South Georgia & South Sandwich Islands Marine Protected Area

Management Plan

S. Gregory & M. Belchier
Government of South Georgia & the South Sandwich Islands

February 2026

Contents

Recommended citation: Gregory S & Belchier M (2026). South Georgia & South Sandwich Islands Marine Protected Area Management Plan. Government of South Georgia & the South Sandwich Islands. DOI: 10.5281/zenodo.18629695

Section 1: Introduction

1.1 Commissioner's Foreword

It gives me great pleasure to present this new Management Plan for the South Georgia and South Sandwich Islands Marine Protected Area (MPA). This Plan reaffirms our ongoing commitment to conserving one of the world's most remarkable marine environments through science-led, responsible, and collaborative management.

The waters surrounding South Georgia and the South Sandwich Islands support an extraordinary array of wildlife and play a vital role in the wider Southern Ocean ecosystem. Since the MPA was first designated in 2012, two independent five-yearly reviews have assessed its effectiveness and informed successive enhancements to its design and operation. These reviews have led to strengthened protection measures, refined management zones, and a deeper understanding of the ecosystems that make these waters so globally significant.

This Management Plan builds on more than a decade of achievement and experience and illustrates the breadth and depth of work required to deliver biodiversity protection, sustainable use, and world-class research. It also reflects the collective dedication of marine managers, scientists, fishery and tourism operators, and other stakeholders working together to safeguard this extraordinary environment.

As custodians of these islands and their surrounding waters, we remain committed to ensuring that the South Georgia and South Sandwich Islands MPA continues to set a global standard for marine conservation and responsible stewardship.

Colin Martin-Reynolds CMG
HM Commissioner
South Georgia and the South Sandwich Islands

1.2 Key Facts

- The South Georgia and South Sandwich Islands Marine Protected Area (SGSSI MPA) **covers an area of 1.24 million km²** - an area 5 times larger than the UK. It is one of the world's largest MPAs and contributes **5.2% of the total global implemented Marine Protected Area coverage[1].**
- The MPA was **established in 2012** with the objective of conserving the rich marine biodiversity within the Territory's maritime zone and provides a framework for marine environmental management and research needs.
- **Further enhancements were made in 2013 and 2019, and in April 2025** the area of the MPA in which fishing is prohibited was greatly expanded following the second independent 5-yearly MPA review in 2024.
- **No Take Zones (NTZs), where all fishing activity is prohibited, now cover 470,000km²** and are coupled with **strict seasonal and spatial management measures** designed to greatly reduce the overlap of foraging predator species including seals and penguins with the highly regulated fisheries.
- **Trawl fishing on the seabed (bottom trawling) is prohibited throughout the entire MPA**.
- **All fishing on the seafloor is prohibited across 95% of the MPA**. **Longline fishing for toothfish is limited to depths between 700 - 2250 m covering less than 5% of the MPA** to conserve biodiverse seafloor habitats.
- **Krill fishing is prohibited across half a million km² of ocean around SGSSI.**
- **Any activities associated with the exploitation of hydrocarbons or minerals are prohibited,** along with the use and carriage of heavy fuel oil (HFO) by all vessels operating within the MPA.
- The MPA receives over **30,000 visitors per year**, primarily cruise ship passengers and crew, who must follow strict biosecurity and wildlife protection regulations.
- The MPA measures are enforced by the **year-round presence of the Government's patrol vessel** in order to reduce the threat of illegal, unauthorised or unregulated (IUU) fishing activity and ensure all licenced and permitted activities are compliant with GSGSSI regulations.
- In addition to **routine and targeted satellite surveillance**, intelligence is obtained from many sources including the licenced fishing fleet and is used to target MPA surveillance.
- **The MPA is subject to five-yearly review** to ensure that the objectives of the MPA are still being met and that its measures continue to reflect the best available science.

***King penguins at St Andrews Bay** – Gabrielle Weise*

[1] According to Marine Conservation Institute Marine Protection Atlas. https://mpatlas.org/large-mpas/ [last accessed 09 February 2026]

1.3 Preface

The South Georgia and South Sandwich Islands Marine Protected Area (SGSSI MPA) is one of the largest and most ecologically significant marine conservation zones in the world. Established in 2012 by the Government of South Georgia & the South Sandwich Islands (GSGSSI), the MPA now encompasses the entire maritime zone (MZ) of the Territory – an area exceeding 1.24 million square kilometres, roughly five times the size of the United Kingdom.

Located in the remote South Atlantic, this vast expanse of ocean is home to some of the planet's most biologically rich marine ecosystems. The SGSSI MPA, classified as a Very Large Marine Protected Area (VLMPA), was created to safeguard these ecosystems, ensuring the long-term conservation of biodiversity while enabling the sustainable use of marine resources and tourism under strict regulation.

The SGSSI MPA plays a vital role in global marine conservation efforts. As of 2026, it accounts for approximately 5.2% of the world's implemented marine protected area coverage, making it a cornerstone of international commitments to protect the Southern Ocean and its unique biodiversity. It also contributes significantly to the United Kingdom's efforts to meet the targets set out in the Kunming-Montreal Global Biodiversity Framework (GBF), agreed upon by members of the Convention on Biological Diversity in 2022.

The MPA substantially reduces threats to biodiversity and far exceeds the GBF's ambition to conserve 30% of marine and coastal areas—particularly those of high importance for biodiversity, ecosystem functions, and services. Additionally, the SGSSI MPA supports progress toward achieving the United Nations Sustainable Development Goal 14 (SDG 14): Life Below Water. Specifically, it includes measures to:

- Reduce marine pollution (Target 14.1)
- Protect and restore marine ecosystems (Target 14.2)
- Promote sustainable fishing practices (Target 14.4)
- Conserve coastal and marine areas (Target 14.5)

The area is managed under a robust legal and scientific framework, with comprehensive reviews conducted every five years to ensure that management measures remain aligned with the best available science and responsive to emerging environmental challenges.

This Management Plan outlines the processes and measures implemented by the Government to ensure the SGSSI MPA achieves its conservation objectives. It explains the rationale behind the MPA's establishment, provides background on the key elements of the regional ecosystem it aims to protect, and details the monitoring and patrolling activities that uphold its effectiveness. The plan also sets out the resourcing and review mechanisms necessary to secure the MPA's long-term success.

SGSSI MPA Objectives

- Conserve marine biodiversity, habitats and critical ecosystem function;
- Increase the resilience of the marine environment to the effects of climate change;
- Ensure that fisheries are managed sustainably, with minimal impact on associated and dependent ecosystems;
- Manage other human activities including shipping, tourism and scientific research, to minimise impacts on the marine environment;
- Protect the benthic fauna from the destructive effects of bottom trawling;
- Facilitate recovery of previously over-exploited marine species;
- Prevent the introduction of non-native marine species.

Section 2: The Physical and Ecological Setting of the MPA

This section provides an overview of the key attributes of the physical environment within the boundaries of the MPA and its wider oceanographic setting. It also details the habitats and biodiversity found within the MPA and which it is designed to protect.

2.1 Physical Environment

2.1.1 Topography

South Georgia and the South Sandwich Islands are part of the Scotia Arc, which is a chain of islands and submarine ridges that form the northern, eastern and southern boundaries of the Scotia Sea, in the Atlantic sector of the Southern Ocean (Fig.1). The Scotia Arc links the mountains of the Antarctic Peninsula with the Andes in South America. The Arc was formed by the subduction of the South American tectonic plate under the South Sandwich Plate.

View from Bird Island – *Ash Bennison*

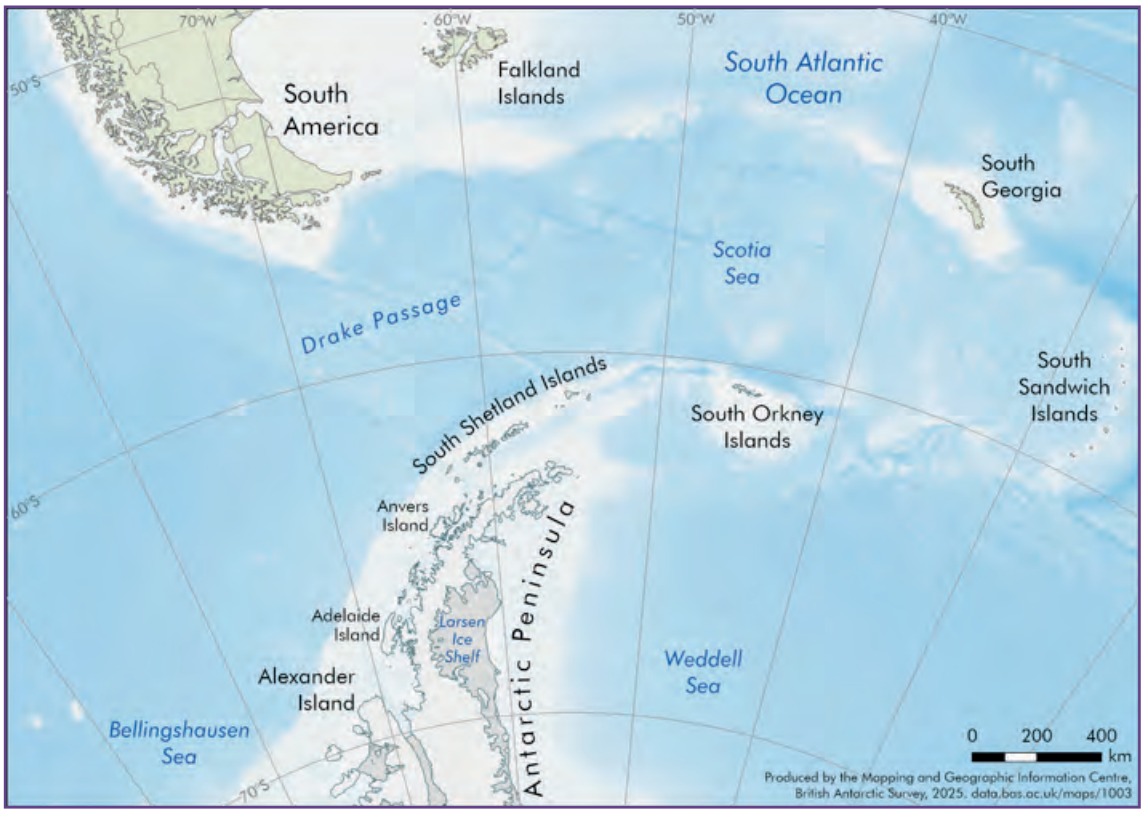


Fig.1: *Scotia Sea region, covering South Georgia, the South Sandwich Islands, the northern Antarctic Peninsula, southern South America and the Falkland Islands (BAS, 2025a)*

2.1.1.1: South Georgia

South Georgia and its associated smaller offshore islands, islets and stacks lie between 53˚30′ and 55˚S and 34˚30′ and 42˚W approximately 1,400km east-southeast of the Falkland Islands (Figs. 1&2). South Georgia itself is a mountainous glaciated island that includes the highest point (Mt Paget; 2,934m) of any UK Overseas Territory. The coastline, which extends over 600 miles in length, is deeply indented, with steep sided and deep (>200m) fjords. The south-west coast of the island is exposed to heavy wave action under the influence of the prevailing westerly wind and ocean swell. The north-east coast is more sheltered, but occasionally subject to swells generated by northerly and, more rarely, easterly winds.

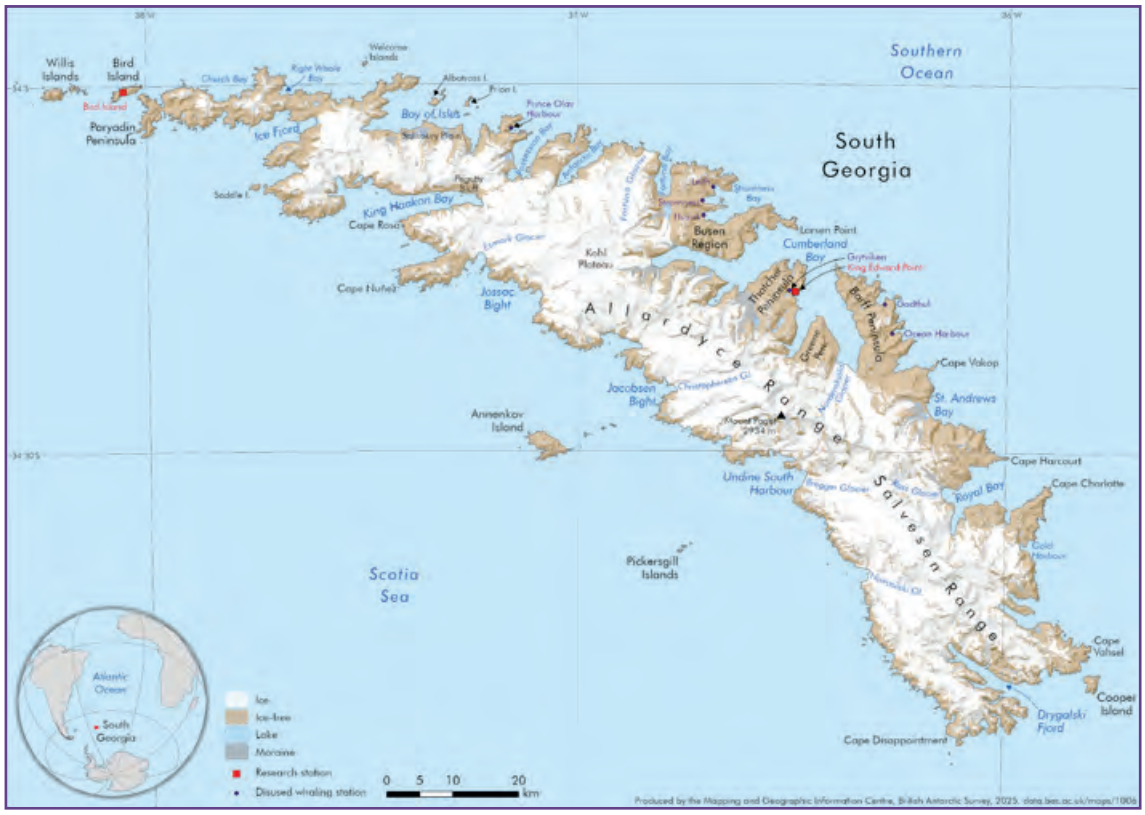


Fig. 2: *Map of South Georgia (BAS, 2025b)*

The island is surrounded by a broad area of continental shelf covering an area exceeding 50,000km^2 which extends out over 90km from the island in places, but with only a small area at depths of less than 50m. The continental shelf consists of a series of banks and troughs. The large troughs are glacially eroded and linked to the major fjords on the island; they radiate out marking the former pathways of large outlet glaciers and ice streams (Graham et al., 2008). The shelf extends south-east to Clerke Rocks. The rocks themselves are around 35 miles south-east of the island. Shag Rocks and Black Rock occupy a separate area of shelf, approximately 100 miles north-west of South Georgia. The Shag Rocks shelf is separated from the South Georgia shelf by a deep channel (>1,000m). Beyond the continental shelf the shelf break falls away sharply to depths of 3,000 – 4,000m.

2.1.1.2: South Sandwich Islands

The South Sandwich Islands consist of eleven uninhabited islands and associated rocks. These volcanic islands rise steeply from deep water between 56˚ and 59˚S and between 26˚ and 28˚W and are surrounded by very small areas of shallow shelf. The main islands (Zavodovski, Leskov, Visokoi, Candlemas, Vindication, Saunders, Montagu, Bristol, Bellingshausen, Cook and Thule) extend over 250 miles in a north to south direction (Fig. 3).

Much of the 124 miles of coast is exposed, with few sheltered bays or beaches. The islands are volcanically active, and the seabed and coastline are subject to periodic topographic changes.

The South Sandwich Trench lies to the east and north-east of the island chain and here depths are in excess of 8,000m, making it the deepest area of ocean under UK jurisdiction (Fig. 3).

Fig. 3: *Map of the South Sandwich Islands (BAS, 2025c)*

2.1.2 Oceanography

South Georgia lies within the path of the Antarctic Circumpolar Current (ACC), which is highly constrained as it flows through the Drake Passage but is able to meander more freely as it crosses the Scotia Sea. The ACC includes high velocity currents associated with four major thermohaline fronts (Fig. 4). The South Sandwich Islands are located south of the ACC and are influenced by subpolar waters that exit the Weddell Sea.

The Sub-Antarctic Front (SAF) separates the ACC from temperate waters to the north, with the Southern Boundary (SB) forming the southern limit of the ACC. The Southern Antarctic Circumpolar Current Front (SACCF) crosses the central Scotia Sea and wraps around the eastern shelf of South Georgia, before retroflecting to the north of the island (Meredith et al., 2003). The Polar Front (PF) lies between the SACCF and SAF and separates waters with a subsurface temperature minimum to the south from warmer waters to the north. Further south the SB maintains a mostly eastward course through the Scotia Sea before being deflected northwards by the topography of the South Sandwich Island arc. Within this area of complex oceanography, different water masses may be characterised by different flora and fauna, with fronts potentially providing elevated productivity and putative barriers to stenothermal (temperature sensitive) fauna.

2.1.2.1: South Georgia

South Georgia lies to the south of the Polar Front and hence the seas surrounding the island are cold throughout the year, with surface temperatures ranging from 0°C in austral winter to 5°C in austral summer. There is clear evidence of significant ocean warming (Whitehouse et al., 2008), with temperatures in the upper 100m having risen by 0.9°C in January and 2.3°C in August between 1925–2006. South Georgia is usually north of the seasonal sea ice zone, although anomalous conditions in winter 2024 resulted in sea ice extending towards the southern shelf of the island. Data from a tide gauge installed at King Edward Point indicates a relatively small tidal range (< 1m).

2.1.2.2: South Sandwich Islands

The waters around the South Sandwich Islands, which are south of the SB, are cooler than the waters around South Georgia, reaching 1.5°C at the surface in the northern area in austral summer. The islands are within the seasonal sea ice zone, with sea ice often encompassing the whole island chain between July and October (Fig. 4).
A latitudinal gradient exists in the environmental conditions along the island arc, with colder waters and greater sea ice cover, both in terms of sea ice concentration and duration, in the south than in the north (Thorpe & Murphy, 2022). There is no direct tide gauge information available for the South Sandwich Islands although global tide model predictions are available.

2.1.3 Icebergs

Icebergs are frequently found in the South Georgia and the South Sandwich Islands MZ.

Icebergs that break away from Antarctic ice shelves are typically, at first, driven anticlockwise around the continent by the Antarctic Coastal Current. Over time, these icebergs drift northward into the Southern Ocean, where the Antarctic Circumpolar Current (ACC) transports them further around Antarctica. Icebergs that exit the Weddell Sea, located east of the Antarctic Peninsula, often follow the ACC northeast through "iceberg alley," which commonly leads them toward South Georgia (Fig. 5). The majority of icebergs do not remain intact during their journey, frequently fragmenting into multiple pieces. Large tabular icebergs and the more substantial remnants tend to be carried south of South Georgia, circulating around the island's southern tip before spinning along the edge of the continental shelf margin and subsequently moving north-westward (Fleming, 2024).

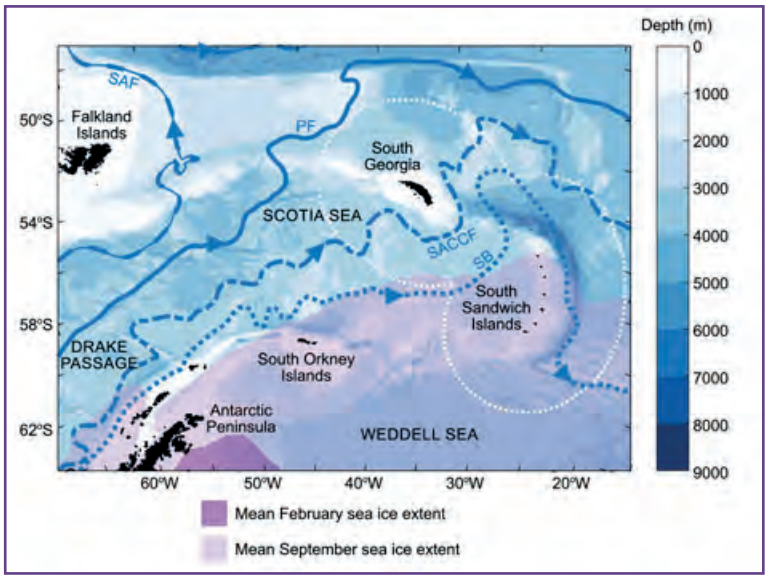


Fig. 4: *The Scotia Sea region of the Southern Ocean illustrating the mean locations of the fronts of the Antarctic Circumpolar Current (ACC; blue lines) and the mean sea ice extent (purple shading) for February (summer) and September (winter) 1981-2010 in relation to the South Georgia and South Sandwich Islands Marine Protected Area (white dashed line). Bathymetry is shaded. Arrows on the fronts indicate direction; abbreviations are: Sub-Antarctic Front (SAF), Polar Front (PF), Southern Antarctic Circumpolar Current Front (SACCF) and southern boundary of the ACC (SB). Front locations from Orsi et al. (1995), Park and Durand (2019), and Park et al. (2019), sea ice edges from Fetterer et al. (2017), and bathymetry from GEBCO Compilation Group (2025) (Image: Sally Thorpe)*

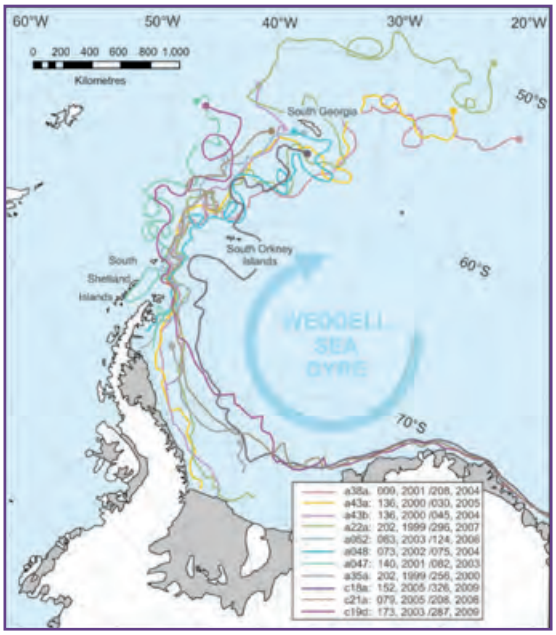


Fig. 5: *Graphic showing tracks of selected large icebergs moving from the Weddell Sea and then the north-easterly track towards South Georgia. (Fleming, 2024 - credit: BAS Mapping and Geographic Information Centre)*

Fishing in the lee of a megaberg – *Arvid Olai Mjønes*

In recent years several 'megabergs' have reached South Georgia (e.g. A68 in 2020/21, A76a in 2023, A23a in 2025) which have generated significant media and scientific interest in the environmental impacts of such incursions (e.g. Amos et al., 2024; Tarling et al., 2024), however historic records show that the occurrence of such icebergs is not a new phenomenon (Headland et al., 2023). It is predicted that the number of icebergs reaching South Georgia may increase in the future as the ice shelves from which they originate experience a more rapid rate of break-up as a result of the impact of climate change.

Calving of ice from South Georgia's numerous glaciers often leads to smaller icebergs being seen inshore, and large glaciers such as the Neumayer and Nordenskjöld glaciers will often have floating ice in front of them (Fleming, 2024).

2.2 Marine Flora & Fauna

The SGSSI MZ includes areas with depths ranging from 0 to 8,200m including the deepest part of the Southern Ocean and the south Atlantic. Much of the MPA is over relatively deep water (2,000-6,000m), with a large region of shallower depths around the coast of South Georgia and on the continental shelf around Shag Rocks. This creates a broad range of marine habitats which can be divided into the pelagic and the benthic realms. The pelagic system is relatively uniform with similar species throughout, but with some depth stratification (Ward et al., 2012). Benthic habitats are considerably more diverse extending from the inter-tidal through the shallows to >8,000m in the depths of the trenches near the South Sandwich Islands. Hogg et al. (2011) highlighted the tremendous faunal diversity in the waters of South Georgia, much of which was in the benthos. In general, the fauna and flora of South Georgia is far better known (albeit with significant gaps) than that of the remote South Sandwich Islands despite dedicated research surveys in the region in recent years.

A list of identified species found in the MPA can be accessed on the SGSSI MPA Data Portal (BAS, 2025d).

2.2.1 Phytoplankton

The waters around South Georgia are amongst the most productive in the Southern Ocean (Atkinson et al., 2001), with large and often long-lasting seasonal phytoplankton blooms usually present throughout the summer months and that are typically distributed across the Georgia Basin and northern South Georgia shelf (Borrione & Schlitzer 2013). These blooms, which are typically dominated by large colonial diatoms, such as *Eucampia antarctica*, *Odontella weisfloggii*, *Chaetoceros socialis* and *Thalassiosira* spp., probably result from iron enrichment associated with South Georgia and other islands in the Scotia Arc (Atkinson et al., 2001; Murphy et al., 2007). The patchy diatom blooms are overlayed on a more constant background of smaller autotrophs and heterotrophs, dominated by small diatoms, with prymnesiophytes and dinoflagellates also contributing (Atkinson et al., 2001). Local alterations to phytoplankton community composition around South Georgia have recently been linked to the influence of giant iceberg collapse through the restructuring of the water column and associated nutrient profiles (Tarling et al., 2024).

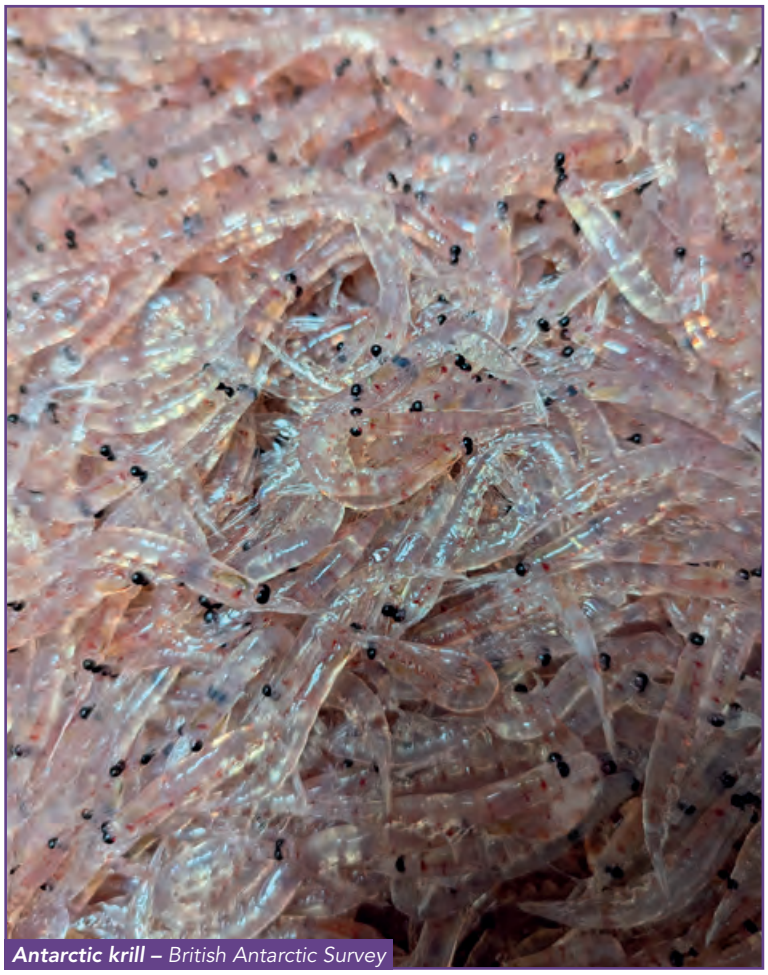
Surface chlorophyll blooms during summer months also occur around the South Sandwich Islands with elevated values typically to the east of the island arc, although the location, magnitude and timing of blooms is highly variable. Blooms appear to be associated with the retreat of the sea ice, with propagation further influenced by local circulation and other processes (Thorpe & Murphy 2022). The bloom region was found to be characterised by large diatoms e.g. *Rhizosolenia* spp., *Proboscia* spp., small centric diatoms and dinoflagellates whilst in regions outside of the bloom flagellates, *Phaeocystis* and small diatoms dominated (Liszka et al., 2022).

2.2.2 Zooplankton and Krill

The biomass of zooplankton is high around South Georgia, with levels roughly 4 to 5 times higher than those more typical of the Southern Ocean (Atkinson et al., 2001; Murphy et al., 2007). The mesozooplankton fauna is dominated by copepods and euphausiids and plays an important role in modulating carbon export (Manno et al., 2020, Manno et al., 2022). Antarctic krill (*Euphausia superba*) make up almost half the zooplankton biomass in South Georgia waters (Atkinson et al., 2001). Krill, which reaches ~60mm in length, forms dense swarms and is a key species in the pelagic food-web of the Southern Ocean, linking primary production to the abundant vertebrate predators in short and highly efficient food chains (see Murphy et al., 2007; Stowasser et al., 2012). Krill is primarily a species of the seasonal sea ice zone and South Georgia is close to the northern limit of their distribution. Krill are advected to the South Georgia and South Sandwich Islands region from the seas around the Antarctic Peninsula, and at South Georgia the population is dominated by adult stages. Early larvae have been rarely seen (Marr, 1962; Ward et al., 1990) although recent observations at South Georgia suggests they may be more common there than previously thought.

Apart from krill, five other euphausiids (*Euphausia triacantha*, *E. frigida*, *E. vallentini*, *Thyssanoessa macrura* and *T. vicina*) are also encountered in South Georgia waters but are considerably smaller and less abundant than *E. superba*. Around the South Sandwich Islands, *Thysanoessa spp.* is most ubiquitously distributed, with *E. triacantha* more common in the northern waters, which are more greatly influenced by the Southern Antarctic Circumpolar Current Front (SACCF) (Liszka et al., 2022).

With the exception of krill, copepods are the dominant zooplankton, with well over 25 species recorded in South Georgia waters. Copepod biomass is dominated by the large Antarctic and sub-Antarctic species, *Calanoides acutus*, *Rhincalanus gigas*, *Calanus propinquus* and *Calanus simillimus*. Small species dominate overall copepod abundance particularly *Oithona similis* and *Ctenocalanus citer*. The small neritic species *Drepanopus forcipatus* is very numerous over the island's continental shelf and is preyed upon by larvae of commercially important fish species (North & Ward, 1989).



***Antarctic krill** – British Antarctic Survey*

In addition to copepods, other important contributors to the zooplankton community include salps (principally *Salpa thompsoni*), amphipods and pteropods. Salps are occasionally abundant and maybe associated with warmer waters. The pelagic amphipods include around 20 species, the most abundant and ecologically important being *Themisto gaudichaudii*, which is an important alternative to krill for many predators (Watts & Tarling, 2012). There are six species of pteropod, of which *Limacina helicina antarctica* is the most abundant and can reach up to >35% of the zooplankton biomass at South Georgia (Hunt et al. 2008). Other important zooplankton groups include the polychaetes, chaetognaths and ostracods. The Scotia Sea region including South Georgia is also sensitive to change with the upper 100m warming by an average of 1.6˚C between 1925-2006 (Whitehouse et al., 2008). Some species of copepod *(R. gigas*, *C. acutus*, *C. simillimus)* have increased in abundance over this time, whilst others (*C. propinquus*) have declined (Ward et al., 2018), although overall spatial distributions of mesozooplankton have so far remained stable (Tarling et al., 2018).

Around the South Sandwich Islands, higher zooplankton biomass and diversity is associated with bloom conditions and the influence of warmer waters from within the SACCF, where mesozooplankton composition is similar to that of South Georgia and dominated by copepods such as *R. gigas*, *C. acutus*, *C. simillimus* and *C. propinquus* (Liszka et al., 2022). The colder, less productive waters south of this feature and outside the bloom region are lower in mesozooplankton biomass and diversity. Some sub-Antarctic species e.g. *C. simillimus* are absent and other groups including euphausiids (principally *Thysanoessa* spp.), salps, amphipods, polychaetes and siphonophores are present in relatively greater proportions (Liszka et al., 2022).

2.2.3 Pelagic Fish and Squid

The dominant family in the pelagic fish fauna is the Myctophidae or lanternfish, which includes 20 species (Collins et al., 2008; Collins et al., 2012). The myctophids are small planktivorous fish that live from the surface layers down to the bathypelagic (>1000m). The most abundant species in South Georgia waters are from the genera *Electrona*, *Protomyctophum* and *Gymnoscopelus*. Myctophids are important in the Southern Ocean foodweb, both as predators (Saunders et al., 2019) and as prey in the diets of many higher predators, particularly king penguins (*Aptenodytes patagonicus*) (Olsson & North, 1997). *Electrona carlsbergi* was the target of commercial fishing in the early 1990s, with catches taken in the polar frontal zone, north of South Georgia. Myctophids are also occasional by-catch in the icefish and krill fisheries. The other important family is the Bathylagidae or deep-sea smelts, which are abundant at depths greater than 400m.

Pelagic squid are not easily caught in nets but are frequently encountered in predator stomachs (Collins & Rodhouse, 2006). The species most frequently caught in nets are juveniles of *Galiteuthis glacialis* and *Slosarczykovia circumantarctica*. The most conspicuous is the colossal squid *Mesonychoteuthis hamiltoni*, which can reach 2.5m mantle length and has occasionally been caught on longlines. *Martialia hyadesi* is a muscular oceanic squid that is frequently found in regurgitates of grey-headed albatross and has been the subject of some exploratory commercial fishing at South Georgia.

Lanternfish (Electrona carlsbergi) *– Martin Collins*

2.2.4 Coastal Marine Benthic Flora

Marine algae (seaweeds) are a dominant and conspicuous feature of South Georgia's coastal environment. Forests of giant kelp (*Macrocystis pyrifera*), with sub-canopies of the large brown seaweed *Himantothallus grandifolius* and complex algal understories (comprising, for example, various red foliose and branched seaweeds and coralline algae), provide critical habitat for inshore biodiversity, including shelter and foraging grounds for marine vertebrates. Intertidal habitats, particularly rocky substrata and pools, support rich seaweed communities exhibiting distinct zonation from the upper shore (featuring various species of 'laver', *Porphyra* and *Pyropia* spp.) to the mid and lower shore (including filamentous and foliose green seaweeds, *Ulva* spp., plus diverse red seaweeds and some brown seaweeds such as *Adenocystis utricularis*), with bull kelp (*Durvillaea antarctica*) and red bladed species (e.g., *Palmaria decipiens*) characterising the shallow sublittoral (Wells et al., 2011).

Based on recent research, c.200 seaweed species (many of them still unidentified and/or undescribed) are currently known from South Georgia (Brodie, 2023), and this number is likely to increase with further study. New species records reflect introductions of non-native seaweeds (such as sea lettuce, *Ulva fenestrata*) (Mrowicki & Brodie, 2023) and suggest distributional shifts of other species in response to climate change. The biogeographical affinities of the seaweed flora of South Georgia lie with other sub-Antarctic islands and, to a lesser extent, continental South America and the Falkland Islands, in addition to Antarctica. It is not yet clear how many, if any, seaweed species are endemic to South Georgia. Recent molecular evidence suggests that some populations on South Georgia are genetically distinct from elsewhere in the sub-Antarctic and Antarctic (Mrowicki & Brodie, pers. comm).

2.2.5 Benthic Invertebrate Fauna

The benthic fauna is almost certainly the least known of all faunal groups and what is known is focused on the larger mega- and macro-fauna, with remarkably little known about the micro-fauna. With a small tidal range, the intertidal zone does not have the visually striking species zonation characteristic of shores north of the Polar Front and does not have the same variety or numbers of species (Davenport & Macalister, 1996), but small molluscs, amphipods and polychaetes can be visually abundant (Barnes et al., 2006). A detailed 2010 survey of South Georgia's north shores indicated patchiness in the intertidal fauna and demonstrated the presence of pockets of high diversity within the intertidal zone (Brewin, unpublished).

Sub-tidal sites are highly variable; some are poor in species diversity and abundance, whilst others are rich and diverse (Barnes et al., 2006), including groups such as marine algae (Wells et al., 2011). The range and abundance of many higher taxa found indicate that the South Georgia benthic fauna is Antarctic in character, but with many Magellanic species, some species with circum-Southern Ocean distributions, and a number of endemic species (Hogg et al., 2011). South Georgia may represent the convergence of the northernmost extent of known Antarctic fauna and southernmost extent of South Atlantic fauna. A relatively extensive survey of the shallow sub-tidal habits was undertaken in 2010 (Brickle & Brewin, 2011), with more than 200 sub-tidal species or putative species identified (Brewin, unpublished). Benthic fauna of the South Sandwich Islands intertidal and subtidal environments remains largely unknown.

On the continental shelf (25-500m) the limited sampling that has been achieved found that the dominant megafauna were echinoderms (particularly ophiuroids), sponges and ascidians, with distinct biogeographical differences between the shelves of Shag Rocks, South Georgia and the South Sandwich Islands (Ramos, 1999; Lockhart & Jones, 2008; Hogg et al., 2021a). At these depths, samples from the Shag Rocks shelf and the north-west of South Georgia were dominated by echinoids, with sponges and octocorals dominating parts of the shelf north of South Georgia.

***Corals and urchins on a glacial dropstone** – Cefas*

Habitat characterisation work indicates highly heterogenous habitats, with great variability in the dominant taxa (Hogg et al., 2016, 2018; Hogg, 2018). In reviewing the biodiversity of South Georgia, Hogg et al. (2011) found high levels of endemism in many benthic phyla including bryozoans, corals and molluscs and noted that many species are at the edge of their geographical ranges and thus likely to be susceptible to environmental change. Pockets of higher benthic diversity across taxonomic and functional groups have been recorded on South Georgia's outer continental shelf edge, leading to suggestions that these regions represent the remnants of non-glaciated refugia during the last glacial maximum (Barnes et al., 2016). Isolated pockets of high benthic biomass and/ or biodiversity appear a common feature at South Georgia. Ramos & San Martin (1999) reported a unique serpulid reef on the shelf in the area of Clerke Rocks and Bohrmann et al. (2017) reported hard rock walls covered with diverse communities of corals and sponges from King Haakon Trough to the south of South Georgia. In contrast, the cross-shelf trough basins that punctuate South Georgia shelf are shown to be relatively depauperate (Hogg, 2018). The steep volcanic flanks of the South Sandwich Islands result in a more limited continental shelf area. These regions have received limited sampling, but recent expeditions have indicated some zones of high benthic biodiversity (Schmidt Ocean Institute, 2025) and distinct latitudinal changes in faunal composition (Hogg et al., 2021a; Hollyman et al., 2022).

In deeper waters (500-1500m), sampling of benthic bycatch from toothfish longliners at South Georgia has identified important areas for octocorals and other vulnerable marine ecosystems (VMEs). Most notably, this includes sites adjacent to Shag Rocks and in the West Gully region between South Georgia and Shag Rocks. Research using longline-mounted deep-water camera systems (Darby and Hogg, 2021; Hogg, 2025) indicate that the areas of the South Georgia slope environment that remain open to licenced demersal longline fishing are characterised by predominantly soft sediment environments at lower risk of depletion. Diverse, epifaunal communities that might constitute VMEs were shown to be rare. At the South Sandwich Islands, Downie et al. (2021) demonstrated substantial variation in faunal composition and diversity along both bathymetric and latitudinal gradients with VME indicator taxa mostly restricted to waters shallower than 700m.

