and although more research is needed, the zebra trout is also abundant in many East Falkland streams.

The Junior School and Camp Education requested our assistance as they got to grips with our Education Packs. I hope to build on these links, and to promote the work of Falklands Conservation at the local level, through press articles, leaflets and activities aimed at giving people a greater awareness of the wildlife around them. By becoming more aware of their natural heritage, they are more likely to become concerned about its protection. It is important for people to see that conservation is not for science, it is for people - both this generation and future generations.

GENTOO PENGUIN POPULATION TRENDS: 1987/88 - 1993/4

During 1993/94 Falklands Conservation undertook a Gentoo penguin population count of the East Falkland mainland to make comparisons with a similar survey conducted in 1987/88, and with earlier works dating back to 1932. Many of the Gentoo colonies are regularly monitored as part of our Seabird Monitoring Programme. Others are counted annually by volunteers who visit their adopted colony twice a year to count nests and chicks.

The present population of Gentoo for East Falkland mainland stands at some 15,000 pairs. Between 1932 and 1987 the population size appears to show no significant change, but since 1987 a decline averaging 3% per year has occurred. Although a full census of West Falkland has not yet been conducted, counts from many of the West Falkland and island colonies indicate that the decline is occurring throughout the Falklands.

This decline appears to have no apparent connection with any form

of disturbance or land-based human activities such as eggging or tourism. Its gradual nature suggests that some factor has altered in the last 5 to 10 years tilting the natural balance against the Gentoo. It seems to be concentrated in the southern colonies where it averages 6% per year since 1987/88. Terrestrial climatic changes such as global warming or ozone depletion are unlikely theories, since such variations between North and South would be minimal. Hot weather can cause high chick mortality, but there is no reason to suppose this would be concentrated in the South, and it can probably be regarded as natural mortality, existing prior to 1987/88. Increased predation cannot be ruled out, but since Sea Lion and Leopard Seal have become less common it is not easy to see how predation on Gentoo could have increased. The most likely change is the availability of food brought about by shifts in ocean currents or as a result of fishing activities.

Falklands Conservation have been examining Gentoo penguin diet since 1987. These studies indicate that Gentoo take roughly equal proportions of Cephalopods (squid and octopus), lobster krill and fish. However, in the southern colonies which are in greatest decline, the diet is roughly two thirds

lobster krill and one third fish, with Cephalopods making very little contribution. This almost certainly reflects changes in the relative abundance of these three food types, with strong evidence of the cephalopods being less abundant in the waters around the southern colonies.

The Falklands hold one third of the world population of Gentoo. It is important that we continue to monitor population trends and seek to establish links between trends and possible causes.

Falklands Conservation would like to thank all the volunteer counters and all the landowners who permit us access to visit colonies. We would be grateful to hear from anyone who has information relating to Gentoo, or who would be prepared to make annual counts of colonies to which they have access especially from West Falkland or any islands, which have less extensive coverage.

Please write to
Falklands Conservation,
PO Box 31, Stanley,
or Telephone 22247.



Gentoo Penguins on New Island. Photo: Simon Lyster.

The Greater Hooked Squid

Moroteuthis ingens

Magnus George and Nicole Buxton



Two male *Moroteuthis ingens*, showing the internal organs.

There is a growing body of knowledge dealing with the two main squid species of commercial importance in the Falkland Islands, *Illex argentinus* and *Loligo gahi*; but these species are not the only cephalopods found in these waters. There are a number of octopus species and several squid species which are rarely caught in commercial fishing operations, such as *Gonatus antarcticus* which is an important food of seabirds. One species of squid which is widely distributed, frequently caught by fishing vessels, and which may be quite abundant is the Greater Hooked squid, *Moroteuthis ingens*.

Moroteuthis ingens is a relatively large species, which reaches over 60 cm body length. As with all squids, *Moroteuthis* has eight arms with rows of suckers, and two long tentacles. In this species, the tentacles are as long as the body, and have rows of sharp backward-pointing hooks at their ends for seizing prey (smaller squids, krill and small fish). It has a circumpolar distribution and has been found in sub-Antarctic waters north of the Antarctic convergence. This species has no commercial value and is considered to be inedible, but is an important food for many higher predators.

Until recently, very little was known about this animal in the Falklands. In July 1993 we met Dr. George Jackson of the University of Western Australia while attending the Southern Ocean Cephalopods Conference in Cambridge, England.

He had been working with specimens of *Moroteuthis* collected by fisheries observers from waters around New Zealand, where it is caught at depths of up to 1200 metres. We initiated a collaborative project to study the species in the shallower waters around the Falklands. Between August and December 1993 scientific observers working at the Falkland Islands Fisheries Department (FIFD) collected specimens and froze them for subsequent analysis in Stanley. Dr. Jackson had meanwhile been applying for funding to visit the Islands to work with us. In November he was successful, and arrived in the Islands for a two week visit in December 1993. During the study, a great deal of information was collected on the distribution of *Moroteuthis*, as well as its growth, maturation and feeding. Historical data from the FIFD Fisheries Observer program has shown that *M. ingens* is distributed through-

out the Falklands Interim Conservation Zone (FICZ). The species appears to be distributed throughout the water column, as it has been caught by trawlers fishing bottom and midwater gear down to 350 meters, and by jiggers fishing the top 70 or 80 meters of water.

Dr. Jackson's primary objective was to collect statoliths from the squid sampled. Statoliths are hard structures found within the head of squids, which can be used to determine the age of the animal. By carefully mounting and polishing the statoliths, it is possible to see rings with a light microscope. Each ring is presumed to represent one day's growth. Statoliths collected from Falklands *Moroteuthis* have been taken to Australia for analysis and comparison with those from the same species collected in New Zealand waters. From these comparisons, Dr. Jackson will be able to determine if there are growth differences between the two populations of this species.

Data from New Zealand has shown that *Moroteuthis* lives for approxi-

mately one year. During early life, there is a rapid increase in body mass and length. This is followed by a period when energy is directed to the development of sexual organs, as well as to continued body growth. Females reach a greater size than males, and at the time of spawning can measure over 60cm in body length, weigh over 5kg, have flesh over 3cm thick, and have an egg mass of 1.2kg. At spawning, there is rapid degeneration of the body tissue when all stored energy is diverted to reproduction, and hormones may begin to inhibit further growth. As with Pacific salmon, *Moroteuthis* spawn and then die, which is defined as "terminal spawning". So far, the depths and areas where spawning occurs in the FICZ are not known.

Another objective of the study was to determine the diet of this species within the Falklands, as no information has been published on *Moroteuthis* diet and feeding methods. Initial results show that

there are changes in the feeding pattern with growth. Juveniles (with a body length of less than 20cm) feed primarily on small crustaceans; larger animals feed on fish and squid such as *Loligo gahi*. The type of fish in the digestive system of the squid can usually only be identified by the presence of otoliths, which are structures in fish equivalent to statoliths. Adult *Moroteuthis* in the Falklands appear to selectively prey on *Gymnoscopelus nicholsi*, a small, abundant midwater fish with distinctive otoliths.

Moroteuthis ingens has been found to be a common food item of a great variety of higher predators (see table). For example, in the report "An assessment of the potential for competition between seabirds and fisheries in the Falkland Islands", written by Dr. Kate Thompson of Falklands Conservation, there are descriptions of the stomach contents of a variety of penguin and other seabird species, many of which include *Moroteuthis*.

Table 1. Incidence of predation on *Moroteuthis ingens*.

Species Common Name	Species Scientific Name	Feeding	Location
Mammals			
Sperm Whale	<i>Physeter macrocephalus</i>	deep diving	South Georgia & Argentina
Southern Elephant Seal	<i>Mirounga leonina</i>	deep diving	Macquarie Heard Islands
Ross Seal	<i>Ommatophoca rossi</i>	diving	South Atlantic
Birds			
King Penguin	<i>Aptenodytes patagonicus</i>	diving	Crozet Islands
Rockhopper Penguin	<i>Eudyptes chrysocome</i>	diving	Falkland Islands
Gentoo Penguin	<i>Pygoscelis papua</i>	diving	Falkland Islands
Magellanic Penguin	<i>Spheniscus magellanicus</i>	diving	Falkland Islands
Thin-billed Prion	<i>Pachyptila belcheri</i>	surface	Falkland Islands
Wandering Albatross	<i>Diomedea exulans</i>	surface	South Georgia
Fish			
Ray	<i>Bathyraja griseocauda</i>	benthic	Falkland Islands
Orange Roughy	<i>Hoplostethus atlanticus</i>	deep pelagic	New Zealand
Kingclip	<i>Genypterus blacodes</i>	demersal	Falkland Islands
Southern Common Hake	<i>Merluccius hubbsi</i>	semi-pelagic	Falkland Islands
Southern Opah	<i>Lampris immaculatus</i>	surface/pelagic	Falkland Islands



M. George with an adult female *Moroteuthis ingens* which weighed 4.7kg. The total length of the squid was 136cm from the tip of the tail to the tip of the longest tentacle.

On the Crozet Islands of the Indian Ocean sector of the Southern Ocean, *Moroteuthis* was found to be the most important contributor by weight, to the diet of King Penguins in winter, when they are feeding their chicks. Fisheries observers have found this squid to feature in the diets of several common fish species caught around the Falkland Islands.

Often all that is found of squids and octopus in the stomach contents of birds, sea mammals or fish are the indigestible hard beaks which they use to chop their prey into bite-sized pieces. It is possible to measure beak sizes from whole specimens and to relate these to squid length or weight. Using these relationships, ecologists can estimate the total quantity of squid in the stomach of a single predator, and from this the relative importance of each squid species to that predator. Over a period of time changes in the relative importance of different prey could suggest a change in the

availability of it compared to more or less "favoured" prey species. Also, knowledge of the distribution of squids will help determine the foraging behaviour of birds and other higher predators. This methodology was used in a study to determine the foraging behaviour and feeding spectrum of the Southern sea lion in the Falkland Islands (see The Warrah, December 1992).

It is unlikely that a fishery for *Moroteuthis* will ever develop, as it is widely regarded as inedible by humans. This is probably due to the high ammonium concentration in its flesh. Ironically, one of the fish species which selectively feeds on *Moroteuthis*, the moonfish (*Lampris immaculatus*), is one of the tastiest fish caught in Falklands waters.

Despite having no commercial value at present, it is clear that this species is of considerable ecological importance. Studies on the biology of *Moroteuthis ingens*, as

well as other cephalopods found within the FICZ, are continuing.

Magnus George came to the Falkland Islands over three years ago to work in the commercial fishing sector. He has an honours degree in Wildlife and Fisheries Management from Edinburgh University, and worked in salmon and trout fisheries management and salmon farming before coming to the Islands. He is at present Observer Coordinator for FIFD, and is a member of Falklands Conservation.

Nicole Bixton is the Data Analyst for FIFD. She holds degrees in Ecology and Fisheries Science from Rhodes College and the University of Rhode Island. She has worked on an aquaculture project in Zaire for the US Peace Corps, as a fisheries observer in Alaska's Bering Sea, and at the world-famous Wood's Hole Laboratory of the National Marine Fisheries Service in the USA.

(all photographs by M. George).

WILDLIFE TREATIES AND THE FALKLANDS

An outline of the international conservation agreements, treaties and conventions which include protection of wildlife in the Islands by Sara Oldfield

On 25 January the UK Government launched "Biodiversity: the UK Action Plan", one of four reports setting out how it will demonstrate a commitment to implementing "The Convention on Biological Diversity", a new agreement signed at the UNCED Earth Summit in June 1992.

The UK Plan sets out fifty nine objectives for the Government. These have been criticised as being too vague and untargeted. The Government response is that the objectives will be refined and priorities for action set over the next two years by a newly formed Biodiversity Action Plan Steering Group.

Under the terms of the Convention, biological diversity is defined as the variability among living organisms, including diversity within species, between species and of ecosystems.

Biodiversity is thus a newly coined term to sum up the richness of the world's biological and ecological resources.

A brief summary of the biodiversity situation in the UK Dependencies is included. The section on the Falklands draws attention to the need for further surveys of the flora and fauna and for ecological research. It also points out that conservation legislation for the Falklands is in need of updating, particularly to ensure effective habitat protection. The most relevant objective states that the UK Government will:

'Encourage individual Dependent Territories to develop strategies for biodiversity conservation, including updating existing legislation and developing new legislation to protect species and habitats as appropriate.'

Dependent Territories are also encouraged to consider ways to develop their institutional capacity to implement the Biodiversity Convention; identify priority areas for biodiversity conservation; and exchange information for the development of wider biodiversity databases.

How the Government will encourage the Falklands and other Dependent Territories to carry out these aims is not yet clear. So far, a grant has been given to the UK Dependent Territories Conservation Forum to help it establish what role NGOs in the Dependencies can play in implementing biodiversity conservation. Falklands Conservation is working closely with the Forum on this project but major efforts will also be needed at governmental and intergovernmental levels to ensure biodiversity conservation measures become a reality.

One significant step would be to review progress on the implementation of other international agreements. Then the UK Government could provide more support to make sure that these are working effectively and work out what additional steps may need to be taken under the Biodiversity Convention. The international conservation agreements already signed up to by the Falklands, through the UK Government, include CITES, Bonn, Ramsar and World Heritage Conventions (see below).

(continued overleaf)

INTERNATIONAL AGREEMENTS COVERING CONSERVATION IN THE FALKLANDS

The Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar Convention):

The objective of the Ramsar Convention is to stem the progressive encroachment on and loss of wetlands now and in the future. To achieve this objective, Ramsar seeks to promote the wise use of all wetlands and special protection for listed wetlands of international importance.

The Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention)

The World Heritage Convention aims to protect natural and cultural sites of outstanding universal value.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

This regulates, by a permit system, international trade in wild animals and plants which are listed in three Appendices to the Convention.

The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)

Its fundamental objective is to protect migratory species.

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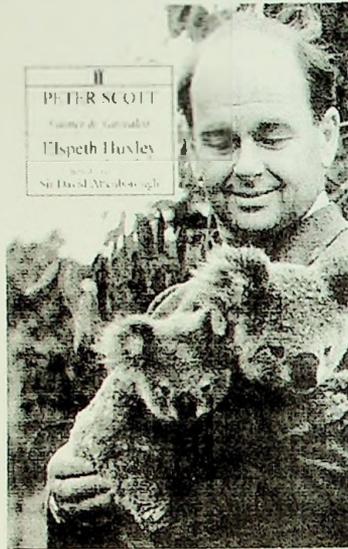
The Ramsar Convention may have most practical relevance for habitat conservation in the Falklands because of the predominance of internationally important wetland habitats. The UK Government has in fact already commissioned a major review of implementation of this Convention in the UK Dependencies, with Falklands Conservation carrying out part of the work. A Report was produced for the Department of the Environment in 1992 but so far none of its recommendations have been implemented. For the Falklands these recommendations included the designation of Swan Inlet, Hawks Nest Ponds and Pebble Island East as wetlands of international importance; field surveys of other largely undocumented wetland areas to assess their relative importance; and consideration of how current conservation legislation could be revised to protect wetland sites.

In general, international conservation conventions help to reinforce national conservation legislation and set common standards for the protection of species and habitats. They place obligations on member countries but also provide opportunities for international cooperation and support for national conservation activities. The Falklands has so much of value in terms of biodiversity that it is inevitably a focus of international conservation attention.

Following on from the new UK Government reports, what is now needed is positive and immediate commitment to help conservation on the ground. In the Falklands revision of legislation to reflect international commitments is clearly an urgent priority in the development of a local biodiversity action plan.

Sara Oldfield is Chair of the NGO UK Dependent Territories Conservation Forum

BOOK REVIEWS



PETER SCOTT, Painter and Naturalist

by *Elspeth Huxley*

This is a very readable account of the life of the founder of Falklands Conservation and one widely regarded as the 'Patron Saint of Conservation'.

The Antarctic explorer Captain Scott in a letter to his wife wrote of his son 'make the boy interested in wildlife.' His wishes were overwhelmingly fulfilled! This was a giant amongst the naturalists of his generation and the one with that special vision to take positive and lasting action for which so many millions of wildlife supporters must be grateful today. He was a very energetic and active man - the stories of his travels, activities and sporting achievements leave one feeling slightly breathless. He travelled the world unceasingly in the cause of protecting wildlife - and one day (16 January 1979) these travels landed him on the Falklands. It was typical of him that 'while watching

penguins' he there and then decided to form a charity to protect all forms of wildlife in the Islands. We should not forget his dream to create a 'wildlife show-case' here.

The tale of his conversion from shooter to protector is fascinating. He led an unusual and undoubtedly privileged life, backed up by a considerable artistic talent and good fortune, but this should not detract from recognising the enormous contribution he made to the cause of wildlife conservation - worldwide. For those involved in wildlife conservation today, this book explains the role of a key player and background to the birth of our movement.

Ann Brown

Peter Scott -
Painter and Naturalist
by *Elspeth Huxley*

361 pages. Faber & Faber.

Price £17.50



BOOK REVIEWS

LIFE IN THE FREEZER -

A Natural History of the Antarctic

by *Alastair Fothergill*

This book is the companion volume to the recently screened BBC series of the same name. It contains a breathtaking selection of photographs, in keeping with the film sequences seen on TV. It is one of those books which truly inspire one to want to go there and see it all for oneself, and must capture the magic of the place in the memory of those who have ventured so far south. The third chapter is of particular interest, covering the 'Islands on the Edge' stressing how very important they are to the animals of the Continent with their regular ice free conditions and provision of suitable breeding places. Although not covering the Falklands themselves, much of the wildlife described is to be found further north. The text adds to our overall picture of the natural history of the whole Region. It is a beautiful book, and definitely not to be kept just for the coffee table.

Ann Brown

Life in the Freezer -

A Natural History of the Antarctic

by *Alastair Fothergill*

224 pages. BBC Books.

Price £18.99

THE FALKLANDS

by *Tony Chater*

In his preface to this book, Tony Chater states his aim as "simply to present the Islands in pictures ... accompanied throughout with a selection of short descriptions, anecdotes and archival extracts which I hope create an impressionistic collage of the moorland and seascape, wildlife and characters, which make up the Falklands". In this superbly produced volume he amply succeeds. The excellent photographs bring all aspects of the Islands alive and the text is a very readable amalgam of personal recollections and factual information.

The book is divided into nine main sections covering the discovery of the Falklands, seabirds, Stanley, predators and passerines, ships and shorelines, waders and wildfowl, camp and the campers, marine mammals and the 1982 war. Each of these sections is comprised of a collection of short photoessays on individual people, places, buildings, ships, birds, mammals or aspects of life, such as the air service or shearing.

There are also a number of fascinating historical pieces, for example on the sealing industry and the missionary settlement at Keppel Island. This format makes the book ideal for dipping into while the whole gives a very comprehensive portrait of the Islands today. There are inevitably a few omissions, such as wildflowers and the Stanley Museum, and the section on the 1982 War is perhaps a little too long, covering almost a fifth of the book. However, these are minor quibbles and I would not hesitate to recommend this beautiful book to anyone who has already visited the Falklands or to those less fortunate who wish to get a real feel for the Islands from this end of the world. The £25 price tag may seem rather steep but represents excellent value for money.

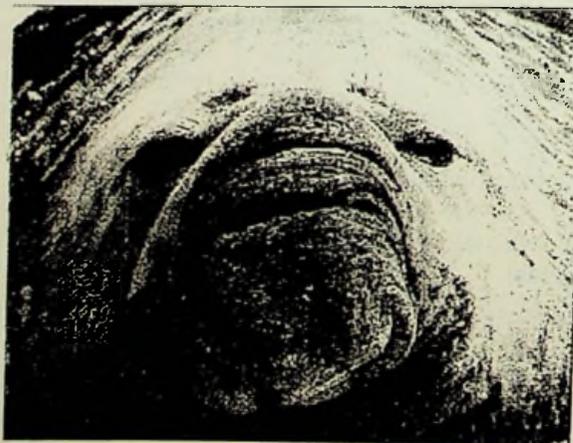
Kate Thompson

The Falklands

by *Tony Chater*

168 pages. Penna Press.

Price £25.



RECENT BIRD RECORDS FROM THE ISLANDS

The summer of 1993/94 has produced some interesting records of unusual bird species in the Islands. Uncommon seabirds included a Light-mantled Sooty Albatross, seldom seen inshore, near West Point island (28 September) and four Soft-Plumaged Petrels (Hookers Point, 6th March) common off-shore this year, but even so, rarely observed from land. Also on the sea was a Great Grebe seen from Sea Lion Island on 15th January.

Pebble Island provided the only reports received on Cascoroba Swan (seven from 25th November to 10th December and three on 26th December) and Cinnamon Teal (one female on 11th December). Two Ashy-headed Geese, a fairly frequent visitor, were seen at Darwin on 28th November and a Rosybill Pochard, a very uncommon visitor, was present at Bull Point from mid December to February.

The report of a juvenile Lake Duck from near Stanley Airport on 7 March would, if confirmed, be the first record for over 70 years. The Buff-necked Ibis is a fairly regular vagrant but the bird seen at Port Howard on 13 January was one of very few records outside the October/November and March/April periods.

Both records of interesting birds of prey came from Port Stephens, with a Harrier (presumably Cinereous) on 25th November and a Chimango Caracara on 31 December for which there are only a handful of previous records.

Vagrant waders were represented by a Baird's Sandpiper at Port Stephens on 16 October and a Lesser Yellowlegs at Cape Pembroke from 31 October to 1 November, possibly only the 5th record of this species for the Falklands. A Southern Lapwing, an irregular visitor, was at Port Stephens on 13 October. The American Golden Plover at Sea Lion Island from 4-13 January is possibly a new species for the Islands. An Eared Dove, a regular visitor, appeared in Stanley from 6th March to at least 10 March 1994. Another regular visitor, the Chilean Swallow, was seen at Port Stephens from 22 - 25 October and on Pebble Island (2) on 10 December.

Thank you to all observers who reported these sightings and to Alan Henry for collating them. There are likely to be additional sightings of unusual birds of which we are unaware. Please send details of any such records to Alan Henry, c/o Falklands Conservation office in Stanley.

ISLAND HOLIDAYS TOUR: November 1994

Island Holidays is once again offering to contribute part of the proceeds of one of their tours to Falklands Conservation.

The tour will leave 21 November 1994 and stay in the Islands for 13 days. It is hoped that Kate Thompson will be leading the tour which will look at all aspects of the Islands' wildlife. The group is limited to eight people. The fully inclusive cost is £3,250 plus travel insurance.

If you would like more details, please contact Libby Weir-Breen at Island Holidays, Drummond Street, Comrie, Perthshire PH6 2DS or telephone her on 0764 670107, stating that you heard about the tour through Falklands Conservation.

Letter to the Editor

Connor Nolan's interesting article on the introduced trout of the Falklands (WARRAH 4) referred briefly to one of the two native fish, the zebra trout, *Aplochiton zebra*, but ignored the "minnow", *Galaxias maculatus*.

While we can all appreciate the importance of the brown trout to recreation (and gastronomy!) in the Falklands, it seems strange that a conservation organisation should not be more concerned about these two native species. Connor refers to *Aplochiton* as "near-endangered". I would have thought its status was closer to fully endangered, such is the enthusiasm for introducing trout.

Although less visually attractive, the two native fish of the Falklands are just as worthy of conservation as any of the birds. The further spread of the trout could mean the extinction of these species. Just think what the reaction would be if we were dealing with Californian condors or giant pandas!

It is good to know that the fisheries department is studying one of the fish. I would like to see Falklands Conservation taking effective steps to raise awareness of the importance of both species and lobbying hard for protection of critical habitats.

Nigel Bonner

WARRAH

The Warrah, or Falkland Fox (*Canis antarcticus*), was the only endemic species of mammal on the Falklands. This bold and inquisitive animal was probably never very numerous but, with the introduction of sheep, farmers backed by a Government bounty were encouraged to hunt them and the last one was killed in 1876. We hope this publication will play a small part in preventing any other Falkland wildlife following the same path to extinction.

Warrah 5 has been produced with financial assistance from WWF U.K.

Falklands Conservation is a member of the International Union for the Conservation of Nature.

Falklands Conservation is a registered charity number 279347

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Member of
IUCN
The World Conservation Union





Rockhopper Penguin

the WARRAH

Newsletter of Falklands Conservation

October 1994 - Number 6 Editor Ann Brown

NEW NATURE RESERVES PURCHASED

Two groups of offshore islands have been purchased this October by Falklands Conservation. They provide our first opportunity to protect in perpetuity a superb microcosm of the wildlife of East Falkland

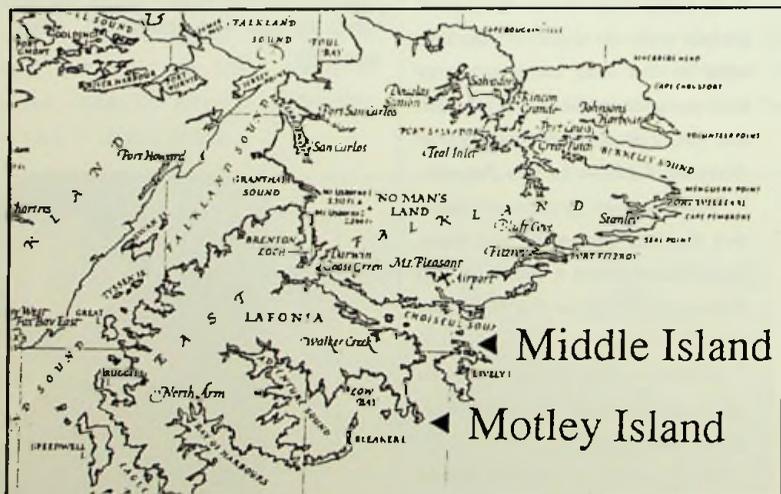
All the islands lie close to Lively Island, off the south east of East Falkland. Motley Island, with the Mot and Sal islets, comprise the first group. Motley Island is 330 hectares with areas of heathland, sand-dune, grassland, marsh and open ponds. The southern end is covered in tall dense tussac, riddled with seabird burrows. Birds known to breed here include Magellanic penguin, rock and imperial shags, Falklands skua, crested caracara, steamer duck, crested wren, tussac bird and yellow-billed teal. From sightings made in 1993 it is almost certain that this is a breeding site for sealions, a species in severe decline.

Our second group of islands includes Middle Island, Pyramid Island, Centre Island and a number of small unnamed islets. Middle Island (150 hectares) has patchy tussac grass cover, ponds and areas of the rare mountain blue grass. Sally Poncet, who visited the Island in July, reported 'many snipe, tussac birds, finches, a pair of grass wrens, a rock wren, burrowing petrels and Megallanic penguins all live here.'

Whilst the islands lack any large spectacular seabird colonies, they possess an exceptional diversity of wildlife and all appear to be rat free. Many of the smaller islets have dense widespread tussac cover. They are potentially particularly vulnerable because they contain numerous species sensitive to disturbance. Such islands are, therefore, disproportionately valuable. Alec Jaffray, who sold the islands to Falklands Conservation, is delighted that the new owner's role will be to safeguard its wildlife.

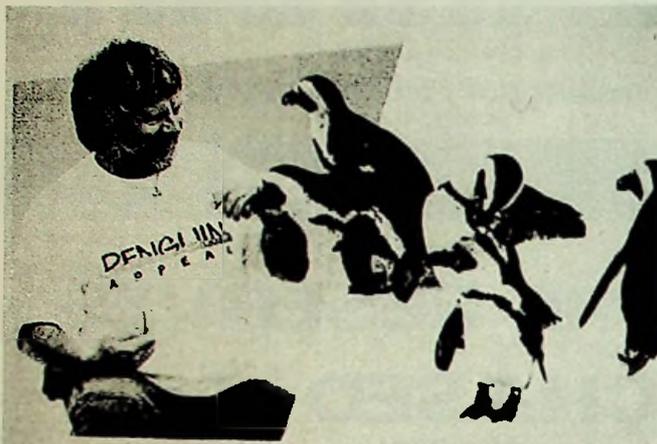
An important priority now is to conduct a full ecological survey of the islands. We expect this to prove of high botanical interest. Following on from the survey, management plans for the islands will be drawn up.

The purchase of these islands would not have been possible without the generous support of the Ernest Kleinwort Charitable Trust, Mr Stephen Spring and the World Parks Endowment Inc. We are very grateful to them for enabling Falklands Conservation to acquire these exceptional wildlife islands.



In This Issue: A Free Lunch? Black-browed Albatrosses and the Fin-fish Fisheries - Penguin Report: Food for Thought - Oil Update - Penguin Appeal News - Southern Ocean Whale Sanctuary

PENGUIN APPEAL UPDATE



Bill Oddie launches public appeal. London Zoo, 28th April 1994. Appeal sweatshirt available price £15. (extra large only) from UK office.



A total of £85,600 has been raised so far, just over 10% of our advertised target of £750,000. The Appeal will continue throughout next year, with further promotions and publicity drawing attention to the conservation importance of the South West Atlantic and its threatened penguin populations.

* In early August two thousand people took up the Zoo voucher offer in the Mail on Sunday to visit penguin collections all over the UK. Zoo visitors have so far donated £3,604 to the Appeal.

* Twenty two groups of Scottish Guides, Brownies and Rainbows have raised a total of £460 through 'Penguin Parties' and special events.

* Schools and youth groups have contributed in their own particular ways:

'At our summer fair we raised £56 to help the penguins. We raised this through doing various stalls such as guess the name of the penguin, pin the beak on the penguin, treasure island and the 10p drop.'

(Stockport, Cheshire)

'The event took place on 4th July on Redcar Beach. Luckily the weather stayed reasonably fine. All together 15 Beavers (aged 6 and 7) took part and a total of 595 sandcastles were built which in the end raised a total of £115.78 for your charity.' (Redcar, Cleveland)

* And many, many individuals have sent in donations, from pensioners, the rich, the not-so-rich and children:

'I am sending 60p because I want to help the penguins.' (Billy, aged 6)

'I organised a jumble sale. We made some drinks and cakes. Altogether we made £40.70, but half of the money is going to save the tiger.' (Jessica E, Hampshire)

'We stood outside at the top of the street selling stones. They are just garden stones that have been written on! We stood there for five days, sometimes cars would stop and give us some money or something - we had posters up too, and wore sandwich boards. We stood there all day long! It kept us very, very busy. We didn't give up and always kept in mind that we were helping penguins.' (Seven young supporters from Long Eaton, Nottinghamshire.)



