Research and Monitoring Plan

SGSSI Terrestrial Protected Areas

Photo: Paul Carroll

Introduction

King Penguins and the FPV Pharos SG by Steve Brown

South Georgia Pipit by Jennifer Black

The terrestrial ecosystems of South Georgia and the South Sandwich Islands are a globally important wilderness and wildlife area. The two groups of sub-Antarctic islands are situated in the Southern Ocean and are well known as a hot spot for breeding seabirds and marine mammals. The islands also have distinctive terrestrial communities structured by the physical characteristics of the two island groups, and the levels and duration of human activity. South Georgia and its outlying islands are mountainous and glaciated, and the South Sandwich Islands are an active volcanic arc of islands approximately 300 km to the south-east. Both groups of islands are uninhabited; however, South Georgia has two permanently staffed research stations and sees many more visitors landing each year from visiting cruise, expedition and research vessels. Both islands were subject to historic whaling and sealing activities that, alongside depleting populations of marine mammals, also led to the introduction of many terrestrial non-native species on South Georgia and a number of now abandoned whaling stations.

Only 3% of South Georgia is fully vegetated, and many of the South Sandwich Islands have over 90% permanent ice cover, yet together the islands are thought to host over 200 invertebrate species, over 25 species of native flowering plants and over 250 species of mosses, liverworts, fungi and lichens. Understanding is currently limited on the distribution and natural variability of native terrestrial species and habitats across both sets of islands and research in recent decades has tended to focus on the marine environment. Furthermore, the terrestrial ecosystems are exposed to a number of current human pressures, including the impacts of climate change, local human activities and the incursion of further terrestrial non-native species, such as plants and invertebrates.

After a programme of work to identify options to strengthen terrestrial protection for South Georgia and the South Sandwich Islands, the entire landmass of South Georgia and its outlying islands, and the South Sandwich Islands were designated as Specially Protected Areas under The Wildlife and Protected Areas (Specially Protected Areas) Order 2022. Designating these Terrestrial Protected Areas (TPAs) and delivering a management plan was the first phase in the Government of South Georgia and the South Sandwich Islands Pathway to Protection. Within the Management Plan for 2023-2029, the development of a Research and Monitoring Plan was identified as a Management Aim. The second phase of the Pathway to Protection is to assess and monitor the TPAs, thereby informing the refinement of management and regulation in the future. This Research and Monitoring Plan aims to assist in the Pathway to Protection by identifying research that will provide knowledge that enables management and regulation to be refined and focused under the second phase of the Pathway to Protection.

Related documents

There are a number of high-level strategies and plans that provide a wider context to the TPA research and monitoring plan. These are available on the Government website.

- Protect, Sustain, Inspire 2021-2025
- Delivering PSI
- Terrestrial Protected Areas: A Pathway to Protection
- Terrestrial Protected Area Management Plan 2023-2029
- SGSSI Marine Protected Area Research and Monitoring Plan

Conservation Objectives and Management Aims of the TPAs

The Terrestrial Protected Areas have two overarching Conservation Objectives: (i) the conservation, protection and preservation of the ecosystem and restoration of biodiversity, and (ii) that activities carried out in the TPA are managed sustainably with minimal impacts on the ecosystem. These overarching objectives include five detailed Conservation Objectives, which are further supported by Management Aims for 2023 – 2029. For ease of reference, the Objectives and Aims are numbered below. This Research and Monitoring Plan is mapped against these Objectives and Aims to ensure that research and monitoring activities within the TPAs support their achievement, and can be used to assess whether the objectives are being achieved.

Conservation Objective	Management Aim (MA)
Conservation, Protection and Preservation of Biodiversity and Restoration of Biodiversity	1a. Ecosystems are protected from present-day and future pressures and recovering from historic human-exploitation 1b. Acknowledging the profound impacts on biodiversity, measures are in place to contribute to global efforts to halt climate change 1c. Increased awareness of conservation success stories and promotion of SG & SSIs unique biological assemblages
Management, Monitoring and Control of Invasive Species*	2a. Measures are in place to manage and if practicable, prevent, the establishment of new non-native species and to reduce the number of non-native species already established 2b. An awareness of the risks of invasive species is at the forefront of all activities
Environmentally Responsible Science	3a. Research activities and methods have minimal impact on the environment 3b. Research which contributes to conservation, protection, preservation and restoration of biodiversity on SG and SSI is supported and encouraged 3c. Encourage collaboration between researchers and the sharing of data and logistic support, including free access to the public
Promoting Wilderness and Wildlife	4a. SG and SSI are internationally revered as a wild space where natural forces dominate 4b. High quality, media outreach projects which promote SGSSI wildlife and its conservation are encouraged 4c. Human activities are undertaken sympathetically and strive to leave no permanent mark on the landscape
Facilitating Sustainable Visits (South Georgia TPA only)	5a. South Georgia is a global role model for responsible tourism, where stakeholders and Government work in partnership 5b. Visitors are actively engaged in the conservation of the island 5c. Systems are in place to recognise and mitigate possible impacts from visits before the environment is harmed

*In the absence of established invasive species, for the SSI TPA this objective is restricted to pre-border management of risk

Structure

The Plan is organised into three overarching themes:

- **Baseline biodiversity, environmental variability and wilderness value**
- **Impact and management of anthropogenic pressures**
- **Management of research**

The first two themes reflect the paucity of data on species distributions and natural variability, and the need for evidence that will inform management to reduce the impacts of local and global pressures on the unique wilderness of SGSSI. Each of these themes is split into sub-themes to help further focus research and monitoring. The third theme collates needs and gaps around data management, methodology development and funding.