Research into the potential impacts of the longline fishery on deep-sea benthic communities was initiated by GSGSSI in 2004 in response to a condition applied by the Marine Stewardship Council (MSC) assessment of the toothfish fishery. Since then, analysis of observer data has enabled identification and mapping of broad groupings of benthic fauna encountered as bycatch by the fishery (Taylor et al., 2013; Benedet, 2017). Benthic bycatch recorded by observers includes a wide variety of taxonomic groups, such as echinoderms including stalked crinoids, basket stars, and pencil urchins; glass and silaceous sponges; bryozoans; ascidians and cnidarians. The latter comprise the greatest proportion of the recorded bycatch (~80% of bycatch samples collected from 2005 to 2009). Phylogenetic research on the Cnidaria shows the majority (72%) of these are Octocorallia, particularly of the family Primnoidae (Taylor, 2011).

Areas of hydrothermal activity (vents) have been described on the East Scotia Ridge and Kemp Caldera near the South Sandwich Islands (Rogers et al., 2012; Linse et al., 2019). Deep-sea hydrothermal vents are usually associated with seafloor spreading at mid-ocean ridges and in basins near volcanic island arcs. These vents support a unique fauna that derive their energy from the oxidation of substances such as hydrogen sulphide that are released by the vents. The fauna of the East Scotia Ridge vents is very different from vents on the mid-Atlantic Ridge and is dominated by a new species of yeti crab (*Kiwa tyleri*), stalked barnacles, limpets, peltospiroid gastropods, anemones, and a predatory sea-star. These hydrothermal sites are now also shown to influence the megafauna of the surrounding regions (Linse et al., 2022).

Hadal research has been limited due to the inherent challenges of conducting science at such depths, however expeditions to the South Sandwich Trench (maximum depth >7,000m) have indicated a rich and diverse fauna with many endemic species (see Jamieson et al., 2021).

2.2.6 Demersal Fish and Cephalopods

The demersal ichthyofauna of the continental shelf is dominated by fish of the sub-order Notothenioidei, including 28 species in 5 families (Nototheniidae, Channichthyidae, Bathydraconidae, Artedidraconidae and Harpagiferidae), which are endemic to the Southern Ocean.

The demersal fauna includes previously exploited species such as the marbled rock cod (*Notothenia rossii*) and the yellow-tailed notothen (*Patagonotothen guntheri*) as well as the currently fished mackerel icefish (*Champsocephalus gunnari*) and Patagonian toothfish (*Dissostichus eleginoides*). The icefish (Channichthyidae) are unique in lacking the pigment haemoglobin in their blood. The three channichthyids that are common in South Georgia waters are all benthic spawners, that lay eggs in reds, which are thought to be guarded by the males.

Many demersal fish species were historically over-fished at South Georgia (see *Section 4.2.1: History of Exploitation*) however following the implementation of highly regulated fisheries management measures, some of these species are now showing signs of recovery (Hollyman et al., 2021).

In deeper depths the fauna is less dominated by the notothenids, although the Patagonian toothfish is caught at depths in excess of 2,000m. Other abundant groups include the grenadiers (Macrouridae) and Moridae (Gregory et al., 2017), which are characteristic deep-sea fauna. The chondrichthyans are represented by two species of skate, the Porbeagle shark (*Lamna nassus*), occasional Lantern sharks (Etmopterida) and the sleeper shark (*Somniosus* sp.).

Demersal cephalopods include four species of incirrate octopus, plus the cirrate octopods *Opisthoteuthis hardyi* and *Stauroteuthis gilchristi* (Collins et al., 2004).

2.2.7 Marine Mammals

Seven species of large cetacean are regularly encountered in South Georgia waters, including six species of baleen whale (blue (*Balaenoptera musculus*), fin (*Balaenoptera physalus*; see below), sei (*Balaenoptera borealis*), humpback (*Megaptera novaeangliae*), minke (*Balaenoptera bonaerensis*), southern right (*Eubalaena australis*), plus sperm whales (*Physeter macrocephalus*)). Five smaller cetaceans regularly seen are the long-finned pilot whales (*Globicephala melas*), southern bottlenose whales (*Hyperoodon planifrons*), killer whales (*Orcinus orca*), plus the spectacled porpoise (*Phocoena dioptrica*) and hourglass dolphin (*Lagenorhynchus cruciger*).

The baleen whales are predominantly krill or copepod feeders that migrate to the Southern Ocean during the austral summer and return to tropical breeding grounds in the winter, although many baleen whales are still seen in the area in winter. These whales were all historically heavily exploited in South Georgia waters (see *Section 4.2.1: History of Exploitation*), but populations are gradually recovering. Humpback whales are now the most frequently seen species, with ~24,500 estimated feeding in South Georgia and South Sandwich Islands waters in 2019 (Baines et al., 2021). Critically endangered Antarctic blue whales are now regularly sighted in South Georgia waters (Calderan et al., 2020).

***Southern right whale** – Judith Brown*

Sperm whales are present around South Georgia throughout the year and, at these latitudes, are likely to be adult males. Sperm whales are deep divers, feeding on fish and squid; they also follow fishing vessels and take toothfish off longlines (Collins et al., 2010).

Killer whales are regularly seen in South Georgia waters, particularly in the winter months, when pods follow longline fishing vessels to take toothfish from the lines. There are now thought to be four different ecotypes of killer whale in the Southern Ocean (Pitman et al., 2011) that may be different species (Morin et al., 2010). The whales seen at South Georgia appear to be large "Type D" (Pitman et al., 2011) and "Type B2" (Towers, unpublished data).

Additionally, it is likely that several species of beaked whale (besides southern bottlenose whale) are present within South Georgia and South Sandwich Island waters (notably Gray's (*Mesoplodon grayii*), strap-toothed (*Mesoplodon layardii*) and Arnoux's beaked whales (*Berardius arnouxii*)). However, very little is known about the distribution of these enigmatic cetaceans.

South Georgia is home to around 3.5 million Antarctic fur seals (*Artocephalus gazella*) (IUCN Least Concern (LC)), which represents 95 to 98% of the global population, and approximately 97% of all Antarctic fur seal pup productivity occurs at South Georgia (Forcada et al., 2023). Fur seals were heavily exploited in the 18th and 19th centuries, with numbers reduced to a few hundred, but they have shown a remarkable recovery and now breed in huge numbers on beaches in the north-west of the island and along the north coast. Although experiencing high numbers, studies at Bird Island have suggested that fur seals have been experiencing approximately 7% annual decline for the last ten years at this site (Forcada et al., 2023). Fur seals also breed in the South Sandwich Islands, but numbers there are much lower and largely restricted to the northern South Sandwich Islands.

Fur seals (particularly females) are primarily krill eaters at South Georgia and breeding success of the seals is reduced in krill-poor years (Forcada et al., 2005). During the breeding season fur seals forage close to South Georgia, notably on the shelf break to the northwest of the island and at Shag Rocks.

Antarctic fur seal pup – *Vicki Foster*

Outside of the breeding season fur seals forage much more widely. In addition to krill, fur seals also feed on fish such as icefish and lanternfish and these prey are more important in krill poor years.

Around 110,000 female southern elephant seals (*Mirounga leonina*) (IUCN LC) breed on South Georgia (Boyd et al., 1996), with small numbers on the South Sandwich Islands. The population size has remained relatively stable over the past 50 years and represents around 50% of the global population, although a recent strain of avian influenza (HPAI) led to significant elephant seal mortality at South Georgia in 2024 (Bamford et al., 2025). Elephant seals are deep divers, foraging on fish and cephalopods and have been reported to eat toothfish.

There is also a small colony (~30) of Weddell seals (*Leptonychotes weddellii*) in Larsen Harbour. This is the northernmost colony which exclusively breeds on land rather than on fast ice and while there is limited data, the colony appears to be declining (Burton, 2015). Leopard seals (*Hydrurga leptonyx*) are frequent visitors to South Georgia, but breed further south, in the pack ice. They can be found year-round, including the summer months, but these are largely juveniles and non-breeding animals (Stainfield & Forcada, 2022).

2.2.8 Seabirds

South Georgia is home to 28 species of breeding seabirds, with a further species (Antarctic fulmar) breeding only on the South Sandwich Islands. The islands and waters of South Georgia and the South Sandwich Islands are visited regularly by a large number of vagrants and non-breeding species (see Clarke et al., 2012).

2.2.8.1: Penguins

Five species of penguin (king (*Aptenodytes patagonicus*), gentoo (*Pygoscelis papua*), Adélie (*P. adeliae*), chinstrap (*P. antarcticus*) and macaroni (*Eudyptes chrysolophus*)), breed on both South Georgia and the South Sandwich Islands. The largest of these species is the king penguin (IUCN LC), which forms large, densely packed colonies typically on sandy beaches near glacial melt water streams. King penguin numbers have been increasing on South Georgia, with new colonies appearing and there are now an estimated 405,425 breeding pairs, the majority of which are in the colonies at St Andrews Bay and Salisbury Plain (Foley et al., 2020). Single figures of king penguins breed on Zavodovski in the South Sandwich Islands. King penguins undertake long foraging trips to the Polar Front in the summer (Trathan et al., 2008; Scheffer et al., 2010) and west as far as the Drake Passage in the winter. King penguins feed primarily on lantern fish (e.g. *Electrona carlsbergi*), with pelagic squid and krill occasionally contributing to their winter diet.

Macaroni penguins – *Vicki Foster*

Gentoo penguins (IUCN LC) breed in small colonies (maximum sizes of several thousand pairs) on beaches and in tussac meadows. Colonies are widely distributed around South Georgia but also occur in small numbers on some of the South Sandwich Islands (Lynch et al., 2016). The population is estimated to be 98,867 breeding pairs at South Georgia (Herman et al., 2020). Gentoos generally forage within 12 miles of the coast, feeding on small fish and krill and are resident all year at South Georgia. There are estimated to be over 1 million pairs of macaroni penguins (IUCN vulnerable (VU)) breeding on South Georgia (Trathan et al., 2012), the majority of which breed in large colonies to the northwest of the island, particularly the Willis Islands. Approximately 95,000 pairs of macaroni penguins also breed in the South Sandwich Islands (Lynch et al., 2016). Macaroni penguins are primarily krill-eaters during the chick-brooding season, when they forage to the north-west of the island over the shelf and as far as the shelf break. During incubation and the creche stage, some adult birds may forage beyond the shelf and experience a more myctophid based diet. Outside the breeding season they disperse and forage over a much greater area of the Scotia Sea and in the Polar Frontal Zone.

At South Georgia there are small colonies of chinstrap penguins (IUCN LC) at Cooper Bay, with about 13,500 pairs, and on Annenkov Island (Strycker et al., 2020). The most northerly breeding chinstraps on South Georgia are on Bird Island where six pairs have bred since 2023. The South Sandwich Islands are home to 1.3 million pairs, including the largest colony in the world on Zavodovski Island (600,000 pairs) (Lynch et al., 2016; Strycker et al., 2020), but recent data in press shows that Chinstrap penguins are declining throughout the South Sandwich Islands (Hart & Ratcliffe, pers comm).

Adélie penguins (IUCN LC) do not regularly breed on South Georgia (only two pairs on Annenkov Island), but do breed on the South Sandwich Islands, where the population was at least 125,000 pairs in 2011 (Lynch et al., 2016), with colonies on Candlemas, Saunders, Montague, Bristol, Bellingshausen, Cook and Thule islands.

2.2.8.2: Albatrosses

Four species of albatrosses breed on South Georgia - wandering albatross (*Diomedea exulans*), black-browed albatross (*Thalassarche melanophris*), grey-headed albatross (*T. chrysostoma*) and light-mantled albatross (*Phoebetria palpebrata*). The number of pairs of wandering, black-browed and grey-headed albatrosses have declined by 39-66% in just 32-40 years, which is attributed to incidental mortality associated with fisheries outside the SGSSI MZ and effects of environmental change (Pardo et al., 2017, Poncet et al., 2017, Mackley et al., 2025). These species, alongside light-mantled albatross, southern giant petrel (*Macronectes giganteus*), northern giant petrel (*M. halli*)) and white-chinned petrel (*Procellaria aequinoctialis*), are listed under the international Agreement on the Conservation of Albatross and Petrels (ACAP). The wandering, black-browed and grey-headed albatrosses at South Georgia are three of just nine ACAP High Priority Populations for conservation. ACAP's goal is to coordinate international efforts to address fisheries interactions and other threats at sea, as well as threats at breeding colonies such as the impacts of introduced species.

The majority of the population of wandering albatrosses (IUCN VU) breed on Bird Island, islands in the Bay of Isles, and Annenkov Island (Poncet et al., 2017). The 2023/24 decadal albatross survey indicated there were 1,278 breeding pairs at South Georgia (Mackley et al., 2025). Wandering albatrosses undertake extensive foraging trips, feeding predominantly on dead or dying squid, and to a lesser extent on fisheries discards. The birds overlap with demersal longline vessels off South America and New Zealand, and with pelagic longline fisheries across the Southern Ocean. A recent outbreak of avian influenza (HPAI) at South Georgia led to the mortality of a significant number of wandering albatross at Bird Island in 2023/24 (Bennison et al., 2024).

Giant petrel and chick – *Rhiannon Nichol*

Black-browed albatrosses (IUCN LC) mainly breed in colonies in the northwest of South Georgia, and at Cooper and Annenkov islands. There were an estimated 55,119 breeding pairs in 2023/24. The long-term decline is attributed primarily to incidental mortality in demersal longline and trawl fisheries off South Africa and Namibia, and pelagic longline fisheries in the southeast Atlantic Ocean.

There were an estimated 18,475 breeding pairs of grey-headed albatrosses (IUCN VU) on South Georgia in 2023/24. This species breeds in colonies in the northwest. The greatest threat appears to be pelagic longline fisheries beyond the SGSSI MZ. The species is principally an oceanic forager, targeting the Antarctic Polar Front and associated areas of upwelling but it also forages in Antarctic shelf-slope waters as far away as the Antarctic Peninsula in years of low squid availability.

Light-mantled albatrosses (IUCN NT) breed in isolated sites or in small groups on steep cliffs on the north coast of South Georgia. There were estimated to be 5,000 breeding pairs in the early 1980s, but the limited count data from Bird Island suggest a steep decline since the mid-2010s. Light-mantled albatrosses have a very broad foraging range from subantarctic waters to Antarctic waters, including the South Scotia Arc and the Antarctic Peninsula region.

2.2.8.3: Petrels

There were an estimated 15,398 pairs of northern giant petrels (IUCN LC) and 8,803 pairs of southern giant petrels (IUCN LC) breeding at South Georgia in 2005/06-2006/07 (Poncet et al., 2020). Southern giant petrels breed in smaller numbers in the South Sandwich Islands (1,882 pairs; Black & White, 2011). Males, particularly of northern giant petrels, are scavengers and, during the breeding season, forage around penguin and seal colonies, whereas females of both species feed predominantly at sea, often following fishing vessels.

The 900,000 pairs of white-chinned petrels (IUCN VU), nest in burrows in coastal areas around South Georgia, representing around three-quarters of the global population (Martin et al., 2009). White-chinned petrels forage widely from the ice edge to the northern Patagonian Shelf and regularly follow fishing vessels, making them particularly susceptible to incidental mortality in both longline and trawl fisheries.

Large numbers of prions (*Pachyptila* spp.) and blue petrels (*Halobaena caerulea*) (Procellaridae), storm petrels (Hydrobatidae) and diving petrels (Pelecanoididae) also breed on South Georgia. Several species are extremely abundant, including an estimated 22 million pairs of Antarctic prions (*Pachyptila desolata*), 3.8 million pairs of common diving petrels (*Pelecanoides urinatrix*) and 2 million pairs of South Georgia diving petrels (*Pelecanoides georgicus*). These species mainly consume zooplankton, including krill, copepods and other crustacea.

2.2.8.4: Other flying birds

Other birds that forage in the marine environment include the South Georgia shag (*Leucocarbo georgianus*), kelp gull (*Larus dominicanus*), Antarctic tern (*Sterna vittata*) and brown skua (*Stercorarias antarcticus*).

Section 3: MPA Management

3.1 Governance of South Georgia and the South Sandwich Islands

South Georgia and the South Sandwich Islands are a UK Overseas Territory, administered by the Government of South Georgia & the South Sandwich Islands (GSGSSI) through the Office of the Commissioner in Stanley, Falkland Islands. The Territories have been under UK administration since 1908. Until 1985, South Georgia and the South Sandwich Islands were part of the Falkland Island Dependencies, after which they became a separate UK Overseas Territory. The SGSSI Territorial Sea, which extends 12 nautical miles (nm) from the coast of South Georgia and the South Sandwich Islands was declared in 1989. The 200nm Maritime Zone (MZ) was declared in 1993 extending from the outer limit of Territorial Waters to 200nm from the baselines. Those baselines were recalculated in 2024 following a new survey and the publication of new charts of the area (see *Appendix 4: SGSSI Territorial Seas, 2024*).

King Edward Point research station – *British Antarctic Survey*

The South Georgia and South Sandwich Islands Maritime Zone (SGSSI MZ) lies south of the Antarctic Polar Front and thus falls within the area managed by the Commission for the Conservation of Antarctic Living Resources (CCAMLR). CCAMLR was established in 1982 as part of the Antarctic Treaty System, with 26 Member countries plus the European Union, and to which the UK is a signatory. It is the body is responsible for fisheries management and marine conservation throughout the Southern Ocean. Fisheries in the SGSSI MZ are managed within the CCAMLR framework and are subject to catch limits and regulations agreed by the Commission, but GGSSSI implements more precautionary catch limits, and enforces stricter regulation, than CCAMLR (see *Section 4.2.2: Management of Sustainable Fisheries*).

Whilst not adopted under a CCAMLR Conservation Measure, the SGSSI MPA makes a significant contribution to CCAMLR's objective of implementing a representative network of MPAs throughout the convention area as it extends over a significant percentage of the CCAMLR 'planning domain 2' (North Scotia Arc) (Fig. 6). CCAMLR has however adopted MPAs in the Ross Sea (Ross Sea MPA) and South Orkney region (SOISS MPA), and other MPAs have been introduced under the domestic legislation of CCAMLR Members, such as those found around other sub-Antarctic Territories including Heard and McDonald Islands (HIMI), Kerguelen, Crozet and Prince Edward Islands (Fig. 6). This means that ~12% of the Southern Ocean is currently located within existing MPAs (Brooks et al, 2020).

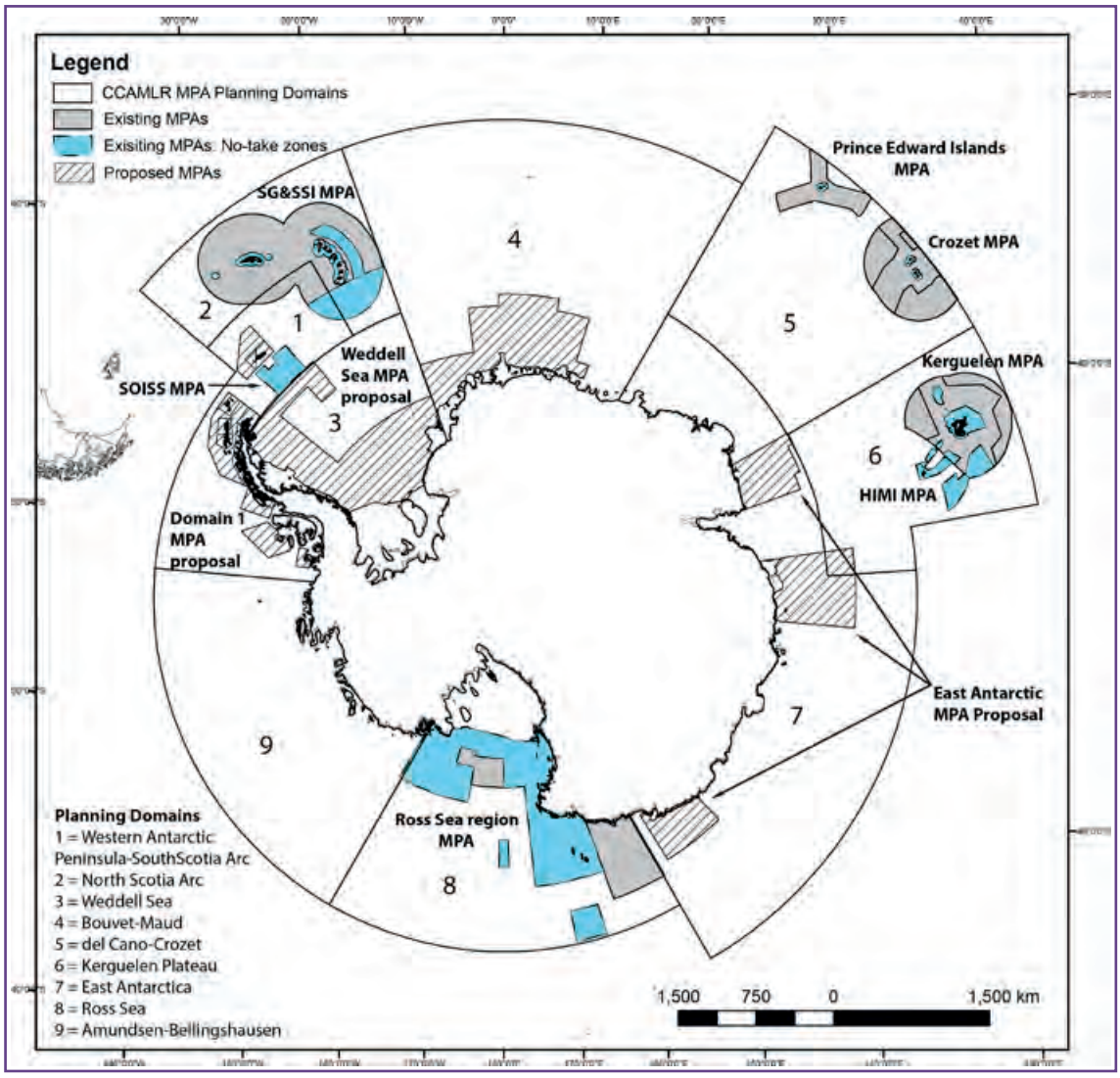


Fig. 6: *CCAMLR planning domains and marine protected areas in the Southern Ocean (Brooks et al, 2020)*

3.2 Legislative Context

Activities within the SGSSI Marine Protected Area are regulated primarily by the MPA Order (2025), however there also exists a broader suite of legislation and legally binding regulations that are used to manage fisheries, tourism and research within the MPA. Much of this legislation pre-dates the introduction of the MPA in 2012. A summary of these documents is available in *Appendix 2: Summary of legislation and other regulations to control activities within the Marine Protected Area*.

3.2.1 Legislation

Marine Protected Areas Order 2025

The Marine Protected Areas Order is subsidiary legislation under the Wildlife and Protected Areas Ordinance (2011). The Order outlines the conservation objectives of the MPA, defines key terminology and then describes all the prohibitions and measures that apply within the MPA. The Order specifies the boundaries of all the spatial closures, indicating the features that each of the zones is designed to protect and the conservation objectives that the closed areas fulfil. A breach of the prohibitions within the MPA Order is an offence against the Wildlife and Protected Areas Ordinance.

Wildlife and Protected Areas Ordinance 2011 (as amended)

The Wildlife and Protected Areas (WPA) Ordinance was enacted in 2011 and provides a legal basis for the strict environmental policies of GSGSSI. It provides the legislative basis under which the MPA and TPA (see below) were enacted. Under the Ordinance it is also an offence to wilfully or carelessly introduce non-native species, to handle or harm any flora or fauna or conduct activities that are likely to result in damage to habitats. Permits are required for any activity undertaken within the Territory that may cause damage to the island's biodiversity.

Fisheries (Conservation and Management) Ordinance 2000 (as amended)

Fishing in the waters around South Georgia and the South Sandwich Islands is regulated by the Fisheries (Conservation and Management) Ordinance 2000 and secondary legislation. In summary, a licence from the Government is required to fish in the territorial waters and maritime zone around South Georgia and the South Sandwich Islands. Fishing without a licence or in breach of license conditions are criminal offences that carry significant fines.

Fisheries (Transhipment and Export) Regulations 1990 (as amended)

The Fisheries (Transhipment and Export) Regulations is subsidiary legislation under the Fisheries (Conservation and Management) Ordinance. The Regulations prohibit the transhipment of fish within SGSSI waters and the transport of fish that have been so transhipped, whether the fish was caught in SGSSI or not, unless it is has been authorised by the Commissioner or their appointed representative. The Regulations also require any authorised transhipments to occur in Cumberland Bay.

Heavy Fuel Oil (Prohibition of Carriage and Use) (Amendment) Ordinance 2020

The purpose of the Heavy Fuel Oil (Prohibition of Carriage and Use) Ordinance is to give effect to MARPOL 73/78, Annex 1, regulation 43 in the Territories and the maritime zone by prohibiting the carriage in bulk as cargo, and the carriage and use, of heavy fuel oil on a vessel in the Maritime Zone. The Ordinance specifies the densities of oil that are prohibited.

Wildlife and Protected Areas (SPA Management Plan and Prohibited Activities) Regulations 2023

Following several years of review and consultation, in July 2022 GSGSSI designated the entire landmass of South Georgia and its outlying islands, and the South Sandwich Islands as Specially Protected Areas under The Wildlife and Protected Areas (Specially Protected Areas) Order 2022. These Terrestrial Protected Areas (TPAs) cover over 3,800 km^2 and complement the Marine Protected Area, making SGSSI the only UK Overseas Territory to have the entirety of their land and sea within a protected area system. The Wildlife and Protected Areas (SPA Management Plan and Prohibited Activities) Regulations provide for the implementation of the TPA Management Plan and lists the activities that are prohibited in SGSSI unless carried out in accordance with a permit issued by the Government.

The TPAs have two overarching Conservation Objectives which align closely with those of the MPA: (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. The TPA Management Plan (GSGSSI, 2023a) provides details of the spatial extent and protected features of the TPA, conservation objectives, implementation, and details of regulated activities, along with details of procedures for permit applications.

Entry Control Ordinance 2022

The primary intention of the Entry Control Ordinance 2022 is to ensure that those who wish to come to the Territories have the permission of the Government to do so in advance of their visit. In 2025, GSGSSI implemented an associated Electronic Travel Authorisation system under the Entry Control Ordinance (GSGSSI, 2025a). The vast majority of people entering SGSSI now require an Entry Permit, and there are separate permits for work (valid for 1 year) and visitor purposes (valid for 30 days). GSGSSI has a separate policy under which specific 'Persons who have Deemed Permission' are exempt from the need for a permit.

Copies of all the relevant legislation can be found on the South Georgia and South Sandwich Islands Laws website

***Interception of a suspected illegal fishing vessel** – George Gittins*

3.2.2 Other regulations:

Regulated Activity Permits

Under GSGSSI legislation, activities which have the potential to cause environmental harm or impact are prohibited. The Regulated Activity Permit (RAP) process is a mechanism to enable such activities to be carried out in certain circumstances, but which allows GSGSSI to gain oversight of these activities and to work with proponents to ensure that risks to the environment are mitigated. Examples of activities which might require a RAP include collection of samples of any kind, animal handling, the use of drones, close approach to wildlife (such as for certain types of media filming or monitoring), research bottom fishing within Benthic Closed Areas, or use of active acoustics outside defined parameters. A tiered system of RAP application depending on the complexity of a project ensures that environmental assessments are scalable and commensurate with the potential impacts of activities.

Marine Scientific Research Approval

In addition to the necessary permissions issued by GSGSSI, any application involving Marine Scientific Research (MSR) which is to be undertaken on non-UK flagged vessels in the SGSSI MZ must also apply for approval through the UK Government's, FCDO Article 246 approvals process. Only research which meets the relevant requirements will receive a consent document granting the vessel diplomatic clearance to conduct its research within the MPA.

Fisheries Licence Conditions

The toothfish, krill and icefish Licencing Information for Applicants (IFAs) are fishery specific documents that accompany all fishing licence applications. They contain all the necessary information on the fishery, including general background, quotas, bycatch limits, fees, and the application and licensing procedure (see *Section 4.2.2: Management of Sustainable Fisheries*). In order to be considered for a licence the IFA specifies the minimum standards that all vessels must meet, and then for the competitive licences it details the licensing criteria against which applications are assessed and the associated scoring. The IFA also contains all the licence conditions for a given fishery which must be complied with at all times, and an explanation of the Compliance and Enforcement framework as it applies to that fishery. In order for any vessel to be granted a licence to fish in SGSSI waters, the IFA requires the vessel to pass a pre-licensing inspection at South Georgia to confirm they meet the terms of the licence.

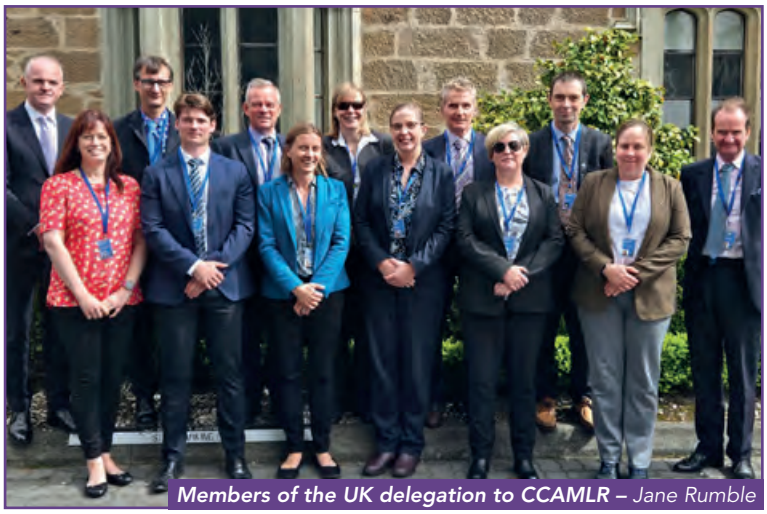
***Elephant seal** – Vicki Foster*

Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) Schedule of Conservation Measures

CCAMLR Conservation Measures (CMs) are legally binding for CCAMLR Members and apply to all fisheries in CCAMLR waters, but it is also a GSGSSI fishing licence condition that all relevant CCAMLR CMs must be complied with at all times. The CCAMLR Schedule of Conservation Measures lists all the CMs and Resolutions that have been adopted by the Commission, including season dates, quotas, bycatch limits, restrictions on gear types, seabird and marine mammal mitigation measures, observer deployment and data reporting requirements.

GSGSSI Fisheries Compliance and Enforcement Framework

Compliance and enforcement of the relevant laws and licensing conditions of each of the fisheries operating within the SGSSI Maritime Zone is undertaken in accordance with the Government's' Compliance and Enforcement (C&E) framework. This outlines the impacts of non-compliance on licencing on vessel applications and on current licences that have been issued, and the enforcement steps that may be taken in the event of a non-compliance including potential revocation or forfeiting of a licence. The C&E Framework also details what may happen if a licenced vessel is unable to complete a fishing season due to unforeseen and exceptional circumstances.



Members of the UK delegation to CCAMLR – *Jane Rumble*

Tourism Management Regulations

All tourism is controlled under a permitting system to ensure that both cruise ship and yacht visits are responsible and sustainably managed. All applicants must provide information relating to vessel safety, contingency and incident response planning, and environmental management in order to operate within the SGSSI MZ. The "Visiting South Georgia: Information for visit permit applicants and holders" (GSGSSI, 2025b) and associated documents include codes of conduct and guidelines that must be observed, including bird strike reporting and a geofenced 10kt speed limit to minimise the risk of whale strikes. Additional dispensation is required to operate a Human Occupied Vehicle (HOV) and Remotely Operated Vehicles (ROVs), such as submarines under the GSGSSI HOV & ROV Policy (see *Section 5: Threats and Threat Mitigation*). Vessel operators are largely members of the International Association of Antarctica Tour Operators (IAATO) and must also comply with IAATO policies and procedures to ensure safe and environmentally responsible tourism in the region.

Biosecurity Policy

The GSGSSI biosecurity policy is designed to safeguard SGSSI against the introduction and spread of invasive non-native species and pathogens. It is enshrined in law under the Wildlife and Protected Areas Ordinance, and any breach may be treated as a criminal offence. The policy applies to anyone entering and moving within the Territory and anyone involved with the operation of vessels within the Maritime Zone. Following the successful rodent eradication programme, the GSGSI Biosecurity Handbook details the regulations for the prevention of rodent reintroduction, alongside measures relating to other non-native species that may be transported on vessels. Guidance on highly pathogenic avian influenza (HPAI) risk and response is also provided. Management advice on marine invasive non-native species is currently under development.

3.3 Evolution of the SGSSI Marine Protected Area

The life cycle of a Marine Protected Area consists broadly of four phases: the Design phase, the Implementation phase, the Research and Monitoring phase, and the Review and Update phase (Fig. 7). Each phase is connected by opportunities for consultation, and once the cycle is completed the outcomes of the Review and Update phase form the beginning of the next MPA cycle in place of the original Implementation phase of the first cycle. The SGSSI MPA has followed this cycle from inception and through two 5-yearly reviews (Fig. 8).

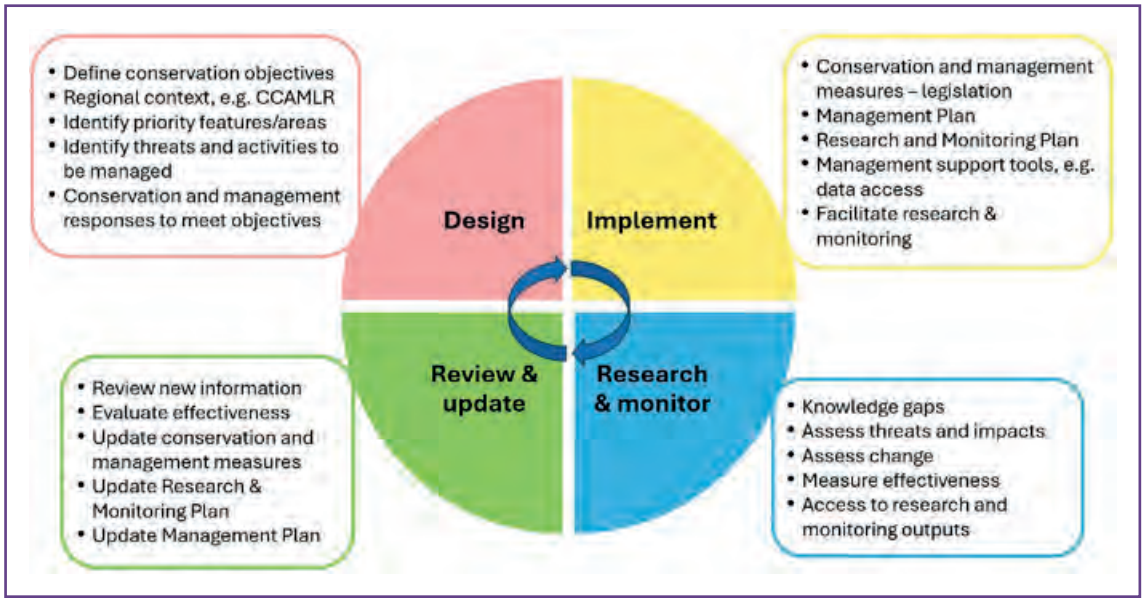


Fig. 7: *Schematic representing the life cycle of a Marine Protected Area. The MPA life cycle includes MPA design, its implementation, research and monitoring, and regular reviewing and updating. Examples of activities within each of the major stages are given in the text boxes, and each stage is framed by consultation periods. Events relating to MPA design are shown in pink, those linked to implementation in yellow, research and monitoring activities are shown in blue, and MPA review points in green (Image: Susie Grant & Marta Soeffker)*

In 2009, proposals were submitted to the UK Government to support the creation of a Marine Protected Area (MPA) around South Georgia and the South Sandwich Islands (SGSSI). These proposals led to two funded projects:

The first project, supported by the UK Overseas Territories Environment Programme (OTEP), ran from April 2010 to March 2013. Its goal was to identify important and vulnerable marine habitats that needed protection to help preserve the unique environment of the SGSSI Marine Zone. Using this information, the project aimed to design a network of MPAs that would represent and safeguard the region's biodiversity. It also supported the sustainable management of the area by considering the impacts of climate change, local fisheries, and tourism.

The second project, funded by the Darwin Initiative from April 2010 to March 2012, focused on collecting baseline data about marine life on the South Georgia shelf and slope. It aimed to identify key species – especially those found only in this region – and biodiversity hotspots. This data was used to help develop strategies for conserving marine biodiversity in the SGSSI Marine Zone. Trathan et al. (2014) provides a comprehensive description of the development process of the MPA.

Fisheries Patrol Vessel – *Vicki Foster*

In February 2012, based on the initial outputs from these projects, coupled with expert scientific opinion, the GSGSSI declared the whole SGSSI MZ north of 60˚S to be a sustainably managed MPA using the new Wildlife and Protected Areas Ordinance (2011) as the legal basis for its introduction. At this time the 1.07 million km^2 expanse of ocean was, at its inception, the largest sustainable use MPA on the planet, protecting the seafloor and associated organisms from the destructive practice of bottom trawling and ensuring the sustainable management of all fisheries, dependent and related species. The initial declaration enshrined in law much of the existing protection that was in force around South Georgia and the South Sandwich Islands through fisheries policies and legislation.

In parallel with the initial declaration of an MPA, GSGSSI convened a scientific workshop to consider what extra protection might be appropriate within the newly created MPA. The workshop produced a series of recommendations, which formed the basis of a stakeholder consultation.

Following this consultation, new measures were agreed and the 2012 Order was repealed and replaced with the South Georgia and South Sandwich Islands Marine Protected Areas Order (2013). This new legislation added Benthic Closed Areas (BCAs), a seasonal closure of the krill fishery, and a 12nm pelagic closed area around each of the South Sandwich Islands, to the existing protections. The new measures were announced in January 2013 and came into force when the Order was enacted on the 13th June 2013. A Management Plan (GSGSSI, 2013) was developed to enhance the public understanding of the MPA measures and their conservation objectives and to provide guidance on how the MPA is managed including permitting of activities such as scientific research, compliance and surveillance.

A review process was established, ensuring regular, 5-yearly analysis by experts to assess whether the MPA measures were achieving their objectives and remained relevant, whilst also considering whether the research that was needed to assess the MPAs effectiveness in achieving its objectives was being carried out (see *Section 3.8: The MPA Review Process*). Since 2013, two 5-yearly MPA reviews have been completed with scientific experts working alongside stakeholders representing environmental NGOs, tourism and the fishing industry under the guidance of an independent chair to provide advice to GSGSSI. Each review has operated under clear Terms of Reference with the 2018/19 review having a focus on assessing the adequacy of the science and monitoring of the MPA. The 2023/24 review focussed more whether there was sufficient evidence to assess the efficacy of the MPA measures in force. Both reviews provided a route by which new scientific information pertaining to the MPA could be assessed by experts and consideration given to whether additional MPA measures were necessary. Following the completion of each review significant enhancements were made to the MPA and its measures.

The 2018/19 review led to a significant extension of the MPA area, extending to cover all of the SGSSI Maritime Zone totalling 1.24 million km^2 whilst the area covered by No Take Zones (NTZs), where all fishing activity is prohibited, increased from 20,431km^2 to 284,213km^2, covering 23% of the MPA total area. The NTZs were extended to encompass the unique hadal environment of the South Sandwich Islands Trench and all the region within the Maritime Zone lying to the south of 60˚S, a large area covering a range highly diverse seabed habitats and seamounts. Additionally, the seasonal closure of the krill fishery was extended by two months based on new data on whale and penguin foraging whilst a complete ban on the use of highly polluting heavy fuel oil (HFO) by vessels operating within the MPA was introduced. At the same time, an announcement was made to prohibit the commercial exploitation of mineral or hydrocarbon resources across the entire Maritime Zone (see Section 5: Threats and Threat Mitigation).

