

# Tristan da Cunha

## Biodiversity Action Plan

**Enquiries relating to this plan:**

Simon Glass

Conservation Officer

Tristan

[tdcconservation@uuplus.com](mailto:tdcconservation@uuplus.com)

James Glass

Head of Tristan Natural Resources Department

Tristan

[tristannrd@uuplus.com](mailto:tristannrd@uuplus.com)

Sarah Sanders

Country Programmes Manager UK Overseas Territories

RSPB

[sarah.sanders@rspb.org.uk](mailto:sarah.sanders@rspb.org.uk)

Cover photograph:

*Atlantic Yellow-nosed albatross on Nightingale Island with Tristan in the background*

All photos by: Paul Tyler, Alison Rothwell, Erica Sommer and James Glass

# Foreword

by Lewis Glass  
Acting Administrator, Tristan da Cunha

From the moment Tristão d'Acunha first sighted the islands in 1506, Tristan da Cunha has been recognised as a unique place, with an assemblage of wildlife found nowhere else on the globe. Our very way of life on Tristan has always been dependant on the sustainable harvest of the natural resources of the island, and careful management has protected this resource for future generations.

For the first time the Tristan islanders are now fully involved in the conservation of our unique natural heritage, not only for the economy of the islands, but also for the enlightenment and enjoyment of current and future generations. This plan will guide and encourage our efforts to protect our unique islands.

Lewis Glass  
Acting Administrator  
Tristan da Cunha  
October 2005

By Mike Hentley  
Administrator, Tristan da Cunha

Residents on Tristan, the world's most isolated island community, well understand the need to live in harmony with nature. Their livelihoods depend on using natural resources wisely, and they take seriously their responsibilities for preserving a healthy environment on Tristan and its neighbouring islands. Five of the six main islands in the group are uninhabited (except for a permanently-manned weather station on Gough Island) and, because of their isolation, contain some of the best-preserved marine and land ecosystems in the cool temperate zone. These islands are globally important for their large populations of seabirds, and are also home to endemic species of land birds and plants.

Although their community is small (currently 275) and the economy fragile, Tristanians have been doing what they can to recognise and to conserve this special heritage. Measures include:

- Implementation of a sustainable fisheries policy: good management has improved rock lobster stocks fished in local waters and enabled progressive increases in annual catch quotas;
- Inscription of Gough Island as a World Natural Heritage Site in 1995, extended to Inaccessible Island in 2004. (Some 44% of land area in the Tristan Group is set aside for conservation);
- A revision of local conservation laws designed to enable Tristan to ratify the international Agreement on Conservation of Albatrosses and Petrels;
- The appointment in 2005 of a full-time Conservation Officer to supplement the ongoing work of local volunteers;
- Successful bids in 2004/05 for UK Government funds amounting to more than £200,000 to support local conservation projects, including alien plant eradication and studies of threatened seabird populations.

There is much more to be done, and the Biodiversity Action Plan provides the framework for the priority actions needed over the next five years. I would like to take this opportunity to thank all involved in its preparation, particularly Alison Rothwell and Paul Tyler who conducted extensive periods of fieldwork on the Islands from 2003 to 2005. I would also like to pay tribute to the continuing support provided by Alison's RSPB and Birdlife South Africa colleagues, and to the unstinting help, effort and encouragement provided by Tristan's Honorary Conservation Officers John Cooper and Peter Ryan of the University of Cape Town.

Mike Hentley  
Administrator

January 2006

## Acknowledgements

The Tristan Biodiversity Action Plan was produced as part of a project 'Empowering the people of Tristan da Cunha to implement the CBD', funded by the UK Darwin Initiative.

The Tristan islanders themselves raised many of the issues covered in the plan, and these and other ideas were discussed at a UK workshop organised by the Tristan Darwin Initiative project.

Much of the recent information on the wildlife of Tristan da Cunha was the result of fieldwork carried out by the Darwin Initiative project team: James Glass, Norman Glass, Simon Glass, Trevor Glass, Warren Glass, Jeremy Green, Matthew Green, Rodney Green, Christine Hanel, Ian Laverello, Eugene Repetto, Sue Scott, Frank Swain, Wayne Swain and Paul Tyler.

The following people helped to prepare the plan: Paul Buckley, John Cooper, Richard Cuthbert, Lewis Glass, Christine Haenel, Mike Hentley, Geoff Hilton, Mike Pienkowski, Peter Ryan, Sarah Sanders, Erica Sommer, Robin Wynde, and special thanks are due to Cynthia Green and Iris Green who helped with the project administration.



*Tristan Fieldwork Team*

# Contents

**Introduction**

**Vision**

**Action Plan**

**Overall Goal**

**Objectives and Actions**

**Monitoring Progress**

**Conservation Framework**

**Description and Biodiversity Audit**

**General Background**

**Tristan**

**Nightingale**

**Alex**

**Stolltenhoff**

**Inaccessible**

**Gough**

**Annexes**

**1. Abbreviations**

**2. Bibliography**

**3. Maps**

**3a. Tristan da Cunha group and Gough**

**3b. Tristan**

**3c. Tristan habitat map**

**3d. Nightingale habitat map**

**4. Breeding Birds of Tristan da Cunha**

**5. Tristan da Cunha Mammal List**

**6a. Tristan da Cunha Plant List**

**6b. Tristan da Cunha Introduced Plant List**

**7. Tristan da Cunha Socio-economic data**

**8. Monitoring Protocols**

**8a. Tristan Habitat (Fixed point monitoring map)**

**8b. Tristan Habitat (Fixed point monitoring instructions)**

**8c. Tristan monitoring manual**

**9. Tristan Conservation Ordinance (2006)**

## Introduction

Since the 1992 Earth Summit in Rio there has been much talk about biodiversity and the urgent need to conserve it. Tristan da Cunha is one of the world's smallest nations, but its wildlife (including millions of seabirds and many endemic species) represents a significant part of the UK's, and the world's, biodiversity.

Much work has already been carried out in order to protect this wildlife, so this action plan gives an overview of the present status of the biodiversity of Tristan da Cunha, and the actions planned to manage it effectively for the next five years.

The UK Government has ratified the Convention on Biological Diversity on behalf of Tristan da Cunha. The plan will assist in meeting the requirements of this international commitment.

The Government of Tristan da Cunha has signed an Environment Charter agreement with the UK Government, and this has outlined the way forward for the protection of the environment on Tristan. The actions within this plan have been cross-referenced to the commitments to this charter.

The concept of long term planning is relatively new to Tristan da Cunha, and this plan has been produced whilst the Tristan government has been in the process of drawing up an overall government strategy. It has been prepared as part of the Darwin Initiative project 'Empowering the People of Tristan da Cunha to Implement the CBD'. The development of the plan must be unique in that the entire population of Tristan was aware of the project. Every family on the island has had the opportunity to be involved.

Initial consultations with the government and people of Tristan da Cunha were carried out from September 2003 to March 2004 to establish the conservation priorities. A workshop held in the UK in July 2004 was attended by UK stakeholders, and the outcomes of this workshop and the earlier consultations have been used to define both the conservation objectives and potential UK partners for taking the actions forward. The action plan has been divided into sections based on the objectives identified at this workshop, which have subsequently been endorsed by the Government of Tristan da Cunha.

Much is yet to be discovered about the wildlife of Tristan da Cunha, and so one of the key recommendations is to survey those taxa where data are lacking. For other species where there are reasonable baseline data, monitoring programmes will be put in place where possible, to allow changes in status to be detected.

The most significant threat to the biodiversity of Tristan da Cunha comes from the introduction of invasive alien species. The priority for the next five years will be to concentrate on eradication of those alien species that pose the severest threat to the native wildlife and to put in place measures to prevent further introductions.

There are significant threats to many of the species that breed on and around Tristan da Cunha caused by activities beyond Tristan and its territorial waters, and although they are mentioned here, the scope of this plan is to cover only actions that are on Tristan da Cunha itself, within the Exclusive Economic Zone (EEZ) or at the ports that serve Tristan. Although some progress has been made on understanding the marine environment around Tristan, there is still very little information and knowledge.

This is a five year plan – it is envisaged that most of the actions in the plan will be carried out, or at least work started, between 2006 and 2010. It will not be possible for the Tristan Island Government or its citizens alone to implement all the actions set out in the plan and some external assistance will be required.

Management plans have already been published for Gough and Inaccessible, and a management plan for Nightingale is in the process of preparation. This plan forms an ‘umbrella’ for all of these plans, and to a large extent is the Tristan management plan. Hence many of the actions are focussed on the main island of Tristan – actions specific to the other three main islands are within the existing management plans.

Overall progress on the plan will be reviewed annually, in the form of a report from the Natural Resources Department. This report will be circulated to the Tristan Island Council and to stakeholders in the UK.

Although perhaps beyond the duration of this plan, we will know whether implementation has been successful if there is a decrease in the number and range of invasive alien species and an accompanying increase in the numbers of native invertebrates and birds and the range of native plants.

Tristan is economically dependant on the sustainable harvesting of its wildlife, so the conservation of the biodiversity of Tristan is of fundamental importance for maintaining the community on Tristan. In addition, there is potential to diversify the island’s economy to include wildlife tourism, so the long-term protection of the wildlife of the Tristan islands is a high priority for the Tristan community.

# Vision

The vision is to enable the people of Tristan da Cunha, in partnership with organisations from around the world, specifically the UK and South Africa, to conserve their globally important and unique biodiversity for the benefit of current and future generations.



*View of the Centre Lake from the Peak*

# **Action plan for the Conservation of Biodiversity in Tristan da Cunha**

## **Overall Goal**

Although beyond the duration and scope of the plan, the overall goal is to conserve the native biological diversity of Tristan da Cunha so that the people of Tristan da Cunha can continue to benefit from it. This will be achieved by halting, or, in the case of some species, reversing, the rate of biodiversity decline on Tristan da Cunha.

The purpose of this plan is to enable the people of Tristan da Cunha to actively contribute to the conservation of and benefit from the biodiversity on their islands.

## **Objectives**

1. Conservation is integrated into all Government programmes, policies and plans (nationally and internationally)
2. Support for biodiversity conservation is strengthened on Tristan
3. Tristanians have the capacity to effectively manage biodiversity
4. The impact of invasive alien species is reduced or eliminated
5. The sustainable use and management of the marine environment is enhanced
6. The knowledge of Tristan's key habitats and species is increased

The next section highlights the main activities under each objective. There is an activity table included at the end of the section, which indicates the timeframe and responsibility.

## 1. Conservation is integrated into all Government programmes, policies and plans (nationally and internationally)



*Fishing Boats waiting for a 'day' at Calshott Harbour*

The economy of the territory is, at present, almost completely dependant on the sustainable harvesting of wildlife, and so the conservation of the biodiversity of Tristan is of fundamental importance to the protection of livelihoods on the island. There is potential to diversify the economy to include wildlife tourism, which would be limited by necessity, but which could raise revenue for the island.

### **1.1 The long term sustainable economic plan will ensure that benefits and potential benefits from economic activities other than fishing (in particular, wildlife tourism, handicrafts) are fully realised (Environment Charter Commitments 1, 3)**

Actions:

- 1.1.1 The Conservation Officer, in conjunction with the Head of the Natural Resources Department, will ensure high priority is put on conservation and the potential benefits to Tristan da Cunha, in particular through discussion at Tristan Island Council meetings.
- 1.1.2 The Tristan Island Council will make contact with cruise ship operators to actively encourage tourism on Tristan.

## **1.2 Tristan will seek sustained and coordinated UK government attention to Tristan conservation issues**

Actions:

- 1.2.1 The Tristan government will develop closer working relationships on conservation and related issues with relevant FCO departments, other relevant UK government departments (DFID in particular) and other UK Overseas Territories government departments, particularly those territories in the South Atlantic.