Gentoo penguin by Tom Hubbard

Under each theme, current and planned data collection activities that contribute to the Conservation Objectives are listed. Some of these activities may also be captured in the the SGSSI Marine Protected Area Research and Monitoring Plan. This plan only includes overlapping research that focuses on the relationship between terrestrial ecosystems and marine species. Current data collection activities include projects targeting specific research questions, ongoing long term active monitoring, and passive monitoring where data are collected and available, but not necessarily analysed specifically for SGSSI (e.g., satellite imagery). The Plan also identifies monitoring and research needs under each theme, focused on informing the Management Aims. These needs are not exhaustive, but have been identified as areas where further data are required for effective management. Throughout, this plan maps activities to the relevant Conservation Objectives and Management Aims in the 2023-2029 TPAs Management Plan. The Research and Monitoring Plan itself also contributes to the Management Aim of 'encouraging and supporting research that contributes to conservation, protection, preservation and restoration of biodiversity on SG and SSI'. Where possible, activities have also been refined to apply to specific areas within the TPAs.


INNS Survey by Simon Browning


South Georgia Pintail by Tom Hubbard

Prioritisation

To aid prioritisation of new activities, monitoring and research needs within this plan are classified as 'Core' or 'Contributing'. Core activities meet one of the following criteria:

1. **One or more Management Aim is substantially dependent on this monitoring or research**
2. **Critical to enable assessment of whether a Management Aim is achieved**
3. **Listed as a Supporting Activity in the Management Plan**

A short justification is provided for core activities.

Baseline biodiversity, environmental variability and wilderness value

Sub-theme Distribution and variability of species and habitats			
Current data collection activities	**Area**	**Status**	**MA***
Records of native plant species collected *ad hoc* whilst conducting non-native species management activities	Class 1 and Class 2 species sites.	Ongoing	1a, 2b
Citizen science species records on platforms including iNaturalist and eBird	Visitor and research sites	Ongoing	1c, 5c
Assessing long term changes in burrowing petrel distribution and density (Seabirds from Space)**	All South Georgia	Ongoing	1a, 3b
Archipelago wide satellite survey of wandering albatross, mollymawks and shag breeding colonies (Seabirds from Space)**	All South Georgia	Ongoing	1a, 3b
Annual marine predator monitoring programme under the South Georgia Science Plan 2024-2029**	Sites around King Edward Point Research Station (KEP) and Prion Island	Ongoing	1a, 1c, 3b
Annual marine predator monitoring programme by the BAS Ecosystems Programme**	Bird Island	Ongoing	1a, 1c, 3b
Snowy sheathbill monitoring to estimate population, biology and phenology	Bird Island	Ongoing	1a
South Georgia pipit acoustic monitoring and transects	KEP	Ongoing	1a

*Management Aim
**These items overlap with the MPA Research and Monitoring Plan theme 'Higher Predators – ecology and demography'

Baseline biodiversity, environmental variability and wilderness value

Sub-theme Distribution and variability of species and habitats			
Monitoring needs	**Area**	**Priority**	**MA**
Develop strategic baseline biodiversity surveys that can be repeated at appropriate timescales, focused on previously exploited species, species that may have been recently impacted by pressures, and species where there is little historic baseline data at strategic sites	Strategic sites in SG & SSI	Core: Provides essential data to assess change	1a, 1c
Develop and disseminate standard protocols for opportunistic baseline surveys of terrestrial biodiversity and ecology to support long term monitoring of biodiversity and ground truth remote sensing studies	Opportunistic sites in SG & SSI	Contributing	1a, 1c
Further develop citizen science to engage visitors with data collection and provide baseline biodiversity data, including the recruitment of volunteer expert reviewers to ensure robustness	Visitor sites	Contributing	1c, 5b
Create fine scale habitat maps for all areas of SGSSI	SG & SSI	Contributing	1a, 1c
Research needs			
Understand recovery of native ecosystems after eradication of non-native vertebrates	Eradication sites	Contributing	1a, 1c, 3b
Understand impact of changing fur seal and penguin populations on terrestrial habitats	SG & SSI	Contributing	1a, 1c
Develop metrics for assessing habitat condition	SG & SSI	Contributing	1a, 1c

