South Georgia Association Newsletter

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The north coast of South Georgia

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South Georgia Government announce terrestrial protected areas (p 9)

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The "Alternative Shackleton" route across South Georgia (p 6-7)

What happens to Antarctic krill in winter?

Cecilia Liszka, Meghan Goggins & Kate Owen

South Georgia is host to stunning biodiversity, including huge colonies of penguins, seals and seabirds, for whom Antarctic krill (*Euphausia superba)* play a vital role as their main source of prey. In addition to this astounding diversity of Southern Ocean wildlife, South Georgia waters are also a favoured location for a carefully managed krill fishery. This fishery is managed both under the auspices of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) and the Government of South Georgia and the South Sandwich Islands (GSGSSI).

Together, these organisations place strict restrictions on the operation of the fishery such as: a maximum annual catch limit of 279,000 tonnes; only allowing the fishery to operate during the winter months (outside of key predators breeding seasons); and the prohibition of fishing in the 30 km No Take Zone (NTZ) surrounding the islands. To monitor the impact of the fishery on wildlife, and inform conservation policies at South Georgia, marine biologists at King Edward Point (KEP) regularly collect plankton samples, analyse the dietary composition of Antarctic fur seals, and measure the breeding success of key predators. In addition, krill biomass is routinely monitored to the NW of the island as part of British Antarctic Survey's (BAS) Western Core Box (WCB) survey.

Krill fishing vessel operating north of South Georgia

However, most of the information we have on krill, and the ecology and behaviour of key krill-dependent predators originates from the austral summer, whilst the fishery operates exclusively during winter. There is, therefore, a disconnect. The emerging issue with this is the concentration of the fishery on the eastern shelf of South Georgia coinciding with the foraging grounds of Antarctic fur seals and gentoo penguins, which do not fully disperse during the winter. Recent work suggests these predators may extend their foraging ranges beyond the NTZ, leading to direct competition with the fishery, which may be exacerbated further in poor krill years. Another issue is that we are now seeing the return of baleen whales, who also rely on krill for their food, yet there is still uncertainty about how many remain over the winter. The importance of these factors is raised by increasing fishery catches over the last two decades, which have the potential to exacerbate the effect of environmentally-driven pressures on krill populations.

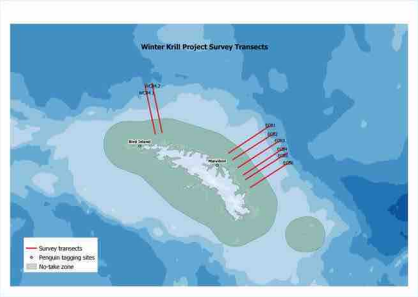
Antarctic krill

This is the background to a 3-year project that started in December 2021, led by the BAS in partnership with the GSGSSI and the Antarctic Research Trust (ART), and funded by Defra's Darwin Plus scheme. The project is centred around winter surveys of krill and predators in two consecutive austral winters (2022 and 2023), to gather information on the distribution and overlap between krill, the fishery and krill-dependent predators. In each year, three surveys are taking place before (May), during (July) and after (September) the krill fishing season.

To obtain data on krill distribution and abundance, acoustic surveys are central to the project. The GSGSSI fisheries patrol vessel, MV *Pharos SG*, was fitted with a scientific echosounder (Simrad EK80) with 38 and 120 kHz transducers in March 2022, before the first year of surveys started. In each survey, six transects in the Eastern Core Box (ECB) were occupied, both day and night, extending within and outside the NTZ and focussing on the area with greatest coincidence with the krill fishery. We also obtained comparative data from two additional transects on the routinely monitored WCB. As the WCB is usually occupied during the austral summer, this will enable both a spatial and temporal comparison. In order to determine krill biomass from the acoustic data, plankton trawls were conducted at the start and end of each acoustic transect to obtain krill length-frequency data. These measurements will also help to ground-truth the acoustics.

We also wanted to be able to understand how krill-dependent predators interact with their prey during winter, and to determine potential overlap between predators and the krill fishery. On each survey, cetacean and seabird observations were carried out, concurrently with the daytime acoustic transects, in order to estimate their abundance and distribution. A specialist seabird observer joined the vessel for all three surveys, recording detailed seabird and marine mammal sightings data from the centre of the bridge. More detailed cetacean observations were collected during the July survey, when a team of three specialist cetacean researchers joined the vessel to carry out detailed sightings data for whales, seals and dolphins. Where possible, cetacean photo identification was also gathered to provide information on residency, movement patterns and population identity. Photographs are also being uploaded to https://happywhale.com/home for comparison to other Southern Hemisphere images. Twelve passive acoustic DIFAR sonobuoys were also deployed to acoustically locate whales in real time, and record their vocalisations.

Finally, working with the ART, who are providing the project with 12 Wildlife Computer satellite tags each year, we deployed 6 satellite tracking tags on gentoo penguins at both Bird Island and Maiviken (near KEP). Four tags were deployed at each site in advance of the May survey, and a further 2 were deployed at each site in July. At the time of writing (Oct 2022), 5 tags were still transmitting data, providing an unparalleled insight into foraging behaviour throughout winter and beyond. Added to this, we are also receiving high resolution tracking data from remote-download GPS tags deployed on seven further gentoos at Bird Island.