HRH the Duke of York, in conversation with Sir David Attenborough, Appeal Patron, at the 'Wildlife of the Southern Oceans' Exhibition, London Ecology Centre on 3rd October.

OIL UPDATE

Draft Offshore Minerals legislation is due to be discussed by the Falklands Islands Government on 27th October. Licences are expected to be agreed for exploration next March. As a consequence of these fast moving developments, Falklands Conservation has been very active on this topic in recent months. We have discussed with the Governor and Chief Executive environmental provisions in the legislation governing licences for hydrocarbon exploration.

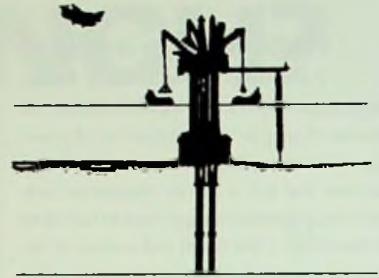
Falklands Conservation has stressed the importance of

- * ensuring that good provision was made for environmental impact assessment, and for independent evaluation of assessment;
- * that adequate baseline data are collected for coastal and marine systems, against which to assess future changes that may relate to hydrocarbon exploration and subsequent exploitation;

- * that appropriate monitoring programmes are established now in coastal and marine systems in order to detect any future changes;

- * that steps are taken to develop a system of environmentally sensitive areas around the Falklands. These would be sites of outstanding national and international conservation importance, within which any developments should be closely scrutinised and, where appropriate, subject to environmental impact assessment. Identification of these areas would need the collation of much relevant available information and would also require the collection of a considerable amount of new data from many parts of the Falklands, especially the marine ecosystem.

Falklands Conservation has also commented in a preliminary, detailed paper on the environmental issues it hopes will be taken on board in formulating draft legislation and providing for administrative matters. Now that



the draft Offshore Minerals Bill and licensing regulations have been published, Falklands Conservation is preparing an analysis of how well they meet its concerns.

It is clear that thoughtful attention has been given to enabling a structured process of environmental impact assessment and to providing for strict liability on the part of offshore operators for environmental damage and loss. The discussions between Falklands Conservation and Government authorities are expected to address how these powers are to be implemented in the best interests of environmental protection.

SOUTHERN OCEAN WHALE SANCTUARY

At their meeting in May 1994 the International Whaling Commission voted 23-1 in favour of establishing the Southern Ocean Whale Sanctuary. There are no prizes for guessing which national member voted against: Japan has already caught some 300 Minke whales for 'scientific' purposes.

The Southern Ocean Whale Sanctuary is intended to include all of the southern ocean south of latitude 40S and was first proposed by France in 1992. In spite of the Japanese attitude to the Sanctuary it must be seen as a considerable step forward in the protection not only of whales but of the whole Antarctic ecosystem.

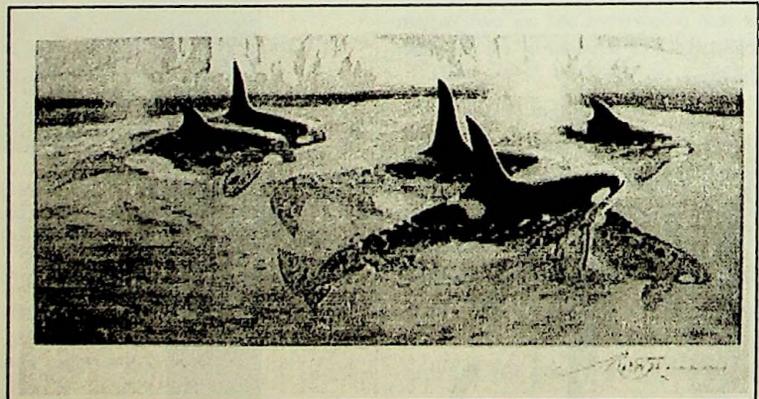
The Ecological Context

The southern ocean provides the main feeding grounds for sperm whales and all the baleen whales in the Southern Hemisphere except for the tropical Bryde's whales. Sperm, blue, fin, sei, southern right, hump-back and minke whales all migrate to the productive southern waters for the

summer feeding season. When they were relatively concentrated in Antarctic waters each summer, the whaling fleets from northern countries were able to hunt hundreds of thousands of whales, until there were too few left to be worth hunting except for the smallest species, the 10metre long minke. All the IWC's efforts to make Antarctic whaling sustainable ended in dismal failure.



This new move to ban whaling from the area must be applauded by all those with an interest in the survival of whales on the planet and we must do all we can to ensure that in due course the Japanese will come to their senses as well.



FALKLANDS CONSERVATION CHRISTMAS CARD In Aid of Penguin Appeal 'Along the Ice Front Orca Whales' from an oil painting by Keith Shackleton, generously donated to the Appeal. 10 for £4 (with envelopes), or £17.50 for 50 from the UK Office. Inside message reads 'With Best Wishes'. Numbered prints of the painting are also available price £25.

PENGUINS *by John Love*

This book is part of a World Wildlife series presented in a very enjoyable format. All species of penguin are described by full coverage of life cycle, life-style, habitat and physical features. The text is liberally interspersed with attractive illustrations (though I would have liked to have seen a few maps) and a series of fascinating anecdotes are highlighted in each chapter.

- * Kings seem obsessed by tucking anything into their brood pouches . . . they will adopt any alternative - egg-shaped stones, bottles and tins, and at Edinburgh Zoo even a stale bun!
- * Kearnton noted that one Cape penguin had no white feathers at all on the sides of its head. Roger Tory Peterson encountered a Megallanic penguin which was 'spotted like a leopard', another recently photographed in the Falklands was completely white except for its flippers and beak.
- * Cape penguins had been seen with patches of green algae or seaweeds up to 10mm long growing on their backs. Fjordland crested penguins have been recorded with centimetre long goose barnacles attached to their tails.

The book finishes with a chapter on conserving penguins and the words:

'No penguins can be deemed secure as long as the human race continues to mismanage this planet. We all need to be vigilant and responsive to environmental dangers if our well-loved penguins are not to go the way of the Great Auk that gave them their name.' This is not a serious scientific study, and indeed some of the detailed information is a little dated, but it will appeal to the many, many fans penguins seem to attract. By reading this book I am sure more people will be inspired to help protect this attractive bird, support active conservation programmes and our own Penguin Appeal. Buy it for someone for this Christmas!

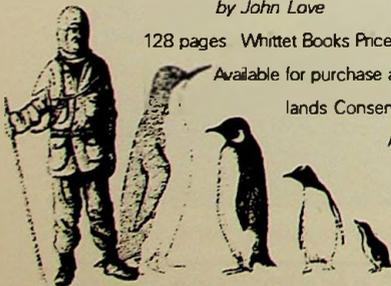
Ann Brown

Penguins

by John Love

128 pages Whittet Books Price £7.99

Available for purchase at Falklands Conservation AGM



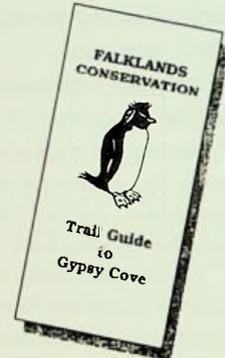
Relative Sizes:

From left - man, the largest fossil penguin, emperor, gentoo and little penguins.

FUNDRAISING

On 24th September, as part of their World Conservation Badge, the Falkland Islands Cub Scouts undertook a sponsored litter pick in aid of the Penguin Appeal. Their tremendous efforts resulted in ninety bags of litter being gathered in just two hours by twelve children, raising an impressive £473.

A raffle and radio auction took place on 6th October. A number of unusual prizes were donated including a load of manure, pony trek for two, and a trip to Seal Bay. The radio auction of a horse raised £85, total for the events reaching £458 for the Appeal.



Trail Guide to Gypsy Cove

Falklands Conservation has produced a trail guide to Gypsy Cove to provide visitors with information on the wildlife and landscape. **Conservation Officer**

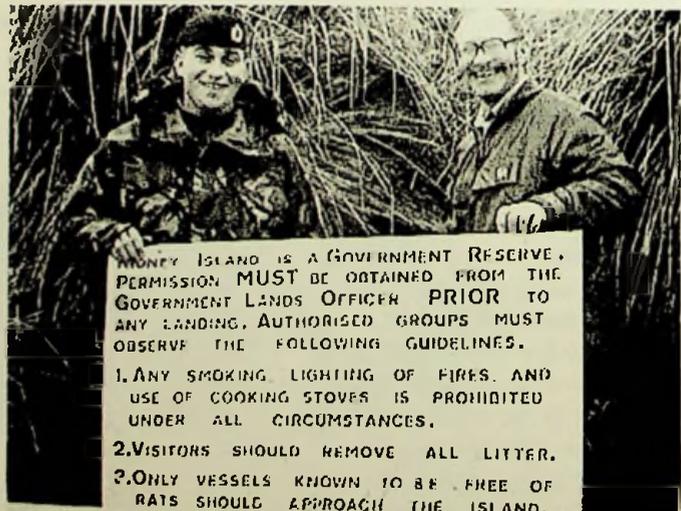
Due to illness, Michael Bingham, our Conservation Officer, has been unable to provide his regular report on conservation matters in the Islands. We wish him a speedy and full recovery, and hope he will be back at work during November.

Falklands Conservation are to begin raising funds for a recovery centre for birds which are affected by oil. This follows the recent rescue of a king penguin found at Surf Bay caked in oil by Hay Miller (our Falklands Secretary) and Maggie Barkman (of the FI Agricultural Department).

After phoning the Norfolk branch of the RSPCA for advice on how to deal with the bird, Hay and Maggie put a tube into his stomach to feed him liquids and a charcoal substitute to help absorb the oil. During the course of a weekend the penguin, which arrived 'very thin' with its chest protruding and backbone visible, consumed about 3 kilos of squid. Everything that Hay and Maggie did for the penguin improved his chances with most of the oil being removed and the king receiving a 'good feed'.

But afterwards, there was simply nowhere else the bird could be kept while it fully recovered and appeared fit enough to be released back into the wild. All they could do was release the penguin and keep an eye on him. On Sunday, after returning the King to Surf Bay, they were informed that a penguin had been seen in a minefield, but he was later nowhere to be found.

A secure enclosure is needed, preferably with some form of pond, to help save any future birds found in this distressing condition.



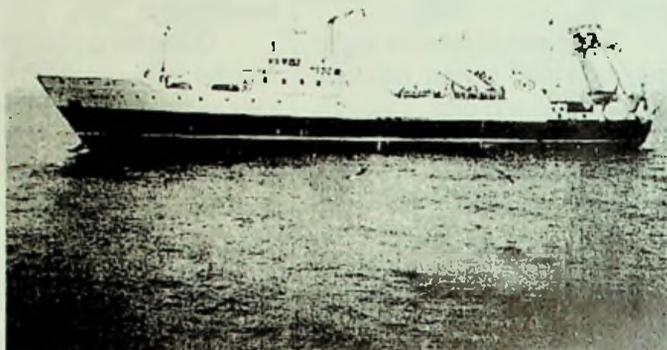
This sign, made for Falklands Conservation by the Royal Engineers, has been put up on Kidney Island. Brian Summers, Falklands Chairman, is seen here with one of the signmakers.

A FREE LUNCH?

A look at the relationship between fisheries and the black-browed albatross

by Dr Kate Thompson

For the generally somewhat conservative British palate, meal times on board a Spanish trawler can prove to be something of a novel experience. Menus feature items such as hakes' cheeks, pigs trotters and potatoes cooked in squid ink, all washed down with rough wine and sweet, but lethally strong, spirits. However, the black-browed albatrosses which breed in the Falklands have few reservations about the free meals which these trawlers provide for them in the form of fisheries waste. Flocks of over a thousand birds may attend a single vessel, with tens of albatrosses competing for each food item discharged from the ship. Fish and squid are also seized from the rising net during hauls. Giant petrels also follow trawlers, but the black-broweds predominate at the dining table.



Trawler

Photo: Kate Thompson

The use of commercial fisheries waste by scavenging seabirds is widespread and in some instances very substantial quantities of otherwise unavailable food may be made available to the birds in this manner. For instance, it has been estimated that around the British Isles, sufficient fisheries waste is produced each year to support over two million scavenging seabirds such as fulmers and gulls. However, while opportunistic scavengers may obtain easy pickings from fishing fleets, seabird populations can also be threatened by overfishing of traditional prey stocks. In the late 1980s, catastrophic breeding failures among seabird colonies in the Shetland Islands were widely attributed to over fishing of sandeel stocks.

At the other end of the Atlantic, the Seabird Monitoring Programme (FISMP) run by Falklands Conservation has been investigating the potential costs and benefits of fisheries to the Falklands' population of black-browed albatrosses. An earlier study of their interactions with the Loligo squid fishery indicated

that while significant quantities of waste were consumed by the albatrosses there was a danger of depletion of the Loligo stocks utilised by the birds (see FIF Newsletter No 19).

More recently, Mike Riddy braved the high seas for several weeks to find out how much food scavenging black-browed albatrosses obtain from the finfish fleet. Total catches of finfish within the Falklands Interim Conservation and Management Zone (FICZ) amount to around 100,000 tonnes per annum, of which roughly one third, mainly hakes, southern blue whiting, hoki and red cod, is taken by the Spanish fleet. The finfish fishery is concentrated to the west of the FICZ with peak catches in March and April, and from July to October. This study looked only at Spanish vessels as most other finfish trawlers operating in the FICZ process fisheries waste to fishmeal and so generate little food for seabirds.

Trawlers in the Spanish finfish fleet are typically large (average GRT is 1,400 tonnes), modern floating factories. Several hauls are made each day

during daylight hours and the catches are immediately processed to produce frozen blocks of fillets. The crews work long hours in often rough seas with irregular breaks for meals and sleep.

Two types of fisheries waste are generated during processing, discards and offal. Discards consist of undersized target species, primarily blue whiting and of non-commercial species such as rock cods and grenadiers. These unwanted fish are sorted from the catch during initial processing. Offal comprises the guts, heads, tails and other parts of target species which are produced in converting whole fish to fillets. Both discards and offal are discharged through outlets in the ships' sides.

Under the terms of the fishing licences issued to vessels operating within the FICZ, each ship is required to provide detailed daily catch reports to the Fisheries Department in Stanley. These figures are processed catch weights for catch target species and are used to calculate monthly and annual catch statistics. The purpose of Mike's work was to find out how much fisheries waste is produced by Spanish finfish trawlers per tonne of reported (ie. processed) catch and to assess the proportion of this waste consumed by black-browed albatrosses.

For discards, this involved assessing the numbers and average weight of each discard species generated during the processing of a number of individual hauls. This allowed for the total weight of the processed catch for the relevant haul, as recorded in the ship's log. Experimental discarding of representative samples of these waste fish was used to estimate the proportion of each species actually consumed by black-browed albatrosses. The results

of this part of the study indicated that on average, discards weighing the equivalent of 22% of total processed catch weight were consumed, although this figure varied considerably between hauls.

Quantifying the production of offal was much more complex as the proportionate weight of offal generated during processing varied both with fish species and size so that the amount of offal produced per fish varied from about 20% to 80% of processed fish weight. As with discards, experimental discarding of offal was used to determine the proportion of various types of offal consumed by scavenging albatrosses. These experiments indicated that almost all guts and over three

quarters of tails and small heads were readily scavenged by single birds. However, large fish heads could not be taken by single albatrosses and were either lost or pecked over by flocks of birds. However, despite these complexities, it proved possible to obtain working estimates of the proportionate weights of offal consumed by albatrosses per tonne of processed catch of each species and size class of target fish.

Applying the results of this study to the fisheries statistics held by the Fisheries Department enabled estimates to be made of the total weights of discards and offal obtained per annum by black-browed albatrosses from the Spanish finfish fleet. These calculations indicate a



Black-browed albatross and chick

Photo: Kate Thompson



Mollies round a trawl net

Photo: Kate Thompson

total consumption of around 8,000 tonnes per annum of which one third is discards and the rest offal.

How does this relate to the total food requirements of the Falklands' black-browed albatross population? On the basis of available equations for the calculation of the daily energy requirements of various types of bird, it can be estimated that the annual food energy intake required by the estimated 740,000 breeding albatrosses in the Falklands is of the order of 10×10^{11} kilo joules. By contrast, the calculated energy content of the 8,000 tonnes of waste obtained from finfish trawlers amounts to less than 5×10^{10} kilo joules, just 5% of the estimated total annual energy requirements of the breeding adult population. If other sectors of the population, such as chicks and immature birds, are also considered, the proportion of food requirements potentially supplied by finfish fisheries waste is even lower.

Unfortunately, no detailed information is available on the 'natural' diet of black-browed albatrosses in the Falklands prior to the large scale development of fisheries in the south-west Atlantic. However, the diet is known to have included squid, lobster krill and fish. If it is assumed that 30% of the energy content of the diet was derived from finfish, then the breeding adult population would require 66,000 tonnes of finfish per annum. Commercial finfish catches currently amount to almost one and a half times this.

In conclusion, the results of both this study and the earlier Loligo work suggest that commercial fisheries in Falklands waters are substantially greater predators of finfish and squid stock than are black-browed albatrosses. Thus, any short-term benefits gained by these albatrosses from scavenging on fisheries waste, which provides less than 10% of their food needs, may in the long term be more than offset by potential depletion of their natural prey stocks.

Further details of the study reported here are given in:

Thompson, K.R. and Riddy, M.D. (1995). Utilisation of Offal and Discards from 'finfish' trawlers around the Falkland Islands by the Black-browed Albatross *Diomedea melanophris*. Ibis, 137 (2) In press

Reprints of this paper may be obtained by sending a stamped addressed envelope to either the UK or FI office of Falklands Conservation

PENGUIN REPORT:

FOOD FOR THOUGHT

By Michael Bingham, Conservation Officer

The Falkland Islands hold a rich variety of wildlife. Many species are either unique to the Islands or found there in regionally or globally significant numbers. During recent years a number of potential new threats have emerged, such as fisheries, tourism and oil exploration. The Falkland Islands Seabird Monitoring Programme (FISMP) was established in 1986 by Falklands Conservation to monitor these threats. The aim was to document changes in seabird populations and, where possible, identify the causes so that early warning could be given of any harmful effects. We have now obtained sufficient data to draw preliminary conclusions for the four main species of penguin found breeding within the Falklands archipelago.

KING PENGUIN (*Aptenodytes patagonicus*)

The Falkland Islands' population of king penguin is largely located at Volunteer Point on East Falkland, although very small numbers can be found breeding in gentoo colonies at a few

other locations. The total population is steadily increasing, probably through continuing immigration from the large and rapidly increasing population at South Georgia. The Falklands population is very small, being only 1% of the world population.

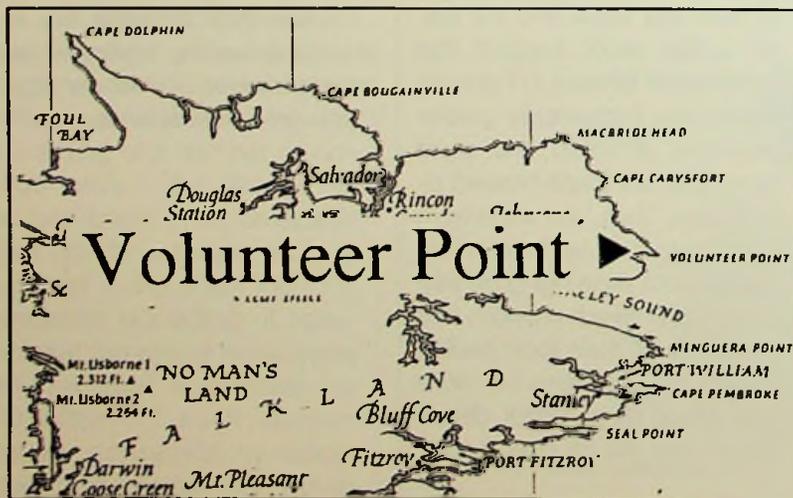
ROCKHOPPER PENGUIN (*Eudyptes chrysocome*)

The rockhopper is an extremely numerous bird in the Falklands. It breeds in colonies on rocky cliffs at some 35 sites, mostly in the west of the archipelago. The Falklands population is the largest concentration of rockhoppers in the world, but is declining, and has probably been doing so for at least 60 years.

This decline became particularly noticeable during the catastrophic season of 1985/86, when mass starvation of adult birds was reported from many colonies. The worst affected colonies in the north and west lost over half their adults as a result. The present low population of rockhoppers has been attributed to this event, but

records show that dramatic declines had already occurred prior to 1985/86. The population on Sea Lion Island had dropped from 150,000 pairs in 1932/33 to just 1,000 pairs by 1981/82, and the population of Kidney Island which numbered over 12,000 pairs in 1914/15 has declined to just 3,000 pairs by 1960/61. This suggests a much more serious problem which may still be persisting today. Comparable declines have also been reported for the same species at several sub-antarctic islands in the New Zealand area. The causes are not understood but may reflect long term changes in sub-antarctic marine systems.

Research, particularly by Ian Keymer, into the 1985/86 event showed that the adults starved to death during their annual moult. This was presumably due to an inability to find sufficient food to build up body-fat reserves prior to moulting, and was an unusually extreme indication of a severe food shortage. Another indicator of food shortage is low chick survival, and during 1985/86 the worst affected colonies reared virtually no chicks. Low chick survival was also observed throughout the period from 1986/87 to 1992/93, and only during 1993/94 did study sites show improved chick rearing success, averaging 60-85% productivity (chicks per pair). The period since 1986/87 saw many fewer immature birds returning to moult than would normally have been expected in a healthy population.



It is possible that a combination of a lengthy period of low productivity and reduced juvenile survival, coupled with occasional years of high adult mortality, could account for the major population decline. Reduced food availability is the most plausible explanation for these events.

MEGALLANIC PENGUIN **(*Spheniscus magellanicus*)**

The Magellanic penguin is a very numerous bird in the Falklands and breeds in a wide range of habitats, from tussac grass to crevices in sea cliffs. Although the Falklands population is of international importance, accurate monitoring of its population status has been complicated by its widespread, low-density distribution, and its habit of nesting in burrows. As a result few accurate data on population size exist for the Falklands.

Studies undertaken by Falklands Conservation since 1990 suggest that a steady population decline is occurring, with the 1994 population being only two thirds of that found in 1990/91. This represents a decline of around 10% per year which would have catastrophic consequences if it continues. This decline could be largely a result of the current failure of adults to rear sufficient young. During the 1990/91, 1991/92 and 1992/93 seasons, colonies were producing less than half a chick per pair (42% productivity) compared to 1993/94 when one chick per pair was reared (100% productivity).

Living as they do in burrows, the chicks are well protected against both predation and the weather. Occasional flooding of burrows does occur, but did not take place during the study. The most likely explanation of the low chick survival rate is that the adults

are unable to find sufficient food during the crucial chick-rearing stage.

GENTOO PENGUIN

The gentoo is a fairly numerous bird with small colonies scattered throughout the Falklands on low-lying coasts. These colonies are of international importance, with approximately one third of the world population. Population monitoring shows a decline around 3% per year, but this is a fairly recent trend, with numbers apparently remaining stable during the 50 years prior to 1987/88.

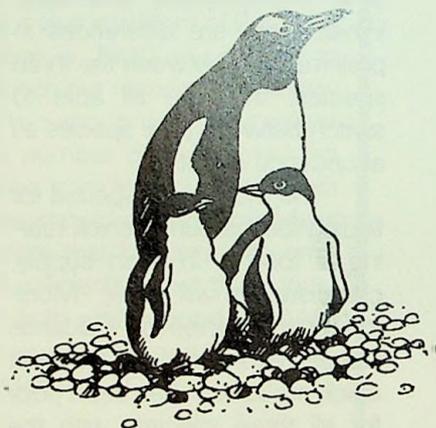
A count of East Falkland undertaken during 1987/88 by Falklands Conservation revealed a breeding population of 18,000 pairs, a figure which agrees with a similar survey conducted by Bennet during 1932/33. However by 1993/94 this population had declined to 15,000 pairs, a reduction by 16% over six years. A more detailed analysis of colony counts indicates a connection between population trends and location, with the southern colonies declining at some 7% per year (42% since 1987/88).

Analysis of diet showed consistent differences in prey type between the southern colonies (which are declining sharply) and other colonies. Cephalopods consistently make up a very small proportion of the diet in the southern colonies (3-7%) but form a much larger proportion (13-44%) of the diet in northern colonies. In the southern colonies adults were returning with less food for their offspring during the chick rearing stage.

The decline in gentoos appears to have no connection with any form of land-based human activity such as egg collecting or tourism. Its gradual nature suggests that some factor has altered within the last 5

to 10 years tilting the natural balance against the gentoo and that the decline is a result of change to the oceanic ecosystem. It is difficult to think of any change in the terrestrial environment (eg. effects of ozone depletion, bad weather) which would differentially effect the southern colonies.

The most likely change is the availability of food brought about by changes in ocean currents or by fishing activities which began just prior to the observed decline. The dietary differences between northern and southern colonies and the



larger meals of 1993/94, the year with higher chick productivity, all suggest that food supply is influencing Gentoo productivity.

CONCLUSIONS

It is a matter of serious concern that populations of the main species of penguin breeding in the Falklands are all declining. The nature of the decline is different for each species: the rockhopper has undergone a very severe decline over a period of at least 50 years, whilst the decline of the gentoo is recent. The underlying causes of the decline may well be linked, with difference in trends being the result of variations in life-cycle, habitat and adaptability between the species.

There is no evidence that disease, predation or terrestrial climatic factors are responsible for the observed decline or low chick productivity, and such factors would not explain the north/south split in gentoo population trends, or the fact that successful breeding seasons coincide amongst three species with such differing nesting habits and locations.

Magellanic penguin nest in burrows, whilst rockhoppers and gentoo nest in colonies above ground, on sea cliffs and low lying coasts respectively. They all exploit similar oceanic food (krill, cephalopods and fish). Whilst there are differences in preferred diet between the three species, they are all able to switch between prey species as abundance dictates.

The most critical period for finding food is during chick rearing. If food is in short supply, chick survival will suffer. Monitoring of colonies by Falklands Conservation has shown that chick production has been poor for all three species, with the exception of 1993/94 when all species had a successful sea-

son (rockhoppers 60-85%: Magellanic 64-129%: gentoo 41-126% chicks per pair). This improvement in chick production was almost certainly due to greater food availability, and this is supported by increased food catches per adult being recorded during chick rearing in 1993-94.

The information we have at present is broadly consistent with a general reduction in the average levels of food available to penguins, with the most pelagic species (rockhoppers) apparently affected more seriously and over a longer period than inshore feeding species (gentoo). It is unlikely that it will be possible to reconstruct past events but the Seabird Monitoring Programme will follow future changes very closely and attempt to match these to changes in the amount and type of food available to penguins.

This work re-emphasizes that penguins can be a useful indicator of the health of our southern oceans; very clearly the magnitude of their current declines, and the way these declines have transcended geographic and taxonomical boundaries, suggests that all is not well.

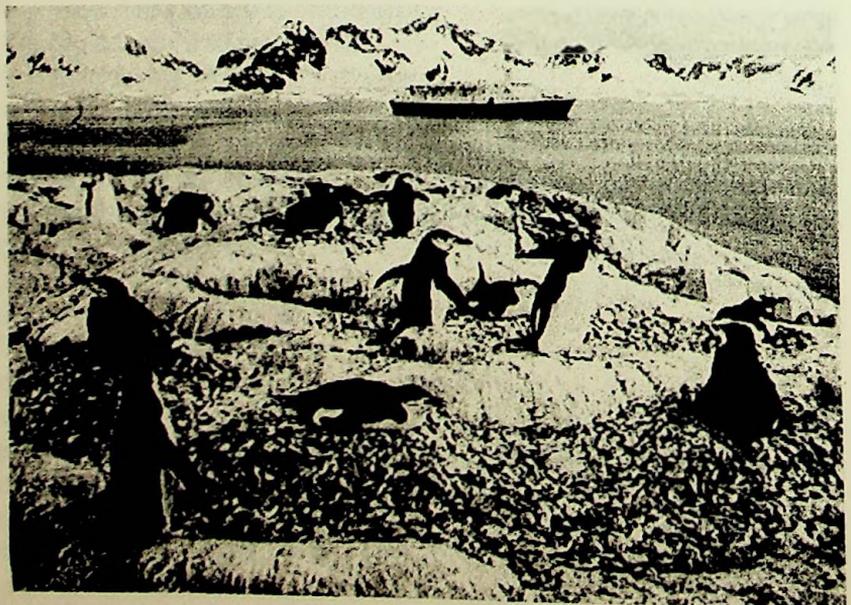


PHOTO: An early Linblad tour visiting South Georgia.

OBITUARIES

Nigel Bonner

It is with great sadness that we record the death of Nigel Bonner, a long-term member and long-serving trustee of Falklands Conservation. Nigel's connections with the Falklands go back to the 1950s when he was based at South Georgia as Sealing Inspector. His links with the Falklands were renewed when he joined the British Antarctic Survey as Head of Life Sciences in the early 1970s and he became a frequent visitor to Stanley. After he retired as Deputy Director of BAS a few years ago, he took on even more active and practical roles, being in charge of the project to create a whaling museum at Grytviken. This museum is a very fitting and tangible memorial to his interests in, and contribution to, South Georgia; his role as one of the architects of the new management plan currently under development for South Georgia may come to have even greater long-term significance for the conservation of the Islands' wildlife, landscape and historic sites. Although Nigel's main work was at South Georgia, he had many friends and deep interests in the Falklands; his wide knowledge and wise advice on all matters pertaining to conservation in the Islands will be greatly missed.

Sir Kenneth Kleinwort, Bt

The sudden death of Sir Kenneth Kleinwort on 8th July was a blow to the cause of international wildlife conservation, and equally to Falklands Conservation. Only a month before, Sir Kenneth had agreed to his name being put to the AGM this November for appointment as our new President. He was playing an active and uniquely important role as a patron of the Penguin Appeal, using his many high level contacts to further our cause. Through his own personal interest, he was able to secure for us the funding for purchase of the Motley Island group, via the Ernest Kleinwort Charitable Trust.