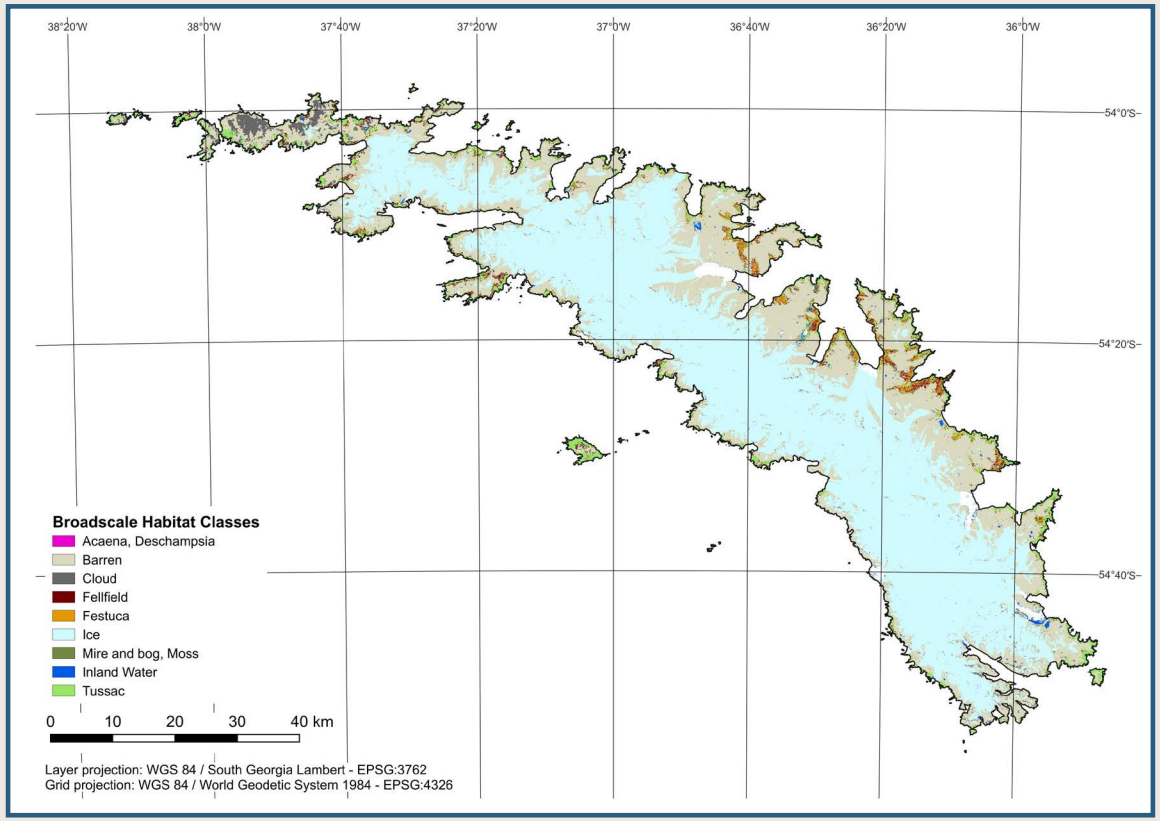
Baseline biodiversity, environmental variability and wilderness value

Sub-theme
Distribution and variability of species and habitats

Relevant projects, plans and strategies

- British Antarctic Survey (BAS) Seabirds from Space Project 2024 - 2026
- King Edward Point Science Plan 2024-2029 (BAS, GSGSSI)
- BAS Ecosystems Programme at Bird Island
- DPLUS065 – Broadscale habitat map for South Georgia
- DPL00019 – Mapping South Georgia's Plant Biodiversity
- Developing a new baseline for wildlife populations of South Georgia – BAS and South Georgia Heritage Trust


Giant petrel & chick photo by Rhiannon Nichol



Baseline biodiversity, environmental variability and wilderness value

Sub-theme Variability in the physical environment			
Current data collection activities	**Area**	**Status**	**MA**
Volcanic activity monitoring through the MODIS Thermal Alert System (MODVOLC)	SSI	Weekly	3a, 3c
Seismic activity monitoring	SG	Continuous	3a, 3c
Collection of satellite imagery through global and regional initiatives	SG & SSI	Continuous	3a, 3c
Automatic data collection of temperature, pressure, humidity, wind speed and direction, solar radiation and precipitation (KEP only)	KEP & Bird Island	Continuous	1a, 3a, 3c
Magnetic Observatory monitoring global magnetic field and the South Atlantic Anomaly	KEP	Continuous	3c
Monitoring needs	**Area**	**Priority**	**MA**
Install automatic environmental monitoring stations that monitor microclimatic variation and analysis of data	All	Core: provides essential data to assess local climate change impacts	3a
Research needs			
Model glacial retreat based on climate change scenarios.	All	Contributing	3a
Understand hydrology including freshwater availability and flow rates	Coastal areas	Core: provides essential baseline data to assess change	3c
Relevant projects, plans and strategies			
DPL00039 – Assessing Terrestrial Climate Change Impacts on a sub-Antarctic archipelago			

