JNCC
Joint Nature Conservation Committee

UK Overseas Territories and Crown Dependencies: **2011 Biodiversity snapshot**

Reef Scene, Bermuda © Ron Lucas

UK Overseas Territories and Crown Dependencies:

2011 Biodiversity Snapshot

Edited by
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Photographs: The images used in this publication have come from a range of sources, and photographers are acknowledged by image caption throughout.

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John Henson Webb and Maddy Smith from the Communications Team at JNCC have also put in a lot of time working to pull the publication together. Tim Dunn from JNCC worked on producing the IUCN Red list figures.

Contents

Introduction

In 1999 the Joint Nature Conservation Committee published a review of biodiversity in the UK Overseas Territories (Proctor and Fleming 1999). Since then, a considerable amount of work has been carried out on the ground to conserve biodiversity in the UK Overseas Territories (OTs).

In 2010, the International Year of Biodiversity, the Steering group of the UK Overseas Territories and Crown Dependencies (CDs) Research and Training Steering programme[1] agreed that the publication was out-dated, and created an editorial committee to decide what to focus on in a new updated publication. Some of the key changes were that Crown Dependencies needed to be included, and the chapters needed to be authored by specialists from the Overseas Territories and Crown Dependencies.

Having agreed some basic headings, the editorial group approached the Steering group for lead authors. As a result, each chapter is authored by an individual or a group from the relevant Overseas Territory or Crown Dependency who has played a lead role in biodiversity conservation in their territory.

As the quantity and level of information provided by authors varies from chapter to chapter, a summary four or five pages has been created for each, so that comparisons cross island can be made. The additional information has been included in appendices that are available online.

The editorial committee has kept the information in the language and voice of the authors. It was agreed that this publication aims to be a 2011 snapshot of Biodiversity and its conservation in the OTs and CDs as presented by the authors. There is a lot of information in the appendices that can be used as a foundation for further scientific analysis or research.

A review team, identified by the editorial committee, comprising members from a number of UK and international organisations was also given the opportunity to review the document.

The Overseas Territories of Gibraltar and Sovereign base areas of Cyprus have not been included in this publication."

Objectives

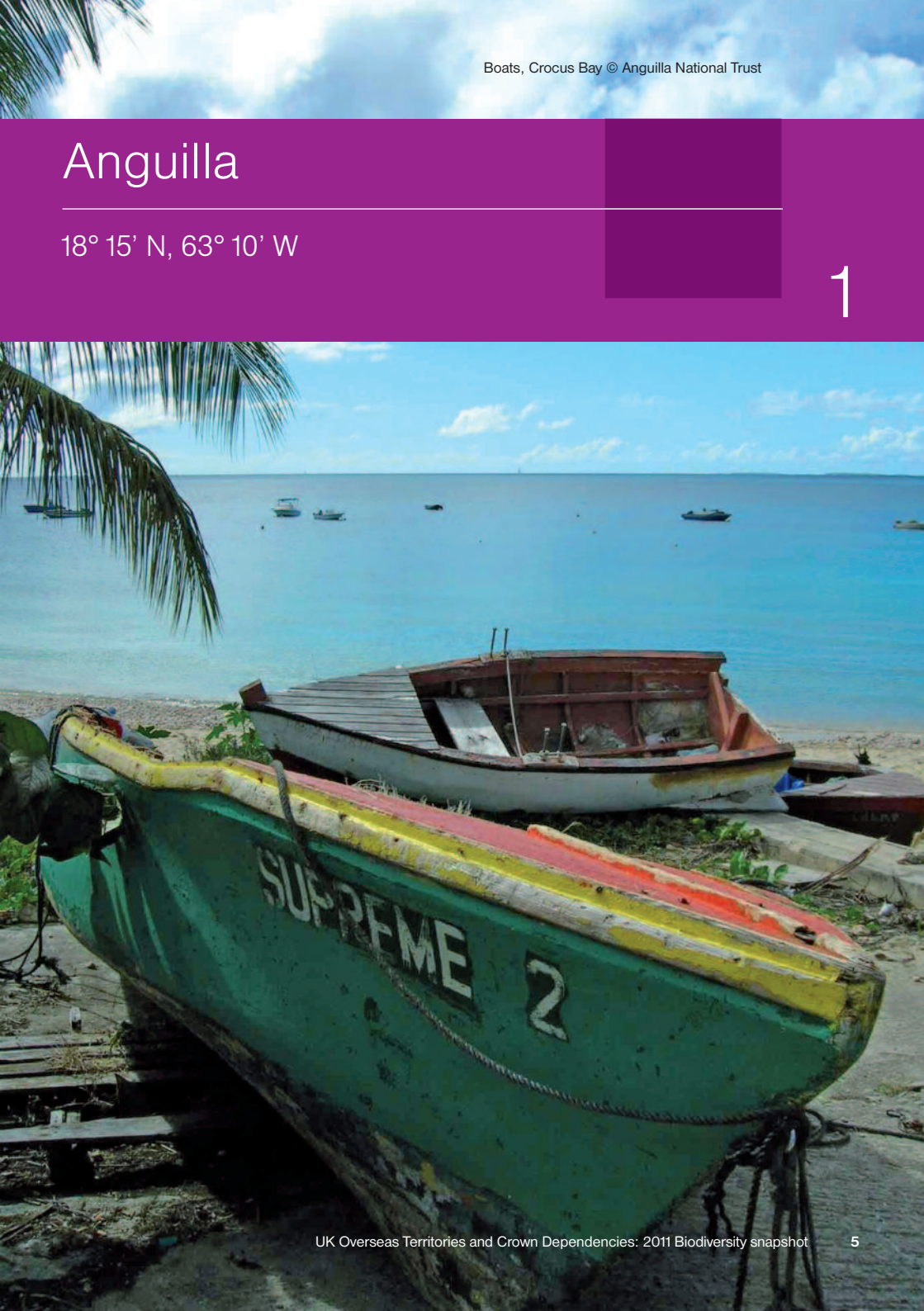
The objectives of this publication are:

(1) To provide a 'snapshot' of Biodiversity in the UKOTs and CDs. Note: this is not intended to be exhaustive in the level of detail provided.

(2) To provide a central access 'place' where as many links as possible to other sources of biodiversity information about the OTs and CDs can be found.

The information in this publication is also available via webpages on the JNCC website www.jncc.defra.gov.uk/UKOTCD.

[1] http://jncc.defra.gov.uk/default.aspx?page=5130



Boats, Crocus Bay © Anguilla National Trust

Anguilla

18° 15’ N, 63° 10’ W

1

Anguilla

Author: **Karim V.D. Hodge,**
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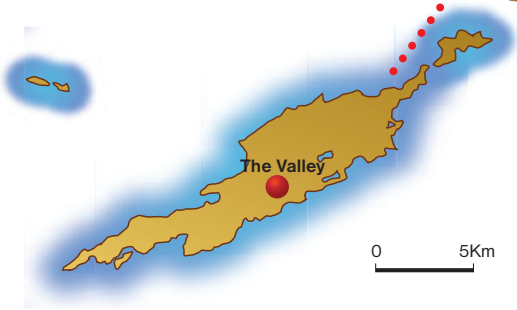

Basic facts and Figures

Location	The island of Anguilla is about 16 miles long and 3.5 miles at its widest. The island is located at 18° 15' N, 63° 10' W.
Area	35 square miles (91km^2) or approximately 22,400 sq acres.
Number of islands	The main island of Anguilla also has several off-shore cays and uninhabited islets, the largest of which are Prickly Pear East, Prickly Pear West, Dog Island, Scrub Island, Little Scrub Island, Sandy Island, Seal Island, Anguillita and Sombrero Island.
Population	Anguilla had an estimated population of 15,962 persons (2010).
Topography	The island is relatively flat and undulating with its highest point at Crocus Hill recorded at 213 feet above sea level. Coastal cliffs are common on the northern side of the island and flatter areas are found towards the south and southeast. Most of the islands are composed of hard crystalline limestone; hard and softer non-crystalline limestone; and clayey marls. These over lie volcanic rocks which are exposed in a small part of the island at Pelican Point, Crocus Bay, Road Bay and Little Bay. Reddish brown patches of soil can be found in pockets of the limestone rock in several areas across the island.
Main economic sectors	Tourism is the main driver of the economy and has direct links to areas and ancillary industries such as restaurants, construction and vehicle rentals.

Legislative and Policy Framework

Multilateral environmental agreements

Anguilla has been included in the ratification of eight multilateral environmental agreements (MEA). Status of ratification of key MEAs:

Multilateral Environmental Agreement	Included in ratification?
Convention on Biological Diversity	✘
Convention on International Trade in Endangered Species	✘
Convention on Migratory Species	✔
Ramsar Convention on Wetlands	✔
World Heritage Convention	✔

National environmental legislation

Anguilla has approximately 18 pieces of legislation related to biodiversity conservation, and the environment (Acts and Regulations) that are used by the Department of Environment, Department of Agriculture, Department of Fisheries and Marine Resources, the Land and Surveys Department, HM Customs and Excise Department and the Physical Planning Department. See Appendix 1.

National environmental strategies

Anguilla has several policy documents produced and adopted within the past few years that provide broad guidance for the sustainable use of natural resources in Anguilla, including its National Biodiversity Strategy and Action Plan and related sector studies (see: Gardner 2008, Homer 2008, Lum Kong 2008 and Lumsden 2008). See Appendix 2 for more information.

Protected Areas

The East End Pond Conservation Area (vested to the Anguilla National Trust in 2001) is the only terrestrial protected area set up specifically to protect vegetation or ecosystem types. There are six marine protected areas (MPAs) designated under the Marine Parks Ordinance. Five of the six sites have been designated to protect the coral reefs at those sites. See Appendix 3 for further discussion on protected areas.

Research Priorities

- General inventory (active research and literature reviews) of the terestrial and marine environment, with a focus on development of ecosystems and species conservation action plans.
- National assessment for establishment of protected areas (marine and terrestrial) management and island restoration iniatives (removal of feral and invasives).
- Research focussed on coastal zone planning and management, awareness and education and the compative studies of the biological diversity and stable communities on the Offshore Keys and Rocks of Anguilla.

Institutional Arrangements

Government: The Department of Environment is the coordinating agency for environmental management in Anguilla. Other agencies such as the Department of Physical Planning; Department of Agriculture; Department of Fisheries and Marine Resources and the Environmental Health Department are also responsible for environmental and biodiversity related management, monitoring and conservation. See Appendix 4 for further information.

Non-Governmental Organisation: The Anguilla National Trust also manages lands and sites vested to it for natural, historic or cultural preservation.

Ecosystems and Habitats

The surrounding waters of the island contain the least damaged coral reefs of the Eastern Caribbean (Petit and Prudent 2008). On the main island, a number of ponds of great biological importance are fed by the water table.

Species

The island of Anguilla is very rich in biodiversity. It includes 321 native plants, 130 species of birds and 21 species of reptiles, including two endemic lizards: the *Ameiva corvina*, native to Sombrero Island and the *Ameiva corax*, native to Little Scrub Island (Hodge *et al*. 2003). The endemic plant, Anguilla Bush *Rondelitia anguillensis* is mainly concentrated on the northern and eastern side of the island (Samuel 2009). Many of the white sandy beaches of Anguilla and its islets are important egg-laying grounds for Hawksbill, Leatherback and Green turtles.

Summary of the 2008 IUCN red listed species for Anguilla

Critically endangered	Endangered	Vulnerable	Near Threatened	Extinct (Extinct in the wild)	Lower risk/ conservation dependent	Data Deficient
3	8	20	12	0	1	16

Brown Booby © Anguilla National Trust

Threats

Invasive species: A number of invasive species have had a negative impact on Anguilla's biodiversity. The Lionfish *Pterois volitans,* the Cuban Tree Frog *Osteopilus septentriionalis* and the Giant African Snail *Achatina fulica* which have been particularly destructive, are thought to have been introduced by the importation of containers containing exotic plants or other building materials to supply the development of the tourism industry (Petit and Prudent 2008).

Climate change: Rising sea temperatures and the threat of more frequent and intense hurricanes have already caused a degradation in the health of coral reefs and coastal mangrove vegetation.

Land use and human impacts: The main threats to native ecosystems and biodiversity in Anguilla is the growing pressure from physical development, which has impacted the island's terrestrial and marine ecosystems. Dry scrub and mangroves have been particularly vulnerable to habitat fragmentation and loss. Research done by the Department of Fisheries and Marine Resources indicates that Anguilla's new shore reefs (less than 10 metres of water) are not threatened, they are endangered and may even become extinct by 2050. The reefs of Anguilla are also threatened by over-fishing and coastal development (Petit and Prudent 2008). Potential pollution and pollution prevention and control is also a growing concern.

Projects

In addition to its core work on: (i) biodiversity conservation, management and heritage protection (sustainable resource utilization, and protection), (ii) environmental protection, and (iii) participation of the private sector and NGOs in the environmental management process, the Department of Environment has undertaken a number of projects such as:

Case Study: The ACRAMAM (Anguilla Coastal Resource Assessment, Monitoring and Management) project

Maintaining Anguilla's "tourism product" of white beaches, turquoise water and coral reefs is essential to attract and retain the levels of high income visitors. The coast and nearshore waters of Anguilla are an important livelihood resource for islanders and biodiversity habitat. Quality information is needed about (1) the nature of development pressures on land and from storm surges and overfishing, (2) the extent of the impact and (3) their intensity in order to make sensible management interventions.

The ACRAMAM (Anguilla Coastal Resource Assessment, Monitoring and Management) project was designed to build an information system to link field collected data to the desks of key government decision makers so that decision-makers could make informed development choices in the coastal zone.

Main outcomes:

- Mapping of coastal resources and quantification of resource changes between 1991 and 2004.
- Development of an integrated GIS combining data from the field with planning, administrative and management information.
- Training provided to key stakeholders in methods to assess the extent of resources, as well as in field work techniques, monitoring regimes and data management.

Monitoring at Little Scrub
© Rhon Connor

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Bibliography

Gardner, Lloyd. 2008
Anguilla National Biodiversity Strategy and Action Plan: Tourism Sector Report. Biodiversity Conservation Inc. Anguilla. Final Report

Hodge, K.V.D., Censky, E.J. & Powell, R. 2003.
The Reptiles and Amphibians of Anguilla, British West Indies. The Anguilla National Trust.

Homer, F. 2008a.
Agriculture Sector Report prepared for the Anguilla Biodiversity Strategy and Action Plan.

Homer, F. 2008b.
Sector Report on Natural Vegetation and Wildlife For The Anguilla Biodiversity Strategy And Action Plan.

Lum Kong, A. 2008.
A Report on the Fisheries/Marine/Coastal sector of Anguilla for the Anguilla Biodiversity Strategy and Action Plan. Biodiversity Conservation Inc. Anguilla

Lumsden, F. A. *2008.*
Anguilla National Biodiversity Strategy and Action Plan. Land use and Environmental Management Report. Biodiversity Conservation Inc.

See Appendix 6 for additional bibliography.

Appendices

All appendices referred to in this chapter are available at
http://jncc.defra.gov.uk/page-5743

Land crab © Anselmo Pelembe

Ascension Island (STH)

7° 57’ S, 14° 22’ W

2

Ascension

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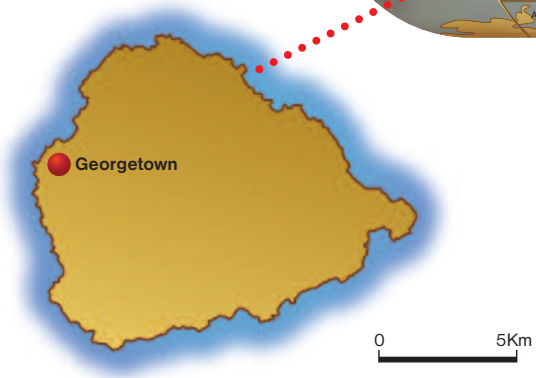

Basic facts and Figures

Note: Ascension forms part of a single UK Overseas Territory with St Helena and Tristan da Cunha, the Governor of which resides in St Helena.

Location	Ascension is a dormant volcanic island in the South Atlantic Ocean, ca. 1,700km from Africa. Ascension lies seven degrees south of the equator (7° 57' S, 14° 22' W) and is extremely isolated.
Area	Approximately 90km^2.
Number of islands	A single inhabited island and some small off shore islands. The largest is Boatswain Bird Island.
Population	c. 900 people.
Topography	Ascension's origin is volcanic; lava flows and cinder cones are conspicuous throughout. The landscape is dominated by Green Mountain, the island's peak and a National Park.
Main economic sectors	The residents on Ascension are mainly the employees (and their families) of the local government. The population consists of civilian contractors from St Helena, some civilian contractors from the UK often on short term contracts with the Ascension Island Government, military from the UK and US and commercial operations.

Legislative and Policy Framework

Multilateral environmental agreements

Ascension has been included in the UK's ratification of 19 multilateral environmental agreements (MEA). Status of ratification of key MEAs:

Multilateral Environmental Agreement	Included in ratification?
Convention on Biological Diversity	✔
Convention on International Trade in Endangered Species	✔
Convention on Migratory Species	✔
Ramsar Convention on Wetlands	✔
World Heritage Convention	✔

National environmental legislation

Ascension has 11 ordinances that are relevant to the environment. See Appendix 1 for more details on environmental legislation for Ascension.

National environmental strategies

Ascension Island Government (AIG) signed an Environmental Charter in 2001 that outlines a number of commitments that both the AIG and the UK government have agreed to. There are five other biodiversity conservation related strategies described at Appendix 2.

Protected Areas

Ascension has one area designated under its National Protected Areas Ordinance: Green Mountain National Park. There are also a number of proposed Protected Areas. See Appendix 3 for more details.

Research Priorities

- Review of long-term population trends of re-introduced endemic and native species to inform habitat restoration efforts and determine methods to ensure survival.
- Assessment of the ecological implications of invasive species on native species and habitats and development of long-term strategies for reducing the rate of encroachment by invasive species onto key habitat areas.
- Data on rainfall and temperature trends (due to climate change) to inform the most effective and sustainable conservation techniques.

Sisters Peak, Ascension © Anselmo Pelembe

Institutional Arrangements

Government: The lead government environmental department is the AIG Conservation Department which is responsible for fisheries, terrestrial and marine conservation, national protected areas, animal husbandry, and invasive species control in conservation areas. AIG Environmental Health Section works on island wide invasive species control (rats, feral animals, plants), and water testing.

Non-Governmental Organisation: The Ascension Island Turtle Group (AITG) carries out annual green turtle monitoring and beach raking.

Ecosystems and Habitats

Terrestrial: Ascension has 14 classes of vegetation. These include desert and woodlands. The Green Mountain summit was once covered in a carpet of ferns with many endemic plants. Hardly any of this carpet now exists due to intensive efforts to increase vegetation in the mountain. Few small rocks still hold a number of endemic species, but even these areas are quickly being overwhelmed by invasive plants and animals. See Appendix 4 for a vegetation map of Ascension.

Marine: There is very little information about marine habitats, however they appear to be in pristine condition.

Ascension Frigate Bird © Anselmo Pelembe

Species

At only one million years old, Ascension is a young island and this, together with its isolation, explains its species-poor biodiversity. However, the degree of endemism of terrestrial and marine biodiversity is high. Twenty-five species are thought to be native to the island, of which 10 are endemic. Three of the endemic species are thought to be extinct.

The relative lack of diversity of marine species compared to other tropical islands is compensated by its special, unique species: the fauna includes an impressive nine species of endemic fish as well as two endemic shrimps. See Appendix 5 for relevant species lists.

IUCN redlisted species for Ascension and Tristan da Cunha are included in the summary table in the St. Helena chapter.

Threats

Invasive species: Ascension is more heavily impacted by invasives than almost any other island on Earth (95% of plant species are introduced). The Mexican thorn *Prosopis juliflora* has been particularly destructive to native vegetation.

Climate change: Little is known about the potential impacts of climate change on biodiversity in Ascension. Current climate change research is pulling together global circulation model data and meteorological data from Ascension to try and assess the likely outcomes.

Illegal fishing is also a threat to marine life. See Appendix 6 for further information.

Projects

In addition to its core work in environment, AIG Conservation Department has undertaken a number of externally funded environmental projects over the last five years. These include the creation and development of a National Park, feral cat eradication, seabird restoration and monitoring, environmental education, endemic plant propagation and restoration. See Appendix 7 for more information on Ascension conservation projects over the last five years.

Case Study: Protected Areas Management

Funded by: OTEP

Dates: April 2004 – End of April 2005

Green Mountain is a site of natural beauty and an important habitat for Ascension's endemic species of plants. The project focused on improving management planning for the Park, endemic plant protection and restoration as well as improved public awareness.

Main outcomes:

- The development of a park management plan.
- Improved public access.
- Provision of a pilot for future protected areas on Ascension.
- Protection of wild endemic plant colonies.
- Creation of an endemic plant nursery.
- Public awareness campaign.

Stedson Stroud © Tara Pelembe

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Project Partners
Ascension works with a number of organisations and researchers, but key partners include: RSPB; Royal Botanic Gardens, Kew; University of Exeter, UKOTCF.