## **1.3 Raise awareness and profile of the importance of Tristan's biodiversity amongst wider decision-making community in the UK**

Actions:

- 1.3.1 Information about biodiversity issues on Tristan will be communicated to a wider network in the UK and beyond through the Tristan da Cunha and other websites
- 1.3.2 Employees and representatives of the Tristan government will maximise the opportunities given by temporary residence in the UK to develop links with UK agencies.
- 1.3.3 Funding will be sought to establish a representative of the Tristan Government in London, to represent Tristan's interests to the UK government and agencies.

## **1.4 Legislation and policies will be put in place to ensure that future economic development does not impact negatively on biodiversity (Environment Charter Commitment 4)**

Actions:

- 1.4.1 Policies will be produced that require infrastructure/development projects to undergo environment impact assessments.
- 1.4.2 The proposed construction of a new harbour will undergo an environment impact assessment, in particular to mitigate the potential introduction of invasive species.

## 2. Support for biodiversity conservation is strengthened on Tristan



*Northern rockhopper penguins below the huts on Nightingale Island*

The Darwin Initiative project has begun to raise awareness of conservation issues amongst the Tristan population, but this process needs to be continued. Tristanians are now directly involved in conservation projects, and this has helped raise awareness of the importance of their natural heritage.

### **2.1 Tristanians are better aware of the importance of the biodiversity of the islands (Environment Charter Commitments 9, 10)**

Actions:

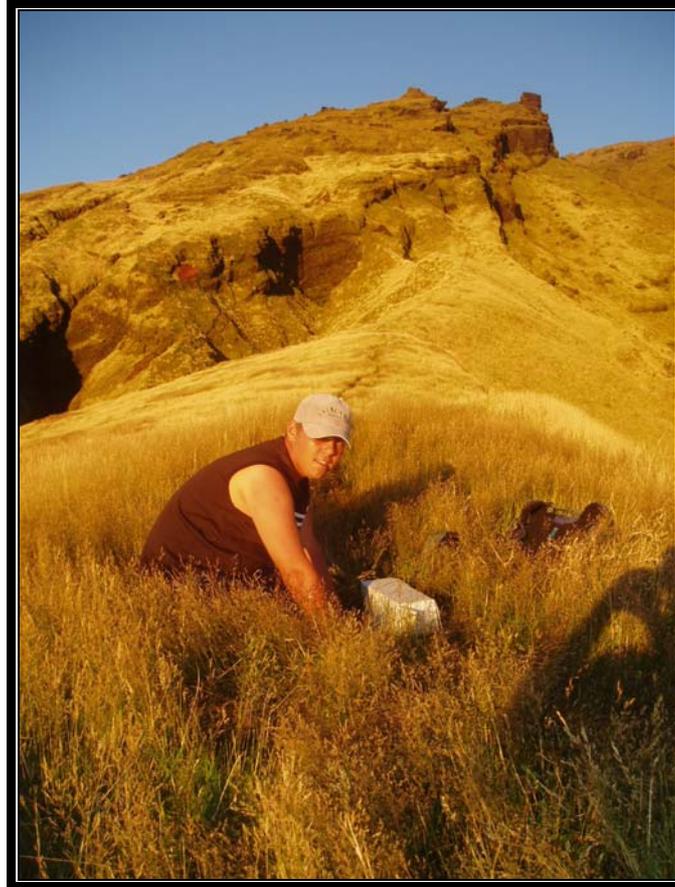
- 2.1.1 Educational materials about the biodiversity of Tristan and its global/local importance will be used in the school and kept updated.
- 2.1.2 The school curriculum will be developed to include environmental education.
- 2.1.3 A booklet produced by the Darwin Initiative project on the wildlife of the island and its global significance will be disseminated throughout the community.
- 2.1.4 Copies of papers and articles about wildlife on Tristan will be announced and available on the island.
- 2.1.5 Where possible, the school will be encouraged to take an active role in conservation.
- 2.1.6 The islands museum will be expanded to include an account of the natural history of Tristan da Cunha.

## **2.2 Islanders given adequate feedback on research on and about Tristan (Environment Charter Commitment 10)**

### Actions:

- 2.2.1 The Conservation Officer will produce an annual newsletter detailing the conservation work that has been carried out and an analysis of the results of that work.
- 2.2.2 The Natural Resources Department will keep the island population informed about conservation projects through reports to the council and open public meetings.
- 2.2.3 Visiting scientists will be encouraged to give presentations about their work to the community.
- 2.2.4 Presentations on conservation in Tristan will be given to all visiting tourist vessels if requested.

### 3. Tristanians have the capacity to manage biodiversity effectively



*Rodney Green setting rodent trap on West Castle*

Current legislation is being updated to take into account international agreements. However, there is a need to increase awareness of conservation legislation on Tristan

The Dawin Initiative project has enabled training to be given to the conservation team on Tristan. Ten Tristan government employees have attended training for conservation management, and the Head of Natural Resources Department has attended project management training in the UK.

A database has been established to store biodiversity data on key species. However, the human and financial capacity to take forward conservation work is limited so some external specialist knowledge and resources will be required.

At present external communication from Tristan is poor, and this has hindered the development and overall management of several key projects. The installation of direct email in the Natural Resources Department has begun to address this problem, but improved access to the internet and better phone and email facilities for all government departments would help in the development of projects.

### **3.1 Adequate conservation legislation to protect species and habitats is introduced, and this legislation is enforced (Environment Charter Commitments 2, 6)**

Actions:

- 3.1.1 Greater emphasis will be given on Tristan to the effective enforcement of conservation legislation.
- 3.1.2 Biodiversity protection legislation will be assessed and upgraded where necessary to comply with international obligations.
- 3.1.3 Programmes will be introduced to monitor harvest of Great shearwaters and Northern rockhopper penguin eggs on Nightingale and Alex islands.

### **3.2 Ensure that the protected sites of the Tristan da Cunha group are maintained at optimal conservation status (Environment Charter Commitments 2, 6, 7)**

Actions:

- 3.2.1 An advisory committee will be established to oversee the management of all the Protected Areas within the Tristan Group, with representatives from partner organisations in UK, South Africa and Tristan.
- 3.2.2 Management plans for Inaccessible and Gough are updated and implemented.
- 3.2.3 A management plan for Nightingale is finalised and implemented.
- 3.2.4 Access is regulated to Protected Areas by the Conservation department.
- 3.2.5 Measures will be put in place to eliminate the risk of introducing alien species to protected sites.
- 3.2.6 Further human-induced habitat loss is prevented – in particular fire prevention measures are put in place on Nightingale and Inaccessible.

### **3.3 Strengthen technical skills to effectively manage biodiversity (Environment Charter Commitment 1)**

Actions:

- 3.3.1 Continue with training for selected Tristan government employees who will assist the conservation officer.
- 3.3.2 The Natural Resources Department will seek help to propose and manage biodiversity projects from UK and other external agencies and individuals.
- 3.3.3 Links will be developed with UK agencies in order to gain funding and progress proposed conservation projects.
- 3.3.4 Visiting scientists will be provided with training on Tristan culture.

### **3.4 Improve external communications and access to this communication (Environment Charter Commitment 1)**

Actions:

- 3.4.1 Improvements to the satellite link to Tristan will be sought to link all government departments to the email system and allow direct emails to all heads of departments.
- 3.4.2 The Natural Resources Department email link will be used to keep stakeholders in the UK and South Africa informed of conservation issues on Tristan.

#### 4. The impact of alien species is reduced or eliminated



*The Removal of Flax from Nightingale*

The greatest threat to the wildlife of Tristan da Cunha is from the introduction of alien species, both plant and animal. Many alien species that have already established on Tristan were plants brought in deliberately to improve pasture and for building purposes, and many more have been accidentally introduced with imported foodstuffs.

At present the only agricultural activity is on the main island of Tristan. In the past there has been livestock and crops on all four main islands, but this is now limited to Tristan, although the affects of agriculture in terms of introduced species are also seen on Nightingale, Gough and Inaccessible. Much of the total area of the main island of Tristan is used for agriculture in one form or another. The coastal plains are used for growing potatoes and other food crops, and cattle and sheep are also grazed there. These areas are separated from the mountainous areas of Tristan by steep cliffs, with fencing in some places, and these areas are used only for the grazing of sheep. Physical constraints such as steep, rocky ground, and dense phylica trees, in addition to force of habit, mean that the areas subjected to sheep grazing are mainly the northern and western parts of the mountain.

The development of agriculture on Tristan da Cunha has led to some significant changes to areas of natural habitat on the main island of Tristan. The first major change was the loss of coastal tussock grass, but more recently alien species have been introduced as a result of agricultural activity, and these are now spreading and affecting native habitats and possibly breeding birds. The spread of alien species is exacerbated by the presence of grazing animals, although the extent of the problem has not yet been quantified.

The most significant introduction has been the arrival of rodents on Tristan and Gough, which severely depleted burrowing petrel populations on Tristan, and continues to threaten the survival of several seabird and landbird populations on both islands, including three endemic species.

#### **4.1 Reduce the number of alien species introduced to Tristan (Environment Charter Commitment 2,3,4)**

Actions:

- 4.1.1 Work with the South African authorities to improve arrangements for checking and transporting cargo in Cape Town.
- 4.1.2 Increase the amount of fruit and vegetables grown on the island to reduce the amount imported from South Africa. Investigate organic methods of increasing yield (for instance crop rotation).
- 4.1.3 Seek advice from UK, other UKOTs and other agencies operating on small islands on the best methods for achieving environmentally sustainable farming.
- 4.1.4 Funding will be sought to ensure that the fruit and vegetables that are imported will be irradiated either at the place of origin or on Tristan.
- 4.1.5 Use species which improve grazing sward but which do not result in a loss of biodiversity.
- 4.1.6 The pasture on the coastal plain will be improved through the application of fertiliser to eliminate the need to import fodder.
- 4.1.7 Alternative fodder (pellets) will be imported to reduce the risk of invasive species introductions.
- 4.1.8 A quarantine area will be established for dealing with alien species when they arrive at Tristan.
- 4.1.9 All cargo will be checked by the Agriculture Officer.

#### **4.2 Ensure casual/adventive alien plants are not able to establish populations in the wild (Environment Charter Commitment 2)**

Actions:

- 4.2.1 Careful monitoring carried out so that alien plants are quickly recognised and are not allowed to establish populations.
- 4.2.2 Contingency supplies of herbicide kept to eradicate quickly any new alien species
- 4.2.3 Training will be given to the Agriculture Department for identification of alien plant species and application of pesticides
- 4.2.4 A booklet with details of alien plant species found on Tristan will be produced

#### **4.3 Prevent the transfer of alien species between islands of the Tristan group (Environment Charter Commitment 2)**

Actions:

- 4.3.1 The recommendations of the Inaccessible and Gough management plans to prevent the introduction of alien species will be enforced.
- 4.3.2 Poison bait stations will be placed on the coasts of Inaccessible and Nightingale to prevent the accidental introduction of rats.
- 4.3.3 All sand taken from Tristan to other islands will be steam treated.
- 4.3.4 Boots and clothing will be cleaned before travelling between the Tristan Islands.
- 4.3.5 Monitoring of spread of alien species will be carried out so that any accidental transfers between islands are quickly recorded and action taken to prevent spreading.
- 4.3.6 All vessels visiting islands in the Tristan group will be required to register with the Natural Resources Department and present certificates to show they are rodent free.