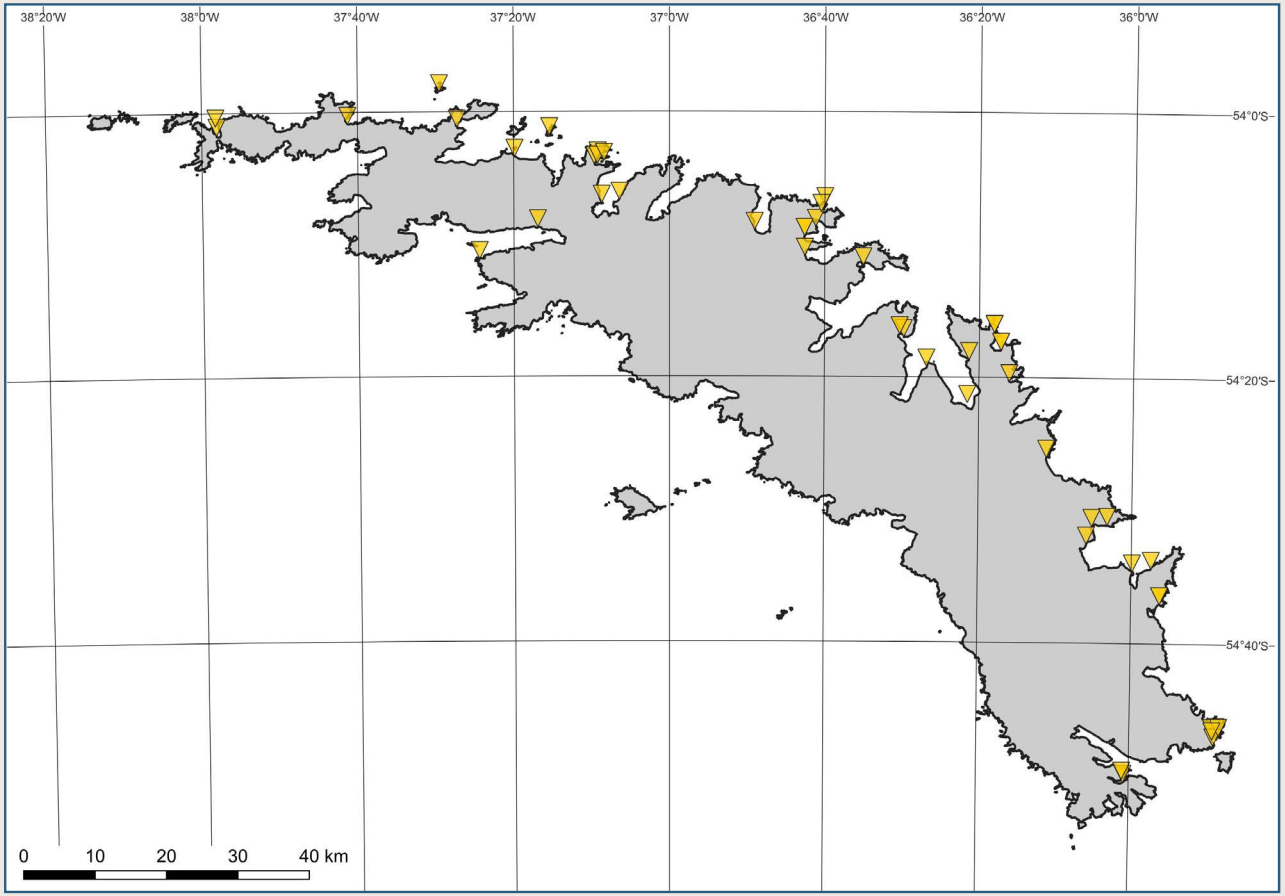
Baseline biodiversity, environmental variability and wilderness value

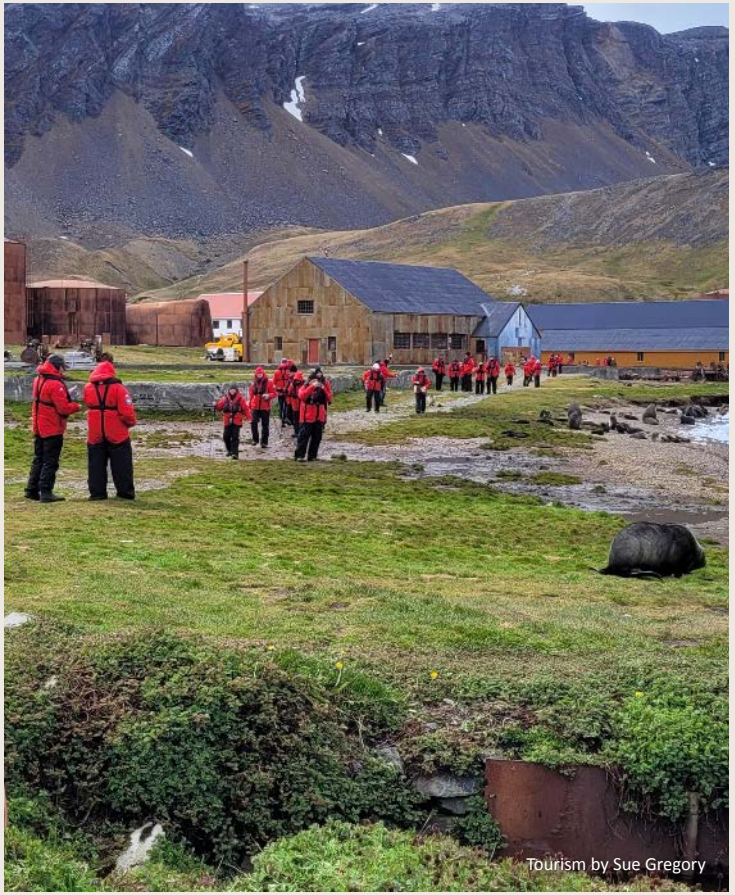
Sub-theme Wilderness value			
Current data collection activities	**Area**	**Status**	**MA**
Records of number of media projects conducted in the territory submitted through the Regulated Activity Permits system	All areas	Ongoing	1c, 4a, 4b
Monitoring needs	**Area**	**Priority**	**MA**
Review post visit reporting and permitting data collection to synthesise data on human footprint on SGSSI and contribute to understanding of wilderness*	All areas	Core: essential data on human activities	1c, 4a, 4b
Collect data on the target audience and reach of media projects	All	Core: essential to assess two management aims & is a Supporting Activity	1c, 4a, 4b
Research needs			
Evaluate the effectiveness of citizen science as a method to inspire regional ambassadors	Visitor sites	Contributing	1a, 1c, 5b
Capture and quantify impressions of SGSSI wilderness, considering all aspects of wilderness including visual and audible, from visitor sites to sites with minimal human footprint	All areas	Core: Supporting Activity	1c, 4a
Relevant project, plans and strategies			
Media Visits - Government of South Georgia & the South Sandwich Islands. https://gov.gs/mediavisits/			