Sir Kenneth was on the governing body of the World Wide Fund for Nature for many years. There is no doubt that his great interest in wildlife combined with the considerable charitable funds at his disposal lead directly to improving the odds in the battle for survival of many endangered species around the globe. We were most fortunate that he was keenly interested in the Falklands, which he visited on one of the very first Linblad tours, and never forgot its wonderful wildlife. We have indeed lost a great champion of our cause. The Trustees of Falklands Conservation will be considering a suitable memorial to Sir Kenneth at their next meeting.

Lord Shackleton

Lord Shackleton, a Vice President of Falklands Conservation, distinguished statesman and great friend of the Islands, died aged 83 on September 22nd. His father was Sir Ernest Shackleton, a national hero and Antarctic explorer. This was the link to this part of the world which saw him appointed to head an investigation into the economic future of the Falklands in 1976, and to update the report it produced after the war. His interest and concern was in both developing and protecting the Islands and indeed the wider Antarctic region. He was appointed a vice president of Falklands Conservation in 1980 and helped to publicly launch our reconstituted charity in 1992. As a very active man involved in a huge number of institutions and organisations, from lighthouses to Youth Hostels, we should consider ourselves very fortunate that he found the time and cared sufficiently about the Islands' wildlife to help and support us. Men of his stature are rare and his loss will be keenly felt.

Lars-Eric Linblad

Eric Lars-Linblad, intrepid explorer and pioneer of expedition tourism died in July. It was from his ship the "Linblad Explorer" that Peter Scott visited the Falklands in 1979 and founded Falklands Conservation. Millions of people were able to discover the farthest corners of the world as a result of his initiatives. He believed that the travel industry should play a leading role in conserving the natural world. He was a member of the US Board of the World Wildlife Fund and instrumental in the establishment of the International Association of Antarctica Tour Operators. In his memory let us hope that his principles of environmentally responsible tourism for the region will not be forgotten.

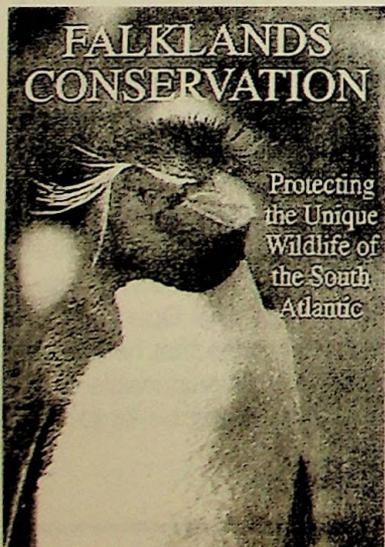
See photo opposite

HOLIDAYS WITH MAJOR SPAFFORD

Major Ronnie Spafford, a trustee of Falklands Conservation, is leading a number of holidays in the Falklands during 1995: from 30th January to 12th February for UK visitors and from 17th February to 3rd March for US visitors. Trips will be made to Stanley, Sealion Islands, Pebble island, Fox Bay, Saunders Islands, Darwin and San Carlos. He is also leading a walking holiday in October 1995, likely to be centred on Darwin, San Carlos and possibly Hill Cove which could be of great interest to those who like wild flowers as well as bird life. If you would like more information please contact him at 29 Queens Road, Weston-Super-Mare, BS23 2LH.

MORE MEMBERS NEEDED

Falklands Conservation needs the support of all those who care about the natural heritage of the Falklands Islands. If you are not already a member, please assist our vital work by joining now. A new membership leaflet has recently been produced (see below). If you are able to recruit more members, or know of a suitable outlet for promoting our membership, please contact the UK office who can provide you with an appropriate supply. Why not give a subscription for Christmas?



PUBLICATIONS FOR SALE

The following publications are available by post from Falklands Conservation UK Office. Prices are inclusive of packing and surface post. Payment may be remitted in \$US at a rate of \$2 per £1. Please make cheques payable to "Falklands Conservation".

Booklets:

Wildflowers of the Falkland Islands*	£4 (Overseas £4.50)
Those were the Days*	£4 (Overseas £4.50)
Corrals and Gauchos*	£4 (Overseas £4.50)

Reports:

Tussac Grass in the Falklands	£7.50 (Overseas £8.50)
An Assessment of the Potential for Competition between Seabirds and Fisheries in the Falklands	£6.00 (Overseas £7.00)

Newsletters:

<i>Falkland Islands Foundation</i> (5-10)	80p (Overseas £1.00)
<i>Warrah</i> (1-5)	80p (Overseas £1.00)

* May be purchased from our Falklands office, a number of retail outlets in Stanley and at MPA for £3.50.



The Falkland Islands Agency

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WARRAH

The Warrah, or Falkland Fox (*Canis antarcticus*), was the only endemic species of mammal on the Falklands. This bold and inquisitive animal was probably never very numerous but, with the introduction of sheep, farmers backed by a Government bounty were encouraged to hunt them and the last one was killed in 1876. We hope this publication will play a small part in preventing any other Falkland wildlife following the same path to extinction.

The Warrah was designed and typeset by
Password Publishing & Design
Development & Environment Centre
38-40 Exchange Street
Norwich NR2 1AX
Tel/Fax: (01603) 616292



Falklands Conservation is a member of the International Union for the Conservation of Nature



Falklands Conservation is a registered charity number 279347

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Printed on Recycled Paper



Rockhopper Penguin

the **WARRAH**

Newsletter of Falklands Conservation

May 1995 - Number 7

Editor Ann Brown

SEA LION SURVEY

This February a census of the Falklands sea lion breeding population was completed by Falklands Conservation. Dave Thompson, of the Sea Mammal Research Unit, reports here on the results.

Dramatic Decline since 1930s

In the 1930s the Falkland Islands held a large proportion of the world population of the southern sea lion (*Otaria flavescens*). Over 80,000 pups were born in the Falklands each year, equivalent to a total population of 380,000 animals. Unfortunately, the population has declined dramatically since then. In 1965 an air survey of the entire archipelago produced an estimate of only 6,000 pups. Incidental observations and a partial aerial survey in 1990 indicated that the decline had continued and that very few sea lions remained in the Falklands Islands.

A Census was Essential

The population decline, coupled with potential new threats from the fishing, oil and tourist industries, highlighted the need for a conservation strategy for sea lions in the Falklands. An accurate estimate of the size and distribution of the population is essential for developing conservation strategies and for testing their effectiveness.

Need to Visit all Breeding Sites

The aim was simply to obtain a complete count of the number of pups born for comparison with the 1930s counts. To accomplish this we needed to visit all the breeding sites in the Islands. In planning the survey we relied heavily on local knowledge, contacting as many land owners as possible asking for details of sea lion sightings during the breeding season. We combined their observations with records from the boat surveys in the 1930s and from aerial surveys in 1965 and 1990 to produce a survey route.

Over Five Thousand Sea Lions

Between 17th January and 15th February 1995, we sailed round the Islands on board the MV Penelope, visiting all the locations identified as possible breeding sites. We visited 191 separate island and mainland sites, and found 103 groups of sea lions, 61 of which were breeding groups with pups present. In total we counted 5,574 sea lions, comprising 2,034 pups, 2,144 adult females, 649 adult males and 747 immatures and non-breeding adults.



Sea Lion Colony, Falkland Islands.

Photo: Ian Strange

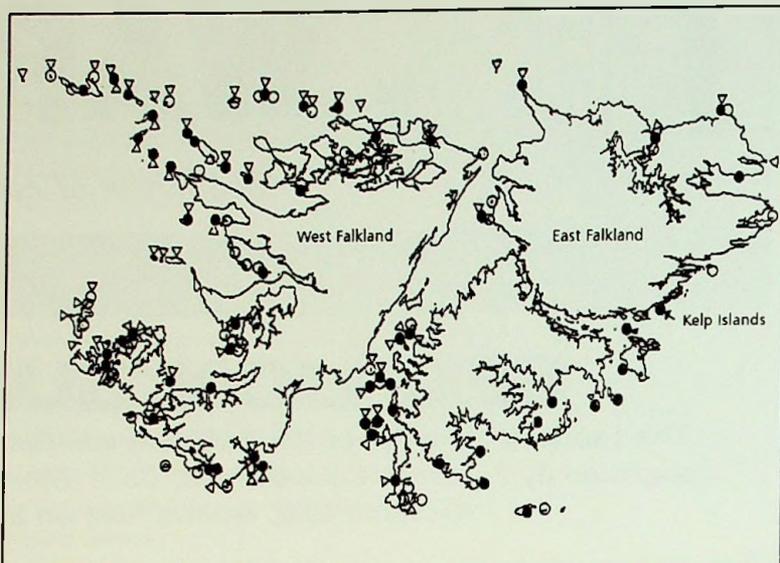
***In This Issue:** How Important are the Falklands for Birds? - Report on 1994/95 Seabird Monitoring Programme - Motley Island Expedition Report - Hadassa Bay Beach Clean-Up - Darwin in the Falklands*

Largest Colony has 138 Pups

We found breeding groups on all sections of the coast, with the lowest density on the north and east coasts of East Falkland (see map). The distribution of breeding sites in 1995 (filled circles) was similar to the distribution in the 1930s (triangles). Open circles represent non-breeding groups of seal lions. However, the largest single colony with 138 pups was on the Kelp Islands off the south coast of East Falkland, in an area not surveyed in the 1930s.

Rates of Population Decline

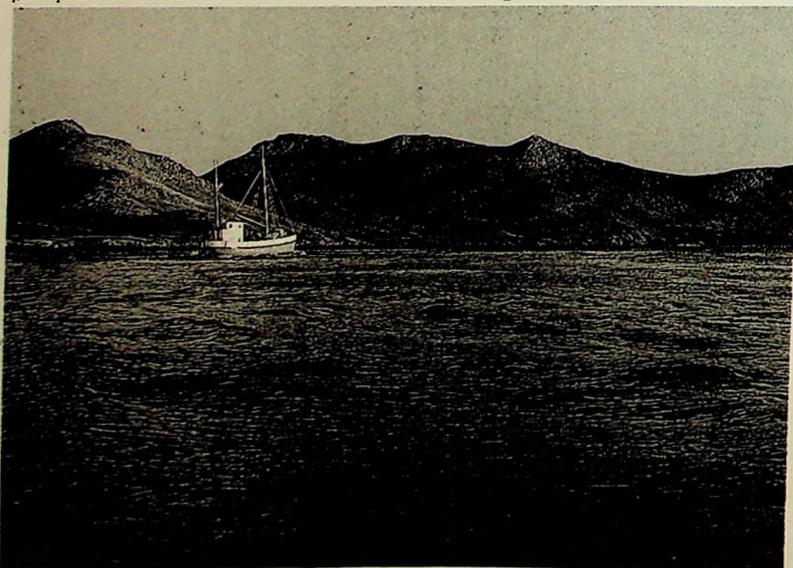
The 1995 count represents only 2.5% of the count obtained in the 1930s. We know that the 1930s count was an underestimate (most of the south coast of East Falkland was missed out) so the sea lion population must have declined by approximately 98% since 1937. The air survey estimate from 1965 provides a check on the rate of decline. Pup production appears to have declined by 93% between 1937 and 1965, an average decrease of over 9% per annum. The current pup production of around 2,000 represents a further decrease of 64% since 1965. The partial air survey in 1990 covered about a third of the 1995 breeding sites. At these 24 sites the pup production has increased by around 8% per year from 1990 to 1995.



Distribution of Sea Lion colonies in the Falklands

Population is Alarmingly Low

So we can conclude that the sea lion population crashed sometime between 1937 and the mid 1960s. The rate of decline slowed between 1965 and 1990, with the population possibly reaching very low levels during this period. Since at least 1990 there may have been some sign of a recovery. However, at less than 2.5% of its original size, the population is still alarmingly low. ◆



MV Penelope on 1995 Sea Lion Survey work

Photo: Dave Thompson

The survey team comprised Dave Thompson, Colin Hunter and Callan Duck from the Sea Mammal Research Unit, and Mike Riddy. This census completes the field work for Falklands Conservation Sea Lion Project. A full report on the Project will be published in due course. Falklands Conservation are very grateful for the generous financial support for this project from the Falkland Islands Development Corporation and the Worldwide Fund for Nature, and to Mike Clarke for the charter of MV Penelope.

PENGUIN APPEAL UPDATE

Appeal Total Reaches £140,500

We are very grateful to everyone who has contributed from a very wide range of supporters, many of whom have made impressive efforts for the Appeal. Particular thanks are due to the following for their donations in the last few months:

£1,000 raised by members of the Guide Association in Scotland

£10,000 from the H B Allen Charitable Trust

£250 from the Carpenters Company Charitable Trust

£362 from Sveriges Ornitologiska Forening (Sweden)

£300 raised by Pencyrnor Wildlife Park at the Welsh National Eisteddfod

£20 from Brigg Ladies Luncheon Club

£50 from the 1st Battalion of the Grenadier Guards

£22.72 from Gabrielle Christopher and friends who "did a three legged" for a day
£77.50 raised by the 1st Watchet Brownies at a Coffee Evening

£56.47 from Perry Hall Primary School.

£62.86 from Stroud High School

£50.20 from Will Wagstaff for a slideshow on Falklands Wildlife on the Isles of Scilly and £50 from Ben Notley for a talk on 'Penguins in a Minefield' to the Perthshire Society of Natural Science.

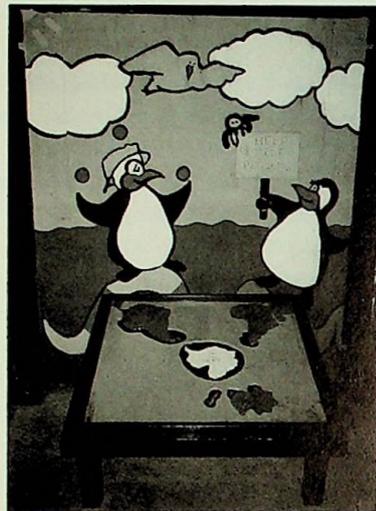
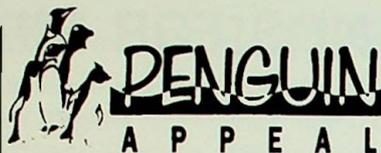


Penguin Biscuits Promotion

Throughout last summer Penguin Appeal featured on Penguin Biscuit bars along with a special offer of four penguin beakers and a poster. Every set of beakers sold benefited the Appeal and as a result a total of £25,000 has been donated. We hope to offer the remaining unsold beakers for sale to bring in further income to the Appeal during the course of 1995.

Support from Zoos

Donations from visitors to Zoos with penguin collections continue to come in, most recently from Edinburgh, Whipsnade, and Banham (Norfolk). Falklands Conservation is working closely with the Federation of Zoological Gardens of Great Britain and Ireland to develop a 'partners in conservation' relationship for the benefit of penguins in the wild. Eleven Zoos are now members of Falklands Conservation. A second special ad-



This very special table which collects coin donations at Drusillas Zoo (Sussex) has raised over £1,300 for Penguin Appeal Photo: Chris Page

mission promotion with Zoos in the Federation is to be run from 28th May to 10th June with the Sunday Mirror. This will offer free children's admission to some twenty penguin collections throughout the UK.



Watch out for the large and very distinctive penguin collection boxes which will be at a number of selected Zoos soon. Photo: Chris Page.

Penguin Appeal Goes to USA

Falklands Conservation is now registered with the newly formed CAF America, an offshoot of the UK Charities Aid Foundation. This will enable our Appeal to receive donations with US tax relief from US charitable foundations and citizens. If any of our US members would like to receive more information about this scheme, or know of appropriate bodies which

may be interested in supporting our Appeal, please contact Christopher Page, our Appeals Director, Penguin Appeal, PO Box 2040, London W12 0ZJ

Paintings for Auction

Two paintings donated to Penguin Appeal are to be auctioned by Christies on 27th July in London at a special sale of wildlife paintings. The pictures are Keith Shackleton's 'Along the Ice Front, Orca Whales' and Robert Bateman's 'King Penguin'. Numbered prints of the Orca painting are available from Falklands Conservation price £25. Stocks of a greeting card featuring the same picture are also available at £4 for 10 or £17.50 for 50. Inside message reads 'With Best Wishes'.

Radio Programme Features Falklands Wildlife

On 27th January the BBC Natural History Programme featured an item on Falklands wildlife and the concerns raised by possible hydrocarbon exploitation. A carefully balanced report included interviews with Dr John Croxall (UK Chairman, Falklands Conservation), Peter Prince (Falklands Conservation Trustee and British Antarctic Survey biologist), Falklands naturalist Ian Strange (looking out of his New Island kitchen window) and Andrew Gurr (Falkland Islands Chief Executive). Mr Gurr gave a reassurance that 'We are the guardians of this environment and we intend to protect it. We are not desperate for oil and will proceed carefully and properly'.

John Croxall however made the point that very little is known about the current status of the wildlife. We have only a few years to acquire much of the primary data on most of the major groups of wildlife with a focus on the marine and coastal environments. Peter Prince commented that some seabirds live forty years or more and therefore it requires a great deal of time and effort to monitor population trends. Ian Strange, remarking on the remains of the whaling industry visible from his window, hoped that the oil industry would leave behind it a better place to live in - but felt that there was a big question mark about that.

The programme generated a large number of enquiries from listeners wishing to support Penguin Appeal ♦

HOW IMPORTANT ARE THE FALKLAND ISLANDS FOR BIRDS?

Alison Stattersfield of BirdLife International gives an assessment of how the Falklands rate in world terms as an area of importance for birds.

A Low Rating?

A recent global review of the distribution of the world's threatened birds by BirdLife International ranks the Falkland Islands (on the basis of its one Vulnerable species, Cobb's Wren) equal 188th (= bottom) in a league table of 211 political units by threatened species. One might conclude therefore that the birds of the Falklands are in pretty good shape and that, on an international scale, the area is not an avian conservation priority. However, this is by no means the full story.

Five Species are Near-threatened

The review by BirdLife uses, for the first time, new (more objective, numerical) criteria to assess threatened status based primarily on population and range sizes, and rates of decline. Cobb's Wren qualifies on the basis of its tiny range of less than 100km². A further five Falkland Island birds, three breeders (Ruddy-headed Goose, Striated Caracara, Canary-winged or Black-throated Finch) and two vagrants (Hudsonian Godwit and Fuegian or Cordilleran Snipe - a possible breeder) just fail to meet the thresholds and are thus classified as Near-threatened. It is obviously important to consider these species in assessing the conservation importance of the Falklands, especially as the Islands are strongholds for the goose, caracara and finch, which are all now very scarce in southern South America.



The Striated Caracara or Johnny Rook is classified as near-threatened.

An Endemic Bird Area

Another study by BirdLife identifies the Falkland Islands as one of only 220 global Endemic Bird Areas (EBAs), on the basis of its two endemic birds, Cobb's Wren and Falklands Steamerduck. This analysis uses restricted-range species (clas-

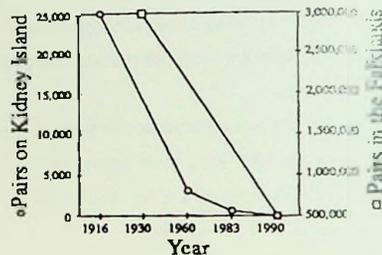
sified as those with a range of less than 50,000 km²) as its starting point and, by overlaying their distributions, seeks to delimit areas of overlap. In addition to its two endemics, the goose, caracara, finch and Tussac-bird all qualify as Falkland birds with restricted ranges (being shared with the EBA which encompasses Tierra del Fuego). Given that areas which are rich in avian endemism are also usually important for endemics of other wildlife groups (eg at least twelve higher plants on the Falkland Islands) and that the association between endemism and threat is very high (75% of all threatened birds have restricted ranges), EBAs are being promoted (eg through the Convention of Biological Diversity) as priorities for the conservation of biodiversity.

Sites may Qualify as Important Bird Areas

Work at BirdLife is currently focused on the selection of Important Bird Areas (IBAs). These are a network of sites which are critical for the long-term viability of bird populations across the ranges of those species for which a site-based conservation approach is appropriate. IBAs are chosen according to standardised criteria including sites which hold significant numbers of threatened species, sites which, as a set, hold all the restricted-range species of an EBA, and sites which hold more than 1% of the global population of colonial species such as seabirds. IBAs have yet to be chosen for the Falkland Islands, but according to the last crite-

non, it is likely that they will be selected for Gentoos Penguin, Rockhopper Penguin, Black-browed Albatross, Southern Giant Petrel and Thin-billed Prion, and perhaps also for Rock Shag, Falkland Skua and Dolphin Gull, although these latter three species tend to breed in small, dispersed colonies.

Rockhopper Penguin declines in the Falkland Islands



Falklands are Internationally Important

Thus, with one globally threatened bird species, an additional five which are classified as Near-threatened, two more which have restricted ranges and globally important breeding populations of eight species of seabird, conservation of Falkland Island birds should be an international as well as national and regional priority. ♦

Alison Stattersfield is a Research Officer at BirdLife International, which is a global conservation federation with a worldwide network of Partner Organisations, representatives and committed individuals. BirdLife seeks to conserve all bird species on earth and their habitats and, through this, it works for the world's biological diversity.

BirdLife
INTERNATIONAL



The Falklands are likely to be classed as an Important Bird Area for the Rockhopper Penguin. Photo: Ian Strange

SEABIRD SURVEYS: 1994-95 REPORT

The seabird monitoring season for 1994-95 has now finished. This article is based on the Falkland Islands Seabird Monitoring Programme Summary Report for 1995 by Michael Bingham, Conservation Officer.

Records show a successful season for chick production with productivity rates higher than averages previously recorded. This year monitoring of king and rock shags was included for the first time, in addition to the continuing survey work for the black-browed albatross and the four main breeding penguins (gentoo, magellanic, rockhopper and king).

Penguin Trends

Records show for the second season running slightly improved chick production for rockhopper penguins. At Fanning Head chicks fledged per breeding pair increased from 85% to 87% and at West Point Island from 60% to 78%. However, fewer immature birds are returning to moult. That the large decline in the population of this penguin (the Falklands still holds the greatest concentration in the world) is showing little sign of major recovery is a matter of serious concern.

The magellanic penguin is monitored at seven study plots on four widely distributed locations. The 1994/95 season saw a 5% increase in population on 1993/94 to a level of 70% of its 1990/91 numbers.

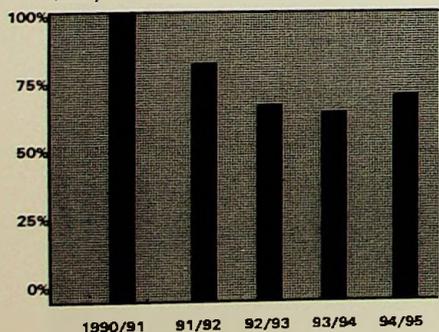


DIAGRAM: Magellanic Population Trends 1990/91-1994/95

Analysis of the productivity for the gentoo penguin shows that the 1993/94 and 1994/95 seasons have been more successful for chick production than any previous season since recording began in 1990/91. The declining southern colonies however continue to show smaller catches of total food being brought back for chicks, with a much lower proportion of squid being caught

The Falkland Islands' population of king penguins once again showed an increase with the present population at 300 pairs. It is likely that this increase arises from continuing immigration from the large and expanding colonies on South Georgia.

Black-browed Albatross

Results continue to show a steady increase in the population. On West Point Island the number of breeding pairs has risen from 4,000 in 1961/62 to 15,000 for 1994/95. Black-browed albatross chicks are very susceptible to hot weather. The 1994/95 season was generally cooler and wetter than the hot summer of 1993/94 favouring higher chick survival and resulting in a good year for chick production.

During the 1994/95 season 230 black-browed albatross were caught by longline fishing operations off the southern coast of the Falklands. These were most likely birds from the breeding colony on Beauchene Is-

be identified for rock shags. For king shags, however, the two sites for which comparisons can be made both show very severe declines over recent years - at Kidney Island down from 441 pairs in 1960/61 to just 29, and at Berkeley Sound down from 2,780 in 1987/88 to 1,220 in 1994/95.

Coastal Surveys

For the first time detailed surveys of extensive sections of coast have begun. The 1994/95 season covered West Point Island and the entire coast of Berkeley Sound as a pilot project funded by the Foreign and Commonwealth Office. Population estimates have been made for bird species not otherwise covered by the FSMSP, maps of habitat and vegetation cover have been produced including feeding areas of kelp forests, green algae and mussel beds.

Falklands Conservation wish to thank the Falkland Islands Government for funding the Seabird Monitoring programme, the Foreign and Commonwealth



Michael Bingham and Tim Stenning putting hands on albatross, West Point Island, December 1994.

land. This type of fishing is new to the Falklands and the operators are in the process of developing measures which will prevent future recurrences.

Shags

With few historical counts with which to compare, it will be several years before trends can

be identified for rock shags. For king shags, however, the two sites for which comparisons can be made both show very severe declines over recent years - at Kidney Island down from 441 pairs in 1960/61 to just 29, and at Berkeley Sound down from 2,780 in 1987/88 to 1,220 in 1994/95. Office for funding the coastal survey pilot project, the Fisheries Department for logistic support, Tim Stenning, Steve Bron and David Crowe for fieldwork, the many volunteer counters who gave up their time to monitor adopted colonies and all the landowners who granted access to study sites and provided valuable information. ♦

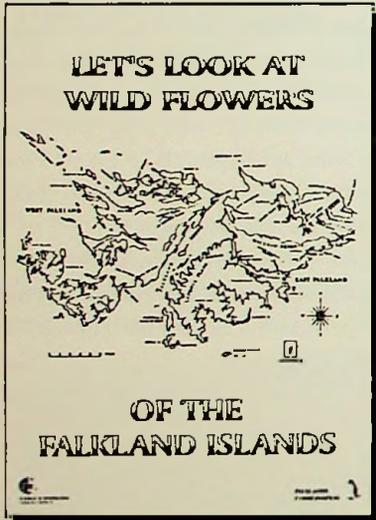
LOCAL NEWS

STANLEY OFFICE MOVES

Falklands Conservation has moved to a new Stanley office in the Beauchene complex on John Street. The address remains the same at PO Box 31. The fax number is now exclusively 22278. The 22247 number is for telephone calls only.

WILD FLOWER PROJECT PACK

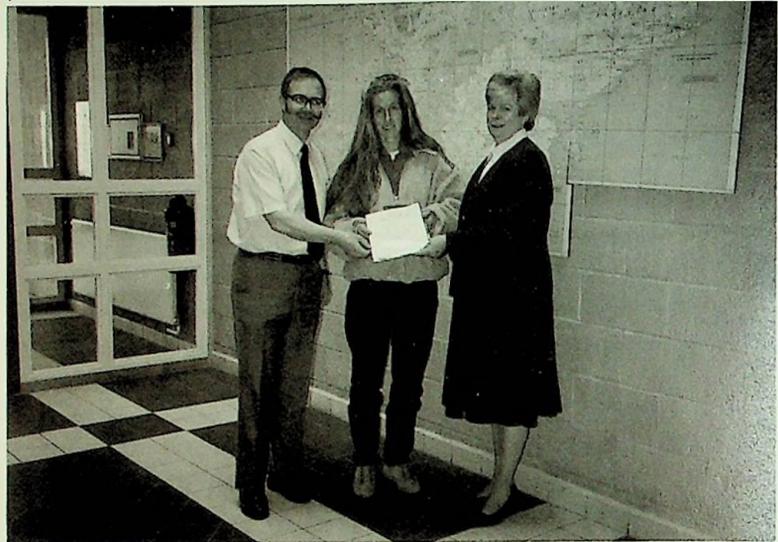
At the end of last year Falklands Conservation produced a new educational pack. "Let's Look at Wild Flowers of the Falkland Islands" is for children from the age of seven and their teachers.



It aims to encourage an awareness of plants and plant habitats of the Falkland Islands, to recognise Falklands wildlife flowers, to recognise that different species of plants grow together in formations, the distribution and composition of which depend on different environmental factors, and to encourage an awareness of the vulnerability of the environment to disturbance and of the need for land care.

Two detailed lessons are aimed at beginners to help them identify plants. Once familiar with a wide range of plants, comparative studies are suggested in four optional extension activities. A complete check list of Falkland Islands' plants is included with sample record sheets.

Falklands Conservation is very grateful to Sally Poncet for initiating, writing and designing the Pack and to Cable and Wireless (Stanley) for sponsoring production costs.



Brian Summers (left), Chairman of Falklands Conservation Local Committee, with Sally Poncet handing over the Wildflower Project Pack to Judith Crowe (right), Head Teacher of the Community School. Photo: Penguin News.

WARM HEART OF ANTARCTIC ARTIST

Peter Harrison, a veteran of twenty years travel to the Antarctic, has donated \$4,375 to Falklands Conservation. He arrived in Stanley last December after his 96th trip as a tour guide to Antarctica. Mr Harrison raises the money by raffling paintings of birds which he does during the tours (he does eight or nine per trip). 'As visitors to these places we earnestly believe in trying to give something back to the areas we visit'. Falklands Conservation is very grateful to him for this generous support for our work.



Peter Harrison hands over his donation to Carol Miller.