Another significant output from the 2019 review was a commitment to develop an MPA Research and Monitoring Plan (GSGSSI, 2021a). With support from the Darwin Plus grant scheme (Grant, 2020), this critical document provides a framework to encourage the collection and analysis of data to evaluate the effectiveness of the MPA. An MPA Data Portal (BAS, 2025d) developed in conjunction with the RMP allows access to the latest information on the status and trends of marine biodiversity, environmental conditions and human activities, as well as updates on scientific research and monitoring (see *Section 3.6: Research & Monitoring*).

The outcomes of the 2024 review resulted in new legislation which came into force in April 2025 which extended the No Take Zones to 470,396km^2 – 38% of the MPA, whilst increasing the area of pelagic closed areas (where krill and icefish fishing are prohibited to 30,919km^2). It also led to the updating of the MPA Management Plan and the RMP will also be revised to include new research priorities identified through the MPA review process.

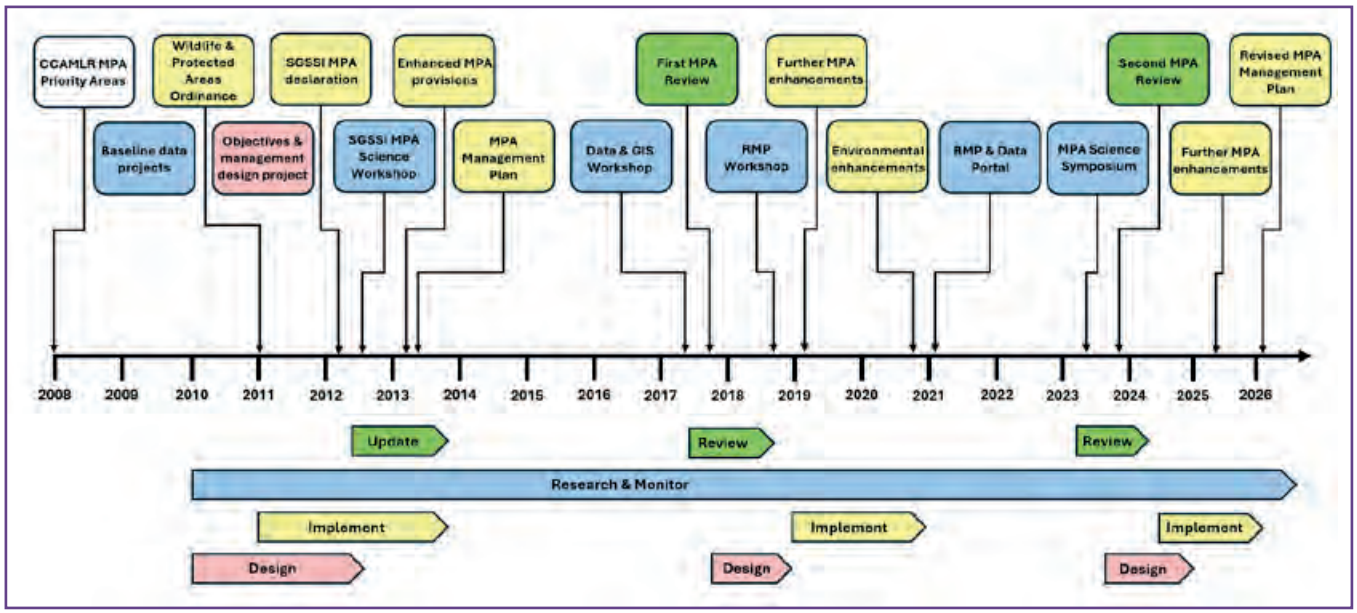


Fig. 8: *Timeline showing key events and actions in the development, designation, implementation, monitoring and research, and review of the SGSSI MPA. The boxes above the timeline summarise key events and actions in the SGSSI MPA life cycle, and the arrows below the timeline show the timeframes of different aspects in the MPA life cycle. Events relating to MPA design are shown in red, those linked to implementation in yellow, research and monitoring activities are shown in blue, and MPA review points in green (Image: Susie Grant & Marta Soeffker)*

3.4 MPA Measures

3.4.1 SGSSI MPA Background

Since inception, the key objective of the SGSSI MPA has been the conservation the rich marine biodiversity within the Territories maritime zone that provides a framework for marine environmental management and research needs. The objectives of the MPA have been considered at successive reviews and are as follows:

3.4.1.1: Objectives

- Conserve marine biodiversity, habitats and critical ecosystem function;
- Increase the resilience of the marine environment to the effects of climate change;
- Ensure that fisheries are managed sustainably, with minimal impact on associated and dependent ecosystems;
- Manage other human activities including shipping, tourism and scientific research, to minimise impacts on the marine environment;
- Protect the benthic fauna from the destructive effects of bottom trawling;
- Facilitate recovery of previously over-exploited marine species;
- Prevent the introduction of non-native marine species.

Elephant seals fighting for beachmaster status – *Rod Strachan*

3.4.1.2: Restrictions

Within the MPA the following restrictions apply:

- Commercial bottom trawling is banned throughout;
- Fishing for krill is not permitted for the seven months between October 1st and 30th April to minimise competition between the fishery and krill dependent predators;
- Fishing activity is highly regulated and only allowed subject to licences issued by GSGSSI (see *Section 4.2.2: Management of Sustainable Fisheries*);
- No disposal of plastic, fishing materials, or other inorganic waste is allowed;

The use and carriage of heavy fuel oil by vessels operating within the MPA is prohibited.

3.4.1.3: Permitted Fishing Activities

- Bottom fishing with longlines for toothfish is permitted outside the No Take Zones and Benthic Closed Areas at depths of between 700m and 2250m within the General Fisheries Zone and Pelagic Closed Area, subject to a conditional licence issued by the Director of Fisheries. This restricts longline fishing to an area of 5% of the MPA;
- Pelagic trawling for mackerel icefish and krill (outside of the closed season, Pelagic Closed Areas and No Take Zones) is permitted, subject to a conditional licence issued by the Director of Fisheries;
- Limited research bottom trawling may be permitted in prescribed areas, subject to authorisation (a Regulated Activity Permit) issued by GSGSSI in order to maintain long-term time-series data.

3.4.2 Zonation/Protection Measures within the MPA

There are a number of different management areas within the MPA regulating where different types of permitted fishing activity can take place (Fig. 9):

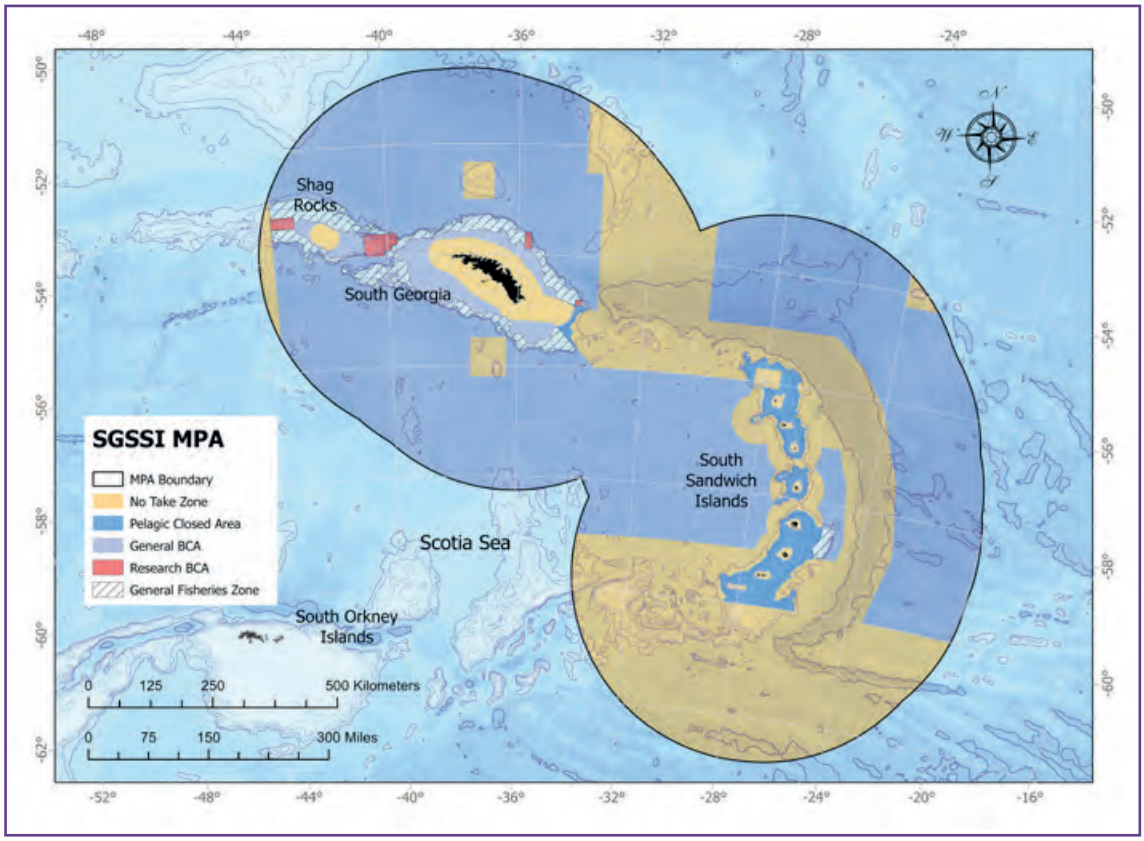


Fig. 9: *Map of the SGSSI MZ highlighting all the different management areas within the MPA*

3.4.2.1: No Take Zones

Within the MPA is a network of 17 No Take Zones (NTZs) in which all fishing is prohibited and research can only be conducted under strict permit conditions (Fig. 10). The NTZs cover 470,396 km^2 - approximately 38% of the total MPA area. There is a contiguous No Take Zone linking the northern and southern boundaries of the MPA, with the South Georgia, South Sandwich and South Sandwich Trench NTZs linked via the North Scotia Ridge. This contiguous zone covers a large range of representative habits including all of the most highly biodiverse shallow water areas surrounding the islands of South Georgia and the South Sandwich Islands archipelago's which were the historic focus of fishing activities.

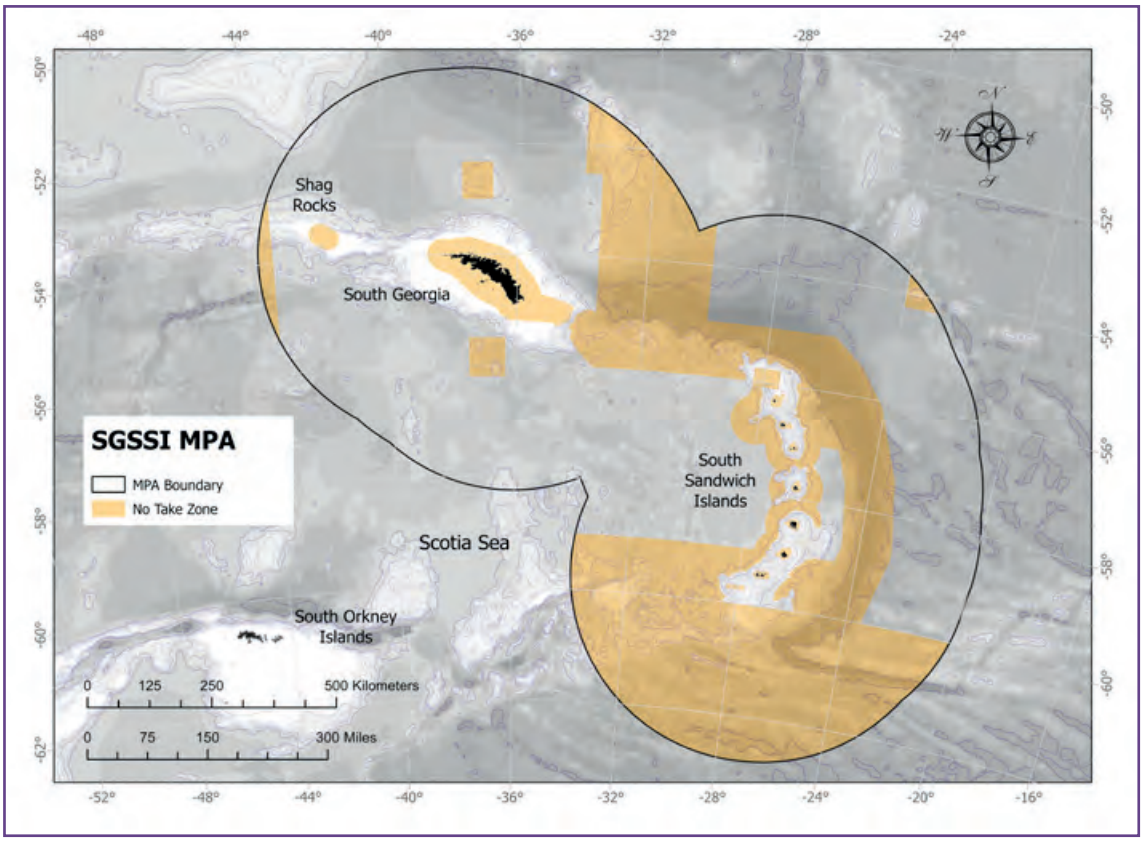


Fig. 10: *No Take Zones (NTZs) (orange) within the MPA*

These NTZs cover habitats ranging from 0 > 8000m and include all areas where depths are less than 100m, plus 58% of seafloor between 100 and 200m where benthic biodiversity is highest and foraging by krill dependent predators is most extensive (Fig. 11). The highly protected NTZs protect the entire water column in a very large areas of ocean which currently represents the 7th largest such area of No Take Zones in any MPA globally (Marine Conservation Institute, 2025). The expansion of the area covered by No Take Zones following the 2025 review (see *Section 3.3: Evolution of the SGSSI Marine Protected Area*) was driven in part by a recommendation that NTZs should extend over areas of higher marine mammal density, including recovering populations of cetaceans. As a result, there is now extensive spatial overlap of the contiguous NTZs with the Scotia Arc and South Georgia Important Marine Mammal Areas (IMMA) (IUCN Marine Mammal Protected Areas Taskforce, 2021) and Key Biodiversity Areas (KBA)s (Handley et al., 2020).

No Take Zones also protect distinct ecological features including the southern seamounts which are spawning areas for Patagonian toothfish, the North West Georgia Rise- a 2,000m high bathymetric feature north of South Georgia. A 12nm No Take Zone extends out over the shallow and biodiverse shelf region around Shag Rocks, a distinct habitat that has ecological similarities with both the Patagonian and South Georgia shelves. Additional No Take Zones were introduced in 2025 covering areas of suitable toothfish habit west of Shag Rocks and a seamount in the extreme northeast of the MPA. Existing Benthic Closed Areas in the South Sandwich Islands region were also changed to No Take Zones to protect specific features from longline fishing interactions.

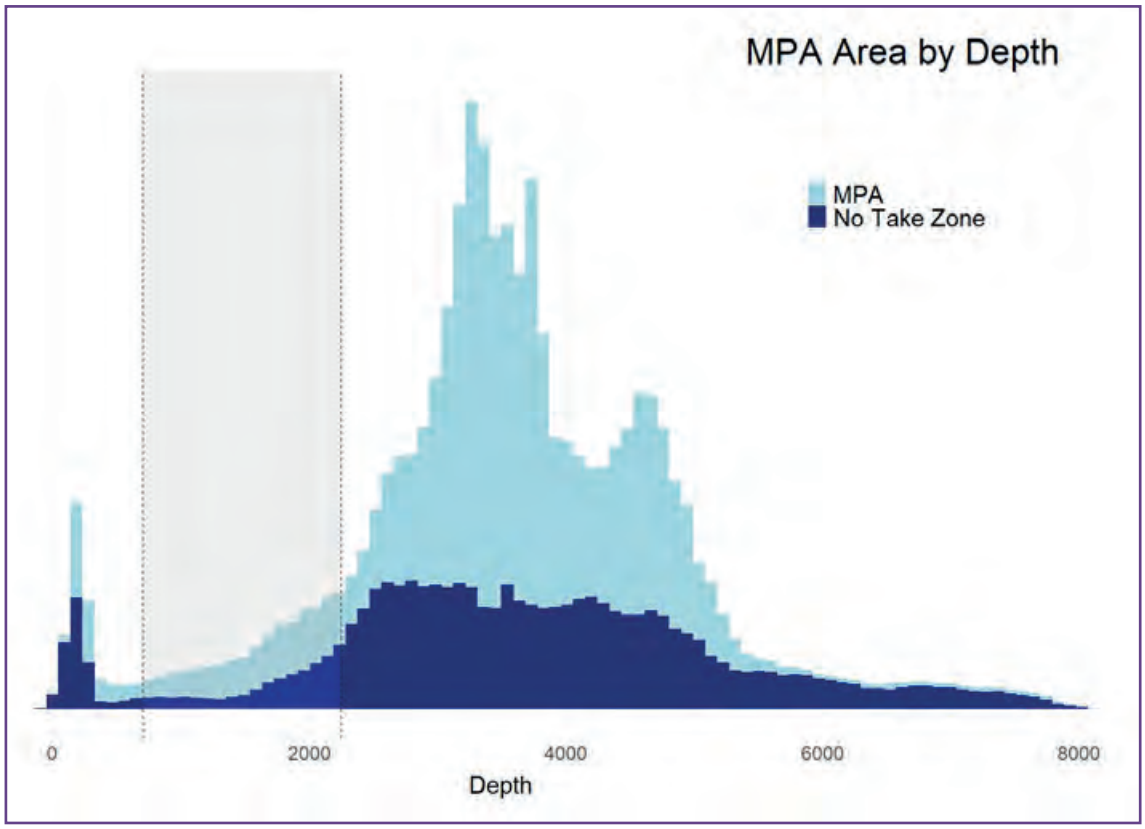


Fig. 11: *Coverage of No Take Zones by depth throughout the SGSSI MPA showing high coverage within highly biodiverse shallow waters. The shaded region indicates depths to which long line fishing on the seafloor is restricted (outside the No Take Zone) (Image: Oliver Hogg)*

3.4.2.2: Pelagic Closed Areas (PCAs)

All pelagic (mid-water) commercial trawl fishing activity is prohibited in these areas (Fig. 12). They cover 30,919km^2 and extend over depths between 700- 2250m water depth with majority of the zone located around the South Sandwich Islands They are an effective means of prohibiting krill fishing activity in relatively close proximity to the coast, where krill dependent predator density is highest, whilst allowing the highly regulated longline fishery for toothfish to continue. This ensures that data necessary for accurate stock assessments for toothfish can be obtained from these areas and facilitate the fishing of research lines in prescribed areas according to the fishery research plans. Icefish fishing is also prohibited in these areas, and all bottom trawling activity is prohibited as it is across the entire MPA.

Taken together, the No Take Zones and Pelagic Closed Areas prohibit all commercial krill and icefish fishing over an area exceeding 500,000 km^2 (40%) within the MPA.

Squid recorded by a longline camera – *Cefas*

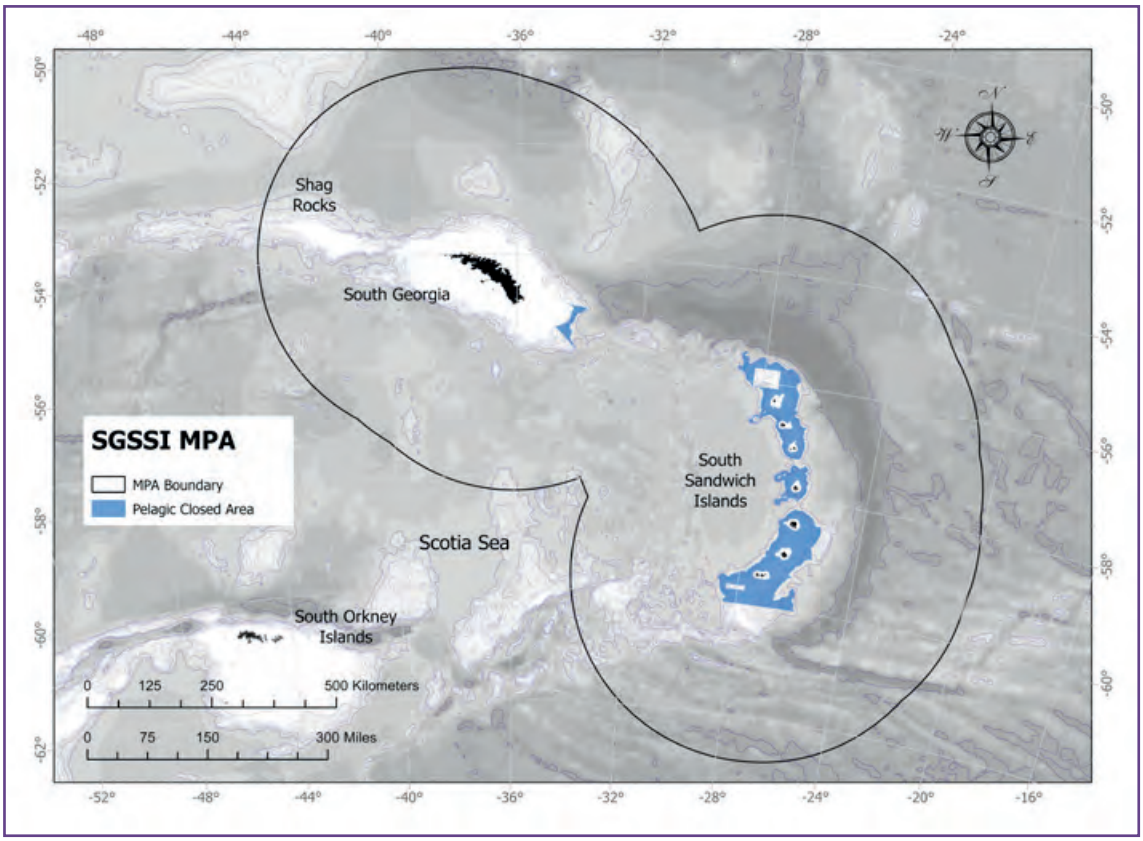
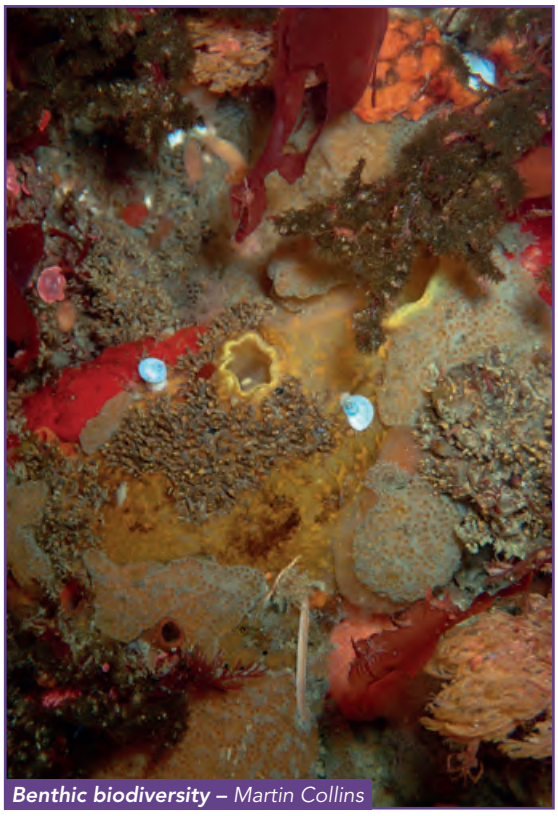


Fig. 12: *Pelagic Closed Areas (PCAs) (blue) within the MPA where all pelagic (mid-water) commercial trawl fishing activity is prohibited*

3.4.2.3: Benthic Closed Areas (BCAs)

General Benthic Closed Area (gBCA)

All commercial fishing activity using any bottom contact fishing gear such as longlines or pots is prohibited over an area of seabed exceeding 705,225km^2 (Fig. 13). Licensed, regulated pelagic fishing for krill is permitted in this zone during the five months of the austral winter (krill fishing is prohibited for the seven months between October - April). The general BCA protects seabed habitats from the impacts of bottom fishing gear and provides refugia for demersal fish species and invertebrates that inhabit waters shallower than 700m and deeper than 2,250m. Whilst krill fishing can take place in this zone there are many additional regulations governing the spatial distribution of the krill fishery. In reality the krill fishery has been confined to discreet locations along the north coast of South Georgia, and no commercial krill fishing activity has taken place at the South Sandwich Islands since the SGSSI Maritime Zone came into force in 1993. If there is a strong scientific rationale to do so, the GSGSSI may permit limited research fishing activity within this area under the Regulated Activity Permit (RAP) process.



Benthic biodiversity – *Martin Collins*

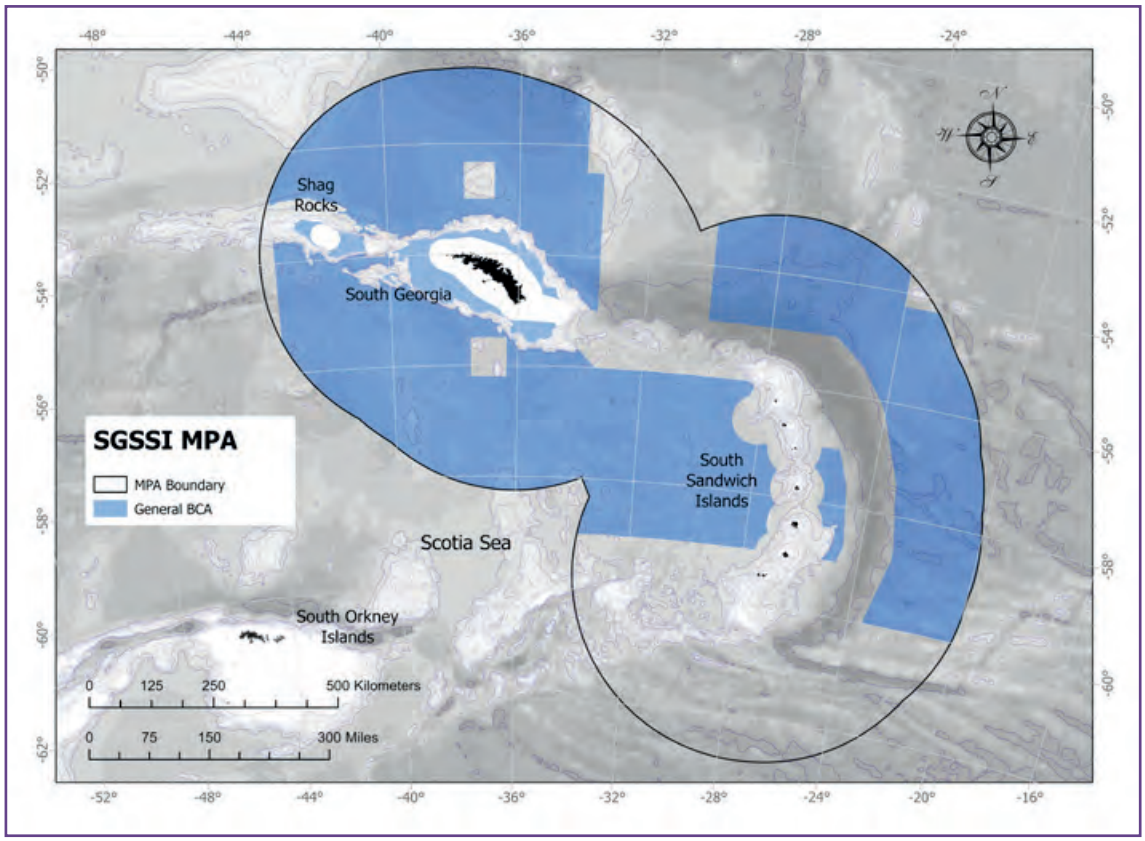


Fig. 13: *General Benthic Closed Areas (gBCAs) (blue) within the MPA where all commercial fishing activity using any bottom contact fishing gear such as longlines or pots is prohibited*

Research BCAs (rBCAs)

Four research BCAs are located at depths of between 700-2,250m around South Georgia (Fig. 14). All fishing with bottom contact fishing gear is prohibited within these areas except for prescribed research activities which can only be carried out under a Regulated Activity Permit from GSGSSI. This research includes the tagging of toothfish which must be tagged at the greatly increased rate of 15 tags per tonne in these areas. The research BCAs serve to greatly reduce fishing effort in order to conserve specific habitats and species in regions and depths where longline fishing for toothfish would otherwise be permitted. The research BCAs cover 4,116 km^2 and are comprised of the following:

West Shag rBCA

The West Shag rBCA (1,039 km^2) is situated on the western end of the Shag Rocks shelf and is intended to protect vulnerable marine fauna and provide refugia for adult toothfish. It was selected as it was an area of high benthic bycatch; particularly abundant in gorgonians, bryozoans and corals.

West Gully rBCA

The West Gully rBCA (2,494 km^2) is situated on the eastern end of the Shag Rocks shelf and is an important area for the dispersion of juvenile Patagonian toothfish. Bycatch monitoring identified it as a hotspot of vulnerable marine fauna, notably gorgonians, corals, bryozoans and sponges.

Northern rBCA

The Northern rBCA (440 km^2) is situated to the northeast of Cumberland Bay and was selected as a refugia for spawning adult toothfish and to protect vulnerable marine fauna; notably gorgonians, sponges and corals.

Eastern rBCA

The Eastern rBCA (143 km^2) is a relatively small area to the east of South Georgia. It is intended to protect vulnerable taxa such as bryozoans, corals and gorgonians.

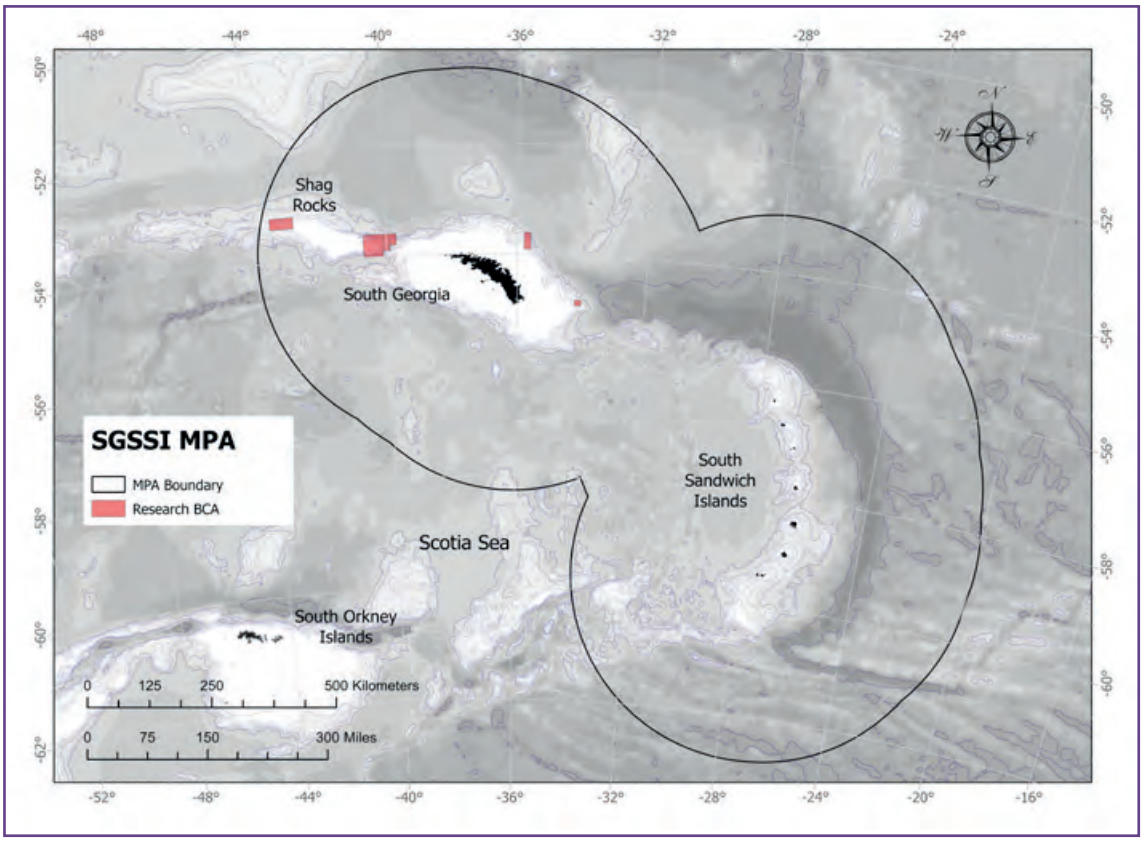


Fig. 14: *Research Benthic Closed Areas (rBCAs) (red) within the MPA where all fishing with bottom contact fishing gear is prohibited except for prescribed research activities which can only be carried out under a Regulated Activity Permit*

Five additional Benthic Closed Areas which were introduced in 2013 were redesignated as NTZs (see above) in April 2025 following the second five-year review - commercial fishing is prohibited in these areas, covering key habitats on the North Georgia Rise, Southern Seamounts, and North East Georgia Rise around South Georgia and the Protector Shoals and Kemp Seamount and Caldera.

3.4.2.4: General Fisheries Zone

This area covers 32,830 km^2, (<3 % of the MPA) with the majority found around South Georgia. Licensed fisheries for toothfish, krill and icefish can operate within this zone, subject to seasonal closures and any other fishery regulations in force (Fig. 15).

Fishing vessels awaiting pre-licensing inspections – *Argos Froyanes Ltd*

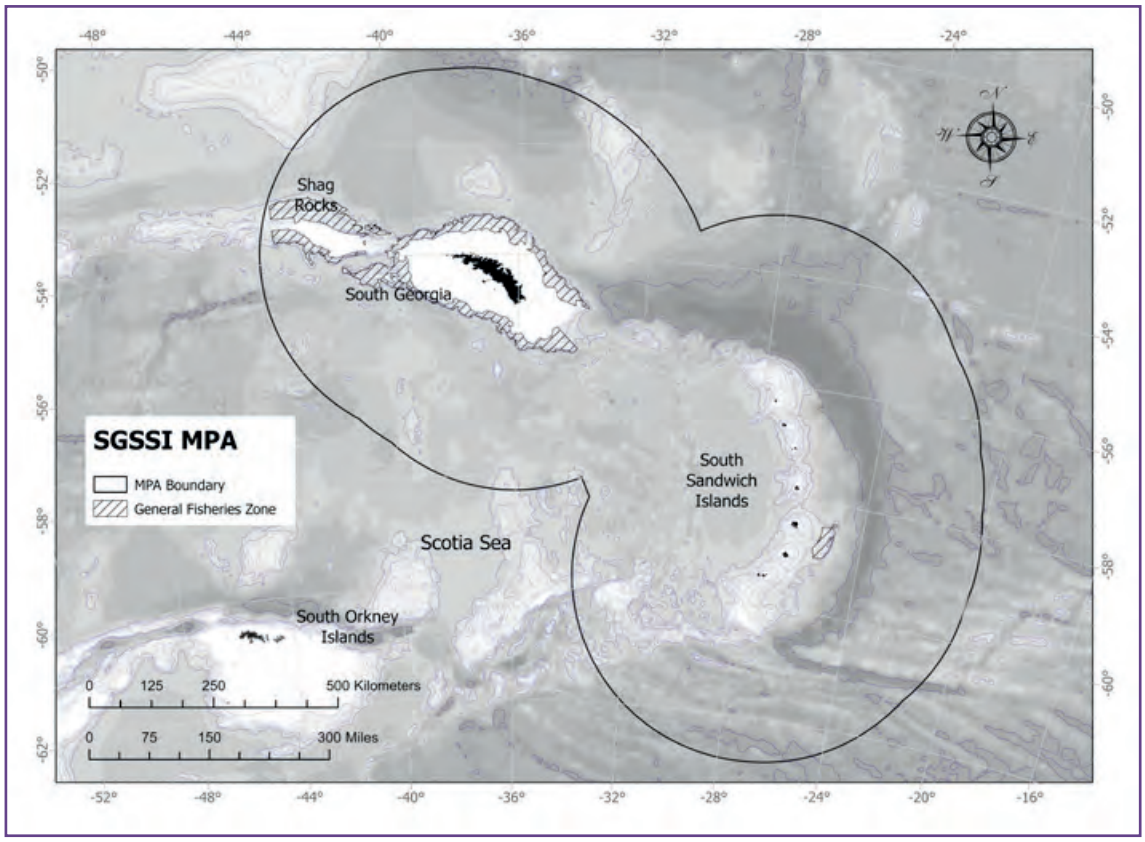


Fig.15: *General Fisheries Zone (stripes) within the MPA where licensed fisheries for toothfish, krill and icefish can operate, subject to seasonal closures and any other fishery regulations*

3.4.3 Seasonal Closure of the Krill Fishery

3.4.3.1: Background

Antarctic krill are a key species in Southern Ocean ecosystems, including the waters around South Georgia and the South Sandwich Islands. Krill link primary production to large predators in short, efficient food chains. It is thus important that the fishery for krill is carefully managed to reduce the risk of any impact on the many krill-dependent predators. A key time for many of the krill-dependent predators is the summer breeding season when they are limited in their foraging range (e.g. Antarctic fur seals, gentoo and macaroni penguins). Whilst the 30km No Take Zone at South Georgia provides considerable protection for many of the land-based predators it would still be possible that krill could be depleted in important predator foraging areas outside the No Take Zones during the key summer months.

Thus, to reduce the risk of the krill fishery having an impact on krill dependent predators, the MPA includes a seasonal closure of the krill fishery to coincide with the main breeding season of birds and mammals.

3.4.3.2: Objectives

- To reduce the risk of competition between the krill fishery and krill-dependent predators during their breeding season.

Restrictions

- No krill fishing is allowed within the South Georgia and South Sandwich Islands MPA from October 1st until April 30th.

For full details of all the MPA Measures, see *Appendix 3: Marine Protected Area Order (2025).*

3.5 Resources for MPA Management

GSGSSI has made a clear and public commitment to safeguard the Territory's environment and ensure environmental recovery and resilience through world-leading evidence-based sustainable management across South Georgia and the South Sandwich Islands. One of the seven priority areas identified within the Government's 'Protect Sustain Inspire' stewardship framework (GSGSSI, 2021b) is "*to set an exceptional standard for management of our marine environment underpinned by robust science*" and this requires an ongoing programme of work (Table 1) and significant resources to deliver this pledge.

3.5.1 Staffing

Responsibility for the management of the MPA lies with the Director of Fisheries and Environment (DoFE) acting on behalf of HM Commissioner for SGSSI, but management is integrated across all sections of the Government. Substantial support is provided by the Senior Marine and Fisheries Manager, who, with the DoFE is responsible for the management of the MPA and the sustainable fisheries that operate in parts of it. Permitting of other activities within the MPA such as scientific research lies with the Head of Environment who works closely with the Visitor Manager to manage all visits of vessels and ensuring that strict biosecurity regulations are enforced. Government Officers operate *in situ* on South Georgia. They monitor all vessel activity within the MPA and work with the Director of Operations and Operations Manager in Stanley who task the Fisheries Patrol Vessel and liaise with the military command in the Falkland Islands to coordinate maritime patrols to the Territories.

3.5.2 Funding

The MPA is primarily funded and supported by the GSGSSI which spends a significant percentage of its annual budget on marine protection (Fig. 16). The expenditure on the Fisheries Patrol Vessel alone accounts for ~ 55% of the budget, with significant outlay on monitoring and research each year. GSGSSI with the FCDO funds the BAS scientific research program carried out from King Edward Point (KEP) which has a significant focus on sustainable fisheries research and monitoring the wider marine ecosystem (see *Section 3.6: Research & Monitoring*). Most of GSGSSI income is obtained from fishing licence revenues, with an increasing proportion coming from tourism (Fig. 16). GSGSSI has a long-term agreement with Cefas to provide fish stock assessment advice, and contracts MRAG/Capfish for the provision of scientific observers on fishing vessels.