#### **4.4 Programme of control or removal of alien plants introduced (Environment Charter Commitment 2)**

Actions:

- 4.4.1 Control and possible eradication methods for the invasive alien species already established on Tristan da Cunha will be investigated.
- 4.4.2 In particular, *Sagina* will be eliminated from Gough, and methods for halting the spread of the species on Tristan will be examined.
- 4.4.3 Alien plants recently introduced accidentally to Inaccessible island will be removed.
- 4.4.4 Nightingale and Inaccessible islands will be closely monitored to ensure that the flax removal programmes were successful and the species is not allowed to re-establish.
- 4.4.5 Effect of alien plants on native species will be investigated, so that resources will be prioritised to the control of those alien species that pose the most threat to the native wildlife.
- 4.4.6 A database will be established, listing alien plants and their distribution, and herbicides that can be used for control/eradication.

#### **4.5 Introduced rodents are controlled or eradicated on Tristan and Gough (Environment Charter Commitment 2)**

Action:

- 4.5.1 A feasibility study will be carried out to look at the control or eradication of house mice from Gough and rats and mice from Tristan.
- 4.5.2 Funding will be sought to carry out the recommendations of this study.
- 4.5.3 Awareness will be raised on Tristan of the danger of accidental introduction of rats to Nightingale or Inaccessible.
- 4.5.4 Measures will be put in place to prevent further introductions of rodents both in cargo from South Africa and by transfer between islands.
- 4.5.5 Contingency plans will be drawn up in case of accidental introduction to Nightingale or Inaccessible.
- 4.5.6 Alternative food sources for rodents will be removed through improved waste management (storage and collection of waste).
- 4.5.7 An improved rat control programme is introduced on the settlement.

#### **4.6 Restoration of affected species and ecosystems following removal of alien species (Environment Charter Commitment 2)**

4.6.1 The possibility of reintroducing the Tristan albatross and Tristan bunting if a rodent eradication takes place will be explored.

## 5. The sustainable use and management of the marine environment is enhanced



*Marine Life – Five Fingers*

The economy of Tristan depends almost entirely on the fishing industry, and in particular the Tristan lobster fishery. Opportunities to increase the income from fisheries will be investigated, whilst ensuring that the use of marine resources is sustainable and that there is no threat to the marine ecosystem. Relatively little survey work has been carried out on the marine life of Tristan da Cunha, despite its obvious importance to the islanders. The local fisheries rely on a healthy marine ecology, about which very little is known.

The marine life of the Tristan group is also very interesting from a scientific and biodiversity standpoint. There is no other warm temperate island group as remote and isolated as Tristan, and the arrival of new species has been a rare event – diversity is extremely low compared to mainland coasts in the same temperature range. As on land, species arriving here have subsequently evolved in isolation, so that a large proportion of them are apparently endemic. This makes the islands important for conservation of biodiversity, and vulnerable to the further accidental introduction of foreign species and pathogens.

One of the main threats to the marine environment of the Tristan EEZ is unregulated fishing, and the government will work towards regulating the legal fishing industry to ensure its sustainability, and will try to eliminate illegal fishing.

### **5.1 Ensure the legal fishery is sustainable (Environment Charter Commitments 1, 3, 7)**

#### Actions:

- 5.1.1 Seek advice on fisheries management from other South Atlantic Overseas Territories, South Africa and the UK.
- 5.1.2 Enhance the monitoring of fish stocks in order to provide better data to inform quota levels.
- 5.1.3 Undertake research on the biology of the Tristan lobster in order to assist the sustainable management of the stock.
- 5.1.4 Seek advice on quotas from more than one source.

### **5.2 Minimise the impact of the legal fishery on the marine environment (Environment Charter Commitments 2, 6, )**

#### Actions:

- 5.2.1 Ensure all long-liners carry a Natural Resources Department fishery observer on board to verify compliance with licence conditions and to ensure that mitigation measures are used.
- 5.2.2 Ensure fishing licences include a condition that mitigation measures are employed to minimize by-catch of non-target species and seabirds.
- 5.2.3 Data on bird bycatch will be collected and analysed annually, and made available through the Tristan da Cunha website.

### **5.3 Minimise illegal fishing in the Tristan EEZ (Environment Charter Commitments 2, 6, 8)**

#### Actions:

- 5.3.1 Regular patrol assistance from licensed fishing boats, research vessels and naval vessels will be requested.
- 5.3.2 The means of setting up a system for monitoring fishing vessels in the Tristan EEZ will be investigated. This may include use of a long range patrol vessel, and surveillance by remotely operated radar installed on either Nightingale or Inaccessible island.
- 5.3.3 The feasibility of monitoring vessels by satellite will be investigated.
- 5.3.4 The scale of the problem will be determined by monitoring reports of landings of Tristan crayfish at foreign ports.
- 5.3.5 Engage with regional and international fisheries organisations (International Commission for the Conservation of Atlantic Tuna, South East Atlantic Fisheries Organisation).

#### **5.4 Maintain marine biodiversity of Tristan at its current level (Environment Charter Commitments 2, 7, 10)**

Actions:

- 5.4.1 Identify the existing collections of preserved animals and seaweeds.
- 5.4.2 Collect and collate published information from previous surveys on the marine ecosystems and identify further work required to establish a baseline of information on marine life.
- 5.4.3 Assess the risk of the introduction of alien marine species (ballast water, ships' hulls, holding tanks for crayfish) and identify likely pathways for alien introductions.
- 5.4.4 Identify the potential impact of introduced species on the native marine life particularly economically important species, and introduce mitigation measures to minimise the likelihood of such introductions occurring.

## 6. The knowledge of Tristan's key habitats and species is increased



*Male Subantarctic fur seal*

So much is yet to be discovered about the wildlife of Tristan da Cunha. There are few data on key taxa and little is known about the interaction between key species and the habitats in which they live.

### **6.1 Ensure the current distribution of native habitats is maintained (Environment Charter Commitments 2, 7)**

Actions:

- 6.1.1 Monitor habitat distributions on Tristan and Nightingale every five years, as per the monitoring manual (Annex 9).
- 6.1.2 Carry out a study to assess the impact of alien species on native plants and habitats on Tristan and Nightingale.

### **6.2 Provide baseline information on endemic plant species (Environment Charter Commitments 2, 7)**

Actions:

- 6.2.1 Continue with the survey work to establish baseline data on the range of the endemic plants.
- 6.2.2 Monitor the range of endemic plants on a five yearly basis.

**6.3 Provide baseline information on invertebrates on Tristan, Nightingale and Gough (Environment Charter Commitments 2, 7)**

Actions:

- 6.3.1 Continue with the present work to identify invertebrates collected on Tristan and Nightingale.
- 6.3.2 Carry out invertebrate collection on Inaccessible.

**6.4 Ensure breeding bird populations are stable (Environment Charter Commitments 2, 7)**

Actions:

- 6.4.1 Monitor populations of the target species and annual harvesting of seabird chicks and eggs to ensure that it is sustainable.
- 6.4.2 Carry out annual monitoring of Northern rockhopper penguins and Atlantic yellow-nosed albatross on Nightingale and Tristan as per the monitoring manual (Annex 9).
- 6.4.3 Monitoring protocols will be put in place for breeding land birds.
- 6.4.4 Seal numbers on Tristan will be counted annually (Annex 9).
- 6.4.5 Investigate the impact of seals on breeding sea birds.

# Activities Plan

The Head of the Tristan Natural Resources Department will be responsible for overseeing the implementation of the plan on Tristan. Many of the actions will be carried out by the Tristan da Cunha Conservation Officer, aided by other Tristan government staff.

As there are a range of departments involved in implementation the activities table below outlines the activities, timeline and departments/persons responsible for taking forward.

	<b>Action</b>	<b>Timescale</b>	<b>Responsibility</b>
<b>1.</b>	<b>Conservation is integrated into all Government programmes, policies and plans</b>		
1.1	The longterm sustainable economic plan will ensure that benefits and potential benefits from economic activities other than fishing are fully realised		
1.1.1	The Conservation Officer attends Island Council meetings on conservation issues	Ongoing	Conservation Officer
1.1.2	Contact is made with cruise ship operators	Ongoing	Administrator & Tristan Tourist Board
1.2	Tristan will seek sustained and coordinated UK government attention to Tristan Conservation issues		
1.2.1	Strengthen relationships with UK Govt. departments	Ongoing	Tristan Island Council, Conservation Officer, UKOTCF/SAWG, Administrator
1.3	Raise awareness and profile of the importance of Tristan's biodiversity amongst wider decision-making community in the UK		
1.3.1	Information about biodiversity will be communicated through the Tristan da Cunha and other websites	Ongoing	Tristan da Cunha Association, RSPB, Conservation Officer
1.3.2	Tristanians will maximise the opportunities given by temporary residence in the UK to develop links with UK agencies	Ongoing	Tristan Island Council
1.3.3	Funding will be sought to establish a representative of the Tristan Govt. in London	Ongoing	Tristan Island Council, Administrator
1.4	Legislation and policies will be put in place to ensure that future economic development does not impact negatively on biodiversity		
1.4.1	Policies will be produced that require infrastructure/development projects to undergo environment impact assessments	Ongoing	Tristan Island Council, Administrator
1.4.2	The proposed construction of a new harbour will undergo an environment impact assessment	2007	Tristan Island Council, Administrator
<b>2.</b>	<b>Support for biodiversity conservation is strengthened on Tristan</b>		
2.1	Tristanians are better aware of the importance of the biodiversity of the islands		
2.1.1	Educational materials about biodiversity will be used and kept updated	Ongoing	Conservation Officer, Head of School
2.1.2	School curriculum will be developed to include environmental education	July 2006	Conservation Officer, Head of School, RSPB
2.1.3	A guide on the wildlife to Tristan will be distributed widely on the island	March 2007	RSPB, UCT, Conservation Officer
2.1.4	Copies of papers and articles about wildlife on Tristan will be announced and available on the island	Ongoing	Conservation Officer
2.1.5	School will be encouraged to take an active role in conservation activities	1 fieldtrip/year	Conservation Officer, School, Education Department
2.1.6	Islands museum will be expanded to include an account of the natural history of Tristan	Ongoing	Administration, Conservation Officer
2.2	Islanders are given adequate feedback on research on and about Tristan		
2.2.1	An annual newsletter will be produced detailing conservation activities	1/year - June	Conservation Officer
2.2.2	Island will be kept informed about conservation projects	Ongoing	Natural Resources Department, Conservation Officer