*Overlap with MPA Research and Monitoring Plan theme 'Other human impacts'

Baseline biodiversity, environmental variability and wilderness value

Visitor sites around South Georgia




Tourism by Sue Gregory

Impact and management of anthropogenic pressures

Sub-theme Climate change			
Current data collection activities	**Area**	**Status**	**MA**
Collection of satellite imagery through global and regional initiatives	SG & SSI	Not actively analysed	1a, 3a
Carbon footprint of BAS operations	SG	Not actively analysed for SG	1b
Monitoring needs	**Area**	**Priority**	**MA**
Analyse remote sensing data to monitor environmental change, including deglaciation and hydrological changes	All	Contributing	1a, 3a
Collect data on the carbon footprint of all shipping and on-island operations (tourism, military, fishing, etc.)	All	Contributing	1b

Non-native plant management activities by Kelvin Floyd.

Grytviken by Kelvin Floyd

*Overlap with MPA Research and Monitoring Plan theme "Climate Change"

Impact and management of anthropogenic pressures

Sub-theme Climate change			
Research needs	**Area**	**Priority**	**MA**
Conduct ecophysiological studies of native species to understand responses to climate change	All	Contributing	1a
Understand impacts of deglaciation on population connectivity and genetic homogenisation of native species	SG & SSI	Contributing	1a
Understand impact of climate change on use of terrestrial ecosystem by marine predator populations, e.g., glacial retreat areas*	SG & SSI	Contributing	1a
Assess biodiversity of geothermally heated and unheated ground to understand species susceptibility to climate change	SSI	Contributing	1a
Track and model vertical and horizontal migration and phenology changes of plant and invertebrate species with climate change	SG & SSI	Contributing	1a
Model the potential formation of peatland carbon sinks with increased warming and changes in water availability	SG	Contributing	1a, 1b
Relevant projects, plans and strategies			
DPL00039 – SGSSI Terrestrial Climate Change Impacts Assessment			
DPLUS144 - Protecting South Georgia's terrestrial communities from climate change-invasion synergies			
SCAR ANTOS group			

*Overlap with MPA Research and Monitoring Plan theme 'Other human impacts'

Impact and management of anthropogenic pressures

Sub-theme Non-native species			
Current data collection activities	**Area**	**Status**	**MA**
Non-native plant presence and distribution monitoring during management activities	Management areas for non-native plants	Ongoing	2
Ad hoc records of new incursions or expansion of existing non-native species	Visitor sites / historic whaling sites	Ongoing	2
Propagule pressure data from BAS and GSGSSI biosecurity activities, including cargo searches and visitor biosecurity audits	Research stations	Ongoing	2, 4c, 3a
BAS Incident Reporting for biosecurity incidents at KEP and Bird Island research stations (MAXIMO)	Research stations	Ongoing	2, 4c, 3a
Surveillance of rodents using monitoring stations	Research stations and limited visitor sites	Ongoing	2, 4c, 3a
Surveillance of invertebrates using monitoring stations	Research stations	Ongoing	2, 4c, 3a
Ad hoc monitoring of vegetation recovery plots established after reindeer eradication and post non-native plant control activities	Sites around Cumberland Bay	*Ad hoc*	1a, 1c, 2b