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Bibliography

Ashmole, P. & Ashmole, M. 2000.
St Helena and Ascension: a natural history. Anthony Nelson.

Packer, J.E. 2002.
A Concise Guide to Ascension Island, South Atlantic. Ascension Heritage Society.

Pelembe, T. 2005.
Green Mountain National Park: Five Year Action Plan 2005 – 2010. Ascension Island Government Conservation Office.

Lambdon, P. *et al*. 2009.
A plan for the Conservation of Endemic and Native Flora on Ascension Island. Funded by OTEP, DEFRA, UK

Appendices

All appendices referred to in this chapter are available at
http://jncc.defra.gov.uk/page-5744

Foureye Butterfly fish © Ron Lucas

Bermuda

32° 19’ N , 64° 46’ W

3

Bermuda

Author: **Alison Copeland,**
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More information available at - **www.conservation.bm**

Basic facts and Figures

Note: Island areas calculated using Bermuda's 2003 Topographic Map Database (TMD). Islets smaller than 30m^2 were excluded from the calculation (M. Shailer, pers comm.).

Location	Bermuda is located in the subtropics of the North Atlantic at latitude 32° 19' N and 64° 46' W. The islands lie 1,476km Northeast of Nassau, Bahamas and 1,052km East of Cape Hatteras, North Carolina, USA. See map at Appendix 1.
Area	53.71km^2 (20.73 miles^2).
Number of islands	There are eight islands connected by bridges and causeways that make up "mainland" Bermuda. There are also approximately 193 other smaller islands/islets measuring 30m^2 or greater. Of these, 56 islands are inhabited, or were at one time (M. Shailer).
Population	64,566 (2010 projection, Dept. of Statistics 2006).
Topography	Bermuda is a mid-Atlantic seamount topped by a limestone cap. The islands lie along the southern edge of the top of the seamount, the rest is a shallow lagoon. The highest point of land in Bermuda is Town Hill in Smiths Parish at 78m. Most of the island is covered by low, rolling hills.
Main economic sectors	International business (including banking, financial services, insurance and reinsurance) and tourism.

Legislative and Policy Framework

Multilateral environmental agreements

Bermuda has been included in the UK's ratification of 17 MEAs. Status of ratification of key MEAs: See also Appendix 2.

Multilateral Environmental Agreement	Included in ratification?
Convention on Biological Diversity	✘
Convention on International Trade in Endangered Species	✔
Convention on Migratory Species	✔
Ramsar Convention on Wetlands	✔
World Heritage Convention	✔

National environmental legislation

Bermuda has at least 19 laws that relate directly to the environment and biodiversity conservation. Most of Bermuda's laws can be found at: www.bermudalaws.bm/Laws/Consolidated%20Laws. See also Appendix 3.

National environmental strategies

There are four national strategies that provide the framework for environmental work in Bermuda, these are: the Bermuda Biodiversity Strategy and Action Plan; Sustainable Development Strategy and Implementation Plan; Strategy for the Sustainable Use of Bermuda's Living Marine Resources; Bermuda Plan 2008. Bermuda has also signed an Environment Charter with the UK government. See Appendix 4 for more details.

Protected Areas

There are 29 areas that have been declared 'no-take' Fisheries Protected Areas under the Fisheries (Protected Areas) Order 2000 and two seasonally protected areas (the South western Area and North eastern Area) The Department of Conservation Services manages 13 Nature Reserves while the Department of Parks owns 75 Amenity Parks, 10 coastal marine areas, and 10 Recreational Parks. In addition, there are 45 Nature Reserves that are owned between the Bermuda National Trust and the Bermuda Audubon Society that have been donated to the NGO or purchased as private land for preservation. See Appendix 5 for a full listing of protected areas.

Research Priorities

- Control of invasive species through investigating legislation and programme development - for both terrestrial and marine species.
- Implementation of protected species (terrestrial and marine) recovery as per published species recovery plans. See Appendix 4 for more detail.
- Investigating pollinators in Bermuda, triggered by decline of honey bee; this includes level of pollination by various pollinators, and identification of target species by pollinators.

Institutional Arrangements

Government: The Department of Conservation Services is responsible for species and habitat management and research, and is the coordination centre for the Bermuda Biodiversity Strategy and Action Plan (NBSAP). The Departments of Planning; Environmental Protection; Parks and Environmental Health also have responsibility for environmental matters.

Non-Governmental Organisation: There are approximately 15 NGOs involved in environment and biodiversity related conservation in Bermuda. See Appendix 6 for further information.

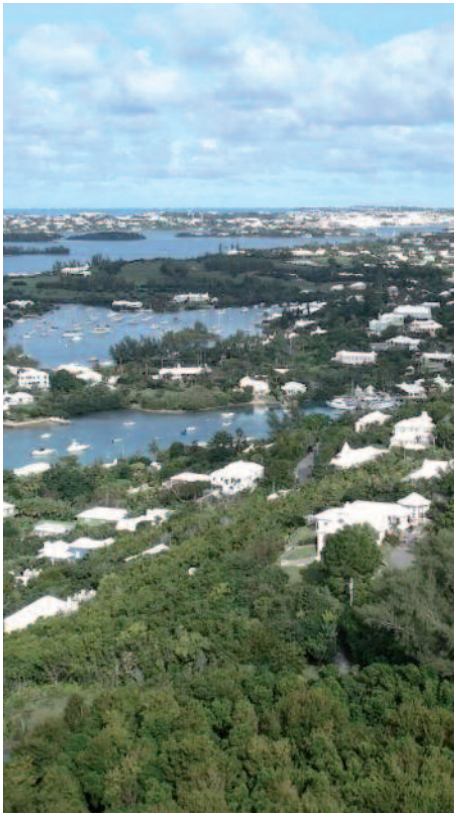
Ecosystems and Habitats

Bermuda's habitats are mapped online at www.conservation.bm/bermudas-habitats/

Given the population density of the islands, none of Bermuda's terrestrial habitats are untouched by human impacts. The largest habitat by area, and least adversely impacted are the coral reefs which appear to be in good health. Five habitats (salt marshes, caves, freshwater marshes, brackish ponds and offshore islands) are threatened – and are home to a significant number of endemic and critically endangered species. See Appendix 7 also.

Species

Bermuda has at least 8,299 recorded species, 4,597 of which are marine and 3,702 are terrestrial. Of these 110 marine species (2.4 %) and 137 terrestrial species (3.7%) are considered endemic (Sterrer 1998). Some of Bermuda's important species are listed online at www.conservation.bm/bermuda-species2/ Also see Appendix 8.



Bermuda © Alison Copeland

Summary of the 2008 IUCN red listed species for Bermuda

Critically endangered	Endangered	Vulnerable	Near Threatened	Extinct (Extinct in the wild)	Lower risk/ conservation dependent	Data Deficient
28	8	15	17	0	2	16

Threats

Invasive species: Bermuda faces a significant and ongoing struggle with invasive species. Brazil pepper tree (*Schinus terebinthifolius*) and the Casuarina (*Casuarina equisetifolia*) are some of the most significant terrestrial plant pests, while the Pacific Lionfish (*Pterois volitans*), first recorded in 2000, is the most significant marine invasive. See also Appendix 9.

Climate change: A recent report on the impact of climate change on Bermuda (Glasspool 2008) discusses threats such as increased erosion from rising sea level and storms that are expected to negatively affect seagrasses and corals. The potential impact on birds, reptiles, amphibians and plants are also discussed.

Projects

In addition to its core work, Bermuda's projects over the last five years include both terrestrial and marine projects focussing on a range of taxa and habitats. Conservation projects, focused on specific species, include the sea turtle, skink, seahorse, tropic bird, Cahow, terrapin, grouper and green heron. Habitat-based projects include seagrass and woodland restoration and marine benthic habitat monitoring and mapping. See also Appendix 10.

Case Study: Cahow Translocation Project

Funded by: Bermuda Government and Bermuda Zoological Society.

Dates: 2004 – 2008 (Phase 1)

The Cahow translocation project aims to establish new breeding colonies of the endangered Cahow, or Bermuda petrel (*Pterodroma cahow*) on larger, more elevated islands kept free of mammal predators. These are safer from erosion and hurricane damage, and have the potential of supporting larger populations of birds than the current nesting islets. Phase I was carried out on Nonsuch Island, using translocation of near-fledged chicks and sound attraction.

Main outcomes:

- 102 translocated chicks successfully fledged from Nonsuch Island over five years.
- Translocated chicks, fledged at essentially the same weight, wing chord length and age as control birds.
- In 2009, first chick since the 1620s to hatch and fledge at Nonsuch Island successfully. In 2010 over a dozen of the translocated Cahows returned as adults to nest; four pairs nested and a second chick successfully fledged from Nonsuch (Madeiros 2010).
- By February 2011, a total of 27 of the translocated Cahows had returned to Nonsuch, and seven pairs were incubating eggs; five additional nest burrows were being prospected by returning birds.

Jeremy Maderios and Cahow chick © Jeremy Maderios

Contacts

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Website: www.conservation.bm
See also Appendix 11 for additional contact information.

Project Partners
See Appendix 6 or www.conservation.bm/biodiversity-action-plan-partn/ for a listing of relevant NGO's and Government Departments working in the environment.

Joint Nature Conservation Committee (JNCC); UK Overseas Territories Conservation Forum (UKOTCF); Royal Botanic Gardens Kew; Overseas Territories Environment Programme (OTEP); Department for Environment, Food and Rural Affairs (DEFRA); – the Darwin Initiative

Acknowledgements

Many thanks to Mandy Shailer, GIS Officer at the Department of Conservation Services, for compiling the geographic information and creating the maps and figures. Thanks to Mr. Jeremy Madeiros, Terrestrial Conservation Officer at the Department of Conservation Services, for writing the case study on the Cahow Translocation Project. Also thanks to Dr. Samia Sarkis the Protected Species Coordinator and liaison with JNCC for proofing the document. Thanks to Mr. David Outerbridge at the Bermuda National Trust and Mrs. Karen Border and Mr. Andrew Dobson at the Bermuda Audubon Society for providing lists of their nature reserves. Thank you to Mr. Andrew Pettit, Director of the Department of Conservation Services, for reviewing the manuscript.

Bibliography

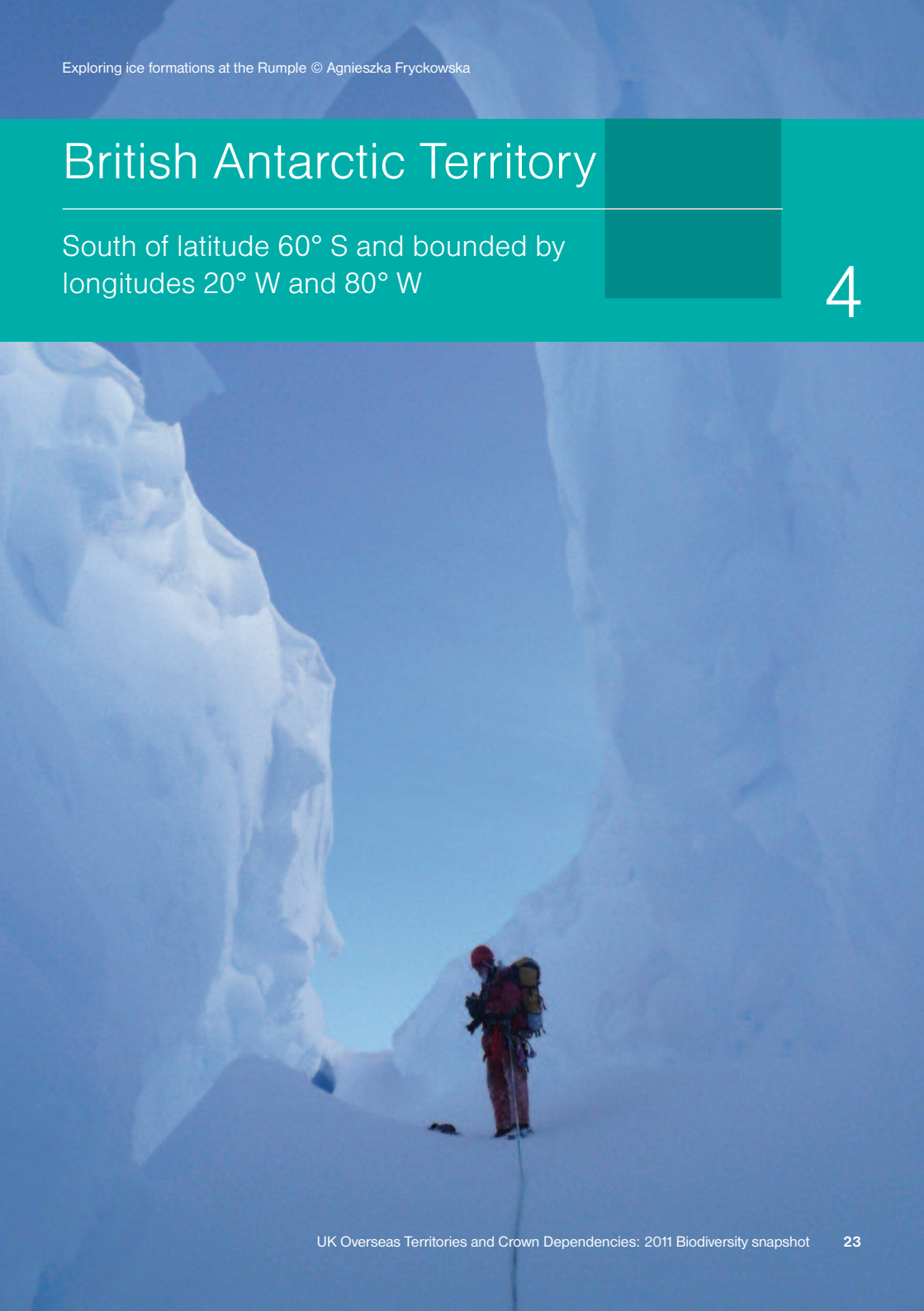
Anderson, C., H. De Silva, J., Furbert, A., Glasspool, L., Rodrigues, W. Sterrer & J. Ward. 2001. *Bermuda Biodiversity Country Study*. Bermuda Aquarium, Museum and Zoo. pp.123.
www.conservation.bm/publications/bermuda-biodiversity-strategy-and-action-plan-2003/Entire_Country_Study2.pdf

Glasspool, A. F. 2008.
The Impact of Climate Change on Bermuda. Report Prepared for the Bermuda National Trust. pp. 190.
www.bnt.bm/Environmental_and_Conservation/climate-change-report.php

See Appendix 12 for additional bibliography

Appendicies

All appendices referred to in this chapter are available at
http://jncc.defra.gov.uk/page-5745



Exploring ice formations at the Rumple © Agnieszka Fryckowska

British Antarctic Territory

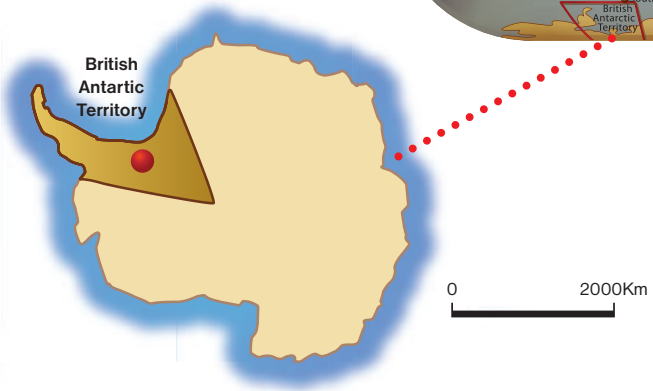
South of latitude 60° S and bounded by longitudes 20° W and 80° W

4

British Antarctic Territory

Author: **Polar Regions Unit,**
Foreign and Commonwealth Office
and British Antarctic Survey

More information available at -
www.britishantarcticterritory.fco.gov.uk/en/



Basic facts and Figures

Location	The British Antarctic Territory (BAT) comprises the sector of the Antarctic south of latitude 60˚S and bounded by longitudes 20˚W and 80˚W. The BAT has no permanent residents and is administered directly from London by the Foreign and Commonwealth Office's (FCO's) polar regions unit.
Area	1,709,400km² (continent), 620km² (South Orkney), 3,687km² (South Shetlands).
Number of islands	South Orkney consists of four main islands. South Shetlands consists of 11 main islands. There are 100s of islands in and around the Peninsula.
Population	No permanent inhabitants. The UK maintains a year-round presence in the territory through the British Antarctic Survey (BAS), of the Natural Environment Research Council (NERC). BAS operates two year-round scientific research stations (Halley and Rothera) and a summer only base at Signy in the South Orkney islands.
Topography	The Antarctic Peninsula and the islands are mostly mountainous with significant ice cover (85% of the South Orkney Islands are ice covered).
Main economic sectors	Scientific research.

Legislative and Policy Framework

Multilateral environmental agreements

The BAT has been included in the UK's ratification of 10 MEAs including a number of specific Antarctic related agreements such as the Antarctic Treaty and its Protocol on Environmental Protection (also known as the Environmental Protocol) the Convention on the Conservation of Antarctic Seals, and the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR). The Antarctic Treaty designates Antarctica as "a natural reserve, devoted to peace and science". Status ratification of key MEAs:

Multilateral Environmental Agreement	Included in ratification?
Convention on Biological Diversity	✘
Convention on International Trade in Endangered Species	✘
Convention on Migratory Species	✘
Ramsar Convention on Wetlands	✘
World Heritage Convention	✘

British Antarctic Territory has ratified the Agreement on the Conservation of Albatrosses and Petrels.

National environmental legislation and strategies

At present there is one main piece of legislation: The Antarctic Act 1994 and associated regulations, which transposes the requirements of the Environment Protocol and decisions and measures adopted by the Antarctic Treaty Consultative Meetings (ATCM) into UK domestic legislation. Strict ATCM conditions relating to environmental protection are supported by a range of governmental, tourism industry and NGO outreach programmes designed to raise awareness of the Antarctic environment.
See: www.fco.gov.uk/antarctica

Alladins Cave Hinge Zone © Craig Brown

Protected Areas

The world's first high seas Marine Protected Area (MPA) was created in the Southern Ocean in October 2009 – an area of over 90,000km^2. On land, there are 12 UK-managed Antarctic Specially Protected Areas (ASPA) and one Antarctic Specially Managed Area (ASMA) that is jointly managed by the UK with five other countries. A full list of ASPAs and ASMAs in the entire Antarctic region can be found on: www.ats.aq/documents/cep/Register_Updated_2010_e.pdf

Humpback Whale, Danco Bay, Antarctica © Richard Burt

Research Priorities

Antarctica's environment is a critical barometer of the world's climate health and the region is important as a global laboratory. Scientists from the British Antarctic Survey (BAS) [*BAS discovered the ozone hole over Antarctica in 1985, so triggering international concerns about the*

effects of atmospheric pollution] and other UK scientists are playing a leading role in a wide range of Antarctic research programmes. Much of the current work of the Antarctic Treaty's Committee for Environmental Protection (CEP) is focused on:

- effective protection of the environment and in particular the impacts of climate change and non-native species and,
- the dynamics of Southern Ocean ecosystems including the response to the impacts of climate and fisheries.

The UK makes a significant contribution to CEP and is taking a leading role in work in CCAMLR including to identify and establish marine protected areas.

Institutional Arrangements

FCO's Polar Regions Unit, with support from the British Antarctic Survey (BAS), leads on biodiversity issues within the BAT.

The UK was one of 12 signatories to the Antarctic Treaty in 1959 and was the first to ratify it. The Treaty, which entered into force in 1961, preserves Antarctica for peace and silence. The UK continues to play a leading role within the Antarctic treaty system.

Ecosystems and Habitats

Terrestrial: The harshness of the climate: low temperatures, strong winds, poor soils, and prolonged periods of light and darkness have strongly conditioned the species of these environments. The dominant plant cover consists of low-growing cryptogams and microorganisms including mosses, liverworts, lichens, fungal algae and *cyanobacteria*, found on ground which is ice-free during the summer months. Terrestrial animal communities consist entirely of invertebrates. Ice free areas are very important for breeding.

Marine: In contrast, marine ecosystems can be very rich in terms of both diversity and biomass, due to the presence of significant numbers of plankton in the cold waters and in the mixing zones where cold sea water mingles with warmer waters. The benthos of the South Orkneys shelf has been identified as particularly biodiverse (Barnes *et al* 2009).

Species

There is considerable invertebrate endemism both in the BAT and across Antarctica (Pugh and Convey 2008). There are only two higher insect species. While terrestrial species diversity is low, population densities can be very high. Marine diversity is particularly rich supporting several species of marine birds that forage in the surrounding waters and use ice-free islands and coastal areas as nesting grounds. Several species of whale (including the threatened Blue whale and Humpback) and seal also take advantage of the fish and plankton-rich waters. See Appendix 2 for more information.