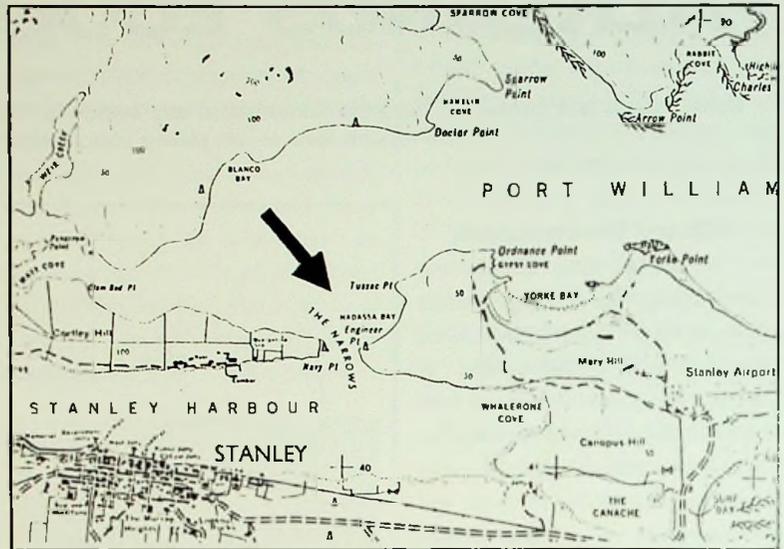
Photo: Penguin News

CLEAN UP AT HADASSA BAY

Falklands Conservation has organised its first community project at Hadassa Bay in Port William. Ships which anchor nearby contribute to the rubbish despoiling this beautiful area, creating an eyesore for people and hazards for wildlife. Clearing the beach of litter was the job to be tackled. **Tim Stenning**, Falklands Conservation Field Officer, reports on the success of the project.

Forty volunteers, including His Excellency the Governor **Mr David Tatham** and a number of Stanley's Guides and Brownies, turned out to give the Bay its much needed clean up on 18th March 1995.

From the high-water line, to in amongst the tussac and up inland in the diddle dee, appeared an almost endless stream of rubbish filled bin liners supplied by our team of cleaners. The magellanic penguins deep in moult must have wondered just what was going on from the safety of their burrows. Before long our supply of eighty bin liners had been used up and some on-the-spot recycling was called for.



Come lunch time, the Agricultural Department's tractor and trailer, with Hugh Marsden at the wheel, had twice filled to over-flowing. As everyone enjoyed the barbecue, it was obvious just how much had been achieved in two short hours. Hadassa Bay had been restored from the eyesore it had been in the morning to how it should be by the afternoon - a beautiful beach rich in wildlife that gives a wonderful view back through the Narrows to Stanley.



At Hadassa Beach - Michael Bingham wearing a cap on the left and the Governor wearing a cap on the right. Photo: Penguin News

A huge array of rubbish found its way into our sacks from the expected fishing net and beer cans to an amazing array of footwear! Plastic bags were an all too common sight, including a large number of the endemic Falklands variety.

No doubt the penguins in their burrows and the kelp geese and steamer ducks out at sea are pleased to get back to peace and quiet again. They can now wander and waddle along Hadassa Bay without the danger of entanglement in discarded rubbish. ♦

Thanks to:

Polar

Consolidated Fisheries

Stanley Fuel Services

Stanley Bakery

Beauchene

San Rafael

Fortuna

Goodwin Offshore

Falkland Islands Company

Stanley Arms

Fisheries Department

Agriculture Department
(for tractor & trailer)

The Military
(for sponsoring the barbecue)

Everyone who came along to help

MOTLEY ISLAND: ON THE FALKLANDS ECOLOGY MAP

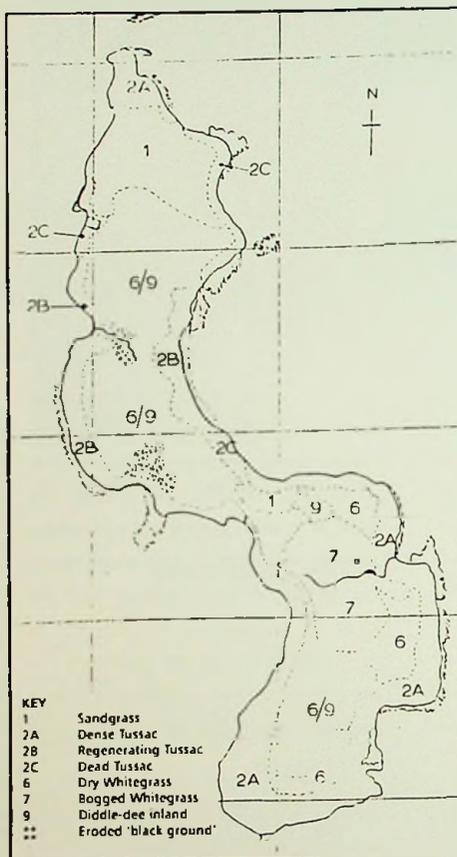
Robin Woods is a Trustee of Falklands Conservation and author of "Guide to Birds of the Falkland Islands". He reports here on his recent visit to Motley Island.

Military Co-operation

In October 1994, Falklands Conservation bought the 330ha (815 acres) Motley Island and several smaller islands near Lively Island, off East Falkland. In January 1995, a party of three staff from Britannia Royal Naval College at Dartmouth, Ted Bloomfield, Commander Chris Peach and Dr Richard Porter, and six midshipmen visited Motley for four days (5th to 9th January) to make baseline ecological observations, with Robin Woods as scientific adviser. Falklands Conservation has a detailed report of their field work. This article shows that excellent results are possible when Falklands Conservation and military personnel co-operate in field work.

Aerial Circuit in a Chinook

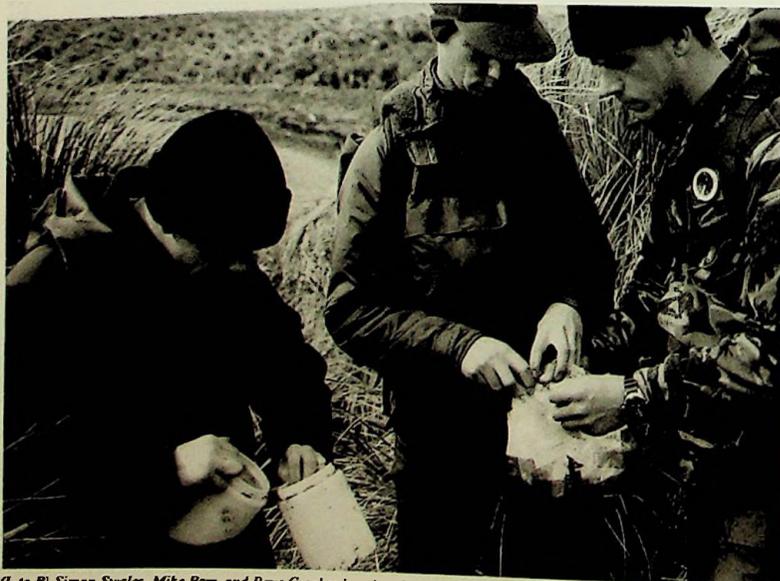
It was fortunate for the group involved in this EXTA (External Training Activity) that rapid communication between Ted, Richard and the military authorities at Mount Pleasant Airport was possible. On the morning after our arrival, local arrangements were finalised by Chris and the naval liaison officer to collect food and equipment from stores and to land us on Motley Island, courtesy of the Officer Commanding the Chinook helicopter squadron. We were airborne within 24 hours of arriving at Mount Pleasant and landed on Motley half an hour later. Departure for Motley was delayed by a thunderstorm and our landing was also delayed, deliberately, as the pilot treated us to a slow circuit of the Island. This allowed Chris and Richard to take aerial pictures and gave an overall impression of Motley which we could never have gained from a sea-borne landing. The resulting colour prints were invaluable when drawing a map of the vegetation.



Map showing vegetation of Motley Island.

First Impressions

Our camp was established on whitegrass near the pond - which we thought might contain fresh water. The pond water was however muddy, peaty and almost impossible to reach from the overhanging banks, and the outlet stream putrid. It was fortunate that we had taken ten large jerrycans full of Mount Pleasant water. Later we walked a section of the east coast, familiarising members with many birds and plants during the fine evening. Early next day, expedition pairs visited each of the 1km squares shown on the map. Within an hour a heavy shower soaked us; later the sun was so strong that we needed UV filter cream. That evening, verbal reports from each team were tape-recorded and the six students installed two transects of plastic pitfall traps for collecting invertebrates in tussac and whitegrass near the camp.



(L to R) Simon Swales, Mike Parr, and Dave Crookes bagging the contents of pitfall traps near the east shore, Motley Island. Photo: Robin Woods

Exploring the Coast

The next morning, more pitfall traps were installed in tussac and in sand dunes covered with marram grass. The contents were later delivered to Jennifer Fuller at the Dept of Agriculture in Stanley for identification.

Richard Porter and two of the team dug a metre down into tussac peat to collect samples at different levels for analysis of embedded pollen grains. During a walk along the west coast to the north, about 15 pairs of kelp gulls and ten pairs of South American terns were found and we saw nests of both blackish and magallanic oystercatchers with eggs. Two fully-fledged juvenile blackish oystercatchers were also seen, showing that they can have a long breeding season.

The Tussac Habitat

There is about 80ha of mature tussac in good condition and another 30ha is regenerating since the Island was last stocked three years ago. The weather was dull and mild during our last two days but it blew and rained hard enough on both evenings to prevent us from sitting in tussac, waiting for petrels or shearwaters to return to their burrows. Luckily, two wings of the common diving petrel and two of a prion, probably the fairy prion, were found and a sooty shearwater was heard calling overhead, early one morning. One short-eared owl pellet was teased apart and found to contain some wing bones, probably of a storm-petrel. The dense tussac at the southern end looked ideal for burrowing seabirds and should be investigated at a future date.

Many Unusual Plants Discovered

In four days we photographed, observed or collected samples of at least sixty-six species of flowering plants. Among plants recognised were some good examples of the yellow orchid, which David Moore (1968) only records from clay cliffs on West Falkland.

Several specimens of the Falkland hairy daisy, Falklands cudweed and smooth yellow ragwort were found near our camp and there were patches of lady's slipper near the coast. It is very probable that other uncommon plants await discovery.

A Varied and Rich Bird Life

We saw thirty-eight bird species, confirmed breeding for twenty four and thought that five more probably bred. The bird that made its presence felt almost continuously was the magellanic (jack-ass) penguin. Adults brayed and nestlings cheeped incessantly from burrows in tussac peat all around the Island. Some even burrowed in the sand dunes. Six small colonies of rock shags were found on low cliffs and there was a colony of seventy-five or more king shags at the south-eastern end. Pairs of flightless



Yellow Orchid (Gavilea littoralis). This may be the first record for this species on an East Falkland island. One of several found in two places on dry heathland.

Photo: Robin Woods

steamer duck and crested ducks were present off all coasts, often with fledged juveniles; upland geese fed inland and on the coasts and kelp geese with small goslings were common. More impressive were the many tussac birds that for-

aged and squabbled along the coasts, especially on heaps of rotting kelp washed inshore by storms. These little brown birds were tame enough to walk around the feet of people standing still and any disturbance to dead kelp immediately brought several to investigate. The beaches and coastal tussac fringe were well populated by Cobb's wrens and they were almost as tame as tussac birds when searching for minute invertebrates around boulders on beaches. The presence of both these songbirds in such good numbers is a strong indication that the Island is free from introduced predators, particularly rats.

Sea Lions and Elephant Seals Discovered

A small colony of southern sea lions was discovered in a sheltered cove at the south-eastern corner. One dominant bull had up to seventeen females around him and there were at least seven black pups. Three younger bulls rested and fought nearby, waiting their chances to usurp the old male. Several elephant seals were resting on beaches at this southern end and at least nine were on the northern beach of the Mot, a tussac-covered islet lying about 500m south of Motley. We did not see any adult male elephant seals.

A Valuable Acquisition

Our brief survey has shown that the habitats are sufficiently varied to be of great ecological interest and that Motley Island is a valuable acquisition for Falklands Conservation. ♦

MEMBERSHIP CONTACT SCHEME

Everyone on our mailing list (UK, Falkland Islands and overseas) will be receiving with this newsletter a Membership Contact form so that the records in our Members Contact Scheme can be fully revised, updated and expanded. This offers a simple means whereby you can get in touch with others having similar interests, expertise or enthusiasm, or indeed to contact those who may be able to help in specific areas where your knowledge is lacking. We hope as many members as possible will participate - the fuller the list, the more useful it should prove to be. It also offers an opportunity to visit and correspond with soulmates on many topics of central importance to Falklands Conservation, and many that are somewhat specialist, but no less important or fascinating. Please also add any suggestions or improvements for Warrah including ideas for future features and topics.

Members should send the completed form back to either the UK or FI office. With the next newsletter we will issue the revised list to all who have responded. It is our intention to update the information every two years.

Matthew Brisbane, murdered on August 26th 1833, had been the first official British Resident, and FitzRoy recorded that they found him buried outside his house with his feet protruding from the ground. A few days later Edward Hellyer, ship's clerk, was drowned, entangled in kelp in a lonely inlet.

Nothing Could be Less Interesting

Unperturbed, Darwin decided to see more of the Island:

'Early in the morning (March 16th) I set out with six horses and two Gauchos. These were the only two Spaniards who were not directly concerned with the murder. However they had no temptation to murder me and turned out to be most excellent Gauchos, that is they were dexterous hands in all the requisites of making the camp-life comfortable. The weather was very boisterous and cold with heavy hail storms. We got on however pretty well. Excepting some little geology nothing could be less interesting. The country is uniformly the same, an undulating moorland; the surface covered with light brown withered grass, and some few very low shrubs all growing out of an elastic peaty soil. There is one main range of quartz rock hills, whose broken, barren crests gave us some trouble to cross. Few sorts of birds inhabit this miserable looking country. There are many small flocks of geese feeding in the valleys and solitary snipe are common in all parts.'

A Banquet at Port Darwin

They crossed the narrow isthmus to the southwest part of the Island, and slept beside a fire, burning to Darwin's surprise, the bones of a bullock, close to a spot which was later named Port Darwin. Darwin was impressed by the skill of the Gauchos with their lassos, and enjoyed the meat roasted with its skin, "carne con cuero", which he considered fit for a banquet for "any worthy alderman in London". But the weather was so bad that after enduring it for four days, he returned thankfully to the relative comfort of the Beagle.

The Great Forests of Kelp

Here it is recorded that for the next two weeks: 'My time passes very evenly - one day hammering the rocks, another pulling up the roots of the kelp for the curious little corallines which are attached to them.'

He was enormously impressed by the number and variety of marine organisms that lived in

the great beds of kelp - the seaweed *Fucus giganticus* - and wrote in his unpublished Zoology Notes preserved in the Cambridge University Library: 'I can only compare these great forests to terrestrial ones in the most teeming part of the Tropics, yet if the latter in any country were to be destroyed I do not believe nearly the same number of animals would perish in them as would happen in the case of kelp. On shaking the great entangled roots it is curious to see the heap of fish, shells, crabs, sea-eggs, cuttle fish, star fish, Planariae, Nereidae, which fall out. If this *Fucus* was to cease living, with it would go many the seals, the cormorants and certainly the small fish and then sooner or later the Fuegian man must follow. The greater number of the invertebrates would likewise perish, but how many it is hard to conjecture.'

Darwin Predicts Demise of Warrah

The specimens that he collected included a number of birds and a few mammals, although his notes were mainly concerned with the detailed anatomy of the corallines. He also remarked on the extraordinary tameness of the indigenous Falklands fox (*Warrah*), *Canis antarcticus*, noting that thanks to the settlers 'in a few years this animal will be classed with the dodo, as an animal which has perished from the face of the earth'. Sadly, this prediction was correct.

Encounter with Jackass Penguin

He was also impressed by the tameness of birds in the Falklands. He describes how he got between a magellanic penguin and the sea: 'Stands quite upright, can run very fast with its head stretched out and crawls amongst the tussocks by

aid of its little wings so as to extraordinarily resemble a quadruped - throws its head back and makes a noise very like a Jackass (hence its alternative name), but when at sea and undisturbed its note is very deep and solemn, often heard at night. When diving (can do so in very shoal water) uses its wings very rapidly and looks like a small seal. From its low figure and easy motion looks crafty like a smuggler. Is very brave, regularly fought and drove me back till it reached the sea - nothing less than heavy blows would have stopped it: every inch he gained he kept, standing close before me erect and determined.'

A Long and Fruitful Journey Home

On April 7th the Beagle weighed anchor, and sailed for the mouth of the Rio Santa Cruz on the coast of Patagonia. At the end of May, the Beagle proceeded through the Straits of Magellan to the west coast of South America, and in October 1836 arrived back in England. Darwin rode huge distances in Chile, studying the geology of the Andes, and made momentous discoveries on the natural history of the Galapagos. He never left England again. ♦

Charles Darwin's Beagle Diary, edited by R D Keynes, was published by Cambridge University Press in 1989, and is currently available from booksellers at £15.00. ISBN 0 521 23503 0.



Magellanic penguins

The **Warrah** is the newsletter of Falklands Conservation, published twice a year. The Editor welcomes letters and articles for publication. Copy date for next issue: 29th September 1995.

The **Warrah**, or Falkland Fox (*Canis antarcticus*), was the only endemic species of mammal on the Falklands. This bold and inquisitive animal was probably never very numerous but, with the introduction of sheep, farmers backed by a Government bounty were encouraged to hunt them and the last one was killed in 1876. We hope this publication will play a small part in preventing any other Falkland wildlife following the same path to extinction.



Falklands Conservation is a registered charity number 279347

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The **Warrah** was designed and typeset by

Password Publishing & Design
Development & Environment Centre
38-40 Exchange Street
Norwich NR2 1AX
Tel/Fax: (01603) 616292

ISSN 1357-9460
Printed on Recycled Paper

A WILL TO HELP FALKLANDS WILDLIFE

Please think about leaving a legacy to Falklands Conservation in your Will. As a registered charity Falklands Conservation would receive your legacy free of inheritance tax. Money which would otherwise go to the taxman would instead be used for our most worthwhile cause.

Making a Will is the best way you can be sure what will happen to your property and possessions after your death. It also provides a useful opportunity to help others - close friends or causes you care about, causes such as wildlife in the Falkland Islands, a very special place which we are working to safeguard for future generations. Your legacy could help us acquire more tussac island nature reserves, devote much needed resources to studies of declining penguin and sealion populations, or run wildlife projects for young Falkland Islanders.

There are several ways in which you can do this, the two most popular being:

Making a Cash Legacy

'I give to Falklands Conservation (UK registered charity 279347) the sum of £—— pounds for the general purposes of the charity and I declare that the receipt of the Treasurer or other proper officer for the time being of the charity shall be a good discharge to my executors.'

Leaving the Residue

'I give and bequeath all (or x% of) the residue of my real and personal estate whatsoever and wheresoever to Falklands Conservation (UK registered charity number 279237) for the general purposes of the charity and I declare that the receipt of the Treasurer or other proper officer for the time being of the charity shall be a good discharge to my executors.'

As a charity we rely on the support of many individuals to provide vital income for our work. Donations are very important to us - with additional funds from legacies we could do so much more. Please consider Falklands Conservation when making your Will.

MARINE ORNITHOLOGY - SPECIAL OFFER

Marine Ornithology is the only international, fully referenced journal dealing solely with seabirds, and thus should be on the shelves of all marine ornithologists. For only double the cost of the normal 1995 subscription to Volume 23, new subscribers will also receive five years of back numbers (Vols 18-22, 1990-1994).

Subscription rates are:

Personal: £40 or US \$60

Institutional: £60 or US \$90

Payment should be made in the name of the 'African Seabird Group' and sent to: PO Box 34113, Rhodes Gift 7707, South Africa.



SALES

The following publications are available by post from Falklands Conservation UK office. Prices are inclusive of packing and surface post. Payment may be remitted in \$US at a rate of \$2 per £1. Please make cheques payable to 'Falklands Conservation'.

Booklets:

Wild Flowers of the Falkland Islands*	£4.00 (overseas £4.50)
Those were the days*	£4.00 (overseas £4.50)
Corrals and Gauchos*	£4.00 (overseas £4.50)

Reports:

Tussac Grass in the Falklands	£7.50 (overseas £8.50)
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Newsletters:

Falkland Islands Foundation (5-10)	£0.80 (overseas £1.00)
Warrah (1-5)	£0.80 (overseas £1.00)

Sundries:

Penguins (WhittetBooks) by John A.Love	£8.75 (overseas £10)
Video - Preserving the Falklands	£7.00 (overseas £8)
Penguin Appeal Sweatshirt (XL only)	£15.00 (Overseas £18)

* May be purchased from our Falklands office, a number of retail outlets in Stanley and at MPA for £3.50.



Rockhopper Penguin

the **WARRAH**

Newsletter of Falklands Conservation

November 1995 - Number 8

Editor Ann Brown

FALKLANDS ENVIRONMENTAL SURVEY GOES AHEAD

The Falkland Islands Government has awarded the contract for undertaking an environmental baseline survey of the Islands to Brown & Root Environmental and Imperial College Consultants Ltd (ICON) who will commence work almost immediately for completion by 1997. Falklands Conservation welcomes the Survey and will work closely with the contractors.

Roy Carryer of Brown & Root Environmental, who is the Project Manager for the Study told us

'We are delighted to have been awarded this Project, and recognise how important it is for high scientific standards to be set for all future environmental work connected with oil-related developments around the Falklands. Falklands Conservation have an active part to play in the project team and we very much look forward to working with them. Personally, I am very pleased to be renewing my links with the Falklands after nearly four years away from the Islands.'

The Survey is being conducted in advance of any potential offshore oil exploration and possible exploitation. The oil licensing round opened in London on 3rd October and will close on 2nd July 1996. Two to three years after that exploratory drilling will commence when the presence of oil will be confirmed, or not. It is hoped

that the Survey will set a baseline to identify environmental trends not just to assess any impact from development of an oil industry, but also from fisheries, tourism and other aspects of environmental change.

The First Phase

A desk study will collate all information known about the coastal, shallow marine and offshore environments. It will include habitats, species of ecological importance and sensitivity, and optimum sites for further marine survey work.

Field surveys of the shallow marine environment (between high tide mark down to 30m depth) will be undertaken. This will identify key species and, possibly, types of substrate for subsequent analysis of existing levels of hydrocarbons, heavy metals and other pollutants, and those species which might be particularly susceptible to pollution incidents. It will be asked to highlight species relevant to commercial

or recreational fisheries. A littoral (shoreline) survey will also be conducted and co-ordinated with the shallow marine survey.

A data recording and collation system will be established which will include the development of a sophisticated Geographic Information System (GIS) for the Islands.

Falklands Conservation Input

Falklands Conservation is named as an active participant in the Brown & Root Environmental/ICON project team. We will have two areas of responsibility:

- Management of data collection in the Falkland Islands for the Desk Study
- Management of the littoral survey

Data from The Seabird Monitoring Programme undertaken by Falklands Conservation will be included in the baseline survey information and the Programme will be extended with the

In This Issue: **Shores of the Falkland Islands - Tussac Island Restoration - The Flora of Motley Island - Whaling History of South Georgia - Major Penguin Survey - Book Reviews**

baseline requirements in mind. In addition, we will be providing data from other environmental monitoring projects run over the past ten years. Our extensive information holdings on seabirds and marine mammals in particular will make an invaluable contribution.

The Second Phase

A second phase of the Survey is envisaged, closer to expected exploratory drilling date. This would include analysis of seawater, sediments and key species to determine background levels of hydrocarbons and heavy metals, and an oceanographic survey to determine current patterns in relation to likely exploration areas.

Monitoring Progress

The desk study will be crucial in determining many aspects of how future monitoring is conducted and analysed. Decisions vital to the wellbeing of wildlife will be taken on the basis of this information. It is important that Reports produced from the Survey are independently reviewed. We hope that this is a role which will be facilitated by FENTAG (Falklands Environmental Task Group), a body set up to advise the Falkland Islands Government. Membership includes Michael Bingham, representing Falklands Conservation. We welcome assurances that it will in future be working closely with the Oil Management Team.

A Helpful Contribution

We know a considerable amount about the birds of the Islands, though we need to know more about many species, especially those of coastal and marine habitats. Our knowledge of the flora and invertebrates is much less detailed. Considerable research is needed before we can take appropriate action to protect the full ecological range of Falklands wildlife.

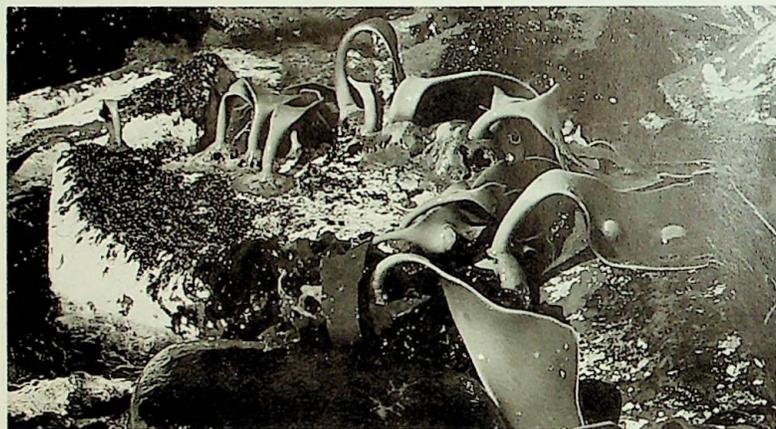
Without this knowledge, broad ranging surveys and desk studies can only be of limited value. Whilst welcoming the environmental baseline survey it must be regarded as a first (albeit very important) step in the right

direction rather than a comprehensive answer to protection of this vulnerable natural heritage. It is now all the more important to initiate projects which will lead to greater knowledge and understanding of all species which inhabit these Islands

SHORES OF THE FALKLAND ISLANDS

By Dr Shelagh Smith

Shelagh visited the Falkland Islands in January 1989 and February 1992, birdwatching, photographing, sketching and, in the little time available, investigating the marine life on the shores, which she describes here.



Kelp on shore, Sea Lion Island.

Photo: Shelagh Smith.

A Varied Coastline

Falkland Islands shores range from extremely sheltered to extremely exposed. Many of the latter are protected from the worst of the westerly gales by extensive beds of kelp (*Macrocystis pyrifera*) which grow on bedrock reefs just offshore and have fronds up to 50m long. The rocky shores comprise cliffs, irregular rock and rock platforms. These have a rich algal flora with many species of small algae and at low water other species of kelp (such as *Durvillea antarctica*) break the force of the waves. As can be envisaged, apart from storm beaches, there are few shores with loose boulders except in the more sheltered areas, where a rich and diverse fauna is present, sponges, sea squirts, starfish and molluscs being especially numerous. The sediment shores include very sheltered sandy

creeks and lagoons, gravel beds and wide sandy beaches with the amount of fauna depending on the degree of exposure. There are numerous brackish lagoons, none of which was I able to visit. The open sea has very clear cold water, but the more enclosed places are murkier and can have problems of pollution. For most habitats the species diversity was found to be less than for similar habitats in Britain, but the biomass was high.

The Influence of Geology

The ecology of the Falkland Islands is much influenced by the geology. The rocks are mostly Devonian and Carboniferous in age, originally part of South Africa, and comprise heavily folded and faulted strata. Bordering the west side of Falkland Sound they are vertical, but else-

where, while apparently more or less flat-lying, are in reality closely folded in the manner of not very tidily folded bedlinen in a cupboard. Much is quartzite which, especially in less sheltered habitats, has few crevices, but there are areas of flags and shales which afford better living accommodation. As examples of some different types of shore, I have chosen Sea Lion Island, the shores of Pebble Island, Port Howard Inlet and Stanley Harbour.

Sea Lion Island

Apart from Beauchene, this is the most southerly island of the Falkland archipelago. Much of the western part is vertical cliffs, some with rock platforms at their base which used to be the home of up to 7,000 sea lions, the population now much reduced. Rockhopper penguins scale the cliffs to nest at the cliff tops. At the east end there are sand dunes with tussac grass, home to jackass (Magellanic) penguins, and boulder and sandy beaches where elephant seals haul out and gentoo penguins live on the higher ground. At the northeastern end there are low wide rock platforms with a rich intertidal flora and fauna where very large limpets (*Fissurella*) are abundant in the pools.

Pebble Island

Pebble Island is separated from West Falkland by waters which are mostly very shallow and studded with low-lying islands, protected in the west by the high islands Saunders and Keppel, although Keppel Sound is about 6km wide and permits considerable wave action. The eastern channel is a mere 750m wide and has tidal streams of up to 10 knots. The southern shore is moderately sheltered and composed of sandy or muddy bays and flaggy rock platforms backed by low cliffs. The rich flora and fauna here includes sponges, starfish and many molluscs such as limpets, whelks and mussels, together with numerous very small species which live on the seaweed. Kelp geese and night herons forage amongst the

weed. The north coast has exposed areas, such as at Green Rincon, where the rocks are covered with limpets and mussels and there is little seaweed. The sandy bays, across which trek gentoo penguins, have burrowing sand crabs. Also on the north coast is a very sheltered shallow inlet, Victor Creek, of mostly tidal sands, where mullet come in. The largest bay is Elephant Bay where wide flat sands sweep in a horseshoe about 6.5km long, backed by sand dunes. The sand is occasionally covered by a fine layer of coal from wrecked ships. Many shells get washed up here including the kelp bivalve (*Gaimardia trapesina*), a very important food for gulls and marine ducks. Rock ridges guard the ends, and at the eastern end there was a catastrophic stranding in 1991 of about twenty pilot whales. Their carcasses still remain.



Port Howard.

Photo: Shelagh Smith.

Port Howard Inlet

Port Howard Inlet is almost land-locked, less than 1 km wide and over 12km long, extended north east-south west with an entrance less than 400m wide halfway along the south east side. To the west the mountains rise to 658m, providing shelter. The inlet is hidden from the open sea by ridges over 100m high.

This situation is brought about because the trough of the inlet is formed of shale whereas the higher ground is quartzite. There are rock ridges with limpets and mussels; platforms with loose slabs under which are yet more limpets and whelks; muddy sand with burrowing molluscs and worms and with mussel beds on top; and a gravelly,

brackish creek leading to fresh water. The inlet operates like a lagoon, tides at the north end take up to nine hours to fall and only three hours to come in. The tide range is about 2m. so flushing is poor and rubbish remains near its source. Port Howard Creek is very polluted, littered with old sheep bones, unwanted portions of fresh carcasses, sundry rubbish and domestic sewage. The numerous scavenging kelp gulls, giant petrels and turkey vultures cannot keep pace. The calm waters are home to widgeon, teal, night herons and steamer duck.