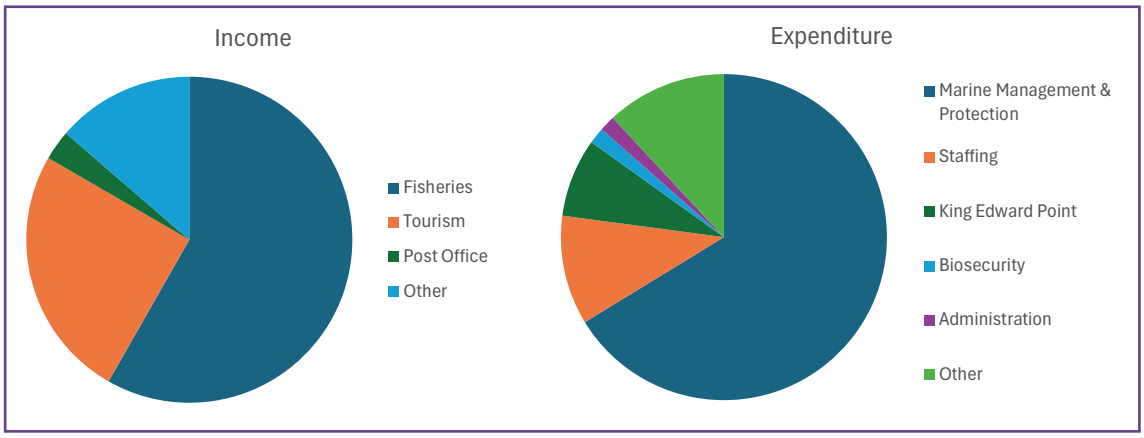


Fig. 16: *GSGSSI Income vs Expenditure [2023]*

The GSGSSI receives substantial support for MPA management from the UK Government, largely through funding from the Blue Belt Programme, the UK Government's marine conservation initiative that supports the sustainable management and protection of marine environments across the UK Overseas Territories. Funds are either provided directly to GSGSSI or used to finance agreed projects from key delivery partners – the Centre for Environment, Fisheries and Aquaculture Science (Cefas) and Marine Management Organisation (MMO). Examples include the remote surveillance of the MPA using satellite technology by the MMO and the dedicated research survey to the South Sandwich Islands led by Cefas scientists in 2019. The Blue Belt Programme has also provided significant financial support for the two 5-yearly MPA reviews undertaken by GSGSSI. A substantial number of projects have also been supported through the UK Darwin Plus grant scheme with a major focus on conservation of biodiversity (Fig. 17).

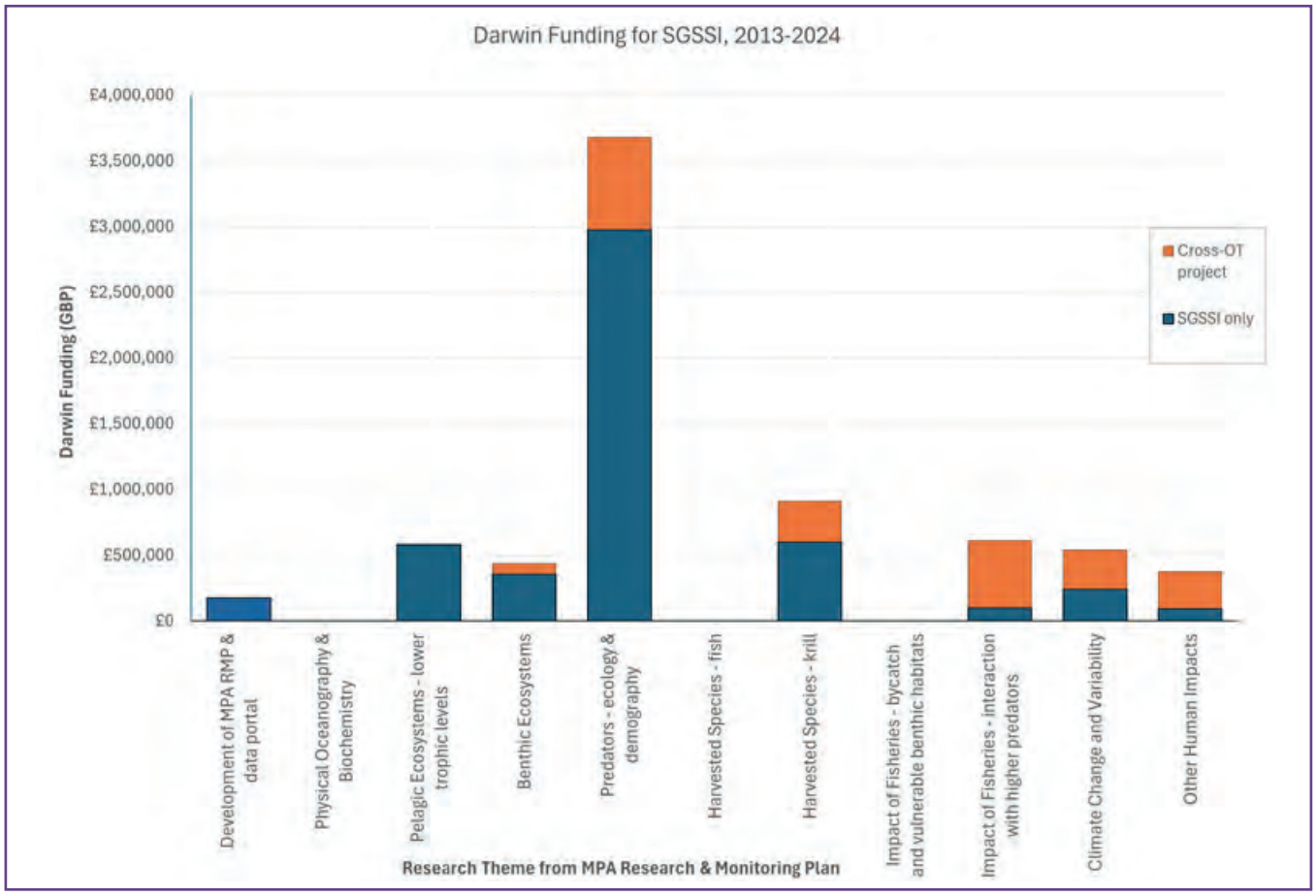


Fig. 17: *Darwin Plus grant funding (2013-2024) for projects under each of the Research & Monitoring Plan themes*

The implementation, monitoring and management of the SGSSI MPA has benefited substantially from the UKs funding of the British Antarctic Survey's scientific research activity in the region. This includes the research facility at Bird Island, which has operated since 1957 with a focus on conservation biology of krill dependent predators, and the long-term ship borne research programmes such as the Western Core Box research into the krill centred ecosystem at South Georgia (see *Section 3.6: Research & Monitoring*).

Maintaining funding for the MPA will be critical to its future success. Funding is vital to ensure monitoring and surveillance to prevent the threat of IUU but also to provide the long-term monitoring to assess efficacy of MPA measures and to support the 5-yearly MPA review process. Several studies have suggested that the ability to diversify income streams within the Government to support funding for MPA management are limited, but GSGSSI will continue to seek opportunities to expand the funding portfolio, including working with the NGO sector. However, it is likely that fishing and tourism revenue will continue to fund the majority of MPA monitoring and management activities in the future.

Table 1: *MPA Management Actions*

Management Theme	Strategic Objective	Methodology/ Activity	Lead/ Partners	Frequency/ Milestones	Expected Outputs/Actions
Appropriateness of MPA Objectives	Assess relevance of MPA conservation aims and whether revised/new objectives are required	Independent expert review chaired externally, involving scientists, Government officials, MPA managers, and stakeholders (fishing, tourism, NGOs)	GSGSSI, external reviewers, Blue Belt partners	Every 5 years	Recommendations for legislative updates; revisions to management plans and spatial mapping outputs
Effectiveness of MPA Measures	Evaluate whether MPA measures are achieving intended conservation outcomes				
Scientific Robustness of MPA Measures	Ensure MPA measures remain valid in light of evolving scientific understanding and emerging threats	Regular dialogue with scientific advisors; formal review of MPA monitoring programmes;	GSGSSI, scientific advisors, Blue Belt partners	Ongoing with formal 5-year MPA review	Adaptive updates to management measures, monitoring protocols, Research & Monitoring Plan, and digital resources
Synergy between MPA & TPA Monitoring and Management*	Ensure complementary management and research activities for overlapping species and habitats	Regular dialogue with scientific advisors; formal review of TPA Management Plan and Research & Monitoring Plan	GSGSSI, scientific advisors, TPA Advisory Group	Ongoing with formal 6-year TPA review	
MPA Management Capacity and Process	Assess whether management systems and resources are sufficient to meet conservation objectives	Regular meetings with UK Blue Belt partners; periodical review of management needs; PAME assessments; use of updated tools	GSGSSI, Blue Belt Programme, MMO	Ongoing with annual review; formal 5-year evaluation	Identification of resourcing gaps; prioritisation of capacity-building actions
Sustainable Management of Fisheries in the MPA	Ensure that licensed fisheries are operating to the highest standards of sustainability and in line with CCAMLR obligations	Stock assessments; in-season catch monitoring; fisheries-independent surveys; competitive licence rounds; MSC recertification with periodical surveillance audits	GSGSSI, Cefas, BAS, Blue Belt Programme, MSC Conformity Assessment Bodies (CABs)	Annual scientific advice, surveillance audits, bi-annual groundfish survey, 5-year MSC recertification	Sustainable, responsible, well managed fisheries; continued high-scoring MSC certification
IUU and Compliance Risk Assessment	Monitor and respond to illegal, unreported, and unregulated fishing and non-compliance threats	Vessel & MZ monitoring; regular update meetings with MMO; seasonal planning for remote surveillance and satellite monitoring	GSGSSI, MMO, Blue Belt compliance team	Daily monitoring, bi-monthly & annual meetings	Risk assessments; surveillance programme updates; compliance reports

*Reflects the overlap between the Marine and Terrestrial Protected Areas (MPA & TPA), particularly relating to those marine species that spend significant time ashore during their breeding seasons (see Section 3.6: Research and Monitoring and Section 3.8: The MPA Review Process)

3.6 Research & Monitoring

Ongoing research and monitoring forms a critical part of effective protected area management. Shaped and supported by Management Plans, Research & Monitoring Plans, and tools such as databases and GIS, it allows managers to address knowledge gaps, assess threats and impacts, monitor change and measure the effectiveness of management measures.

3.6.1 MPA Research and Monitoring Plan

The South Georgia and South Sandwich Islands (SGSSI) Marine Protected Area (MPA) Research and Monitoring Plan (RMP) (GSGSSI, 2021a) provides a strategic framework to evaluate and enhance the effectiveness of conservation measures within the SGSSI MPA. Developed in collaboration with scientists from the British Antarctic Survey and a broad network of scientific stakeholders, the RMP was supported by Darwin Plus - a UK Government funding programme for environmental initiatives in the UK Overseas Territories (UKOTs) (Grant, 2020).

Deploying remote cameras at the South Sandwich Islands – *Tom Hart, Penguin Watch*

The RMP encourages scientists and stakeholders to collect, access, and analyse data, including baseline indicators, to inform evidence-based management. It guides scientific activities that aim to:

- Deepen understanding of the SGSSI marine ecosystem
- Assess the nature and extent of environmental change
- Identify and evaluate threats to biodiversity
- Measure the effectiveness of existing conservation measures
- Support the development of adaptive and responsive management strategies

Organised around ten core research themes aligned with the MPA's objectives, the RMP outlines current and proposed monitoring activities that track the status of key ecological features—particularly in relation to environmental change and human impacts. It also highlights priority research areas and identifies specific management zones or geographic locations for each activity. Where applicable, the plan indicates the status of ongoing efforts and the priority level for future work. Active and planned research projects are also featured.

Research and Monitoring Themes

- Physical Oceanography and Biogeochemistry
- Pelagic Ecosystems – Lower Trophic Levels
- Predators – Ecology and Demography
- Benthic Ecosystems – Species and Habitats
- Harvested Species – Fish
- Harvested Species – Krill
- Fisheries Impacts – Bycatch and Vulnerable Benthic Habitats
- Fisheries Impacts – Interactions with Higher Predators
- Climate Change and Variability
- Other Human Impacts

First published in 2021, the RMP was developed in response to recommendations from the 2017/18 MPA review. The SGSSI MPA undergoes a formal review every five years, providing an opportunity to assess and update the RMP to reflect emerging science, evolving threats, and management needs.

3.6.2 TPA Research and Monitoring Plan

When the TPA was designated in 2022, it was recognised that there would be considerable overlap between the marine and terrestrial realms, particularly relating to those marine species that spend significant time ashore during their breeding seasons. The TPA RMP (GSGSSI, 2025c) was designed to follow a similar format to the MPA RMP with three overarching themes:

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

The TPA RMP maps activities to the relevant Conservation Objectives and Management Aims in the 2023-2029 TPA Management Plan (GSGSSI, 2023a). Under each theme, current and planned data collection activities that contribute to the TPA Conservation Objectives are listed. Some of these activities may also be captured in the MPA RMP, so the TPA RMP only includes overlapping research that focuses on the relationship between terrestrial ecosystems and marine species.

3.6.3 Data Portal and Geographic Information System (GIS)

The South Georgia and South Sandwich Islands (SGSSI) Marine Protected Area (MPA) Data Portal is a powerful tool designed to support the management of one of the world's largest MPAs. It offers a central platform where managers, scientists, and stakeholders can access up-to-date information on marine biodiversity, environmental conditions, human activities, and ongoing scientific research and monitoring.

Launched in 2022, the Data Portal was developed through the same Darwin Plus-funded project as the Research and Monitoring Plan (Grant, 2020). The initiative was led by the British Antarctic Survey and the UK Polar Data Centre, in partnership with the Government of South Georgia & the South Sandwich Islands, and with contributions from a broad network of scientific experts and stakeholders.

Key features of the Data Portal include:

- Over 150 interactive maps and data summaries
- Direct links to the South Georgia online GIS
- Integration with the UK Polar Data Centre's Discovery Metadata System

Complementing the portal is the SGSSI MPA Geographic Information System (SGSSI MPA GIS - https://www.sggis.gov.gs/home/sgssi_mpa). This comprehensive digital mapping platform allows users to visualise and explore MPA measures in detail. Through this system, users can view spatial data, examine management zones, and download shapefiles for further analysis.

Together, the Data Portal and GIS provide an accessible, transparent, and scientifically robust foundation for informed decision-making and adaptive management of the SGSSI MPA.

3.6.4 Scientific Research

3.6.4.1: British Antarctic Survey (BAS) Science

The British Antarctic Survey (BAS) has two research stations on South Georgia, at Bird Island and King Edward Point. The Bird Island research station, active since 1957, has a year-round scientific presence of three zoological field assistants (ZFAs) plus a station leader, and additional scientists and technical staff visit the station during the summer period. The ZFAs specialise in seals, penguins or albatross/petrels and their work focuses on the population dynamics, feeding ecology and reproductive performance of these higher predators, with a remarkable long-term data series dating back several decades.

The King Edward Point (KEP) Research Station is operated by BAS on behalf of GSGSSI and the FCDO, and supports a collaborative scientific programme aimed at advancing the sustainable management of the SGSSI Marine and Terrestrial Protected Areas. The South Georgia Science Plan (BAS, 2024) outlines a 5-year programme of research designed to deliver essential data that align with the objectives of the RMP and sustainable fisheries management (Fig. 18). There are two marine biologists based at KEP who deliver the science plan in conjunction with the UK-based KEP science team and a wide range of collaborators from both BAS and external organisations.

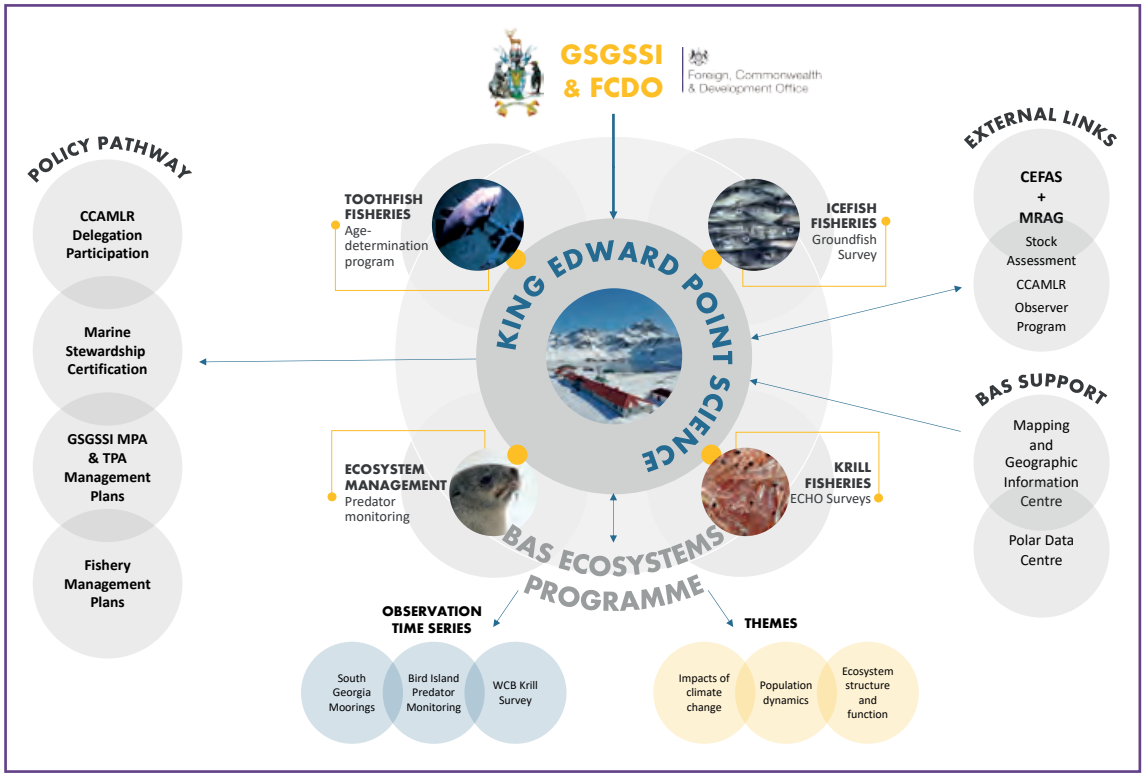
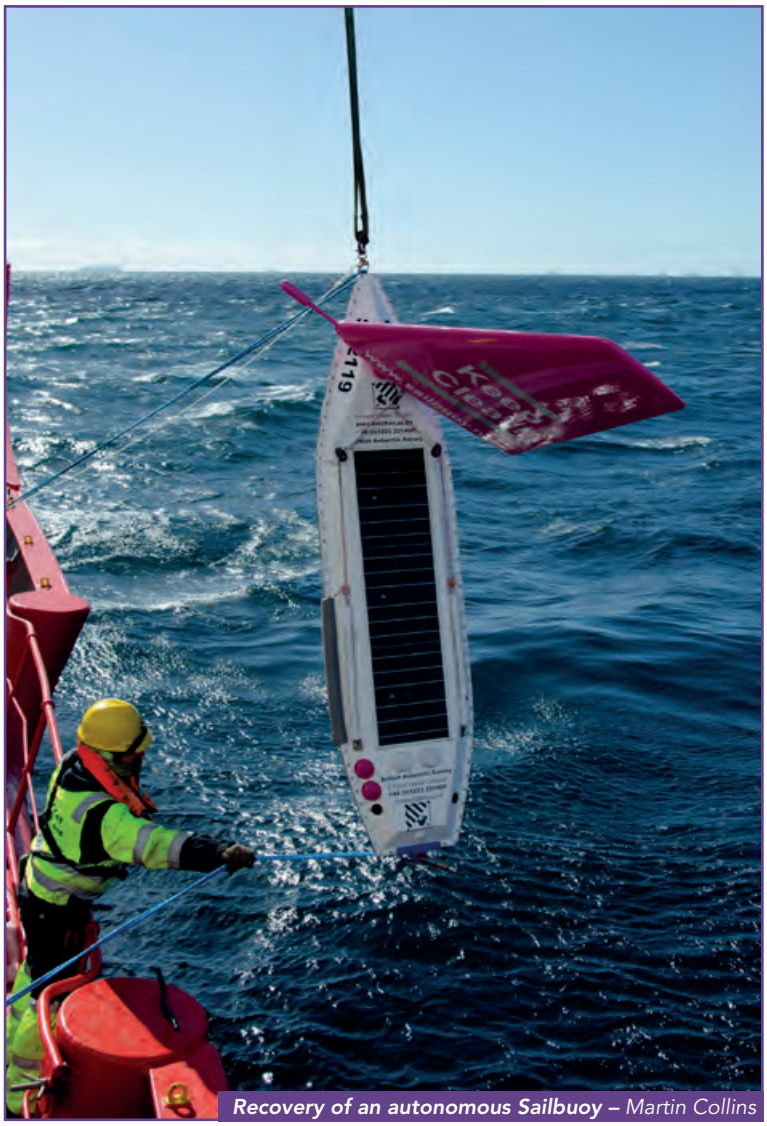


Fig. 18: *Schematic of the KEP Science Project, illustrating its connections to the BAS Ecosystems Programme, other BAS scientific initiatives and support functions, as well as key external partnerships including the Foreign and Commonwealth Development Office (FCDO), Government of South Georgia & the South Sandwich Islands (GSGSSI) and the South Georgia Liaison Committee (SGLC) (Adapted from BAS, 2024)*



Recovery of an autonomous Sailbuoy – *Martin Collins*

3.6.4.2: Visiting Scientists

In addition to the core BAS research programmes, SGSSI welcomes visiting scientists every year covering a range of themes from the RMP, from large scale research cruises using autonomous technology to explore the deepest hadal zones of the South Sandwich Islands Trench, to small scale projects collecting water samples for eDNA analysis. Fishing vessels, cruise ships, yachts and the GSGSSI Fisheries Patrol Vessel have all provided 'platforms of opportunity' for scientists wanting to complete research in this hard-to-reach part of the world. A number of citizen scientist projects are also undertaken within the MPA each year, often as part of the science and education experiences provided to visitors by cruise ship operators.

3.6.4.3: Centre for Environment, Fisheries and Aquaculture Science (Cefas)

Cefas has been contracted since 2012 to carry out annual stock assessments, monitor by-catch levels, provide licensing advice, and conduct other population-level science for the South Georgia fisheries. The contract is jointly operated by the Government of South Georgia & the South Sandwich Islands and the UK Foreign, Commonwealth and Development Office. In addition, as a Blue Belt Programme core delivery partner, Cefas oversees a range of research activities to support management of the MPA, including monitoring spatial and temporal trends in sea temperatures and understanding the potential impact of fishing gear on the seabed by analysing footage from underwater cameras deployed on longlines.

3.6.4.4: Fisheries Observers

All fishing vessels operating in the SGSSI MPA are required to have an independent scientific observer who carries out specific research taskings under the CCAMLR Scheme of International Scientific Observation (SISO). These tasks include collecting biological measurements of target and by-catch species, tagging fish under a catch/release programme, and recording details of tag-recaptures. The observers also follow additional GSGSSI research protocols such as deploying underwater cameras and temperature sensors, completing additional seabird and marine mammal observations, and collecting samples for research projects. Data collected by observers are critical to assess ecosystem impacts of the fisheries on target species and on dependent and related species, and this underpins the entire fisheries management approach.

3.7 Maritime Surveillance

Maritime surveillance is essential to ensure compliance with MPA measures and enable regulations to be effectively enforced. Surveillance helps detect and prevent unauthorised activities, in particular Illegal, Unreported, Unregulated (IUU) fishing. The term IUU can encompass a wide range of fishing activity by vessels that are unwilling or unable to undertake licensed fishing activities in a given area. These vessels can be either licenced operators operating outside of their licence conditions, or completely unlicenced actors operating illicitly (see *Section 5.2: IUU Fishing*).

Maritime surveillance is not only used to detect and deter IUU fishing, but also to ensure that any vessels which are authorised to operate within the MPA are fully compliant with all their permit or licence conditions. A suite of different surveillance techniques is utilised to monitor activities across the SGSSI MPA.

3.7.1 Physical Surveillance

3.7.1.1: "Eyes on the Water"

Vessels that are permitted to operate within the MPA are a major asset for maritime surveillance. Throughout the year, all licenced vessel traffic including visiting expedition vessels and yachts are required to report any fishing vessel sightings to GSGSSI. In 2005 the crew on the cruise ship *Explorer II* identified a potential IUU fishing vessel operating in the SGSSI Maritime Zone and reported it to GSGSSI. The vessel, the FV *Elqui*, was arrested and seized, and subsequently prosecuted and fined. When the fines weren't paid, the vessel was publicly scuttled. The subsequent media coverage reinforced the strict surveillance and enforcement measures in place at SGSSI and undoubtedly encouraged the IUU fleet to avoid the region.

The licenced fishing fleets that usually operate from mid-April to September are also required to report all sightings of other fishing vessels to GSGSSI. The presence of authorised vessels during both the summer and winter months provides surveillance opportunities whilst also creating a deterrent effect. Due in part to the above factors IUU risk is considered to be low, and there have been no confirmed cases since the FV *Nika* case in 2019 (see *Section 5.2: IUU Fishing*). Various surveillance resources are utilised to provide surveillance of the MPA throughout the year as the seasonal activity changes.

3.7.1.2: Fisheries Patrol Vessels

The largest expense for GSGSSI is the contract for a Fisheries Patrol Vessel (FPV). The primary purpose of the vessel, as the name suggests, is fisheries patrolling, although she fulfils numerous other roles including transportation and logistics, as well as providing a platform for science.

Fishery patrols are conducted to locate any potential unlicenced vessels or activities within the MPA and to act as a deterrent to IUU fishing. FPV officers are both licenced GSGSSI Fisheries Protection Officers (FPOs) and designated CCAMLR inspectors, and can monitor compliance of the licensed fishing fleet, whilst also supporting Government Officers in observing the activities of tourist vessels as they operate around the islands.

In addition to the year-round presence of GSGSSI's patrol vessel, maritime patrolling activities are also carried out at SGSSI by the Royal Navy. Their offshore patrol vessel stationed in the Falkland Islands, is a regular visitor to the Maritime Zone.

HMS Protector, the UK's ice patrol ship, also assists with taskings in the SGSSI MZ during her Antarctic season. One of her key roles is undertaking hydrographic surveys of the area to improve the safety of navigation, however several HMS *Protector* officers are also designated CCAMLR inspectors with the capability to conduct at-sea boardings and inspections on any fishing vessels operating within CCAMLR waters.

3.7.1.3: Maritime Patrol Flights

Routine reconnaissance flights, known as "Operation Coldstare", are conducted over the SGSSI Maritime Zone by British Forces South Atlantic Islands (BFSAI) as part of their mission is to help regulate and protect against illegal fishing in the region. Coldstare flights can cover both South Georgia and the South Sandwich Islands, enabling patrolling of the furthest reaches of the MPA.

Priority taskings for the flights are identified by GSGSSI. These can include overflying areas at high risk of IUU fishing, attempting visual confirmation of potential IUU vessels or other features identified by satellite surveillance and collecting imagery of ice conditions including megabergs. The flight also aims to make visual and radio contact with licenced vessels operating in the SGSSI MZ. A designated GSGSSI Fisheries Patrol Officer will be on board Coldstare flights whenever possible.

The maritime patrol flight is often combined with coastal surveillance, including overflying expedition vessels in the bays and inlets around the island. GSGSSI provides a "Wildlife and Low Flying Avoidance Map" indicating the areas and times of year that low level flying is not permitted to prevent wildlife disturbance, particularly during the breeding season.

Maritime patrol flight – *Argos Froyanes Ltd*

3.7.2 Remote Surveillance

The Marine Protected Area encompasses 1.24 million km^2 of ocean and physical monitoring can only cover a fraction of this area, but with assistance from the UK Government's Blue Belt Programme, physical surveillance is supported by a suite of satellite based remote sensing sources. These vessel tracking and "detection" tools facilitate repeated data collection over the vast expanses, enabling risk analysis, detection, tracking and compliance monitoring.

3.7.2.1: AIS Monitoring

Automatic Identification System (AIS) is a means of transmitting information about a ships identity and position to other vessels and shore stations. All vessels >500GT, >300GT on international voyages, and all passenger ships irrespective of size are required to carry AIS onboard under SOLAS regulations, and it is a GSGSSI licence condition that all fishing vessels are required to have an operational AIS which must remain switched on at all times within the SGSSI MZ.

AIS is primarily intended as a safety mechanism to improve navigation and help prevent collision; but it can also be used a means of surveillance which allows GSGSSI to monitor almost all vessel activity within the MPA. However, AIS was not designed to be a tracking tool and it should be noted that nefarious operators can simply not use the system, or manipulate AIS information to attempt to cover their activities. Therefore, other means of surveillance are needed for effective maritime monitoring.

The Blue Belt Programme utilises AIS to monitor vessel movements in the SGSSI MZ in conjunction with CAMTES (Computer Assisted Maritime Threat Evaluation System), which provides maritime analysts with essential vessel information, risk assessment, and analysis tools to help identify targets of interest.

IUU vessels are highly unlikely to broadcast their presence by transmitting their position on AIS, although in 2019 the IUU vessel FV *Nika* was initially identified through AIS monitoring (see *Section 5.2: IUU Fishing*).

3.7.2.2: Satellite Surveillance

Working with the Blue Belt Programme and external partners we have been able to utilise both commercial and publicly available satellite sources to conduct remote sensing surveillance. One source for example is the Sentinel satellite constellation which provides both Electro-Optical (EO) and Synthetic Aperture Radar (SAR) imagery. Optical imagery is essentially high-resolution photographs which are taken of the ocean and can be analysed to identify potential vessels. However, data collection is limited to daylight hours and clear weather conditions which creates challenges for SGSSI where dense cloud cover is a regular occurrence.

SAR technology sends out radar pulses and analyses the reflected signals to create detailed images of the sea surface, revealing the presence of ships by detecting hull signatures. By using radar waves, it allows for observation even through clouds and darkness - essentially, it's a way to "see" an area using radar instead of optical imagery. Vessel detections are subsequently correlated with AIS tracking to identify any "dark" and potentially nefarious vessels.

Amongst other sensors, the Blue Belt Programme also uses Visible Infrared Imaging Radiometer Suite, or VIIRS, another satellite-based optical sensor which enables light sources to be seen both at day and night. The sensor is highly sensitive so that it can detect light emitted by vessels on the ocean at night.

One of the trade-offs with satellite surveillance is that it is possible to either cover a large distance at relatively low resolution, or a smaller area at higher resolution. Additionally, there is a reliance on a predetermined orbiting schedule and frequency of data collection which may or may not pass over a given area of interest where and when required. It is however possible to combine different surveillance methodologies, including SAR, EO, VIIRS and AIS to build up a clearer understanding of potential risks.

3.8 The MPA Review Process

Regular review of the MPA and its associated measures is a key component of effective management which ensures measures remain scientifically robust and effective. GSGSSI has committed to formal five-yearly reviews of the MPA, with two completed since its establishment in 2012. These reviews serve multiple functions, primarily focusing on assessing the efficacy of the MPA measures and evaluating whether the scope of research and monitoring undertaken to assess environmental change and MPA effectiveness remains appropriate.

The review process brings together a broad spectrum of stakeholders, including representatives from Government, the scientific community, the fishing and tourism industries, and NGOs. This is conducted under the guidance of an independently appointed chair, working to agreed terms of reference (GSGSSI, 2018, 2024c). The previous reviews, concluded in 2018 and 2024, led to substantial enhancements to the MPA measures, which were enacted through revised orders and WPA legislation.

In addition to policy refinement, the review process has enabled evaluation of the MPA using globally recognised tools such as the Protected Area Management Evaluation (PAME) process. It also relies heavily on the provision of new scientific data on the SGSSI marine ecosystem—particularly updates on the effects of climate change and anthropogenic impacts on regional marine biodiversity.

The 2023/24 review was preceded by a GSGSSI-hosted two-day scientific symposium, which brought together international experts to present new data across a wide range of ecological disciplines relevant to the management of the SGSSI MPA (GSGSSI, 2023b). These insights have informed both the review itself and the update of the comprehensive research and monitoring plan, helping to identify data gaps and emerging issues requiring urgent scientific attention—such as the ecological consequences of the apparent increasing frequency of 'mega bergs' within the region.

The 5-yearly review process provides a framework that is recognised by stakeholders within which conservation objectives and management effectiveness can be assessed. However, GSGSSI recognises that new threats and/or increasing severity of known risks can occur outside of the regular review cycle. If significant new data emerge during the intervening period, GSGSSI will consider additional MPA management provisions outside of the review period.

As with the MPA, the TPA will undergo a regular review cycle enabling research priorities and management activities to be updated as required. Future reviews of both protected areas will need to take account of the inter-relationship between the MPA and TPAs, ensuring that any complementary management and research activities are considered.

Section 4: Regulated Human Activities

4.1 Visitors to SGSSI

With no permanent population, everyone who arrives at South Georgia and the South Sandwich Islands is classed as a visitor, even those who may be resident at the research stations for a period of time, such as Government Officers, British Antarctic Survey staff, visiting scientists and museum personnel.

South Georgia and the South Sandwich Islands are only accessible by sea. Visiting ships and yachts are carefully managed to minimise any threats to the marine environment, with almost all vessels requiring a permit or licence to operate within the Maritime Zone (excluding military vessels and ships exercising their right of free passage). In addition, in August 2025 GSGSSI introduced a new Entry Control Ordinance (ECO) under which anyone entering South Georgia and the South Sandwich Islands for work or visitor purposes (unless otherwise exempted) now require an Entry Permit (GSGSSI, 2025a).

As a general rule, fishing vessels and reefers/support vessels will only visit Cumberland East Bay, whilst cruise ships, yachts and military vessels visit other inshore sites on the north coast of the island, however all vessels visiting South Georgia must report to the Government Officers at King Edward Point for customs clearance and relevant inspections. Each vessel visit to Cumberland East Bay has been recorded since 1990. These figures include repeat visits to Cumberland Bay by the same vessel in a season (such as krill trawler repeat visits to tranship their catch). Since the MPA was designated in 2012 the number of vessels visiting South Georgia has fluctuated (Fig. 19). Excluding the obvious impacts of Covid in the 2020/21 and 2021/22 seasons, the variation has primarily been driven by the expansion of the tourism industry and changes in the dynamics of the fishing fleets (and their support vessels) caused by both natural fluctuations in krill availability and geopolitical issues affecting vessel numbers.

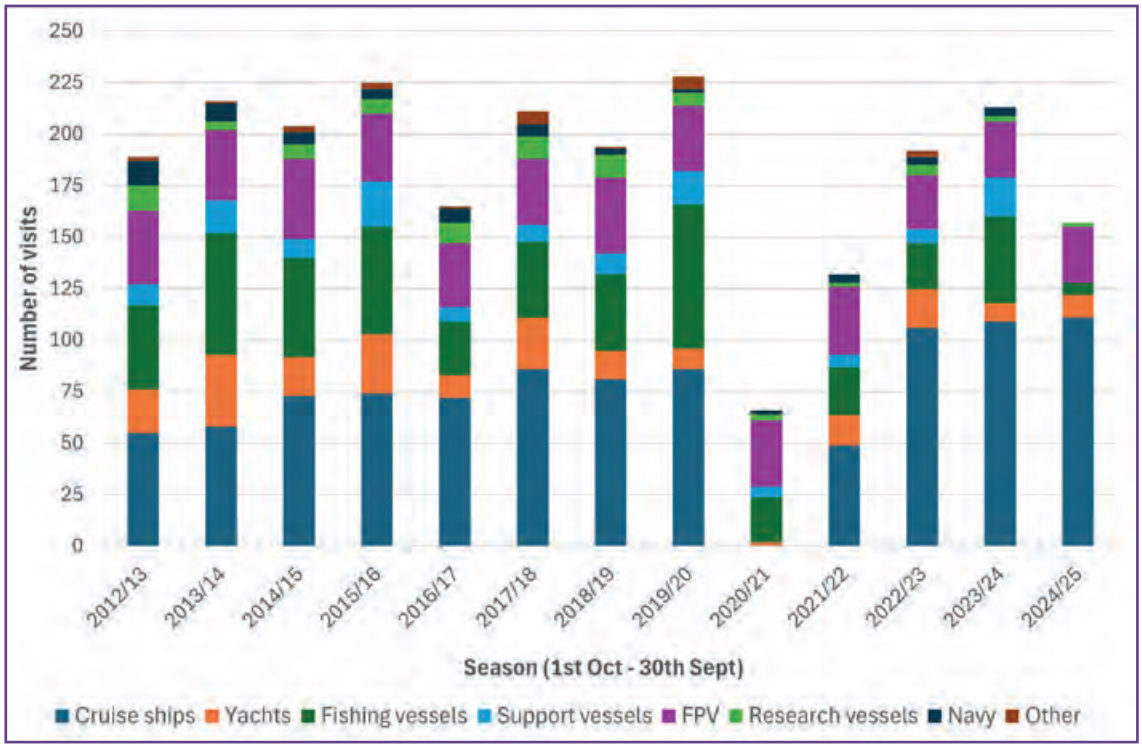


Fig. 19: *Numbers of vessels visiting Cumberland Bay since the MPA was designated in 2012*

4.1.1 Tourism

All tourist vessels that wish to operate in the SGSSI MPA must submit a vessel notification prior to their arrival, and all visitors to South Georgia must be in possession of a valid visit or work permit for the duration of their stay unless they are classed as exempt. GSGSSI works closely with the International Association of Antarctica Tour Operators (IAATO) to ensure high standards are maintained by visiting tourist vessels. Strict biosecurity and wildlife protection regulations apply to all visitors and vessels are only allowed to take passengers ashore at the 42 designated visitor landing sites (GSGSSI, 2024a; GSGSSI, 2025b,d). Larger cruise ships are more restricted in where they can land than smaller cruise ships and the numbers of passengers allowed ashore at any time is also restricted. Use of the IAATO 'ship scheduler' allows cruise ships to book time at the different designated visitor sites, preventing multiple vessels trying to land passengers at the same site at the same time. Popular visitor sites include Bay of Isles (Salisbury Plain and Prion Island), Fortuna Bay, Stromness Bay, St Andrews Bay, Gold Harbour and Cooper Bay, primarily due to the large wildlife colonies in these areas, with some being sites of historical interest.

Cruise ship visits had been gradually increasing for several years until the Covid pandemic, and in the 2020/21 season South Georgia experienced a season with no tourism except for one visiting yacht. After a gradual recovery in 2021/22, numbers have increased significantly in line with the polar tourism growth trend being seen in Antarctica (IAATO, 2025a), and the 2024/25 season saw South Georgia's highest number of visitors on record with 40 expedition cruise ships making 110 visits, and 7 yachts making 8 visits. Passenger numbers totalled 15,816, but when including all staff and crew on both cruise ships and yachts the overall total reached 29,955 visitors (GSGSSI, 2025e).

Tourists landing by zodiac – *Tracy Cooper*

Cruise ships tend to follow standard routes with clear corridors visible on vessel monitoring (AIS) data between the Falkland Islands and the western approach to South Georgia via Shag Rocks, and then between the south-east end of South Georgia and South Orkneys/Antarctic Peninsula (Fig. 20). These data were used alongside whale density information to generate the 10kt voluntary speed limit to prevent whale strikes around South Georgia (see *Section 5: Threats and Threat Mitigation*).