Threats

Invasive species: Non-native species could become a threat to existing Antarctic biodiversity. Increased human activity in Antarctica mean that more seeds, insect eggs, spores and soil are accidentally transported to the region, while warmer temperatures and increased water availability resulting from climate change may make it easier for introduced species to become established (Frenot *et al*. 2005; Convey *et al*. 2006; Convey 2008).

Climate change: The Antarctic Peninsula has experienced one of the highest rates of warming in the last 50 years (Turner *et al*. 2009; Convey *et al*. 2009). Other influences such as increased ultra–violet radiation and seasonal drought compound the impacts of climate change (Convey 2006). Rising air temperatures will pave the way for plants to grow and reductions in Antarctic seasonal sea ice in some regions could also reduce the production of phytoplankton (and therefore krill populations) affecting food chains and ecosystems. Ice-dependent ecosystems will be required to evolve and adapt to new environmental conditions or become extinct in some areas (Turner *et al*. 2009). Management authorities for fisheries may need to adapt their management framework and procedures (Trathan and Agnew 2010). Further information on threats can be found at Appendix 3.

Projects

The Government of the BAT has directly funded a wide range of environmental projects which have contributed towards protection of biodiversity. It has recently commissioned a separate environmental strategy. Previous projects include production of a Wildlife Awareness Manual, development of a "toolkit" to aid and facilitate management of marine protected areas, a DNA survey to assess distribution of penguin colonies and the impacts of climate change, identification of important bird areas in the Antarctic Peninsula, and identification and development of Marine Protected Areas around the BAT. A list of BAT funded projects can be found on the BAT website.

Case Study: Baseline vegetation survey in the Antarctic Peninsula using hyperspectral imaging

In February 2011, in a project funded by the BAT, BAS completed a successful field campaign to collect the first hyperspectral airborne data in the Antarctic. Together with Canadian collaborators from ITRES Research Limited and DRDC (Defence Research and Development Canada) BAS collected contemporaneous ground, airborne and satellite observations. Details of vegetation type and the underlying rock can be identified from the reflected spectral signature recorded in these surveys.

Vegetation changes in response to contemporary climate change in the Antarctic Peninsula are amongst the most widely predicted consequences of environmental change. The Antarctic Peninsula is experiencing warming temperatures and increasing numbers of visitors, both of which will potentially impact the extent and type of vegetation in the region. However, robust and large-scale baseline vegetation information does not exist against which to identify these consequences, and cannot practicably be obtained through traditional ground survey approaches.

The data collected from the airborne survey will facilitate the development and calibration of a relatively low-cost method of monitoring vegetation changes in ASPAs and other sensitive regions.

Leopard seal © Craig Brown

Contacts

FCO

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British Antarctic Survey Website: www.antarctica.ac.uk/

Royal Geographic Society Website: www.discoveringantarctica.org.uk/
Interactive teaching and learning resources on Antarctica

Bibliography

Convey, P. 2008.
Non-native species in Antarctic terrestrial and freshwater environments: presence, sources, impacts and predictions. *Non-native species in the Antarctic Proceedings*, ed. M. Rogan-Finnemore, pp. 97-130. Gateway Antarctica, Christchurch, New Zealand

Convey, P. 2006.
Antarctic climate change and its influences on terrestrial ecosystems. Trends in Antarctic Terrestrial and Limnetic Ecosystems: Antarctica as a Global Indicator, eds. Bergstrom, D.M, Convey, P. & Huiskes, A.H.L. Springer, Dordrecht, 253-272.

Convey, P., Bindschadler, R.A., di Prisco, G., Fahrbach, E., Gutt, J. Hodgson, D.A., Mayewski, P. Summerhayes, C.P. & Turner, J. 2009.
Antarctic Climate Change and the Environment. Antarctic Science 21, 541-563.

Convey, P., Frenot, F., Gremmen, N. & Bergstrom, D. 2006.
Biological invasions. Trends in Antarctic Terrestrial and Limnetic Ecosystems: Antarctica as a Global Indicator, eds. Bergstrom, D.M, Convey, P. & Huiskes, A.H.L. Springer, Dordrecht, pp. 193-220.

Barnes, D. K. A., Kaiser, S., Griffiths, H. J. & Linse, K.
Marine, intertidal, freshwater and terrestrial biodiversity of an isolated polar archipelago. Journal of Biogeography 2009 36, 756–769.

Frenot, Y., Chown, S.L., Whinam, J., Selkirk, P., Convey, P., Skotnicki, M. & Bergstrom, D. 2005.
Biological invasions in the Antarctic: extent, impacts and implications. Biological Reviews 80, 45-72.

Pugh, P.J.A. & Convey, P. 2008. *Surviving out in the cold: Antarctic endemic invertebrates and their refugia.* Journal of Biogeography. 35, 2176-2186

Appendicies

All appendices referred to in this chapter are available at
http://jncc.defra.gov.uk/page-5746

Underwater Chagos © Charles Sheppard

British Indian Ocean Territory

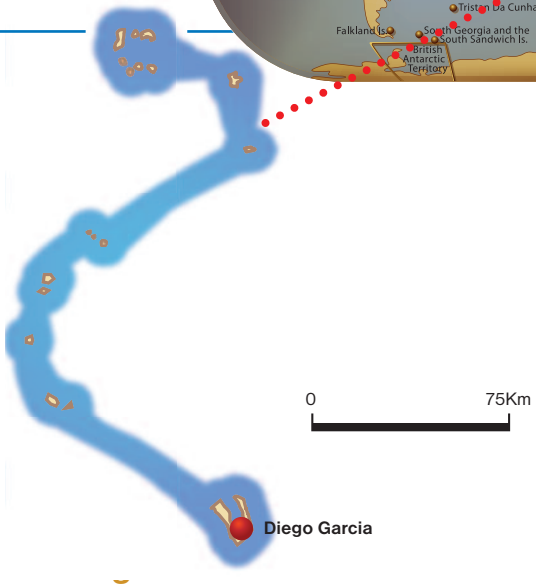
6° 00’ S, 71° 30’ E

5

British Indian Ocean Territory

Author: **Charles Sheppard,** University of Warwick and advisor to the School of Life Sciences. Commissioner: British Indian Ocean Territory.

More information available at - **www.fco.gov.uk**



Basic facts

Location	Approximately 1,770km east of Mahe (the main island of the Seychelles).
Area	The territory covers some 544,400km^2 of ocean. The islands have a land area of only 60km^2 and 698km of coastline. Diego Garcia, the site of a US Naval Support Facility, is the largest at 27km^2
Number of islands	BIOT is an archipelago of approximately 55 islands.
Population	No permanent population. Currently inhabitants are UK and US military personnel and civilian contract employees, all living on Diego Garcia.
Topography	All islands are very small (except for the atoll Diego Garcia). All are low coral islands and most have maximum elevations of about 1-2m; the highest parts are found in a perimeter rim, with the centres of islands being very close to, or below, present sea level.
Main economic sectors	There are no economic, industrial or agricultural activities on the islands apart from construction projects and other support services as part of the US defence facility on Diego Garcia.

Legislative and Policy Framework

Multilateral environmental agreements

BIOT has been included in the UK's ratification of 12 multilateral environmental agreements (MEAs). Status of ratification of key MEAs:

Multilateral Environmental Agreement	Included in ratification?
Convention on Biological Diversity	✘
Convention on International Trade in Endangered Species	✔
Convention on Migratory Species	✔
Ramsar Convention on Wetlands	✔
World Heritage Convention	✘

Holothurian © Charles Sheppard

National environmental legislation

BIOT has numerous pieces of legislation relevant to biodiversity conservation. See Appendix 1 for more details. The BIOT administration is currently preparing new legislation and enforcement arrangements following the recent establishment of the BIOT Marine Protected Area (MPA). See 'protected areas' below for further information.

National environmental strategies

There are two strategies that provide a framework for environmental management in BIOT:

- The Chagos Conservation Management Plan (2003)
  http://www.reefnewmedia.co.uk/ cmt_chagos/uploads/PDF/Science/Chagos_Conservation_Management_Plan_2003.pdf.
- The Natural Resources Management Plan, prepared by the USA for operation in Diego Garcia.

Following the establishment of the MPA, environmental management frameworks are under review.

Protected Areas

On 1st April 2010 a marine reserve (the Marine Protected Area) was declared. The MPA is a strict 'no take' reserve that covers the whole of the Environmental (Protection and Preservation) Zone of BIOT, making it the largest such reserve in the world. This protection provides a comprehensive framework for conservation. In addition to the MPA, Diego Garcia benefits from a large Ramsar site and there are several strict Nature Reserves through the Territory.

Research Priorities

With the introduction of the MPA, a Scientific Advisory Group (SAG) is being formed. The SAG's remit will be to provide advice on the development and implementation of an appropriate scientific programme for BIOT. Scientists who have been involved in research projects in BIOT have identified areas of further research such as:

- General database and ecological mapping of changes to underpin management;
- Reef resilience studies to aid management of climate change effects;
- Connectivity (species and genetic) of Chagos with other areas of Indian Ocean.

A full list of potential research projects is attached at Appendix 2.

Institutional Arrangements

Government: Responsibility for the environment of BIOT rests with the British Indian Ocean Territory Administration. The Scientific Advisory Group will provide advice on appropriate scientific programmes with input from Prof Charles Sheppard in his role as Science Advisor to the Commissioner.

Non-Governmental Organisation: The Chagos Environment Network (CEN) is a UK body of NGOs and scientific organisations that promote the study and protection of Chagos biodiversity: www.protectchagos.org

Ecosystems and Habitats

Terrestrial: Larger islands were cleared of natural vegetation to make way for coconut farming which existed for over 150 years resulting in diminished terrestrial biodiversity. Some of the smaller islands contain substantial numbers of several species of seabirds which nest and roost in the native vegetation.

Habitat maps at a broad scale set are now becoming available. Construction of a more detailed GIS map set is a research priority.

Marine: The primary habitat is coral reef. Coral reefs in BIOT are considered among the best in the Indian Ocean.There are five atolls with islands and a greater number of atolls and banks which are submerged, comprising approximately 60,000 to 80,000km² of reefs in the illuminated (photosynthetic) zone. Some areas support sea grass beds and the deeper seafloor and most reefs still remain a largely unexplored area. The coral reefs of BIOT are among those in the best condition in the Indian Ocean. Some areas of unknown extent support seagrass beds. Much information about the deep seafloor remains unknown.

Species

The updated species lists are being compiled on the website of the Zoological Society of London www.zsl.org.
A full list of plant species has been compiled by Royal Botanical Gardens Kew:
www.reefnewmedia.co.uk/cmt_chagos/uploads/Chagos-Flora-Checklist_190809.pdf

Hawksbill sea turtle nesting on Eagle Island © Charles Sheppard

Summary of the 2008 IUCN red listed species for BIOT

Critically endangered	Endangered	Vulnerable	Near Threatened	Extinct (Extinct in the wild)	Lower risk/ conservation dependent	Data Deficient
1	7	75	110	0	6	36

Threats

Invasive species: Invasive rats and cats have diminished nesting seabird populations on most of the islands. In the marine environment, a study by IUCN in 2006 showed that there were no marine invasive species, including in the harbour area of Diego Garcia.

Climate change: Episodic ocean warming is becoming more frequent, leading in some cases to coral mortality and in others subtle changes in the nature of the corals now reaching adulthood. This has caused reduction in coral growth which has contributed to shoreline erosion in several places. Shoreline erosion is being exacerbated by rising sea levels. Sea levels are being measured on Diego Garcia.

Land use and human impact: On the Northern Islands, anchor damage due to private yacht visits has been observed. However, the implementation of strict anchoring regulations has reduced the impact. Poaching of sharks and sea cucumbers has increased and been fairly steady over the last 15 years. The BIOT patrol vessel is engaged in ongoing anti-poaching activity and continues to make arrests.

Projects

The Scientific Advisor makes annual visits and conducts desk-based work between visits. Projects including terrestrial habitat restoration involving conversion of old coconut plantations back to native vegetation are underway. See Appendix 3 for further information on projects.

Eagle Island © Charles Sheppard

Underwater Survey, Middle Brother lagoon © Charles Sheppard

Case Study: Protected Areas

Funded by: Overseas Territories Environment Programme (OTEP)

Dates: 1999 to present

The Chagos Archipelago is one of very few sites where climate change effects can be examined in the absence of localized human impacts. The coral reefs of the Chagos Archipelago were badly affected by the 1998 warming event when more than 80% of corals and soft corals to 15m depth or greater were lost (Sheppard *et al*. 2002). Shallow water mortality was nearly total.

Research conducted by Sheppard *et al*. (2008), at intervals between 1999 and the present demonstrated that recovery from the 1998 mortality has been rapid. The rapid recovery is attributed to the lack of local anthropogenic effects (Sheppard *et al*. 2008). Recovery of coral cover has been greatest in shallow water, though the shallowest Acropora palifera zone still shows reduced 3-D structure. In deeper water, both cover and 3-D structure are recovering rapidly. In comparison to African and Asian sites, reproduction of all genera has been high in Chagos, with recruitment densities of 6-28m^{-2} compared to less than 1 m^{-2} at African and Asian sites (Harris and Sheppard 2008).

The result of this study show that recovery of coral reef ecosystems from warming can occur if additional stressors are absent. Thus, in inhabited areas, good local management becomes more important – not less – in a period of ocean warming.

Contacts

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Website: www.fco.gov.uk

Project Partners

The Chagos Environmental Network consists of: The Chagos Conservation Trust, The Linnean Society of London, The Marine Conservation Society, The Pew Environment Group, The Royal Botanic Gardens Kew, The Royal Society, The Royal Society for the Protection of Birds, The Zoological Society of London, and Professor Charles Sheppard of Warwick University.

Bibliography

Harris, A. & Sheppard, C.R.C. 2008.
Status and recovery of the coral reefs of the Chagos Archipelago, British Indian Ocean Territory. In: Obura, D, Souter, D, Linden O (Eds) *CORDIO*, pp 61-70

Sheppard, C.R.C., Spalding, M., Bradshaw, C. & Wilson, S. 2002.
Erosion vs. recovery of coral reefs after 1998 El Niño: Chagos reefs, Indian Ocean *Ambio* 31:40-48.

Sheppard, C.R.C., Harris, A. & Sheppard, A.L.S. 2008.
Archipelago-wide coral recovery patterns since 1998 in the Chagos Archipelago, central Indian Ocean. Marine Ecology Progress Series 362: 109–117.

A near complete bibliography is available online at
www.chagos-trust.org/extrapage.asp?id=5
This will be supplemented and summarised in the volume 'Coral Reefs of the UK Overseas Territories' in late 2011.

Appendices

All Appendices referred to in this chapter are available at
http://jncc.defra.gov.uk/page-5747

Summer Programme © BVI National Trust

British Virgin Islands

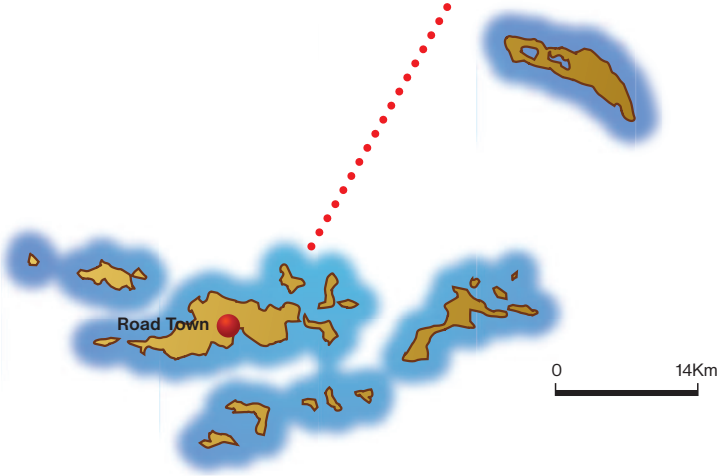
Between latitudes 18° 26’ N and 18° 44’ N and longitudes 64° 20’ W and 64° 37’ W

6

British Virgin Islands

Author:
Conservation and Fisheries Department, Government of the Virgin Islands

More information available at - **www.bvidef.org**



Basic facts and Figures

Location	The British Virgin Islands is located within the Eastern Caribbean between latitudes 18° 26' N and 18° 44' N and longitudes 64° 20' W and 64° 37' W.
Area	153km^2. The four main islands are Tortola (54km^2), Anegada (38km^2), Virgin Gorda (21km^2) and Jost van Dyke (9km^2).
Number of islands	The BVI consists of 60 small islands, cays and rocks.
Population	29,537 inhabitants (est.) 2010
Topography	Most islands are hilly with steep slopes (uplifted submerged volcanoes) except for Anegada, the northernmost island of the BVI, which is a coral limestone platform.
Main economic sectors	The main economic activities are financial services and tourism, with yachting being an important sector within the latter industry. Tortola is the most developed.

Legislative and Policy Framework

Multilateral environmental agreements

The BVI is included in regional and international multilateral environmental agreements (MEAs). Status of ratification of key MEAs: See also Appendix 1.

Multilateral Environmental Agreement	Included in ratification?
Convention on Biological Diversity	✔
Convention on International Trade in Endangered Species	✔
Convention on Migratory Species	✔
Ramsar Convention on Wetlands	✔
World Heritage Convention	✔

National environmental legislation

The BVI has nine pieces of legislation dealing with protected areas, species protection and conservation. See Appendix 2 for more details.

National environmental strategies

BVI has three main biodiversity related plans and policies for the entire territory as well as a Biodiversity Action Plan for Anegada, which is the second largest island in the BVI. An environmental profile for Jost Van Dyke was also completed in 2009. See Appendix 3 for more details.

Protected Areas

The Government of the Virgin Islands, Ministry of Natural Resources and Labour has developed a well-structured system of marine and terrestrial protected areas. Terrestrial areas consist of national parks, bird sanctuaries, wetlands / salt ponds, forestry and watershed protected areas. Currently, the BVI National Parks Trust manages 19 land-based national parks (five of which are bird sanctuaries) and one marine park. The Conservation and Fisheries Department manages 14 fisheries protected areas and Agriculture Department manages six watershed protected areas and one forestry protected area. A detailed breakdown of designated protected areas is included in Appendix 4.

Research Priorities

- Investigations to identify Red Hind *Epinephelus guttatus* spawning sites within the British Virgin Islands. Red Hind is an important commercial fish species in the territory and thus, this information will be used to assist in the management of the fish stock.
- Mapping of the distribution of all important, endangered and endemic organisms within the British Virgin Islands (Biodiversity profile mapping). This information will assist with other projects such as habitat monitoring programmes.
- Identify and develop actions that can affect the status of invasive species in the BVI and restore invaded habitats (Invasive species control). See also Appendix 5.

Institutional Arrangements

Government: The Ministry of Natural Resources and Labour is the main agency that manages land in the Territory, both directly and through its Departments of Agriculture, Conservation and Fisheries, National Parks Trust, Survey and Land Registry. In addition the Town and Country Planning Department, under the Premier's Office manages all development within the Territory.

The National Parks Trust of the Virgin Islands is a Statutory Body that is legally responsible for managing the protected areas system of the BVI. The National Parks Ordinance (1978 revision) established the National Parks Trust, and provided for the creation of national parks as protected areas to be managed by the Trust. They also proposed the 2007 – 2017 System Plan, in which more protected areas were proposed.

Non-Governmental Organisation: There are a number of environmental NGO's in the BVI including the Jost Van Dyke Preservation Society (JVDPS); the Virgin Islands Environmental Council (VIEC); the Caribbean Youth Environmental Network BVI Chapter (CYEN-BVI Chapter) and Green VI. See also Appendix 6.

Ecosystems and Habitats

Terrestrial: The islands' vegetation is predominantly made up of cacti, thickets and dry forests. There are also rain forests on the upper slopes of the larger islands of Tortola and Virgin Gorda (Petit and Prudent 2008). Also present within the BVI are woodlands and shrublands.

Marine: The BVI has 380km² of coral reefs that range in size from small fragments of a few square metres to The Anegada reef which is made up of close to 77km² of coral (Smith 2000). Anegada is also the home of the Anegada Horseshoe reef which is the third largest

Horseshoe Reef © BVI National Trust

barrier reef in the world. The archipelago also has 580 hectares of mangroves (of which 75% are found in Anegada) (Sanders 2006). There are also sea grasses, sandy stretches, salt ponds, ghuts and sub-marine hills and vales (Petit and Prudent 2008).

Species

The British Virgin Islands supports approximately 45 plant species endemic to the Puerto Rican bank (Sanders 2006). This includes single-island endemics including the threatened *Acacia anegadensis* and *Metastelma anegadense* (in Anegada) and *Calyptranthes kiaerskovii* (in Virgin Gorda). Other Red Listed species include the *Cordia rupicola* and *Leptocereus quadricostatus* (in Anegada). One quarter of the 24 reptiles and amphibians are endemic. Among them the Anegada rock iguana *Cyclura pinguis* is only found on the Island of Anegada.