Stanley Harbour

Stanley Harbour is of similar size and shape to Port Howard Inlet and also has many problems of rubbish and pollution, but the westerly winds do aid flushing into the outer bay, Port William. The shores are mostly gravel or muddy sand, with only about 1m tidal range. There is little seaweed and few animals are visible on the shore although a number are burrowers. Bird life is dominated by scavengers such as kelp gulls and giant petrels. Both the eastern and western ends are brackish. Outside the harbour, Cape Pembroke is an exposed rock headland about 10m high, with a considerable variety of limpets and many species of algae together with kelp at low water and York Bay, to the south, is a wide sand. These are primarily the domain of jackass and gentoo penguins, too small to set off mines which at least up to 1992 kept larger two-legged animals away.

The Untouched Shores

The Falkland shores exhibit a diversity of marine life in a wide range of habitats. Although the ecology of the sheltered inlets with settlements is, as in the rest of the world, deteriorating due to inattention to control of pollutants, the outer parts, except for rubbish washed up from the sea (chiefly off fishing boats), are virtually untouched. Such areas are rare today and should be protected from any threats they may face in the future.

LOCAL NEWS

BERKELEY SOUND SURVEY

During the 1994/95 austral summer season Michael Bingham surveyed the entire 117 kilometre coastline around Berkeley Sound assessing the population size and distribution of its birds and mammals, and mapping the vegetation and habitat zones. A full Report on the survey has been produced. It was one of three pilot wildlife surveys funded by the Foreign and Commonwealth Office.

Large Numbers of Breeding Birds

Berkeley Sound was confirmed as an area of great biological diversity and richness. It supports large numbers of breeding birds: over 8,000 breeding pairs of penguin, 2,500 breeding pairs of shag, and 289 pairs of steamer duck. It is an important feeding area for thousands of shore-birds, especially waders, including over 2,000 white-rumped sandpipers. In addition to the sheer numbers of birds, Berkeley Sound also shows great diversity in the species present. The 11,000 breeding pairs of seabird include all

the main breeding penguins and shags, and over 70% of all Falklands breeding birds species.

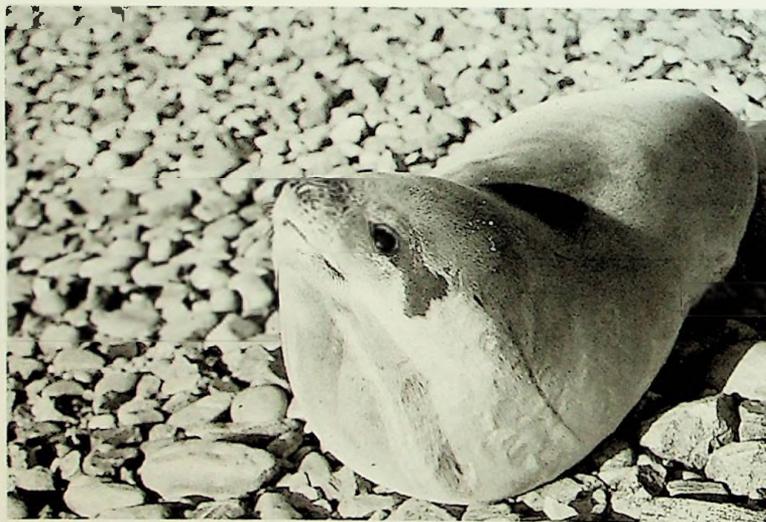
Great Diversity of Habitats

The large number of birds species can largely be attributed to the number of habitat types, over 75% of the terrestrial habitat and all the littoral habitat types being found here. These range from low cliffs, which provide sites suitable for rockhoppers and shags, to estuaries rich in waders, and feeding grounds for geese and ducks. From sample work conducted at the same time the numbers of invertebrates and plants indicate a similar wealth of species.

Risk of Disaster

In his Survey Report Michael Bingham gives a word of warning however.

'At present this important site remains relatively unspoilt, but with the Sound being used on a regular basis for shipping, there is the constant risk of a serious disaster occurring from fuel-oil spillage. The enclosed and sheltered nature of the Sound means that even a small spill could have serious consequences, and operational discharges are already resulting in oiled penguins and seabirds. Consideration needs to be given to reducing discharges and producing contingency plans in the event of a spill occurring. If the environmental consequences of the present level of shipping activity and bunkering cannot be controlled then it is difficult to be optimistic about the control of any future environmental consequences of oil development.'



Ross Seal on the shore of the Canache (South Eastern end of Stanley Harbour)

Photo: Andrew Miller

NEW APPOINTMENT

Fiona Didlick has recently been appointed Education/Community Officer based in the Islands. Fiona has lived in the Falklands for about six years, but comes originally from Scotland. Her main role is to work with the School, teachers and youth groups to promote environmental awareness and the work of Falklands Conservation. She will also be producing educational materials, giving walks and talks, running community events, producing displays and encouraging voluntary help with fieldwork, surveys, bird and penguin counting.

RECORD WINTER WEATHER

This winter has been the coldest in the Islands since 1902. In August snow was recorded lying on 27 days, three times the normal and over twice as much as in any previous year. Due to this continuous snow cover birds have found difficulty finding food. The most noticeable of these were the Upland Geese, and in many areas large numbers of geese have starved to death.

ROSS SEAL VISITS FALKLANDS

On 20th August a Ross Seal was seen at the South eastern end of Stanley Harbour. The specimen, measuring 1.85 metres long, appeared in good health but presumably had lost its way - it is the first time a Ross Seal has been seen in the Islands. They are the rarest of the Antarctic seals, normally living deep in the Antarctic pack ice.

TUSSAC ISLAND RESTORATION

Falklands Conservation has commissioned a feasibility study to consider whether it is practical to remove introduced animals (particularly rat, rabbit, cat and Patagonian fox) from a number of tussac islands. The study was undertaken in July 1995 by Brian Bell with his son Paul of Wildlife Management International whose aim is to restore the original biodiversity of habitats.

Tussac Islands are Rare

There is no doubt that tussac grass forms the most valuable wildlife habitat in the Falklands. 75% of native breeding birds nest or feed in tussac areas. They are among the Islands' most distinctive features, being the last remnants of the amazing fringe of vegetation which once surrounded the Islands, until largely wiped out on the mainland by the depredations of the sheep on which the colony's wealth depended. Islands with tussac are now a rare resource. But whilst some of the remnant islands teem with wildlife, neighbouring islands may be disappointingly empty.

Birds Need Rat-Free Islands

Those tussac islands that are rat and cat-free include Carcass, Sea Lion, Kidney, Beauchene, the Jasons and just a few tiny stacks (maybe 60 at the most). Their uniqueness is due to the fact that birds such as prions, diving petrels, tussac-birds, Cobb's wrens, and short-eared owls are able to nest and feed here only because there is no predation. To a small bird a rat is a fearsome predator, taking eggs, chicks and even adults as well as the insects on which some of these birds feed. Small ground-nesting and burrowing birds have no defence against this killer, and birds big enough to tolerate rats are often killed by cats.

A Range of Islands Inspected

The predator eradication study involved the inspection of six islands or island groups: Top/Bottom Islands, North East Island, Channel Island/Rookery Island, Tea Island with Split and Little Coffin, New Island and Beaver Island. Top and Bottom Islands lie close to Stanley and could be used to illustrate animal control techniques and to eventually provide a suitable visitor site to see restored tussac islands with associated bird life. Both are infested with rats.

North East Island is the only island in the Lively Group with rats which probably arrived from a ship wrecked on the north coast. Lively itself is the largest rat-free island in the Falklands and although we do not have information on how far rats will swim in Falkland waters, with a passage of only 200m separating it from the rats, it may not be long before they cross from North East Island to infest the larger island. The Channel and Rookery Islands, close to Beaver, offer a good opportunity to monitor recovery, being relatively close to larger islands. Rookery Island is owned by Falklands Conservation. Tea and Split Islands both have Patagonian foxes which make survival of bird species very difficult. New Island is well known as a very important seabird habitat. It has its share of problem species including rabbits (which make a considerable impact on the vegetation and stability of the soil), cats, black and common rats, and mice. This could be an example of a larger island project. Beaver Island, with foxes and rats, was the largest (4,000 ha) of the islands inspected. The removal of rats from Beaver and its satellite islands would provide a major area of recolonisation to both terrestrial and sea birds.

Predator Removal is Feasible

Brian Bell's Report concludes that while these islands are remote, it is quite feasible to remove the problem species with a well planned and implemented programme and a specialist professional team to do the job. Falklands Conservation will be considering how to take his recommendations forward, how to undertake surveys needed before any action is taken, and how to raise the substantial sum of money to fund such a worthwhile conservation project. Falklands Conservation is grateful for the assistance provided by the RSPB to this project. The Editor thanks Sally Poncet and Michael Bingham for providing information for this article which also draws on Brian Bell's Report *'Eradication of Problem Animals from the Falkland Islands'*.

TUSSAC ISLANDS RESTORATION GROUP

The idea of forming a working group of land owners and farmers interested in restoring their tussac islands came about during Brian Bell's visit. The purpose of the Tussac Islands Restoration Group is to liaise with conservation organisations, Government and research bodies, and to centralise and disseminate information to interested land owners on habitat restoration. It hopes to encourage practical solutions to the problems of erosion, to eradication of introduced wildlife predators, (such as rats), and to replanting tussac and other native grasses. Falklands Conservation welcomes the formation of the Group. For further information about the Group contact Sally Poncet on Beaver Island (Telephone 500 42316, fax 500 22659).

THE FLORA OF MOTLEY ISLAND

By Jim McAdam and Robin Woods

Jim McAdam is a Scientist and lecturer within the Department of Applied Plant Science, The Queen's University of Belfast. He is a Trustee of Falklands Conservation and coauthor of 'The Wild Flowers of the Falkland Islands'. He reports here on the wild flower data collected by Robin Woods during his visit to Motley Island earlier in 1995 and reported in WARRAH 7.

Introduction

There is a need to provide information on the distribution and ecology of plant species in the Falkland Islands. Since the early 1990s, a Wild Flower Recording Scheme has been developed which aims to gradually accumulate information on the flora so that species distribution maps can be generated and the records further analysed to provide more information on the composition of the vegetation. In addition, accompanying ecological and environmental data recorded can be used to help determine habitats which are of particular importance and in need of conservation and protection.

In January 1995, Robin Woods (1995a) concluded an ecological study (with military support) of Motley Island, purchased in 1994 by Falklands Conservation. As part of that survey, records were collected for the Wild Flower Recording Scheme. The main findings of the ecological survey are presented in the Survey Report (Woods, 1995a) and summarised in WARRAH 7 (Woods 1995b). This article presents further information on an analysis of the wild flower data collected.

Methodology

The method used was based on a thorough collection of higher plant

records associated with topographic and ecological data (on Habitat; Status; Altitude; Aspect; Exposure; Surrounding Vegetation) with a 1km square basis using the methodology already developed for the Wild Flower Survey. The records were then summated using a spreadsheet package and added to the overall species distribution maps for the Falkland Islands wild flowers, generated using the D.MAP programme (Morton, 1992).

Results

Five 1km squares from the Falkland Islands, UTM Grid (UC 89/22; 89/23; 89/24; 90/21 and 90/22) which cover most of Motley Island were sampled. A total of 62 different species were recorded from eight vegetation types with a further 3 probable records. Of the definite species records, 47 (76%) were species native to the Falklands and 15 (24%) introduced or alien species. The highest numbers of introduced species were found in the Sandgrass (13 species) and Tussac grass (3 species) habitats (Table 1). Almost half of the species found

around the shoreline in the Sandgrass area were alien. All six of the grass species introduced to the Island (*Aira praecox*, *Ammophila arenaria*, *Elms arenaris*, *Poa Anua*, *Poa pratensis*, *Vulpia bromoides*) were found in this habitat. Of the native species, *Carex trifida*, (Sword grass) is classed by Moore (1968) as rare in the Falkland Islands. In the tussac grass vegetation type, as would be expected, 3 species (Tussac, Wild Celery and Sorrel) were found in all squares on the Island.

Groundsel, nettles, Sorrel and Goose grass were introduced. *Cotula scariosa*, described as rare by Moore (1968) was found on Motley. In the Whitegrass-dominant areas on the Island a total of 17 species were recorded including Sword grass *Carex trifida*. The Diddle-dee areas were equally species diverse (18 species). The endemic *Erigeron incertus*, rare *Acaena pumila* and locally common orchid *Gavilea littoralis* were recorded from this habitat.

Table 1:
The origin of the 62 species (Classified by vegetation type) recorded from Motley Island

	No. of native species	No. of introduced species	Total species
Sandgrass	15	13	28
Tussac grass	9	4	13
Other maritime	4	1	5
Pond & Valley Green	2	1	3
Bogged Whitegrass	14	0	14
Diddle-dee (Inland)	18	0	18
Mountain	1	0	1



Tussac grass on Motley: found in all squares.

Photo: Robin Woods

The other vegetation types, Pond and Valley Green, Other Maritime and Mountain, were represented by few (mainly native) species, all of which were relatively common in the Falkland Islands (Moore, 1968).

Discussion

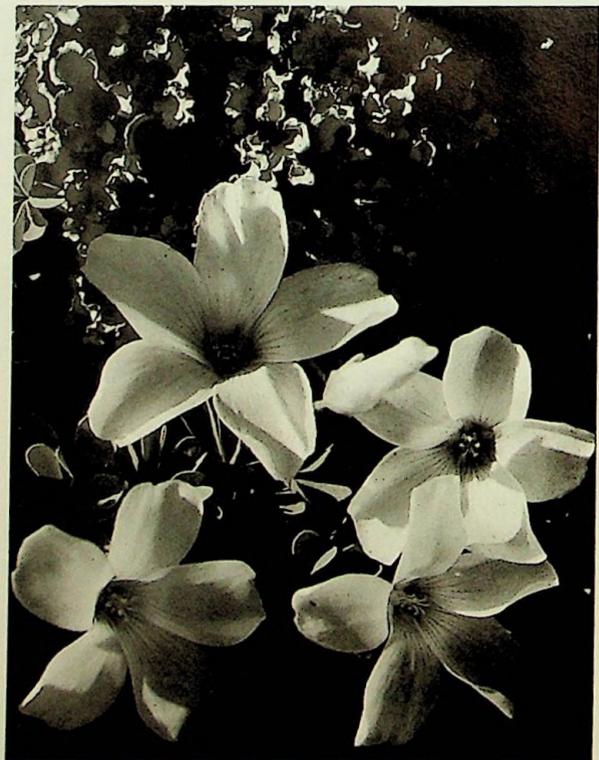
It is particularly interesting to note that over 28% of the native flora of the Falkland Islands were found on one small island, approximately 0.03% of the total land area (and not even marked on many maps)! This illustrates the relative uniformity of the flora (Skottsberg, 1913; Moore, 1968) and also how species diverse some of these small islands are. The absence of prolonged and intensive grazing on Motley may well have contributed to its relative species diversity and a comparison with a similar-sized island off Lafonia which had a history of grazing would provide a valuable ecological study. The proportion of introduced species (24%), was considerably lower than the overall total for the Falklands' flora (40%). This reflects the relatively low influence of human activity over the recent history of the Islands. Most introduced species were found around the coastline (13 out of the 15 introduced species in the Sandgrass area) and very few inland. This may indicate either that most of the visits to the Island have been concentrated

around the coastline, that many aliens 'arrive' by sea, or that the inland habitats are particularly unsuitable for introduction. This latter reason can probably be ruled out as introductions are generally found in a wide range of habitats and the alien species found on Motley are normally found in many other habitats and vegetation types throughout the Islands. There were several plants found on Motley which are described as rare by Moore (1968). The two most interesting species could be considered to be the endemic *Erigeron incertus* (one of the rarities) found in two of the five sample squares on Motley and the unusual and attractive yellow orchid *Gavilea littoralis* found in two areas on the Island. This plant is not previously recorded from East Falkland (Moore, 1968).

These interesting finds, along with the overall habitat importance for wildlife conservation of relatively undisturbed Tussac grass, highlight the need to conserve such islands. The study also highlights the need for, and value of, a systematic recording scheme for the flora of the Falkland Islands.

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- SKOTTSBERG, C J F (1913). A Botanical Survey of the Falkland Islands. K. Svenska Vetensk Akad. Handl., 50 (3): 1-129.
- WOODS, R W (1995a). The Motley Island expedition, January 199. Unpublished report, pp52.
- WOODS, R W (1995b). Motley Island. On the Falklands Ecology Map. The Warralt, No. 7, pp 8-9.
- Members who wish to assist with the Wild Flower Recording Scheme should contact Dr McAdam at Agriculture & Food Science Centre, Department of Applied Plant Science, The Queen's University of Belfast, Newforge Lane, Belfast BT9 5PX.*



Scrubby grass (Oxalis eneaphylla) - commonly found in Diddle-dee areas on Motley.

Photo: R Lewis-Smith

THE HISTORY OF WHALING IN SOUTH GEORGIA

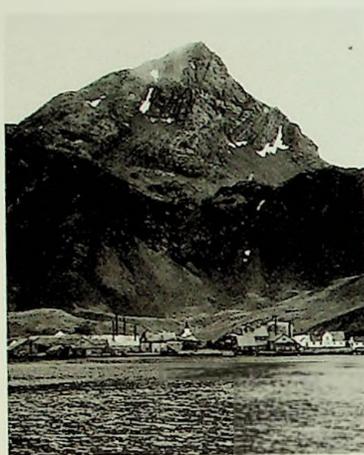
By Geoffrey Moir, DFC, FRGS, FRPSI

Geoffrey Moir worked as a schoolteacher on West Falkland 1982-86. His great interest in philately (specialising in the Falklands and Antarctica) led to his study of whaling and its history. He visited South Georgia in 1985.

Although whaling has now become almost extinct in most parts of the world, it would be entirely wrong to consider it unnecessary in years gone by. With the birth of the industrial world, oil was growing in demand almost every day for the preparation of synthetic foods and cosmetics, and for lighting. There were no suitable alternatives. During World Wars I and II the demand became even greater for the preparation of munitions.

The extraction of oil from blubber was not the only product of note. It had been the practice for many years to utilise every part of that enormous creature. Its meat is delicious for human consumption and, indeed, considerable quantities were consumed in the UK in the aftermath of the Second World War. The baleen, or whalebone, commanded a place in the clothing industry. The remainder was made into a high protein animal food, with the bones crushed and powdered to form an excellent soil fertiliser. Nothing was wasted.

Whaling has been known since the 11th century and for many decades was confined mostly to the Arctic waters of the Northern Hemisphere. A rapid decline of whales led to a search for other sources, and it was Captain Larsen, often referred to as 'the father of whaling', who set about the introduction of the industry in the South Atlantic, centred on South Georgia, an isolated island, some 900 miles from the Falkland Islands and a further 960 miles from the nearest point on the mainland of Antarctica.



Grytviken, South Georgia with Mount Sugar Top rising up behind. Only on its northern seaboard were found sheltered bays and flat areas for the construction of buildings on an otherwise very mountainous island. Photo: G.Moir.

Captain Larsen was commander of the 'Antarctic', the fated vessel of the Swedish Antarctic Expedition. During one of many landings carrying out geological, zoological and botanical studies, they came upon a cave containing 'tri-pots' used by old time sealers. 'Pot Cove', as it was named, is translated in Swedish as Grytviken, and that remains the name today, becoming in the early years of this century not only the centre of administration (King Edward Cove), but also the largest land-based whaling station in the Antarctic region.

Larsen was impressed with the vast number of whales to be found, and vowed he would return. Unable to raise the necessary finance in Norway, his company was registered in Buenos Aires as Compania Argentina de Pesca. He returned to Norway, purchasing three vessels, the 'Louise', 'Rolf', and a new steam whaler 'Fortuna'. All his employees were Norwegian, and they successfully reached Grytviken on 16 November 1904 and the whaling industry now commenced.

At the height of the whaling era, no fewer than nine stations operated to a lesser or greater degree. By far the most important was Grytviken, but another which has played a part in the history of South Georgia is Leith. Originally named Penguin Cove, it was owned by Christian Salvesen & Co. of Leith, Scotland who were granted a lease of land in October 1909, and eventually moved their operation here from the only whaling station on the Falkland Islands at New Island. The greater feeding grounds for whales around South Georgia is reflected in the size of catches and products (see Table 1). Leith remained a whaling station, with only a brief interruption, for 50

Table 1: Whaling statistics: New Island and South Georgia

New Island								
Season	Approx. no. caught	Oil		Whalebone		Guano		Total value
		Barrels	Value	Tons	Value	Bags	Value	
1912-13	200	6,628	26,512	---	---	---	£	26,512
1913-14	300	4,505	13,515	10	---	3,363	1,681	15,196
1914-15	200	7,434	29,763	10	18	7,870	3,849	33,630
1915-16	69	4,902	16,340	---	---	1,014	500	16,840
South Georgia								
Whales caught		Barrels of oil		Bags of guano		Estimated value		
1917-18	1918-19	1917-18	1918-19	1917-18	1918-19	1917-18	1918-19	
3,199	2,476	202,503	131,794	994	6,676	£1,253,200	£1,081,500	

years. The patch of flat ground on which the station was situated was not particularly large, and behind the factory buildings the cliffs rose sheer. In July 1911 the guano factory and the meat meal boiling plant were swept into the sea. Later, in August 1929, another avalanche crushed several houses, killing three hands.

Christian Salvesen's share of modern whaling was the largest of any single firm. All whaling in these southern waters has now ceased, but Salvesen still hold the leases on all sites with a possible view to the return of the industry in the future. I sincerely hope not. However, it should be remembered that it was Christian Salvesen's son, Theodore, who insisted on the complete exploitation of the whole whale, reducing the entire carcass to a marketable product. It was he too, who constantly appealed to the British authorities for more stringent regulations to ensure both this and the control of catching. Even as far back as the 1920s the voice of conservation was being raised, although it seemed to fall on deaf ears.

Leith Harbour was not the only whaling establishment in Stromness Bay; Husvik and Stromness stations also found shelter within its waters. Husvik, which mean House Cove, was leased to the Tonsberg Hvalfangeri of Norway by the Falkland Islands Government in 1908, originally as a floating factory site, with the shore sta-

tion not opening until 1910. It remained in operation until 1960 when it was leased to Albion Star (South Georgia) Ltd, the successor to the Compania Argentina de Pesca, when the station was partly dismantled and its meat freezing plant moved to Grytviken. It completely ceased operations in 1979. The central station of the three on the west side of Stromness Bay was Stromness itself, once referred to as Rosita Bay. That original lease was granted in 1907 as a floating factory site, but the ship involved was wrecked. A shore station finally became established in 1912. It was subleased to the Southern Whaling and Sealing Co. in 1917 until a new company was formed and ceased operations in 1931. From that time, until 1945, Stromness was used as a ship repair yard by the South Georgia Co.

Not all whaling stations were land-based, some were purely shelters for factory ships and there is now virtually no tangible evidence of their existence. The ravages of time and weather have wreaked havoc among the remaining land stations. Prince Olaf Harbour, between Possession Bay and Cape Creuse, was once known as Ratten Hafen or Rat Harbour by both sealers and whalers, probably because of the brown rat introduced to South Georgia here in the late 19th century. It gained its



present name from Norwegian whalers after Prince Olaf of Norway, born in 1903.

When whaling stations were abandoned, they were left substantially intact so that they could be reopened should whaling resume. The effects of weather and human interference have caused many of the buildings to collapse, whilst others are very dilapidated. There is an uncanny silence as one wanders amongst the remains of boilers, pressure cookers, rotary driers, power houses and much else, all of which have attracted interest from salvage collectors. The odour of whales still permeates everywhere – amongst dilapidated offices, laboratories, hospital accommodation, and kitchens. The paths and tracks are all overgrown and a substantial population of rats now seem to be the only occupants.

No one would now support whaling as it was carried out at Grytviken, but attitudes were very different a generation ago, when it was a highly respected profession for many Norwegians, and the products much in demand prior to the introduction of suitable alternatives. Nor should the memories of an industry which has played a great part in people's lives, be allowed to disappear. The recent opening of the Whaling Museum at Grytviken is of prime importance, where so many objects from abandoned and rotting whaling stations are being collected and preserved.



The Whaling Museum, Grytviken. This used to be the Manager's Office and Administrative Building.

Photo: G Motz.

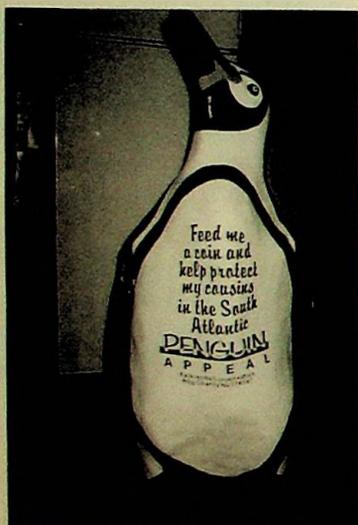
PENGUIN APPEAL



Appeal News

Particular thanks are due to the following for their donations in the last few months:

Cotswold Wildlife Park
Drusillas Park Zoo
North of England Zoological Society
Birdworld
Mr R B Blight
A S Butler Charitable Trust
Twycross Zoo
Aberdare Boys School



Penguin Collection Box: One of fifteen boxes now in zoos around the UK. Photo: Chris Page

Donations are coming in from our penguin collection boxes located at fifteen zoos across the UK. In addition we have shipped two boxes to the Islands and hope these can be found a suitable home at MPA and on the public jetty where they will catch the attention of both residents and visitors.

The Appeal has been donated a large number of beakers featuring four different penguins. We are unable to post individual orders of these, but would like to hear from anyone who may be able to sell them on our behalf. The minimum order for delivery is 96 beakers (4 types x 24 of each). Please contact Julian Fitter (telephone 01747 853 380) for further details.

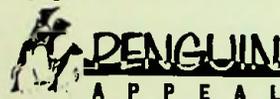
Penguin Survey

In 1932/33, the Falklands 'Government Naturalist', Mr A. G. Bennett, conducted a complete census of the entire Falklands population of Gentoo and Rockhopper penguins. It is our intention to repeat this survey this November using funds raised from the Penguin Appeal.

Two survey teams will be roaming East and West Falkland by Land-rover, visiting Gentoo, Rockhopper

and King penguin colonies, while a third team will visit the island colonies aboard the MV Penelope. The number of breeding birds will be counted and, wherever possible, a photographic record of the colonies will be taken.

So far public support for the project has been remarkable, with information and offers of help coming from all quarters. It is being assisted by military personnel in the Islands and an expedition from the RAF Ornithological Society, by various landowners and local enthusiasts. The counting of so many sites in one season is certainly a major undertaking, but hopefully the results will give us a clearer insight into the changes occurring in the penguins populations as a whole.



Ann Brown inspects EC Land Rover prior to shipment to the Islands. The vehicle was purchased with Penguin Appeal Funds for 1995-96 survey work.

BOOK REVIEWS

Penguins of the World

By Pauline Reilly

This book begins 'To see penguins coming out of the sea – walking, scrambling, leaping - is to become enchanted'. Pauline Reilly admits she was 'bewitched' irrevocably by penguins right from the start. In this book she conveys the world of penguins in simple language taking us chapter by chapter through all seventeen species, describing their biology, distribution, measurements, population, locomotion, diet, vision and breeding. She also addresses questions such as how do penguins navigate, how fast do they travel and how deeply do they dive? This is a straightforward, attractive and informative book for anyone who loves these unique birds. It is well illustrated and easy to read and would make an excellent present for Christmas.



Courtesy display: Snouwenberg Penguin illustration taken from *Penguins of the World*

Penguins of the World

by Pauline Reilly

Oxford University Press

164 pages

£12.99 ISBN 0 19 553547 2.

The Penguins

by Tony D Williams

This is the second handbook in the series *Bird Families of the World* (the first volume covering *The Hornbills*).

Each volume seeks to provide a comprehensive and accurate synthesis of the knowledge of one bird family for the keen amateur ornithologist and professional scientist. It contains some remarkable facts:

'Penguins are important consumers or predators of marine resources: the seven species in the Southern Ocean ecosystem consume an estimated 3.6 million tonnes of fish, 13.9 million tonnes of crustaceans and 0.7 million tonnes of squid each year.'

The book is in two parts, the first covering origins and evolution, distribution, breeding, biology and moult, foraging ecology, behaviour, and conservation. Part Two covers accounts of each penguin species, including recent research and published literature. For the serious penguin-phile it is an excellent and thorough work of reference packed with information though perhaps a trifle expensive at £35.

Bird Families of the World: The Penguins

by Tony D Williams

Oxford University Press.

300 pages.

£35. ISBN 0 19 854667 X

The Wreck of the Isabella

by David Miller

This is an exciting, racy tale which begins with the shipwreck of the *Isabella* on the Falkland Islands at the beginning of the 19th century. A true story, the result of very thorough research, yet it has all the ingredients of a work of great imaginative fiction. The author's interest was first stirred to investigating the 'American Crusoe' when shown a stone hut by Tony Chater on New Island, which incorporates today the remains of 'the Crusoe's' shelter. Five men abandoned here had endured 534 days castaway through two gruelling winters. What makes the

book so readable and fascinating is the everyday detail against a background of extraordinary adventures by a bunch of ordinary people.

Not only does it give us an account of an early period in the history of the Islands, but also provides glimpses of the wildlife, mostly it has to be said in the context of how starving men obtained their next meal – be it penguin eggs, albatross eggs, elephant seals, and even 'a fox' which they found to be totally unpalatable – though the pelt was used for a hat. The animal is described as *'the only species of quadruped found in the Islands, called the wolf-fox, from its resemblance to both these animals. It is about the size of the common shepherd's dog, with very long sharp fangs, and barks in the same manner, but not so loud. It digs a kennel under the ground, and preys upon the wild fowl and seal.'*

We learn how they competed for food with 'crowds of screaming, vicious skuas', and of how they tore up tussac roots which when eaten gave alarming symptoms and we learn that even in 1814 exploitation of the resources was well under way with the dreadful slaughter of thousands of seals described in revolting detail. There were occasions, however, when even these desperate men 'just watched the birds'. This is an excellent read for anyone, but particularly fascinating for anyone who has an interest in the Falkland Islands.

The Wreck of the Isabella

by David Miller

Leo Cooper.

260 pages.

£16.95. ISBN 0 85052 456 3.