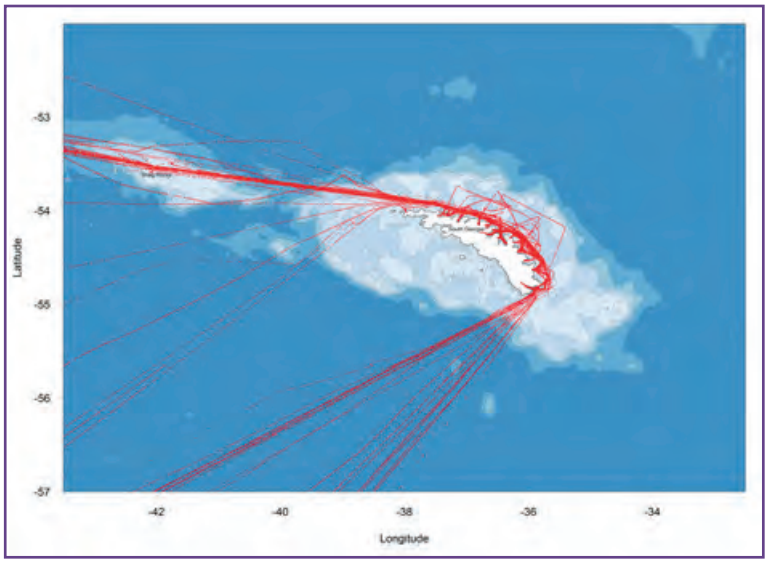


Fig. 20: *Passenger vessel activity (AIS tracks) at South Georgia in January 2019 (Image: Russell Leaper)*

Whilst cruise ships and yachts operate within the MPA, facilitating sustainable visits largely falls under the Terrestrial Protected Area Management Plan (GSGSSI, 2023a), along with tourism management regulations (GSGSSI, 2025b) and the Entry Control Ordinance (GSGSSI, 2025a).

4.2 Management of Living Resources

Abandoned whaling station – *George Lemann*

4.2.1 History of Exploitation

Despite its remote location the environment of South Georgia and the South Sandwich Islands is by no means unspoiled by human intervention. Since Captain James Cook claimed South Georgia for King George III in 1775 it has seen sequential exploitation of its rich natural resources. Alerted by Cook's reports of an abundance of seals, commercial sealers arrived in the late 1700s and by the 1820s had exploited the Antarctic fur seal population to the verge of extinction. Sealers also took large numbers of penguins and elephant seals for both oil and food.

Next came the whaling fleet. The Norwegian, Carl Larsen established the first shore based whaling station at Grytviken in 1904 and by 1912 there were six in operation, as South Georgia became the epicentre of Southern Ocean whaling. Although shore-based whaling was controlled through licences sold by the British Government, stocks of blue and humpback whales were quickly depleted.

In1925 the focus of whaling effort shifted from the shore stations to the pelagic factory ships, which were much harder to control. Concerns about the expansion of whaling led to the establishment of the International Committee for the Regulation of Whaling in 1935, which later became the International Whaling Commission (IWC). Shore based whaling declined in the 1930s, but whaling continued on or around South Georgia until the late 1960s. Pelagic whaling at the South Sandwich Islands continued into the mid-1970s (Belchier et al., 2022).

During the whaling period, elephant seals continued to be exploited, but only adult males were allowed (by the British Government) to be taken, which meant that females continued to breed and the population was not reduced as much as it might have been. Following the decline in Southern Ocean whale stocks, attention switched to fish and krill and the 1970s saw large catches of mackerel icefish, the marbled rockcod and other related species taken from the rich waters around South Georgia by Soviet and Eastern Bloc fleets. These fish resources were rapidly over-exploited, although a small sustainably managed fishery for mackerel icefish continues today (see *Section 4.2.3.3: Current Fisheries (Mackerel Icefish)*) alongside evidence of recovery of once depleted stocks of the marbled rockcod (Hollyman et al., 2021).

Attention then turned to Antarctic krill, and a fishery quickly developed in the 1980s and continues to this day (see *Section 4.2.2.4: Current Fisheries (Antarctic Krill)*) with annual catches increasing in the Scotia Sea and Antarctic Peninsula regions, reaching 620,000 tonnes in 2025 (against a regional quota of 5.6 million tonnes). Catches at South Georgia are highly variable and unpredictable but have been slowly increasing and reached a 25-year peak of 157,000 tonnes in 2024.

The late 1980s saw another wave of exploitation with the rapid development of the fishery for Patagonian toothfish. Concerns over seabird mortality in the fishery led to trials using pots to catch toothfish, however these trials were unsuccessful as the catch rate was too low to be economically viable (Agnew, 2004). The toothfish fishery continued using demersal set longlines but with strict bycatch mitigation measures that have reduced seabird mortality to negligible levels (Collins et al., 2021) (see *Sections 4.2.3.1 & 4.2.3.2: Current Fisheries (South Georgia & South Sandwich Islands Toothfish)*).

A pot fishery for stone crabs (Lithodidae) took place sporadically between 1992 and 2010. Five species of lithodid crab occur in South Georgia waters (Yau et al., 2002), but the fishery focussed on the two most abundant species *Paralomis spinosissima* and *P. formosa*. Maximum catches in the fishery were less than 500t in a season. The biology, ecology and fisheries management regime for lithodid crabs was reviewed in 2012 (Belchier et al., 2012). The study identified some significant gaps in knowledge of the crab ecology and suggested that a fishery is not likely to be viable because catch rates of males above the threshold size are prohibitively low. The fishery has been closed by CCAMLR until new data become available however, the introduction of extensive Benthic Closed Areas and depth limits to fishing within the MPA (see *Section 3.4: MPA Measures*) would constrain any future development of this fishery. Crabs are an occasional by-catch in the toothfish fishery but must be released alive where possible.

An experimental fishery for the ommastrephid squid *Martialia hyadesi* last took place in June 2001 to assess the potential for a commercial fishery (Dickson et al., 2004). Jigging vessels from the far east undertook the experimental fishing, with powerful deck lights creating a shadow beneath the vessel to concentrate the squid. Lines of plastic lures, hauled through the illuminated area, are mistaken for prey by the squid and a ring of barbless hooks beneath the lure catches the squid and they are landed on board. The experimental fishing had limited success and a fishery has never developed. The biology and distribution of *M. hyadesi* is poorly understood, but they are frequently associated with the Polar Frontal Zone. There is no realistic prospect of a fishery in the future.

4.2.2 Management of Sustainable Fisheries

Currently, the Government of South Georgia & the South Sandwich Islands (GSGSSI) licences three highly regulated fisheries within the SGSSI MPA (see *Section 4.2.3: Current Fisheries*). As a sustainable-use MPA where strictly controlled fisheries are allowed to operate, the MPA measures and fisheries management measures are inextricably linked, and ensure that authorised fishing vessels can operate responsibly within a robust regulatory framework. The Fisheries (Conservation and Management) Ordinance 2000 (as amended) governs fishing activities within the MZ (see *Section 3.2.1: Legislation*) and this legislation authorises the Director of Fisheries to administer the Ordinance and assume responsibility for the development and management of the fisheries. The Ordinance allows for stringent conditions to be applied to licences enabling strict regulation of the fisheries.

***Mackerel icefish** – Sue Gregory*

All SGSSI fisheries are managed under the auspices of the Convention for the Conservation of Antarctic Marine Living Resources, an international agreement established in 1982 to conserve Antarctic marine life and to which the UK is a signatory. Under the terms of the Convention, conservation includes rational use, and an international Commission (CCAMLR) meets annually to agree a set of Conservation Measures that govern all fishing activities in the Southern Ocean, including quotas, acceptable gear, reporting systems, bycatch limits, seabird & marine mammal bycatch mitigation, spatial restrictions, and a framework for research and exploratory fisheries.

CCAMLR pioneered the ecosystem approach to fisheries management. As well as considering research and stock assessments for the target species, CCAMLR also takes into account the needs of dependent species (those that feed on the target species or are impacted by their removal from the foodweb), and associated species (those impacted directly by fishing, e.g. through bycatch or incidental mortality) (Fig. 21). Under the CCAMLR Ecosystem Monitoring Programme (CEMP) there are two monitoring sites on South Georgia at Bird Island and Maiviken, where the British Antarctic Survey undertake long term monitoring of higher predators that spend significant time on land (fur seals and penguins). This allows researchers to detect and record significant changes within study colonies, and to distinguish between causes of change – for example, from environmental variability or potentially as a result of fishing activity.

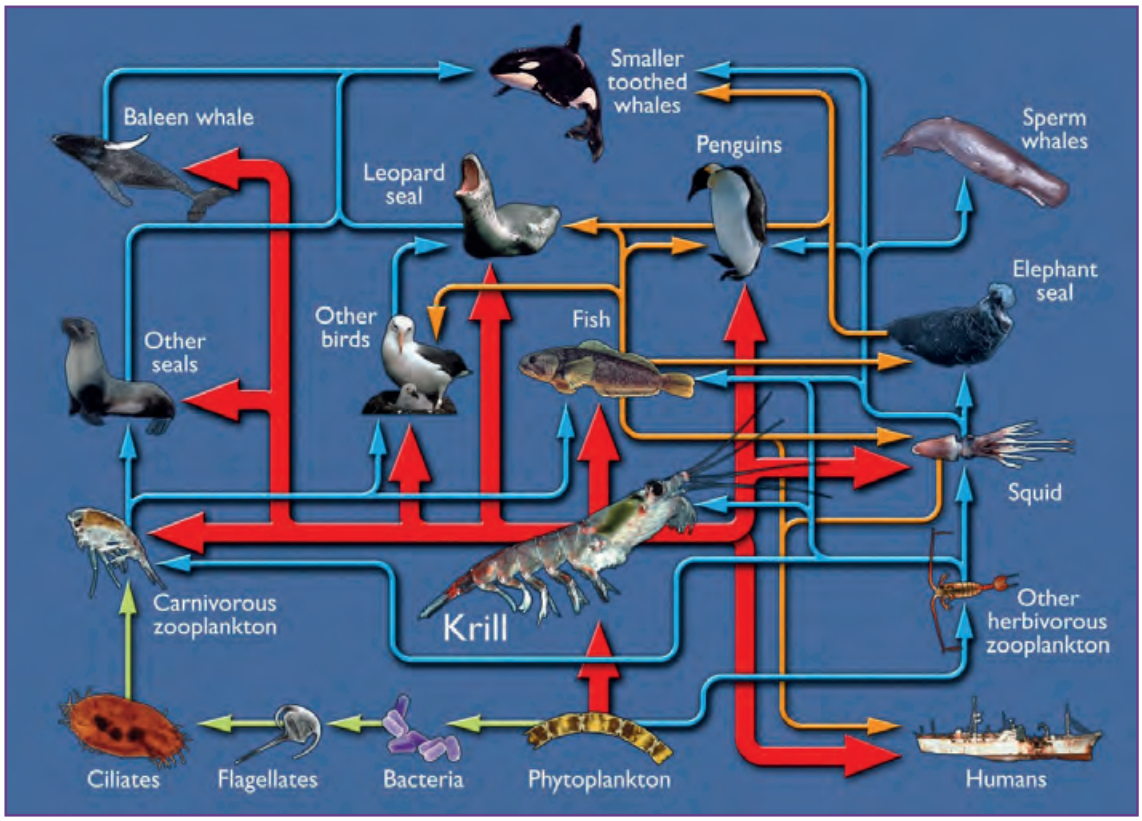


Fig. 21: *South Georgia foodweb (BAS)*

In addition to the CCAMLR Conservation Measures, GSGSSI then implements further, stricter licence conditions to deliver an even more precautionary management approach, including setting catch limits that are lower than those set by CCAMLR. The MPA measures restrict where, when and how vessels are allowed to fish (see *Section 3.4: MPA Measures*), and fisheries licence conditions cover a suite of requirements relating to quota allocations, vessel safety, fishing gear, bycatch mitigation, electronic monitoring, biosecurity, raising standards and scientific research. Individual Fisheries Management Plans specify the conservation and management objectives, research priorities and science and monitoring expectations for each of the fisheries (e.g. GSGSSI, 2024d; GSGSSI, 2025f).

GSGSSI undertakes a rigorous application process for each of its fisheries to ensure that only vessels which meet the requisite high standards are offered a licence. All applications are assessed for compliance with certain minimum standards to establish a consistent operational baseline for all vessels in the fisheries, and in particular to ensure that appropriate standards of safety and compliance are met. This includes providing evidence of safety certificates, insurance certificates, sanitation certificates, records of where the vessel has operated previously, and emergency response plans. Vessels must also prove that they are compliant with the International Convention for the Safety of Fishing Vessels. For the fisheries with a competitive licence process, all applications

that meet the minimum standards are then assessed and scored against four criteria (compliance, welfare and safety, raising fishery standards, and experience) which underpin the management of the fisheries. Once vessels have completed this process they may then be offered a licence, which is contingent on passing a pre-licensing inspection by Government Officers at South Georgia where documentation, safety equipment, fishing gear, mitigation measures and a range of other criteria are all physically checked.

GSGSSI licence conditions require all vessels fishing in the SGSSI MPA to have at least one independent, non-flag state, scientific observer on board to carry out specific taskings under the CCAMLR Scheme of International Scientific Observation (SISO) and any additional research and monitoring requested by GSGSSI (see *Section 3.6.4.4: Fisheries Observers*). Scientific observers are primarily responsible for collecting reliable scientific data, and whilst they are required to comment on compliance with relevant conservation and management measures in their end-of-trip report, they do not have enforcement powers on the vessel. Any issues relating to potential non-compliance with CCAMLR requirements will be evaluated by CCAMLR's Standing Committee on Implementation and Compliance (SCIC) at the end of the season. GSGSSI's Director of Fisheries will review any issues relating to potential breaches of domestic management measures and, if necessary, take appropriate action under the GSGSSI Fisheries Compliance and Enforcement Framework.

Once a vessel has caught their fish, GSGSSI also regulates what happens next. Krill vessels are only allowed to tranship their catch with approved support vessels within Cumberland Bay, allowing Government Officers to maintain oversight of the process. Toothfish vessels must offload their product in Stanley, Falkland Islands, under the watchful eyes of a GSGSSI catch verification team, who ensure that the amount of fish on the vessel matches the catch records submitted throughout the season, before the fish then enters the CCAMLR Catch Documentation Scheme which regulates the import/export of all toothfish catches.

4.2.2.1: Marine Stewardship Certification

The Marine Stewardship Council (MSC) is an international non-profit organisation which sets standards for sustainable fishing. MSC certification and its associated ecolabelling are a globally recognised means of identifying that a seafood product has come from a well-managed and environmentally responsible fishery. All three South Georgia fisheries hold either full or partial MSC certification.

Applications for MSC certification can be submitted either by the regulator or from individual or consortiums of fishing companies. The Patagonian toothfish certificate is held by GSGSSI and covers every vessel in the fleet. The icefish and krill certificates are held by fishing companies and only apply to the named vessels within their client group.

MSC assessments are carried out by independent, accredited Conformity Assessment Bodies who assess the fishery against a range of performance indicators across three core principles – Principle 1: Sustainable fish stocks, Principle 2: Minimising environmental impacts, and Principle 3: Effective management. The minimum acceptable score for each principle is 60, while 80 represents global best practice and 100 is state of the art performance (MSC, 2025). Strong management implemented under GSGSSI's MPA measures, including seasonal closures, depth restrictions and closed areas to protect juvenile fish, vulnerable benthic species and predator foraging ranges all contribute to the assessment scoring process.

***Catch verification of Patagonian toothfish** – Sue Gregory*

The South Georgia toothfish fishery was the first toothfish fishery to achieve MSC certification back in 2004. This was a significant moment for a species which had once been boycotted by chefs, restaurants and environmental groups because of concerns about IUU activity and overfishing across the Southern Ocean. This raised the bar for other toothfish fisheries to improve their standards, and subsequently multiple other toothfish fisheries have achieved certification. Through a process of annual surveillance audits and 5-yearly recertification, the South Georgia toothfish fishery continues to demonstrate exceptional standards of sustainability and has maintained its status as one of the highest scoring MSC certified fisheries across the three assessment principles. The other South Georgia fisheries have also achieved impressively high certification scores (Table 2).

Table 2: *Principle level scores for the MSC certified fisheries operating at South Georgia (P1: Sustainable fish stocks, P2: Minimising environmental impacts, P3: Effective management)*

Fishery	Client Group	First certified	Most recent recertification	P1 score	P2 score	P3 score	Reference
South Georgia Patagonian Toothfish (longline)	GSGSSI	2004	2024	96.7	91.7	98.8	Andrews & Sharov (2024)
South Georgia Mackerel Icefish (pelagic trawl)	Industry	2010	2021	95.8	92.3	98.8	Andrews & Medley (2021)
Antarctic Krill* **(pelagic trawl)**	Industry	2010	2020	89.2	96.7	96.0	Hønneland, et al. (2020)

* The South Georgia (CCAMLR subarea 48.3) krill fishery is included as part of a wider certification covering all of CCAMLR Area 48. The krill fishery is undergoing recertification in 2025/26

4.2.3 Current Fisheries and their development

South Georgia currently supports licensed fisheries for Patagonian toothfish, Antarctic krill and mackerel icefish, with a small fishery for both Patagonian and Antarctic toothfish in the South Sandwich Islands.

*4.2.3.1: South Georgia Patagonian toothfish (*Dissostichus eleginoides*)*

Patagonian toothfish are a large, long-lived species, belonging to the Notothenidae family (often called Antarctic cods) (Collins et al., 2010). Toothfish show distinct depth preferences with age, with juveniles (< 500mm TL) living on the continental shelf and moving into deeper water (>500m) as they reach maturity (~900mm TL). Adult toothfish are scavengers and predators, with juveniles primarily feeding on small fish (Collins et al., 2007).

In South Georgia waters the fishery for Patagonian toothfish began in the late 1980s and expanded rapidly during the early 1990s, when considerable illegal, unregulated and unreported (IUU) catches were taken. The fishery, which uses hooks baited with sardine or squid, initially had major problems with seabird by-catch, with large numbers of albatross and petrels attracted to the baited hooks, getting caught and drowned. In response to these issues CCAMLR introduced strict regulations designed to prevent bird bycatch. These regulations, which include seasonal closures, line-weighting regimes (to ensure baited hooks sink rapidly) and night setting requirements, have virtually eliminated the seabird by-catch problem in South Georgia waters (Fig. 22).

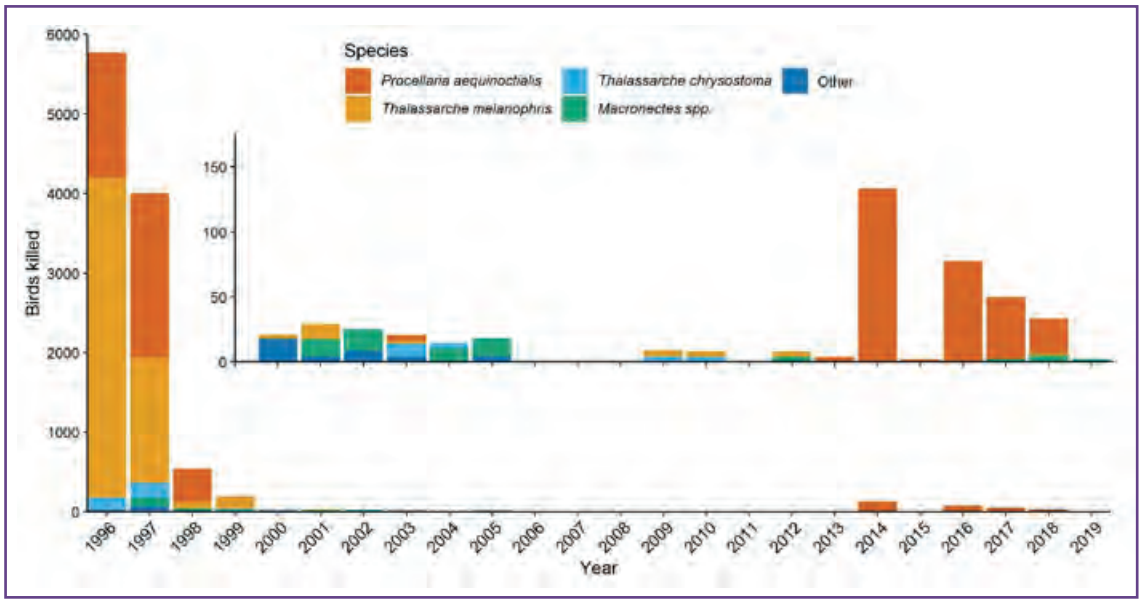


Fig. 22: *Estimated numbers of seabirds killed in the South Georgia Patagonian toothfish fishery since 1996, extrapolated from CCAMLR data [1996 data is extrapolated from 4 of the 17 vessels that fished during that season] (Adapted from Collins et al, 2021)*

Since 1998 the fishery has been restricted to the winter months (Mid-April to Mid-September) to minimize interactions with foraging seabirds during their breeding season. In 2004 a minimum depth of 500m was introduced to protect smaller fish. The minimum depth was increased to 550m in 2010 and 700m in 2011, with a maximum depth of 2,250m in force to protect and conserve large fish and sensitive benthic habitats. The fishery is now extremely well regulated. It was conditionally certified as sustainable and well-managed by the Marine Stewardship Council (MSC) in 2004 and has been recertified without conditions approximately every five years since, with the latest recertification achieved in 2024 (Andrews & Sharov, 2024) (see *Section 4.2.2: Management of Sustainable Fisheries*).

The toothfish fishery uses baited demersal longlines, in which a line of baited hooks is deployed on or close to the seafloor at average depths of over 1,100m (but occasionally at depths up to 2,000m). Surface buoys indicate the presence of lines and vessels typically recover lines after a 'soak-time' of 24-48 hours. Longline vessels are generally small (50-80m), with vessels' lines set in one of two different configurations:

a) The autoline system has a single weighted line (polypropylene line with integrated weight ~50gm^{-1}), from which hooks are attached via swivels and multi-filament snoods. The line is divided into magazines, each consisting of 800-1,500 hooks and although the length of lines varies, an autoliner will be able to deploy 30,000 automatically baited hooks per day.

b) The Spanish or doubleline system uses a strong main- or mother- line attached at each end to an anchor and buoy line. The fishing line is attached to the main line by a series of connecting ropes. The hooks are attached to the fishing line with monofilament snoods (short lengths of line that attach hooks to the fishing line), with each section of fishing line comprising around 25 hooks, with around 7,000 hand baited hooks per line. Weights (5kg – 8.5kg depending on spacing) are attached between each section of hooks to sink the line and keep it on the seafloor. Weights must be metal or concrete and the use of netting bags to hold weights is now prohibited, to reduce risks to the environment.

Trotlines have previously been trialled at South Georgia, but their use is now not permitted as the fish caught using this method tend to be in poorer condition and are therefore less suitable for tagging. Since 2021 only autolines have been used at South Georgia providing consistency in data collection (such as catch per unit effort) for stock assessments but this has resulted in a slight increase in the level of fish bycatch in the fishery, although the reasons for elevated fish bycatch with the autoline system remains uncertain.

Longlines, whilst much less destructive than bottom trawls, can still have a localised impact on benthic fauna, particularly habitat forming species of cold-water corals (Taylor, 2011). Extensive work has been undertaken in the last decade to map vulnerable benthic habitats and to assess the impact of longlines on the seafloor (e.g. Darby & Hogg, 2021; Hogg, 2025). Work to investigate the impact of longlines on benthic animals using in situ cameras deployed on longlines and by examining benthic by-catch continues There are four research Benthic Closed Areas (r-BCAs) in fishable depths that were previously open to longlining (see *Section 3.4: MPA Measures*) whilst all bottom fishing is prohibited within the general Benthic Closed Area (g-BCA) at depths shallower than 700m and greater than 2,250m and the No Take Zones, meaning an area of seafloor exceeding 1.1 million km^2 is closed to bottom fishing.

***Scientific observer releasing a tagged toothfish** – Arvid Olai Mjønes*

The fish stock assessment of Patagonian toothfish utilises a programme called CASAL (C++ Algorithmic Stock Assessment Laboratory), which implements a generalised age-structured model, taking into account a wide range of fishery and stock parameters including catch per unit effort (CPUE) and population estimates based on a tagging (mark and recapture) programme. To provide data for the tagging programme all vessels are required to tag toothfish at a rate of 1.3 fish per tonne over the fishing season- with areas of higher and lower tagging effort introduced in 2022 to ensure appropriate tag distribution. The size frequency of the fish tagged must mirror that of the catch size frequency. There is a reward for crew that find tag returns to ensure any recaptured fish are identified and properly recorded.

The catch limit for the fishery has gradually been reduced in recent years due to uncertainty around estimates of future recruitment. Evidence from research surveys and length-frequency data from the fishery suggests that recruitment is episodic and related to environmental conditions (Belchier & Collins, 2008). Strong year classes (3-year-olds) were detected during the 2021 and 2023 surveys with evidence of a strong cohort appearing in the fishery data from South Georgia in 2024 and 2025.

Due to the actions of one CCAMLR member, and for wholly political reasons, it has not been possible for the CAMLR Commission to reach agreement on a catch limit for Patagonian toothfish at South Georgia in recent years. Since 2022, GSGSSI, with the full support of the UK Government, has continued to operate the fishery under domestic regulations, but remaining fully in line with the requirements and obligations of CCAMLR. GSGSSI continues to set more precautionary catch limits than those derived using CCAMLR's 'harvest control rules (HCRs) and endorsed by CCAMLR's Scientific Committee at meetings since 2021. Catch limits of around 1,600t have been set in recent seasons and 3-4 vessels have been licensed to fish for Patagonian toothfish at South Georgia each season since 2022.

*4.2.3.2: South Sandwich Islands Patagonian (*Dissostichus eleginoides*) and Antarctic (*Dissostichus mawsoni*) toothfish fishery*

The South Sandwich Islands (SSI) support a small research fishery for both Patagonian (*Dissostichus eleginoides*) and Antarctic (*Dissostichus mawsoni*) toothfish that provides information on the wider toothfish stock in the region. The Patagonian toothfish fishery began in 1992 when CCAMLR set a catch limit of 240 tonnes, but initial catches were poor. CCAMLR subsequently adopted a catch limit for Patagonian toothfish of 28 tonnes per season whilst the taking of Antarctic toothfish, other than for scientific purposes, was prohibited. These limits remained until 2004, when a mark and recapture study was initiated to provide information on stock status and 27 tonnes of Patagonian toothfish were caught. This study was extended to subsequent seasons with catches of 75- 100 tonnes and with fishing limited to the north of the area. In 2008 a similar study began in the southern area with a catch limit of 75 tonnes for both toothfish species CCAMLR agreed that the fishery should be spatially divided into northern and southern areas with directed fishing in each area limited to Patagonian and Antarctic toothfish respectively. An integrated stock assessment was endorsed for the stock in 2009, using information derived from the tagging programme as the key input parameters. In 2013, with more data and information available, CCAMLR adapted this management approach in the subarea by setting separate subarea-wide catch limits by species, with each stock assessed for the entire region and removing the management split between the northern and southern islands of the archipelago. As at South Georgia, GSGSSI sets Patagonian toothfish catch limits that are more precautionary than those agreed at CCAMLR. Extensive research is carried out by vessels fishing at the SSI. Standardised research lines must be fished at the start of the season before any commercial fishing can take place. Catch limits were 10 tonnes of Patagonian toothfish and 37 tonnes of Antarctic toothfish for the 2025 season with one vessel licence issued.

The fishery can operate year-round as there is a significantly lower risk of bird bycatch, but it has tended to operate prior to the start to the South Georgia fishery and GSGSSI usually requests that the fishery concludes by 31st May to maintain consistency in the timings with previous years fishing operations to enable comparative data analysis.

*4.2.3.3: South Georgia mackerel icefish (*Champsocephalus gunnari*) fishery*

Mackerel icefish (*Champsocephalus gunnari*) grow rapidly to a maximum size of 55cm, reaching a marketable size of 30cm in three years. Icefish inhabit the continental shelf all round South Georgia and Shag Rocks. They form large aggregations to feed on krill, and their abundance has been linked to interannual variations in krill biomass. During krill-poor years they switch to feed on the pelagic amphipod *Themisto gaudichaudii* and mysids (Main et al., 2009). Spawning takes place on the shelf, with eggs laid on the seafloor. Larvae are planktonic and are caught in coastal areas during winter. Younger (age 1 yr old) fish are less reliant on krill, which may allow a rapid recovery of stocks following krill-poor years (Main et al., 2009). Icefish predators include Antarctic fur seals and gentoo penguins (Reid et al., 2005).

Fishing for mackerel icefish began in South Georgia waters in the late 1970s, with large catches taken by eastern European (then Eastern Bloc) vessels using bottom trawls. Catches peaked in 1981/82 with a reported 178,000 tonnes, although there is some doubt about the accuracy of the data. Following concerns about the depletion of stocks CCAMLR closed the fishery in 1989. The fishery was later re-opened, but with a highly conservative total allowable catch (TAC) and was restricted to pelagic trawling to avoid impacts on non-target species. In recent seasons there has been very little commercial fishing despite high biomass estimates and associated catch limits (Fig. 23). The last significant fishery catches were taken by a UK vessel in 2013 since when access to traditional markets has been limited.

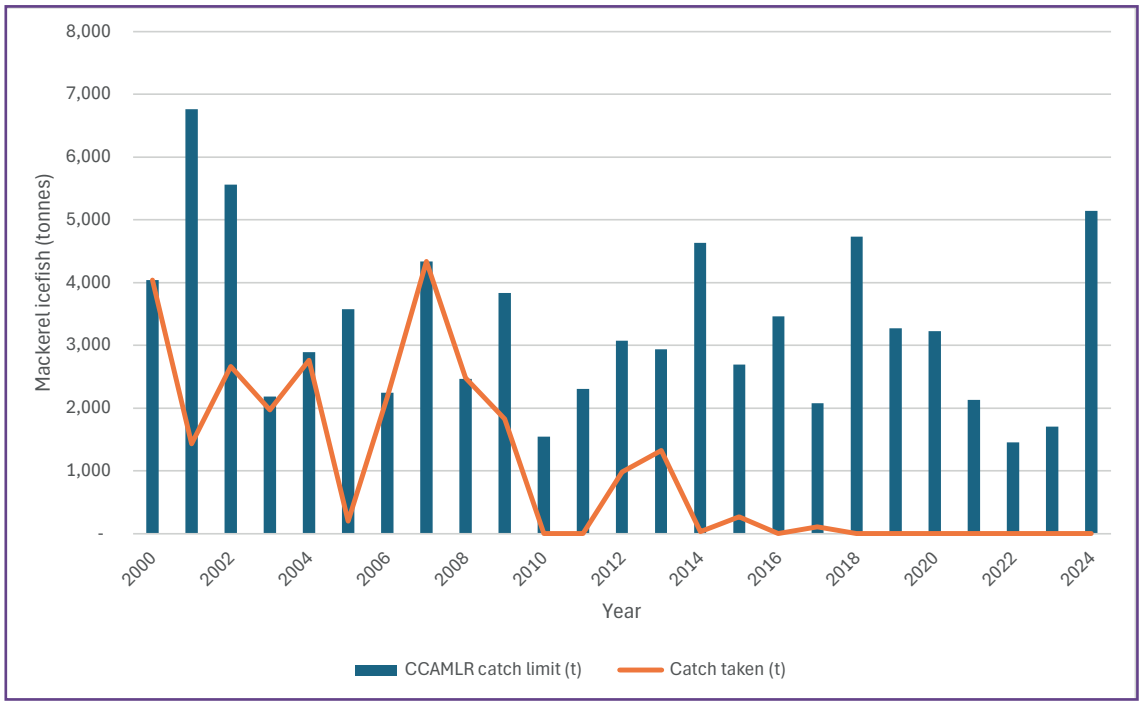


Fig. 23: *Mackerel icefish catch and effort history in tonnes in CCAMLR sub-area 48.3 (noting no commercial effort occurred between 2019-2024) (Data from CCAMLR, 2025c)*

Icefish fishing activity has usually been focussed on an area of moraine banks to the north-west of South Georgia. The pelagic trawls, with a minimum mesh size of 90mm, catch little bycatch and so have little impact on non-target species. Seabirds have occasionally been killed in the fishery, usually as a consequence of diving through the large meshes to feed on fish stuck in the net. This can be avoided by cleaning the net, adding weights to the cod-end and binding the net with twine, so that it does not open until the trawl doors are deployed. These measures are mandatory under fishing licence conditions. The fishery has been MSC certified as sustainable since 2010 (Andrews & Medley, 2021) (see *Section 4.2.2: Management of Sustainable Fisheries*).

The mackerel icefish stock assessment uses a two-year projection model. The initial data for the projection is the lower 1-sided 95% confidence interval (CI) of the biomass estimated by the trawl survey. This is projected forward with growth and natural mortality (which assumes 50% die in any year) but assumes no recruitment. The allowable catch must leave 75% of the stock that would remain in the absence of fishing. The use of the lower 1-sided 95% CI of the biomass estimate, plus the assumed high rate of natural mortality and the assumption of no recruitment ensure that the catch limit is highly precautionary. The catch limit for the 2024/25 season was 3,579 tonnes with recent catch limits in the region of 2,000 – 5,000 tonnes per year.

*4.2.3.4: Antarctic krill (*Euphausia superba*) fishery*

The Antarctic krill (*Euphausia superba*) fishery began in the early 1970s with Japanese and Soviet Union vessels catching krill in the Scotia Sea for human consumption in tinned, frozen or paste form. The fishery focussed in three principal areas, near the South Shetlands (Food and Agriculture Organisation (FAO) area 48.1), near the South Orkney Islands (FAO area 48.2) and off South Georgia (FAO area 48.3) (Fig. 24). The fishery was later joined by vessels from Poland, Chile and Korea and peaked in 1981/82 with catches of 528,000 tonnes.

Concern about the rapid expansion of the krill fishery and the potential impact on non-target species led to the establishment of CCAMLR in 1982 (see *Section 4.2.2: Management of Sustainable Fisheries*).

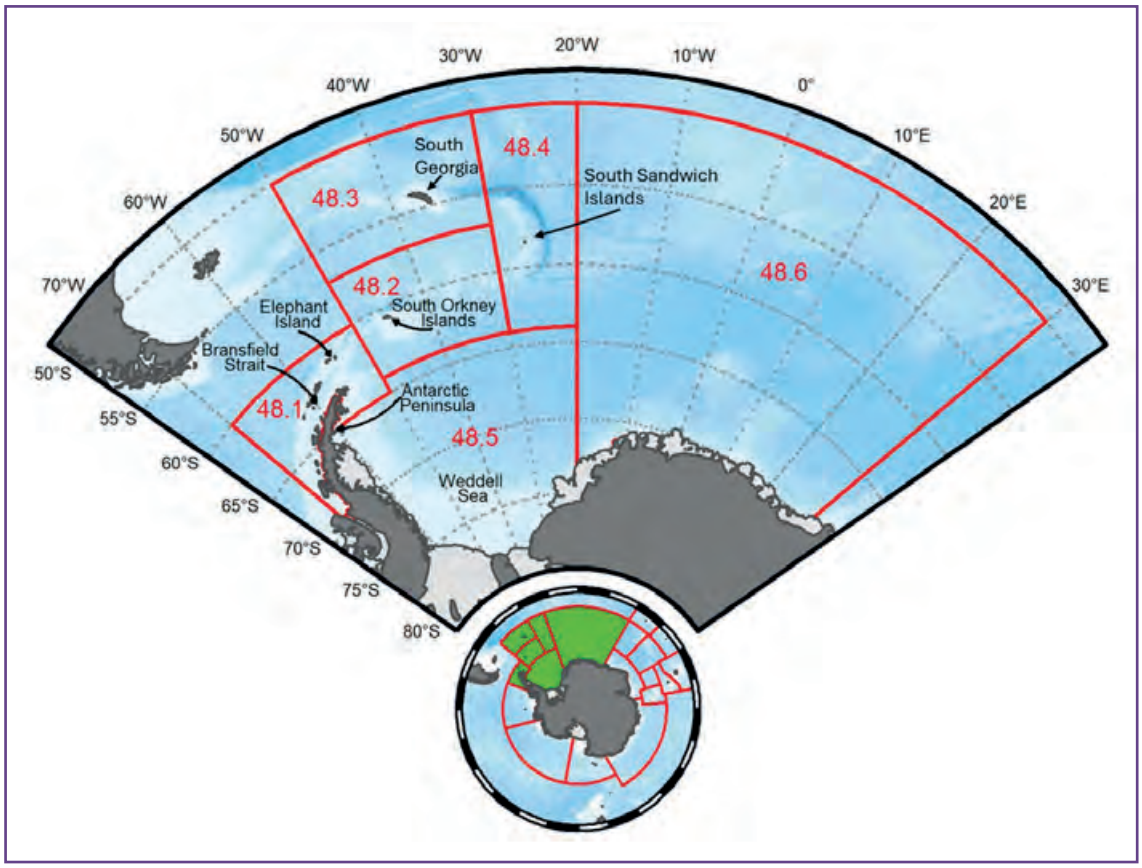
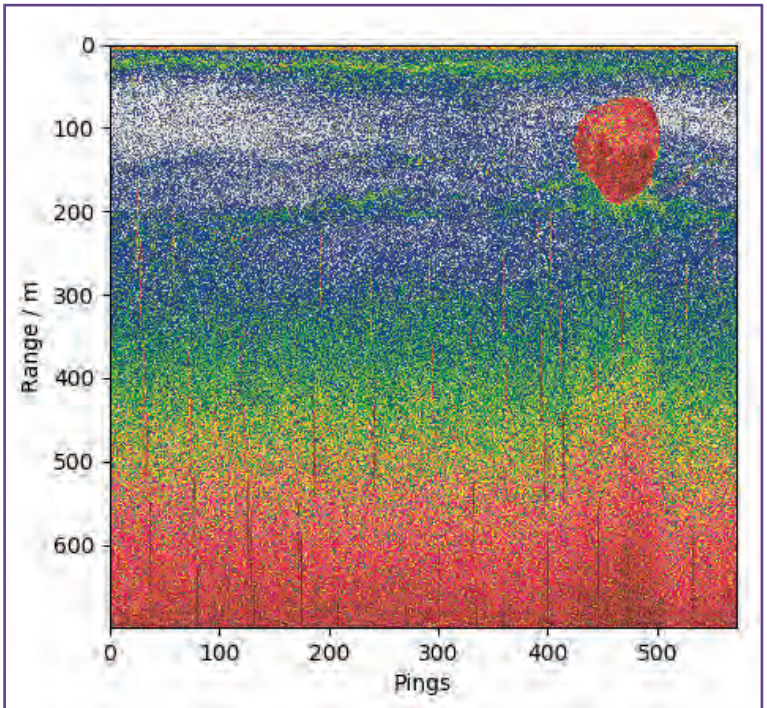


Fig. 24: *Map of the FAO area 48 (green area) and its subareas, which correspond to the CCAMLR Convention areas. The krill fishery operates in subareas 48.1, 48.2 and 48.3 (Adapted from Meyer et al., 2020)*

Following the establishment of CCAMLR, catches dipped from 1983 to 1985 but remained above 200,000 tonnes between 1985 and 1992. The reduction in catches in 1983 is attributed to the discovery of high levels of fluoride in the exoskeleton and the associated processing problems. The sharp reduction in catches in the early 1990s was due to the break-up of the former Soviet Union and reduction in effort from eastern European states. From 1992 to 2009 catches remained stable at around 100,000 - 150,000 tonnes per year but started to increase from 2010 reaching nearly 500,000 tonnes in 2024 (Fig. 25) prior to changes in the fleet dynamics (see below). Norwegian and Chinese vessels account for the majority of the catch, with vessels from Chile, Republic of Korea and the Ukraine also notifying to fish. Several vessels operating within the krill fleet in CCAMLR Area 48 have achieved MSC certification (Hønneland et al., 2020; Addison et al., 2021) (see *Section 4.2.2: Management of Sustainable Fisheries*).