Summary of the 2008 IUCN red listed species for the British Virgin Islands

Critically endangered	Endangered	Vulnerable	Near Threatened	Extinct (Extinct in the wild)	Lower risk/ conservation dependent	Data Deficient
14	10	18	17	0	2	14

Threats

Threats to biodiversity in the BVI include natural disasters as well as man-made factors. Some of the more common threats to biodiversity include habitat loss/fragmentation, sedimentation, anchor damage, marine pollution, insensitive development, climate change and invasive species.

Invasive species: The BVI have a considerable amount of invasive species within its small domain. Terrestrially the Cuban tree frog, Mongoose and feral rats and cats are becoming a great nuisance to the environment. In the marine environment, the newly introduced Lion fish is causing a great impact on marine animals and thus the fisheries industry. All these invasive species threaten the growth and survival of native organisms.

Climate change: Climate Change brings a series of impacts globally; the BVI expects higher temperatures and increase in hurricane and flood events. These events will cause considerable impact on both the terrestrial and marine environments. The increase in temperatures will put 20% to 30% of local plant species at greater risk of extinction in addition to encouraging bleaching events of one of our tourist attractions; the coral reefs. Hurricanes and flooding events also puts animals and other plant species at high risk of danger due to habitat loss and increase of diseases among livestock and plants (Burnett Penn 2010).

Habitat loss / fragmentation: Over the years, the BVI has undergone increased developmental activities which have resulted in habitat loss and fragmentation.

See also Appendix 7.

Projects

The British Virgin Islands has undertaken a number of terrestrial and marine projects over the last five years.

Case Study: Enhancing the Capacity to Combat the Imminent Invasion of Lionfish in the BVI

Dates: 2009 onwards

The Lionfish (*Pterois volitans*) eradication project was initiated in 2009 after the Conservation and Fisheries Department received funding from JNCC. This project provides a framework to coordinate activities among government and non-governmental agencies and local businesses and organisations to prevent the lionfish from negatively impacting the Virgin Islands fisheries, marine ecosystems and endangering public safety.

Main outcomes:

To control the invasion of lionfish and suppress the local populations in local waters, the Department trained persons through a series of workshops and educated the public on the invasive species through brochures, signage and media/public announcements.

Diving © BVI National Trust.

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Mangrove © BVI National Trust

Bibliography

Burnett Penn, Angela. 2005.
The Terrestrial Biodiversity of the Virgin Islands.

Burnett Penn, Angela. 2010.
The Virgin Islands Climate Change Green Paper.
Conservation and Fisheries Department, Ministry of Natural Resources and Labour.

GeoHack, Anegada. Accessed 25th March, 2001.
http://toolserver.org/~geohack/geohack.php?pagename=Anegada&params=18_44_N_64_20_W_

GeoHack, Norman Islands. Accessed 25th March, 2011.
http://toolserver.org/~geohack/geohack.php?pagename=Norman_Island&params=18_19_N_64_37_W_

GeoHack, Little Tobago, British Virgin Islands. Accessed 25th March, 2011.
http://toolserver.org/~geohack/geohack.php?pagename=Little_Tobago,_British_Virgin_Islands&params=18_26_N_64_51_W_type:isle_source:GNS-enwiki

http://www.bviddm.com/document-center/System%20Plan%202008%20-%20Approved%20Version.pdf

http://www.bvidef.org/main/ media/NEAP_Draft.pdf

http://www.cep.unep.org/pubs/meetingreports/LBS%20ISTAC%20III/english/NEMS.doc

www.cepal.org/publicaciones/xml/8/5608/lcl1440i.pdf

http://www.bvidef.org/main/media/NIDSIntPolicies.pdf.

www.seaturtle.org/mtrg/projects/anegada/Anegada%20BAP. pdf

http://www.reunion2008.eu/pdf/en/Pages%20from%2042.10_LOW_FINAL_book_EN-3.pdf

National Parks Trust. 2007.
British Virgin Islands Protected Areas System Plan 2007-2017

Appendices

All Appendices referred to in this chapter are available at
http://jncc.defra.gov.uk/page 5748

Cayman parrot © Thomas Hadjikyriakou

Cayman Islands

Between latitudes 19° 20’ N and 19° 43’ N and longitudes 79° 50’ W and 81° 21’ W

7

Cayman Islands

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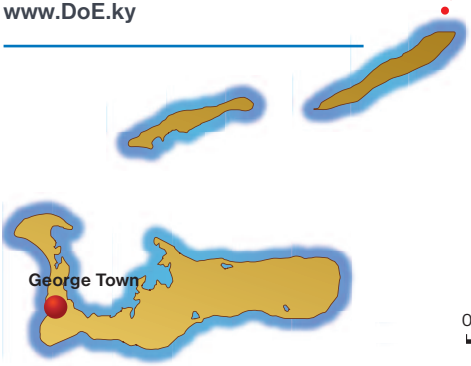

Basic facts and Figures

Location	The Cayman Islands are located in the Greater Antilles of the Caribbean between latitudes 19° 20' N and 19° 43' N and longitudes 79° 50' W and 81° 21' W.
Area	260km^2
Number of islands	The territory consists of three islands, Grand Cayman (197km^2), Cayman Brac (38km^2) and Little Cayman (28km^2).
Population	47,862 inhabitants (2008). Most of the population lives on Grand Cayman.
Topography	The islands form emergent peaks of a partially submerged mountain range which extends from southeast Cuba across the northwest Caribbean to the Gulf of Honduras. 'The Bluff' on Grand Cayman at 43m is the highest point. The Cayman Islands are mostly surrounded by fringing reef. There is a shallow terrace reef located at a depth of 5-10m, and a deep terrace at 15-20m, culminating in a deep fore-reef with a precipitous drop-off at an average depth of 22 meters. The islands' shelf widths average 500m.
Main economic sectors	The islands' economy is based on tourism and the offshore financial sector.

Legislative and Policy Framework

Multilateral environmental agreements

The Cayman Islands has been included in the UK's ratification of 20 MEAs. Status of the ratification of key MEAs:

Multilateral Environmental Agreement	Included in ratification?
Convention on Biological Diversity	✔
Convention on International Trade in Endangered Species	✔
Convention on Migratory Species	✔
Ramsar Convention on Wetlands	✔
World Heritage Convention	✔

National environmental legislation

The Cayman Islands have five main pieces of legislation dealing with area protection and the conservation of a limited number of animal species. There is no legal protection for plants. A comprehensive National Conservation Law has remained pending Cayman Islands Government approval for the past eight years. See Appendix 1 for more details on current legislation.

National environmental strategies

The Cayman Islands has a Biodiversity Action Plan (BAP) (www. DoE.ky) published in 2009. Nineteen Habitat Action Plans and thirty Species Action Plans were developed out of the BAP process. Two other strategies: The Cayman Island Development Plan and National Sustainable Development Strategy are also relevant. See Appendix 2 for further information.

Protected Areas

The Cayman Islands Department of Environment (DOE) has established a well-structured network of marine protected areas. Land-based protected areas are limited to Animal Sanctuaries and National Trust property. A detailed breakdown of protected habitats is included in Appendix 3.

Research Priorities

See also Appendix 4

- Identification of native trees to promote landscaping with native species, and reduce the reliance on exotic imports and potential for the introduction of invasives.
- Developing monitoring protocols for endangered species e.g. Cayman Parrot (*Amazona leucocephala caymanensis* and *A .l. hesterna*), Sister Islands iguana (*Cyclura nubila caymanensis*) and red mangrove restoration to determine success and cost-effectiveness.
- Continue to contribute to the identification of previously unknown species of animals and plants such as past successes with Cayman sage *Salvia caymanensis*, feared extinct.

Institutional Arrangements

Government: The Department of Environment which sits under the Ministry for Health, Environment, Youth, Sports and Culture is the main government agency responsible for the management and conservation of the environment and natural resources in the Cayman Islands and the implementation of the CBD and other MEA commitments. www.DoE.ky

Non-Governmental Organisation: The National Trust for the Cayman Islands has powers to buy, lease, sell, hold or deal in property of any nature. The Trust has steadily been purchasing lands, currently some 1,980 acres which have been secured through direct purchase, gifted or by Crown transfer.

Ecosystems and Habitats

Terrestrial: The dominant vegetation consists of dry sub-tropical forests, shrubland and mangrove swamps. Shrubland is a biodiverse habitat and of particular importance for reptiles, particularly the Grand Cayman Blue iguana. The Central Mangrove Wetland (CMW) on Grand Cayman represents the most significant area of wetland in the islands and remains largely intact, extending to some 8,639 acres.

Marine: Coral reefs are perhaps the most significant feature of the Cayman Islands marine environment, from both biodiversity and economic perspectives. The Cayman Islands are mostly surrounded by fringing reefs enclosing shallow, sand and seagrass filled lagoons. A detailed breakdown of habitat types is included in Appendix 5.

Diving in Cayman © Nikki Chapman

Species

Some 716 species of vascular plants are now known. Twenty-six species are endemic (Proctor 2011). Close to 75% of the reptiles found in Grand Cayman are native, including the Grand Cayman Blue iguana *Cyclura lewisi*. A variety of invertebrates, including a scorpion, centipede and numerous species of land snails are endemic. Some 222 species of birds (100 species of waterbirds and 122 species of landbirds) have been recorded in the Cayman Islands. (Bradley 2000). See Appendix 6 for Cayman Islands species designated for protection.

Summary of the 2008 IUCN red listed species for the Cayman Islands

Critically endangered	Endangered	Vulnerable	Near Threatened	Extinct (Extinct in the wild)	Lower risk/ conservation dependent	Data Deficient
6	7	20	17	1	1	20

Threats

Invasive species: The *Casuarina equisetifolia* and *Scaevola sericea* exact most significant impact, especially in coastal regions in terrestrial environments. The Brazilian Pepper is newly established in Cayman Brac and spreading rapidly. In the marine environment, the Lionfish *Pterois volitans* is likely to cause extreme impact to reef biodiversity, despite the plethora of control measures.

Climate change: Local long range implications of climate change remain largely unknown but elevated sea temperatures over the past two decades have resulted in significant increases in major coral bleaching episodes and subsequent rise in coral disease and mortality in the Cayman Islands. Major storms have also resulted in substantial impacts to the shallow and fringing reef environments.

Legislation: There is a lack of appropriate legislation that enables a comprehensive approach to biodiversity conservation. The (draft) National Conservation Law has been under consideration by successive governments for the past eight years, however, to date this crucial legislation has not been enacted.

Land use and human impact: Development in the Cayman Islands proceeds with little consideration for environmental impact through weak planning laws, poor enforcement of existing planning legislation and lack of requirement for Environmental Impact Assessments (EIA) even for major projects. See also Appendix 7.

Projects

The Cayman Islands have run a number of terrestrial and marine projects over the last five years.

Case Study: Creation of the National Biodiversity Action Plan for the Cayman Islands

The NBAP is the major biodiversity project to have been undertaken by the Department of Environment in the past five years. Production of this document provided an opportunity for assessment and collation of existing and well-established projects and data, and also to identify gaps in data, towards facilitating better-informed planning of further project priorities, and more ready identification of valuable opportunities for collaboration with outside institutions and agencies.

The NBAP has contributed directly to the development of a variety of new projects, including:

- Lionfish control programme
- Parrot survey
- Marine Parks review
- Cat control
- Native tree nursery (pictured)
- Caribbean Hub

Native Tree Nursery © Department of Environment Cayman Islands Government.

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Project Partners
The Cayman Islands works with a number of organisations and researchers on island, regionally and internationally.

Bibliography

Bradley, P.E. 2000
The birds of the Cayman Islands: BOU checklist series 19.
Tring, UK: British Ornithological library.

Bradley, P.E., Cottam, M., Ebanks-Petrie, G. & Solomon, J. 2006.
Cayman Islands section. In: *Important Bird Areas in the United Kingdom Overseas Territories*. (ed. S.M. Sanders), pp. 65-96. Sandy, UK: RSPB. ISBN: 1-901930-76-9

See also Appendix 8

Appendices

All Appendices referred to in this chapter are available at
http://jncc.defra.gov.uk/page 5749

Elephant Seal, Kidney Island © Nick Rendell

Falkland Islands

Between 51° S and 53° S, and 57° W and 62° W

8

Falkland Islands

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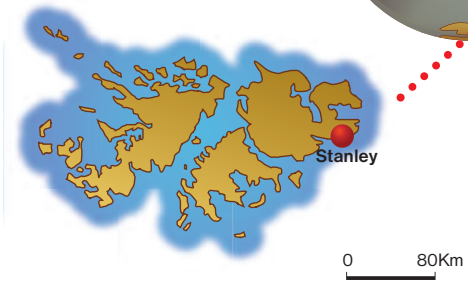

Basic facts and Figures

Location	The Falkland Islands lie in the SW region of the South Atlantic Ocean, around 600km E of South America, between 51° S and 53° S, and 57° W and 62° W.
Area	Approximately 12,200km^2 or just over 1,100,000ha.
Number of islands	There are two main islands – East Falkland and West Falkland, and about 780 smaller islands and islets.
Population	Approximately 3,000 people. The first settlement was in 1764. Most people live in the capital Stanley, with 360 people living in 70 settlements across the islands, and there is a British Military base in East Falkland.
Topography	There are three principal upland areas with land above 600m: the Wickham Heights, including Mt Usborne (705m) on East Falkland, and Mount Adam (700m) and the Hornby Mountains on West Falkland. Much of the coastline is deeply indented forming sheltered inlets. Coastal cliffs, mainly in the south-west region, are as high as 50 - 100m.
Main economic sectors	Sheep and cattle low intensity ranch farming and nature-based tourism. Wool production has been the traditional mainstay of farming in the Falkland Islands but there is a gradual switch to meat production now underway. Since the late 1970s, the seas around the Falkland Islands have been an important area for commercial fisheries and this is the single largest contributor to the economy. Wildlife tourism is now a well-established industry in the Falkland Islands and the cruise ship sector has grown considerably in recent years, with 45,000 visitors expected during the 2010/11 season. Offshore oil exploration is currently underway with the potential for income from this industry in five to ten years.

Legislative and Policy Framework

Multilateral environmental agreements

The Falkland Islands have been included in the ratification of 18 MEAs. Status of ratification of key MEAs:

Multilateral Environmental Agreement	Included in ratification?
Convention on Biological Diversity	✘
Convention on International Trade in Endangered Species	✔
Convention on Migratory Species	✔
Ramsar Convention on Wetlands	✔
World Heritage Convention	✔

The Falkland Islands has ratified the Agreement on the Conservation of Albatrosses and Petrels

National environmental legislation

The Falklands have 11 main laws that relate to biodiversity conservation. These range from wildlife, fisheries, control of invasive species and pollution. All Falkland laws can be found at www.epd.gov.fk. Appendix 1 lists the relevant environmental laws and regulations.

National environmental strategies

There are six main national policy documents that guide environmental management in the Falkland Islands. Key among these are: The Falkland Islands Environmental Charter (September 2001) that lays out 11 key commitments for the Falkland Island Government (FIG) and UK Government; Falkland Islands Biodiversity Strategy (2008-18); and Falkland Islands State of the Environment Report 2008. See Appendix 1 for links to each of these strategies.

Protected Areas

The Falklands have officially designated 19 terrestrial Nature Reserves and two Ramsar sites: Sea Lion Island and Bertha's Beach. Eight Nature Reserves are FIG owned, 10 privately owned and one is owned by Falklands Conservation. A few have management plans while others are currently in preparation (see Appendix 2). Twenty-two Important Bird Areas and 16 Important Plant Areas have been identified but these sites are not yet designated. See Appendix 2 for more details on protected area sites and sites of international biodiversity importance.

Research Priorities

- Investigate predicted changes in climate and how these changes may affect native species and ecosystems and land-use and marine-use activities.
- Investigate impacts of introduced plants and animals, as well as diseases on native biodiversity.
- Increased baseline knowledge of many top predator marine mammal and seabird species as well as shallow marine and deep water environments.

See Appendix 3 for a full discussion of biodiversity related research needs.

Institutional Arrangements

Government: Environmental issues are the responsibility of the Falkland Island Government's Environmental Planning Department (EPD). In addition, an Environmental Committee advises the Executive Council on environmental issues. This committee comprises two councillors, EPD representatives, conservation groups, the farming and fishing industry and two community members. See Appendix 4 for more information.

Non-Governmental: Falklands Conservation undertakes environmental monitoring, education and fundraising. In addition there are a number of local and international non-governmental conservation and research organisations including New Island Conservation Trust, the Falkland Islands Trust, Beaver Island Land Care Group, Antarctic Research Trust and Sub-Antarctic Foundation Research.

Ecosystems and Habitats

Stanley tourist ship © Nick Rendell

Terrestrial: The Falkland Islands Broad Habitat Classification (Broughton 2000) sets out a framework of 19 habitat types. Most of the terrestrial vegetation of the Falklands consists of maritime heath, acid grasslands, peatlands and coastal tussock grass (Petit and Prudent 2008).

Marine: The surrounding waters of the South Atlantic are very rich and support large populations of higher predators in the food chain. The archipelago is also a breeding ground for seabirds and marine mammals (ibid). See Appendix 5 for more details.

Species

Insects make up the largest share of terrestrial ecosystem species in the Falkland Islands. Seventy per cent of the world's Black-browed albatross population *Thalassarche melanophrys* and between a quarter and a third of the global Rockhopper penguin population *Eudyptes chrysocome* breed in the Falkland Islands. The Striated Caracara *Phalcoboenus australis*, (locally known as the "Johnny Rook"), is a rare predatory bird, found only in the Falkland Islands and in some islands off the coast of Cape Horn. Over 50% of the worlds Gentoo population breed in the Falklands. In addition a number of seals and sea-lions breed on the islands and fifteen or so species of whale and dolphin are found in the Falklands waters (Petit and Prudent 2008). There are also 14 endemic vascular plant species.

Species lists are available at Appendix 6.

Summary of the 2008 IUCN red listed species for the Falklands

Critically endangered	Endangered	Vulnerable	Near Threatened	Extinct (Extinct in the wild)	Lower risk/ conservation dependent	Data Deficient
0	8	16	14	1	0	16

Threats

Invasive species: Feral grazing animals, introduced livestock such as sheep, horses and goats, as well as rats, mice and cats have had the biggest environmental impacts. In the Falkland Islands, the native avifauna is predominantly ground nesting species and this makes them very susceptible to introduced predators.

Climate change: There has been a marked increase in sea water temperatures since the 1960s but scientists predict a cooling of the Falkland Islands rather than warming due to melting of Antarctic ice. Mixes of species and shifts in centers of production are expected, which is likely to have huge detrimental effects on top marine predators.

See Appendix 7 for more details on threats to biodiversity.

Projects

In addition to its core work in environment, externally funded environmental projects over the last five years include; the coordination of the Agreement for the Conservation of Albatrosses and Petrels (ACAP), an action plan for the conservation of Falkland Island rockhopper penguins, the ocean climate and rockhopper penguin foraging strategies project, the Falkland Islands shallow marine programme, the Cobb's Wren conservation project, Falkland Islands native plants programme, protecting galaxiids from salmonid invasions in Chile and the Falkland Islands, conservation of Falkland Islands raptors - reducing conflicts with sheep farming and the Darwin Southern sea lion programme.

Case Study: Cobb's Wren Conservation Project

Funded by: OTEP, FIG, RSPB, ART

Dates: April 2009 – April 2011

The Cobb's Wren is one of two endemic bird species in the Falkland Islands and is limited to small rodent-free islands. This project aimed to increase awareness of the species, identify its extent and enhance habitats to better protect it from introduced predators.

Cobb's Wren © Nick Rendell

Main outcomes:

- Over 35 islands surveyed for the presence of Cobb's Wrens.
- Rodent eradication (of Norwegian rats) attempted on seven islands and island groups, including the largest island attempted yet in the Falkland Islands (Staats Island, 500 hectares).
- Over 150 locals undertook visits to see Cobbs Wren in their native environment.
- Assessment made of Cobb's Wren genetic variation of different geographic areas.
- Feasibility of translocation potential for Cobb's Wren explored.
- Cobb's Wren Species Action Plan fully reviewed and updated.

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See also Appendix 8 for additional contacts

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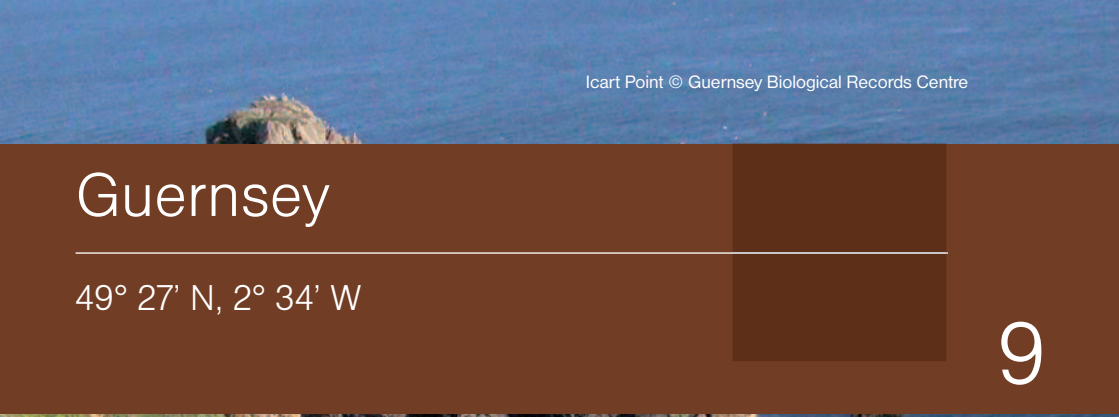
Bibliography

Broughton, D.A. 2000.
A New Broad Habitat Classification for the Falkland Islands. Report to Falklands Conservation and the Environmental Planning Department. The Queens University of Belfast.