2.2.3	Visiting scientists will be encouraged to give presentations of their work	Ongoing	Conservation Officer
2.2.4	Presentations on conservation in Tristan will be given to all visiting vessels if requested	Ongoing	Conservation Officer
<b>3</b>	<b>Tristanians have the capacity to manage biodiversity effectively</b>		
3.1	Adequate conservation legislation to protect species and habitats is introduced, and this legislation is enforced		
3.1.1	Greater emphasis will be given on Tristan to the enforcement of legislation	Ongoing	Police, Conservation Officer
3.1.2	Biodiversity legislation will be assessed and upgraded where necessary to comply with international obligations	Ongoing	Tristan Island Council, External support
3.1.3	Programmes will be introduced to monitor harvest of Great shearwaters and penguin eggs on Nightingale and Alex	Ongoing	Natural Resources Department
3.2	Ensure that the protected sites of the Tristan da Cunha group are maintained at optimal conservation status		
3.2.1	An advisory committee will be established to oversee the management of all the Protected Areas within the Tristan Group, with representatives from partner organisations in UK, South Africa and Tristan	December 2006	RSPB
3.2.2	Management plans for Inaccessible and Gough are updated and implemented	Gough – December 2006	Honorary Conservation Officers, Natural Resources Department, Conservation Officer
3.2.3	A management plan for Nightingale is finalised and implemented.	March 2007	Natural Resources Department, Conservation Officer
3.2.4	Access is regulated to Protected Areas by the Natural Resources department	Ongoing	Natural Resources Department, Police
3.2.5	Measures will be put in place to eliminate the risk of introducing alien species to protected sites	Ongoing	Conservation Officer, Natural Resources Department
3.2.6	Further human-induced habitat loss is prevented – in particular fire prevention measures are put in place on Nightingale and Inaccessible	Ongoing	Natural Resources Department
3.3	Strengthen technical skills to effectively manage biodiversity		
3.3.1	Continue with training for selected Tristan government employees who will assist the conservation officer	Ongoing	Conservation Officer, Natural Resources Department, Darwin team
3.3.2	The Natural Resources Department will seek help to propose and manage biodiversity projects from UK and other external agencies and individuals	Ongoing	Natural Resources Department
3.3.3	Links will be developed with UK agencies in order to gain funding and progress proposed conservation projects	Ongoing	Natural Resources Department
3.3.4	Visiting scientists will be provided with training on Tristan culture	Ongoing	Conservation Officer
3.4	Improve external communications and access to this communication		
3.4.1	Improvements to the satellite link to Tristan will be sought to link all government departments to the email system and allow direct emails to all heads of departments	Ongoing	Administrator
3.4.2	The Natural Resources Department email link will be used to keep stakeholders in the UK and South Africa informed on conservation issues in Tristan	Ongoing	Natural Resources Department & Conservation Officer
<b>4</b>	<b>The impact of alien species is reduced or eliminated</b>		
4.1	Reduced the number of alien species introduced to Tristan		
4.1.1	Work with the South African authorities to improve arrangements for checking and transporting cargo in Cape Town	Ongoing	Natural Resources Department, Tristan Island Council

4.1.2	Increase the amount of fruit and vegetables grown on the island to reduce the amount imported from South Africa. Investigate organic methods of increasing yield (for instance crop rotation)	Ongoing	Agriculture Department
4.1.3	Seek advice from UK, other UKOTs and other agencies operating on small islands on the best methods for achieving environmentally sustainable farming	Ongoing	Agriculture Department
4.1.4	Funding will be sought to ensure that the fruit and vegetables that are imported will be irradiated either at the place of origin or on Tristan	Ongoing	Agriculture Department
4.1.5	Use species which improve grazing sward but which do not result in a loss of biodiversity	Ongoing	Agriculture Department
4.1.6	The pasture on the coastal plain will be improved through the application of fertiliser to eliminate the need to import fodder	Ongoing	Agriculture Department
4.1.7	Alternative fodder (pellets) will be imported to reduce the risk of invasive species introductions	Ongoing	Agriculture Department
4.1.8	A quarantine area will be established for dealing with alien species when they arrive at Tristan	Ongoing	Police, Agriculture Department
4.1.9	All cargo will be checked by the Agriculture Officer	Ongoing	Agriculture Department
4.2	Ensure casual/adventive alien plants are not able to establish populations in the wild		
4.2.1	Careful monitoring carried out so that alien plants are quickly recognised and are not allowed to establish populations	Ongoing	Conservation Officer, Agriculture Department
4.2.2	Contingency supplies of herbicide kept to eradicate quickly any new alien species	Ongoing	Agriculture Department
4.2.3	Training will be given to the Agriculture Department for identification of alien plant species and application of pesticides	2007	Need to identify external expertise
4.2.4	A booklet with details of alien plant species found on Tristan will be produced	2008	Need to identify external expertise
4.3	Prevent the transfer of alien species between islands of the Tristan group		
4.3.1	The recommendations of the Inaccessible and Gough management plans to prevent the introduction of alien species will be enforced	Ongoing	Police, Conservation Officer
4.3.2	Poison bait stations will be placed on the coasts of Inaccessible and Nightingale to prevent the accidental introduction of rats	Twice/year	Conservation Officer
4.3.3	All sand taken from Tristan to other islands will be steam treated	Ongoing	Conservation Officer, Natural Resources Department, Public Works
4.3.4	Boots and clothing will be cleaned before travelling between the Tristan Islands	Ongoing	Conservation Officer
4.3.5	Monitoring of spread of alien species will be carried out so that any accidental transfers between islands are quickly recorded and action taken to prevent spreading	Ongoing	Conservation Officer
4.3.6	All vessels visiting islands in the Tristan group will be required to register with the Natural Resources Department and certify they are rodent free	Ongoing	Natural Resources Department, Police
4.4	Programme of control or removal of alien plants introduced		
4.4.1	Control and possible eradication methods for the invasive alien species already established in Tristan da Cunha will be investigated	Ongoing	Tristan Biodiversity Advisory Committee

4.4.2	In particular, <i>Sagina</i> will be eliminated from Gough, and methods for halting the spread of the species on Tristan will be examined	Ongoing	Conservation Officer, UCT
4.4.3	Alien plants recently introduced accidentally to Inaccessible island will be removed	Ongoing	Conservation Officer, UCT
4.4.4	Nightingale and Inaccessible islands will be closely monitored to ensure that the flax removal programmes were successful and the species is not allowed to re-establish	Ongoing	Conservation Officer
4.4.5	Effect of alien plants on native species will be investigated, so that resources will be prioritised to the control of those alien species that pose the most threat to the native wildlife	Ongoing	Conservation Officer
4.4.6	A database will be established, listing alien plants and their distribution, and herbicides that can be used for control/eradication	Ongoing	Conservation Officer
4.5	Introduced rodents are controlled or eradicated on Tristan and Gough		
4.5.1	A feasibility study will be carried out to look at the control or eradication of house mice from Gough and rats from Tristan	Completed by March 2007	RSPB
4.5.2	Funding will be sought to carry out the recommendations of this study	Ongoing	Tristan Biodiversity Advisory Committee
4.5.3	Awareness will be raised on Tristan of the danger of accidental introduction of rats to Nightingale or Inaccessible	Ongoing	Conservation Officer
4.5.3	Measures will be put in place to prevent further introductions of rodents both in cargo from South Africa and by transfer between islands	Ongoing	Tristan Island Council, Administrator
4.5.5	Contingency plans will be drawn up in case of accidental introduction to Nightingale or Inaccessible	2007	Conservation Officer
4.5.6	Alternative food sources for rodents will be removed through improved waste management (storage and collection of waste)	2008	Public Works Department
4.5.7	An improved rat control programme is introduced on the settlement	2007	Agriculture Department
4.6	Restoration of affected species and ecosystems following removal of alien species		
4.6.1	The possibility of reintroducing the Tristan albatross and Tristan bunting to Tristan if a rodent eradication takes place will be explored	Ongoing	Tristan Biodiversity Advisory Committee
<b>5</b>	<b>The sustainable use and management of the marine environment is enhanced</b>		
5.1	Ensure legal fishery is sustainable		
5.1.1	Seek advice on fisheries management from other South Atlantic Overseas Territories, South Africa and the UK	Ongoing	Natural Resources Department
5.1.2	Enhance the monitoring of fish stocks in order to provide better data to inform quota levels	Ongoing	Natural Resources Department
5.1.3	Undertake research on the biology of the Tristan lobster in order to assist the sustainable management of the stock	Ongoing	Natural Resources Department, Marine Coastal Management, Stellenbosch University
5.1.4	Seek advice on quotas from more than one source	Ongoing	Natural Resources Department
5.2	Minimise the impact of the legal fishery on the marine environment		
5.2.1	Encourage all long-liners to carry a Natural Resources Department fishery observer on board to verify compliance with licence conditions and to ensure that mitigation measures are used	Ongoing	Natural Resources Department
5.2.2	Ensure fishing licences include a condition that mitigation measures are employed to minimize by-catch of non-target species and seabirds	Ongoing	Natural Resources Department

5.2.3	Data on bird bycatch will be collected and analysed annually	Ongoing	Natural Resources Department, UCT, RSPB, BirdLife Global Seabird Programme
5.3	Minimise illegal fishing in the Tristan EEZ		
5.3.1	Regular patrol assistance from licensed fishing boats, research vessels and naval vessels will be requested	Ongoing	UK Government, Natural Resources Department
5.3.2	The means of setting up a system for monitoring fishing vessels in the Tristan EEZ will be investigated. This may include use of a long range patrol vessel, and surveillance by remotely operated radar installed on either Nightingale or Inaccessible island	Ongoing	UK Government, Natural Resources Department
5.3.3	The feasibility of monitoring vessels by satellite will be investigated	Ongoing	UK Government
5.3.4	The scale of the problem will be determined by monitoring reports of landings of Tristan crayfish at foreign ports	Ongoing	UK Government, Ovenstones (South Africa)
5.3.5	Engage with regional and international fisheries organisations (International Commission for the Conservation of Atlantic Tuna, South East Atlantic Fisheries Organisation)	Ongoing	UK Government
5.4	Maintain marine biodiversity of Tristan at its current level		
5.4.1	Identify the existing collections of preserved animals and seaweeds	Ongoing	University of Grahamstown, Sue Scott
5.4.2	Collect and collate published information from previous surveys on the marine ecosystems and identify further work required to establish a baseline of information on marine life	March 2008 (Darwin dependent)	Natural Resources Department, RSPB, Sue Scott
5.4.3	Assess the risk of the introduction of alien marine species and identify likely pathways for alien introductions	Ongoing	Natural Resources Department
5.4.4	Identify the potential impact of introduced species on the native marine life particularly economically important species, and introduce mitigation measures to minimise the likelihood of such introductions occurring	Ongoing	Natural Resources Department
<b>6</b>	<b>The knowledge of Tristan's key habitats and species is increased</b>		
6.1	Ensure the current distribution of native habitats is maintained		
6.1.1	Monitor habitat distributions on Tristan and Nightingale every five years, as per the monitoring manual (Annex 10)	Ongoing	Conservation Officer
6.1.2	Carry out a study to assess the impact of alien species on native plants and habitats on Tristan and Nightingale	Ongoing	Conservation Officer, Tristan Biodiversity Advisory Group
6.2	Provide baseline information on endemic plant species		
6.2.1	Continue with the survey work to establish baseline data on the range of the endemic plants	Ongoing	Conservation Officer
6.2.2	Monitor the range of endemic plants on a five – year basis	Ongoing	Conservation Officer
6.3	Provide baseline information on invertebrates on Tristan, Nightingale and Gough		
6.3.1	Continue with the present work to identify invertebrates collected on Tristan and Nightingale	Ongoing	Conservation Officer, Christine Haenel
6.3.2	Carry out invertebrate collection on Inaccessible	Funding dependent	Conservation Officer
6.4	Ensure breeding bird populations are stable		
6.4.1	Monitor populations of the target species and annual harvesting of seabird chicks and eggs	Ongoing	Conservation Officer

6.4.2	Carry out annual monitoring of Northern rockhopper penguins and Atlantic yellow-nosed albatross on Nightingale and Tristan as per the monitoring manual	Ongoing	Conservation Officer
6.4.3	Monitoring protocols will be put in place for breeding land birds	2007	Conservation Officer, RSPB
6.4.4	Seal numbers on Tristan and Nightingale will be counted annually	Ongoing	Conservation Officer
6.4.5	Investigate the impact of seals on breeding sea birds	Funding dependent	Conservation Officer

## Monitoring Progress

The Head of the Tristan Natural Resources Department will be responsible for monitoring progress of plan implementation.

An annual report on the progress of the plan will be submitted to the Tristan Island Council by 1 May each year, which will report against activities.

At the end of 5 years (2010), the action plan will need to be reviewed. Table 1 outlines indicators to monitor progress in implementing the plan at the end of 5 years.