Impact and management of anthropogenic pressures

Sub-theme Non-native species			
Monitoring needs	**Area**	**Priority**	**MA**
Establish systematic non-native plant and invertebrate monitoring, targeting potentially high impact species and newly opened or highly connected areas	SG	Core: essential data to underpin management aims	1a, 2
Ensure data on biosecurity are regularly reviewed to assess effectiveness of biosecurity activities (see Research management needs)	SG & SSI	Core: Supporting Activity	2, 3a, 4c, 5c
Research needs			
Understand non-native plant species modification of native biodiversity and ecosystem functioning to inform prioritisation of management	SG	Contributing	1a, 2
Assess invasion potential through determining survival rates for horizon scanned non-native species in different transit and climate change scenarios	SG & SSI	Contributing	1a, 2
Identify and determine the likely origin of non-native plant species with a DNA reference library for native and non-native plants, focused on species which are suspected to be non-native, e.g., *Gaultheria pumila*	SG	Contributing	1a, 2
Improve site specific habitat information for non-native plants, including associated invertebrate communities and seedbank assessments	SG	Contributing	1a, 2
Undertake fine scale mapping of the distribution of non-native plants within visitor and non-visitor sites to inform control and understand potential for secondary spread	SG	Contributing	1a, 2
Trial new technologies and products to allow mapping and control of non-native plants in areas that would not currently be feasible for control attempts	SG	Contributing	2
Investigate effective species-specific herbicide use, including concentrations and wider impacts	SG	Contributing	2

Impact and management of anthropogenic pressures

Sub-theme Non-native species
Relevant projects, plans and strategies
DPLUS00175 – Enhancing monitoring and prevention of invasive non-native species across UK Overseas Territories
DPL00099 – An innovative method to trap invasive ladybirds on South Georgia
South Georgia Non-Native Plant Management Strategy (GSGSSI 2022)
BAS Biosecurity Regulations & GSGSSI Biosecurity Handbook

Biosecurity GSGSSI

Non-native plant management by Kelvin Floyd

Impact and management of anthropogenic pressures

Sub-theme Physical/behavioural disturbance and habitat destruction			
Current data collection activities	**Area**	**Status**	**MA**
Recording of the number of land-based visitors and sites visited	Visitor sites	Ongoing	5c
Monitoring of spatial location and population size of marine predator colonies*	Visitor sites	Ongoing	1a
Expedition Reports from 2006 to present of numbers of persons at landing and recovery locations and record of intervening routes	SG & SSI	Ongoing	5c
Reporting of bird strike incidents at research stations**	KEP & Bird Island	Ongoing	1a, 5c
Monitoring needs	**Area**	**Priority**	**MA**
Undertake detailed tracking of visitor behaviour at sites, including number of person hours and connectivity between sites	SG & SSI	Core: essential data to assess impact	5a, 5c, 4c
Research needs			
Determine sensitivity and seasonal recovery thresholds of different vegetation types to physical disturbance	Visitor sites	Contributing	4c
Understand impact of visitors on marine vertebrate behaviour, including stress response and breeding success	Visitor sites	Contributing	4c, 5a, 5c
Understand impacts of human activity on perceptions of wilderness	Visitor sites	Contributing	4a, 4c
Assess cumulative impacts of multiple human pressures at sites	All areas	Contributing	1a, 5c
Relevant project, plans and strategies			
SCAR Expert Group Birds and Marine Mammals			

*Overlaps with the MPA Research and Monitoring Plan theme 'Higher Predators – ecology and demography'
** Overlaps with MPA Research and Monitoring Plan theme 'Other human impacts'

Impact and management of anthropogenic pressures

Sub-theme Pollution			
Current data collection activities	**Area**	**Status**	**MA**
BAS Incident Reports for station fuels spills, lost equipment, building material, etc.	Research stations	Ongoing	1a, 3a, 4c
Monitoring needs	**Area**	**Priority**	**MA**
Assess footprint of infrastructure and activities – waste management, incidents, sewage, fuel spillage*	All	Contributing	1a, 3a, 4c
Research needs			
Quantify pollution released from abandoned human infrastructure and understand its impact on biodiversity	Whaling stations	Contributing	1a
Relevant project, plans and strategies			
SCAR IMPACT (Impact of persistent organic pollutants) expert group			

Chick by Simon Masson

Imperial shag by Tom Hubbard

* Overlaps with SGSSI MPA Research and Monitoring Plan theme 'Other human impacts'

Impact and management of anthropogenic pressures

Sub-theme Pathogens			
Current activities	**Area**	**Status**	**MA**
Ad hoc swabbing of carcasses for Highly Pathogenic Avian Influenza (HPAI)	Sites around KEP and Bird Island	Ongoing	1a
Reporting by visitors & researchers of suspected HPAI cases to IAATO and GSGSSI	Visitor sites	Ongoing	1a
Research needs			
Understand impacts of HPAI on population size and location of breeding colonies	All	Contributing	1a
Understand whether and how human pressures, such as climate change and visitors affect the arrival and spread of wildlife disease to SGSSI, and if biosecurity protocols are effective	All	Contributing	5a, 5c
Relevant project, plans and strategies			
Antarctic Wildlife Health Network HPAI database			
Project Avalon: Exposure risk of humans to H5N1 in the polar environment and perseverance of H5N1 in the environment.			