The *Warrah* is the newsletter of Falklands Conservation, published twice a year. The Editor welcomes letters and articles for publication.

Copy date for next issue: 15 March 1996.
Back issues available £1 each (WARRAH 1-7; Falkland Islands Foundation 5-10)

The *Warrah*, or Falkland Fox (*Canis antarcticus*), was the only endemic species of mammal on the Falklands. This bold and inquisitive animal was probably never very numerous but, with the introduction of sheep, farmers backed by a Government bounty were encouraged to hunt them and the last one was killed in 1876. We hope this publication will play a small part in preventing any other Falkland wildlife following the same path to extinction.



Falklands Conservation

Registered charity number 279347

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The *Warrah* was designed and typeset by

Password Publishing & Design

Tel/Fax: (01603) 616292

ISSN 1357-9480

Printed on Recycled Paper

FC Attends Patagonian Shelf Workshop

On behalf of Falklands Conservation, John Croxall, Peter Prince, Michael Bingham, Sally Poncet and Robin Woods attended a Workshop in May 1995 on the *Conservation of the Marine Biota of the Patagonian Shelf*, hosted by the Wildlife Conservation Society in New York. The meeting identified the high global importance of the region both in terms of breeding species, wintering grounds for within-shelf residents and for migrants from outside the area.

The report of the meeting will contain a review of the status of the seabirds, seals and cetaceans together with a review of the main environmental threats. It is hoped that future developments will include a meeting of specialised workshops in late 1996/ early 1997 in Argentina, a one day symposium to present conservation and management aims to appropriate organisations (including Government), facilitating interchange of ideas on monitoring methods for key species (especially Magellanic penguins), and developing an integrated programme of research and management for marine animals in the region.

Falklands Conservation Shop

Booklets

Available from both FI and UK offices. Price £4.50 inclusive of postage and packing:

Wild Flowers of the Falkland Islands

Those Were the Days

Corrals and Gauchos

UK Sales (from UK office postage and packing inclusive in prices)

Preserving the Falklands (video) £7

Penguin Appeal Sweatshirt (XL only) £15

Christmas Card 'Along the Ice Front' and 'Orca Whales'
pack of 10 with envelopes £5

Numbered print of above painting £25

FI Sales (from FI office prices do not include postage)

T Shirt (M, L, XL, in white/grey/royal) £7.50

Polo Shirt, embroidered logo
(M, L, XL, XXL, in sky, green, white, royal) £15

Sweat Shirt with FC logo on front
(S, M, L, in teal, red, green, royal, XL red only) £18

Sweat Shirt with FC embroidered logo on front
(XL in navy, burgundy, grey) £18

Polo Sweat Shirt with embroidered logo
(M, L, XL, in green, grey, navy) £23

FC Baseball Caps (green/royal) £5

Car Stickers £1

Round Stickers £1

FC Key Fobs £3

FC Pins £2

Membership Contact Scheme

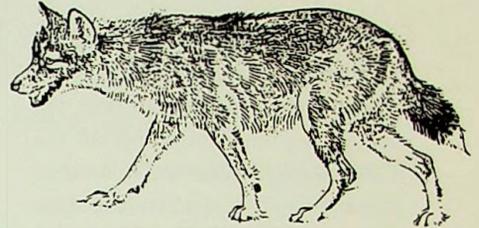
The revised Contact List is not available for distribution with this edition and will now be issued with the next *Warrah*. We still await returned forms from a number of members and would be grateful if these could be sent in as soon as possible. Further forms can be supplied on request.

Radio Programme to Feature Falklands Wildlife

Following on from our mention on the Natural History Programme in January, Falklands wildlife will be the subject of a complete programme to be broadcast on BBC Radio 4, December 15, 11.30 am, repeated Sunday 17 December at 8 pm. We understand that arrangements are being made to broadcast the programme in the Falklands and on the BBC World Service.

the WARRAH

Newsletter of Falklands Conservation



May 1996 - Number 9

Editor Ann Brown

COMMUNITY AND EDUCATION WORK TAKES OFF

Over the past six months Falklands Conservation has run its first school field trip, undertaken a second impressive beach clean up, organised a bird walk, produced a new poster, begun issuing a fortnightly local newsletter, and held regular monthly meetings with the military. This has all been due to the work of Fiona Didlick, our Community and Education Officer.



Fiona Didlick

Back to School

Working with the Islands' Schools has been a priority. A programme of conservation related activities submitted to the Junior School will give opportunities for children to acquire information, values, attitudes and skills needed to protect the environment, to improve their knowledge of native plants and animals and develop an appreciation of all living things. A number of these activities are linked to our sets of wipe-clean

identification charts (for insects, plants and birds) and to Sally Poncet's Wild Flower Project Pack. Fiona has already undertaken some classroom work, but also took a group of nine year olds on a field trip which turned out to be more thrilling than expected:

'Walking across the Camp in the vicinity of Yorke Bay, to the east of Stanley, one of the children called out that he had found "a thing" in a depression in the ground. The "thing" was round and green and to my horror looked very much like the cap of an anti-personnel mine. Fortunately, our children are well trained in dealing with ordinance left over from the 1982 Falklands War and made no attempt to touch it. Later that day the Bomb Disposal Unit investigated and found a buried cache of ammunition wrapped in sacking. The green cap was the end of a live mortar rocket. With it were four more rockets plus a bag of grenades and 1,000 rounds of ammunition, all of which were so un-

stable they had to be destroyed in situ. And we only went bird spotting!'

With a new Geography Teacher in post at the Senior School, plans are being laid for a number of conservation related projects for the older students.

Popular Support for Walk and Clean Up

Nudging Falklands Conservation into the public eye is a delicate task which has to be achieved repeatedly without becoming too aggressive or tedious. Two recent events have been well supported. The Bird Walk around Gypsy Cove on 13 January 1996 was well attended and should be the first of many.

The Whalebone Cove Beach Clean Up attracted even greater support. On 9 March eighty adults and children turned out in their wellies and, once issued with bin bags and gloves, set to making a significant difference to the appearance of the whole area. The majority of the rubbish found

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was plastic, but there were a number of medical items removed, some thought to have come from the Argentine medical dump on the Canache. A lot of hard work resulted in the filling of 93 large refuse sacks plus a variety of bigger items such as a bilge pump and two metal tanks hauled up for disposal. We would like to thank all the volunteers who gave their time to clean up the Cove, and also Consolidated Fisheries Ltd, Polar Ltd, Stanley Bakery, Mike Butcher, Dave Thorsen and, last but not least, Sgt. Sam Allen and his team from Hillside Camp who cooked everyone an excellent lunch.



The Gypsy Cove walk proved popular with families. Photo: Robin Woods.

The Dirty Dozen

The most common items found at Whalebone Cove

Small plastic items (6 pack yokes, toys, combs and toilet brushes)	22%
Plastic bags and plastic sheets	15%
Aluminium cans and bottle tops	13%
Glass bottles and broken glass	11%
Rope	10%
Polystyrene packaging and fragments	8%
Plastic containers and bottles	7%
Plastic strapping	4%
Sanitary towels, paper and cardboard	4%
Cloth items and shoes	3%
Fishing line and fishing net	2%
Medical supplies	1%

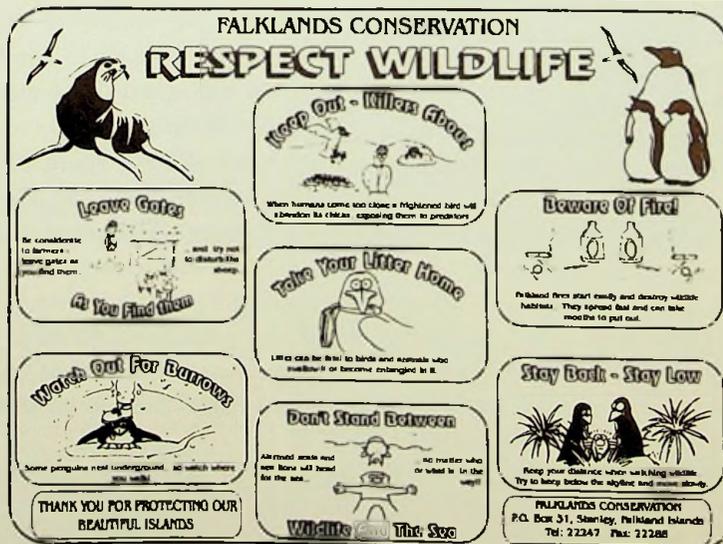
Community Includes the Military

Fiona's community role extends to the military forces stationed in the Islands. Recently, this has been made considerably easier by the appointment of a designated officer with whom she holds monthly meetings. As the majority of the two thousand military personnel are only in the Falklands for four to six months it makes it all the more important to keep educating new arrivals through regular presentations.

Future Plans

Projects in the pipeline include a Wildlife Watch Group in the Junior School, a display at the new museum at San Carlos and new promotional material. Falklands Conservation will be kept in the public eye through press releases about progress on the annual Seabird Monitoring Survey and other Falklands Conservation activities.

Fiona reflects that *'Taking up this newly created post in September '95 was just the sort of challenge I appreciate. Installed in the Stanley office, I have to admit that my initial reaction was "Where do I go from here?," but the first six months have been very rewarding.'*



The new 'Respect Wildlife' Poster distributed around the Islands' hotels and lodges. Produced by Christopher Didlick and Kate Levick for Falklands Conservation.

Letters

The Story of a GAP Student

Kate Levick recently spent six months in the Islands assisting Falklands Conservation between leaving school and going to Oxford University.

I arrived in the Falklands on 17 October after a gruelling 17 hour flight, disorientated and with no idea what to expect. I soon learned to expect the unexpected.

My first job was to help with the Penguin Census. I spent a month sailing around the smaller and more obscure islands on a 53ft boat with four men who I had never met before. Plunged into a world of wilderness and ocean, I visited vast colonies of penguin and albatross, scrambled over rocks, up cliffs and through ten foot high tussock grass in rain, wind and baking sun. I encountered seals, sea lions, dolphins, caracaras and giant thirty foot waves and got pecked, dived on or chased by much of the abundant and beautiful wildlife we encountered. We sometimes stopped at island settlements where we always received a warm welcome and excellent hospitality.

Back in Stanley at the beginning of November I spent a few weeks in the office doing various jobs including setting up a computerised filing system and producing a leaflet of conservation guidelines for tourists.

After Christmas fieldwork began again, and I went on a series of short camping trips with Jeremy Smith, gathering data for the Seabird Monitoring Programme. We travelled extensively throughout East Falkland, and I also got a chance to visit Pebble Island doing Baseline Survey work. Since my main task was to help analyse the diet samples we collected, my status in Stanley pubs changed from 'The Penguin Counter' to 'The Girl Who Studies Penguin Vomit'.

In short, I have had a fabulous time - the experience of a lifetime. I can't thank Falklands Conservation enough for giving me this opportunity.

What Future for Falklands Wildlife?

From Ms A Gendron, Northwood, Middlesex, UK.

I have just returned from my second visit to the Falkland Islands, the first being a stopover on the way back from Antarctica two years ago. As someone who lives and works in London, the sheer joy of spending time in such a tranquil, unpolluted haven is beyond words - although I am sure other readers will know exactly what I mean.

My visit on this occasion was precipitated by a growing concern for the future of the Falkland Islands given recent press coverage of commercial exploitation of resources and Argentine claims and enticements. I felt I should hasten my return before the unique habitat which I have been so fortunate to glimpse on my first visit was gone forever. An extreme reaction? Perhaps... or maybe I just needed an excuse to return earlier than my bank balance warranted!

Now I know that some development is inevitable and desirable if the community is to remain viable and prosperous. There can be no standing still and who am I to look gloomy when, for so many, development will bring the prospect of increased income and job opportunities. I am not selfish nor unrealistic, but I am concerned.

Did my visit do anything to reassure me? In some respects it did because I met so many dedicated and enthusiastic people committed to preserving the fauna and flora of the Islands. The 'wildlife mentors' as I call them, very generously shared their expertise with me and it was obvious that they, and many like them, would be a formidable obstacle to any development plans which would endanger the natural habitat. However, I had no real opportunity to talk to younger Islanders about their views nor did I see much evidence of their involvement in wildlife conservation. I was therefore particularly interested to read in Issue 8

of the *WARRAH* about Fiona Didlick's work in promoting an awareness and appreciation of the environment with youth groups and their teachers.

I say this because it seems to me that human nature, being what it is, tends to take for granted the familiar. Often we need a perspective of time or distance before we can appreciate what we have and value it accordingly. Younger Islanders who are currently working or studying in the UK, in some cases on development related topics, will at least acquire an objective view of their birthplace. This may encourage them one day to take over the work of the current generation of guardians, educators and advocates in protecting the unique qualities of The Falklands. I wish Fiona well in her endeavours because ultimately, the future of the Falklands lies with its young people. They will need to be aware of the dangers if they are to resist the insidious pressures of insensitive development and short-term vested interests.

Perhaps I am being too pessimistic. I do want to believe that appropriate safeguards, enlightened policies and careful management will successfully harness the interests of both the Falklands environment and its people, but I have seen too many examples where greed, influence and power have wrought havoc to the complacent.

I welcome the news that the long overdue Baseline Survey is now underway since information, preparation and foresight are essential prerequisites to any sensitive development strategy. Whilst I will be observing events in 1996 with some trepidation, the best way that I can express my appreciation for benefits that I have derived from visiting the Falklands is to be involved in any individual or collective efforts aimed at conservation.

Here, then, is my subscription, pledge of support and best wishes to all involved in Falklands Conservation.

Recent Bird Records

with commentary from Robin Woods, Author of *Guide to Birds of the Falkland Islands*

The spring and summer of 1995/96 has brought some very interesting records of vagrants and the rarer breeding birds. Records are presented in the order of species used in the 1988 *Guide to Birds of the Falkland Islands*. Photographs or descriptions were provided by some observers. An asterisk * marks records that have not been confirmed by pictures or descriptions. Incidentally, anyone seeing an apparently unusual kind of bird should compare it with a species that is well known and write some notes about the differences. Try to take photographs and find someone else who is willing to look at the bird, if it stays long enough! Illustrations are by Geoffrey McMullan and taken from the forthcoming *Atlas of Falkland Islands Breeding Birds*.

King Penguin *Aptenodytes patagonicus*; in December 1995, a bird at the Volunteer Point colony was carrying a flipper band (MR). Enquiries made by Sally Poncet established that it was banded at Husvik, South Georgia. This record provides the first evidence of immigration to the Falklands from the massive colonies on South Georgia.

Emperor Penguin *Aptenodytes forsteri; an immature bird was reported from Great Island on 20 January 1996 (N&RP).

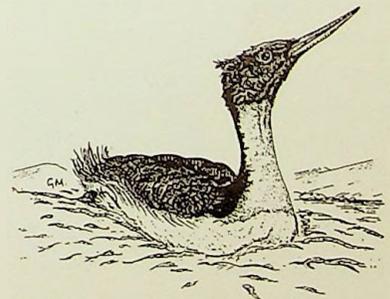
Rockhopper Penguin *Eudyptes chrysocome*; a very interesting record came from Macbride Head, where an adult with a small bill and very long and thick yellow head

plumes was photographed in December 1995 (MM). This is the first Rockhopper that has been noticed in the Falklands showing the characteristics of the race *E.c. moseleyi* that breeds on Tristan da Cunha, Gough, Amsterdam and St Paul Islands. An incubating adult penguin, apparently a hybrid between the Rockhopper and **Macaroni Penguin *E. chrysolophus*** was pointed out at New Island on 7 December 1995 (IS,RW). The head showed eyestripe, crest and bill characteristics of both species but did not resemble other species of crested penguin (*Eudyptes*). Hybrids between Rockhopper and Macaroni have been recorded in the past, though not apparently in the Falklands.

Great Grebe *Podiceps major, one at Burnside on 10 November 1995 was thought to be the same bird that was seen in June (BK). One was seen in Chabot Creek, Johnson's Harbour, from 19 December 1995 to at least 8 January 1996 (MR).

Observations from individuals are identified as follows:

AB	Ann Brown, Falklands Conservation, UK	LT	Lesley Thomson, British Antarctic Survey
BK	Bill Kidd, Burnside	ME	Michael Edwards, Preston, UK
CM	Carol Miller, Falklands Conservation, Stanley	MG	Squadron Leader Martin Godfrey, Mount Pleasant
CMu	Commander Clive Murgatroyd, Mount Pleasant	MM	Mike Morrison, Port Louis
CO	Captain Carol O'Nians, Adjutant General's Section, Mount Pleasant	MR	Mike Rendell, Stanley
DG	David Gray, Sea Lion Island	N&RP	Nancy & Raymond Poole, Great Island
DM	David Mcleod, Stanley	RAFOS	Nick Smith, Mike Hays and others of the Royal Air Force Ornithological Society expedition to Saunders and Pebble Islands
FC	Fred Clarke, Hawkbit, near Mount Pleasant	RB	Ron Buckett, Stanley
GS	George Smith, Johnson's Harbour	RW	Robin Woods, UK
IS	Ian Strange, New Island	SF	Sonia Felton, Goose Green
JD	John Davies, Stanley	SK	Shirley Knight, Coast Ridge, Fox Bay
JM	James McGhie, Pebble Island	SM	Steve Mee, British Antarctic Survey
JSn	Joan Stephenson, Moody Brook	WF	Walter Felton, North Arm
JSp	Joan Spruce, Stanley	WW	Will Wagstaff, Isles of Scilly, a tour leader in January 1996
KS	Katrina Stephenson, Stanley	ZS	Zachary Stephenson, Stanley
KW	Keith Whitney, Douglas Station		

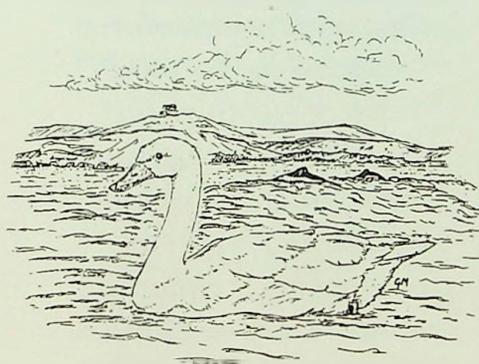


Great Grebe at sea

Common (Great White) Egret *Egretta alba; one was seen at Felton Stream, Stanley in December 1995 (JSn).

***Buff-necked Ibis** *Theristicus caudatus*; one at Fox Bay East from 2-5 January 1996 (JSp, SK). One seen at Stanley Airfield on 6-7 April (KS) was probably the same bird that was seen in a garden on Fitzroy Road, Stanley 'fit and healthy', on 10 April (RB).

Chilean Flamingo *Phoenicopterus chilensis*; one was reported from ponds in the eastern part of Carcass Island from 1 December 1995 (CO). One adult, possibly the same bird, was seen by many visitors and photographed in the vicinity of the King Penguin colony at Volunteer Point between 10 and 14 December (AB). It was seen there again up to at least 21 December (MR). A flamingo was reported from Sparrow Cove off Port William on 6 April (ZS).

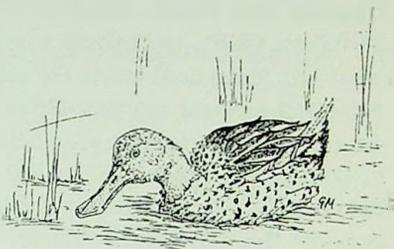


Coscoroba Swan

Coscoroba Swan *Coscoroba coscoroba*; two on the Big Pond, Pebble Island were reported by RAFOS between 29 November and 9 December 1995. They remained in the area for much of December, were photographed (CO) and were reported again on 15 January 1996 (WW).

Ashy-headed Goose *Chloephaga poliocephala*; a single bird found at Douglas Station (KW) on 14 September 1995, was photographed (MM) and remained in the area until the end of October.

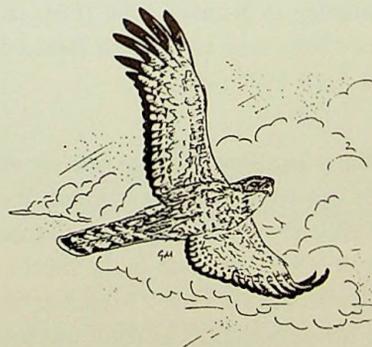
***Red Shoveler** *Anas platalea*; one adult male was on Bett's Pond, Pebble Island on 15 January 1996 and an adult female and immature male were on Green Pond, Pebble Island on 16 January (WW).



Red Shoveler

***Lake Duck or Argentine Blue-bill** *Oxyura vittata*; one adult male was on Ship Harbour Pond, Pebble Island, between late November and 9 December 1995 (RAFOS), though conditions were not good enough to be certain whether it was this species or the similar Peruvian Ruddy Duck *Oxyura jamaicensis*. One, possibly the same bird, was seen on Swan Pond, Pebble Island, on 16 January 1996 (JM, WW).

***Cinereous Harrier** *Circus cinereus* and ***White-winged Coot** *Fulica leucoptera*; single birds of both species were reported from Pebble Island between 29 November and 9 December (RAFOS).



Cinereous Harrier

Hudsonian Godwit *Limosa haemastica*; this past summer there were far more reports than in any previous year. Two were seen at Barrow Harbour, east of North Arm settlement on about 20 October (WF); 15 were at Victor Creek, north of the settlement on Pebble Island on 24 October where they were photographed (JM); 30 were in the Bertha's Beach area of East Falkland on 29 October (CO) and up to 25 were seen at Fox Point nearby on 31 October (FC). On 16 November 12 were at the west end of Concordia Beach, north of Salvador (CM) and between 29 November and 9 December, two were seen on Pebble Island (RAFOS). This large shorebird which breeds in the central Canadian Arctic was thought to be nearly extinct because very few were seen on eastern coasts of North America. It is now known that flocks overfly temperate North America on the way to their wintering grounds in southern South America. Aerial survey work between 1982 and 1986 showed that over 19,000 of these godwits wintered in Bahia San Sebastian on the Atlantic coast of Tierra del Fuego (Morrison & Ross 1989). With such numbers regularly visiting within 750km (500 miles) of central Falkland Sound, it needs only a slight deviation from their flight path for some birds to end up on Falkland coasts.

Whimbrel *Numenius phaeopus*; one was seen and heard flying over Kidney Island on 23 October 1995 (RW) and two were seen near Volunteer Beach on 27 October (GS). Single birds were heard uttering their distinctive flight-calls and were seen on 26 and 29 November near Bertha's Beach (CMu, CO).

Sanderling *Calidris alba*; these active little shorebirds were again present in the Bertha's Beach area of East Falkland. Three were seen on 29 October 1995 and a month later, 32 were counted (CO).

Baird's Sandpiper *Calidris bairdii; one probably of this species was flushed from beached kelp at Ronda, Salvador on 7 January 1996 (RW) and two were seen at the eastern end of Sea Lion Island with White-rumped Sandpipers *C. fuscicollis* on 14 January (WW).

Wilson's Phalarope *Phalaropus tricolor*, a single bird was reported from Sea Lion Island on 16 November 1995 (DG). Foggy weather on 20 November caused cancellation of a FIGAS flight and allowed a visit to the ponds in the eastern part of Pebble Island. On the shore of Green Pond, three phalaropes found resting behind a boulder (JM,LT,RW,SM) were watched and photographed; one was seen at Swan Pond, Pebble Island, on 15 January 1996 and three again at Green Pond on 16 January (WW).

White-bellied Seedsnipe *Attagis malouinus*; a chance remark on 1 December 1995 by a visitor (ME) at breakfast on Sea Lion Island eventually led to the sighting of this very unusual bird on sandy banks, where it was photographed (RW). This species was last recorded in April 1991 by Peter Abbott, north-east of Bertha's Beach and the only other record this century came from Stuart and Jesse Booth in 1981 on Cape Pembroke.

Arctic Skua *Stercorarius parasiticus*; three birds were identified in the Bertha's Beach area on 26 November 1995, with a further sighting the following week (CO).

Falkland Skua *Catharacta antarctica*; one of the two birds that were colour ringed by children in 1981 returned again in December 1995 to North Arm. 'Ringo Right' still wore the spiral white chicken ring it was given 14 years earlier. Its plumage was much lighter than most others that fed around Philip and Isabel Hutton's house (RW).

Eared Dove *Zenaida auriculata; only one record, of a bird outside G and J Fiddes' house on Fitzroy Road East on 12 March 1996.

Barn Owl *Tyto alba*; one long-dead bird was found on the sand dunes at Elephant Bay, Pebble Island on 16 November (RW). In December another was found dead inside the old gorse and peat-sod corral at Salvador (NP) and a third in an old stable at Darwin by Sonia Felton (SF). Breeding was proved at Port Louis and Seal Bay and suspected at several other settlements in East Falkland. Fifty pellets examined were found to contain remains of many House Mice *Mus musculus*, some remains of rats and several small songbirds. The Seal Bay owls are apparently catching mice locally as the nearest settlement of Johnson's Harbour is 12.5 km (8 miles) to the south.

Fire-eyed Diucon *Pyrope pyrope; one was seen at Beaver Island during the first half of November and a male of the distinctive ***Rufous-backed Negrito *Lessonia rufa*** was seen at Tea Island in early November (DM).

Chilean Swallow *Tachycineta leucopyga*; two were seen at West Point Island on 1 and 2 November 1995 (JD, RW), one at Beaver Island in early November (DM) and two at New Island on 7 December (AB). Another was at Gypsy Cove near Stanley in January 1996 (CM) and two were seen on Carcass Island on 8 April 1996 (MG).

Barn Swallow *Hirundo rustica*; one to two were at Kidney Island, East Falkland on 23, 24 and 25 October 1995 (RW), one was in the Bertha's Beach area between 23 October and 6 November (CO), an adult was seen at Beaver Island on 6 December and an adult and immature were hawking near Stanley Airfield on 5 January 1996 (RW).

Rufous-collared Sparrow *Zonotrichia capensis*; one bird with head stripes (one of the races breeding in central Argentina) was photographed on Pebble Island between 9 and 22 September (JM) and two birds, also with head stripes had an assisted passage on the RS James Clark Ross from Montevideo to the Falklands between about 20 and 25 October 1996 (LT, SM). Two were seen at Sea Lion Island on 29 March 1996 and three at Carcass Island on 8 April (MG).

We are grateful to all those observers who reported such a good batch of sightings this year. We hope that you will continue to look out for and report any unusual birds either to Alan Henry or Carol Miller in Stanley or to Robin Woods via Falklands Conservation, UK.

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Distribution and Movements of South Georgia Black-browed Albatrosses

Implications for Falkland Islands' Populations

Recent research at South Georgia by scientists at the British Antarctic Survey (including Falkland Conservation Trustees John Croxall and Peter Prince) highlights the problems from fisheries for the black-browed albatross, of which the Falklands hold 85% of the world population.

Using satellites to track black-browed albatrosses breeding at South Georgia has provided new insights into their at-sea movements and distribution. Combined with information from recoveries of banded birds on distribution outside the breeding season, these data provide the first real overview of the species' year-round movements. This information is important for assessing the vulnerability of South Georgia black-browed albatrosses to both natural and human-related environmental changes and influences. It also allows some insights into present and future threats to black-browed albatrosses breeding at the Falkland Islands.

Background

The diet, feeding ecology and population dynamics of black-browed albatrosses *Diomedea melanophris* have been studied at Bird Island, South Georgia since 1976 (eg Prince 1980, Prince *et al.* 1994). In addition some adults and many juveniles were banded there in the 1960s by Ron Pinder and Lance Tickell as part of a study of breeding biology (Tickell & Pinder 1975).

Recent work has indicated that, following probable population increases in the 1970s, many black-browed albatross colonies at Bird Island started to decline in the 1980s and that all are currently decreasing. This mainly

reflects a massive reduction in survival of juveniles, with only 5% of a year class surviving nowadays compared with 27% in the early 1970s and also, more recently, reduced adult survival.

These changes made it vital to find out more about the distribution at sea of these black-browed albatrosses and in particular their potential for interaction with longline fisheries, an important source of mortality for most albatross species (Gales 1993). We used satellite transmitters (for details see Prince *et al.* 1992) to record the movements at sea of birds while rearing chicks. We used recoveries of banded birds to assess general distribution and movements,

ceedings volume (Croxall *et al.* in press; Prince *et al.* in press).

Satellite Tracking

While rearing chicks, black-browed albatrosses from Bird Island make trips lasting about 2 days and are abundant over the shelf waters of South Georgia and Shag Rocks and not uncommon at the South Orkney Islands (Fig. 1).

They are also widely distributed over deeper water in the area of the Antarctic Polar Frontal Zone to the north of South Georgia and more locally in certain areas in the southern Scotia Sea. Despite travelling up to 6,000km on round trips and reaching distances of 1,300km from South

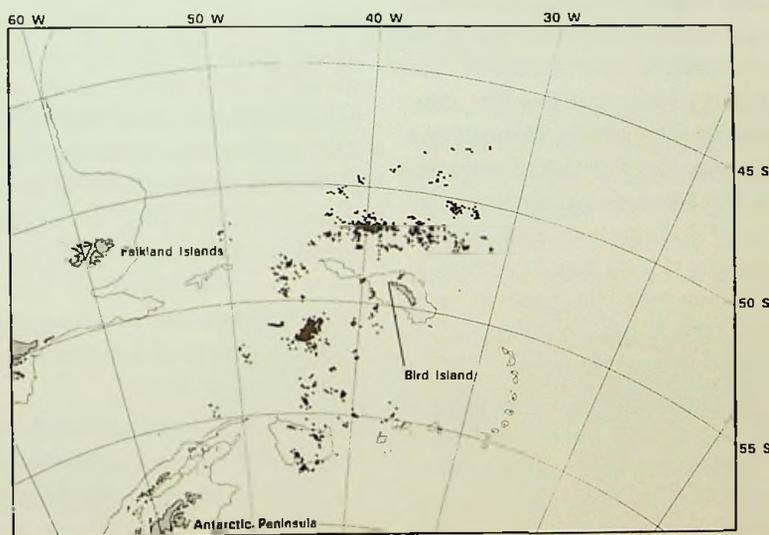


Fig 1: Distribution at sea of black-browed albatrosses, breeding at Bird Island, South Georgia, during the chick-rearing period, January-March 1993.

particularly outside the breeding season. Many of these data were presented in greater detail to the International Conference on the Biology and Conservation of Albatrosses in Hobart in August 1995 and will be published in the forthcoming pro-

Georgia, none of our birds foraged near the Falklands – or indeed anywhere over the Patagonian Shelf.