Sample echogram depicting an Antarctic krill swarm – *Sophie Fielding*

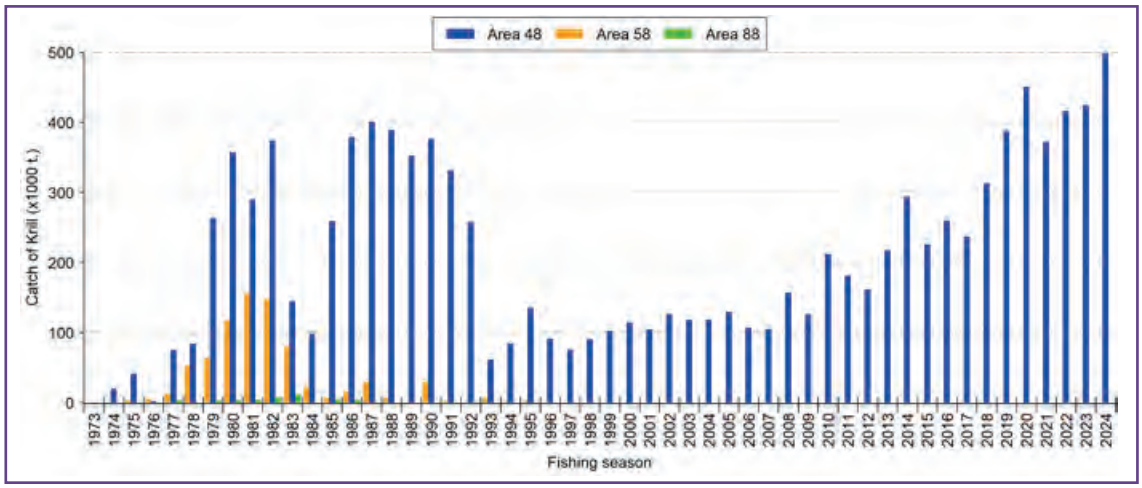


Fig. 25: *Annual catches of Antarctic krill (Euphausia superba) in the CCAMLR Convention Area prior to the lapse of CCAMLR CM 51-07 controlling spatial distribution of catch in Area 48 (CCAMLR, 2025a)*

The current CCAMLR TAC for Area 48 is set at 5.6 million tonnes, but with a 'trigger level' at 620,000 tonnes. The lower (trigger) limit is intended to ensure that the impact of the fishery on krill-dependent predators is minimised and that trigger level cannot be exceeded until agreement is reached on spatial management and division of catches. The krill catch in Area 48 is all taken in subareas 48.1, 48.2 and 48.3. However, the CCAMLR Conservation Measure (CM 51-07) which has limited catches within each subarea since 2009 lapsed in 2024 with no consensus reached at CCAMLR to maintain the spatial subdivision of catches between subareas in the SW Atlantic sector. This now means that all 620,000 tonnes could, theoretically, be fished from one subarea. In 2025, the first season after CM 51-07 lapsed, the 620,000-tonne trigger level was reached for the first time, with >99% of the catch being taken in subareas 48.1 and 48.2 (57.5% and 41.7% respectively), and <1% taken at South Georgia.

Prior to the changes in spatial distribution regulations, krill catches at South Georgia had been increasing and exceeded 150,000 tonnes in 2024, the highest catch since the late 1980s (Fig. 26) but remain well below the 279,000 tonnes precautionary catch limit. The dynamics of the fishery under the new management approach are currently uncertain and environmental factors such as sea ice impacting access to the fishing grounds are likely to be a key driver for vessels coming to South Georgia in the future.

***Cape petrel** – Jamie Coleman*

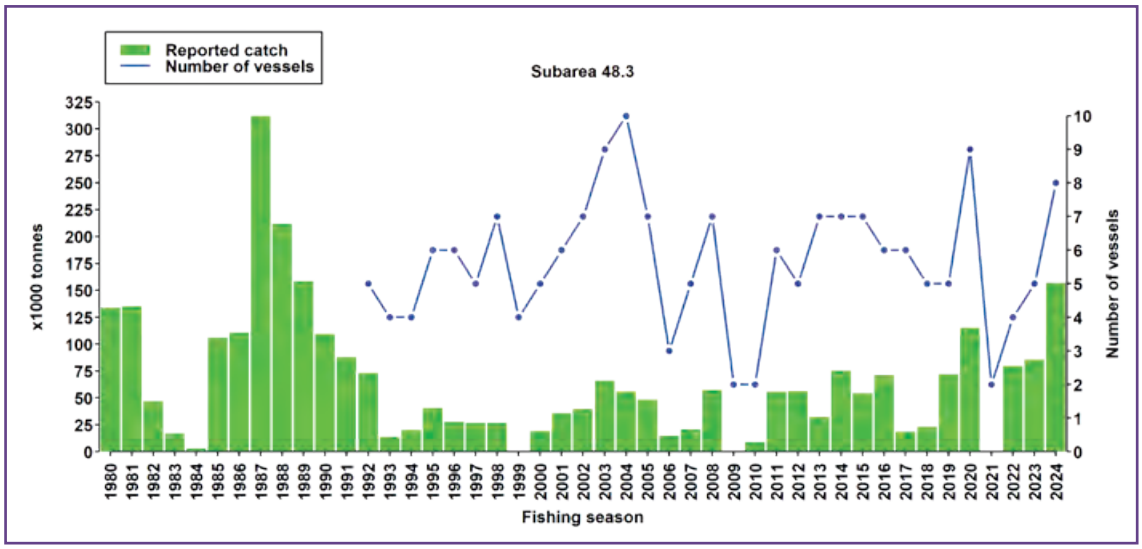


Fig. 26: *Catch and effort history of krill catches in Subarea 48.3. The number of active vessels before 1992 is uncertain (CCAMLR, 2025b)*

Despite the lapse in CCAMLR spatial management restrictions, GSGSSI has retained the previous precautionary catch limit for South Georgia (subarea 48.3) of 279,000 tonnes which is further subdivided between three small scale management units to reduce the risk of localised competition between the fishery and krill dependent predators. This risk is further reduced by limiting the fishery to the months of the austral winter when predator densities are substantially lower than summer. Following the 2019 MPA review the season length was reduced by an additional two months to a 5-month period between 1st May and the 30th September. No fishing can take place within 30km of South Georgia where predator density is highest- this area is designated as a No Take Zone. Fishing for krill is prohibited at any time of year in over 40% of the MPA, including key habitats at the South Sandwich Islands and in areas used by cetaceans during their annual migrations. GSGSSI does not issue licences to fish for krill around the South Sandwich Islands as their remote location makes monitoring of krill-dependent predators and routine estimates of regional krill biomass difficult. Additionally, transhipment regulations that require all transhipments of fishery products to be carried out in the shelter of Cumberland Bay at South Georgia makes the prospect of fishing in this region highly unlikely.

Fishing vessels are a mix of conventional stern trawlers and continual pumping vessels, and the fishery operates in two main areas around South Georgia: to the north and north-east of Cumberland Bay and northwest of the Willis Islands. Vessels tend to move from east to west as the season progresses following the movement of krill aggregations.

In the early years of the fishery, vessels employed large conventional pelagic trawls to catch krill, with vessels capable of catching and processing up to 300 tonnes per day. The last decade and a half has seen a continuous trawling method employed, with krill pumped continuously from the cod-end of the net to the processing deck. Some vessels no longer use otter trawls, instead using rectangular mid-water trawls, often deployed from the side of the vessel and held open by large beams, with continuous pumping from the cod-ends. Catches using the continuous pumping method can be as high as 800 tonnes per day.

Processing varies greatly between vessels, but krill oil is now a major product. Some vessels are utilising all the krill to produce krill oil, dried meat pellets and dried carapaces, for other vessels krill meal remains their primary product. Bycatch within the krill fishery is, in general, very low. The main bycatch is larval fish, although numbers of these are relatively few. Fur seals have occasionally been caught in the nets of the krill trawlers, but mandatory use of marine mammal exclusion devices has greatly reduced the risk. Following the incidental mortality of six humpback whales in the krill fishery in subareas 48.1 and 48.2 between 2021 - 2024, the use of a cetacean exclusion device is also now mandatory in Area 48, although there have never been any incidences of whale bycatch at South Georgia.

***Fisheries patrolling** – British Antarctic Survey*

4.3 Human Lives at Sea

Environmental protection is one of the guiding values for GSGSSI, but the Government strongly believe that ensuring the welfare of the people who work within the South Georgia MPA is as important as protecting the waters they sail on. Whilst not strictly part of the MPA Management Regime, ensuring the safe and ethical work and living conditions of all mariners is a GSGSSI commitment under the 'Protect Sustain Inspire' strategic framework (GSGSSI, 2021b).

Cruise ship crews are covered by the welfare provisions within the Maritime Labour Convention (ILO, 2024), whilst GSGSSI's fishing licence conditions follow the framework for the ILO Work in Fishing Convention - ILO-c188 (ILO, 2007) and include requirements for vessel operators to provide valid contracts and appropriate training for all crew, to ensure safe and ethical living and working conditions for all on board, and provide an ability for crew to contact family and friends whilst working at sea. By making these conditions compulsory (GSGSSI, 2024b) the aim is to drive up standards across SGSSI's fishing fleets which will hopefully then be maintained wherever else in the world the vessels may operate.

Section 5: Threats and Threat Mitigation Within the MPA

5.1 Climate Change

The sub-Antarctic region of South Georgia and the South Sandwich Islands is undergoing rapid change due to interrelated climate-driven changes, including in temperature, ice, winds, circulation and ocean chemistry. These changes pose significant risks to the region's marine ecosystems through a range of direct and indirect effects, including impacts on charismatic wildlife and on ecosystem services such as fisheries, tourism and carbon storage.

A key driver of environmental change in the region is warming sea-surface temperatures (SSTs). In recent years, waters south of 30°S have warmed substantially, absorbing a large percentage of the global increase in upper-ocean heat. SSTs at South Georgia are among the fastest warming in the Southern Hemisphere with the upper 100m of the water column undergoing a mean increase of around 0.9°C in January and 2.3°C in August over the last century. Other significant changes in the region include extensive glacial retreat, with negative mass balance (losing more ice than gained) observed at South Georgia and 97% of glaciers in retreat (Hogg et al., 2021b).

In 2021, due to increasing concerns about the effects of climate-driven change on marine ecosystems, a regional working group of scientific experts and policymakers identified three priority climate-related issues for the region:

***Receeding glacier** – George Lemann*

***Brash ice on the beach** – Vicki Foster*

a) Changes in food webs and ecosystem function

The effects of climate-driven changes include observed and projected species range shifts, constrained by physiological limits and habitat suitability. For example, sub-Antarctic and Antarctic species tend to have more limited temperature tolerances than species elsewhere. Warming, sea-ice loss, ocean acidification, and changes in circulation also affect important processes such as breeding and migration, and predator–prey interactions. Over time, these changing conditions may result in different species assemblages, leading to fundamental changes in the food web, and potentially driving regime shifts in the ecosystem.

b) Changes in carbon uptake, export and sequestration by biological processes

The Southern Ocean stores dissolved carbon at higher levels than warmer seas, and marine organisms further capture and store carbon. In the SSGSSI region, carbon in the seabed and zooplankton has increased in recent decades, with high biomass species such as Antarctic krill and longer-lived species such as baleen whales, barrel sponges and corals having important roles. These "carbon sinks" provide a rare negative feedback to climate change, enhanced by ice loss and moderate warming. However, continued ice loss, seasonal light limitations, climate-driven shifts in biological communities, and environmental disturbance (e.g. increased iceberg scouring) may reduce future uptake and sequestration.

c) Changes in the distribution of sea ice habitat

The polar regions are losing sea ice and while the sub-Antarctic and Antarctic experiences significant inter-annual and annual variability, a recent regime shift has reduced Antarctic sea-ice extent far below its natural variability of past centuries. Sea ice is a critical habitat in the Southern Ocean, influencing species distribution, supporting key ecological processes, and providing refuge and foraging grounds for many species. Within the SGSSI region, the southern half of the South Sandwich Islands lie within the seasonal sea-ice zone and as such is under the greatest threat from changes in sea ice extent.

Climate-driven change in the Southern Ocean and SGSSI is part of broad-scale change across the entire Earth system, necessitating ongoing international commitment to address. At local and regional scales, ecosystem-based management can enhance the resilience of ecosystems by reducing the risk of other potential threats from human activities. Complementing this, VLMPAs such as the SGSSI MPA can help safeguard critical habitats and support connectivity between populations, helping to increase and maintain resilience to climate change by protecting sink and source populations and key transport pathways whilst reducing additional pressures and threats to the marine environment.

5.2 IUU Fishing

Illegal, Unreported, Unregulated (IUU) fishing is a global problem, with estimates that IUU fishing across the world's oceans accounts for 8-14 million tonnes of fish catches each year, with a suggested gross revenue of US$9–17 billion (Sumaila et al., 2020).

Toothfish, the primary species caught commercially at South Georgia (see *Section 4.2.3 - Current Fisheries and their development*) has a high market value so has inevitably been a target species for illegal operators who are often called "pirates". Despite, or maybe because of, the remote and challenging waters, IUU fishing for toothfish was widespread across the Southern Ocean in the 1980's and 90's including at South Georgia. However, this has been greatly reduced thanks to coordinated efforts including increased surveillance and enforcement alongside introduction of trade measures such as the CCAMLR Catch Documentation Scheme which regulates the import/export of all toothfish catches, and the creation of the Coalition of Legal Toothfish Operators (COLTO) (Baird, 2024).

IUU fishing poses a substantial risk to toothfish populations from the complete disregard for sustainable catch limits (see *Section 4.2: Management of Living Resources*). However, it also threatens many other species including seabirds through the failure to implement any conservation measures and from the use of gillnets which are a much more indiscriminate means of fishing compared to the longlines used by licenced vessels (CCAMLR, 2009). Gillnets are associated with high levels of bycatch and prolonged 'ghost fishing' where lost/abandoned gear continues to catch and kill marine life. IUU vessels are also notorious for being poorly maintained with dangerous living and working conditions for their crews, with IUU vessels also engaging in slave labour and human trafficking (Sumaila et al., 2020).

Whilst IUU risk is believed to be low at South Georgia, an incursion into the SGSSI MZ by the FV *Nika* occurred in 2019. The vessel was visible on AIS (see *Section 3.7.2.1: AIS Monitoring*) but was "spoofing" their identity by broadcasting the details of a cargo vessel, the *Jewel of Nippon,* whilst exhibiting tracks and speeds that did not match the behaviour of such a vessel. Combined with a complex flag and ownership history; these unusual characteristics attracted the interest of GSGSSI and other regulatory bodies. This ultimately led to the interception and boarding of the vessel by GSGSSI Government Officers, subsequent tracking by Interpol and other agencies, and eventual seizing and prosecution of this vessel by Indonesian authorities after it entered their waters. This international, multilateral, collaboration, which culminated in the vessel being IUU listed under CCAMLR, was instigated by the actions of GSGSSI in monitoring the MPA (Leech, 2021).

5.3 Marine Pollution

Pollution is a significant threat to the marine environment of South Georgia and can come from many different sources both within and beyond the Maritime Zone:

5.3.1 Heavy Fuel Oil

Traditionally, large commercial vessels including cruise ships and fishing vessels have relied on Heavy Fuel Oil (HFO) as a relatively low-cost fuel option, however this thick, black, tar-like fuel poses a significant risk to the marine environment in the event of a spillage (Fritt-Rasmussen et al., 2018). In 2001 the International Maritime Organisation (IMO) banned the use and carriage of Heavy Fuel Oil south of 60°, and following the 2017/18 MPA review this restriction was also implemented in the SGSSI MZ under the MPA Ordinance (2019).

5.3.2 Fishing-Related Debris

Fishing vessels are often cited as a major source of pollution from the deliberate or accidental discarding of gear and rubbish, however the licensed fleet in the SGSSI MZ must comply with strict measures to prevent this and fisheries observers monitor waste and debris related activities onboard. Vessels are prohibited from dumping or discharging garbage, which must be incinerated or stored on board for disposal at a suitable facility on shore, and the use of packing bands on bait boxes is banned. Discarding of hooks is prohibited in SGSSI waters and fishing licence conditions require longliners to have a hook management system that ensures that hooks are not lost overboard, including appropriate storage and a method of removing hooks from offal before it is discharged. Longliners are also required to use uniquely marked hooks that can be traced back to the vessel. The use of net bags to secure weights on Spanish system lines is also prohibited.

Despite these measures within the SGSSI MZ, beached debris is regularly recorded (Waluda et al. 2020). As South Georgia has relatively few direct sources of man-made marine waste, and high levels of compliance with relevant legislation, a high proportion of debris is likely to be transported from further afield. The impact of debris on wildlife is occasionally observed with small numbers of fur seals encountered with packing bands,

***Entangled fur seal prior to net removal** – Sam Balderson*

loops of rope or sections of fishing net around their necks. However, the number of entanglements recorded annually has reduced significantly since 1994 thanks to improved legislation and mitigation measures (Waluda & Staniland, 2013). Occasional foul-hooking of seabirds, particularly wandering albatrosses, are reported from South Georgia, with debris including fishing gear and non-fishing related items frequently encountered around the nests and in the stomach contents of many of South Georgia's larger breeding birds (Huin & Croxall, 1996; Phillips et al., 2010; Phillips and Waluda, 2020).

Across the monitored seabird colonies, the prevalence and type of fishing and non-fishing related debris found varies between seabird species, with albatrosses and giant petrels the most heavily impacted (Phillips et al., 2010; Phillips & Waluda, 2020). This is likely to reflect the wide and differing seabird foraging ranges and the types of vessels each species encounter. The types of materials that have been identified are likely to have originated from fishing fleets operating beyond the SGSSI MPA (Phillips & Waluda, 2020), and the introduction of marked hooks in the SG longline fleet has shown only a very small percentage of the hooks found in seabird nests have come from vessels that are licensed to fish at SGSSI.

BAS have undertaken long term monitoring of beached marine debris, debris found in association with seabird colonies and entanglements at South Georgia since the late 1980s (Waluda & Staniland 2013; Phillips and Waluda 2020; Waluda et al. 2020). Survey work is undertaken at Bird Island and King Edward Point in accordance with a standardised methodology, with data and reports submitted to CCAMLR on an annual basis.

5.3.3 Microplastics

Microplastic pollution is ubiquitous across the world's oceans, including in the Southern Ocean (Waller et al. 2017). Research carried out at South Georgia has found microplastics in samples collected from seawater, zooplankton, fish and higher predators (Le Guen et al., 2020; Fragao et al., 2021; Buckingham, 2023; Hunter et al. 2024). Fragments of textiles and paint/varnish flecks likely to be from ships indicate that a some of this pollution is potentially being generated by visitors to the region, not just tourists but also scientists on research vessels and the resident populations at the two research stations (Buckingham et al., 2022, Rowlands et al., 2023). Long term monitoring studies suggest a trend towards more smaller items of debris at South Georgia over time, probably related in part to the breakdown of larger items into microplastics (Waluda et al. 2020). Exposure to microplastics may have a range of negative impacts on the ecosystem (Jeong et al., 2024, Marcharla et al., 2024) and whilst some operators are attempting to mitigate this pollution by using microfibre filters on washing machines and restricting the use of toiletries containing microplastics (ATCM, 2019; Jain et al., 2025), the presence of these pervasive fragments and fibres originating from within and beyond the region is inevitable.

5.3.4 Shipwrecks and other sources of pollution

In May 2003 there was a major incident in Cumberland Bay East when three longliners ran aground in stormy weather. One vessel was pulled off the beach near King Edward Point, but two (FV *Moresko* and FV *Lyn*) went aground on rocks near the entrance to Moraine Fjord. Despite considerable efforts neither vessel was refloated. Much of the oil was pumped from the vessels and the fishing gear removed, but the wrecks remained in Cumberland Bay. Over the intervening years the vessels gradually broke up releasing material such as insulation foam which was regularly washed up on beaches in the bay; however the wrecks are now in the final stages of disintegration, and the release of further debris is negligible. GSGSSI requirements for vessels operating in the MPA- such as compliance with the Torremolinos International Convention for the Safety of Fishing Vessels (IMO, 1993), ensuring vessel crews are appropriately trained, and that they carry out regular safety drills based on their emergency contingency plans- aim to minimise the chance of future shipwrecks. Vessels must also provide evidence of compulsory insurance under the Nairobi International Convention on the Removal of Wrecks, which provides the legal basis to remove future wrecks, should an incident occur.

Marine pollution can also come from unexpected sources. In 1987 the Russian Druzhnaya I research station on the Filchner Ronne ice shelf in Antarctica was evacuated when the ice beneath it began to calve and the station became trapped on the iceberg A23a. The base was buried under deep snow as it drifted in the Southern Ocean and whilst the most valuable equipment was salvaged by airlift (Shabad, 1986), some materials remained. When A23a finally began to break up in the Scotia Sea in January 2025, cruise ships reported seeing debris including fuel drums being shed from the ice into the ocean. That season there were also reports of oil drums being sighted in the waters around the South Sandwich Islands, likely those from the Druzhnaya I research station.

5.4 Hydrocarbon & Mineral Extraction

In recent years there has been an increasing interest in deep sea mining to meet the demand for metals such as aluminium, cobalt, copper, nickel, manganese, lithium and zinc. These elements are used to produce technologies like smartphones, but also in wind turbines, solar panels and batteries as efforts are made to transition away from fossil fuels (IUCN, 2022). Whilst alternative energy options are progressing, there is still an interest in developing an offshore oil and gas industry in the Southwest Atlantic region (Falkland Islands Government, 2025). Extraction of all these resources has the potential to cause significant damage to the seafloor and the wider marine ecosystem, therefore following the 2017/18 MPA Review, SGSSI announced a prohibition on the commercial exploitation of mineral or hydrocarbon resources across the entire Maritime Zone, mitigating the threats faced from deep sea mining and other extractive activities.

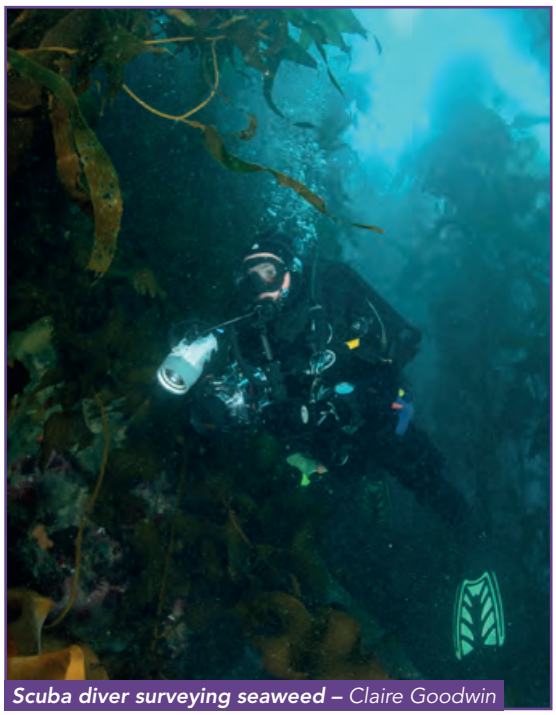
5.5 Marine Invasive Non-Native Species

Non-native species are plants and animals that are living in areas where they wouldn't naturally be found. They may have been introduced accidentally or deliberately, and many are harmless, but those that have a detrimental impact on the ecosystem are classed as invasive non-native species (INNS) (GBNSS, 2025).

Marine INNS pose a substantial threat to the marine ecosystems of South Georgia and the South Sandwich Islands, with the potential to have significant impacts on native biodiversity including displacement of native species, alteration of community structure, food webs and ecological processes, destruction of habitats, reduction of water quality and the introduction of disease (Blue Belt Programme, 2025). A Horizon Scanning workshop conducted in 2018 identified 12 marine species of concern for SGSSI (Roy et al., 2019) but to date, only two marine non-native species have been recorded at South Georgia - one established seaweed (*Ulva fenestrata*) (Mrowicki & Brodie, 2023) and one historic record of a single individual mussel (*Mytilus edlis*) (Ralph et al., 1976). However, physical and physiological barriers to marine invasions are increasingly being broken down by the growth in vessel traffic and climate change impacts, enhancing the risks of future introductions and the establishment of non-native species (Vye, 2024a).

Anthropogenic pathways are key mechanisms for marine INNS movement, and whilst ballast water dispersal is largely controlled through IMO regulations (Bayley et al., 2024), biofouling- the growth of animals and algae on ship hulls and submerged equipment- is largely unregulated (Vye 2024a).

GSGSSI initiated a multi-stage programme of marine INNS research in 2023 with a Phase 1 risk analysis of invasion pathways (Bayley et al., 2024). Phase 2 was completed in 2025 and included analysis of biofouling through hull surveys, a review of management options, and physiological studies to assess the survival of species when crossing temperature gradients (Vye, 2024a,b,c; Vye et al., 2024a,b). The intention is that Phase 3 will lead to the development of a biofouling management approach and further data collection to better understand risk and underpin any future voluntary and/or mandatory regulations.



***Scuba diver surveying seaweed** – Claire Goodwin*

A survey of inshore waters was carried out in 2010 at 25 sites along the northern coast of South Georgia, sampling subtidal habitats between 5 and 18m depth; however known potential invasive species were not detected at any site (Brickle & Brewin, 2011). This survey provided baseline data on the inshore marine flora and fauna, and a 2024 survey at Grytviken (the landing site with the highest level of vessel traffic on South Georgia) did not detect any new INNS of concern (Vye 2024b). The findings of a subsequent laboratory-based physiological study did however confirm that marine non-native species present in the Falkland Islands pose a risk of being able to survive the transit across the Polar Front to South Georgia, and that the Polar Front may have little or no impact on the fitness of the species to establish in a new location (Vye et al., 2024b). If an INNS is introduced and becomes established at South Georgia then eradication would be difficult and expensive, and may not even be possible, therefore robust pre-border biosecurity is critical to minimise the risk of introduction.

5.6 Wildlife Disturbance

The high densities of wildlife at South Georgia are one of the main attractions for visitors to islands, but with a growth in polar tourism (see *Section 4.1: Visitors to SGSSI*) occurring at the same time as the recovery of historically over-exploited species, there is an increasing risk of interactions between visitors and wildlife.

5.6.1 Ship Strikes

The recovery of whales at South Georgia has been a major conservation success story (Calderan et al., 2020, Jackson et al., 2023), but there will always be a risk of collision wherever whales and ships coincide. The International Whaling Commission has advised that limiting vessel speeds in areas of high overlap is a key method of minimising whale strikes (IWC, 2016). Following a review of vessel traffic and whale densities, in 2022 GSGSSI established a 10kt speed limit in a designated polygon that encompasses the areas deemed to be of highest risk for whale strikes. Ongoing research into cetacean populations and vessel movements will allow the adaptive management of this polygon to ensure it continues to cover the areas where whales are most vulnerable to ship strikes.

Bird-strike - where seabirds land on or collide with a vessel - is known to be a cause of seabird injury and mortality around SGSSI. The main risk factor for bird-strike is vessel lighting since many seabirds are attracted to artificial light, therefore GSGSSI implements strict requirements for all vessels to minimise light output by using the minimum ship's lights necessary for safe operation and using blackout blinds on vessel windows.

A recent Darwin Plus project (DPLUS 143) has developed a new standardised bird-strike reporting form for all vessels operating in the SGSSI MZ, which should enable GSGSSI to better understand the level of threat to bird populations and inform further development of mitigation measures (Tierney et al., 2024).

5.6.2 People

Tourists coming ashore at SGSSI to see the vast colonies of seals, penguins and seabirds, as well as scientists and other visitors working in the region, can pose a serious risk of disturbance to wildlife. Animals that are disturbed can show physiological responses including elevated heart rates and increased stress hormone levels as well as behavioural responses such as increased vigilance and abandonment of eggs/chicks which may all have long-term effects at a population level (Coetzee & Chown, 2015). Visitor regulations limit the number of passengers allowed ashore at any one time, and there are strict regulations enforced under the Wildlife and Protected Areas Ordinance (2011, as amended) to minimise wildlife disturbance, including how to approach animals, avoidance of burrows, and maintaining an appropriate distance from all animals (GSGSSI, 2025b,d). Additionally, IAATO produce a suite of guidelines and operational procedures for viewing whales, seals and birds (IAATO, 2025b) which must be adhered to. Regulated Activity Permit conditions require applicants to identify and mitigate any potential disturbance to wildlife.

Whale research using drones – *Tracy Cooper*

5.6.3 Submersibles and Drones

With technological advances and more cost-effective products on the market, the increasing use of submersibles (Human and Remotely Operated Vehicles (HOVs/ROVs)) and drones (Unmanned Aerial Vehicles (UAVs)) by scientists and cruise ship operators comes with a risk of wildlife disturbance.

The GSGSSI policy for HOVs and ROVs (GSGSSI, 2020) requires pilots to be suitably qualified/experienced, and limits where and when submersibles can be used. The pilot must strive to maintain appropriate distances from wildlife so as not to cause disturbance, stress or aggressive responses, and any disturbance to wildlife requires the submersible to back away or abort the dive. Submersibles are not allowed to make contact with the seabed, underwater structures or animals, and care must be taken to prevent thrusters disturbing delicate benthic communities.

Responses to aerial disturbance can vary between species and also different life stages (Weimerskirch et al., 2018) so GSGSSI has banned recreational drone flying and will only permit UAVs to be used by suitably qualified/experienced pilots for scientific research and media/outreach purposes (GSGSSI, 2022a).

Compulsory standing conditions for drone operations (GSGSSI, 2025g) must be complied with by anyone who receives a Regulated Activity Permit to fly a UAV to ensure that any potential environmental impacts have been fully mitigated.

The remote nature of SGSSI and lack of any landing strips mean that aircraft visits are a rare occurrence. The only flight that may impact wildlife is the maritime patrol flight, "Operation Coldstare", carried out by the RAF (see *Section 3.7.1.3: Maritime Patrol Flights*) where low-level surveillance of the coastline has the potential to impact penguin colonies, particularly during the breeding season. A 'Wildlife and Low Flying Avoidance Map' is provided to pilots which indicates areas where low-level flying is prohibited at specified times of year to prevent disturbance. Whilst some research vessels, cruise ships and super yachts may carry helicopters, GSGSSI will only permit the use of helicopters where they are essential to the delivery of science or conservation, and their use will only be authorised in exceptional circumstances, where no other option exists and when robust environmental and safety criteria are met (GSGSSI, 2022b).

Section 6: Conclusion

6.1 Forward Look

This MPA Management Plan reinforces the Government of South Georgia & the South Sandwich Islands commitment to the conservation of biodiversity and sustainable marine management. By integrating robust scientific evidence, international best practice, transparent governance, and regular reviews, it provides a framework that can respond to current pressures and emerging challenges in a rapidly changing Southern Ocean.

Looking ahead, priorities for the SGSSI MPA will be shaped by ongoing environmental change, evolving ecological understanding, and the need to keep conservation and sustainable use in balance. New technologies - such as higher-resolution remote sensing, improved bioacoustic surveys, and autonomous sampling tools - will present new opportunities to detect change, understand ecosystem dynamics, and support evidence-based adaptation of the MPA's management measures.

Stakeholder engagement will remain essential. Responsible stewardship relies on open dialogue with scientists, fisheries and tourism operators, international NGOs, and the wider community. Strengthening these partnerships will help ensure the SGSSI MPA continues to set a global benchmark for transparency, accountability, and shared responsibility for healthy oceans.

GSGSSI will continue to take a precautionary, adaptive approach - welcoming new data, responding decisively to emerging threats, and recognising the close links between marine ecosystems, tourism, fisheries, and wildlife. Through this commitment, the SGSSI MPA will continue to protect a region of exceptional ecological value, support global biodiversity and climate goals, and stand as a leading example of science-based marine protection in a changing world.

6.2 Acknowledgements

The SGSSI MPA Management Plan (Version 3) was prepared by Sue Gregory and Mark Belchier (GSGSSI). It builds on Version 2 (GSGSSI, 2013), and we gratefully acknowledge all those who contributed to that earlier document.

Version 3 text contributed by Dave Barnes, Ashley Bennison, Rachel Cavanagh, Martin Collins, Jaume Forcada, Susie Grant, Jennifer Jackson, Cecilia Liszka, Stephanie Martin, Richard Phillips, Norman Ratcliffe, Ryan Saunders, Geraint Tarling, Sally Thorpe and Claire Waluda (all British Antarctic Survey); Oliver Hogg and Marta Soeffker (Centre for Environment, Fisheries and Aquaculture Science); Andy Deary, Sebastian Jennings and Joseph Peters (all Marine Management Organisation); Juliet Brodie and Rob Mrowicki (both Natural History Museum); and Tom Hart (Oxford Brookes University).

Maps and figures provided by the British Antarctic Survey Mapping and Geographic Information Centre (MAGIC); Laura Gerrish, Susie Grant, Tom Hughes and Sally Thorpe (BAS); Oliver Hogg and Marta Soeffker (Cefas); Russ Leaper (IFAW).

Front cover photograph by Sally Hesketh.

Back cover montage includes images by Ashley Bennison, Jennifer Black, Gemma Clucas, Jamie Coleman, Martin Collins, John Dickens, Claire Goodwin, Sue Gregory, Tom Hart, Matthew Phillips, Rod Strachan, Jared Towers, and modified Copernicus Sentinel data (2018) processed by ESA.

Financial support to produce this document was provided by the UK Government's Blue Belt Programme.

Document layout design by Ralph Design Ltd, Cambridge, UK.

6.3 Literature Cited

Addison J, Gaudin G, des Clers S, Cho J-H & Ernst H (2021). Jeong Il Corporation Antarctic Krill Fishery Public Certification Report. Control Union UK Ltd. https://fisheries.msc.org/en/fisheries/jeong-il-corporation-antarctic-krill-fishery/@@assessments

Agnew DJ (2004). Fishing South: The History and Management of South Georgia Fisheries. Penna Press, St Albans, UK.

Amos, J Rivault E & Gaynor K (2024). A23a: Tracking the world's biggest iceberg as it drifts towards oblivion. BBC News: https://www.bbc.co.uk/news/resources/idt-f4de435a-d215-4a7c-86e9-9b838701c993

Andrews J & Medley P (2021). South Georgia Icefish Pelagic Trawl Fishery: Public Certification Report. LRQA. https://fisheries.msc.org/en/fisheries/south-georgia-icefish-pelagic-trawl/@@view

Andrews J & Sharov A (2024). South Georgia Patagonian Toothfish Longline Public Certification Report. LRQA. https://fisheries.msc.org/en/fisheries/south-georgia-patagonian-toothfish-longline/@@assessments

ATCM (2019). Reducing Plastic Pollution in Antarctica and the Southern Ocean. Working Paper 14, submitted by the UK to the XLII Antarctic Treaty Consultative Meeting, Prague, Czech Republic. https://documents.ats.aq/ATCM42/wp/ATCM42_wp014_e.doc

Atkinson A, Whitehouse MJ, Priddle J, Cripps GC, Ward P & Brandon MA (2001). South Georgia, Antarctica: a productive, cold water, pelagic ecosystem. *Marine Ecology-Progress Series, 216*: 279-308. https://doi.org/10.3354/meps216279

Baines ME, Kelly N, Reichelt M, Lacey C, Pinder S, Fielding S, Murphy E, Trathan P N, Biuw M, Lindstrøm U, Krafft BA, & Jackson JA (2021). Population abundance of recovering humpback whales (*Megaptera novaeangliae*) and other baleen whales in the Scotia Arc, South Atlantic. *Marine Ecology Progress Series, 676: 77-94.* https://doi.org/10.3354/meps13849

Baird R (2024). The CAMLR Convention and IUU Fishing. In: Scott SV, Stephens T & McGee J (eds) *Geopolitical Change and the Antarctic Treaty System*. Springer Polar Sciences. Springer, Singapore. https://doi.org/10.1007/978-981-97-9808-7_5

Bamford CCG, Fenney J, Coleman J, Fox-Clarke C, Dickens JD, Fedak M, Fretwell P, Hückstädt L & Hollyman P (2025). High Pathogenicity Avian Influenza Viruses (HPAIV) Associated with Major Southern Elephant Seal Decline on South Georgia. *Communications Biology, 8*: 1493. https://doi.org/10.1038/s42003-025-09014-7

Barnes DKA, Linse K, Waller C, Morely S, Enderlein P, Fraser KPP & Brown M (2006). Shallow benthic fauna communities of South Georgia Island. *Polar Biology, 29*: 223-228. https://doi.org/10.1007/s00300-005-0042-0

Barnes DKA, Sands CJ, Hogg OT, Robinson BJ, Downey RV & Smith JA (2016). Biodiversity signature of the last glacial maximum at South Georgia, Southern Ocean. *Journal of Biogeography, 43 (12)*: 2391-2399. https://doi.org/10.1111/jbi.12855

BAS (2024). South Georgia Science Plan, King Edward Point 2024-2029. British Antarctic Survey.

BAS (20205a). Scotia Sea overview map. Mapping and Geographic Information Centre, British Antarctic Survey, version 1.https://data.bas.ac.uk/maps/1003

BAS (2025b). An A4 overview map of South Georgia. Mapping and Geographic Information Centre, British Antarctic Survey, version 1. https://data.bas.ac.uk/maps/1006

BAS (2025c). South Sandwich Islands map. Mapping and Geographic Information Centre, British Antarctic Survey, version 1. https://data.bas.ac.uk/maps/1018

BAS (2025d). The South Georgia & the South Sandwich Islands MPA Data Portal. https://apex.nerc-bas.ac.uk/f?p=154:1:2969596768589

Bayley DTI, Brewin PE, James R, McCarthy AH & Brickle P (2024). Identifying marine invasion threats and management priorities through introduction pathway analysis in a remote sub-Antarctic ecosystem. *Ecology and Evolution, 14 (4)*: e11299. https://doi.org/10.1002/ece3.11299

Belchier M & Collins MA (2008). Recruitment and body size in relation to temperature in juvenile Patagonian toothfish (*Dissostichus eleginoides*) at South Georgia. *Marine Biology, 155 (5):* 493-503. https://doi.org/10.1007/s00227-008-1047-3

Belchier M, Peatman T & Brown J (2012). The biology, ecology and development of fishery management advice for the anomuran crabs at South Georgia (CCAMLR Subarea 48.3). *CCAMLR Science, 19*: 1-15. https://nora.nerc.ac.uk/id/eprint/502029/

Belchier M, Collins MA, Gregory S, Hollyman P & Soeffker M (2022). From sealing to the MPA – A history of exploitation, conservation and management of marine living resources at the South Sandwich Islands. *Deep Sea Research Part II: Topical Studies in Oceanography, 198*: 105056. https://doi.org/10.1016/j.dsr2.2022.105056

Benedet RA (2017). The bottom longline fishery and its use as a source of benthic biodiversity information around South Georgia. Open University (United Kingdom). https://doi.org/10.21954/ou.ro.0000be24

Bennison, A., Adlard, S., Banyard, A. C., Blockley, F., Blyth, M., Browne, E., … Phillips, R. A. (2024). A case study of highly pathogenic avian influenza (HPAI) H5N1 at Bird Island, South Georgia: the first documented outbreak in the subantarctic region. *Bird Study*, *71*(4): 380–391. https://doi.org/10.1080/00063657.2024.2396563

Black AD & White RW (2011). Expedition to the South Sandwich Islands on board the Golden Fleece, 1 January – 5 February 2011. Government of South Georgia & the South Sandwich Islands, pp 23

Blue Belt Programme (2025). Blue Belt Programme Roundtable: Marine Biosecurity. Workshop Report, 34pp. https://assets.publishing.service.gov.uk/media/67fd0d36694d57c6b1cf8cd9/Blue_Belt_Programme_UKOT_Marine_Biosecurity_Roundtable_Report_FINAL.pdf

Bohrmann G. (2017). R/V METEOR Cruise Report M134, Emissions of Free Gas from Cross-Shelf Troughs of South Georgia: Distribution, Quantification, and Sources for Methane Ebullition Sites in Sub-Antarctic Waters, Port Stanley (Falkland Islands) - Punta Arenas (Chile), 16 January - 18 February 2017. Berichte aus dem MARUM und dem Fachbereich Geowissenschaften der Universität Bremen. https://media.suub.uni-bremen.de/entities/publication/d81ebce1-d839-4bcb-b871-47deb9d7fb88

Borrione I & Schlitzer R (2013). Distribution and recurrence of phytoplankton blooms around South Georgia, Southern Ocean. *Biogeosciences, 10:* 217-231. https://doi.org/10.5194/bg-10-217-2013

Boyd IL, Walker TR & Poncet J (1996). Status of southern elephant seals at South Georgia. *Antarctic Science, 8*: 237-244. https://doi.org/10.1017/S0954102096000338

Brickle P & Brewin P (2011). Invasive species monitoring of South Georgia. Government of South Georgia & the South Sandwich Islands, 9 pp.