See Appendix 9 for a comprehensive list of reference on Falklands biodiversity,

Appendices

All Appendices referred to in this chapter are available at
http://jncc.defra.gov.uk/page 5606



Icart Point © Guernsey Biological Records Centre

Guernsey

49° 27’ N, 2° 34’ W

9

Guernsey

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More information available at -
www.biologicalrecordscentre.gov.gg

Basic facts and Figures

See also Appendix 1

Location	The Bailiwick of Guernsey consists of a group of islands situated in the English Channel, in the Gulf of St. Malo. The largest island, Guernsey is 45km from France and about 100km from England.
Area	Guernsey, the largest island is 63km^2
Number of islands	Seven inhabited islands and a large number of uninhabited islets.
Population	Guernsey: 63,000; Alderney: 2,400; Sark: 600; Herm: 60. Jethou, Brecqhou and Lihou are also inhabited.
Topography	The major islands have a plateau at about 100m above sea level and have cliffs around all or part of their coast. The geology is metamorphic gneisses and granite. Alderney is the only island with large areas of sedimentary rock.
Main economic sectors	International business (banking, insurance along with fund, company and trust administration) and tourism are the main sectors of the economy but agriculture (the Guernsey cow is renowned worldwide) and horticulture, manufacturing, commerce and fisheries are also important.

Legislative and Policy Framework

Multilateral environmental agreements

Bailiwick of Guernsey (Guernsey) has been included in the UK's ratification of six MEAs. Status of ratification of key MEAs: See also Appendix 2

Multilateral Environmental Agreement	Included in ratification?
Convention on Biological Diversity	✘
Convention on International Trade in Endangered Species	✔
Convention on Migratory Species	✔
Ramsar Convention on Wetlands	✔
World Heritage Convention	✘

National environmental legislation

Guernsey has 33 pieces of legislation that are relevant to the environment. See Appendix 3 for a list of Guernsey laws. In addition, http://www.guernseylegalresources.gg/ccm/portal/ has details of laws and ordinances from the 1970s onwards for Guernsey, Alderney & Sark.

National environmental strategies

Guernsey has a States Strategic Plan as a medium term planning document for the island, http://www.gov.gg/ccm/navigation/government/states-strategic-plan/. This document is primarily a business plan but it considers the environmental effects of local policies. See Appendix 4.

Protected Areas

Fifty sites in Guernsey have been recognized as Sites of Nature Conservation Interest (SNCIs), but they have little legal protection. See Appendix 5 for a map and list of SNCIs or go to http://maps.digimap.gg/SitesOfNatureConservation/

Bay of Bordeaux © Guernsey Biological Records Centre

Research Priorities

The Guernsey Renewable Energy Commission (GREC) was formed in 2008 to investigate the potential for, facilitate and consent the development of, macro renewable energy projects, particularly tidal. Research has started on the ecological effect that tidal power devices will have but the research priority is to continue this research to investigate ecological impacts after their commissioning.

Institutional Arrangements

Government: The Environment Department advises the States on Environmental policy including sustainable development of the natural environment. Further details about the role of the Environment Department can be found at Appendix 6.

Non-Governmental Organisation: There are at least seven NGOs involved in biodiversity and habitat conservation in Guernsey. See Appendix 6 for more details.

Ecosystems and Habitats

Terrestrial: Guernsey has about 30 classes of vegetation. See Appendix 7 for details. The dominant vegetation is grasslands. Most threatened habitats are saltmarshes, dune slacks and open dune. The terrestrial habitats most important for their biodiversity include Dune, Coastal and Marshy Grasslands.

Marine: The marine flora and fauna is particularly rich, the island has many species not found further north in the British Isles.

Species

The terrestrial species found are a subset of those in North West France. Over 13,000 species have been recorded from the islands not counting bacteria, protozoa or single-celled algae. Complete lists of the insects, arachnids, many invertebrate groups, plants and fungi together with a list of the literature references to their occurrence in all the Channel Islands can be downloaded from the Guernsey Biological records Centre website at: http://www.biologicalrecordscentre.gov.gg/files/downloadlists.html. See Appendix 8 for a discussion of species diversity and species of significance.

Old Harbour © Guernsey Biological Records Centre

Threats

Invasive species: A third of the vascular plants in the Bailiwick are non-native, many of these are of no concern. Some invasive species are native. Rats are a particular threat to breeding birds. Appendix 6 discusses invasive species of concern.

Climate change: Sea level rise, particularly in the North of the island which is very low lying, is expected to reduce important wildlife habitat. See Appendix 9 for more information.

Projects

Guernsey has undertaken a number of terrestrial and marine projects over the last five years. See Appendix 10.

Case Study: Protection of species-rich marshy grassland habitats by La Société Guernesiaise.

Funded by: La Société Guernesiaise, donations, bequests

Dates: 1975-present

In the 1970s La Société Guernesiaise realised that many species and habitats were under threat in the island, particularly wet meadow habits famous for their orchids which were threatened by draining, building and modern farming methods. La Société changed its constitution to enable it to purchase land and started buying up these threatened fields.

Main outcomes:

Now the majority of the fields in the island with this habitat are owned or managed by La Société and these biodiverse areas are preserved and sensitively managed, at least in the short-term. See Loose-flowered Orchid in Appendix 5 for a description of one of the plants.

Triangular Field Vicheries © Guernsey Biological Records Centre

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See also Appendix 11

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Bibliography

See also Appendix 12

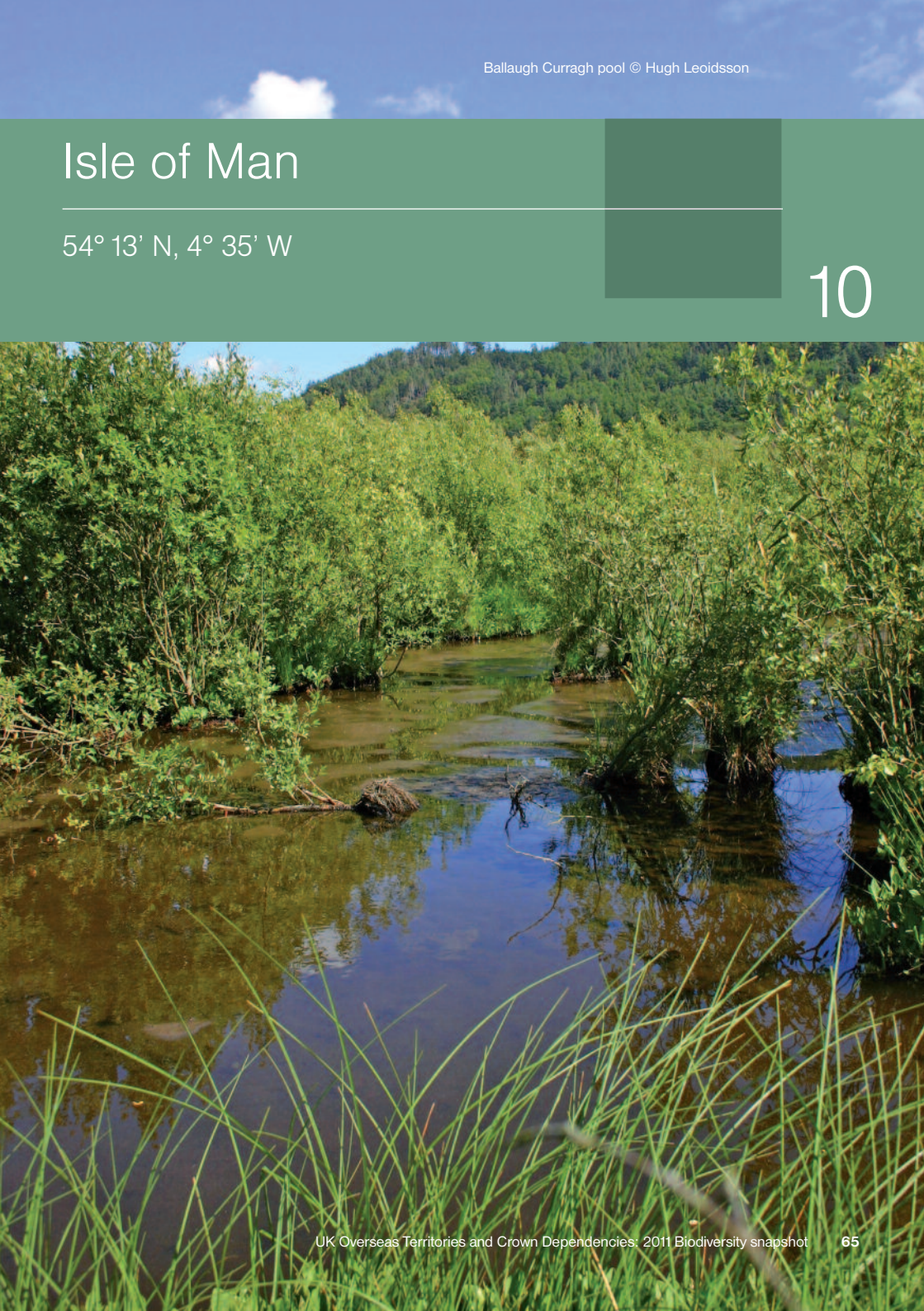
Daly, S. 1998.
Marine life of the Channel Islands. Kingdom Books, Waterlooville

Daly, S. 2004.
Wildlife of the Channel Islands. Seaflower Books. Bradford on Avon

David, C. T. & Gilmour, K.J. 2003.
A review of sites of nature conservation importance in the revised rural area plans.
A report to the IDC by La Société Guernesiaise

Appendices

All Appendices referred to in this chapter are available at
http://jncc.defra.gov.uk/page-5821



Ballaugh Curragh pool © Hugh Leoidsson

Isle of Man

54° 13’ N, 4° 35’ W

10

Isle of Man

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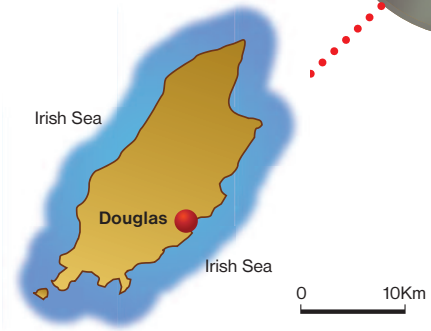
More information available at -
www.gov.im/defa/



Basic facts and Figures

Location	The Isle of Man lies in the northern part of the Irish Sea roughly equidistant from the coasts of Cumbria, County Down and Galloway. Its centre is at latitude 54° 13' N and longitude 4° 35' W. It is 51km long and 21km wide at its maximum.
Area	572 sq km of land, the Territorial Sea area is 3,965 sq km.
Number of islands	There is one main island, but also a small island, the Calf off the southern tip. Around the main island there are five smaller islands, two of which are joined on by causeways (St Michael's and St Patrick's Isles).
Population	80,058 (2006)
Topography	The highest hill on the island is Snaefell which is 621m above sea level. Of the 120km of coastline the Northern coast is sand and shingle with dunes and soft cliffs, while the Southern coastline is hard cliffs and the occasional sandy bay. There are two upland masses divided by the Central Valley, these make up about a quarter of the land area. The longest river on the Island is the Sulby. The largest wetland is probably the Ballaugh Curragh (Ramsar site) at the foot of the northern hills on the northern plain.
Main economic sectors	The main economic sectors include financial services (37% of GDP), construction (6%), manufacturing (7%), professional services (21%), tourism (5%), farming and fishing (1%). (2007 – 08 figures).

Legislative and Policy Framework

Multilateral environmental agreements

The Isle of Man (IOM) has been included in the UK's ratification of 12 multilateral environmental agreements (MEA). Status of ratification of key MEAs:

Multilateral Environmental Agreement	Included in ratification?
Convention on Biological Diversity	✘
Convention on International Trade in Endangered Species	✔
Convention on Migratory Species	✔
Ramsar Convention on Wetlands	✔
World Heritage Convention	✔

Note: The Isle of Man Government is waiting for the UK to agree to having the Convention on Biological Diversity (CBD) extended to the Island. The level of CBD implementation has been assessed by the island Government in preparation for requesting this extension (Appendix 1).

National environmental legislation

The earliest wildlife legislation was the 1867 Sea Gull Preservation Act, which conserved seagulls from those wishing to exploit their feathers, in appreciation for their role in cleaning up the sea from fisheries waste. The Isle of Man now has at least eight Wildlife laws (see Appendix 2). Of these the most important is the Wildlife Act 1990. This Act protects birds, other animals and plants, controls introductions to the wild, enables marine and terrestrial site protection and controls the keeping of certain birds.

National environmental strategies

The conservation work of government is outlined in the Department of Environment, Food and Agriculture's service delivery plan each year. www.gov.im/DEFA .

Protected Areas

Under the Wildlife Act government may designate; Areas of Special Scientific Interest (ASSI) (currently 16 designated); National Nature Reserves (currently one designated); Marine Nature Reserves (currently none designated); Areas of Special Protection for Birds, Plants or Animals (currently one designated).

The Island is aiming to have at least 10% of the land area protected by ASSI designation (See Appendix 3 for more information).

Coastal heath at Ayres National Nature Reserve © Ben Jones DEFA

Research Priorities

- In the marine field recent attention has focussed on basking sharks (*Cetorhinus maximus*), understanding their movements (by tagging), attempting to estimate their population size (using DNA analysis and fin ID) and recording their breeding behaviour. In 2006-07 Grey Seal census work was undertaken and regular monitoring is necessary.
- The island has a recently established (breeding since 1977) but important population of hen harrier (*Circus cyaneus*). Breeding numbers have been as high as 60 pairs (in 2004). The 2010 Census indicates a drop of approximately 50% since that of 2004 and research is required to understand their population changes and needs.
- Following the publication of the 2007 Manx Bird Atlas, about half the repeat breeding bird survey has been completed, (2006-15) which will create a sustainability index for habitats, including farmland. This will enable breeding trends and a red list to be identified. Last winter work started on the repeat of the wintering bird atlas. These will give Government unprecedented information about ecological change in the wider countryside. (See Appendix 5 for more information).

Graham Hall about to tag a basking shark with an MK10 Pat satelite tag.© Mank Basking Shark Watch

Institutional Arrangements

Government: The Department of Environment, Food and Agriculture (DEFA) is responsible for statutory nature conservation, forest and upland management, fisheries protection, energy and climate change, agricultural support, environmental protection, air and water quality and pest control. Manx National Heritage is an agency of government and also contributes to biodiversity conservation (see Appendix 4).

Non-Governmental Organisation: There are two main NGOs involved in biodiversity conservation on the Isle of Man: the Manx Wildlife Trust and Manx Birdlife. There are more than 10 other small conservation NGOs (see Appendix 4).

Manx Conservation Forum: The conservation and countryside NGOs are represented on the Manx Conservation Forum, together with agricultural and fisheries producer groups. Established by DEFA in 2009, this forum focuses on dialogue, Government and NGO partnerships, promotion of biodiversity conservation and dissemination of scientific information. (See Appendix 4).

Ecosystems and Habitats

The island is notable for the variety of habitats in a small area. In the 1990s the terrestrial habitats and land use were mapped (using Phase 1 field survey techniques). Detailed survey (phase 2) was done for areas of high ecological importance, in preparation for Area of Special Scientific Interest (ASSI) designation.

Most of the island is Manx slates with small areas of granite and an area of limestone around Castletown in the south. The hills and some small lowland areas have peat of varying depths. The northern plain is made up of glacial outwash gravels and sands (See Appendix 6 for habitats list and map).

Species

As with all islands the species diversity is less than on the adjacent land masses. However, the marine diversity is significant. Allen, in the Flora of the Isle of Man (1984) noted that “in every plant and animal order (except the wholly freshwater ones) that has so far been adequately worked, with striking consistency Man proves to have two-thirds of the Irish total and two-fifths of the British”.

It is also a feature of the island that some species are only found at single sites and are therefore highly vulnerable. For this reason those with three or fewer sites are listed in schedule 7 (of the Wildlife Act 1990). These include such species as agrimony (*Agrimonia eupatoria*), bee orchid (*Ophrys apifera*) and spring sandwort (*Minuartia verna*) (see Appendix 7 for species lists).

Chough © Peter McEvoy DEFA

Threats

Invasive species: There are a number of species considered to be non-native and invasive although some may not yet have shown indications of being invasive on the Isle of Man. Coarse fish are moving between ponds with the help of man, while some species; Japanese knotweed, *Falopia japonica* and Wireweed, *Sargassum muticum*, are spreading of their own accord. (see Appendix 8 for more detail).

Summary of known invasives in the Isle of Man

Plants	Invertebrates	Reptiles	Fish	Birds	Mammals	Amphibian
35 +3 Marine	5	0	5	2	5	0

Climate change: Currently DEFA is contributing to work by the Marine Biological Association on rocky shore invertebrates which are marine indicators of climate change. No analysis has been done on which habitats could be affected by climate change, but sea level rise and increased storminess could threaten our saltmarshes and dune systems, as well as the soft cliffs in the north of the Island. No analysis has been done on which species could be affected by climate change but the very few alpine plants such as dwarf willow (*Salix herbacea*) on Snaefell could be affected (Appendix 8).

Projects

In addition to its core work, the Isle of Man has undertaken a number of marine and terrestrial projects over the last five years, including the Point of Ayre gravel pit restoration project, the basking shark project, a native wildlflower nursery, bat survey road transects and development of a marine reserve (see Appendix 9).

Case Study: Manx Basking Shark Project

Funded by: Dept of Environment, Food and Agriculture; Save Our Seas Foundation; Manx Lottery Trust; Gough Ritchie; Global Ocean; Dept of Leisure and Tourism; Tower Insurance; Department of Economic Development; Sea World Busch Gardens; Good Gifts Catalogue Charity and individuals.

Dates: 2005 - ongoing

Aims

1 Raising public awareness of basking sharks;
2 Research into basking sharks; and
3 Coordination of worldwide scientific activity into basking sharks.

Main outcomes:

- Establishment of an on-line public sightings scheme and phoneline.
- Enable various film crews to make films about basking sharks in Manx waters.

Satellite tagging and tracking sharks has revealed new information about their movements including crossing the Atlantic. Fin ID and DNA analyisis are helping gauge the population size.

- The project collaborated with international players to organise an international basking shark conference in 2009. This enabled scientists to come together to collaborate on DNA analsysis, etc.
- Incidents of disturbance and damage to sharks have been logged.
- Signs of courtship and breeding behaviors, not previously recorded for Manx waters, have been observed.

www.manxbaskingsharkwatch.com

Basking Shark Project boat, Happy Jack, going through Calf Sound © Manx Basking Shark Watch

Contacts

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Department of Environment, Food and Agriculture (DEFA) – Chief Executive Officer.

Principal Biodiversity Officer, Elizabeth Charter, Department of Environment Food and Agriculture

Minister of Environment, Food and Agriculture

Head of Fisheries Division of DEFA

Head of NGOs; Chairman and Director of Manx Wildlife Trust, Manager of Manx Birdlife,

Project Partners
In Government: Manx National Heritage, (MNH); Department of Infrastructure, (DOI); Department of Economic Development, (DED); Department of Communities Culture and Leisure

Outside Government: Manx Wildlife Trust (MWT), Manx Birdlife (MBL), Manx Bat Group; Manx Whale and Dolphin Watch, others

UK/International: UK Overseas Territories Conservation Forum, Marine Conservation Society, Royal Society for Protection of Birds, Bat Conservation Trust.

Acknowledgements

Thanks to Chris Sharpe (MBL), Duncan Bridges (MWT) and Philippa Tomlinson (DEFA).

Bibliography

See also Appendix 10

Allen, D. E. 1984.
Flora of the Isle of Man. Manx Museum and National Trust.

Bruce, J.R., Coleman & J.S., Jones, N.S. 1963
Marine fauna of the Isle of Man and its surrounding seas. (Marine Biological Station, University of Liverpool, Port Erin).