**Table 1: Tristan Biodiversity Action Plan Indicators**

<i>Goal</i>	<i>Description and justification</i>	<i>Indicators</i>
<b>To halt, or in the case of some species and habitats, reverse the rate of biodiversity decline on Tristan da Cunha</b>	Tristan is one of the world's smallest nations but its wildlife, including millions of seabirds and many endemic species, represents a significant part of the UK's and the world's biodiversity	IUCN Red List reports a stable population of key species over a five-year period e.g. Atlantic yellow-nosed albatross and Rockhopper penguin
<i>Purpose (5 years)</i>	<i>Description and justification</i>	<i>Indicators</i>
<b>To enable the people of Tristan to actively engage in and benefit from the conservation of biodiversity on their islands</b>	The economy of Tristan is, at present, almost completely dependent on the sustainable harvesting of its wildlife, and so the conservation of the biodiversity of Tristan is of fundamental importance to the protection of livelihoods on the island	Use of the quota system to manage fisheries sustainably provides 90% of the total Tristan government revenue  Revenue raised from tourism increases by 10%  At least 10 Tristanians are actively involved in biodiversity conservation activities

<b>Objectives</b>	<b>Description and Justification</b>	<b>Indicators</b>
<b>1. Biodiversity Conservation is integrated into all Government, programmes, policies and plans (nationally and internationally)</b>	As the conservation of biodiversity is fundamental to livelihoods on the island any development plans must take its protection into account	References to biodiversity are made in the economic development plan  4 reports/year submitted to the South Atlantic Working Group  Conservation Officer participates at Tristan Island Council meetings at least 2 times/year
<b>2. Support for biodiversity conservation is strengthened on Tristan</b>	The Darwin Initiative project has begun to raise awareness of conservation issues on Tristan but this process needs to be continued	1 conservation newsletter/year produced for the Tristan community  Environmental education is included in the school curriculum  Tests show school children are more aware of the natural heritage of Tristan da Cunha
<b>3. Tristanians have the capacity to manage biodiversity effectively</b>	Capacity is limited on Tristan therefore external support from South Africa and the UK is required. Although current legislation is being updated to take into account international agreements, there is a need to strengthen enforcement on Tristan.	Advisory Committee established for Protected Areas  Conservation Officer uses network of contacts, particularly in the South Atlantic UKOTs in order to strengthen biodiversity management on Tristan  Management plans for all four islands of the Tristan group are produced/updated and implemented
<b>4. The impact of alien species are reduced or eliminated</b>	The greatest threat to the wildlife of Tristan is from the introduction of alien species, both plant and animal.	There is no new introduction of alien species to the Tristan islands from each other and elsewhere  <i>Sagina</i> is eradicated from Gough  Flax is eradicated from Nightingale & Inaccessible  Import of hay to Tristan ceases  Impact of rodents on birdlife is decreased/halted through control/eradication

<p><b>5. The sustainable use and management of the marine environment is enhanced</b></p>	<p>The marine life of the Tristan islands is of global significance and holds many endemic species, yet there is little information or knowledge. The Tristan economy is almost entirely dependent on a sustainable harvest of marine resources.</p>	<p>Marine survey is undertaken</p> <p>Data is collected according to best practice and submitted annually for analysis to establish quotas</p>
<p><b>6. Knowledge of Tristan's key habitats and species is increased</b></p>	<p>Information is lacking on the numbers and distribution of many of the key species, particularly the native invertebrates. Very few species have had long term monitoring.</p>	<p>Annual monitoring of key species on Tristan and Nightingale is carried out as detailed in the monitoring manuals, and the data published or made available via the Tristan website</p> <p>A full terrestrial invertebrate survey of Tristan is undertaken</p> <p>Habitat survey undertaken every 5 years</p>

# Conservation Framework

## **Roles and responsibilities:**

Responsibility for the conservation of the biodiversity of Tristan da Cunha lies primarily with the Tristan Island Government, with advice from the governments of St Helena and the UK. The UK retains responsibility for external affairs, including the ratification of international conventions such as the Convention on Biological Diversity.

## **Financing conservation:**

Tristan has an Environment Fund, which supports a small number of conservation activities. This is supplemented with funding from the joint UK Foreign and Commonwealth Office and Department for International Development Overseas Territories Environment Programme (OTEP) (to help support implementation of the Environment Charter) and the Department for Environment, Food and Rural Affairs' Darwin Initiative as well as from UK and international NGOs.

## **Legislation and Protected sites:**

The first Protection Ordinance was passed at Tristan in 1950, with several subsequent additions. The latest revision to the Conservation Ordinance was agreed by the Tristan Island Council in June 2005, and approved by the Attorney General in St Helena in January 2006. The objectives of this comprehensive legislation are the maintenance of fauna, flora, geological, scenic and historical features of the islands. The Tristan da Cunha Fisheries Limits Ordinance of 1983, as amended in 1991, 1992, 1997 and 2001, defines the fisheries limit around each of the islands as 200 nautical miles, and makes provision for fishing within these limits.

Land management on Tristan, and the export and import of livestock and fresh goods is controlled by the Agricultural Ordinance of 1984.

Under the Tristan da Cunha Conservation Ordinance of 1976, Gough Island and its territorial waters out to three nautical miles was proclaimed a Wildlife Reserve. This was modified by the Tristan da Cunha Conservation Ordinance (Amendment) of 1997, such that Gough Island was renamed a Nature Reserve and the boundary was extended to 12 nautical miles. Gough Island is divided into a logistic zone (six ha. for support of the meteorological station), marine zone, scientific research zones, and the conservation zone that encompasses the vast majority of the island. A 'Management Plan for the Gough Island Nature Reserve' took effect in 1993, and is due to be amended in 2006.

Inaccessible Island was declared a Nature Reserve under Tristan da Cunha Conservation Ordinance (Amendment) of 1997, including the surrounding waters up to 12 nautical miles. Under this legislation, although Tristan islanders still retain the right to collect driftwood and guano, other access is restricted and all living resources are protected.

While Tristan Island and the Nightingale island group are not protected as Nature Reserves, they are subject to the Tristan da Cunha Conservation Ordinance as given above.

In total, some 44% of the land area of the Tristan da Cunha Territory has been set aside for conservation.

Protection of the birds of the Tristan group is provided for by the Tristan da Cunha Conservation Ordinance. Seabird harvesting is restricted to Nightingale and Alex islands. Penguin eggs are collected in September, and eggs, chicks and adults of the great shearwater are harvested throughout the summer on Nightingale.

### **International measures relevant for the conservation of sites:**

As a territory of St Helena, Tristan da Cunha and Gough Island are included under the ratification by the UK of the Convention of Biological Diversity, CITES, the Ramsar Convention, the Convention on Migratory Species, and the World Heritage Convention. Gough Island was granted World Heritage status in December 1995, only the third British site to be so recognized for its biological value. In 2004, the World Heritage designation was extended to cover Inaccessible Island.

Many seabirds and other marine species spend significant proportions of their lifespans outwith the Tristan da Cunha EEZ, and their conservation in international waters is facilitated by international agreements, in particular Convention on Conservation of Antarctic Marine Living Resources (CCAMLR) and Agreement on Conservation of Albatrosses and Petrels (ACAP).

In April 2006, the UK Government ratified ACAP on behalf of Tristan. The priorities for action under this agreement will be the monitoring of populations of the three albatross species, Southern giant-petrel, Spectacled petrel and Grey petrel. Also the eradication of rodents from Tristan da Cunha and Gough and the development of rigorous quarantine procedures on materials entering Tristan and moving between islands in respect of rodents and avian diseases.

### **Conservation Management:**

Much of the survey and monitoring of the biodiversity of Tristan da Cunha has been carried out to date by teams of visiting scientists. The capacity to carry out conservation work is limited on Tristan by a small workforce, lack of experience and very little formal scientific education.

The Tristan Darwin Initiative project has given fieldwork training to a team of ten government employees, and most conservation work will now be carried out by this team, led by the Tristan Conservation Officer and the Head of the Natural Resources Department. There will still be a need for specialist input for some taxa, but seabird and seal monitoring will be carried out by the government workforce. Where possible, at least two members of this team will work with any future conservation projects in order to maximise the training opportunities afforded by these projects.

# Description and Biodiversity Audit

## General Background

### Location/geography

Tristan da Cunha is a group of six islands in the mid South Atlantic Ocean, 2,800 km from Cape Town, South Africa and 3,950 km from Mar del Plata, South America. The main island of Tristan da Cunha itself, and the islands of Nightingale, Inaccessible, Alex and Stoltenhoff lie within 40km of each other and constitute the main Tristan da Cunha group. Gough Island is 350 km south-southeast of Tristan da Cunha itself.

The islands are of volcanic origin, of varying geological age and stage of erosion, with the oldest rocks dating back 18 million years. However, the main group shows evidence of recent activity (indeed there was a submarine eruption near Nightingale in August 2004 and an eruption on the main island of Tristan in 1961 resulted in a two-year evacuation of the entire community), and therefore cannot be regarded as volcanically extinct. Lying somewhat east of the crest of the mid-Atlantic Ridge, near its junction with the aseismic Walvis Ridge, the islands rise from a sea depth of about 3,500 m.

The islands are classed as a distinct Overseas Territory of the United Kingdom. There is no air link – transport to and from the islands is by fishing vessels every few months, and the annual visit by a South African research vessel.

### People

The islands were first discovered by Portuguese sailors in 1506, and first inhabited in 1811, by a succession of British soldiers, sealers and whalers and shipwrecked sailors of various nationalities. The present population of 275 are the descendants of the seven early male settlers (Glass, Green, Hagan, Laverello, Repetto, Rogers and Swain). All age groups are represented with 64% of the population under the age of 55. The population has remained relatively stable since the 1960s. The number of families on the island is increasing while at the same time the average family unit becomes smaller.

The entire population live in one settlement, Edinburgh of the Seven Seas, which is in the north of the main island of Tristan.

As a UK Overseas Territory the UK Government, is represented by a resident Administrator who is advised by an Island Council of eight elected and three appointed members. The elected member with the most votes is chosen as Chief Islander and acts as Administrator during the latter's absence.

## **Economy**

Tristan only became a cash economy in the 1950s when the crayfish industry was established. Until then it had been a subsistence living and it is still the case that some of the food of the islanders (meat, potatoes, a small amount of vegetables, fish) is not purchased but produced themselves.

Currently Tristan da Cunha is almost economically self-supporting – only large capital projects require overseas funding. Government revenue finances the provision of healthcare and education on the island.

The economy of Tristan is mainly based on the crayfish *Jasus tristani* fishery (the frozen product is exported), with small revenues raised from philately (worldwide sales) and handicrafts (mainly woollen goods).

In the past profits from the fishery have been used to build up reserves. However, Tristan is currently drawing on these reserves to maintain government activities as revenue from the crayfish industry is declining. The government is aware of the urgent need to diversify the economy as these reserves will soon be depleted. However, without the improvement of the harbour (see below) there are few options available for Tristan.

The government is the chief employer on the island with a workforce of 147. The crayfish factory provides permanent employment for 23 and casual employment for 36 fishermen and 70 factory workers on fishing days. Many of those employed in the crayfish industry also do casual work for the government as fishing only takes place on about 60 days/year. At present only one person is employed solely by a private venture. However, if incomes from tourism, including wildlife tourism increase, this could open up the possibility of private enterprise.

The Government own the one shop on the island and virtually all supplies come from Cape Town. Most items are subject to a 40% tax but basic foodstuffs, including flour, tea and sugar are exempt and in some cases subsidised.

## **Fisheries**

The main commercial fishery of Tristan is for crayfish but other species taken commercially are octopus, bluefish, tuna and alfonsino.