Management of research

Relevant databases and data portals are listed in Annex 2

Research needs	Priority
Centralise all biosecurity activity data collected by GSGSSI and BAS to enable analysis of incursion risk and effectiveness of biosecurity interventions	Core: essential to assess effectiveness of management activities
Secure new funding streams that can support long term baseline monitoring	Core: enables core monitoring activities
Develop a centralised data portal that contains spatially referenced historic and current data for species, habitats and pressures, similar to data management for the SGSSI MPA	Core: enables managers to more easily access biodiversity data for decision making
Ensure all future data from research and monitoring activities that are useful for the management of TPAs are open access, or provided to GSGSSI to inform TPA management	Core: enables managers to access relevant data
Produce data portal for drone data that facilitates the development of AI monitoring for relevant species and habitats	Core: Supporting Activity
Support research into the effective use of technology such as cameras, drones and machine learning that can be incorporated into biological monitoring, in particular of habitats and vascular plants, to reduce logistical / resource needs to generate baseline data*	Contributing
Provide open access to key information contained in the Regulated Activities Permit database on research and monitoring activities to (i) improve visibility of historic and ongoing research and monitoring, and (ii) encourage collaboration	Contributing
Incorporate investigator disturbance controls in tagging studies to understand impact of research on wildlife	Contributing

*These items overlap with the MPA Research and Monitoring Plan theme 'Higher Predators – ecology and demography'

Assessing progress

The Government intends to review this plan within a maximum of six years of publication to assess progress against the research and monitoring needs. Not all needs in this plan are expected to be started or completed within the review period. At review, the following questions can be used to assess progress and reprioritise as required:

1. **Is there evidence of progress with data collection or delivery of research gaps in the form of published papers or reports, successful funding applications, confirmed plans, datasets or other evidence?**

2. **Is the data collection or research directly informing management and/or policy decisions or are further steps required to apply it to management decisions?**

3. **Have additional research gaps arisen since the publication of this plan that are important for TPA management?**

There are likely to be research and monitoring activities that occur in the TPAs that also contribute to the Conservation Objectives but are not listed in this Plan. Similarly, it is not expected that all monitoring needs or research gaps outlined will be addressed in the lifetime of this plan, owing to the dependence on funding and resourcing.