Appendices

All Appendices referred to in this chapter are available at
http://jncc.defra.gov.uk/page-5819

Beauport beach from Les Creux, Jersey © States of Jersey

Jersey (Bailiwick of)

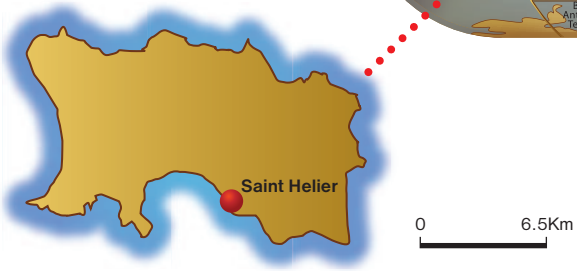
49° 13’ N, 2° 7’ W

11

Jersey

Author: **N.Cornish, K.Fleming, T. Liddiard, L Magris, G Morel, J. Pinel, J. Srives, D. Tipping, M.Woodhall**

More information available at - **www.gov.je**



Basic facts and Figures

Location	Jersey sits in the Bay of St Malo - 25km[1] from the French coast.
Area	Jersey is 8km long[2] by 14.5km wide, with a land area of 117km^2.
Number of islands	Jersey is the largest of the Channel Islands (five of which are inhabited). Jersey's 2,072km^2 of territorial waters also encompass the offshore islands and reefs of Les Minquiers, Les Écréhous, La Motte, Les Dirouilles and Les Pierres de Lecq or Paternosters, which together form the Bailiwick of Jersey.
Population	In 2001, Jersey's population stood at 87,186.[3]
Topography	The Island is roughly rectangular in shape and is tilted from the north to south. The highest part is at Les Platons on the north coast which is more than 130m above sea level. Geologically, Jersey has much in common with the adjacent French mainland of Normandy and Brittany comprising a range of hard ancient rocks. The oldest rocks exposed on the Island belong to the Jersey Shale Formation, comprising silts, sandstones and conglomerates.[4]
Main economic sectors	International business (banking, insurance along with fund, company and trust administration) accounts for 50% of Jersey's economic activity with tourism, agriculture and fisheries, retail, construction, manufacturing, utilities, transport and other business activities contributing to the other 50%.[5]

[1] www.gov.je/countrysidecharacterappraisal
[2] www.gov.je/countrysidecharacterappraisal
[3] A figure of 92,500 was estimated in 2009.A census is currently being carried out at time of printing and will be available at the end of 2011 www.gov.je/census
[4] www.gov.je/countrysidecharacterappraisal
[5] www.gov.je/economictrends2010

Legislative and Policy Framework

Multilateral environmental agreements

Jersey has been included in the UK's ratification of 31 multilateral environmental agreements (MEA). See Appendix 1. Status of the well recognized MEAs is:

Multilateral Environmental Agreement	Included in ratification?
Convention on Biological Diversity	✔
Convention on International Trade in Endangered Species	✔
Convention on Migratory Species	✔
Ramsar Convention on Wetlands	✔
World Heritage Convention	✔

National environmental legislation

Jersey has at least 23 laws that relate directly to the environment and/or biodiversity conservation. These are outlined in Appendix 2.

National environmental strategies

Jersey has at least 13 strategies that provide a policy framework for its environment and biodiversity. This includes a Biodiversity Strategy and associated Biodiversity Action Plans. For more details see Appendix 3.

Protected Areas

Jersey has 16 terrestrial protected areas, which are designated under local legislation as Site of Special (ecological) Interest (SSI) and a further 21 geological SSI's. In addition there are four designated Ramsar sites. There are currently no legally protected marine conservation areas. See also Appendix 4.

Grass snake, Jersey © Ben Tapley

Research Priorities

- Review of Conservation of Wildlife (Jersey) Law 2000.
- Development of Invasive Species Strategy.
- The conservation status of the grass snake *Natrix natrix*.
- The impact of the introduction of pheasant *Phasianus colchicus.*

See Appendix 5 for more detail.

Institutional Arrangements

Government: The main government department with environmental responsibility is the Department of the Environment who is responsible for: Environmental Policy, Fisheries and Marine Resources, Habitat and Species Protection, Rural Economy, Pollution Control, Water and Waste Management, Metrological forecasting, States Vetinary Service, Agricultural Inspectorate.

Non-Governmental Organisation: There are a number of NGO's including: The National Trust for Jersey; La Société Jersiaise; Durrell Wildlife Conservation Trust and Trees for Life. See also Appendix 6.

Ecosystems and Habitats

The Biodiversity Strategy for Jersey is the main policy document for habitat and species conservation in Jersey. The strategy identifies 10 key habitats and provides a format for the production of Species Action Plans for species of conservation concern. A phase 1 habitat survey is being carried out in 2011. See Appendix 7 for more detail.

Portelet common SSI dwarf shrub heath, Jersey © States of Jersey

Species

The Channel Island's geographic location, sheltered by the bay of St Malo and warmed by the Gulf Stream, creates a temperate climate providing the conditions required for many species, especially plants, more likely to be found in more southern European regions. A large proportion of Jersey's flora has been introduced over the past few centuries and a number of species of our flora and fauna have become locally extinct, including in the past 20 years; the stoat *Mustela erminea*, Cirl bunting *Emberiza cirlus* and the yellow hammer *Emberiza citronella*. See also Appendix 8.

Threats

Invasive species: Many of the species introduced to Jersey over the years have settled into the native flora and fauna and have found niches that do not conflict with the natives. However, a number are or are becoming problematic due to prolific reproduction or vegetative spread. A few native plant species such as bracken *Pteridium aquilinum agg*. and western gorse *Ulex europeaus* are very invasive in a range of habitats and are economically of the greatest impact. However, invasive alien species such as Hottentot fig *Carpobrotus edulis* cover extensive areas of coastline to the detriment of the native flora and fauna, but due to the terrain, are extremely difficult to manage. Many alien species are already or are becoming highly invasive and a strategy for their management is currently being produced. See Appendix 9 for more detail.

Projects

There are a number of projects being carried out in Jersey including one to protect the agile frog *Rana dalamatina.* (See Appendix 10).

Case Study: Protecting the Agile frog

Dates: Late 1980's – ongoing

The agile frog Rana dalmatina is distributed widely throughout much of southern and central Europe, but is found in only a few northern locations including Jersey - the frog is not found anywhere else in the British Isles. The Jersey population of the agile frog has been declining in both range and numbers since the early 1900's. By the 1970's only seven localities were listed where the frog could still be found, and by the mid 1980's this had fallen to only two sites.

Main outcomes:

In the late 1980s, The Agile Frog Group (AFG), now known as JARG – Jersey Amphibian & Reptile Group - was formed to try to stop the potentially terminal decline of the agile frog in the wild, through a program of captive-breeding, re-introduction to the wild and careful management of suitable habitat.

Significant progress has been made in the areas of habitat management, captive breeding and re-introductions to the wild. However, the future of Jersey's agile frog is still far from secure as the factors which probably played a key role in the frogs decline are still very much in evidence.

Juvenile Agile frog, Ouaisne SSI, Jersey © States of Jersey

Contacts

See also Appendix 11

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Website: www.gov.je

Project Partners

Project partners include Action for Wildlife Jersey, Durrell Wildlife & Conservation Trust (DWCT). See also Appendix 11.

Bibliography

Air Quality Strategy, Planning and Environment Department, 2010. States of Jersey

Biodiversity Action Plans, Planning and Environment Department, 2010. States of Jersey

Biodiversity Strategy, Planning and Environment Committee, 2000. States of Jersey

Countryside Renewal Scheme, Planning and Environment Department, 2009. States of Jersey

Draft (Jersey) Island Plan Planning and Environment Department, 2010. States of Jersey

Energy Policy Green Paper 'Fuel for Thought', Planning and Environment Department, 2009. States of Jersey

Rural Habitat Statement, Department of Environment, 2011. States of Jersey

St Ouen's Bay Planning Framework, Planning and Environment Committee, 1999. States of Jersey

The States Strategic Plan, 2009-2014, 2005. States of Jersey

The State of Jersey: a Report on the Condition of Jersey's Environment, Environment and Public Services Committee, 2005. States of Jersey

Turning Point: The ECO-ACTIVE guide to the Science and Impacts of Climate Change in Jersey, Planning and Environment Department, 2009. States of Jersey

Urban Habitat Statement, Department of Environment, 2011. States of Jersey

Appendices

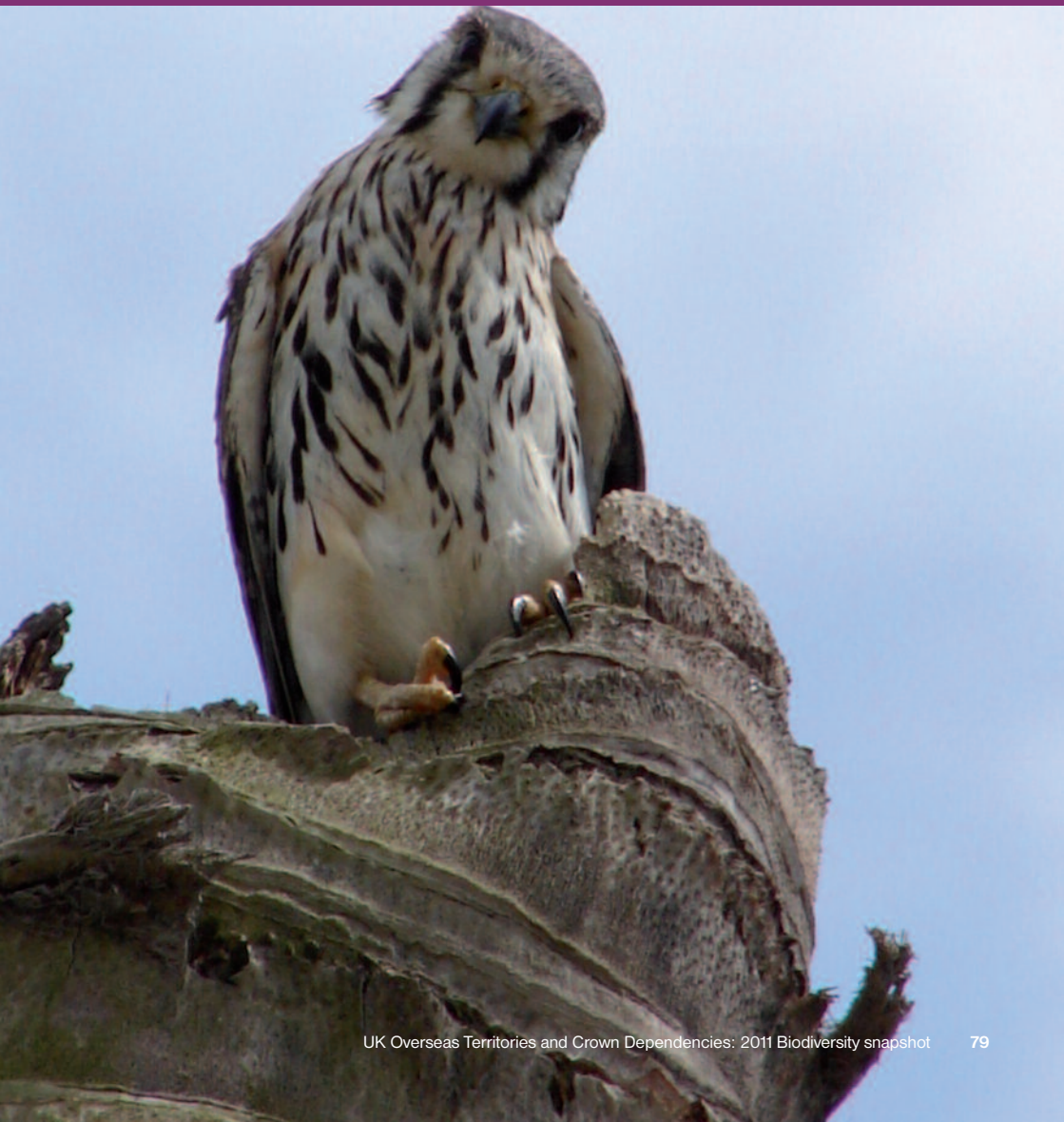
All Appendices referred to in this chapter are available at http://jncc.defra.gov.uk/page-5823

Kestrel at Old Road © Stephen Mendes

Montserrat

Between 16° 40’ N and 16° 50’ N and
62° 9’ W and 62° 15’ W

12



Montserrat

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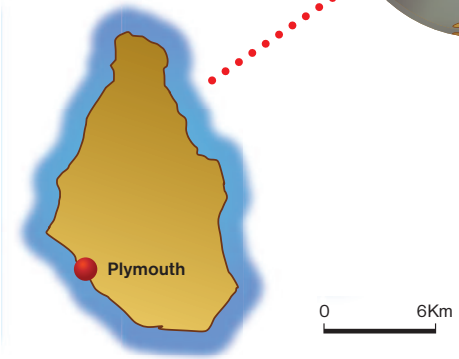

Basic facts and Figures

Location	Montserrat is located in the Leeward Island chain of the Eastern Caribbean. The island lies between 16° 40' N and 16° 50' N and 62° 9' W and 62° 15' W.
Area	Total area of 102.6km^2. The island is 17.7km (11 miles) long at its longest point and 11.3km (7 miles) at its widest point.
Number of islands	One main island
Population	Estimated at 4,819 inhabitants (2007). Before the first volcanic eruption in 1995, Montserrat had 10,400 inhabitants; 62.5% of the population has since emigrated.
Topography	Montserrat is the most mountainous of the Leeward Islands; its highest peak is Chances Peak (915m). The two main mountain masses of Montserrat are the Centre Hills and the Soufrière and South Soufrière Hills. The only flat lowlands are drowned river valleys on the North West coast.
Main economic sectors	In 1995, the Soufrière Hills Volcano erupted and has continued ever since. The island now has two zones: a Safe Zone (33% of the land mass) in the north and the Exclusion Zone in the south. The main economic driver is Government services (41.5%). Other major contributions to GDP, in order of importance, are: real estate, housing, banks and insurance, construction and transport.

Legislative and Policy Framework

Multilateral environmental agreements

Montserrat has been included in the UK's ratification of 14 MEAs. Status of ratification of key MEAs:

Multilateral Environmental Agreement	Included in ratification?
Convention on Biological Diversity	✘
Convention on International Trade in Endangered Species	✔
Convention on Migratory Species	✔
Ramsar Convention on Wetlands	✔
World Heritage Convention	✔

National environmental legislation

The legislative framework for environmental management in Montserrat comprises several legislative instruments dealing with endangered species, forestry, agriculture, waste management and pollution control, environmental health, and planning and development control. See Appendix 1 for an exhaustive list of relevant existing legislation. The following legal instruments are being developed: a comprehensive Conservation and Environmental Management Act and Regulations and Revised Endangered Animals and Plants Act and Regulations (CITES).

National environmental strategies

The environmental policy framework is composed of: St George's Declaration of Principles for Environmental Sustainability in the OECS; Montserrat UK Overseas Territories Environment Charter; Sustainable Development Plan 2008-2020; National Environmental Management Strategy; Forestry Policy; Biodiversity Research Protocol; Public Participation Policy and Physical Development Plan (PDP) for North Montserrat (2000-2009). The PDP is currently being revised.

Protected Areas

There are four terrestrial protected areas on Montserrat covering an area of 2,851.9ac (1,155ha); this represents 11% of the total land area and 30% of the volcano safe zone. The protected areas include (i) the Centre Hills Forest Reserve and protected forest (4.31 sq mi or 11.16 sq km), (ii) Piper's Pond Wildlife Reserve and associated conservation area (1.9ac or 0.8ha), (iii) Silver Hills Forest Reserve (75ac or 30.4ha) and (iv) Foxes Bay Bird Sanctuary (15ac or 6.1ha), which has been decimated by volcanic activity. Additionally most ghauts,ravines and steep land receive de facto protected areas status.

Thrasher at the woodlands © Stephen Mendes

Research Priorities

i. Development and implementation of action plans for selected species (e.g. Montserrat Oriole, galliwasp, yellow shouldered bat, Pribby and Montserrat orchid).

ii. Impact of volcanic activity on terrestrial and marine biodiversity.

iii. Control of terrestrial and marine invasive alien species.

iv. Impacts of habitat loss and fragmentation on terrestrial biodiversity.

v. Efficacy of artificial coral reefs.

vi. Impacts on natural and anthropogenic stresses on coastal and marine environment.

vii. Measuring and monitoring ecosystem services at site scale: building practical tools for real world conservation.

Institutional Arrangements

Government: Responsibilities for various aspects of environmental management fall within the mandates of several agencies, which themselves are spread across a number of Ministries. The lead responsibility for overall environmental management falls within The Ministry of Agriculture, Lands, Housing and Environment, and more specifically within the Department of Environment (DOE). See Appendix 2 for further information. Through its Forestry Division the DOE has statutory responsibility for conservation and sustainable utilization of biodiversity. The major aims are (i) to promote sustainable use of natural resources and environmental goods and services in an equitable manner and (ii) to maintain biodiversity in its widest definition, including biodiversity between and within ecosystems and habitats, diversity of species and variation within species.

Non-Governmental Organisation: Three main NGOs: The Montserrat National Trust, the Montserrat Fishermen's Cooperative and the Montserrat Farmer's Association assume responsibility for environmental management on behalf of their stakeholders. The two dive shops on the island are also involved in coastal and marine conservation (Appendix 2).

Ecosystems and Habitats

Terrestrial: Montserrat lost approximately 45% of its forest to volcanic activity. Presently the area of forest is 13,965ac (5,656ha) broken down as follows: wet forest 1,084ac (439ha), mesic forest 7,474ac (3,027ha), littoral forest 1,195ac (484ha), dry forest 4,187ac (1,696ha) and elfin woodland 23ac (9.3ha). The distribution of forest types is shown in Appendix 3 as is the eleven distinct vegetation types described for Montserrat.

Marine: Small patch and fringing coral reefs are found scattered around the island in many cases close to shore, along with pockets of seagrass, sand and sediment. The limited stands of mangrove have been severely impacted by volcanic activity and poor land use practices. See Appendix 3 for more information.

Wetlands: Because of Montserrat's topography and geology, the extent of its wetlands is relatively small. Wetlands are being severely impacted by ongoing volcanic eruptions. For example, the total area covered by wetlands is estimated to be about 65 acres (26ha) approximately 50% of which has been destroyed by volcanic eruptions (Gray, 2010). Further details are outlined in Appendix 3.

Species

The Montserrat plant checklist records 795 known native species; of these, 78 are of restricted-range and therefore represent the highest priority for conservation (Young 2008). Three endemic plants have been listed for Montserrat. Two of these plants, Pribby (*Rondeletia buxifolia*) and the Montserrat Orchid (*Epidendrum montserratense*) have extremely restricted distributions, the vast majority of which are not protected. The third endemic plant, *Xylosma serratum*, has not been found recently and is believed to be extinct (Gray 2010).

The number of invertebrate species known to exist on Montserrat is 1,241. About 120 have been identified as being possibly endemic to Montserrat and should be afforded the highest conservation priority (Appendix 3).

There are three species of amphibians and 11 species of reptiles reported for Montserrat; these include six endemics at the species or sub-species level. The remarkable Mountain Chicken *Leptodactylus fallax* is the second largest frog in the world, found only on Montserrat and Dominica (Appendix 3).

There are 102 species of birds recorded for Montserrat, including 34 breeding, one endemic and 11 restricted range species. The endemic Montserrat Oriole (*Icterus oberi*), the national bird, is critically endangered and is now restricted to the Centre Hills and the South Soufrière Hills.

Please see Appendix 3 for further details.

There are 10 species of bats known on Montserrat (Appendix 4).

Montserrat mountain chicken © Carole McCauley

Summary of the 2008 IUCN red listed species for Montserrat.

Critically endangered	Endangered	Vulnerable	Near Threatened	Extinct (Extinct in the wild)	Lower risk/ conservation dependent	Data Deficient
6	8	22	12	0	3	6

Ash destroying the crops © Stephen Mendes

Threats

Volcanic activity: The Soufrière Hills Volcano erupted in 1995 and has continued ever since. As a result 45% of the island's forest ecosystem and associated biodiversity was destroyed. The eruption also led to a reduction and fragmentation of habitats for many island endemics, which by their very nature were already small, thereby pushing them closer to extinction. Siltation from ash fall and pyroclastic flows resulted in severe adverse impacts on coastal and marine ecosystems and related biodiversity. Because about 65 to 70% of the total land area was made inaccessible, there has been increased development pressure on protected areas or lands earmarked for protection status. The Centre Hills, the largest area of intact forest, has been repeatedly exposed to falling ash and acid rain.

Invasive species: During a workshop involving a broad cross section of stakeholders from the private, public and civil society, a list of the most significant invasive species was drawn up (see Appendix 5).

Climate change: Montserrat has been severely impacted by hurricanes (e.g. Hugo 1989, Luis & Marilyn 1995) and the threat of more intense hurricanes will have a negative impact on the remaining terrestrial habitats and the species they support. Sea-level rise and severe storms are expected to adversely impact beaches, seagrass beds and coral reefs; this is likely to negatively impact marine turtles and fisheries.

Projects

In addition to its core functions, the Department of Environment has undertaken a number of externally funded projects since its inception in late 2006. These include habitat and species conservation, revision of existing and production of new legislation and enabling regulations, environmental education, invasive species management, biodiversity survey and monitoring and conservation of key endemic, rare and/or endangered species. Please consult Appendix 6 for additional information on conservation projects undertaken over the past four years.