The crayfish concession is held by a British registered company, Eurex, that has offices in South Africa (Ovenstone agencies). The two boats belonging to this company, the Edinburgh and Kelso, fish around the islands of Nightingale, Inaccessible and Gough for which a quota is set each year by the Natural Resources Department. Eurex owns the factory on Tristan and the 18 smaller boats that are used by the islanders to fish for the Tristan crayfish quota. The Tristan quota is caught solely by the Tristan fleet and only on days when the weather is fine. These fishing days are decided by a team of two on a daily basis – a ‘dong’ is rung early in the morning to signify a fishing day and then the fishermen and the factory workers are employed on the crayfish fishing that day. The crayfish fishing season begins in July/August and continues until the quotas have been caught, usually in March.

There is no trawling of the seamounts taking place at the present. Tristan grants one licence for long lining each year. In 2006 it has been sold to Quayside fishing.

The present sea fisheries patrol boat is a 34ft fibreglass boat with a range of about 200 miles. There is a limit to the size of fisheries patrol vessel that can be kept on Tristan due to the harbour restrictions (see below). The NRD uses this vessel to patrol the northern islands of Nightingale, Inaccessible and Tristan, but there is no capability on Tristan to patrol the waters around Gough. In the future it is hoped to use VMS (Vessel Monitoring Systems) and satellite surveillance to protect the Tristan fisheries. For the present Tristan relies on the crayfish boats, and the occasional military boat travelling through the area, to report any illegal fishing.

The NRD is responsible for providing the information necessary to manage the fisheries, and fisheries observers are placed on as many boats as possible. Data taken from the catches is analysed and this information is used to set quotas. In the case of the crayfish fishery 5,000 samples are taken from each island and measurements taken from these. This data, along with information on catch per unit effort (CPUE), used to be analysed by Marine Resource Assessment Group (MRAG), but is now fed into a computer modelling programme in Tristan, which then allows the NRD to set the Total Allowable Catch (TAC) for the next season.

The management of the fishery around the main island of Tristan is decided by a fishing committee, which has eight members representing the fishermen, the fishing company, the NRD and the Island Council. The Tristan fishery is controlled not only by the quota given for the island, but also by the amount of time boats are allowed to spend in the water on fishing days. This limits how far from the harbour the boats are able to fish.

The management of the crayfish fishery around Tristan seems to be sustainable. This was not always the case, and until the 90s the stocks were decreasing due to overfishing. The stocks presently appear to be recovering, although those around Gough are lagging behind possibly due to poaching.

### **Tourism**

At present there is little tourism to Tristan, but this is beginning to increase. Most tourists used to come on the Royal Mail Ship St Helena, but apart from a one off to celebrate the Tristan quincentenary in January 2006, this made its last run to Tristan in January 04. However, there are increasing opportunities for visitors to come on other cruise ships, and in recent years tourists have also come to the island on the South African research vessel SA Agulhas. In 2006, 8 cruise ships have visited raising £22,689 in landing fees. The Royal Mail Ship alone, which visited Tristan in February 2006 and where passengers stayed on the island for a week, raised £8,100. This is significantly higher than the two ships, which visited in 2005 that raised £2,150.

There is no hotel on Tristan and tourists that stay on the island stay either with an island family or rent one of the houses available for self-catering.

The majority of tourists arrive on a cruise ship, although many of these do not land because of the harbour restrictions (see below). Tourists provide an important source of government revenue in the form of landing fees and purchases from the Post Office. They also buy handicrafts and pay for guides, which forms an important part of the private income for some people.

### **Harbour**

The present harbour was built in the 1960s, after the previously used landing beach was covered by the lava flow from the 1961 eruption. The harbour is very prone to being closed by bad weather and is only in use 80-100 days of the year. Boats kept on Tristan are lifted in and out of the harbour by crane. This places severe restrictions on the island. There are many occasions when passengers and freight cannot be landed because of the weather conditions, and there is a limit to the size of boat that can use the harbour both because of the need to be lifted by crane and the shallow depth of the harbour. At present most cruise ship passengers that visit Tristan do not land on the island because of the dangerous nature of the harbour. EU funding has now been approved to improve the existing harbour but it still will not remove the problems associated with landing cruise ships.

### **Agriculture**

Each family has sheep and cattle, and grows potatoes.

### *Sheep*

There are approximately 3000 sheep on Tristan. Most of these are grazed in the settlement plain in the north of the island. The numbers of sheep in this area are strictly controlled and each family is only allowed to keep 8 sheep in this area. This may well be reduced to 7 in the near future as the number of families increases.

The sheep are sheared annually in December, and everyone on the island helps with this process. The sheep are all gathered and then those belonging to individual families are penned separately and then sheared and marked. This is also an occasion when many sheep are slaughtered in one of two slaughterhouses. The meat is stored in home freezers and in crates in the island store freezer.

On the mountain plateau there are a number of herds of sheep owned by groups of people who are collectively responsible for shearing these and bringing them down for slaughter. Not everyone on the island has animals on the base, but often mutton from these animals is given away to those who do not have mountain sheep. The meat tastes significantly different to the mutton from sheep on the coast plain. Some fences have been erected on the mountain plateau to separate the different herds of mountain sheep, although many of these are in need of repair. Fencing materials are taken up to the base by helicopter on the very few occasions when this is possible but they are hard to maintain, and in general the sheep are free-ranging. The groups who own the mountain sheep only go up to gather them once or twice a year. The sheep are either slaughtered up on the Base and the meat carried down, or they are driven down the two access routes with the aid of dogs, and slaughtered in the village.

Although there are now fewer people maintaining herds on the Base than in the past, sheep are still present in relatively large numbers. Many sheep are now feral, and there is nothing controlling their numbers. Sheep grazing has almost certainly been responsible for the spread of introduced plants on the mountain.

### **Cattle**

Most of the island cattle are kept on the settlement plain – in fact many of them graze in the village itself. There are about 700 kept here, including two bulls. Each family is entitled to two cows, which are slaughtered annually, in addition to the breeding animals.

There are also three herds of cattle on the other coastal plains, comprising a total of about 300 animals. These are owned privately, but not every family has cattle here and recently those who have cattle in these herds have sold their surplus beef. Breeding heifers are taken to these areas by boat, and the animals are shot and butchered in the open before the meat is brought back by boat.

Cattle feed in the form of hay is brought in from Cape Town. The UK government used to provide fertiliser for the island, but when this was stopped in the 1980s grazing was not rich enough to provide for all the cattle, and it was cheaper to import fodder than fertiliser. Unfortunately, this imported fodder has been the source of many of the introduced plant species.

### **Other livestock**

The agriculture department owns a breeding sow, and the piglets are sold for fattening. Almost all households have hens and ducks, which lay for most of the year. Donkeys are still kept on Tristan although they have not been used for transport for many years.

### **Crops**

Potatoes are the main crop and these are grown at the Patches, about three miles from the village. Other vegetables are grown at the patches, and also on plots within the village. All families own potato plots, which are dug and planted by hand. Most of the seed stock is from the island, but occasionally fresh seed potatoes are brought in from Cape Town. Agricultural weeds (known locally as Kikuyu Grass, Logan berry, Fumitory, Milk Weed, and Yellow Nut Grass) are a big problem, especially as the soil is turned by hand. Most plots are sprayed before planting, but several plots have now been abandoned, as they are overgrown with weeds. Again it would serve both conservation and agricultural interests to investigate control methods for these introduced plants.

### **Seabird harvesting**

Since the earliest settlements on Tristan da Cunha seabirds have formed an important part of the diet of the islanders. Until 1976 this was unregulated. With the introduction of the Tristan da Cunha Conservation Ordinance of 1976 and subsequent amendments, the taking of seabirds and their eggs was prohibited on Tristan, Gough and Inaccessible.

The taking of Northern rockhopper penguin eggs and juvenile and adult great shearwaters is still permitted on Nightingale. The penguin eggs are normally taken from the largest rookery on Nightingale and from the nearby islet called Alex Island. The collection is made in September by a team of about 6 islanders, and the eggs are then distributed throughout the households. In 2003, 600 eggs were taken. There were none collected in 2004 and 2,000 in 2005. The small numbers collected are thought unlikely to have an effect on the population.

Great shearwater chicks and adults are collected from burrows in a specific area of Nightingale Island. No record is kept of numbers taken, although the total is almost certainly going down. It used to be traditional for eight long boats each with a team of four to go to Nightingale for shearwaters, but in 2003 only two boats went. The shearwaters are still plentiful in the area where the collection takes place, and the density based on personal observations of the hunters seems the same from year to year, suggesting that the taking of shearwaters is not having any effect on the overall population.

### **The other islands**

The other islands are uninhabited, but there are traditional longboat trips to Nightingale Island for seabird and guano harvesting. About 30 wooden huts and shacks, and pathways, have been constructed on Nightingale for this purpose. Inaccessible Island has been less often visited since 1938, but before then was visited more frequently than Nightingale. A research hut built on Inaccessible by the Denstone Expedition in 1982 was both demolished and replaced in January 2000. The only settlement on Gough is the meteorological station, about 10 buildings, at Transvaal Bay in the south-east of the island.

### **Biodiversity**

The islands are primarily known for their birdlife (See Annex 4 for birdlist). The six species of breeding landbird are all endemic, and there are millions of pairs of breeding seabirds. Four species of seabird – the Atlantic yellow-nosed albatross, Tristan albatross, Atlantic petrel and Spectacled petrel - are endemic, and the Tristan da Cunha group is internationally important for their breeding populations of some eighteen other species. There are two endemic bird areas covering the main Tristan group and Gough. At least 212 plant taxa (See Annex 6 for plantlist) have been recorded, including 35 native ferns and 58 native flowering plants. Of these, 20 fern and 34 flowering plant taxa are considered to be endemic. There are no reptiles, amphibians or freshwater fish, and there are no records, other than poultry, of introduced birds. An invertebrate fauna (See Annex 7 for list) includes weevils and snails of particular interest, but with a relatively low number of native species. The only native breeding mammals are seals, Subantarctic fur seal and Southern elephant seal, which have been exploited in the past. Five whales - Southern right whalesperm whale, Humpback whale, Long-finned pilot whale and Shepherd's beaked whale occur relatively frequently, the last with regular strandings. Various species of dolphin, including Dusky dolphin, are common.

### **Conservation Threats**

The two main threats to biodiversity on all the islands are introduced invasive species and Long-line fishing. Longline fishing is a major threat to some of the Procellariiform seabirds on the island, most notably the Spectacled petrel, Tristan albatross, Atlantic yellow-nosed albatross and Sooty albatross. Large-scale mortality of the former two species has been recorded off the South American continental shelf near southern Brazil. Illegal fishing in the Tristan EEZ may also contribute significant mortality.

The six islands of the Territory each have distinct topographical, floral and faunistic characteristics. We have only included a summary here:

## **Tristan da Cunha**

**Area:** 96 km<sup>2</sup>

### **Conservation Status:**

The Northern rockhopper penguin colonies on Tristan are classified as nature reserves. Tristan is subject to the Tristan da Cunha Conservation Ordinance. The south-eastern sector, which remains the largest refuge for the Tristan thrush and seabirds, and is rarely visited, should remain a wilderness area.

### **Geology and geomorphology:**

Roughly circular in plan with an average diameter of some 12 km, Tristan is a strato-volcano made up of interbedded lavas (mainly basaltic) and pyroclastic deposits, with a central cone, the Peak, rising to 2,060 m. A series of ravines, locally known as gulches, radiate from the central peak down to the coast. It is geologically the youngest in the group, c.500,000 years old. At the summit it is an unbreached crater, and there are several crater lakes on the plateau (known as the base) at just above 600m. There are two significant coastal plains – the settlement plain in the north and a smaller one between Cave Point and Stoney Beach in the south.