Nassauvia magellanica by Kelvin Floyd

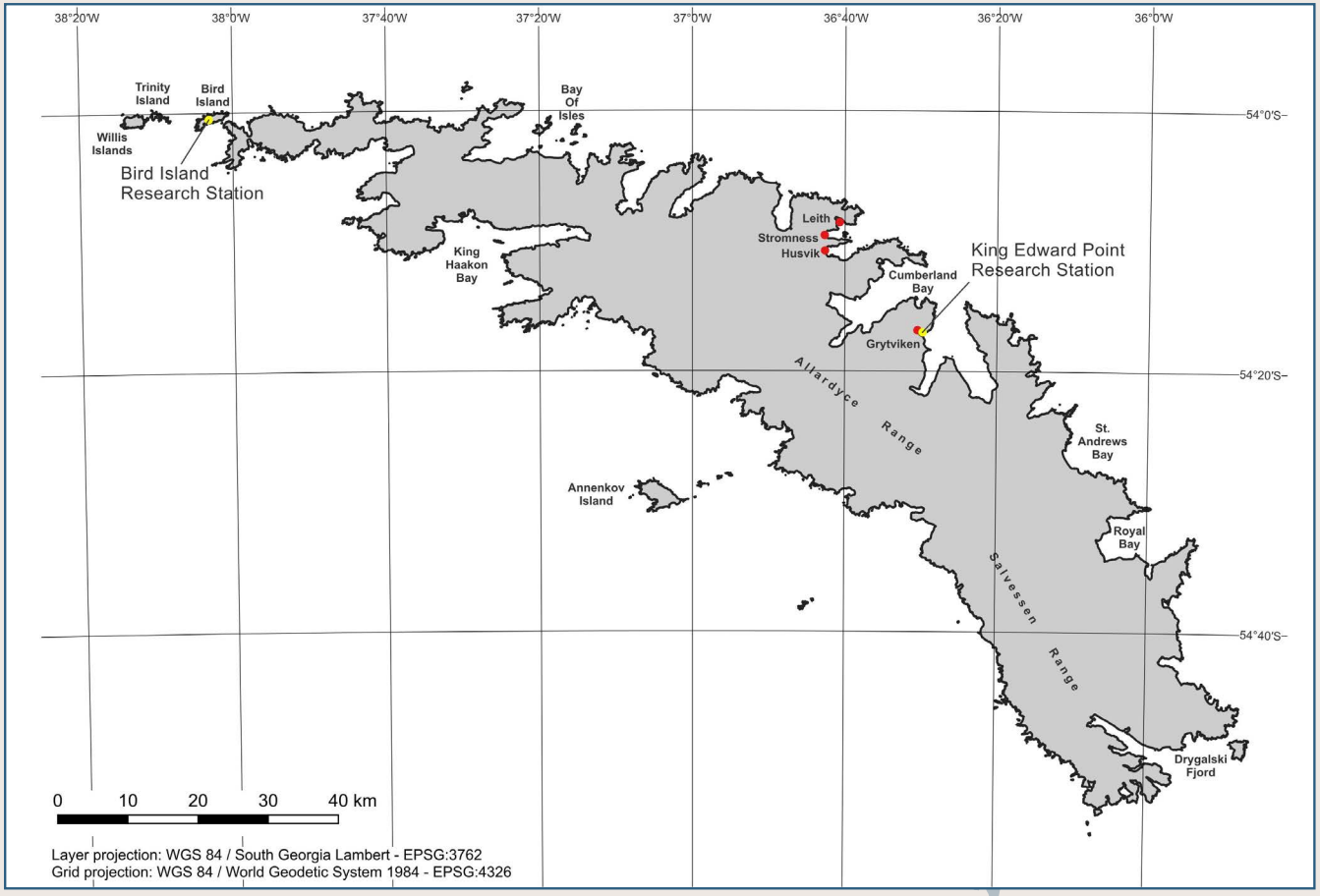
Fur seal by Jennifer Black

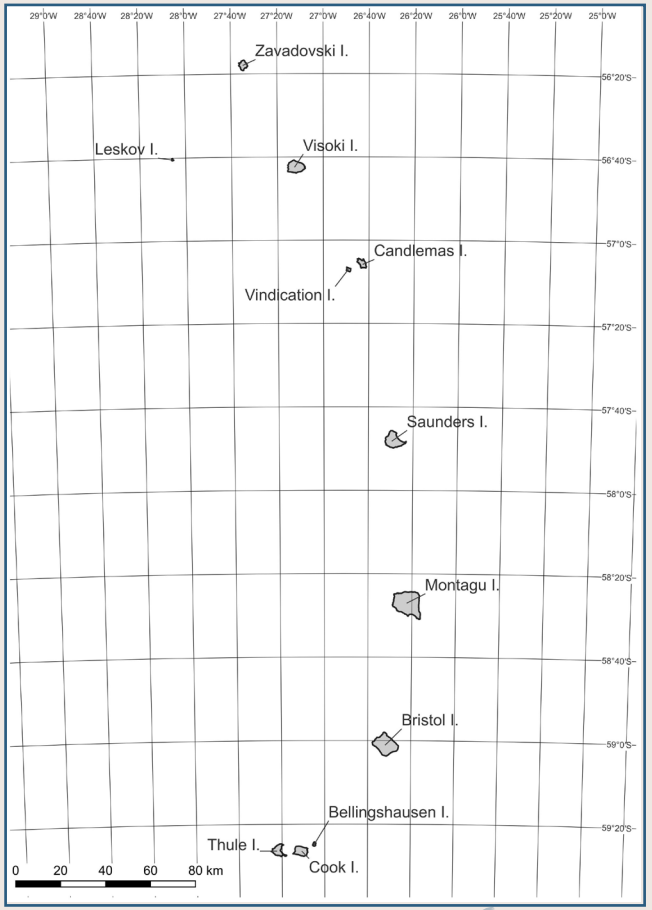
Acknowledgements

This plan was developed for the Government of South Georgia and the South Sandwich Islands by the South Atlantic Environmental Research Institute, in partnership with the British Antarctic Survey, with the support and insight from SGSSI stakeholders.

Annex 1: Map of the TPAs

The South Georgia Terrestrial Protected Area covers the island of South Georgia and its offshore islands to the mean high-water mark including Shag Rocks and Clarke Rocks (not shown on the below map). The South Sandwich Islands Protected Area covers the islands of Zavodovski, Leskov, Visokoi, Candlemas, Vindication, Saunders, Montagu, Bristol, Bellingshausen, Cook and Thule including all offshore stacks and islets to the level of the mean high-water mark.





Annex 2: Useful databases & portals

The databases and portals listed below are non-exhaustive, but contain a substantial quantity of biodiversity and management data on SGSSI terrestrial environments

Current useful databases and portals for research and monitoring	Description	Status
Regulated Activity Permit Database	Contains data on permit applications for research, monitoring and media activities	Regularly updated. Private - accessible only to GSGSSI
Visitor Management Database	Contains data on visitor numbers and locations	Regularly updated. Private - accessible only to GSGSSI
Weed Management Database	Documents the locations and treatments of non-native plant species on South Georgia	Updated yearly. Publicly available
Antarctic Plant Database	Documents information on herbarium specimens held by the British Antarctic Survey	Updated, but few new records from SGSSI as specimens have rarely been collected in recent years
UK Polar Data Centre	Primary data portal for UK-funded research on SGSSI, including all BAS data from KEP and Bird Island Research Stations	Updated regularly. Publicly available
iNaturalist	Widely used citizen science portal for recording species occurrences	Live updates. Publicly available
eBird	Widely used citizen science portal for recording bird sightings	Live updates. Publicly available
SGSSI MPA Data Portal	Platform for managers, scientists and stakeholders to access latest information on marine biodiversity, human activities, and research and monitoring	Updated regularly. Publicly available
South Georgia Geographic Information System	Contains information on topography, vegetation, glacier change, historic sites and some distribution data	Updated as required
Global Biodiversity Information Facility	Pulls in biodiversity records from a range of sources, including eBird and the Antarctic Plant Database	Updated regularly. Publicly available
Polar Pathogen Portal	Contains HPAI and unusual mortality records from BAS, GSGSSI and UK Animal and Plant Health Agency (APHA)	In development