Case Study: Montserrat Centre Hills Project

Funded by: The Darwin Initiative, Royal Society for the Protection of Birds and OTEP

Dates: 2005 – 2008

Since volcanic activity has devastated most of the southern forests of Montserrat, the Centre Hills Project aimed to enable the people of Montserrat to conserve the Centre Hills which has become the last remaining habitat for numerous threatened species such as the Montserrat oriole, 'mountain chicken' frog, galliwasp lizard and the endemic Montserrat orchid.

Main outcomes:

- Three-year Management Plan for the Centre Hills.
- Economic Valuation of ecosystem services.
- Socio-economic assessment of importance of Centre Hills.
- Wildlife Guide to the Centre Hills.
- Trail map of the Centre Hills.
- Educational materials including a teachers resource map.

www.malhe.gov.ms/centrehills

Centre Hills Project © Tara Pelembe

Contacts

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Project Partners
Montserrat National Trust (MNT); Montserrat Department of Agriculture (DOA); Durrell Wildlife Conservation Trust (DWCT); Royal Society for the Protection of Birds (RSPB); Joint Nature Conservation Committee (JNCC); UK Overseas Territories Conservation Forum (UKOTCF); Royal Botanic Gardens Kew (RBG); Overseas Territories Environment Programme (OTEP); DEFRA – the Darwin Initiative; Food and Environment Research Agency (FERA); Zoological Society of London (ZSL).

Acknowledgements

Thanks are extended to Ms Gillian Cooper and Ms Tara Pelembe of JNCC for their assistance, guidance and patience during the writing of the manuscript and to Mrs Deloris Mullings (Senior Clerical Officer - DOE) for her assistance with typing, formatting and editing the document.

Bibliography

See also Appendix 7

Gray, G.A.L. 2010.
Montserrat National Climate Change Issues Paper: Towards the Formulation of a National Climate Change (Adaptation) Policy and Action Plan.
Department of Environment, Ministry of Agriculture, Land, Housing & the Environment.

Gray, G.A.L. 2008.
Foreword. In A Biodiversity Assessment of the Centre Hills, Montserrat, ed. R.R. Young, Durrell Conservation Monographs No 1 (2008).
Durrell Wildlife Conservation Trust, Les Augrés Manor, Trinity, Jersey JE3 5BP, Channel Islands.

Gray, G.A.L. 1996.
The Effects of the Volcanic Eruptions on the Flora and Fauna of Montserrat. OECS Forester, A Handbook on Forests in the Eastern Caribbean.
Organisation of Eastern Caribbean States Natural Resources Management Unit, P O Box 1383, Castries St Lucia, W.I.

Appendices

All Appendices referred to in this chapter are available at
http://jncc.defra.gov.uk/page-5751

Longboat © Dr Noeleen Smyth

Pitcairn

24° 21’ 41” S, 128° 18’ 58” W

13

Pitcairn

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More information available at -
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Basic facts and Figures

Note [1] The Governor of Pitcairn is the Wellington (New Zealand) based British High Commissioner. An appointed Governer's Representative resides on the island for one year secondments.

Location	Pitcairn has high volcanic steep slopes and a maximum altitude of 329m. The territory lies 1,570km West of Easter Island and 5,350km North East of New Zealand.
Area	A total land area of approximately 47km^2. Pitcairn is 5km^2.
Number of islands	Four: The main island, Pitcairn and three uninhabited islands - Henderson Island (World Heritage Site), Ducie Island and Oeno Island.
Population	Fifty-six permanent residents. Part of the population is made up of Government contracts/secondments from the New Zealand police, school teachers and social workers.
Topography	Pitcairn's origin is volcanic with steep slopes and cliff faces with volcanic soils varying from red to black in different locations. Landscape is dominated by coconut palm trees, Norfolk pine trees, banana trees, breadfruit trees and a wide variety of trees.
Main economic sectors	The island's economy is dependent on subsistence agriculture and fishing. A large percentage of residents are employed by the Government[1] with a small stream of private enterprise.

Legislative and Policy Framework

Multilateral environmental agreements

Pitcairn has been included in the UK's ratification of 12 MEAs. Status of ratification of key MEAs is:

Multilateral Environmental Agreement	Included in ratification?
Convention on Biological Diversity	✘
Convention on International Trade in Endangered Species	✔
Convention on Migratory Species	✔
Ramsar Convention on Wetlands	✔
World Heritage Convention	✔

National environmental legislation

Pitcairn has five environmental ordinances implemented by the Government of Pitcairn Islands (GPI) and Natural Resources Division that are of environmental interest. Please see Appendix 1 for a list of those legislative documents.

National environmental strategies

Pitcairn has an Environmental Charter that was signed with the UK Government in 2001. The most important environmental strategies for the GPI are the guidelines and strategies set out in the Pitcairn Islands Environment Management Plan 2008 and Henderson Island Management Plan 2004-2009.

Protected Areas

Henderson Island is listed as a World Heritage Site http://whc.unesco.org/en/list/487

Pitcairn Harbour © Dr Noeleen Smyth

Research Priorities

- How to sustain past efforts to eradicate the invasive Roseapple *Syzygium jambos.*
- Managing future water availability and how it might be affected by climate change, tourism and changes to water use patterns.
- Baseline survey information on plant species, invertebrates and marine species.

Institutional Arrangements

Government: The Pitcairn Island Council is responsible for the local government and administration of internal affairs. The Island Council comprises: the Island Mayor (elected every three years), the Island Secretary, Deputy Mayor, four Councillors (elected annually), a Governor's appointee (Councillor) and the Governor's Representative (ex-offcio member). There are currently two Pitcairn Island posts that deal with environmental matters, those of Division Manager Natural Resources and Director of Biosecurity.

Ecosystems and Habitats

Terrestrial: Henderson Island remains little disturbed. There is relatively little human influence because of its remoteness and inhospitable nature.

Marine: Two-thirds of Henderson Island is surrounded by coral reef. The islands of Oeno and Ducie are small atolls. The coral reefs are well developed in Oeno and Ducie. See Appendix 2 for further information on Henderson, Oeno and Ducie islands.

Species

The flora of Pitcairn includes 81 species of indigenous vascular plants, of which 10 are endemic (Kingston & Waldren 2005, Kingston 2010). The territory is home to 28 species of nesting bird, most of which are seabirds. Approximately 90% of the global population of Murphy's petrel (*Pterodroma ultima*) nest on the island of Ducie (Sanders 2006). A population of Green turtles uses East Beach on the Island of Henderson as a breeding ground. On the whole, Pitcairn's biodiversity has been little documented.

Coconut crab © Dr Noeleen Smyth

Summary of the 2008 IUCN red listed species for Pitcairn.

Critically endangered	Endangered	Vulnerable	Near Threatened	Extinct (Extinct in the wild)	Lower risk/ conservation dependent	Data Deficient
1	9	30	24	0	4	10

Threats

Invasive species: On Pitcairn, the introduction of invasive species has damaged indigenous species. The invasive Roseapple *Syzygium jambos*, introduced as a source of fuelwood to the island, is now outcompeting the native forest species *Meterosideros collina* and *Homalium taypau* through much of the centre of the island. *Syzygium jambos* forms monsospecific stands which contain few native species. The total species diversity was found to be adversely affected by its presence (Kingston & Waldren 2005, Smyth 2008 & 2010). Feral goats have seriously affected the local coastal habitat where there is much evidence of grazing of the *Pandanus tectorius* coastal fores.

Land use and human impacts: Much of the local woods, used for fuel, building and carving for export have also been over-exploited.

Projects

The Pitcairn Island Government has undertaken a number of internally and externally funded environmental projects over the last five years, including the roseapple clearance project, and the *Abutilon pitcairnense* recovery project.

Case Study: Abutilon pitcairnense recover project

Dates: Ongoing

Abutilon pitcairnense recovery – this is a partnership project with the Pitcairn Island Government and the National Botanic Gardens Dublin. Pitcairn Islanders are working at collecting and recording data on island, on pollinators, growth rates, numbers propagated. Work at National Botanic Gardens, Glasnevin, Dublin, in Ireland is focussing on the genetic fingerprinting of seedlings obtained from a clonal collection at the gardens.

Native *Abutilon pitcairnense* © Dr Noeleen Smyth

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Project Partners
The Pitcairn Islands Government works closely with some international organisations on environmental issues including National Botanic Gardens Dublin, Royal Society for the Protection of Birds and JNCC.

Acknowledgements

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Bibliography

Saunders, S.M. ed. 2006.
Important Bird Areas in the United Kingdom Overseas Territories. Sandy
UK: RSPB.

Smyth, N. 2008.
The Pitcairn Islands Environmental Management Plan 2008.
Pitcairn Government and Foreign and Commonwealth Office.

Smyth, N. 2010.
Plant conservation. Invasive species control and forest restoration on Pitcairn Island
South Central Pacific. Lambert Academic Publishing

Kingston, N. & Waldren, S. 2005.
A plan for the Conservation of Endemic and Native Flora on Ascension Island.
Biodiversity and Conservation 14:781-800.

Kingston, N. 2010.
Island Plant conservation. The case study of Pitcairn Island.
Lambert Academic Publishing. Lambdon, P. *et a*l. 2009.

Treadwell, P. J. 2001.
The Laws of Pitcairn, Henderson, Ducie and Oeno Islands.
Revised Edition

Appendices

All Appendices referred to in this chapter are available at
http://jncc.defra.gov.uk/page-5752

Endemic Redwood © St Helena National Trust

St. Helena

15° 58’ S, 5° 43’ W

14

St. Helena

Author: **Isabel Peters,** Environmental Coordinator and **Annalea Beard,** Environmental Assistant, Environmental Planning and Development Section, Secretariat, St. Helena Government.

More information available at - **www.sainthelena.gov.sh**

Basic facts and Figures

Note: St. Helena forms part of a single UK Overseas Territory with Ascention and Tristan da Cunha, the Governor of which resides in St Helena.

Location	St Helena lies in the South Atlantic Ocean at Latitude 15° 58' S and Longitude 5° 43' W. The nearest continental land mass is South Africa 1,800km to the east. South America 3,260km to the west. The closest island is Ascension 1,300km to the northeast. The highest point on St Helena is 820m above sea level.
Area	Approximately 121.7km^2
Population	Approximately 4,250
Topography	St Helena is a volcanic island defined by a high central ridge. The island emerged from the sea in the Miocene Epoch approximately 14 million years ago due to the activity of two, now coalesced, shield volcanoes. The north-eastern volcanic centre located at Flagstaff and Knotty Ridge formed the bulk of the island; the younger south-western volcanic centre is found at Sandy Bay. Rocks on the island are almost entirely volcanic in origin. The soils are variable from place to place; the majority of soils are heavy clays that have poor structure and are mostly acidic, however along the central ridge there are extremely acid, peaty soils.
Main economic sectors	The residents on St Helena are mainly employed by the government and through the commercial sector. St Helena has a high import dependency and relies heavily on financial aid, therefore most income is sourced through UK Aid, this includes a shipping subsidy and development aid. The only significant export from the island is fish.

Legislative and Policy Framework

Multilateral environmental agreements

St. Helena has been included in the UK's ratification of 17 multilateral environmental ageements (MEA). See Appendix 1. The status of ratification of key MEA's:

Multilateral Environmental Agreement	Included in ratification?
Convention on Biological Diversity	✔
Convention on International Trade in Endangered Species	✔
Convention on Migratory Species	✔
Ramsar Convention on Wetlands	✔
World Heritage Convention	✔

National environmental legislation

Local Environmental legislation is rather fragmented with different aspects incorporated in at least 17 different ordinances (Appendix 2). However, as part of the proposed revised institutional arrangements for Environmental Management on St Helena a new and comprehensive Environmental Management Ordinance is proposed.

National environmental strategies

The Environment Charter Strategy for Action (2004) is broadly used by Government Departments and the National Trust as a tool to identify gaps and input into strategic planning. It is however recognised that it is now out of date and needs to be revised urgently.

Protected Areas

St Helena currently has only one legally designated Protected Area, but is developing a Protected Areas Network. See Appendix 3.

Research Priorities

(See also Appendix 3 and 4)

- Baseline flora and fauna surveying and monitoring of terrestrial and marine habitats and analysis and subsequent utilisation of data.
- Terrestrial Ecological Restoration.
- Climate Change Implications on terrestrial and marine species, habitats and ecosystems.

Institutional Arrangements

Government: There are currently four sections within the St Helena Government that deal with St Helena's conservation and wider environmental issues. In the Agriculture and Natural Resources Directorate: the Environmental Conservation and Marine Sections; In the Secretariat: the Environmental Planning and Development Section; and in the Health and Social Welfare Directorate: the Environmental Health Section.

Non-Governmental Organisation: The St Helena National Trust, established in 2002, has brought together all the Non-Governmental organisations that were involved in environment and/or conservation matters under one umbrella organisation. See also Appendix 5.

Ecosystems and Habitats

St Helena's habitats can be broadly categorised into 12 categories (Appendix 6): A detailed habitat analysis was done as part of the South Atlantic Invasives Species Project and 64 types were identified. See Appendix 6.

Currently very little information is known about the marine habitats.

Half Tree Hollow © St Helena National Trust

Species

St Helena has a high level of endemicity, which defines its natural environment and is our greatest asset. The islands endemic flora consists of approximately 51 flowering plants and ferns and 25 bryophytes (mosses, liverworts and hornworts). The lichen flora is highly diverse with approximately 223 species occurring on the island, this includes nine endemic species. St Helena has an exceptional diverse invertebrate fauna with over 400 of the 1,000+ invertebrates being endemic. The most well known, the endemic giant earwig *Labidura herculeana* and ground beetle *Aplothorax burchelli* are thought to have been driven to extinction through destruction of habitat and human interference. These insects are thought to have been severely affected by introduced predators (vertebrate and invertebrate). St Helena has only one endemic land bird species. See Appendix 7 for species lists.

Summary of the 2008 IUCN red listed species for St. Helena, Ascension and Tristan da Cunha.

Critically endangered	Endangered	Vulnerable	Near Threatened	Extinct (Extinct in the wild)	Lower risk/ conservation dependent	Data Deficient
18	15	27	10	38	1	21

Threats

Invasive species: Invasive species are contributing to the loss of native biodiversity, undermining food production, limiting water supply and raising concerns for human health. They also lead to reduced access to heritage and recreational sites, with negative impacts for tourism. The ongoing control of invasives is a huge financial burden on the island. The key invasive species identified as part of the recent EU funded South Atlantic Invasive Species Project are given in Appendix 8.

Climate change: At present the extent to which St. Helena's natural environment will be affected by climate change seems uncertain. It would be beneficial for the island to assess the biological and ecological implications of climate change on native biota and ecosystems.

See Appendix 8 for more information on other key issues.

Projects

There have been a number of externally funded environmental projects carried out on St Helena over the last five years (see Appendix 9). These include the establishment of monitoring programmes for seabirds, turtles, cetaceans and grouper; endemic plant propagation and species and habitat conservation; wirebird conservation and establishing an environmental information system for St Helena.

Case Study: Enabling the people of St Helena to conserve the St Helena Wirebird

Funded by: OTEP

Dates: April 2006 – June 2007

The project undertook research to better understand the wirebird's ecology and assessed the extent of threats to this species and identified and tested solutions to address these.

Main outcomes:

- The culmination of the project works was a Species Action Plan for the Wirebird.

St. Helena Wirebird © Gavin Ellick

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Project Partners

Government: Department for Environment, Food and Rural affairs (DEFRA); Food and Environment Research Agency (FERA) Centre for Environment, Fisheries and Aquaculture Science (CEFAS); Joint Nature Conservation Committee (JNCC); Royal Botanical Gardens, Kew.

Non Government: Royal Society for the Protection of Birds (RSPB); United Kingdom Overseas Territories Conservation Forum (UKOTCF). Buglife - The Invertebrate Conservation Trust.

There are a number of cross territory working groups that St Helena is a part of: Southern Oceans Working Group (SOWG); Overseas Territories Biodiversity Group (OTBG); Overseas Territories and Crown Dependencies Training and Research Programme Steering Group.

Acknowledgements

Thank you to Dr Phil Lambdon, Herbarium, Kew and Mr Andrew Darlow, St Helena Nature Conservation Group for providing information and assistance on the flora and habitats on St Helena. And to Len Coleman, GIS Manager, for help with the GIS components of the review.

Bibliography

See Appendix 10.

Appendices

All Appendices referred to in this chapter are available at
http://jncc.defra.gov.uk/page-5753

Light Mantled Sooty Albatross with chick © Jonathan Ashburner

South Georgia and South Sandwich Islands

Between latitudes: 53’ 58’ - 54’ 53’ S and
longitudes: 35’ 47’ - 38’ 01’ W

15

South Georgia and South Sandwich Islands

Author: **Darren Christie,**
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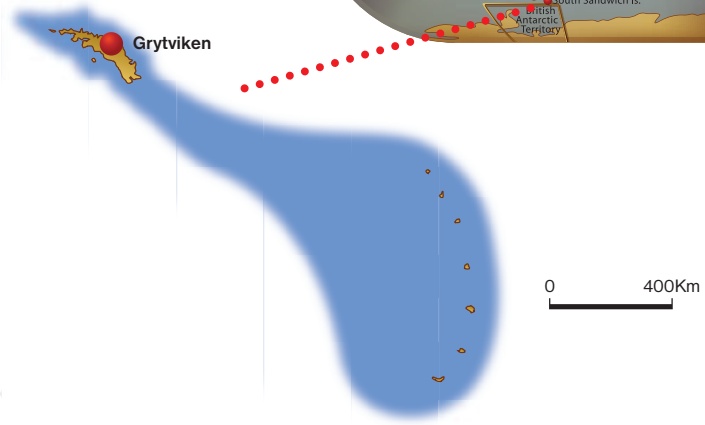
More information available at -
www.sgisland.gs www.sggis.gov.gs
www.sgpublications.gs



Basi

Location	1,390km ESE of the Falklands, below the Antarctic Convergence Latitude: 53'58'-54'53' S Longitude: 35'47'-38'01' W
Area	3,755km^2
Number of islands	Approximately 805
Population	No indigenous people or permanent residents • King Edward Point approx 11 staff in winter, with four museum staff in summer and additional visiting summer scientists. • Bird Island – approx four winter staff, up to 12 staff in summer.
Topography	Main island is 170km long, and ranges between 2-40km wide. Axis lies in a NW-SE direction. Over 50% of the island is permanent snow and ice. Central spine formed by the Allardyce and Salvesen mountain ranges. Home of the highest peak in either metropolitan UK or the UK Territories, Mt Paget (2,934m).
Main economic sectors	Fisheries: approx £3.5 million per annum, Toothfish £3m, Icefish £0.25m and Krill £0.25m. Tourism: approx 7,500 visitors per annum, revenue £750,000 Philately: approx £100k per annum

Legislative and Policy Framework

Multilateral environmental agreements

South Georgia and South Sandwich Islands have been included in the UK's ratification of 16 multilateral environmental agreements (MEA). Status of ratification of key MEAs:

Multilateral Environmental Agreement	Included in ratification?
Convention on Biological Diversity	✘
Convention on International Trade in Endangered Species	✘
Convention on Migratory Species	✔
Ramsar Convention on Wetlands	✔
World Heritage Convention	✔

South Georgia has ratified the Agreement on the Conservation of Albatrosses and petrels. For information on the implementation status of other MEAs which South Georgia has ratified, please see Appendix 1.

National environmental legislation

South Georgia has a Wildlife and Protected Areas Ordinance (www.sgisland.gs). This Ordinance is intended to provide protection for all of the Territory's native wildlife, to enable the declaration of Specially Protected Areas and Marine Protected Areas and, where appropriate, for species or habitats to be listed as Specially Protected. In addition there is a Fisheries Ordinance and a Fisheries Licensing Policy (See Appendix 2).

National environmental strategies

The South Georgia Government has a strategy for 2010-2015 that includes guidance on its direction in relation to the environment www.sgisland.gs/index.php/(g)SGSSI_Strategy_2010-2015 .

In addition, there are guidelines for the implementation of the Agreement on the conservation of Albatrosses and Petrels (ACAP) at South Georgia and the South Sandwich Islands.

South Georgia whaling station © Pippa Christie

Protected Areas

Specially Protected Areas (SPAs) have been designated on South Georgia to provide a high level of protection to areas of special conservation or scientific interest, areas which are rat-free, areas restricted due to health and safety concerns, heritage sites and sites designated for monitoring. Thirteen Specially Protected Areas have been designated (see Appendix 3 for more detail and maps). These sites will all be reviewed under the new Wildlife Protected Areas Ordinance and in light of the fact that the whole of South Georgia is intended to be rat free by 2015.

Research Priorities

- Understand the potential impacts of climate change on key exploited fisheries species (toothfish, icefish and krill).
- Conduct survey work to determine the distribution and abundance of both terrestrial and marine invasive plants and invertebrates, and the current state of glacial fronts in order to both prioritise and establish the scale of invasive species management in response to climate change.
- Ensure compliance with international treaties such as ACAP, and consider the extension of Convention on Biological Diversity (CBD) to South Georgia. Commitments to ACAP require maintaining long-term data sets. These include whole island surveys every 10 years following the 2003/4 Albatross census and the 2005/6 Petrel Surveys, and the continued annual surveys of the breeding wandering albatross populations on Albatross and Prion Islands. Additional survey work would be required if rapidly declining populations were identified.