### **Habitats:**

Nine broad habitat types can be identified on the island, defined by a dominant vegetation type and which are determined by altitude, aspect and topography (See Annex 3a for habitat map). While they fall into bands roughly determined by altitude, most are mosaics of many of the plant species with one species being more common than the others – for instance areas designated as *Blechnum palmiforme* heath are often interspersed by patches of *Phyllica* trees and *Empetrum rubrum*. The nine habitat types are as follows:

### **Lowland Grassland**

The lowland plains are dominated by alien grasses, which provide grazing for sheep and cattle. Tussock grass was once widespread on the settlement plain but is now found only in small patches, mainly along the edges of the low sea cliffs, although it is found in abundance at the other islands of the group. Alien grasses are not confined to low altitudes however, they are found in patches in all areas of the base and have even been recorded as high as 1,600m within the cinders zone. Alien grasses appear to be most prevalent in areas of disturbance such as areas grazed by sheep (eg Nellie's Hump) and areas of nutrient enrichment such as around albatross nests.

### ***Blechnum penna-marina* heath**

The heath is dominated by a low-lying fern, which thrives on the steepest of slopes. It is most common on the sea cliffs and the sides of gulches that intersect the base.

### ***Blechnum palmiforme* heath**

This habitat is dominated by small tree ferns, referred to as bog ferns. It occurs at intermediate altitudes, from the upper levels of the sea cliffs to the steeper gradients on the base where it is replaced by grasses and mosses. The size of the ferns varies according to age and exposure; in a sheltered area they will grow to about a metre in height whereas those on exposed ridges are much reduced in size.

### ***Phyllica* woodland**

*Phyllica* trees dominate this habitat. They are found at similar altitudes to the bog ferns, and are often found growing together. They tend to thrive better in slightly sheltered situations, and are commonly found at the bottom of gulches and throughout the side of the island sheltered from the prevailing westerlies where they form an almost continuous cover. In unusual circumstances *Phyllica* will grow to a considerable size, up to 10 m or so, but are usually no more than 2 or 3m in height. In exposed positions they will adopt a recumbent habit, growing small creeping branches that rarely extend more than 30 cm above the ground.

### ***Empetrum rubrum* heath**

This procumbent plant dominates some areas on the base and is also found at low altitudes, particularly at the south of the island. It produces large numbers of berries which are collected by the islanders.

### **Wet heath**

A small number of places are permanently waterlogged and consequently support a different flora, dominated by mosses. The area known as Soggy Plain is the largest occurrence of this habitat type.

### **Upland grassland**

The main species occurring here is *Rumex acetosella*, locally known as 'sour-grass'. It is particularly abundant in the higher-mid altitudes, between the bogfern/*Phyllica* habitats and the *Rhacomitrium* moss habitat, which is common higher on the mountain. While some areas will be dominated by *Rumex* plants, it is usual to find introduced farm grasses mixed in with, and at times completely replacing it.

### ***Rhacomitrium* moss**

Large areas of the higher reaches of the mountain are covered with this pale green moss which is able to colonise, and appears to stabilise, some of the cinder slopes. It also occurs in small patches on rock outcrops at these high altitudes and has been found at the highest point of the peak. Its habit of colonising loose substrates means that it is easily dislodged by walkers and sheep; the few human visitors to this altitude tend to follow fixed routes and are therefore unlikely to create any significant impact at the present rate of useage but the impact of sheep at higher altitudes is noticeable.

### **Cinders**

The highest reaches of the mountain are dominated by a cinder cone, which consists of scree slopes, which are highly mobile and colonised by a few hardy lichens and mosses that can withstand the severe climatic conditions experienced at these altitudes.

In addition to the major habitats outlined above there are additional areas of non-native grassland and woodland on the settlement plain. Around the village in particular are dense stands of New Zealand flax, which was formerly cultivated to provide roofing materials for the islanders' houses, while today its primary function is to provide gardens with a wind-break. A plantation of pine and eucalyptus trees with occasional fruit trees and bushes, which is no longer managed, is located at Sandy Point on the East coast.

### **Birds:**

Although as many as 56 bird taxa have been recorded (including visitors and vagrants), there are now only 13 known species of breeding seabirds and two species of resident landbirds. The seabirds are Northern rockhopper penguins, Atlantic yellow-nosed albatrosses, Sooty albatrosses, Atlantic petrels, Great-winged petrels, Soft-plumaged petrels, Broad-billed prions, Grey petrels, Great shearwaters, Sooty shearwaters, Subantarctic skuas, Antarctic terns and Brown noddies (See Annex 4 for status and population estimates). Tristan is the only known breeding site within the group for Atlantic petrels (except Gough) and for Sooty shearwaters while numbers of the endangered Atlantic yellow-nosed albatrosses are the highest for any island in the Tristan group. Kerguelen petrels and Little shearwaters may also breed; there is a remote possibility that the critically endangered Spectacled petrel breeds, and this requires further investigation. There are currently an estimated 20,000-40,000 breeding pairs of seabirds, most known from the south-eastern quadrant, which has suffered least from human disturbance. The terrestrial species include the Gough moorhen, introduced from Gough Island in 1956, and a subspecies of the Tristan thrush, confined to this island and numbering 50 – 80 pairs in 2004.

There are more records of non-breeding visitors and vagrants on Tristan than from the other islands of the group. This is probably due to the island's larger size and permanent human presence. The strong westerlies create favourable conditions for a crossing from South America, and this would explain the presence of gallinules and other non-breeding landbirds that have reached Tristan from that continent.

Tristan requires much further field study, especially the southern side.

**Mammals:**

There are no endemic terrestrial mammals. The only breeding native mammal is the Subantarctic fur seal *Arctocephalus tropicalis*, of which there is a small colony at Cave Point on the south side of the island. Southern elephant seals *Mirounga leonina* haul out regularly on Tristan beaches and breed sporadically. Southern right whales occur in offshore waters between September and November, but in very low numbers.

The ship (black) rat arrived on Tristan in 1882 from the *Henry B. Paul*, which ran aground at Sandy Point. The house mouse was probably introduced by sealers during the 18<sup>th</sup> century. These rodents have negatively impacted on the biodiversity of Tristan, particularly the bird populations. Richardson (1984) suggests 'the greatest present threat from introduced species to the birds of the group comes from the ship rat *Rattus rattus*'. The ship rat was almost certainly a significant factor in the severe depletion or local extinction of burrowing petrel populations and was likely a contributing factor to the extinction of the Tristan moorhen. It is likely they are also affecting invertebrates and vegetation but these areas are poorly studied.

Domestic cats (*Felis domesticus*) were present on Tristan from the time of settlement in 1811 (Wace & Holdgate 1976) and by 1824 a feral population had established itself (McCormick 1966). The domestic population was eradicated in 1974 due to the suspected link to a case of Toxoplasmosis. The feral population has apparently also died out, with no sightings or signs of cats since.

**Invertebrates:**

For the northern islands of the archipelago, the most comprehensive study was carried out by the Norwegian Scientific Expedition in 1937/38, which focused on Tristan, but also included Nightingale and Inaccessible. Despite the huge contribution this made, not all taxa known to exist at the islands could in the limited time be covered, leaving to the present, groups like the spiders, mites, collembola, worms and groups, still largely un-recorded.

Essentially the fauna represented at the islands is an impoverished one, but includes a significant portion of flightless invertebrates, many of which are endemic to the archipelago and limited to individual islands. Using this as a baseline, subsequent collections have shown that alien species are increasingly colonizing the islands with many of them having become pests on Tristan, affecting in particular crops and also livestock of the islanders.

Of the currently estimated 96 native terrestrial invertebrates recorded from the island, at least 27 are rated as endemics. Of those, six species, are restricted to just Tristan.

### **Conservation issues/threats:**

Tristan itself, as the only permanently inhabited island, has incurred the greatest effects of human activity. These include overgrazing by sheep, tree-felling, fire and, in particular, predation by introduced mammals.

Before the arrival of man, the island may have supported 19 seabird species and three landbird species. The Tristan albatross became extinct as a breeder between 1880 and 1907 due to excessive harvesting, and the Southern giant-petrel probably became similarly extinct around 1870 due to disturbance and a decrease in its food supply, and is now only a non-breeding visitor to the main Tristan group. The Southern skua may soon also disappear as a breeding species due to persecution and a reduced food supply. The Tristan bunting became extinct on Tristan between 1852 and 1873. The Tristan moorhen is thought to have become extinct between 1873 and 1906.

Seabird populations are likely to have been massively reduced since human occupation, as a result primarily of cat and rat predation, the latter of which is ongoing. Many of the seabird populations on Tristan – such as the Atlantic petrel - are now reduced to tiny remnants, and the smaller species (common diving petrel and several storm-petrel species) are thought to be locally extinct. The current status of seabird populations on Tristan da Cunha is very poorly understood. For the majority of species, there has been no assessment of numbers since the early 1970s. As a result, it is unclear whether declines are ongoing. Given the continued presence of rats, this seems likely.

On Tristan, the Tristan thrush has decreased markedly, due to overgrazing, introductions of alien plants, predation by cats and nest-predation by rats. The current population is patchy and largely restricted to high alpine slopes, and gulches on the Base plateau. There are no accurate data on population trends, but a decrease is suggested by reports that the species no longer inhabits 'gulches' near the Hillpiece (Settlement Plain), nor visits the settlement itself, even though in the last 25 years birds have been seen in *Phyllica* above the new volcano. The genetic identity of the population is threatened by introgression from other subspecies brought over from Inaccessible and Nightingale Islands.

It would appear that indigenous invertebrate species, especially the flightless ones such as the endemic flightless moths *Dimorphinoctua cunhaensis* and *D. pilifera* are declining, possibly because they are vulnerable to predators and being out-competed for space and resources.

It is unclear whether invasive alien plants or invertebrates are having a significant effect on the native biota of Tristan da Cunha, although this is certainly a significant risk.

Overall, the current status of and threats to Tristan's biota are very poorly known, and further information is needed before effective conservation management can take place.

## Nightingale

Area: 2.6 km<sup>2</sup>

### Conservation Status:

Nightingale has no protected area status though it is subject to the Tristan da Cunha Conservation and Fisheries Ordinances. A management plan has been prepared for the island in 2006.

### Geology and geomorphology:

Nightingale Island lies 38 km south-west of Tristan and 22 km south-east of Inaccessible Island. The maximum height of the island is High Ridge, which rises to 337 m. There are no streams or gulches, but in the centre are four marshy areas known as 'The Ponds', in one of which are pools of open water (See Annex 3d for map).

### Habitat:

The flora of the island is poor in species, due to the small size and narrow range of environments. Nineteen species of vascular plants and 15 pteridophytes are native, and by 1968 only six alien vascular plants had been recorded. The predominant vegetation is dense *Spartina* tussock-grassland, forming almost pure stands 2–3 m in height, usually on hard fibrous peat. There are some 20 ha of *Phylica*, in small groves, which have few epiphytes, other than lichens, and a sparse understorey. Around the central swamps, and on some of adjoining gently sloping ground, meadows of hummock-forming *Scirpus bicolor* replace the *Spartina*. Kelp extends off shore in the east but there is less to the south and west.

### Birds:

Thirteen species of breeding seabird and three of the native landbirds occur. The seabirds comprise Northern rockhopper penguin, Atlantic yellow-nosed albatross, Sooty albatross, Soft-plumaged petrel, Broad-billed prion, Great shearwater, Little shearwater, white-faced storm-petrel, white-bellied storm-petrel, common diving-petrel, Southern skua, Antarctic tern and Brown noddy. The breeding population of Great shearwater is the largest known, and at the highest density in the world, with an estimated one million pairs per km<sup>2</sup>. Kerguelen petrel may also breed. The terrestrial species include the Tristan thrush (a subspecies unique to the Nightingale group), Tristan bunting and Wilkins' bunting.

### Mammals:

The only breeding native mammal is the Subantarctic fur seal *Arctocephalus tropicalis*. The population appears to be increasing.