Brodie J (2023). Biodiversity discovery and the future of South Georgia's seaweed habitats. Darwin Plus Project DPLUS122 Final Report. https://darwinplus.org.uk/documents/DPLUS122/26805/DPLUS122%20FR%20-%20edited.pdf

Brooks CM, Chown SL, Douglass LL, Raymond BP, Shaw JD, Sylvester ZT & Torrens CL (2020). Progress towards a representative network of Southern Ocean protected areas. *PLoS ONE 15(4)*: e0231361. https://doi.org/10.1371/journal.pone.0231361

Buckingham J (2023). The ecological fate of microplastic in the nearshore environment of South Georgia, a sub-Antarctic island. PhD Thesis, University of Hull. https://hull-repository.worktribe.com/output/4347844

Buckingham JW, Manno C, Waluda CM & Waller, CL (2022). A record of microplastic in the marine nearshore waters of South Georgia. *Environmental Pollution, 306:* 119379. https://doi.org/10.1016/j.envpol.2022.119379

Burton R (2015). The Weddell seals of Larsen Harbour, South Georgia: a unique but apparently declining colony. *Polar Record, 51(6)*: 667-671. https://doi.org/10.1017/S0032247414000953

Calderan SV, Black A, Branch TA, Collins MA, Kelly N, Leaper R, Lurcock S, Miller BS, Moore M, Olson PA, Siroviç A, Wood AG & Jackson JA (2020). South Georgia blue whales five decades after the end of whaling. *Endangered Species Research, 43*: 359-373. https://doi.org/10.3354/esr01077

CCAMLR (2009). Report on the abandoned gillnet retrieval operation conducted by Australia in CCAMLR Statistical Division 58.4.3b (BANZARE Bank). Delegation of Australia; CCAMLR-XXVIII/BG/22. https://meetings.ccamlr.org/en/ccamlr-xxviii/bg/22

CCAMLR (2025a). CCAMLR Fishery Report 2024*: Euphausia superba* in Area 48. https://fishdocs.ccamlr.org/FishRep_48_KRI_2024.pdf

CCAMLR (2025b). CCAMLR Fishery Summary 2024: *Euphausia superba* in Area 48. https://fishdocs.ccamlr.org/FishSum_48_KRI_2024.pdf

CCAMLR (2025c). Fishery Report 2024: *Champsocephalus gunnari* in Subarea 48.3. https://fishdocs.ccamlr.org/FishRep_483_ANI_2024.pdf

Clarke A, Croxall JP, Poncet S, Martin AR & Burton R (2012). Important bird areas of South Georgia. *British Birds, 105*: 118-144. https://nora.nerc.ac.uk/id/eprint/18855/

Coetzee BWT & Chown SL (2015). A meta-analysis of human disturbance impacts on Antarctic wildlife. *Biological Reviews 91 (3)*: 578-596. https://doi.org/10.1111/brv.12184

Collins MA & Rodhouse PGK (2006). Southern Ocean cephalopods. *Advances in Marine Biology, 50:* 191-265. https://doi.org/10.1016/S0065-2881(05)50003-8

Collins MA, Allcock AL & Belchier M (2004). Cephalopods of the South Georgia slope. *Journal of the Marine Biological Association of the United Kingdom, 84*: 415-419. https://doi.org/10.1017/S0025315404009373h

Collins MA, Ross K, Mitchell R & Belchier M (2007). Distribution and diet of juvenile Patagonian toothfish on the South Georgia and Shag Rocks shelves (Southern Ocean). *Marine Biology 152:* 135-147. https://doi.org/10.1007/s00227-007-0667-3

Collins MA, Xavier JC, Johnston NM, North AW, Enderlein P, Tarling GA, Waluda CM, Hawker EJ & Cunningham NJ (2008). Patterns in the distribution of myctophid fish in the northern Scotia Sea ecosystem. *Polar Biology, 31:* 837-851. https://doi.org/10.1007/s00300-008-0423-2

Collins MA, Brickle P, Brown J, Belchier M (2010). The Patagonian toothfish: Biology, ecology and fishery. *Advances in Marine Biology, 58*: 227-300. https://doi.org/10.1016/B978-0-12-381015-1.00004-6

Collins MA, Stowasser G, Fielding S, Shreeve R, Xavier JC, Venables HJ, Enderlein P, Cherel Y & Van de Putte A (2012). Latitudinal and bathymetric patterns in the distribution and abundance of mesopelagic fish in the Scotia Sea. *Deep-Sea Research Part II – Topical Studies in Oceanography, 59/60*: 189-198. https://doi.org/10.1016/j.dsr2.2011.07.003

Collins MA, Hollyman PR, Clark J, Soeffker M, Yates O & Phillips RA (2021). Mitigating the impact of longline fisheries on seabirds: Lessons learned from the South Georgia Patagonian toothfish fishery (CCAMLR Subarea 48.3). *Marine Policy, 131*: 104618. https://doi.org/10.1016/j.marpol.2021.104618

Darby CD & Hogg OT (2021). The use of miniature cameras to monitor the behaviour and benthic impact of longline fishing gear at South Georgia. Blue Belt Programme, Report number CR130. 72 pp.

Davenport J & Macalister H (1996). Environmental conditions and physiological tolerances of intertidal fauna in relation to shore zonation at Husvik, South Georgia. *Journal of the Marine Biological Association of the United Kingdom, 76:* 985-1002. https://doi.org/10.1017/S0025315400040923

Dickson J, Morley SA & Mulvey T (2004). New data on *Martialia hyadesi* feeding in the Scotia Sea during winter; with emphasis on seasonal and annual variability. *Journal of the Marine Biological Association of the United Kingdom, 84*: 785-788. https://doi.org/10.1017/S002531540400944h

Downie AL, Vieira RP, Hogg OT & Darby C (2021). Distribution of Vulnerable Marine Ecosystems at the South Sandwich Islands: results from the Blue Belt Discovery Expedition 99 deep-water camera surveys. *Frontiers in Marine Science, 8*: p.662285. https://doi.org/10.3389/fmars.2021.662285

Falkland Islands Government (2025). Department of Mineral Resources: Production Licences. https://falklands.gov.fk/mineralresources/offshore/production-licences

Fetterer F, Knowles K, Meier WN, Savoie M & Windnagel AK (2017). Sea Ice Index, Version 3, Updated Daily. Median Antarctic Sea Ice Extent 1981-2010. NSIDC: National Snow and Ice Data Center, Boulder, Colorado, USA. https://nsidc.org/data/g02135/versions/3

Fleming, A (2024). South Georgia and Icebergs. South Georga Association Newsletter, No. 47. https://southgeorgiaassociation.org/newsletters/

Foley CM, Fagan WF & Lynch HJ (2020). Correcting for within-season demographic turnover to estimate the island-wide population of King Penguins (*Aptenodytes patagonicus*) on South Georgia. *Polar Biology, 43*: 251–262. https://doi.org/10.1007/s00300-020-02627-0

Forcada J, Trathan PN, Reid K & Murphy EJ (2005). The Effects of Global Climate Variability in Pup Production of Antarctic Fur Seals. *Ecology, 86*: 2408-2417. https://doi.org/10.1890/04-1153

Forcada J, Hoffman JI, Gimenez O, Staniland IJ, Bucktrout P & Wood AG (2023). Ninety years of change, from commercial extinction to recovery, range expansion and decline for Antarctic fur seals at South Georgia. *Global Change Biology, 29(24)*: 6867-6887. https://doi.org/10.1111/gcb.16947

Fragão J, Bessa F, Otero V, Barbosa A, Sobral P, Waluda CM, Guímaro HR & Xavier JC (2021). Microplastics and other anthropogenic particles in Antarctica: Using penguins as biological samplers. *Science of The Total Environment*, 788:147698. https://doi.org/10.1016/j.scitotenv.2021.147698

Fritt-Rasmussen J, Wegeberg S, Gustavson K, Sørheim KR, Daling PS, Jørgensen K, Tonteri O & Holst-Andersen JP (2018). Heavy Fuel Oil (HFO): A review of fate and behaviour of HFO spills in cold seawater, including biodegradation, environmental effects and oil spill response. Nordic Council of Ministers, 89 pgs. https://www.sintef.no/en/publications/publication/1624457/

GBNSS (2025). Great Britain Non-Native Species Secretariat, https://www.nonnativespecies.org

GEBCO Compilation Group (2025). GEBCO 2025 Grid. https://doi.org/10.5285/37c52e96-24ea-67ce-e063-7086abc05f29

Graham AGC, Fretwell PT, Larter RD, Hodgson DA, Wilson CK, Tate AJ & Morris P (2008). A new bathymetric compilation highlighting extensive paleo-ice sheet drainage on the continental shelf, South Georgia, sub-Antarctica. *Geochemistry Geophysics Geosystems, 9*: Q07011. https://doi.org/10.1029/2008GC001993

Grant SM (2020). Building data resources for managing the SGSSI Marine Protected Area. Darwin Plus Project DPLUS069 Final Report. https://darwinplus.org.uk/documents/DPLUS069/25107/DPLUS069%20FR%20-%20edited.pdf

Gregory S, Collins MA & Belchier M (2017). Demersal fish communities of the shelf and slope of South Georgia and Shag Rocks (Southern Ocean). Polar Biology, 40 (1): 107-121. https://doi.org/10.1007/s00300-016-1929-7

GSGSSI (2013). South Georgia & the South Sandwich Islands Marine Protected Area Management Plan: August 2013, Version 2.0. Government of South Georgia & the South Sandwich Islands.

GSGSSI (2018). South Georgia & the South Sandwich Islands Marine Protected Area 5-year Review: Report to the Government of South Georgia and the South Sandwich Islands.

GSGSSI (2020). The Use of Human Occupied Vehicles (HOV) and Remotely Operated Vehicles (ROV). Government of South Georgia & the South Sandwich Islands.

GSGSSI (2021a). South Georgia and South Sandwich Islands Marine Protected Area Research & Monitoring Plan. Government of South Georgia & the South Sandwich Islands.

GSGSSI (2021b). Protect Sustain Inspire: a values-driven approach to the stewardship of South Georgia & the South Sandwich Islands 2021-2025. Government of South Georgia & the South Sandwich Islands.

GSGSSI (2022a). Government of South Georgia & the South Sandwich Islands: General information for drone operators on SGSSI – V1. Government of South Georgia & the South Sandwich Islands.

GSGSSI (2022b). Government of South Georgia & the South Sandwich Islands: Policy - Permitting the use of helicopters for civilian purposes. Government of South Georgia & the South Sandwich Islands.

GSGSSI (2023a). Government of South Georgia & the South Sandwich Islands Terrestrial Protected Areas Management Plan. Government of South Georgia & the South Sandwich Islands.

GSGSSI (2023b). SGSSI Marine Protected Area 5-Year Review Science Symposium. Government of South Georgia & the South Sandwich Islands.

GSGSSI (2024a). Government of South Georgia & the South Sandwich Islands: Biosecurity Handbook 2024-25. Government of South Georgia & the South Sandwich Islands.

GSGSSI (2024b). South Georgia Toothfish Licensing Information for Applicants for the 2024 – 2025 Fishing Seasons. Government of South Georgia & the South Sandwich Islands.

GSGSSI (2024c). South Georgia & the South Sandwich Islands Marine Protected Area 5-Year Review Workshop Report, March 2024. Government of South Georgia & the South Sandwich Islands.

GSGSSI (2024d). South Georgia & the South Sandwich Islands Mackerel Icefish Fishery (48.3) Management Plan 2025. Government of South Georgia & the South Sandwich Islands.

GSGSSI (2025a). Government of South Georgia & the South Sandwich Islands Entry Control Ordinance Electronic Travel Authorisation – Permit Application Process. Government of South Georgia & the South Sandwich Islands.

GSGSSI (2025b). Government of South Georgia & the South Sandwich Islands: Visiting South Georgia 2025-26: Information for Visitors and Operators. Government of South Georgia & the South Sandwich Islands.

GSGSSI (2025c). South Georgia and South Sandwich Islands Terrestrial Protected Area Research & Monitoring Plan. Government of South Georgia & the South Sandwich Islands.

GSGSSI (2025d). Government of South Georgia & the South Sandwich Islands: Code of Conduct Whilst Ashore. Government of South Georgia & the South Sandwich Islands.

GSGSSI (2025e). Government of South Georgia & the South Sandwich Islands: Annual Visitor Report July 2024 - June 2025. Government of South Georgia & the South Sandwich Islands.

GSGSSI (2025f). South Georgia & the South Sandwich Islands Toothfish Fishery (48.3) Management Plan 2024-2025. Government of South Georgia & the South Sandwich Islands.

GSGSSI (2025g). Government of South Georgia & the South Sandwich Islands: Standing conditions for drone operations on South Georgia & the South Sandwich Islands. Government of South Georgia & the South Sandwich Islands.

Handley JM, Pearmain EJ, Oppel S, Carniero APB, Hazin C, Phillips RA, Ratcliffe N, Staniland IJ, Clay, TA, Hall J, Scheffer A, Fedak M, Boehme L, Putz K, Belchier M, Boyd IL, Trathan PN & Dias MP (2020). Evaluating the effectiveness of a large multi-use MPA in protecting Key Biodiversity Areas for marine predators. *Diversity and Distribution 26 (6)*: 715–729. https://doi.org/10.1111/ddi.13041

Headland RK, Hughes NE & Wilkinson JP (2023). Historical occurrence of Antarctic icebergs within mercantile shipping routes and the exceptional events of the 1890s. *Journal of Glaciology, 69 (278)*: 2046-2058. https://doi.org/10.1017/jog.2023.80

Herman R, Borowicz A, Lynch M, Trathan P, Hart T & Lynch H (2020). Update on the global abundance and distribution of breeding Gentoo Penguins (*Pygoscelis papua*). *Polar Biology, 43*: 1947–1956. https://doi.org/10.1007/s00300-020-02759-3

Hogg OT (2018). An integrated ecological and geophysical approach to habitat mapping and its application in marine conservation (Doctoral dissertation, University of Southampton). https://eprints.soton.ac.uk/424752/1/Hogg_Oliver_PhD_Thesis_June_2018.pdf

Hogg OT (2025). The use of fisheries mounted camera systems and their application in the marine management of the South Georgia and South Sandwich Island Marine Protected Area. Blue Belt Programme Report number CR208, vii + 51 pp.

Hogg OT, Barnes DKA & Griffiths HJ (2011). Highly diverse, poorly studied and uniquely threatened by climate change: An assessment of marine biodiversity on South Georgia's continental shelf. *PLoS ONE 6(5)*: e19795. https://doi.org/10.1371/journal.pone.0019795

Hogg OT, Huvenne VA, Griffiths HJ, Dorschel B & Linse K (2016). Landscape mapping at sub-Antarctic South Georgia provides a protocol for underpinning large-scale marine protected areas. *Scientific Reports, 6(1)*: 33163. https://doi.org/10.1038/srep33163

Hogg OT, Huvenne VA, Griffiths HJ & Linse K (2018). On the ecological relevance of landscape mapping and its application in the spatial planning of very large marine protected areas. *Science of the Total Environment, 626*: 384-398. https://doi.org/10.1016/j.scitotenv.2018.01.009

Hogg OT, Downie AL, Vieira RP & Darby C (2021a). Macrobenthic assessment of the South Sandwich Islands reveals a biogeographically distinct polar archipelago. *Frontiers in Marine Science, 8*: 650241. https://doi.org/10.3389/fmars.2021.650241

Hogg OT, Cavanagh RD, Grant S, Belchier M, Gregory S & Collins MA (2021b). Key climate change effects on the coastal and marine environment around the Polar UK Overseas Territories. MCCIP Science Review 2021, 27pp. https://doi.org/10.14465/2021.orc02.pol

Hollyman PR, Hill SL, Laptikhovsky VV, Belchier B, Gregory S, Clement A & Collins MA (2021). A long road to recovery: dynamics and ecology of the marbled rockcod (*Notothenia rossii*, family: Notothenidae) at South Georgia, 50 years after overexploitation. *ICES Journal of Marine Science, 78 (8)*: 2745–2756, https://doi.org/10.1093/icesjms/fsab150

Hollyman PR, Soeffker M, Roberts J, Hogg OT, Laptikhovsky VV, Queirós JP, Darby C, Belchier M & Collins MA (2022). Bioregionalization of the South Sandwich Islands through community analysis of bathyal fish and invertebrate assemblages using fishery-derived data. *Deep Sea Research Part II: Topical Studies in Oceanography, 198*: 105054. https://doi.org/10.1016/j.dsr2.2022.105054

Hønneland G, Revenga L & Addison J (2020). Aker Biomarine Antarctic Krill: Public Certification Report. LRQA. https://fisheries.msc.org/en/fisheries/the-qrill-company-antarctic-krill/@@view

Huin N & Croxall JP (1996). Fishing gear, oil and marine debris associated with seabirds at Bird Island, South Georgia, during 1993/1994. *Marine Ornithology, 24*: 19-22. http://marineornithology.org/PDF/24/24_3.pdf

Hunt BPV, Pakhomov EA, Hosie GW, Siegel V, Ward P & Bernard K (2008). Pteropods in Southern Ocean ecosystems. *Progress in Oceanography, 78*: 193-221. https://doi.org/10.1016/j.pocean.2008.06.001

Hunter A, Thorpe SE, McCarthy AH & Manno C (2024). Microplastic hotspots mapped across the Southern Ocean reveal areas of potential ecological impact. *Scientific Reports, 14*: 31599. https://doi.org/10.1038/s41598-024-79816-y

IAATO (2025a). International Association of Antarctica Tour Operators (IAATO) overview of Antarctic Vessel: The 2024-25 season, and preliminary estimates for 2025-26. IP 32 rev.1. ATCM 47 - CEP 27. Milan 2025. https://iaato.org/system/files?file=2025-07/ATCM47_ip032_rev1_e.pdf

IAATO (2025b). Visitor Guidelines Library. https://iaato.org/visiting-antarctica/visitor-guidelines-library

ILO (2007). International Labour Organisation, Work in Fishing Convention, 2007 (No. 188). https://normlex.ilo.org/dyn/nrmlx_en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C188

ILO (2024). International Labour Organisation, Maritime Labour Convention, 2006, as amended [including 2022 amendments]. https://www.ilo.org/resource/other/maritime-labour-convention-2006-amended-including-2022-amendments

IMO (1993). International Maritime Organisation, The Torremolinos International Convention for the Safety of Fishing Vessels. https://www.imo.org/en/about/conventions/pages/the-torremolinos-international-convention-for-the-safety-of-fishing-vessels.aspx

IUCN Marine Mammal Protected Areas Taskforce (2021). South Georgia IMMA. https://www.marinemammalhabitat.org/factsheets/south-georgia/

IUCN (2022). Issues Briefing: Deep Sea Mining. https://iucn.org/sites/default/files/2022-07/iucn-issues-brief_dsm_update_final.pdf

IWC (2016). Information on recent outcomes regarding minimizing ship strikes to cetaceans. Paper MEPC 69/10/3 presented to IMO Marine Environment Protection Committee, submitted by the International Whaling Commission. https://iwc.int/document_3728

Jackson JA, Kennedy AS, Bamford CCG, Hart I, Martin S, MacDonald D, Moore MM & Carroll EL (2023). Humpback whales (*Megaptera novaeangliae*) return to Cumberland Bay, South Georgia, one century after the peak of whaling. *Marine Mammal Science, 40*: 237-245. https://doi.org/10.1111/mms.13050

Jain A, Hughes KA & Manno C (2025). Low-cost preventative measures can effectively mitigate microplastic release from scientific research facilities in Antarctica. *Antarctic Science, 37:* 372–383. https://doi.org/10.1017/S0954102025100217

Jamieson AJ, Stewart HA, Weston JNJ & Bongiovanni C (2021). Hadal fauna of the South Sandwich Trench, Southern Ocean: Baited camera survey from the Five Deeps Expedition. *Deep Sea Research Part II: Topical Studies in Oceanography, 194*: 104987. https://doi.org/10.1016/j.dsr2.2021.104987

Jeong E, Lee J-Y, & Redwan M (2024). Animal exposure to microplastics and health effects: A review. *Emerging Contaminants, 10 (4)*:100369. https://doi.org/10.1016/j.emcon.2024.100369

Leech K (2021). Marine Protected Areas – Showing their teeth in Overseas Territories. Marine Development Blog, Marine Management Organisation. https://marinedevelopments.blog.gov.uk/2021/06/05/marine-protected-areas-showing-their-teeth-in-overseas-territories/

Le Guen C, Suaria G, Sherley RB, Ryan PG, Aliani S, Boehme L & Brierley AS (2020). Microplastic study reveals the presence of natural and synthetic fibres in the diet of King Penguins (*Aptenodytes patagonicus*) foraging from South Georgia. *Environment International, 134*: 105303. https://doi.org/10.1016/j.envint.2019.105303

Linse K, Copley JT, Connelly DP, Larter RD, Pearce DA, Polunin NV, Rogers AD, Chen C, Clarke A, Glover AG & Graham AG (2019). Fauna of the Kemp Caldera and its upper bathyal hydrothermal vents (South Sandwich Arc, Antarctica). *Royal Society Open Science, 6(11)*: 191501. https://doi.org/10.1098/rsos.191501

Linse K, Römer M, Little CT, Marcon Y & Bohrmann G (2022). Megabenthos habitats influenced by nearby hydrothermal activity on the Sandwich Plate, Southern Ocean. *Deep Sea Research Part II: Topical Studies in Oceanography, 198*: 105075. https://doi.org/10.1016/j.dsr2.2022.105075

Liszka CM, Thorpe SE, Wootton M, Fielding S, Murphy EJ & Tarling GA (2022). Plankton and nekton community structure in the vicinity of the South Sandwich Islands (Southern Ocean) and the influence of environmental factors. *Deep-Sea Research Part II: Topical Studies in Oceanography, 198*: 105073. https://doi.org/10.1016/j.dsr2.2022.105073

Lockhart SJ, Jones CF (2008). Biogeographic patterns of benthic invertebrate megafauna on shelf areas within the Southern Ocean Atlantic sector. *CCAMLR Science, 15*: 167-192. https://www.ccamlr.org/es/system/files/science_journal_papers/09lockhart-jones.pdf

Lynch HJ, White R, Naveen R, Black A, Meixler MS & Fagan WF (2016). In stark contrast to widespread declines along the Scotia Arc, a survey of the South Sandwich Islands finds a robust seabird community. *Polar Biology, 39*: 1615–1625. https://doi.org/10.1007/s00300-015-1886-6

Mackley EK, Poncet S, Black A, Black J, Floyd K, Hall RM, Holmes EE, Manthorpe SJ, Passfield K, Bennison A & Phillips RA (2025). Endurance or extinction: long-term declines in albatrosses at South Georgia highlight threats from South Atlantic fisheries and climate change. *Endangered Species Research, 57*: 437-451. https://doi.org/10.3354/esr01427

Main CE, Collins MA, Mitchell R & Belchier M (2009). Identifying patterns in the diet of mackerel icefish (*Champsocephalus gunnari*) at South Georgia using bootstrapped confidence intervals of a dietary index. *Polar Biology, 32:* 569-581. https://doi.org/10.1007/s00300-008-0552-7

Manno C, Fielding S, Stowasser G, Murphy EJ, Thorpe SE & Tarling GA (2020). Continuous moulting by Antarctic krill drives major pulses of carbon export in the north Scotia Sea, Southern Ocean. *Nature Communications, 11*: 6051. https://doi.org/10.1038/s41467-020-19956-7

Manno C, Stowasser G, Fielding S, Apeland B & Tarling GA (2022). Deep carbon export peaks are driven by different biological pathways during the extended Scotia Sea (Southern Ocean) bloom. *Deep Sea Research Part II: Topical Studies in Oceanography, 205*: 105183. https://doi.org/10.1016/j.dsr2.2022.105183

Marcharla E, Vinayagam S, Gnanasekaran L, Soto-Moscoso M, Chen WH, Thanigaivel S & Ganesan S (2024). Microplastics in marine ecosystems: A comprehensive review of biological and ecological implications and its mitigation approach using nanotechnology for the sustainable environment. *Environmental Research, 256*: 119181. https://doi.org/10.1016/j.envres.2024.119181

Marine Conservation Institute (2025). Marine Protection Atlas: Largest Marine Protected Areas. https://mpatlas.org/large-mpas/

Marr JWS (1962). The natural history and geography of the Antarctic krill (*Euphausia superba* Dana). *Discovery Reports, 32*: 33-464. http://dx.doi.org/10.1002/iroh.19630480411

Martin AR, Poncet S, Barbraud C, Foster E, Fretwell P & Rothery P (2009). The white-chinned petrel (*Procellaria aequinoctialis*) on South Georgia: population size, distribution and global significance. *Polar Biology, 32*: 655-661. https://doi.org/10.1007/s00300-008-0570-5

Meredith MP, Watkins JL, Murphy EJ, Ward P, Bone DG, Thorpe SE, Grant SA & Ladkin RS (2003). Southern ACC front to the northeast of South Georgia: Pathways characteristics, and fluxes. *Journal of Geophysical Research, 108*: 3162. https://doi.org/10.1029/2001JC001227

Meyer B, Atkinson A, Bernard KS… Kawaguchi S (2020). Successful ecosystem-based management of Antarctic krill should address uncertainties in krill recruitment, behaviour and ecological adaptation. *Communications Earth & Environment 1:* Article 28. https://doi.org/10.1038/s43247-020-00026-1

Morin PA, Archer FI, Foote AD … Harkins T (2010). Complete mitochondrial genome phylogeographic analysis of killer whales (*Orcinus orca*) indicates multiple species. *Genome Research, 20 (7)*: 908-16. https://doi.org/10.1101/gr.102954.109

Mrowicki RJ & Brodie J (2023). The first record of a non-native seaweed from South Georgia and confirmation of its establishment in the Falkland Islands: *Ulva fenestrata* Postels & Ruprecht. *Polar Biology, 46*: 489–496. https://doi.org/10.1007/s00300-023-03136-6

MSC (2025). How the MSC Fisheries Standard Works. https://www.msc.org/standards-and-certification/fisheries-standard/how-the-standard-works

Murphy EJ et al. (2007). Spatial and temporal operation of the Scotia Sea ecosystem: a review of large-scale links in a krill centred food web. *Philosophical Transactions of the Royal Society of London Series B-Biological Sciences, 362*: 113-148. https://doi.org/10.1098/rstb.2006.1957

North AW & Ward P (1989). Initial feeding by Antarctic fish larvae during winter at South Georgia. *Cybium, 13*: 357-364. https://doi.org/10.26028/cybium/1989-134-007

Olsson O & North AW (1997). Diet of the King Penguin *Aptenodytes patagonicus* during three summers at South Georgia. *Ibis, 139 (3):* 504-512. https://doi.org/10.1111/j.1474-919X.1997.tb04666.x

Orsi AH, Whitworth T & Nowlin WD (1995). On the meridional extent and fronts of the Antarctic Circumpolar Current. *Deep Sea Research Part I, 42(5):* 641-673. https://doi.org/10.1016/0967-0637(95)00021-W

Pardo D, Forcada J, Wood AG, Tuck GN, Ireland L, Pradel R, Croxall, JP & Phillips RA (2017). Additive effects of climate and fisheries drive ongoing declines in multiple albatross species. *Proceedings of the National Academy of Sciences of the USA, 114 (50):* E10829-E10837. https://doi.org/10.1073/pnas.1618819114

Park Y-H & Durand I (2019). Altimetry-derived Antarctic Circumpolar Current fronts. SEANOE. https://doi.org/10.17882/59800

Park Y-H, Park T, Kim T-W, Lee S-H, Hong C-S, Lee J-H, Rio M-H, Pujol M-I, Ballarotta M, Durand I & Provost C (2019). Observations of the Antarctic Circumpolar Current over the Udintsev Fracture Zone, the narrowest choke point in the Southern Ocean. *Journal of Geophysical Research: Oceans, 124 (7):* 4511-4528. https://doi.org/10.1029/2019JC015024

Phillips RA & Waluda CM (2020). Albatrosses and petrels at South Georgia as sentinels of marine debris input from vessels in the southwest Atlantic Ocean. *Environment International, 136*: 105443. https://doi.org/10.1016/j.envint.2019.105443

Philips RA, Ridley C, Reid K, Pugh PJA, Tuck GN & Harrison N (2010). Ingestion of fishing gear and entanglements of seabirds: Monitoring and implications for management. *Biological Conservation, 143*: 501-512. https://doi.org/10.1016/j.biocon.2009.11.020

Pitman RL, Durban JW, Greenfelder M, Guinet C, Jorgensen M, Olson PA, Plana J, Tixier P, Towers JR (2011). Observations of a distinctive morphotype of killer whale (*Orcinus orca*), type D, from subantarctic waters. *Polar Biology, 34*: 303-306. https://doi.org/10.1007/s00300-010-0871-3

Poncet S, Wolfaardt AC, Black A, Browning S, Lawton K, Lee J, Passfield K, Strange G & Phillips RA (2017). Recent trends in numbers of wandering (*Diomedea exulans*), black-browed (*Thalassarche melanophris*) and grey-headed (*T. chrysostoma*) albatrosses breeding at South Georgia. *Polar Biology, 40 (7)*: 1347-1358. https://doi.org/10.1007/s00300-016-2057-0

Poncet S, Wolfaardt AC, Barbraud C, Reyes-Arriagada R, Black A, Powell R & Phillips RA (2020). The distribution, abundance, status and global importance of giant petrels (*Macronectes giganteus* and *M. halli*) breeding at South Georgia. *Polar Biology, 43 (1)*: 17-34. https://doi.org/10.1007/s00300-019-02608-y

Ralph R, Maxwell J, Everson I & Hall J (1976). A record of *Mytilus edulis* from South Georgia, *British Antarctic Survey Bulletin, 44*: 101–102. https://nora.nerc.ac.uk/id/eprint/525721/

Ramos A (1999). The megazoobenthos of the Scotia Arc islands. *Scientia Marina, 63*: 171-182. https://doi.org/10.3989/scimar.1999.63s1171

Ramos A, San Martin G (1999). On the finding of a mass occurrence of *Serpula narconensis* Baird, 1885 (Polychaeta, Serpulidae) in South Georgia (Antarctica). *Polar Biology, 22*: 379-383. https://doi.org/10.1007/s003000050432

Reid K, Hill SL, Diniz TCD & Collins MA (2005). Mackerel icefish *Champsocephalus gunnari* in the diet of upper trophic level predators at South Georgia: implications for fisheries management. *Marine Ecology Progress Series, 305:* 153-161. https://doi.org/10.3354/meps305153

Rogers AD, Tyler PA, Connelly DP… Zwirglmaier K (2012). The discovery of new deep-sea hydrothermal vent communities in the Southern Ocean and implications for biogeography. *PLoS Biology, 10(1)*: e1001234. https://doi.org/10.1371/journal.pbio.1001234

Rowlands E, Galloway T, Cole M, Peck VL, Posacka A, Thorpe S & Manno C (2023). Vertical flux of microplastic, a case study in the Southern Ocean, South Georgia. *Marine Pollution Bulletin, 193*: 115117. https://doi.org/10.1016/j.marpolbul.2023.115117

Roy HE, Peyton JM, Pescott OL, Rorke SL, Adriaens T, Cottier-Cook E, Dawson W, Frohlich D, Malumphy C, Martinou AF, Minchin D, Rabitsch W, Rorke SL, Tricarico E, Turvey KMA & Winfield I (2019). Prioritising Invasive Non-Native Species through Horizon Scanning on the UK Overseas Territories. CEH Report. http://dx.doi.org/10.13140/RG.2.2.18951.34726

Saunders RA, Hill, SL, Tarling GA & Murphy EJ (2019). Myctophid Fish (Family Myctophidae) Are Central Consumers in the Food Web of the Scotia Sea (Southern Ocean). *Frontiers in Marine Science, 6*: 530. https://doi.org/10.3389/fmars.2019.00530

Scheffer A, Trathan PN, Collins MA (2010). Foraging behaviour of king penguins (*Aptenodytes patagonicus*) in relation to predictable mesoscale oceanographic features in the Polar Front Zone to the north of South Georgia. *Progress in Oceanography, 86*: 232-245. https://doi.org/10.1016/j.pocean.2010.04.008

Schmidt Ocean Institute (2025). New Coral Gardens and Hydrothermal Vents Found in the Icy Depths of the Remote South Sandwich Islands. https://schmidtocean.org/new-coral-gardens-hydrothermal-vents-found-south-sandwich-islands/

Shabad T (1986). News notes. *Polar Geography and Geology, 10(4)*: 339–341. https://doi.org/10.1080/10889378609377305

Stainfield C & Forcada J (2022). Leopard Seal (*Hydrurga leptonyx*) Immature Play Behaviour. *Aquatic Mammals*, *48 (6):* 568-573. https://doi.org/10.1578/AM.48.6.2022.568

Stowasser G, Atkinson A, McGill R, Phillips RA, Collins MA & Pond DW (2012). Food web dynamics in the Scotia Sea in summer: a stable isotope study. *Deep-Sea Research II -Topical Studies in Oceanography, 59/60*: 208-22. https://doi.org/10.1016/j.dsr2.2011.08.004

Strycker N, Wethington M, Borowicz A, Forrest S, Witharana C, Hart T & Lynch H (2020). A global population assessment of the Chinstrap penguin (*Pygoscelis antarctica*). *Scientific Reports, 10*: 19474. https://doi.org/10.1038/s41598-020-76479-3

Sumaila UR, Zeller D, Hood L, Palomares MLD, Li Y & Pauly D (2020). Illicit trade in marine fish catch and its effects on ecosystems and people worldwide. *Science Advances, 6 (9)*: eaaz3801. https://doi.org/10.1126/sciadv.aaz3801

Tarling GA, Thorpe SE, Henley SF, Burson A, Liszka CM, Manno C, Lucas NS, Ward F, Hendry KR, Woodward EMS, Wootton M & Abrahamsen EP (2024). Collapse of a giant iceberg in a dynamic Southern Ocean marine ecosystem: In situ observations of A-68A at South Georgia. *Progress in Oceanography, 226*: 103297. https://doi.org/10.1016/j.pocean.2024.103297

Tarling GA, Ward P, Thorpe SE. (2018). Spatial distributions of Southern Ocean mesozooplankton communities have been resilient to long-term surface warming. *Global Change Biology, 24*: 132-142. https://doi.org/10.1111/gcb.13834

Taylor ML (2011). Phylogenetics and taxonomy of deep-sea octocoral associated with fisheries by-catch in the long-line fishery for Patagonian toothfish around South Georgia. PhD, Imperial College London.

Taylor ML, Yesson C, Agnew DJ, Mitchell RE & Rogers AD (2013). Using fisheries by-catch data to predict octocoral habitat suitability around South Georgia. *Journal of Biogeography, 40(9)*: 1688-1701. https://doi.org/10.1111/jbi.12122

Thorpe SE & Murphy EJM (2022). Spatial and temporal variability and connectivity of the marine environment of the South Sandwich Islands, Southern Ocean. *Deep Sea Research Part II: Topical Studies in Oceanography, 198*: 105057. https://doi.org/10.1016/j.dsr2.2022.105057

Tierney M, Parsons M, Wheatley H, Grant E, Gregory S, Black J, Belchier M, Lynnes A & Thomson P (2024). What goes thump at night: managing bird-strike in South Georgia and the South Sandwich Islands. *ACAP Joint SBWG12/PaCSWG8 Inf 16*. https://www.acap.aq/working-groups/joint-sbwg12-pacswg8-meeting/joint-sbwg12-pacswg8-information-papers/4744-joint-sbwg12-pacswg8-inf-16-managing-birdstrike/file

Trathan PN, Bishop C, Maclean G, Brown P, Fleming A, Collins MA (2008). Linear tracks and restricted temperature ranges characterise penguin foraging pathways. *Marine Ecology Progress Series, 370*: 285-294. https://doi.org/10.3354/meps07638

Trathan PN, Ratcliffe N, & Masden EA (2012). Ecological drivers of change at South Georgia: the krill surplus, or climate variability. *Ecography, 35(1)*: 983-993. https://doi.org/10.1111/j.1600-0587.2012.07330.x

Trathan PN, Collins MA, Grant SM, Belchier M, Barnes DKA, Brown J & Staniland IJ (2014). The South Georgia and the South Sandwich Islands MPA: Protecting A Biodiverse Oceanic Island Chain Situated in the Flow of the Antarctic Circumpolar Current. In: Magnus L. Johnson and Jane Sandell, editors, *Advances in Marine Biology, Vol. 69*, Oxford: Academic Press. https://doi.org/10.1016/B978-0-12-800214-8.00002-5

Vye SR (2024a). Quantifying biofouling on vessels operating in South Georgia and the South Sandwich Islands. Report for the Government of South Georgia and the South Sandwich Islands. 19pgs.

Vye SR (2024b). Surveillance for marine non-native species incursions at King Edward Cove. Report for the Government of South Georgia and the South Sandwich Islands. 23pgs.

Vye SR (2024c). Biofouling management in the Sub-antarctic: Learning from others. South Georgia and the South Sandwich Islands Invasive Non-Native Species Project 2023-2024. Report for the Government of South Georgia and the South Sandwich Islands. 30pgs.

Vye SR, Baylis A, Morley S & Brickle P (2024a). Comparative analysis of biofouling management policies: potential options for South Georgia and the South Sandwich Islands. Report for the Government of South Georgia and the South Sandwich Islands. 48pgs.

Vye SR, Buering T & Morley S (2024b). The tolerance of a common invasive ascidian to transport across the Polar Front. Report for Government of South Georgia and the South Sandwich Islands. 14pgs.