Elephant seal in tussock grass on South Georgia © Anthony Clements

Institutional Arrangements

Government: The Environment Officer (EnvO) is responsible for all terrestrial environmental policy, including biosecurity, and reports to the Senior Executive Officer (SEO). The EnvO carries out pre-border biosecurity inspections on cargo originating or passing through the Falkland Islands. On South Georgia, the Government Officers are responsible for post border biosecurity and contingency response to new incursions, in consultation with the EnvO. The SEO is also the Director of Fisheries, and is responsible for marine and fisheries policy, with oversight of all environmental matters.

Non-Governmental Organisation: The South Georgia Heritage Trust and South Georgia Surveys.

Ecosystems and Habitats

The South Georgia shelf has been identified as the most biodiverse region of the Southern Ocean, with greater species richness than comparable northern latitudes.

Terrestrial: Five broad categories of plant communities are recognized and generally occupy habitats mostly in the coastal lowlands up to around 100m altitude (200m in sheltered areas). However, because of topographic and environmental gradients, much of the vegetation comprises a series of intermediate zones sharing floristic features of adjacent communities.

Marine: Marine communities around South Georgia display high species diversity, biomass and abundance. The exception to this is the littoral communities, which are relatively low in diversity and abundance due to ice abrasion and glacial input. See Appendix 4 for more information.

Species

There are 80 recorded bird species, 31 of which breed in South Georgia; four species of seals. Known terrestrial invertebrates include the following species numbers: nine beetle, 14 fly, 20 springtail, 41 flea and louse, six spider, 91 free-living mite and 47 parasitic mite species. There are 18 species of native flowering plant, six species of native ferns, one species of native clubmoss, ~200 species native moss, ~200 species of native lichens and numerous species of native fungi.

Approximately 100 species of fish have been recorded around South Georgia, including 13 species of Antarctic cods, 20 species of lantern fish and six species of grenadiers. The marine algal flora is extremely diverse with over 100 species recorded. At least 12 species of cetacean are regularly seen around South Georgia. There are also numerous species of sponges, tubeworms, molluscs, echinoderms and crustacean. See Appendix 5.

Summary of the 2008 IUCN red listed species for South Georgia

Critically endangered	Endangered	Vulnerable	Near Threatened	Extinct (Extinct in the wild)	Lower risk/ conservation dependent	Data Deficient
0	5	5	6	0	0	7

Darren Christie by Harker Glacier, South Georgia © Pippa Christie

Threats

See also Appendix 6.

Invasive species: Currently, the presence of marine invasive species is not known. The most detrimental introduced terrestrial species are the alien vertebrate species, rats *Rattus norvegicus*, mice *Mus musculus* and reindeer *Rangifer tarandus*. The South Georgia Heritage Trust is attempting a phased island-wide rodent eradication between 2011 and 2015, and the GSGSSI is committed to eradicating the reindeer during the same period. By 2015 South Georgia should be free of all introduced vertebrate species. Of the introduced plants, it is possible that 20 species are eradicable with timely intervention. At present an eradication programme is underway for four species at Grytviken, with numerous other species being controlled until resources become available for eradication.

Climate change: Mainland South Georgia is effectively subdivided into numerous smaller "mainland islands" by glaciers, which act as natural barriers to the spread of seeds, animals and disease, both alien and native. At present, glaciers protect a safe haven along the south coast, free of the worst invasive species as described below. Glaciers are retreating at an increasing rate. Current studies estimate that 97% of South Georgia's marine glaciers have retreated in the past 50 years.

Projects

There have been a number of terrestrial and marine projects in South Georgia over the last five years including rat eradication feasibility, biosecurity, benthic survey and fish surveys. In addition the British Antarctic Survey carries out ongoing BAS ecosystem science base on Bird Island, with monitoring of seals, penguins and albatross.

Case Study: South Georgia Biosecurity Facility

Funded by: OTEP, SAISP, GSGSSI

Dates: November 2008-March 2009

Following the introduction of a suite of biosecurity measures, it was felt that a dedicated facility was necessary. In the absence of any off-the-shelf plans for such a building, GSGSSI designed a bespoke facility.

Main outcomes:

- Bespoke biosecurity facility created on island.
- Provides dedicated space for post-border biosecurity checks.
- Acts to contain any imported alien species whilst providing storage of materials for the immediate destruction of those species.
- Provides a dedicated area for inspecting, cleaning and storing field and scientific equipment, and imported cargo up to a pallet in size.
- Provides an external wash area for plant machinery.

Biosecurity facility © Darren Christie

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Environmental NGO's

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South Georgia Heritage Trust.

Project Partners

Kew Gardens (www.kew.org); Royal Society for the Protection of Birds (www.rspb.org.uk); Joint Nature Conservation Committee (www.jncc.gov.uk); International Association of Antarctic Tour Operators (www.iaato.org); Buglife International (www.buglife.org.uk); British Antarctic Survey (www.bas.ac.uk).
See also Appendix 7.

Acknowledgements

GSGSSI wishes to thank its project partners and those individuals and organisations who work to preserve the environment of South Georgia and the South Sandwich Islands, and whose dedication serves to further the knowledge of their species and habitats.

Bibliography

See also Appendix 8.

McIntosh, E. & Walton, D.W.H. 2000
Environmental Management Plan for South Georgia. Published by British Antarctic Survey on behalf of the Government of South Georgia and the South Sandwich Islands.

Pasteur, L. and Walton, D.W. 2006.
South Georgia, Plan for Progress – Managing the Environment 2006-2010. Cambridge, UK. Published by British Antarctic Survey on behalf of the Government of South Georgia and the South Sandwich Islands.

Appendices

All Appendices referred to in this chapter are available at
http://jncc.defra.gov.uk/page-5754

Rock Hopper penguins © Trevor Glass

Tristan da Cunha (STH)

37° 15’ S, 12° 30’ W

16

Tristan da Cunha (STH)

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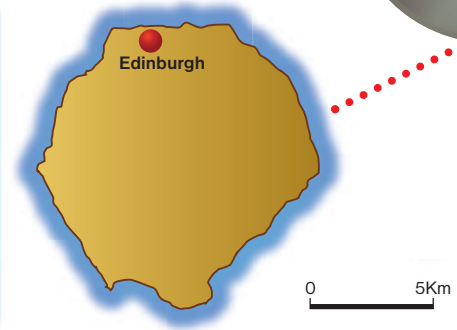
More information available at - **www.tristandc.com**



Basic facts and Figures

Note: Tristan da Cunha forms part a single UK Overseas Territory with St Helena and Ascension, the Governor of which resides in St Helena.

Location	The Tristan da Cunha archipelago is a group of mountainous volcanic islands in the central South Atlantic Ocean. The main island Tristan lies approximately 2,800km from Cape Town at 37° 15' S and 12° 30' W.
Area	Tristan: 96km^2 roughly circular, 12km across; Nightingale: 4km^2 including two large islets, Stoltenhoff and Alex (or Middle); Inaccessible: 14km^2, rhomboidal 5 by 4km; Gough: 65km^2, 13km long and 5km across, with numerous sea-stacks.
Number of islands	Four main islands (Tristan, Nightingale, Inaccessible and Gough) and several smaller islands or islets including Alex/Middle and Stoltenhoff.
Population	c. 280 people
Topography	The Tristan group of islands are the summits of massive shield volcanoes rising up from depths over 3,000m deep. Tristan, an active volcano most recently erupting in 1961, has steep-sided gulleys radiating from the central peak (2,060m) and steep cliffs caused by marine erosion rising to a plateau.
Main economic sectors	Tristan's economy is almost totally dependent upon revenue from a commercial fishery from Tristan rock lobster *Jasus tristani*.

Legislative and Policy Framework

Multilateral environmental agreements

Tristan has been included in the UK's ratification of 16 MEAs. Status of the ratification of key MEAs:

Multilateral Environmental Agreement	Included in ratification?
Convention on Biological Diversity	✔
Convention on International Trade in Endangered Species	✔
Convention on Migratory Species	✔
Ramsar Convention on Wetlands	✔
World Heritage Convention	✔

Tristian da Cunha has ratified the Agreement on the Conservation of Albatrosses and Petrels.

National environmental legislation

Tristan has three Ordinances – the Conservation Ordinance, Fisheries Limits Ordinance, and Agricultural Ordinance that deal with environmental management, biodiversity conservation and protected areas. See Appendix 1 for further information.

National environmental strategies

Tristan has four important strategies concerned with environment and biodiversity conservation (see Appendix 1), including a Biodiversity Action Plan.

Protected Areas

Gough and Inaccessible Islands are a World Heritage Site. These two islands and all breeding colonies of the Northern Rockhopper Penguin *Eudyptes moseleyi* on the Main Island, Tristan, have been declared Nature Reserves under the Conservation Ordinance 2006. 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. See also Appendix 2

Research Priorities

- Monitor changes in native and invasive plant distribution, abundance and ecology due to the effects of grazing pressure and climate change across the main island of Tristan.
- Collect baseline information on invertebrate taxonomy, populations and ecology and impacts of introduced species and habitat change on invertebrate populations.
- Compile information on demography, population trends, at-sea ecology and feeding locations of key marine populations. In addition, fisheries based research is needed to understand the economics sustainability and bycatch rates of relevant fisheries.

Institutional Arrangements

Government: The Conservation Department is responsible for terrestrial and marine conservation, national protected areas and invasive alien species control etc. The Fisheries Department is responsible for providing the information necessary to manage the fisheries. The Tristan fishery is controlled by a fishery quota as well as by the amount of time boats are allowed to spend in the water on fishing days. Agriculture and stocking levels are managed by the Agriculture Department. See Appendix 3 for further information.

Ecosystems and Habitats

Terrestrial: Main habitats are: Tussock grassland; Fern bush – Phylica woodland *Phylica arborea* and Bog fern heath *Blechnum palmiforme*; Wet heath; Feldmark and Alpine; Bogs – Scirpus bog and Sphagnum bog. Inaccessible and Nightingale islands are almost pristine. The absence of human inhabitants means that there have been no human impacts on the vegetation, no introduced vertebrates, and relatively few impacts by invasive plants.

Marine: Despite low overall diversity, many marine species are endemic to the islands. Intertidal zone is small because of the small tidal range, steep shores and exposed coastline. Subtidal zone is characterised by forests of kelp and other seaweeds. Much less is known about the communities of the open ocean.

Species

The islands are well known for their birdlife. Seven species of breeding land-birds are all endemic, and there are millions of breeding seabirds. Four species of seabird are endemic, and the Tristan da Cunha group is internationally important for their breeding populations of some 18 other species.

At least 212 plant taxa have been recorded, including 35 native ferns and 58 native flowering plants. Of these, 20 fern and 34 flowering plant taxa are considered endemic. Lower plants are still poorly known and recorded. An invertebrate fauna includes weevils and snails of particular interest, but with a relatively low number of native species.

The only native breeding mammals are seals, Sub-Antarctic fur seal and Southern elephant seal, which have been exploited in the past. Five whales - Southern right whale, sperm whale, Humpback whale, Long-finned pilot whale and Shepherd's beaked whale occur relatively frequently. Various species of dolphin, including Dusky dolphin, are common.

See also Appendix 4.

Threats

Invasive species: Invasive species have had a major impact on biodiversity. Rats and mice have been responsible for the disappearance of a large proportion of the indigenous bird life.

Climate change: Long-line 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 Exclusive Economic Zone (EEZ) may also contribute significant mortality.

Projects

In addition to its core work in environment, the Tristan da Cunha Conservation Department has undertaken a number of externally funded environmental projects over the last five years. These include the clearance of invasive Logan Berry plants at Sandy Point, development of the Tristan Biodiversity Action Plan, implementation of marine surveys, and invasive species control and survey work.

Edinburgh, Tristan da Cunha © Anton Wolfaardt

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Project Partners
Tristan works closely with RSPB, JNCC, RBG Kew in the UK and University of Cape Town in South Africa.

Bibliography

Cooper, J. & Ryan, P. G. 1995.
Conservation status of Gough Island. Pp 71-84, in: P.R.Dingwall, ed.
Progress in the Conservation of the Subantarctic Islands. Gland and Cambridge, UK: International Union for Conservation of Nature.

Ryan, P.G. (ed.). 2007.
Field Guide to the Animals and Plants of Tristan da Cunha and Gough Island.
Newbury, UK: Pisces Publications.

Tristan Island Government in partnership with RSPB and The University of Cape Town. 2006.
Tristan Biodiversity Action Plan 2006-2010. Tristan Island Government.

Appendices

All Appendices referred to in this chapter are available at
http://jncc.defra.gov.uk/page-5757

Chalk Sound National Park, Providenciales © Eric Salamanca

Turks and Caicos Islands

21° 45’ N, 71° 31’ W

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Turks and Caicos

Author:
Department of Environment and Coastal Resources, Turks and Caicos Islands Government

More information available at -
www.environment.tc

Basic facts and Figures

Location	The Turks and Caicos Islands are an archipelago located in the Atlantic Ocean that lie between 21° 45' N and 71° 31' W, approximately 920 kilometres southeast of Miami, Florida.
Area	Approximately 430km^2. The islands can be divided into two distinct groups: The Caicos Islands and the Turks Islands which are separated by a deep water channel called the Columbus Passage which is approximately 35 kilometres wide.
Number of islands	Nine inhabited islands and 40 uninhabited cays. Providenciales, North Caicos, South Caicos, Middle Caicos, Pine Cay, Parrot Cay, Big Ambergris Cay, Grand Turk and Salt Cay are inhabited.
Population	22,352 inhabitants (2008).
Topography	Turks and Caicos Islands are relatively flat. Providenciales island rises to a high point of 50m above sea level while Flamingo Hill on the north western point of East Caicos has an altitude of about 49.68m. Sinkholes, caves and ridge formations are common. The islands consist largely of Pleistocene oolitic limestones and unconsolidated Holocene sands.
Main economic sectors	Tourism is the main economic activity. The offshore financial sector is also significant. Fishing for export to the US (mainly lobster and conch) is the third most important economic sector.

Legislative and Policy Framework

Multilateral environmental agreements

Turks and Caicos Islands have been included in the UK's ratification of 16 MEAs. Status of the ratification of key MEAs:

Multilateral Environmental Agreement	Included in ratification?
Convention on Biological Diversity	✘
Convention on International Trade in Endangered Species	✘
Convention on Migratory Species	✔
Ramsar Convention on Wetlands	✔
World Heritage Convention	✔

National environmental legislation

There are approximately 15 ordinances relevant to environmental management, and biodiversity and habitat conservation. See Appendix 1 for a list of legislation.

National environmental strategies

Turks and Caicos Islands Government (TCIG) signed its Environment Charter with the UK in 2001. In 2003 the TCIG approved the Strategy for Action to Implement the Environment Charter. There are additional national strategies related to environmental and biodiversity conservation.

Protected Areas

There are 35 protected areas on Turks and Caicos - 11 national parks, 11 nature reserves, four designated sanctuaries and nine areas of historic interest. These protected areas are managed by the Department of Environment and Coastal Resources (DECR). The Turks and Caicos National Trust currently manages three protected areas. See Appendix 2 for a brief description of each of the protected areas.

Research Priorities

- Marine and coastal ecosystem mapping and vulnerability assessment, including considerations for climate change to assess temporal and spatial variations.
- Management of protected areas: Development of management plans for all protected areas and wetlands; capacity building to improve management skills; public awareness.
- Protection and conservation of flora and fauna, specifically endemic and endangered species, fisheries, invasive species, birds and other wildlife.

Mangrove, East Caicos © David Stroud

Institutional Arrangements

Government: DECR is mandated to ensure sustainable utilization of the natural resources of the TCI, through biodiversity conservation, managing protected areas and maintaining economic prosperity through sustainable development approaches.

Non-Governmental Organisation: The Turks and Caicos National Trust (TCNT) is mandated to safeguard the cultural, historical and natural heritage of TCI through the preservation of areas, sites, buildings, structures and objects of cultural, historical or natural significance. The Turks and Caicos Reef Fund (TCRF) aims to dedicate more than 85% of all funds raised to marine conservation projects in TCI. The National Museum focuses on the islands culture and history.

Ecosystems and Habitats

Terrestrial: There are 40 terrestrial habitats described for Turks and Caicos (see Appendix 3). The vegetation of TCI consists of dry forests and mangroves. The archipelago has 26,700ha, of wetlands and 38,000ha of inter-tidal sand banks and mudflats (Sanders 2006). The wetlands also include periodically flooded mangroves, but also different types of swamp and complex estuaries, which merge with underwater sands.

Marine: The archipelago has the least damaged coral reef in the entire Caribbean region. Its surface area is estimated at some 1,200km². The north coasts of the four largest islands are fringed by a single reef. Most of the reefs are healthy with a large diversity of corals (30+ species) (Petit and Prudent 2008).

Species

The bird life of the archipelago includes 204 species, 58 of which are nesting birds (Sanders 2006). The territory is home to an important number of migratory and nesting birds, many of which are endemic. The Turks and Caicos has one of the largest populations of Rock Iguana in the Caribbean *Cyclura carinata carinata* - 30,000 adults. See Appendix 4 for endemic, near-endemic and selected native species lists.

School children © Brian Riggs

Summary of the 2008 IUCN red listed species for the Turks and Caicos Islands.

Critically endangered	Endangered	Vulnerable	Near Threatened	Extinct (Extinct in the wild)	Lower risk/ conservation dependent	Data Deficient
6	10	18	17	0	3	12

Threats

Invasive species: In TCI's marine ecosystems, the invasive lionfish *Pterois volitans* has affected both the fisheries industry and tourism. On land, the invasive pine tortoise scale insect has significantly damaged the population of the TCI national tree, Caicos Pine *Pinus caribaea var. bahamensis*. The Cowbush *Leucaena leucocephala* and Australian Pine *Casuarina equisetifolia* and Feral domestic mammals are also significant pests that threaten endemic species. See Appendix 5 for invasive species lists.

Climate change: The large mangrove areas and sand banks are particularly at risk from rising sea levels and prone to flooding. These areas are important nesting grounds for migratory birds and nurseries for economically important fisheries. In the marine environment, coral bleaching has been observed (Petit and Prudent 2008).

The Built environment is another major threat.

Projects

Over the last five years, the DECR has undertaken a number of externally funded projects to recover/restore habitat and important native and endemic species; map the islands' habitat; control invasive species and monitor specific species. See Appendix 6 for more details.

Case Study: Turks and Caicos Islands Invasive Lionfish Control Program

Funded by: United Kingdom's Joint Nature Conservation Committee (JNCC)

Dates: 2010 – April 2011

Project partners are: JNCC, TCI Government: DECR

The Lionfish *Pterois volitans* is native to the tropical waters of the Red Sea, South Pacific and Indian Oceans but has now invaded waters off the east coast of the United States and much of the Caribbean. In 2009, three Caribbean countries (Cayman Islands, Virgin Islands and Turks and Caicos) requested financial assistance towards monitoring, control and raising awareness of the growing threat posed by the invasive Lionfish in Caribbean waters.

Lionfish © David Stone

In order to protect the marine waters of the Turks and Caicos Islands, this project has encouraged individuals in the community to get involved in the monitoring and control of the lionfish. Individuals have been asked to report any sightings. In addition, tournaments for the capture of the fish have been promoted and the products used in various dishes to encourage the consumption of the species. A Turks and Caicos Islands lionfish recipe book was published in 2011.

Contacts

See also Appendix 7

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Project Partners
DECR works with a number of organisations and researchers including the Joint Nature Conservation Committee (JNCC); Marine Conservation Society (MCS); Royal Botanic Gardens (RBG Kew) Kew; San Diego Zoo Conservation and Research of Endangered Species; Society for the Conservation and Study of Caribbean Birds (SCSCB); Turks and Caicos National Trust (TCNT); Wildfowl and Wetland Trust (WWT)

Bibliography

Carleton, C. & Hambrey, J. 2006.
Review and Re-Assessment of the TCI Protected Area System. Nautilus Consultants.

Correll, D.S. & Correll, H.B. 1982.
Flora of the Bahamas Archipelago. Gantner.

McNary-Wood, K. 2003.
Flowers of the Bahamas and Turks & Caicos. MacMillan Caribbean.

Petit, J. & Prudent, G. 2008.
Climate Change and Biodiversity in the European Union Overseas Entities. IUCN, Brussels. 196 pp.

Pienkowski, M. (ed.) 2001.
Plan for Biodiversity Management and Sustainable Development around Turks & Caicos Ramsar Site. Turks & Caicos National Trust and UKOTCF.

Reefcheck – available online: www.reefcheck.org

Sanders, S. 2006.
Important bird areas in the United Kingdom Overseas Territories. Priority sites for Conservation. Sandy, UK: RSPB.

Appendices

All Appendices referred to in this chapter are available at
http://jncc.defra.gov.uk/page-5758

JNCC
Joint Nature Conservation Committee

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