### Invertebrates:

Currently at least 49 species of native terrestrial invertebrates are known of which the majority (30+spp) are endemics. These include five endemic listroderine weevils, all of which are specific and restricted to Nightingale, and seven of endemic drosophilid *Scaptomyza*, including the strap wing fly *S. frustulifera*.

**Conservation issues/threats:**

This island has been less affected by alien animals than Tristan and no alien vertebrates have become established. Besides the annual harvest by Tristan islanders of Northern rockhopper penguin eggs, Great shearwater eggs, chicks, and adults, of which the annual toll is not high, the remaining seabirds are little affected. The introduction of mammalian predators and tussock fires are the principal threats, while the recent die-back of trees, possibly caused by an introduced fungal pathogen, is being investigated and is, potentially, serious for Wilkins' bunting.

The presence of several alien plants, including New Zealand Flax, gives some cause for concern, although actions to reduce this threat have commenced. The presence and impact of introduced invertebrates is not known.

Nightingale is the main island for nature tourism so all visitors must be informed about the risk of accidental introductions and take necessary precautions.

It is thought the increase in seal populations may be negatively impacting on the rockhopper colonies but further research is required.

**Alex Island**

**Area:** 0.5 km<sup>2</sup>

**Geology and geomorphology:**

Known also as Middle Island, Alex Island lies 100 m north to north-west of Nightingale Island. Containing the oldest rocks, it rises to a height of 46 m. The island is largely composed of volcanic tuff.

**Habitat:** The island is covered in *Spartina* tussock and has a few boggy areas. Pin Rock, 9 m high, lies off the north-western extremity.

**Birds:** There is a large Northern rockhopper penguin colony.

**Mammals:** The only breeding native mammal is the Subantarctic fur seal *Arctocephalus tropicalis*.

## **Stoltenhoff Island**

**Area:** 0.2km<sup>2</sup>

### **Geology and geomorphology:**

Stoltenhoff Island lies 1.5 km north of Nightingale Island, and rises steeply to 99 m at its southerly point. To the east, separated from the island and each other by narrow chasms, are a high narrow pinnacle and a large, vegetated stack.

### **Habitat:**

On its westerly (windward) side, low cliffs give way to bare rock where brackish water collects. The island is otherwise covered with short *Spartina* tussock below 1 m in height, through which many rocky outcrops protrude. Only one stunted tree (*Phyllica*) has been recorded.

## **Inaccessible**

**Area:** 14 km<sup>2</sup>

### **Conservation Status:**

The island, including the surrounding waters up to 12 nautical miles, was declared a Nature Reserve in 1997, although islanders retain the right to visit. The Gough Island World Heritage Site was extended to cover Inaccessible Island in 2004.

### **Geology and geomorphology:**

Inaccessible Island lies 40 km south-west of Tristan. Roughly rhomboidal in plan, it is 14 km<sup>2</sup> in size, 5.7 km from west to east, and 4.6 km north-south. The highest part, Swales Fell, in the west, rises to 550 m. Geologically, it is the second youngest in the Tristan group, around three million years old, and it is a volcanic remnant dominated by interbedded basalt flows and pyroclastic deposits that dip gently towards the east. Cliffs rise sheer from sea-level round most of the coastline, to 500 m at Swales Fell. The inland plateau comprises three principal drainage systems, with numerous additional ravines and gulches, a shallow central basin and a few small, conical hills. Narrow boulder beaches are present at the base of most cliffs, but are wider at Salt Beach and Waterfall Beach, in the north-east. Landslide material at West Point forms the only extensive, relatively flat land area at sea-level. A recent bog, about 400 years old, incorporates the only area of open standing freshwater on the island.

**Habitat:**

The vegetation comprises three main types. The lower slopes are blanketed with dense, uniform *Spartina* tussock-grassland, up to 2.5 m high. The western part of the plateau comprises largely *Blechnum* tree-ferns, interspersed with stunted thickets (about 1 m) of *Phylica* trees. Dense stands of taller *Phylica* (3 m or more) occur in the lower, eastern part of the plateau and at sea-level at Skua Bog in the west. Scattered *Phylica* occurs elsewhere over much of the island, particularly in sheltered 'gulches'. Encircling the island is a sublittoral zone of *Macrocystis* kelp. Wet heath is found along the highest ridges.

**Birds:**

Sixteen species of breeding seabirds and four of native landbirds occur. The seabirds include Northern rockhopper penguin, Tristan albatross, Atlantic yellow-nosed albatross, Sooty albatross, Kerguelen petrel, Soft-plumaged petrel, Broad-billed prion, Spectacled petrel, Great shearwater, Little shearwater, White-faced storm-petrel, White-bellied storm-petrel, Common diving-petrel, Southern skua, Antarctic tern and Brown noddy. It is possible that Great-winged petrel, Atlantic petrel and Grey petrel also breed here.

The critically endangered Spectacled petrel is, so far as is currently known, entirely restricted to Inaccessible Island for breeding. A census in 1999 estimated 6,000 pairs; a repeat census in 2004 found approximately 9,000 pairs.

The island is one of only two breeding localities for the endangered Tristan albatross, although the Inaccessible population has been reduced to 2-3 pairs.

The terrestrial species comprise the endemic flightless Inaccessible rail, a subspecies of the Tristan thrush, Tristan bunting and Wilkins' bunting.

**Mammals:**

The only breeding mammal is the Subantarctic fur seal *Arctocephalus tropicalis*. Southern Elephant Seals haul out regularly. Southern elephant seals haul out regularly. In the past the island was used to graze sheep, cattle, and pigs, but these species have not been present on the island since at least 1974 (Richardson, 1984).

**Invertebrates:**

At least 39 species of native terrestrial invertebrates are known. The island is particularly rich in the listroderine weevils, endemic to the Tristan group as a whole.

**Conservation issues and threats:**

Perhaps its greatest value is its virtually unspoilt state. The greatest and most immediate threats are the introduction of alien predators, most notably rats and mice, and the accidental burning of the tussock.

A number of invasive alien plants already occur. New Zealand flax, which has the potential to exclude native vegetation communities, was spreading around the cliff northwest of the Waterfall, until control efforts in 2004 removed all large plants. Followup is required to remove seedlings and any small plants that were overlooked. The introduced grass *Holcus lanatus* and dock *Rumex obtusifolius* are both widespread on the plateau, with the former apparently having the ability to exclude native species. Other localised alien plants may cause problems in the future. There are at least 12 alien invertebrate species. Earthworms, slugs and woodlice, all formerly absent, are now widespread and abundant, with unknown effects on the ecology of the island.

Visits to the island must be carefully controlled as two new alien plant species were introduced in 1999/2000 during the construction of the research hut.

**Gough**

**Area:** 65 km<sup>2</sup>

**Conservation Status:**

In 1976 Gough Island was declared a Wildlife Reserve and in 1997 it was renamed a Nature Reserve and its boundaries were extended to 12 nautical miles. It was listed as a World Heritage Site in 1995.

**Geology and geomorphology:**

Gough Island is 350km south-south east of the main island of Tristan, and is the most complex in both terrain and structure. Gough is a basaltic shield volcano with a complex structure resulting from four main periods of volcanic activity, the last of which ceased at least 0.2 to 0.1 million years ago. More or less rectangular, it is 13 km in length from north-west to south-east, and over 5 km from south-west to north-east at its widest point. The summit, Edinburgh Peak, reaches 910 m, and the second highest point, Gonzalo Alvarez, 894 m. The upland plateau has deep glens running from it in the East and more convex slopes in the West.

**Habitats:**

The vegetation exhibits marked changes with altitude in relation to climatic differences, and five types are described. At the coast it consists of tussock-grassland on the offshore stacks, sea cliffs and adjacent slopes where salt spray is regular.

Fern bush occurs above the coastal grassland, up to about 500 m. It is better developed on the more sheltered eastern side and is most extensive on the southern coastal lowlands. The deciduous fern *Histiopteris incisa* forms the dominant climax assemblage. Fern bush is also characterized by *Phyllica arborea* and *Blechnum palmiforme*. *Sophora microphylla*, the only other woody tree on the island, is restricted to a few individuals in Sophora Glen. Wet heath occurs from the upper limit of fern bush to above 800 m in sheltered locations. It is a transitional vegetation-type, with fairly short plants, less than 1 m high. Diverse, it contains species found in virtually all other vegetation-types. Three assemblages are recognized, dominated by *Blechnum*, *Empetrum* and grasses and sedges respectively. Feldmark, a community of dwarf, cushion-forming or crevice plants, is found on exposed areas such as ridges, above 600 m. Dwarf *Empetrum rubrum*, *Lycopodium magellanicum*, *Huperzia insularis*, *Acaena stangii*, *Agrostis media*, *A. carmichaelii* and several sedges, mosses and lichens characterize this alpine community. Peatbogs are widespread on the level uplands above 600 m. The bogs are sodden, and are dominated by *Sphagnum* mosses and a number of hepatics. The only abundant vascular plants are *Tetronicum magellanicum* and *Scirpus* spp. However, a wider diversity occurs along bog margins, including *Empetrum rubrum* and various grasses.

Offshore, 40 species of algae are recorded, of which two are endemic. From sea-level to 5 m depth, the principal species is the bull kelp *Durvillea antarctica*. Beyond 20 m the dominants are *Laminaria pallida* and the giant kelp *Macrocystis pyrifera*.

### **Birds:**

The site has been described as 'a strong contender for the title of most important seabird colony in the world'. The breeding seabirds include Northern rockhopper penguin (about 48% of world population), Tristan albatross, Atlantic yellow-nosed albatross, Sooty albatross, Southern giant-petrel, Kerguelen petrel, Great-winged petrel, Soft-plumaged petrel, Atlantic petrel, Broad-billed prion, Grey petrel, Great shearwater, Little shearwater, Grey-backed storm-petrel, White-faced storm-petrel, White-bellied storm-petrel, Common diving petrel Southern skua, Antarctic tern and Brown noddy. The island holds well over 90% of the world population of the endangered Tristan albatross and the Atlantic petrel. The terrestrial species are the Gough moorhen and Gough bunting.

### **Mammals:**

There are only two native breeding mammals. In the 1970s 90% of the global Subantarctic fur seal *Arctocephalus tropicalis* population was found on Gough. Numbers are about 200,000 individuals and increasing. The Southern elephant seal *Mirounga leonina* (about 100 individuals) was in decline but recent counts indicate the population has stabilised.

House mice are the only introduced mammals, and there is no record of them on the offshore islets and stacks. Goats and sheep have been introduced in the past, but are no longer present.

### **Invertebrates:**

Several hundred freshwater and terrestrial invertebrates have been recorded. Among winged insects, only 28 species out of 99 recorded are thought to be native, of which at least eight are endemic, while 14 are native to the Territory as a whole.

**Conservation issues/threats:**

The only introduced vertebrate is the house mouse. Recent evidence from other islands suggests that this species can have profound effects on invertebrate populations, plant population dynamics and nutrient cycling in Subantarctic ecosystems. Perhaps even more importantly, new evidence from Gough shows that the species has evolved to become a major predator of Procellariiform seabird chicks. Predation on the Tristan albatross, Great shearwater and Atlantic petrel has been confirmed to date, but probably extends much more widely. There may also be substantial predation on and competition with the Gough bunting. Mice are therefore thought to be having a major impact on Gough's terrestrial biota. Introduction of other vertebrates – most notably rats, would be catastrophic.

There are numerous introduced invertebrate species, which may be having a profound effect on the island's ecology. Relatively few invasive alien plants are known, but *Sagina procumbens*, having survived an eradication attempt in 1999, has the potential to spread and cause substantial damage.

New evidence suggests that the population of Northern rockhopper penguins has declined substantially since the 1950's, in common with populations elsewhere in the range. The causes are unknown.