In each of two years we tracked one bird after its breeding had finished. Both birds followed very similar paths from an area just to the north-east of

South Georgia direct to South Africa (Fig. 2). In crossing the South Atlantic Ocean the 1992 bird covered a minimum distance of 4,213km in 8 days; the 1993 bird travelled at least 4,522km in 4 days at a minimum average speed of 48km per hour. Both birds then stayed in the waters of the South African shelf within the Benguela Current until their transmitter batteries failed. Comparison of their localities with those of local fishing vessels showed that both were operating simultaneously in identical areas.

Recoveries of Banded Birds

Since 1959 some 2,905 adults and 24,250 chicks of black-browed albatrosses have been ringed at Bird Island. Of the 9 adults recovered away from South Georgia, 6 were from South Africa, 2 from the South Atlantic and 1 from Australia. Of the 262 recoveries of chicks, 85% came from South Africa, 9% from Australia, 4% from South America and 2% from the South Atlantic.

This suggests that adult black-browed albatrosses from South Georgia commute annually to and from South Africa, with only a very few moving east to Australia. Juveniles show a very similar basic pattern but range slightly more widely, particularly to the east. Very few indeed move west to the large area and productive waters of the Patagonian Shelf. Most recoveries of birds have come from association with fishing activity. In recent years this has almost exclusively related to longline fishing.

The movements of South Georgia black-browed albatrosses are in marked contrast to those of birds banded in the Falkland Islands by Roddy Napier, Robin Woods and others in the early 1960s. Of 8,793 chicks banded, 66 were recovered, 88% from South America and only 12% from South Africa (Tickell 1967).

Implications

We believe that the reduction in survival of juvenile black-browed albatrosses from South Georgia has mainly reflected their interactions

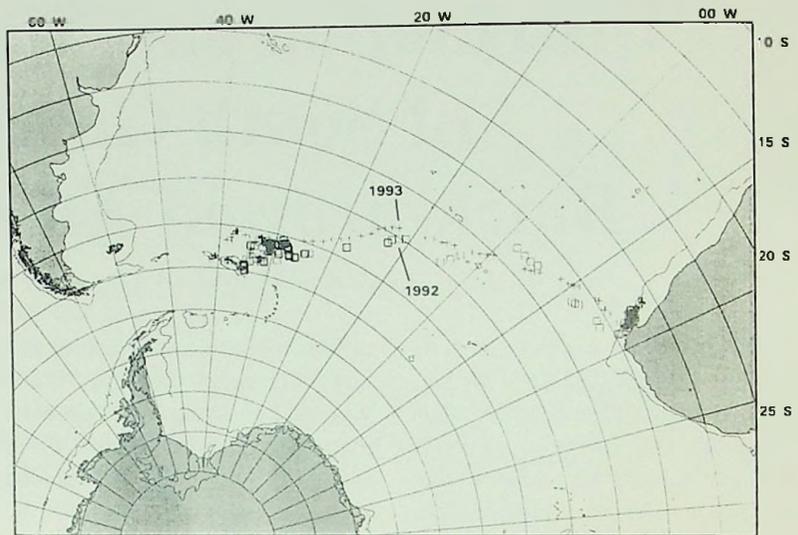


Fig 2: Tracks of black-browed albatrosses, after concluding breeding activities at Bird Island, between South Georgia and South Africa, in March-April of 1992 (squares) and 1993 (crosses).

with trawlers (we presume birds were killed, until fairly recently, by collisions with netsonde monitor cables (see Bartle 1991) in South African waters but more especially with longline vessels fishing for tuna to the south and south-east of South Africa. The very recent increase in adult mortality, however, may well reflect interactions with longline vessels fishing for Patagonian toothfish *Dissostichus eleginoides* around South Georgia. This fishery started in 1988, almost exactly coincident with the recent decrease in adult survival. The current development of longline fisheries for hake in South African shelf waters has serious implications for South Georgia black-browed albatrosses – particularly as measures to reduce/prevent albatross mortality in these fisheries are not yet in use.

The available data suggest that there is relatively little overlap between black-browed albatrosses from South Georgia and the Falklands, which together form 95% (11% and 84% respectively) of the world population of the nominate race of the species.

Most Falkland Islands' black-browed albatrosses, probably being restricted year round to the Patagonian Shelf, should be relatively unaffected by interactions with fisheries around South Georgia and South

Africa. However, they are seriously at risk from longline fisheries operating anywhere over the Patagonian Shelf – from Uruguay to Tierra del Fuego. Recent accounts (Schiavini *et al.* in press, Stagi *et al.* in press) of the massive development of longline fisheries in this region (largely, if not exclusively, without the use of measures to prevent albatrosses being killed) indicate that sometimes hundreds of black-browed albatross are killed on single sets of longline (several thousand of which take place during a fishing season). Most of the victims will be Falkland Islands' birds and it cannot be long before Falklands' populations, once increasing (presumably through benefits from discards and offal from local trawl and jig fisheries (Thompson 1992, Thompson & Ridy 1995) begin to be affected. Indeed it is of concern that one of the two largest Falklands' colonies, at Beauchêne Island, has decreased from 140,000-170,000 pairs in 1980 (Prince 1982) to 135,000 pairs in 1991 (Thompson 1993) and to 109,000 pairs in 1993 (M Bingham *in litt.*).

All this suggests an urgent need for the widespread use of techniques to reduce the mortality of albatrosses caused by longline fisheries. Thanks particularly to the efforts of Consolidated Fisheries Ltd, longline vessels

fishing around the Falklands do now use streamer lines to discourage birds and have available good information on how to use these (and other) devices to maximum effect. However, it may be time to consider also restricting the setting of longlines to night-time because experience around South Georgia has shown that this reduces albatross bycatch to very low levels indeed (Ashford *et al.* 1995; CCAMLR 1995). Adoption of such measures around the Falklands would greatly strengthen the case for seeking to have similar measures introduced into longline fisheries operating elsewhere on the Patagonian Shelf. Only by improving the operations of these fisheries can we protect adequately the black-browed albatross population of the Falklands - the world stronghold for this species.

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PENGUIN APPEAL

Particular thanks are due to the following for their contributions in the last few months:

Sir Peter Daniell Charitable Trust
 Sir John Gielgud Charitable Trust
 Manifold Charity Trust
 Sir Andrew Carnwaths Trust
 HDH Wills 1965 Charitable Trust
 Fyffes Group
 Whitley Charitable Trust
 Godinton Charitable Trust
 Laspen Trust
 The Bromley Trust
 Marsh Christian Trust
 Lindeth Charitable Trust
 John Ellerman Foundation
 The Bewley Charitable Trust
 Miss Eileen M. Tyler's Charitable Trust
 The Study Preparatory School whose pupils donated a magnificent £800 when the Appeal was adopted as the term's good cause and
 Sue Barrett for the 10,000 Chilean



pesos left over from her holiday.
 Good luck to Lucy Tipton who is running a sponsored Penguin Day at School - everyone taking part 'to dress-up like a penguin, only eating fish and drinking water'!

We would be pleased to hear from anyone able to sell quantities of our Penguin Appeal beakers (available only in 96 sets of four: Rockhopper, Emperor, King and Adelie). Enquiries to Ann Brown at the UK Office.



Our recent Penguin Census of the Islands was successfully undertaken by three shoreward teams covering East Falkland, West Falkland and a boat-based team for the smaller islands. A full report will feature in the next issue. The Census Team before departure (left to right): Kio Smallwood, Mike Riddy, Kate Levick, Sinead Doherty, Jeremy Smith and Michael Bingham. Photo: Fiona Didlick.

Songbird Studies in the Falklands

By Robin Woods

The letter from Don Kroodsma in Amherst, Massachusetts, came as a complete surprise. He has studied Grass Wrens in the United States and Central America and wanted to tape-record the Falkland Islands' Grass Wren. Earlier work has led him to believe that some individual wrens have up to 150 different song phrases. How many did Falkland Grass Wrens have? The only way to answer this question was to visit in spring and spend hours standing in the cold dawns and early mornings watching, listening to and tape-recording individual wrens as they sang.

In 1995 I was planning a three-month visit for general bird observations linked with botanical recording. We arranged to share field work and in mid-October left for the Islands. Don had only one month, so we were at work, taping Grass Wrens on Kidney Island within two days of landing at Mount Pleasant. Apart from marvelling at the thousands of Sooty Shearwaters and White-chinned Petrels that milled over the Island at dusk, we obtained tapes of the song repertoires of about six Grass Wrens in the week. We were outside the hut by 05:00 most days, trying to get into position near our selected birds in order to record their first songs and then follow them as they moved about their territories, from perch to perch on tall, dense tussac for two or three hours. By that time, songs tended to become less frequent and we were definitely in need of a substantial second breakfast.

During the week we experienced weather from near calm and warm (one afternoon) to strong gales with hail and snow showers. Even the latter did not deter our wrens from singing in near-freezing temperatures before dawn when it was barely light

enough to see them. We also trapped 18 male wrens in mist-nets and marked each with a numbered aluminium ring and one or two coloured plastic rings. We found eight more males within the areas that we surveyed and calculated that each singing bird had a territory of 0.8 hectares, similar to the territory size calculated for one male in the 1983 census plot (Woods 1984). We thought that this famous island with its dense cover of old tussac probably supported about 40 pairs of Grass Wrens. They were all in the tussac rather than on the beaches and seemed to be fairly evenly spread across the Island which was not surprising, given the general uniformity of the habitat.

We were rescued from Kidney Island on 25 October in a southerly gale with large snow squalls. By the following afternoon we had flown over 100 miles by FIGAS Islander to West Point Island, where we arrived in much better weather. There were singing Grass Wrens in Boxwood Point paddock, a fenced coastal strip replanted with tussac over a century ago, as in 1963 (Woods 1984). This habitat was easier to work in than on Kidney Island because the tussac grew in irregular patches separated by low grasses, especially introduced Yorkshire Fog and native Cinnamon Grass. Once again, we aimed to be

out by dawn each day and on some days were both ready to record before the wrens started singing. We obtained good long samples of songs from a few males and found one nest being built by a male between bouts of singing.

Other songbirds on West Point Island made a big impression, both from their numbers by the house we were living in and the volume of their songs. Falkland Thrushes sang from first light through most of the day. This was especially true of one male whose favourite perch was the top-most twig of a large Monterey Cypress, at least 10m tall. He sang against three or four others in adjacent cypresses. When not singing, these males seemed to spend considerable time chasing each other through the twigs of the trees, uttering harsh callnotes. I returned to West Point Island for Christmas six weeks later and was somewhat surprised to find several Thrushes at the settlement still singing strongly each morning, though I knew that at least one brood had already fledged from some nests. Possibly the most varied songs close to the settlement came from Black-chinned Siskins. These tiny yellow-green birds often moved in small twittering parties and it was not unusual to hear more than one male singing strongly from a single



Don Kroodsma tape-recording a Grass Wren west of the hut on Kidney Island, East Falkland. Photo: Robin Woods

patch of cypresses. Roddy and Lily Napier felt that the very severe weather with snow lying for 87 days from mid-June and which was rounded off by a ferocious freezing blast in September, had killed the majority of siskins. Even so, there were still several pairs resident at the settlement and they made their presence known almost continuously. The third type of song, which was very noticeable around the trees at West Point settlement, came from Long-tailed Meadowlarks. Pairs of these starling-like birds have a habit of singing duets. Often the amazingly red-breasted male would be singing from a fence post or branch while the female would sing what sounded like a short echo of his song, from the ground nearby. Meadowlarks apparently found the thick low gorse, Magellanic Currants, cypresses and fuchsias to their liking at the settlement. They also occupied the open tussac in Boxwood Point, where the adjacent boundary fence of posts and wire provided many convenient song perches.

By early November, we had moved to Carcass Island, only four minutes flying-time away by FIGAS Islander. On our first afternoon, we did not find any Grass Wrens during a reconnaissance of the large Point paddock near the settlement. However, we did find some Cobb's Wrens and Tussacbirds, two species that had been noticeably absent from West Point Island. Tussacbirds lived along the shore and further inland around the three houses on Carcass Island. At 04:35 the next morning, one started its repetitive, staccato trilling song near our front door and several others were singing or chasing near the gorse and cypresses around the other houses. Later that morning we located several Grass Wrens by playing short snatches of pre-recorded song. On later days we both taped lengthy song sessions by a few males singing from dense tussac grass, just like those on Kidney Island. Don felt that we had obtained enough Grass Wren songs for analysis and



Grass Wren singing from dense tussac. Photo: Robin Woods.

comparison after a few days, so we studied Cobb's Wrens. Most males occupied territories with dense tussac bordering the shoreline of boulders or bedrock. Accumulations of dead rotting kelp, harbouring flies and small crustaceans, provided these wrens with a ready larder. With no introduced feral cats or rats on Carcass Island, conditions were ideal for this tiny endemic bird. Their territories were therefore small, which inevitably lead to much vocal competition between males and plenty of song to record.

At the end of Don's month we had collected about 60 hours of song, the majority from Grass Wrens. Before I returned to England in January, I visited several other islands and mainland settlements and was able to sample Grass Wren song on Sea Lion Island, the most southerly locality at which they occur in the Falklands and on Split Island off Beaver Island, the most westerly with tussac. Analysis of songs has started in Amherst but there is still much to do, including comparison of songs from different islands in the Falklands. We hope that it will be possible to measure the degree of similarity between the Grass Wrens of Kidney Island and Sea Lion Island, for instance, by comparing the song phrases used at each locality.

After Don Kroodsmas left, I spent time tape-recording Falkland Thrushes where Grass Wrens were absent. I found several thrushes singing around the Marble Shanty on Pebble Island, where there were few other passerines and certainly no Tussacbirds or Cobb's Wrens, probably due to the rats and

feral cats that live in the open camp. We hope to compare Thrush songs from many of these islands, looking for similarities and differences, which may give us clues to the extent of local movements of this endemic race.

This field work was the first to concentrate on the songs of Falkland passerines and it goes a little way towards redressing the bias toward studies of the large, conspicuous and spectacular penguins and albatrosses. Although Cobb's Wren and the Tussacbird could be affected by contamination of the seashore, other songbirds may not be potentially at risk from oil exploration, drilling or transportation. However, they have all suffered tremendous loss of habitat through destruction of the natural vegetation, particularly tussac grass, and their current populations are only a fraction of what they were before the Falklands were settled by humans.

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Newsletter No 2, Falkland Islands Foundation, August 1984, pages 4-6.

Acknowledgements

We are grateful to the Falkland Islands Government for allowing us Duty Fare concessions on the transatlantic flight and for permitting the mist-netting of these songbirds. We are also grateful for the hospitality and assistance given and the interest shown in our work by many local people.



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The *Warrah* is the newsletter of Falklands Conservation, published twice a year. The Editor welcomes letters and articles for publication.

Copy date for next issue:

9th September 1996.

Back issues available:

£1 each (WARRAH 1-8;
Falkland Islands Foundation
5-10).

The *Warrah*, or Falkland Fox (*Canis antarcticus*), was the only endemic Falklands mammal. This bold and inquisitive animal was never very numerous but, with the introduction of sheep, farmers backed by a Government bounty were encouraged to hunt them. The last one was killed in 1876. We hope this publication will play a small part in preventing any other Falkland wildlife following the same path to extinction.

The *Warrah* was designed and typeset by
Password Publishing and Design
Tel/Fax: 01603 616292

ISSN 1357-9460

Printed on Recycled Paper

Books & Reports

The Falkland Islands is a new and comprehensive bibliography covering the history, geography, economy, politics and people of the Islands (and including South Georgia and the South Sandwich Islands). It contains descriptive, up-to-date references for books, maps, conference papers, journal articles and a small number of Spanish language publications. Sections of particular interest to the Falklands naturalist include 'Conservation and Environmental Management', 'Flora and Fauna', 'Geography and Geology' and 'Agriculture, Forestry and Fisheries'. It is well laid out and easy to use. Although probably not totally comprehensive in every section, it provides an excellent starting point for anyone interested in researching a particular topic and has many intriguing (often historic) entries leaving one wishing for immediate access to a huge library. Indeed only the long-term really serious scholar would be able to justify purchase of such an expensive book, even if it is crammed with information.

The Falkland Islands: Volume 184, World Bibliographic Series compiled by Alan Day.

ABC-CLIO Ltd

ISBN: 1-85109-236-6.

231 pages + 2 maps. £39.50.

Southern Sea Lions in the Falkland Islands (Population size, foraging behaviour and diet) is the official report of a project carried out by the Sea Mammal Research Unit over the period 1991-1995 for Falklands Conservation. The main findings of this work were reported in WARRAH 7.

The full Report is now available for purchase by members of Falklands Conservation at the special price of £10 including postage and packing (£15 to non-members).

A Selected Bibliography of Falkland Island Birds by Barry Phillips, produced in 1983 for the Falkland Islands Foundation. We still have a number of these available for sale from the UK office. It is inevitably somewhat outdated, but is a very detailed list of the bird references known at that time and remains a useful document for the keen Falkland ornithologist. Special price of £2 including postage and packing.

Wildlife Cartoon Notecard (below) by Charlie Coleman. No message. In aid of and available from Falklands Conservation (UK & FI) £3 for 10 including envelopes and postage. Also available individually to personal callers at the Stanley Office.



Correction:

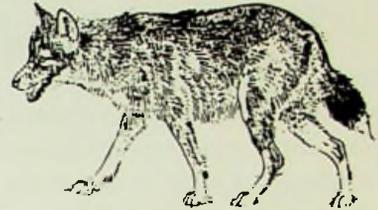
In the article 'Tussac Island Restoration' which appeared in WARRAH 8 it was stated that Rookery Island belongs to Falklands Conservation. This is not correct - it is in fact part of the Beaver group of islands and belongs to Sally and Jerome Poncet. We apologise for any embarrassment this may have caused. We got confused with 'our' Rookery Island near San Carlos. In addition, New Island is known only to have the black rat (*Rattus rattus*) not the common rat.

Obituary

We are sad to report the death on 21st April 1996 of Neville French CMG, LVO, a Vice President of Falklands Conservation and Governor of the Falkland Islands 1975-77. Although he did not play a very active role in our affairs, he gave his name to further our cause over the past sixteen years and was a sincere believer in the importance of the unique wildlife of the Islands. We shall miss his distinguished support.

the WARRAH

Newsletter of Falklands Conservation



November 1996 - Number 10

Editor Ann Brown

WILDLIFE PROTECTION LAWS TO BE UPDATED

In August 1995 Falklands Conservation presented a report to the Falkland Islands Government on how to improve legal protection for the wildlife of the Islands. The Government recognised the need to update its conservation laws and has accepted the broad principles of the Report. A process of public consultation is now nearly complete and legislation is likely to be enacted early next year. This will be a major step forward in safeguarding an environment of world heritage quality.

The Need to Update

It is widely recognised that the current conservation legislation is weak, outdated and ineffective. In his Report to the Falklands Government 'A New Look at Nature Conservation Law in the Falkland Islands', Kevin Standring (a Trustee of Falklands Conservation and an expert in environmental law, whose time was donated by RSPB for this work) identifies a number of major deficiencies which any revision needs to address, in particular:

- nature reserves can only be established for study/research
- there is no protection for plants
- there is no protection for invertebrates or fish

The Land

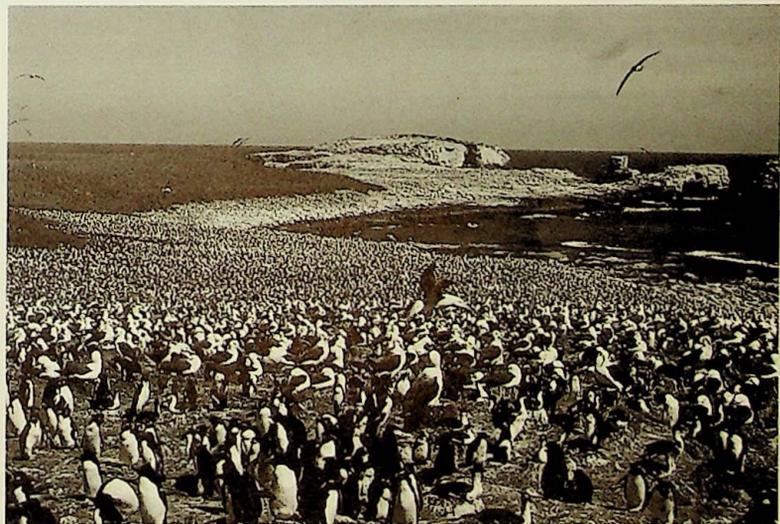
In order to give protection to the very best of the Falkland natural heritage, but in addition to provide areas for public enjoyment and education, two new categories of nature conservation area are proposed: 'National Nature Reserves' to take the place of

existing wild-animal and bird sanctuaries and nature reserves; and a new category of 'Environmentally Sensitive Areas'. ESAs would be areas of special scientific merit and/or of national heritage value. They would provide a checklist of key areas relevant to planning and development control. NNRs (under revised legislation) are likely to be on both Government and private land, with the owners agreement and co-operation.

The Sea

There is currently no protection for inshore marine areas such as the extensive Falkland kelp beds. It is suggested that marine areas up to the twelve-mile limit of Falkland territorial waters be included in any revised legislation provisions.

Beaucherne Island has a pristine ecology. It is one of 21 Government-owned nature reserves - all uninhabited islands. Photo: Prince & Pearson



In This Issue: Status of Falkland Penguins 1933 - Penguin Population Census 95-96 - Falkland Islands Insects - The Eleven Spot Ladybird in the Falkland Islands - Of Fish and Birds - Local News

Taking or Killing Animals

It is proposed that a single measure be introduced to make it an offence to take or kill wild birds or animals by methods such as the use of live decoys, electrical devices capable of killing or stunning, artificial light sources, explosives, crossbows, poisons, automatic weapons, or non-selective traps and nets. The wording of this new regulation will, however, have to take into account control of pest species (such as rats and flies).

Egging

'Egging' has been a long standing Falklands custom. However, the taking of penguin and albatross eggs for food alone is no longer an important social necessity, and today it should not be encouraged unnecessarily. Which birds eggs (if any) should continue to be taken for food will be the subject of important public debate in the Islands to determine any appropriate changes to current practice and control, including a review of the egg collecting licensing system.

Any revised licensing system should require the landowners written consent, be specific as to location, and the quantities to be taken.

Shooting Birds

It is proposed that all wild bird species be protected in law. There may, however, be some particular exceptions – the Upland Goose may be exempt and continue to be huntable all year round and its eggs freely collectible.

Two categories of bird are unprotected under present legislation. In the first category



The Johnny Rook is in imminent danger of extinction on the South American mainland. How can it best be protected in the Falklands?
Photo: J Cruick

are those considered as 'pests' which may be killed at any time and by any means, and includes the Crested Caracara, Thin-billed Prion and Turkey Vulture. The second category is classed as 'game species' which can be hunted outside of a closed season, and these include species of duck and snipe.

The Review Working Group set up by the Government to consider new legislation proposals has recognised that there are strong arguments against maintaining any list of huntable birds, with the possible exception the the Yellow-billed Teal.

The Johnny Rook (Sriated Caracara) raises high passions because of its rare status globally (IUCN category is 'Near Threatened') and its reputation for violent attacks on sheep and lambs. Controlled shooting may have to be allowed, but only under licence

The Falklands Native Plants

Falkland Rock Cress (*Arabis macloviana*)
Felton's Flower (*Calandrinia feltonii*)
Clubmoss Cudweed (*Chevreulia ycopodioides*)
Hairy Daisy (*Erigeron incertus*)
Falklands Cudweed (*Gnaphalium affine*)
Silver-leaved Ranunculus (*Hamadryas argentea*)
Falkland Lilaeopsis (*Lilaeopsis macloviana*)
Coastal Nassauvia (*Nassauvia gaudichaudii*)
Snake Plant (*Nassauvia serpens*)
Falkland False Plantain (*Nastanthus falklandicus*)
Woolly Falkland Ragwort (*Senecio littoralis*)
Smooth Falkland Ragwort (*Senecio vaginatus*)

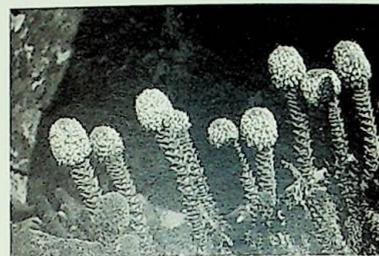
to farmers in certain circumstances or times of year. The Ruddy-headed (Brent) Goose (IUCN category also 'Near Threatened') may be similarly dealt with.

Introductions

The Falklands are very vulnerable to the unwelcome effects on native fauna or flora of imported alien species – for example, the impact of rats on tussac nesting birds is disastrous. Increased vigilance and regulation is being suggested along with a means to prosecute unauthorised releases, and to underpin an existing determination to avoid new alien invasions.

Plants

Endemic plants of the Falkland Islands, particularly those recognised as rare or vulnerable, might be scheduled for full legal protection against picking, uprooting or destruction.



The Snake Plant is an unusual plant in both appearance and habitat normally found only among boulders making up the spectacular stone-runs of the mountains and hills. It does not occur elsewhere in the world.
Photo: B Lewis-Smith

Species with restricted world ranges, eg Vanilla Daisy (*Leuceria suaveolens*), may also be singled out for listing on this Schedule. There is, however, a lack of information about many plants in the Islands. Further survey work must be a priority so that the status of existing plant populations can be determined. Any initial list of scheduled species may have to be expanded to include species and associated habitats found to be under threat either globally or locally.

And Finally

Jeremy Smith, our Assistant Conservation Officer, writes from Stanley:

'I have been privileged to travel extensively on both East and West Falklands in recent years and have found people to have a keen appreciation of the value of the wildlife and habitats that exist on their land, and to have a genuine interest in their conservation. The proposed new legislation, if properly discussed and considered, could build upon an already strong base of conservation sympathies within these Islands. It could be enacted with no discernible impact on any individuals or their freedom. Our unique collection of wildlife deserves the best protection, and it is our responsibility to provide it.'

Kevin Standing will be visiting FI in November to progress the legislative consultation process. We look forward to enactment of the new laws early in the New Year.

The advisory document 'A New Look at Nature Conservation Law in the Falkland Islands', was prepared by Kevin T Standing, commissioned by Falklands Conservation at the request of and with support from the Foreign & Commonwealth Office.

Of Birds and Fish

World Congress Resolves to Protect Seabirds

A resolution, co-sponsored by Falklands Conservation, aimed at eliminating the seabird by-catch within longline fisheries, was adopted at the World Conservation Congress* held in Montreal in October.

At least thirteen species of seabirds are suffering from incidental but severe mortality by being hooked and drowned within longline fisheries worldwide, but particularly in the Southern Ocean. This is producing a significant decline in populations of several seabird species and some are considered to be globally threatened with extinction. In WARRAH 9 we drew attention to the problem for the Black-browed Albatross, calling for improvements in the operations of fisheries on the Patagonian Shelf, and for additional measures to be implemented around the Falklands.

The Congress Resolution called for longlining practices to be modified. Recommended measures include setting streamer lines, making it difficult for birds to seize the bait (as is done now around the Falklands), restricting the setting of lines to night-time, adapting longline vessels for underwater setting, and for a reduction in fishing efforts near the breeding areas of vulnerable populations.

Adoption of this important resolution is just a first step in bringing the problem on to the world stage. The global battle to protect our seabirds is, in fact, far from won. It has been estimated that 44,000 albatrosses or more are killed annually on Japanese longlines in the Southern Ocean – Japan (and

Panama) spoke strongly against the Resolution, claiming that seabirds were not threatened or declining. But the conservation movement can now speak together from a position of greater strength to seek support for research, and bring pressure to bear on all fishing nations to ensure their future activities are sustainable for both fish stocks and seabirds.

** The World Conservation Congress is the General Assembly of IUCN, held every three years. Falklands Conservation is a full member of IUCN. We gratefully acknowledge our thanks to Robert Gibbons for funding our IUCN subscription over a period of many years.*



BirdLife
INTERNATIONAL

BirdLife International is a worldwide partnership of conservation organisations that seeks to conserve all wild bird species and their habitats. It is now the leading authority on the status of the world's birds and the urgent problems that face them. BirdLife's World Council has recently appointed Falklands Conservation as its official Representative for the Falkland Islands. Jane Lyons, Head of the Americas Division, writes: 'We would like to extend our congratulations to you and our wishes for continued successes in bird conservation.'

'Fish are for the Birds'

Mark Jones writes from New Zealand:

'I'm moved to write a short note regarding the Penguin Appeal acknowledgements on page 9 of WARRAH 9, in particular Lucy Tipton's sponsored Penguin Day "... to dress up like a penguin, only eating fish and drinking water".

Surely someone has missed the point here. It has become obvious that one of the greatest threats to penguins, and indeed to all too many seabirds, is the over-exploitation of the oceans' resources, linked to the desperate need for stricter regulation of worldwide fishing practices. Should we not be educating those eager youngsters about these burgeoning problems by *boycotting* seafood in a sponsored "Fish are for the Birds" campaign rather than enticing them to think that it is both fun and noble, and moreover, *actually supportive* of penguins to consume products pilaged from the sea?

Anyone concerned about the future well-being of the world's dwindling wildlife acknowledges the dire need for conservation organisations to have an educated and caring public to support and fund them. It must not be easy to get school kids fired up to actively participate in conservation moves, but please let's put a bit of forethought into what kinds of activities are endorsed by our organisation, and help steer well-meaning and much valued efforts in the appropriate directions.

Food for thought, perhaps. Please don't let these comments overshadow the overwhelmingly positive feelings we have about the good work you do.'