Waller CL, Griffiths HJ, Waluda CM, Thorpe SE, Loaiza I, Moreno B, Pacherres CO & Hughes KA (2017). Microplastics in the Antarctic marine system: An emerging area of research, *Science of The Total Environment, 598*: 220-227 https://doi.org/10.1016/j.scitotenv.2017.03.283

Waluda CM & Staniland IJ (2013). Entanglement of Antarctic fur seals at Bird Island, South Georgia. *Marine Pollution Bulletin, 74(1):* 244-252. https://doi.org/10.1016/j.marpolbul.2013.06.050

Waluda CM, Staniland IJ, Dunn MJ, Thorpe SE, Grilly E, Whitelaw M & Hughes KA (2020). Thirty years of marine debris in the Southern Ocean: Annual surveys of two island shores in the Scotia Sea. *Environment International, 136:* 105460. https://doi.org/10.1016/j.envint.2020.105460

Ward P, Atkinson A, Peck JM & Wood AG (1990). Euphausiid life-cycles and distribution around South Georgia. *Antarctic Science, 2*: 43-52. http://dx.doi.org/10.1017/S0954102090000050

Ward P, Tarling GA & Thorpe SE (2018). Temporal changes in abundances of large calanoid copepods in the Scotia Sea: comparing the 1930s with contemporary times. *Polar Biology, 41*: 2297-2310. https://doi.org/10.1007/s00300-018-2369-3

Watts J & Tarling GA (2012). Population dynamics and production of *Themisto gaudichaudii* (Amphipoda, Hyperiidae) at South Georgia, Antarctica. *Deep-Sea Research Part II – Topical Studies in Oceanography, 59/60*: 117-129. https://doi.org/10.1016/j.dsr2.2011.05.001

Weimerskirch H, Prudor A & Schull Q (2018). Flights of drones over sub-Antarctic seabirds show species- and status-specific behavioural and physiological responses. *Polar Biology, 41*: 259–266. https://doi.org/10.1007/s00300-017-2187-z

Wells E, Brewin P & Brickle P (2011). Intertidal and subtidal benthic seaweed diversity of South Georgia. Report for the South Georgia Heritage Trust and Joint Nature Conservation Committee Survey, pp.1-20.

Whitehouse MJ, Meredith MP, Rothery P, Atkinson A, Ward P & Korb RE (2008). Rapid warming of the ocean around South Georgia, Southern Ocean, during the 20th century: Forcings, characteristics and implications for lower trophic levels. *Deep Sea Research Part I: Oceanographic Research Papers, 55 (10)*: 1218-1228. https://doi.org/10.1016/j.dsr.2008.06.002

Yau C, Collins MA, Bagley PM, Everson I & Priede IG (2002). Scavenging by megabenthos and demersal fish on the South Georgia slope. *Antarctic Science, 14 (1)*: 16-24. https://doi.org/10.1017/S0954102002000536

All websites last accessed 05 November 2025. GSGSSI documents available on request

Section 7: Appendices

Appendix 1: Glossary

ACAP	Agreement on the Conservation of Albatross & Petrels
ACC	Antarctic Circumpolar Current
AIS	Automatic Identification System
APF	Antarctic Polar Front
BAS	British Antarctic Survey
BCA	Benthic Closed Area
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
Cefas	Centre for Environment, Fisheries and Aquaculture Science
CEMP	CCAMLR Ecosystems Monitoring Programme
DoFE	Director of Fisheries & Environment
ECO	Entry Control Ordinance
EN	Endangered (IUCN Status)
FAO	Food and Agriculture Organisation
FPO	Fisheries Protection Officer
FPV	Fisheries Patrol Vessel
GSGSSI	Government of South Georgia & the South Sandwich Islands
HFO	Heavy Fuel Oil
HOV	Human Operated Vehicle
HPAI	Highly Pathogenic Avian Influenza (bird flu)
IAATO	International Association of Antarctica Tour Operators
IFA	Information for Applicants
ILO	International Labour Organisation
IMMA	Important Marine Mammal Area
IMO	International Maritime Organisation
INNS	Invasive Non-Native Species
IUCN	International Union for the Conservation of Nature
IUU	Illegal, Unreported and Unregulated (fishing)
IWC	International Whaling Commission
KBA	Key Biodiversity Area
KEP	King Edward Point
LC	Least Concern (IUCN Status)
MMO	Marine Management Organisation
MPA	Marine Protected Area
MSC	Marine Stewardship Council
MZ	Maritime Zone
NGO	Non-Governmental Organisation
NT	Near Threatened (IUCN Status)
NTZ	No Take Zone
PAME	Protected Area Management Evaluation
PCA	Pelagic Closed Area
RA	Regulated Activity Permit
RMP	Research & Monitoring Plan
ROV	Remotely Operated Vehicle
SACCF	Southern Antarctic Circumpolar Current Front
SAF	Sub-Antarctic Front
SB	Southern Boundary of the Antarctic Circumpolar Current
SGSSI	South Georgia and the South Sandwich Islands
SISO	Scheme of International Scientific Observation
TAC	Total Allowable Catch
TPA	Terrestrial Protected Area
UAV	Unmanned Aerial Vehicle
UKOT	United Kingdom Overseas Territory
VIIRS	Visible Infrared Imaging Radiometer Suite
VLMPA	Very Large Marine Protected Area
VME	Vulnerable Marine Ecosystem
VMS	Vessel Monitoring System
VU	Vulnerable (IUCN Status)

Appendix 2: Summary of legislation and other regulations to control activities within the Marine Protected Area

Legislation/ Regulation	Enacted / Amended	Summary	Requirements / Breaches
Marine Protected Areas Order	2025	Establishes conservation objectives for Marine Protected Areas (MPAs), including zoning and specific spatial closures designed to protect marine biodiversity. It sets out key terminology and defines prohibitions for activities within MPAs, detailing the boundaries of restricted zones and their conservation goals.	Any activities violating the prohibitions within the MPA, such as fishing, extraction, or habitat destruction in protected zones, constitute an offence under the Wildlife and Protected Areas Ordinance.
Wildlife and Protected Areas Ordinance	2011 (as amended)	Provides the legal framework for environmental protection in the territory. It bans the introduction of non-native species, prohibits harm or disturbance to wildlife and habitats, and requires permits for activities that might negatively impact biodiversity.	Individuals or entities conducting activities without necessary permits, introducing non-native species, or causing harm to protected flora and fauna may face legal penalties.
Fisheries (Conservation and Management) Ordinance	2000 (as amended)	Governs fishing activities within SGSSI waters. It requires Government-issued licences for all fishing activities and sets conditions such as catch limits, conservation measures, and operational standards for vessels.	Fishing without a valid licence or failing to adhere to licence conditions, such as exceeding quotas or disregarding conservation rules, is a criminal offence punishable by significant fines.
Fisheries (Transhipment and Export) Regulations	1990 (as amended)	Controls transhipment of fish in SGSSI waters, prohibiting unauthorised transfers to prevent illegal fishing and unregulated trade. Authorised transhipments are required to occur in specific locations such as Cumberland Bay.	Unauthorised transhipment or transport of fish transhipped in SGSSI waters without approval from the Commissioner is prohibited. Violations can result in penalties.
Heavy Fuel Oil (Prohibition of Carriage and Use) Ordinance	2020 (amended)	Implements MARPOL 73/78, Annex I, Regulation 43 to prohibit the carriage and use of heavy fuel oil within SGSSI waters, aiming to reduce environmental risks from oil spills. Specifies prohibited oil density thresholds.	Vessels carrying or using heavy fuel oil in prohibited zones are in breach of the ordinance and may face sanctions.
Wildlife and Protected Areas (SPA Management Plan and Prohibited Activities) Regulations	2023	Lists the activities that are prohibited in SGSSI unless carried out in accordance with a permit issued by the Government. It also provides for the implementation of the TPA Management Plan, which sets out the policies and procedures that apply to applications for permits for activities otherwise prohibited under regulation and the entry into the SSI in exceptional circumstances	Any activities violating the prohibitions within the Specially Protected Areas, such as wildlife disturbance, extraction of soil or minerals, or erection of structures in protected areas, constitute an offence under the Wildlife and Protected Areas Ordinance.
Entry Control Ordinance	2022	Controls the entry into and residence in SGSSI and allows for the removal of persons from the Territory. Unless exempted under the GSGSSI 'Deemed Permission' policy, all visitors require either a work or visitor permit in order to land on SGSSI.	It is an offence to enter or remain in SGSSI without a valid permit or deemed permission, punishable by a fine or period of imprisonment
Regulated Activity Permits	N/A	Mechanism to approve activities with environmental risks. Examples include sample collection, drone use, animal handling, or research fishing in restricted areas, ensuring oversight and risk mitigation.	Activities with potential environmental harm require approval via the Regulated Activity Permit (RAP) process. Failure to obtain a permit for such activities is a breach of GSGSSI regulations.

Marine Scientific Research Approval	N/A	Requires approval for marine research conducted within SGSSI waters, specifically for non-UK flagged vessels. Approval is obtained through the UK Government's FCDO Article 246 process, ensuring compliance with research standards.	Research projects that do not meet requirements or fail to obtain diplomatic clearance cannot legally operate in SGSSI waters.
Fisheries Licence Conditions	N/A	Defines fishing licence conditions, including quotas, bycatch limits, vessel standards, and enforcement measures. Competitive licences have specific selection criteria for applicants.	Licence holders must comply with all conditions, including passing a pre-licensing inspection. Non-compliance may impact licence renewal or result in enforcement action.
CCAMLR Schedule of Conservation Measures	Updated annually	Legally binding conservation measures applicable to CCAMLR Members, governing fishing activities in CCAMLR waters. Includes quota management, gear restrictions, bycatch limits, and observer deployment requirements.	Compliance with CCAMLR measures is mandatory for licence holders. Breaches may result in penalties, loss of licence, or restrictions on future fishing operations.
GSGSSI Fisheries Compliance and Enforcement Framework	N/A	Establishes the enforcement system for SGSSI fisheries, detailing consequences for non-compliance with licensing conditions. Includes provisions for licence revocation or forfeiture.	Violations can lead to revocation of fishing licences, financial penalties, or restrictions on future licence applications. Exceptional circumstances affecting fishing seasons are also considered.
Tourism Management Regulations	N/A	Requires permits for all tourism activities to ensure sustainable operations. Regulations cover vessel safety, incident response planning, and environmental management. Operators must adhere to visitation guidelines, wildlife approach rules.	Operators failing to comply with permit conditions may face restrictions on future operations.
Biosecurity Policy	N/A	Designed to prevent the introduction and spread of invasive non-native species and pathogens. Covers protocols for visitors and vessel operators to minimize biosecurity risks.	Violations, such as failure to adhere to biosecurity procedures or accidental transport of invasive species, may be treated as criminal offences under the Wildlife and Protected Areas Ordinance.

Appendix 3: Marine Protected Areas Order 2025

SUBSIDIARY LEGISLATION

Marine Protected Areas Order 2025

(S.R. & O. No.: 1 of 2025)

ARRANGEMENT OF PROVISIONS

Article

3

SUBSIDIARY LEGISLATION

WILDLIFE & PROTECTED AREAS

Marine Protected Areas Order 2025

S. R. & O. No.: 1 of 2025

Made: *17 April 2025*
Published: *22 April 2025*
Coming into force: *on publication*

IN EXERCISE of my powers under sections 18(1) and 20(1) of the Wildlife and Protected Areas Ordinance 2011 (No 1 of 2011), after consultation with the Secretary of State as required by section 5(5) and (6), and being satisfied that the criteria in section 18 of that Ordinance are met, I make the following order —

1. Title
This order is the Marine Protected Areas Order 2025.

2. Commencement
This order comes into force on publication in the *Gazette.*

3. Interpretation
In this order —

"**baselines**" means the baselines established by article 3 of the South Georgia and South Sandwich Islands (Territorial Sea) Order 1989 (SI 1989/1995) from which the territorial sea is measured;

"**bottom fishing**" means fishing on the sea floor including —

(a) bottom trawling; and

(b) the use of lines, pots, nets or traps on the sea floor;

"**bottom trawling**" means towing a trawl or fishing net along (and in contact with) the sea floor;

"**closed season**", means, in respect of fishing for Antarctic krill, the season referred to in Schedule 3;

"**fishing vessel**" means a vessel of any size that is used for, equipped to be used for, or intended for use for the purposes of fishing or fishing related activities including —

(a) vessels engaged in transshipment of fish or fishery products; and

(b) carrier vessels equipped for the transportation of fish or fishery products;

"**general benthic closed area**" means the area described in Schedule 1;

"**no-take zone**" means each of the zones described in Schedule 4;

"**Ordinance**" means the Wildlife and Protected Areas Ordinance 2011 (No 1 of 2011);

"**pelagic closed area**" means each of the areas described in Schedule 5;

"**pelagic fishing**" means fishing using a trawl, long line, jig or other method that is not designed to come into contact with the sea floor during normal fishing operations;

"**research benthic closed area**" means each of the areas described in Schedule 2;

"**SGSSI MPA**" means the South Georgia and South Sandwich Islands Marine Protected Area designated by article 4; and

"**SGSSI waters**" means —

(a) the internal waters of the Territory between —

(i) the baselines; and

(ii) the mean high water at spring tide;

(b) the territorial sea established for the Territory by article 2 of the South Georgia and South Sandwich Islands (Territorial Sea) Order 1989; and

(c) the Maritime Zone (SGSSI Maritime Zone).

4. South Georgia and South Sandwich Islands Marine Protected Area

(1) The SGSSI waters are declared to be a marine protected area called the South Georgia and South Sandwich Islands Marine Protected Area ("SGSSI MPA") and is shown on the map in Schedule 6.

(2) The principal conservation objectives for the SGSSI MPA are to —

(a) conserve marine biodiversity, habitats and critical ecosystem function;

(b) ensure that fisheries are managed sustainably, with minimal impact on associated and dependent ecosystems;

(c) manage other human activities including shipping and scientific research, to minimise environmental impacts on the marine environment;

(d) protect the benthic marine organisms from the destructive effects of bottom trawling;

(e) facilitate recovery of previously over-exploited marine species;

5

(f) increase the resilience of the marine environment to the effects of climate change; and

(g) prevent the introduction of non-native marine species.

5. Conservation order prohibitions

(1) The following activities are prohibited within the SGSSI MPA —

(a) bottom trawling;

(b) fishing in the no-take zones;

(c) fishing vessels entering the no-take zones, except in exercise of the right of innocent passage or under force majeure;

(d) bottom fishing in —

(i) the general benthic closed area;

(ii) the research benthic closed areas;

(e) pelagic fishing in the pelagic closed area; and

(f) fishing for Antarctic krill (*Euphausia superba*) during the closed season.

(2) The prohibitions under paragraph (1) do not apply to —

(a) anything carried out in accordance with a permit granted by the Commissioner under section 21(1) of the Ordinance; or

(b) anything permitted by section 20(8) of the Ordinance.

6. Marine Protected Areas Order 2019 repealed

The Marine Protected Areas Order 2019 (No. 1 of 2019) is repealed.

SCHEDULE 1 - General benthic closed area

(article 3)

Area	**Boundaries**	**Protected features**	**Conservation objectives** To conserve and protect:-
General Benthic Closed Area	All waters lying within the outer 200 NM boundary of the SGSSI Maritime Zone except (1) the no-take zones; (2) the research benthic closed Areas; and (3) the areas where the water is in the range from 700-2,250 m	The seabed, and associated organisms in an area of 705,225 km^2	The potentially sensitive (but largely unknown) deep-sea benthic fauna and South Georgia's outer continental shelf which includes:- (1) the spawning grounds of many fish species, including mackerel icefish; (2) a diverse range of benthic habitats and associated invertebrate communities

6

SCHEDULE 2 - Research benthic closed areas

(article 3)

Area	Boundaries	Protected features	**Conservation objectives** To conserve and protect:-
West Shag Research Benthic Closed Area	53°12'-53°24'S; 43°30'-42°48'W	The seabed, and associated organisms in an area of 1,039 km^2	The vulnerable marine fauna identified in this location; provides refugia for toothfish
West Gully Research Benthic Closed Area	(1) 53°36'-54°00'S; 40°42'-40°06'W; (2) 53°36'-53°54'S; 40°06'-39°54'W; (3) 53°36'-53°48'S; 39°54'-39°42'W	The seabed, and associated organisms in an area of 2,494 km^2	The vulnerable marine fauna in this area and protect juvenile toothfish, which are abundant in this area
Northern Research Benthic Closed Area	53°36'-53°54'S; 35°48'-35°36'W	The seabed, and associated organisms in an area of 440 km^2	The vulnerable marine fauna identified in this location; provides refugia for toothfish
Eastern Research Benthic Closed Area	54°48'-54°54'S; 34°00'-34°12´W	The seabed, and associated organisms in an area of 143 km^2	The vulnerable marine fauna identified in this area (particularly gorgonians)

SCHEDULE 3 - Closed season (Antarctic krill)

(article 3)

Description	Season	Protected features	**Conservation objectives** To conserve and protect:-
Seasonal closure of the fishery for Antarctic krill	1 October – 30 April inclusive	The pelagic ecosystem in an area of 1.24 million km^2 during a 7 month period	Mammalian and avian krill dependent predators, such as penguins and fur seals during the key part of the breeding season

SCHEDULE 4 - No-take zones

(article 3)

Zone	Boundaries	Protected features	**Conservation objectives** To conserve and protect:-
South Georgia No-take Zone	Between:- (1) a line 16.20 NM from the baselines around the coast of South Georgia; and (2) mean high water at spring tide	The seabed, overlying water and associated organisms in an area of 18,517 km^2	The shallow marine environment around South Georgia including:- (1) the spawning grounds of many fish species, including mackerel icefish; (2) the inshore foraging areas of marine predators such as gentoo penguins, cormorants, petrels and prions

7

Zone	Boundaries	Protected features	**Conservation objectives** To conserve and protect:-
Clerke Rocks No-take Zone	The area lying between the South Georgia No-take Zone and North Scotia Ridge No-take Zone excluding where water depths range from 700-2,250 m and bounded by a line linked by the following points:- 54°42'S, 35°15.7'W; 54°49.5'S, 34°32'W; 54°54'S, 32°12'W; 54°54'S, 34°00'W; 55°00'S, 33°30'W; 56°00'S, 33°30'W; 55°13'S, 34°53'W; 55°11.1'S, 36°01.7'W	The seabed, overlying water and associated organisms in an area of 7,875 km^2	The marine environment to the south east of South Georgia including:- (1) the spawning grounds of many fish species, including mackerel icefish; (2) the inshore foraging areas of marine predators such as gentoo penguins, cormorants, petrels and prions; (3) the "spirulid reef" at approximately 55°00'S, 34°31'W; (4) all benthic habitats shallower than 700 m and deeper than 2,250 m
Shag Rocks No-take Zone	Between:- (1) a line 12 NM from the baselines around Shag Rocks and Black Rock; and (2) mean high water at spring tide	The seabed, overlying water and associated organisms in an area of 2,344 km^2	The shallow marine environment of the Shag Rocks shelf incorporating:- (1) the principal recruitment area for juvenile Patagonian toothfish; (2) spawning grounds of mackerel icefish; (3) a key foraging area for black-browed albatross, Antarctic fur seals and baleen whales
Western Edge (Area A) No-take Zone	The area lying to the west of 43°30'W and inside the outer 200 NM boundary of the SGSSI Maritime Zone	The seabed, overlying water and associated organisms in an area of 5,848 km^2	The potentially sensitive (but largely unknown) benthic fauna; provides refugia for adult toothfish on this lightly fished area of the North Scotia Ridge
North Georgia Rise No-take Zone	52°20'-53°00'S; 36°45'-37°40'W	The seabed, overlying water and associated organisms in an area of 4,590 km^2	The potentially sensitive (but largely unknown) benthic fauna of this area; provides refugia for adult toothfish
North East Georgia Rise No-take Zone	The part of the Maritime Zone to the east of 34°00'W and north of 52°30'S	The seabed, overlying water and associated organisms in an area of 14,275 km^2	The potentially sensitive (but largely unknown) benthic fauna of this area; provides refugia for adult toothfish
Southern Seamounts No-take Zone	55°30'-56°12'S; 36°20'-37°30'W	The seabed, overlying water and associated organisms in an area of 5,614 km^2	The potentially sensitive (but largely unknown) benthic fauna; provides refugia and is a spawning location for adult toothfish that is likely an area of high biological productivity

Zone	Boundaries	Protected features	Conservation objectives To conserve and protect:-
East South Georgia No-take Zone	The area lying within the outer 200 NM boundary of the SGSSI Maritime Zone between 52°30'-55°00'S; 30°30'-33°30'W	The seabed, overlying water and associated organisms in an area of 58,256 km^2	A diverse range of deep seabed habitats and a region used for seasonal migrations by cetaceans
North Scotia Ridge No-take Zone	The area lying between 55°00'-56°00'S and between 33°30'W extending east to the boundary of the South Sandwich Trench No-take Zone. It excludes those areas where water depths range from 700-2,250 m lying south of 55°30'S and east of 29°00'W	The seabed, overlying water and associated organisms in an area of 39,187 km^2	A region of seamounts and complex bathymetry that is a refugia for adult toothfish and a migration route between South Georgia and the South Sandwich Islands for toothfish and marine mammals
South Sandwich Islands No-take Zones	Between:- (1) mean high water at spring tide; (2) lines 3 NM from the baselines around the coasts of the South Sandwich Islands; and (3) lines from 3 NM to 26.99 NM excluding those areas where water depths range from 700-2,250 m	The seabed, overlying water and associated organisms in areas that total 27,047 km^2	The shallow marine environment around each of the South Sandwich Islands including:- (1) the inshore foraging grounds of marine predators; (2) the spawning grounds of fish species; (3) all benthic habitats shallower than 700 m and deeper than 2,250 m
North East South Sandwich Islands Seamount No-take Zone	The part of the Maritime Zone between 54°15'S and 24°00'W	The seabed, overlying water and associated organisms in areas that total 2,488 km^2	The potentially sensitive (but largely unknown) benthic fauna on an unfished seamount. Likely to provide refugia for adult toothfish
South Sandwich Trench No-take Zone	A line:- (1) 26.99 NM around a baseline through the midpoint of the South Sandwich Trench defined as:- 55°0'0''S-27°9'25''W 55°44'56''S-25°32'49''W 56°19'59''S-24°48'11''W 57°30'4''S-24°2'24''W 58°42'25''S-23°43'16''W 60°0'0''S-24°23'24''W and (2) extending between 55°S to 60°S	The seabed, overlying water and associated organisms in an area of 62,900 km^2	A unique biogeographical feature which could potentially contain rare or unique habitats and biodiversity including hydrothermal communities

Zone	Boundaries	Protected features	**Conservation objectives** To conserve and protect:-
South Sandwich Trench Eastern Extension No-take Zone	The area lying between 56°00'-57°00'S located between the South Sandwich Islands No-take Zones and South Sandwich Trench No-take Zone	The seabed, overlying water and associated organisms in an area of 5,354 km^2	The potentially sensitive (but largely unknown) benthic fauna of this area; provides refugia for adult toothfish and foraging habitat for penguins
Herdman Bank No-take Zones	The area lying between 59°00'-60°00'S and inside the 200 NM SGSSI Maritime Zone Extending east to the western boundary of the South Sandwich Trench No-take Zone. It excludes:- (1) those areas where water depths range from 700-2,250 m lying south of 59°30'S and east of 29°00'W. (2) areas already covered by the South Sandwich Islands No-take Zones	The seabed, overlying water and associated organisms in an area of 41,184 km^2	Area containing unique features including areas of the East Scotia Ridge Spreading Zone, Herdman Bank and regions of high hydrothermal and tectonic activity linking existing No-take Zones in the region
No-take Zone south of 60° South	The area lying to the south of 60° South and inside the 200 NM SGSSI Maritime Zone	The seabed, overlying water and associated organisms in an area of 172,635 km^2	A unique biogeographical feature which include seamounts, deep trenches and a large area of the South Sandwich Fracture Zone and Herdman Bank - regions of high hydrothermal and tectonic activity
Protector Shoals No-take Zone	55°45'-56°05'S; 27°30'-28°20'W	The seabed, and associated organisms in an area of 1,934 km^2	The potentially sensitive (but largely unknown) benthic fauna; provides refugia for adult toothfish
Kemp Seamount and Calderas No-take Zone	59°40'-59°45'S; 27°45'-28°25'W	The seabed, and associated organisms in an area of 348 km^2	The potentially sensitive (largely unknown) benthic fauna of this seamount and caldera. Protects different chemosynthetic habitats, including white smoker vent fields

10

SCHEDULE 5 - Pelagic closed areas

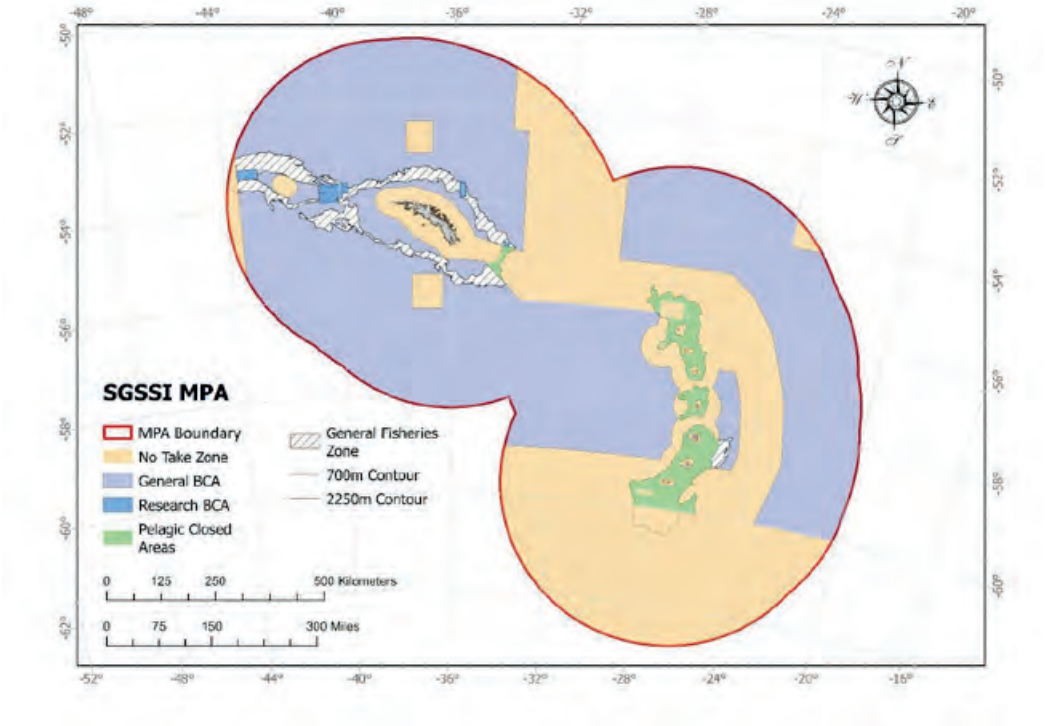
(article 3)

Area	Boundaries	Protected features	**Conservation objectives** To conserve and protect:-
Clerke Rocks Pelagic Closed Area	The area lying within the Clerke Rocks No-take Zone where water depths range from 700-2,250 m	The pelagic ecosystem across an area of 1,258 km^2 and all benthic habitats excluding those lying between 700-2,250 m depth in this area	The pelagic ecosystem and dependent predators in the area east of Clerke rocks forming a contiguous No-take Zone for pelagic fisheries between South Georgia and the South Sandwich Islands a key migration corridor for krill dependent predators
Protector Shoals Pelagic Closed Area	The area lying between 55°30'-56°00'S and between 29°00'W and the eastern boundary of the South Sandwich Trench No-take Zone where water depths range from 700-2,250 m	The pelagic ecosystem outside the Protector Shoals No-take Zone in an area of 2,741 km^2	To extend protection for the pelagic ecosystem and dependent predators in the area around Protector Shoals
South Sandwich Islands Pelagic Closed Area	Between:- (1) a line 26.99 NM from the baselines around the coasts of each of the South Sandwich Islands; (2) mean high water at spring tide; and (3) those areas where water depth is between 700-2,250 m	The pelagic ecosystem around each of the South Sandwich Islands in an area of 23,496 km^2	The pelagic ecosystem and dependent predators in the area around each of the South Sandwich Islands, particularly the highly abundant chinstrap and Adelie penguins
Kemp Seamount Pelagic Closed Area	The area lying between 59°30'-60°00'S and between 29°00'W and the western boundary of the South Sandwich Trench No-take Zone where water depths range from 700-2,250 m	The pelagic ecosystem surrounding the Kemp Seamount in an area of 3,424 km^2	To extend protection for the pelagic ecosystem and dependent predators in the area around the Kemp Seamount

11

SCHEDULE 6 - SGSSI MPA Map

(article 4)



Made 17 April 2025

A. M. BLAKE C.M.G.,
Commissioner.

EXPLANATORY NOTE
(not part of the order)

This order repeals and replaces the Marine Protected Areas Order 2019.

Section 18(1) of the Wildlife and Protected Areas Ordinance 2011 (No 1 of 2011) (the Ordinance) allows the Commissioner to designate areas of sea as marine protected areas (MPAs).

The criteria for designation of a marine protected area are set out in section 18(2) of the Ordinance and the requirements for orders designating MPAs are set out in the rest of section 18 and in section 19. Section 5(5) requires consultation with the Secretary of State about whether there would be any implications for foreign policy or relevant international obligations resulting from a proposed MPA. The consultation took place and the Secretary of State gave their permission for the Order to be made.

Section 20(1) of the Ordinance allows the Commissioner to make conservation orders to further the objectives of an MPA. Section 20(3) allows the Commissioner to prohibit or restrict

activities in a conservation order and section 20(6) allows for different prohibitions or restrictions to apply in different parts of an MPA.

This order designates the South Georgia and South Sandwich Islands Marine Protected Area (the SGSSI MPA). The designation is intended to conserve marine biodiversity, habitats and critical ecosystem function.

The SGSSI MPA consists of the SGSSI waters.

This order revises the existing measures and also introduces new measures based on outcomes of the SGSSI MPA five-year review. The new MPA measures are based on revised baseline data contained within the South Georgia and South Sandwich Islands (Territorial Sea) (Amendment) Order 2024 (SI2024/994).

The changes agreed through a series of stakeholder meetings, are to increase the areal extent of the existing No-take Zones and Pelagic Closed Areas. This order revises and incorporates changes to the areal extent of the measures listed under Schedules 1, 3 and 4 and makes the necessary changes to the map and reference to the new baselines.

A revised map, which illustrates the boundaries of the SGSSI MPA, the no-take zones, the pelagic closed areas, general benthic closed area and the research benthic closed areas is in Schedule 6.

To protect benthic marine organisms, the order prohibits bottom trawling throughout the SGSSI MPA and all bottom fishing in waters of less than 700 m depth and in waters of depths greater than 2,250 m (Schedules 1 and 2). Bottom fishing is prohibited in areas identified in Schedules 1 and 2.

Fishing for Antarctic krill is prohibited between 1 October and 30 April (closed season). Pelagic fishing is prohibited within 26.99 NM of the South Sandwich Islands (Schedule 5).

This order also defines a no-take zone 26.99 NM either side of a defined line representing the approximate mid-point of the South Sandwich Islands trench (Schedule 4).

Article 5 prohibits certain activities in the SGSSI MPA. These prohibitions do not apply to activities covered by the limited exceptions in section 20(8) of the Ordinance or by a licence granted by the Commissioner under section 21(1) of the Ordinance.

Breach of the prohibitions is an offence against section 20(9) of the Ordinance.

Published by the Attorney General's Chambers, Stanley, Falkland Islands

To access **South Georgia and South Sandwich Islands Laws** online visit:- https://laws.gov.gs/
To access **South Georgia and South Sandwich Islands Gazettes** online visit:- https://laws.gov.gs/gazettes/

Appendix 4: Territorial Seas Order (2024)

Status: *This is the original version (as it was originally made). This item of legislation is currently only available in its original format.*

STATUTORY INSTRUMENTS

2024 No. 994

SOUTH ATLANTIC TERRITORIES

The South Georgia and South Sandwich Islands (Territorial Sea) (Amendment) Order 2024

Made - - - - 2nd October 2024

Coming into force - - 3rd October 2024

At the Court at Buckingham Palace, the 2nd day of October 2024

Present,

The King's Most Excellent Majesty in Council

His Majesty, in pursuance of the powers conferred upon Him by the Colonial Boundaries Act 1895(**1**) and all other powers enabling Him on that behalf, is pleased, by and with the advice of His Privy Council, to order, and it is hereby ordered, as follows:

Citation and commencement

1. This Order may be cited as the South Georgia and South Sandwich Islands (Territorial Sea) (Amendment) Order 2024 and comes into force on 3rd October 2024.

Amendment of the South Georgia and South Sandwich Islands (Territorial Sea) Order 1989

2.—(1) The South Georgia and South Sandwich Islands (Territorial Sea) Order 1989(**2**) is amended as follows.

(2) In Article 3, paragraph 3—

(a) for "in the first column" each time it occurs, substitute "in the second and third columns";

(b) for "in the second column", substitute "in the fourth column";

(c) for "points 19 and 20", substitute "points 20 and 21".

(3) For the Schedule, substitute the Schedule to this Order.

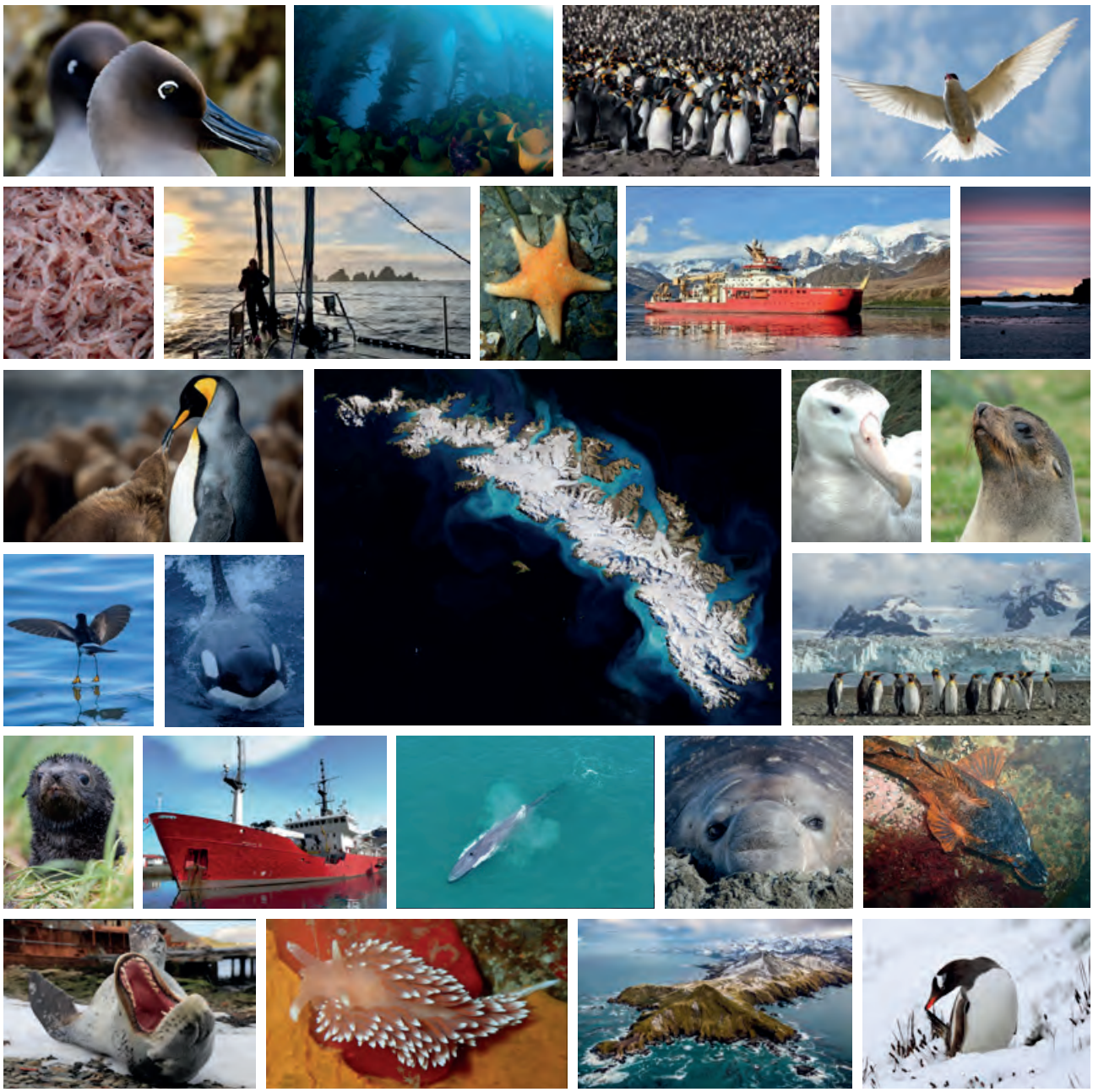
(**1**) 1895 c.34. Parts of the 1895 Act not relevant to this Order have been repealed by the Statute Law Repeals Act 1989 (c.43).
(**2**) S.I. 1989/1995.

Richard Tilbrook
Clerk of the Privy Council

Schedule

POINTS ON OR IN THE VICINITY OF THE ISLAND OF SOUTH GEORGIA JOINED TO FORM BASELINES, EXCEPT BETWEEN POINTS 20 AND 21

	Co-ordinates of Latitude South	*Co-ordinates of Longitude West*	*Name of Feature*
1.	53° 59’ 27”S	38° 17’ 52”W	Ramp Rock - N
2.	53° 59’ 40”S	38° 10’ 31”W	Trinity Island
3.	53° 59’ 49”S	38° 01’ 22”W	Bird Island
4.	53° 59’ 24”S	37° 55’ 08”W	Sørn
5.	53° 58’ 31”S	37° 44’ 31”W	Cape North
6.	53° 57’ 48”S	37° 29’ 21”W	Rock north of Welcome Island
7.	54° 03’ 23”S	36° 59’ 17”W	Cape Constance
8.	54° 03’ 44”S	36° 57’ 35”W	Contrast Rocks
9.	54° 04’ 47”S	36° 51’ 13”W	The Guides
10.	54° 06’ 48”S	36° 40’ 09”W	Hercules Point
11.	54° 07’ 06”S	36° 38’ 38”W	Turpie Rock
12.	54° 07’ 30”S	36° 37’ 34”W	Humpback Rocks
13.	54° 10’ 58”S	36° 29’ 25”W	Jason Island
14.	54° 15’ 33”S	36° 18’ 01”W	East Skerry
15.	54° 17’ 20”S	36° 14’ 44”W	Cape George
16.	54° 22’ 33”S	36° 09’ 21”W	Cape Vakop
17.	54° 32’ 37”S	35° 53’ 27”W	Rock off Cape Charlotte
18.	54° 41’ 57”S	35° 43’ 37”W	Filchner Rocks
19.	54° 48’ 14”S	35° 46’ 02”W	Cooper Island - NE
20.	54° 49’ 16”S	35° 46’ 32”W	Cooper Island - SE
21.	54° 49’ 31”S	35° 48’ 13”W	Cooper Island - SW
22.	54° 55’ 26”S	36° 06’ 47”W	First Rock
23.	54° 45’ 54”S	36° 19’ 53”W	Kupriyanov Islands
24.	54° 38’ 19”S	36° 45’ 44”W	Tanner Island, Pickersgill Islands
25.	54° 30’ 46”S	37° 06’ 02”W	South West Point
26.	54° 29’ 48”S	37° 08’ 24”W	Mislaid Rock
27.	54° 08’ 27”S	37° 45’ 54”W	Saddle Island
28.	54° 04’ 39”S	38° 00’ 40”W	Olsen Rock



Contact Details:

Director of Fisheries and Environment
Government of South Georgia & the South Sandwich Islands
Government House
Stanley
Falkland Islands
FIQQ 1ZZ

Tel: (+500) 28200
Email: dof@gov.gs
www.gov.gs