Sixty Years Ago

The Status of the Penguin Populations of the Falkland Islands

A G Bennett worked as Assistant Government Naturalist in the 1920s and 1930s. His Report on the penguin population produced 'for the information of the Governor' has proved an invaluable source of information, serving as a benchmark from which subsequent changes can be measured

Species Counted

The two common species were enumerated the Gentoo (*Pygoscelis papua*) and the Rock-hopper (*Eudyptes nigrivestis*). A third species the Jackass* (*Spheniscus megallanicus*) is no less numerous than the Gentoo, but its enumeration was not possible because of its burrowing nesting habits, mostly commonly on tussock clad islands. The few King Penguins that appear, and the small number of the Macaroni (*Eudyptes cyrsolophus*), probably immature birds, have not been considered.

'No Fear of Extinction'

I believe that the figures attached are on the conservative side and should at once pacify any fears there might be of a near future extinction. The approximate number of nests were asked for as being a fixed quantity and would indicate, roughly, the number of adult birds by doubling the number of nests. No account can here be taken of the immense number of immature birds, although they may be taken at a further 20%.

No large 'rookery' could be accurately counted especially if, as is often the case, it is placed in tussock grass and is further hopelessly mixed with breeding shags (*Phalacrocorax albiventer*) and the Mollymawk** - a smaller albatross (*Thalassarche melanophris*). Such sites are generally remote.

Owing to the many islands that are seldom or never visited, such as Bird Island and Beauchene, both quite large and smothered with breeding

birds, no estimate has been found possible. To cover these a further 10% could be added with safety, and there are hosts of smaller islands about which nothing is known of the birds thereon.

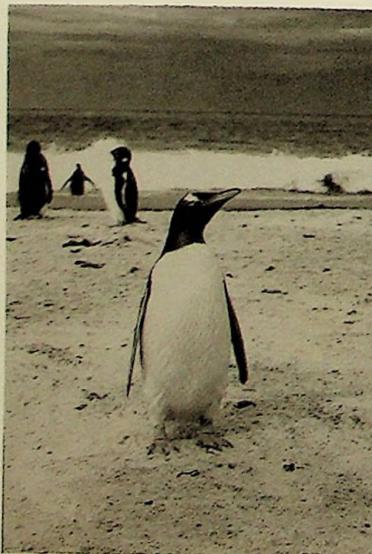
The Gentoo

The Gentoo penguin seems to be exclusively a fish eater; it is not migratory in the sense of most penguins. It remains about the land the whole year, although some wandering may take place in the winter.

The distribution of this species is given below:

West Falkland and outliers	140,000
East Falklands and outlier	91,900
	231,940
Add 20% for immature birds	46,388
Add 10% for uncounted birds	23,194
	301,522

West Falkland is the smaller island, but is chosen by 60% of the breeding birds for nesting purposes. The North and West coasts of the Group carry 74.6% of the adults against 35% for the East and South coasts.



This penguin favors flat, grassy land, and a more or less sheltered sandy beach landing. Gentoo Penguins on the beach at Sea Lion Island. Photo: A.G. Brown.

The Rockhopper

The Rockhopper is migratory, arriving in November and leaving in April. Numbers are calculated from nests given:

West Falklands and outliers (nests)	2,848,600
East Falklands and outliers	320,500
	3,169,100
	(adults) 6,338,200
Add 10% for uncounted birds	633,820
	8,239,660

The Jackass

The Jackass* can be taken, at least, in equal numbers to the Gentoo: 300,000.

Total Penguin Population

	Adults	Estimated Stock
Gentoo	231,940	301,522
Rock-hopper	6,338,200	8,239,660
Jackass	232,000	300,000
	6,802,140	8,841,182

Distribution

The insular distribution of the Rockhopper is even more westerly than the Gentoo. The western side of the Islands carries 89% of the birds, leaving but 10.7% for the rest of the Group. The Rockhopper selects bold, rocky headlands in exposed situations for nesting purposes, and is not known to breed along the shores of the extensive Falkland Sound.

The distribution of the Gentoo, and the Rockhopper, together with that of the Mollymawk, are strikingly similar. A very high percentage of the penguins, nearly all of the Mollymawks**, and vast numbers of Shags are concentrated on the North-West, and West of the Colony during the breeding season; this is certainly not due to accident, or the pres-

ence of man. In seeking for some explanation, it might be mentioned that the same area attracts an immense amount of both hair and fur seal. Whales too are quite numerous, at times. The answer is obviously one of food in abundance, at least during the months of September–April. It is in this period that the small pilchard is commonly met with, especially in this area.

Great Capacity for Fish

In order to secure some data on this subject, I have fed experimentally, a tame Macaroni penguin with the object of finding its capacity for food. This bird thrives on 8–12 ozs of fish per day, has no exertion and is ever ready for food. On one day, this bird ate 21,13, and 6 ozs of small fish within six hours – two and a half

pounds. It is reasonable to suppose that in a wild state, with the expenditure of much energy, a medium sized penguin would eat no less food, if obtainable.

If 80% of the penguins on the Falklands is taken as the number living for half of the year on the West and Northwest and multiplied by this weight of food, the daily consumption derived from the sea runs into thousands of tons, apart from the other birds mentioned, and they are all voracious feeders.

A Future in Farming?

It seems desirable to farm some portion of this life without depletion. The export of eggs offers the least objectionable method, always providing there is a market for them and that the collection could be done sys-

tematically. As an alternative to shipping as fresh eggs, they could be either dried or frozen. As a food the Gentoo egg is much to be preferred to the Rockhopper.

A survey largely of the birds of the outliers, together with seals seems desirable, especially those to the West and Northwest of the Colony.

We would like to thank Mr Harold Bennett for his kind permission to reproduce this Report.

** Jackass is the local Falklands name for the Magellanic Penguin.*

*** Mollymawk is the local Falklands name for the Black-browed Albatross.*

	Gentoo Penguin		Rockhopper Penguin	
	1932 - 33	1995 - 96	1932 - 33	1995 - 96
West Falkland	16,470	23,490	24,200	12,973
Saunders/Kepple	1,900	4,070	3,400	699
West Point Island			50,000	4,042
Passage Islands	1,000	300	10,000	392
Weddell Group	12,000	2,112		
Pebble Island	1,000	754	6,000	6,702
Carcass Island	200	180		
New Island	2,500	5,100	130,000	8,972
Beauchene Island				74,300
Bird Island				10,600
East Falkland	17,800	16,407	153,500	20,552
Kidney Island			12,000	615
Speedwell	6,150	2,555		
Bleaker Island	1,600	875	5,000	700
Lively Island	2,400		490	
Sea Lion Island	18,000	1,928	150,000	504
TOTAL	116,020	64,380	3,169,100	296,701

Penguin Population Census 1995-96

Sixty years after the first penguin census by A G Bennett, Falklands Conservation has completed a second census of the entire population of Gentoo and Rockhopper penguins using funds raised through its Penguin Appeal. The results of the survey are outlined here.

Why Now?

Evidence collected by Falklands Conservation as part of the Falkland Islands Seabird Monitoring Programme suggested a decline in breeding populations of the Gentoo and Rockhopper penguins. Patchy evidence from other sites also indicated that populations of Rockhopper penguins had decreased substantially since the counts made in 1932/33. A wider-scale survey, ideally of all breeding sites of both species was needed as a high priority to confirm the magnitude of this historical decline. In addition, the data collected will form part of the Islands' environmental 'stocktake' prior to the commencement of any exploration for oil.

How it was done

The Census took place between October 1995 and January 1996. It was timed to correspond with the end of the egg-laying period to give the best estimate of the number of breeding pairs. For most Rockhopper and all Gentoo breeding sites, two separate counts were made of all occupied nests using a tally counter. For very large colonies sample plots were counted, and for very small colonies, where landing by boat was not possible, they were counted directly from the air.

Three teams of surveyors under the direction of Mike Bingham, FC Conservation Officer, covered East Falkland, West Falkland and the smaller islands with the aid of Landrovers,

motorcycles, horses, boats, helicopters, light aircraft and a military transport Hercules. Additional survey work was undertaken by groups and individual observers. Their help is much appreciated.



Members of the RAF Ornithological Society assisting with census work, counting Rockhopper Penguins on Pebble Island. Photo: N Smith.

Gentoo Penguin

A total of 81 breeding sites are distributed throughout the archipelago with a population of 65,000 breeding pairs. The most important sites were Bull Point (East Falkland), Albemarle and Carcass Bay (West Falkland), and on the islands of New, Steeple Jason, Grand Jason, Saunders and Speedwell. The Gentoo Penguin is found in small colonies which number a few hundred breeding pairs. The Falklands population represents about 22% of the world population, and is second in size only to South Georgia. The census figures indicate an overall decline of 45% between 1932 and 1996.

Rockhopper Penguin

The Falkland Islands are the world's most important breeding site for this species and hold the world's largest concentration for this species. The 1995/96 Rockhopper Penguin population was 300,000 pairs on a total of 36 sites. These are distributed around most of the Falklands, but with a concentration in the West and the outer islands. 74% of the total population was found to be on the islands of

Steeple Jason, Grand Jason and Beauchene.

A Serious Decline

The current population estimate is considerably lower than the 3,169,000 pairs recorded by Bennett and has declined to about 10% of its 1932/33 level. Data from other monitoring work suggests that this serious decline has been taking place since at least the 1980s and possibly before. Further evidence of the decline was seen from the breeding sites which are all old colonies with a pocket of nests lying at the centre of an area cleared by a colony that was once much larger.

More Investigation Needed

The cause of the decline in the penguin populations is not known. Detailed investigations into their foraging ranges and feeding ecology are required to gain an understanding of underlying factors. Further work also needs to be done to determine the level of competition between penguins and commercial fisheries for squid and finfish.

Evidence around the world shows that oil exploration and exploitation presents a serious threat to all seabird populations. Their coastal breeding sites, and semi aquatic life styles make them highly vulnerable to oil pollution. Other threats may come from intensification of agriculture, tourism or other new industries. This new baseline data will allow a greater level of protection to be given to sensitive areas during the course of any such activities.

Magellanic Penguin

There are indications that the Magellanic Penguin is also declining in numbers. No previous Falkland-wide census has ever been

conducted against which population levels can be assessed, but a census is now urgently needed. It will be necessary to devise an appropriate counting method for this species which nests in burrows of varying abundance along hundreds of kilometres of coastline.

King Penguin

The present Falklands population of about 400 breeding pairs is concentrated at Volunteer Point, East Falkland. This colony has expanded from 38 chicks in 1980/81 to 330 chicks in 1995/96. Nevertheless, this comprises less than 1% of the world population and the increase in the Falklands is probably due to immigration from the expanding population on South Georgia.

An Urgent Search for the Cause of Decline

As a result of the 1995/96 Falklands Penguin Census, it is clear that further ecological studies are needed to find out the reasons behind such a serious decline in numbers. The foraging behaviour and the at-sea distribution outside the breeding season

must be thoroughly researched. Comparative studies of the Falkland, South American and New Zealand populations including environmental conditions, fisheries, pollution and the effect on penguins of hydrocarbon exploitation need investigation. A monitoring of the major populations of Rockhopper and Gentoo Penguins should be undertaken every five years – on easily accessible sites, annually. In addition, the first Falkland-wide census of the Magellanic Penguin is an urgent priority.

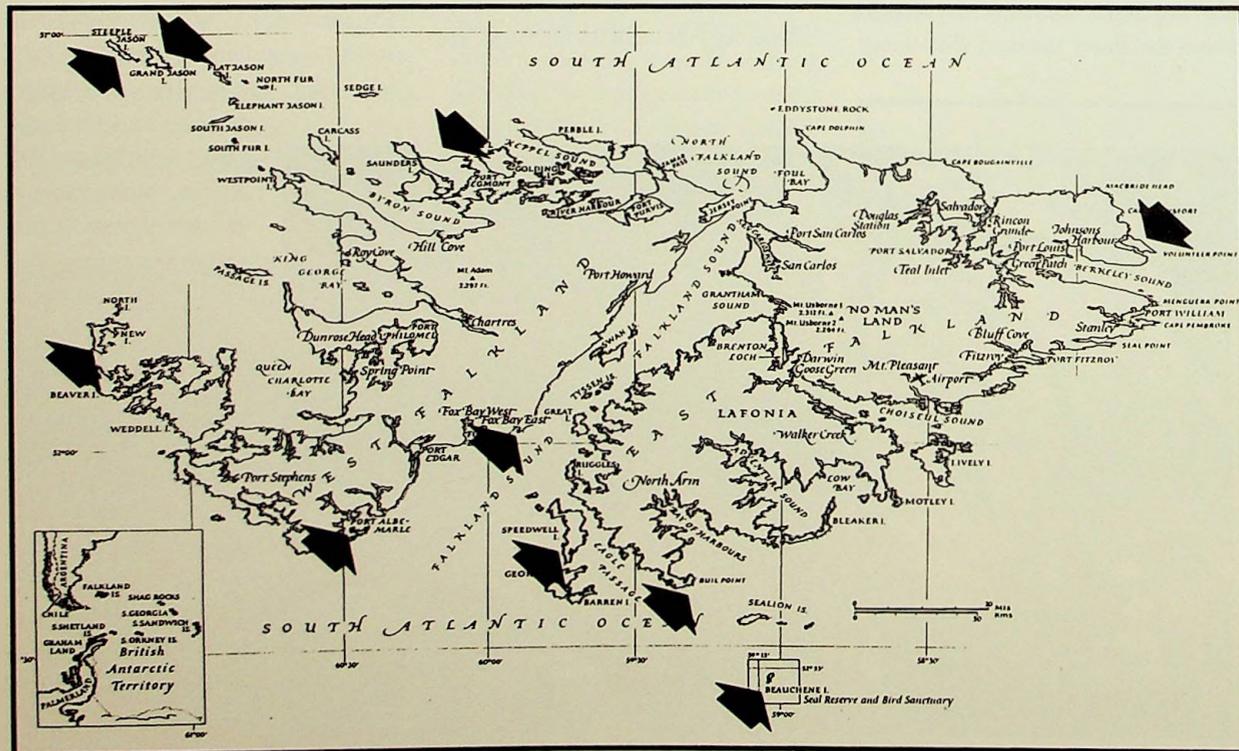
Falklands Conservation will be addressing these challenging requirements. Through its Penguin Appeal, it will seek resources to implement the essential steps in understanding why penguins are in trouble, and the best ways we can help them to survive and flourish.

The Report 'Falkland Islands Penguin Census 1995–96' is available price £5 from Falklands Conservation UK Office.

Catastrophic Decline of Penguins in New Zealand Sub Antarctic

Recent surveys on the remote Antipodes Islands have shown that both Erect-crested (*Eudyptes sclateri*) and Rockhopper (*Eudyptes crestatus*) populations have declined considerably since surveys in 1990; the Erect-crested from 115,000 to 50,000–60,000 pairs and the Rockhopper from 50,000 to fewer than 4,000 pairs. These losses are mirrored in other Rockhopper colonies in the Auckland and Campbell Island groups and if the rate of decline continues, Rockhoppers will become extinct in the New Zealand subantarctic within a few decades. The Erect-crested Penguin is confined to nesting on the Antipodes and nearby Bounty Islands so the decline is of particular concern. The losses are thought to be due to increased temperatures which have affected the birds' food supply.

(Source: Conservation News (Forest & Bird), May 1996, pp.4–5.)



Major Penguin Breeding Sites in the Falkland Islands (1995–96).

Falkland Islands Insects

Jenny Fuller, who recently undertook a study of the insect 'pests' on Tussac Grass, gives an overview of the Falkland invertebrates

A Neglected Subject

While the Falkland Islands are known throughout the world for their vertebrate wildlife, the invertebrate fauna of the Islands has been somewhat overlooked. Insects in particular have received very little attention. Difficulty of access, the harsh climate, and the limited nature of the insect fauna appears to have minimised the Islands' appeal to entomologists.

The Falklands Insect Checklist

In 1984 Gaden Robinson, from the British Natural History Museum, compiled a checklist of all the insects that have ever been recorded in the Falkland Islands (Robinson 1984). This list did not include any information on the ecology or abundance of any of the insects as this type of data is unavailable for most of the species. The checklist is, however, an important source of reference, and it also highlights some notable features about the insect fauna of the Islands.

High Proportion of Endemic Species

Firstly, a large proportion (about 70%) of the insect species are endemic to the Islands (ie the Falklands is the only place where these species are found). Endemic species are common on isolated islands, but the level of endemism found in the Falkland insect fauna is exceptionally high. One possible explanation for this is that some of the insects which are currently regarded as being endemic may actually exist in South America (and are therefore not endemic) but have not yet been collected. Since regions of South America such as Tierra del Fuego are very much under-studied from an entomological point of view, this is a credible theory.

Conservation of Native Species is Important

There is no doubt, however, that there are some insects which are only found within the Falklands archipelago, and

the conservation of these species is therefore important not just on a local, but on a global scale. Devising effective conservation and protection strategies for these species is extremely difficult when there is virtually no information available on their biology and ecology.

Most Foreign Species Do Not Survive

The non-endemic species of insects in the Falklands have a close association with the fauna of the southern tip of South America (Morrone *et al.* 1994). Some of the South American insects which have established successfully have flown across to the Falkland Islands while others inadvertently arrived on food and produce. Many of the insects that do arrive from South America do not survive due to habitat and climatic restrictions. Increasing trade and travel connections with the United Kingdom in recent years has not resulted in any known insect introductions (with the notable exception of the eleven-spot ladybird – see page 10). Again, most insects that arrive from Britain perish because of the different vegetation and climatic conditions.

Flightless in the Falklands

Another notable feature is that many of the insects exhibit the sub-antarctic adaptation of brachyptery (complete loss of wings). Several species of small flies and some moth species



Many different species of birds including the indigenous Tussac bird (*Circus antarcticus*), seen here on Montley Island, feed on insects such as beetles, flies and springtails which are found in the Tussac grass.

Photo: Robin Woods.

are flightless, while none of the endemic species of ground beetles are known to be winged. The strong winds that characterise the Falkland Islands climate have undoubtedly contributed to the loss of wings in many of the smaller insects.

Tussac is Tops for Insects

More detailed information on some insect species was obtained during a recent study of the insect pests of Tussac grass (Fuller 1995). The results from this study indicate that Tussac grass communities support a more abundant and varied insect fauna than other vegetation communities, eg Whitegrass or Diddle-dee. The physical structure of Tussac grass provides a more sheltered and varied microclimate for insects than other plants in the Falkland Islands. Since Tussac grass grows around the coast where the climate can be severe and few other plants survive, it may also act as a refuge for insects.

Insects form Part of a Rich Tussac Ecosystem

The insect fauna of the Tussac grass communities also represents an important food source for the avifauna of the Islands (Woods 1970).

The decimation of natural habitats in many countries has already caused the decline and, in some cases, extinction of many plants and animals.

It is therefore conceivable that the decline of the Tussac grass habitat in the Falkland Islands (Strange *et al.* 1988) during the last century may have had a detrimental effect on the invertebrate and avian populations in the Islands. The maintenance of the Tussac grass habitat would therefore appear to be a vital factor in the protection of some of the Islands' insect and avian faunas.

Tussac Study Finds New Species

In the course of this short study two new species of beetles and five new species of spiders were found, indicating that there are a large number of insect species in the Falklands which have yet to be recorded. Correct nomenclature and descriptions of these new species are currently being devised by the author in conjunction with the British Natural History Museum.

Insects are Important!

The detailed study of other vegetation communities in the Falkland Islands would undoubtedly reveal more new species. It is hoped that increasing awareness of the unique nature of the insect fauna and their importance to the Islands' avifauna will lead to more detailed studies of insects in the Falkland Islands.

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Falkland Blue Butterfly

This small blue butterfly (*Parachilades* sp.) was reportedly common before the 1900s, although never collected and identified. Similar sightings are still made every two or three years, suggesting a small population still exists in some remote area of the Islands. *We would be interested in hearing of any recent sightings.*

Photographed by C Samson, 10 km east of Hill Cove, West Falkland in 1987. N facing slopes, about 350m altitude. Reproduced by kind permission of the British Natural History Museum.

The Eleven-spot Ladybird in the Falkland Islands

Ladybirds are a recent introduction to the Islands. Robin Woods reports here on their status and natural history

The 11-spot Ladybird, a beetle known to entomologists as *Coccinella 11-punctata*, is native in Britain, Europe and North Africa across to northwestern India, but is not found in tropical regions. It was introduced to Australasia about a century ago and has been recorded from Tasmania and New Zealand. Two forms have been described and the specimens from the South Pacific are of the western form which is native to Britain. This species has not been recorded in mainland South America.

The First Collected Specimen

Roger Booth of the entomological department at the London Natural History Museum was in Stanley in March 1982 and heard from schoolchildren that ladybirds were seen in Stanley during the summer of 1981/82. He had confirmed that the earliest Falkland Island specimens in the museum are of the western form of this species and were collected at Surf Bay near Stanley by Kevin Standing on 20 January 1982.

Earliest Recollections

It is not known when ladybirds first arrived in the Falklands. Some people with whom I talked thought that they had come with plants for the tree nursery or fresh foods. Others thought that they had hibernated in vehicles or mobile homes transported from England in the 1970s or 1980s. Harold Bennett was uncertain about their arrival though it was years ago. He remarked that there had been two kinds, one larger that died out after a few years and one smaller, presumably the 11-spot. Nick Pitaluga's recollections from childhood produced the earliest date.

He remembered seeing them in about 1965 at Salvador, partly because the McLeod children had then taught him the 'Ladybird, ladybird fly away home' rhyme.

Recent Records

During my last visit between October 1995 and January 1996, I saw seven individuals. These were on a clifftop at Sea Lion island, in the vegetable and flower gardens, on driftwood at a beach and 900 feet up Cliff Mountain on West Point Island, near the jetty at Salvador and on paving behind a house at north Arm. I also had reports of their presence at Beaver, Saunders and Speedwell Islands, Port Louis, Island Harbour on East Falkland and in Stanley.

Around the Islands in Suitcase and Matchbox

Alan Cordory, from Mount Pleasant Airport, reported seeing many emerging from dead, black tussac peat on a hot day in November 1993, on the south side of Sea Lion Island. Several people described how they had helped to spread ladybirds from Stanley, either accidentally by carrying one or more in a suitcase or intentionally, by catching and taking some in a matchbox. The ladybirds at Beaver Island, North Arm, Speedwell Island and Teal River were reported to have been introduced like this within the last ten years.

Have you seen one?

The carnivorous ladybirds prey on aphids (greenfly), which have also been introduced at several settlements. Little is known about the preferred habitats or food of the 11-spot Ladybird in the Falklands, though it is not restricted to settlement gardens and it survived what was probably the hardest winter this century (1995). Any further information about their first appearance in the Falklands would be valuable and more records would be welcome.

Acknowledgements: I am grateful to Harold Bennett, Roger Booth, Tony Carey, Alan Cordory, David Gray, Isabel and Phillip Hutton, Ronnie and Yvonne Larsen, Clara and Bill MacKay, Mike and Sue Morrison, Roddy and Lily Napier, Robin and Nick Pitaluga, Suzan and David Pole-Evans and Sally and Jerome Poncet for information and observations.

Reference: Majerus, M & Kearns, P. (1989) Ladybirds, Naturalists' Handbooks No. 10, Richmond Publishing Co. Ltd., Slough, UK.



Eleven-Spot Ladybird photographed on Burnt Island South of Saunders Island
Photo: Suzan Poll-Evans

Local News

International Clean Up Campaign and Falklands Litter

Fiona Didlick relates her latest activity at the Community School:

The annual International Conservation Clean Up Campaign gathers information on types, amounts and sources of marine and beach litter. This year's event was held on 21st and 22nd September, and environmental organisations in over 60 countries around the world organised activities such as beach clean ups and litter surveys. In the Falklands, we hold our annual beach clean up in late summer when the weather is a little more reliable (is it ever?) and, not wishing to disrupt this, I had to think of a different activity.

Fortunately, I have recently received an excellent video from the National Aquarium in Baltimore. 'Saving Inky' is a 15 minute documentary which tells the story of a baby sperm whale found dying on a beach in New Jersey. Taken to the National Aquarium, a whole battery of tests were carried out to establish the nature of its illness. All were inconclusive until an endoscope was passed into its stomach and the problem was revealed – part of a plastic weather balloon, pieces of a plastic refuse sack and a cellophane cigarette-packet wrapper. The hardest heart cannot fail to be moved by the sight of Inky, the baby whale, lying gurgling on the surgeon's table as these items are gently drawn out through its mouth.

With the help of a team of marine biologists and volunteers Inky recovered rapidly from the ordeal and was eventually returned to the sea. Sadly, even in the middle of the Gulf Stream where she was released, litter is shown floating in the water and real fears were expressed that she may once again ingest the plastics which so nearly killed her.

I took this video to the Community School where it was shown, class by class, to all the pupils. To accompany it I took a collection of photographs taken in the islands of litter, entangled birds, plus a bag of plastic, and other items which I picked up on a local beach the previous weekend. (These included a washing-up-liquid bottle from Spain, a cigarette lighter printed with a ship's logo, lots of plastic rope and strapping, and a full can of Foster's lager!) Useful discussion resulted with each showing and it was apparent how conscious our young people are of the benefits of recycling although, as it is not an option here, their enthusiasm is in vain. Much of our marine litter problem is caused by inadequate refuse disposal facilities, namely an uncovered tip outside Stanley, and I impressed upon the pupils the need to take responsibility for their own litter and to 'think before they throw'.

New Wildlife Sanctuary Created

A new Wildlife Sanctuary has been declared (under the Wild Animals and Bird Protection Ordinance 1964) on Mossie Farm, East Falkland, on the area known as Top Side of Sand Grass and Sorrel Pond Camps. This includes, not surprisingly, an area of sand grass, along with sand dunes and Fachine.

The Sanctuary was declared following Falklands Conservation meeting with farmers during Farmers Week in July to discuss the new conservation legislation. The owners, Michael and Donna Minnell wish to control activities such as eggging, difficult under

current legislation, and shooting on their land.

Lewis Clifton To Chair Local Trustees Committee

Lewis Clifton has been appointed the new Chairman of our Local Committee in the Falklands. Brian Summers, the hard-working Chairman for the previous three years seeing through many significant changes in our operations on the Islands, stepped down in October following the annual local members meeting in Stanley. He will remain on the Committee, where we will value his wide experience.

Lewis has been a long-standing supporter of Falklands Conservation and was originally appointed a Trustee in the UK where he has been based for the past three years. He has now returned to live in the Islands.

Magnus George, who works as Observer Co-ordinator in the Fisheries Department, has been appointed as a new member of the Local Committee. Dennis Middleton and Jan Miller have decided to stand down and are thanked for their contribution.



Fachine (*Chilactichum diffusum*), a bushy plant which can reach 2m tall, used to be much more widespread throughout the Islands than it is today. Most commonly found along the banks of streams or in areas where grazing pressures are very light. Photo: A Lewis-Smith.



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The Warrah is the newsletter of Falklands Conservation, published twice a year. The Editor welcomes letters and articles for publication.

Copy date for next issue:

7th April 1997.

Back issues available:

£1 each (WARRAH 1-8; Falkland Islands Foundation 5-10).

The Warrah, or Falkland Fox (*Canis antarcticus*), was the only endemic Falklands mammal. This bold and inquisitive animal was never very numerous but, with the introduction of sheep, farmers backed by a Government bounty were encouraged to hunt them. The last one was killed in 1876. We hope this publication will play a small part in preventing any other Falkland wildlife following the same path to extinction.

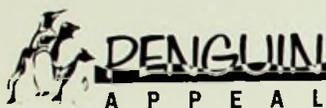
The Warrah was designed and typeset by
Password Publishing and Design
Tel/Fax: 01603 616292

ISSN 1357-9460

Printed on Recycled Paper

WARRAH First Edition

Copies of the very first (now rare!) edition of The WARRAH are to be reproduced and made available to members. John Peatfield, one of the first editors, has kindly agreed to supply these. If you are interested in obtaining a copy please write to the UK Office.



We are discontinuing use of our Penguin Appeal PO Box. Any donations or correspondence in connection with the Appeal should be addressed to the UK Office at 1 Princes Avenue, Finchley, London N3 2DA.

We would like to thank the following for their major donations to the Appeal in the last six months:

Kilverstone Wildlife Charity Trust

Mary Webb Trust

Hillsdown Holdings

Vibroplant

Schroder Charity Trust

A S Butler Charitable Trust

Throughout the UK our penguin collecting boxes have been attracting support from visitors to Zoos and Gardens with penguin collections. Congratulations and many thanks to Paradise Park in Cornwall (topping the league of donors) for a total of £845 raised for the Appeal this summer. At London Zoo more than two thousand Penguin Appeal beakers have been sold. These are now available in the Falklands at the West Store in Stanley.

Wildlife Card

Why not buy some of our very own cartoon notecards featuring Falklands wildlife for Christmas? In aid of and available from Falklands Conservation (UK & FI) £3 for 10 including envelopes and postage. Also available individually to personal callers at the Stanley Office.

Falklands Conservation on the Internet

Our new internet site is at:

<http://www.oeworld.org/falklands-conservation/index.html>.

Obituary: Bobby Tulloch

Falkland Islanders and many of those interested in the wildlife of the Islands will be saddened to learn of the death of one of Britain's most charismatic conservationists.

Apart from two years' National Service, Bobby spent his whole life on the Island of Yell in Shetland where he could trace his lineage back through many generations. Born on a croft, his passion for birds and animals began when he was a 'peerie lad'. His affinity with nature was never sentimental and perhaps that is why he was able to do such superb work as Shetland's RSPB Officer, a post he held for 21 years.

Although brought up in an isolated island community, Bobby was never an insular person. He loved to travel, and word soon got around that he was a superb tour leader. Bobby first visited the Falkland Islands in 1987, although he had wanted to do so for many years before that - the tours he had been asked to lead simply hadn't filled! So it was no passing whim which found him heading south that November. He loved the Falkland Islands - nearly as much as his native Scotland, and he soon made many friends among the Islanders. Following this visit Island Holidays was set up, a company in which he was a partner until ill health forced him to retire two years ago. Island Holidays has organised many holidays to the Falklands since and is a keen supporter of Falklands Conservation.

For those of us who had the privilege to know and work with Bobby Tulloch the world is a poorer place for his absence. But for all of us and for a much wider audience, the work he did and the pleasure he gave will have a lasting place in the history of conservation.