Location of acoustic transects

The Winter Krill scientists and crew of the Pharos SG after the July survey

Work is now underway to analyse this rich suite of data, and to plan for the second season's surveys. The project's progress can be followed on our website: https://www.bas.ac.uk/project/winter-krill-at-south-georgia/

For further information or to join our stakeholder mailing list, please email ceclis56@bas.ac.uk or macol@bas.ac.uk

Gentoo penguins at Maiviken; note the two tagged penguins in the centre and *Pharos SG* in the background.

Update on Darwin plus project *Initiating monitoring support for the SGSSI-MPA*

Nathan Fenney, Jamie Coleman & Adrian Fox

Our recent article in the April 2022 newsletter described how during December 2021 and January 2022 a team of BAS researchers completed the first field season for a project which has: 1) identified key predator population sites that can be routinely monitored using a fixed-wing Remotely Piloted Aerial System (RPAS); and, 2) can provide baseline census data from aerial images at these sites. Images from successful flights were obtained from thirteen sites with either Antarctic fur seals, gentoo penguins, king penguins or wandering albatross.

Over the past summer, Nathan Jamie processed hundreds of high-quality images from the RPAS leading to geospatially corrected mosaics for each site, in preparation for counting of the target animals in the images. (*Fortuna Bay king penguins graphic*).

Processed mosaic of RPAS images of Fortuna Bay king penguin colony, individual birds can easily be differentiated at full resolution.

Counting will follow a two-stranded approach, firstly using a novel computer-assisted counting method developed collaboratively with the University of St Andrews, HiDef Aerial Surveying Ltd and the Norwegian Polar Institute, and secondly using manual check counts of selected survey samples.

The second field season is currently under way (October and November 2022), with Nathan and Jamie using the RPAS to survey elephant seal beaches, with support from MV Pharos SG and staff at King Edward Point Research Station. Target beaches include Gold Harbour, Grytviken, Hound Bay, St. Andrews Bay and Undine Harbour. The entire beach and king penguin colony at St Andrews Bay was covered in a single flight, highlighting the endurance and range of the fixed-wing RPAS platform.

RPAS in flight at Husvik, 4 November 2022 (Photo – Jamie Coleman)

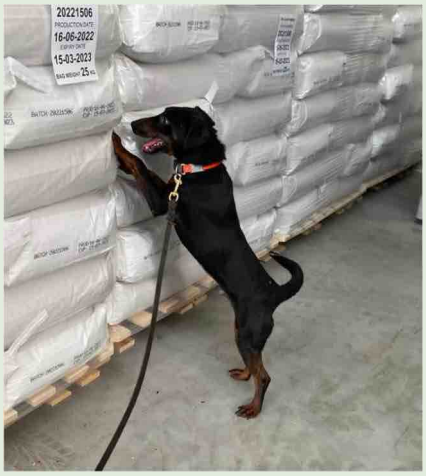
New dogs recruited for the rodent detector programme

Following the successful rodent eradication project, in 2018 GSGSSI engaged the charitable foundation *Working Dogs for Conservation (WD4C)* in the United States to establish a framework for a biosecurity dog programme, as well as to source its first working dog, Sammy.

Ahead of the 2022/23 season, the GSGSSI engaged an additional handler, Duncan Willis, in the Falkland Islands to respond to projected increases in tourism vessel traffic. Duncan joins Naomi Cordeiro, who was the first locally based dog-handler having joined the programme in 2019. With further support from the South Georgia Heritage Trust, two more dogs were also recruited from *Scent Imprint Conservation Dogs,* a training kennel in the Netherlands. These additional dogs have increased the programme's resilience, as well as providing a succession plan for when Sammy eventually retires.

All of the dogs are from hunting breeds, with a genetic predisposition. **Sammy** is a 6-year-old *Shiba Inu*, a spitz hunting breed native to Japan and is the longest serving member of the programme. He was acquired as a pet in the US, and was adopted by the US charitable foundation *Working Dogs for Conservation* who trained him to undertake biosecurity work. In 2018 he travelled to the Falkland Islands with his handler Mark as part of a trial into the efficacy of using dogs to search vessels bound for South Georgia. The trial was successful, and in 2019, Sammy moved to the Falkland Islands permanently to live with his local handler, Naomi.

Hunter is a 5-year-old Jagd Terrier (also known as a German Hunting Terrier) a mainland European hunting breed. He was born in Slovakia and trained in the Netherlands by the organisation Scent Imprint Conservation Dogs. He was originally deployed on a conservation project in Europe from 2019, where he worked to indicate the presence of rodent burrows on the banks of canals from vessels on the water. When this project concluded, his tested ability made him an ideal choice for the GSGSSI programme. He is handled by Duncan.



King is a 2-year-old Patterdale Terrier, an English hunting breed. He was born in Hungary and trained in the Netherlands by the organisation Scent Imprint Conservation Dogs. The GSGSSI programme is King's first operational deployment. He travelled to the Falkland Islands in 2022 aboard the South Atlantic Airbridge with Hunter and is now handled by Naomi. King has a mild and biddable temperament and is a very playful dog who enjoys being handled and cuddled.

The "Alternative Shackleton" - perhaps a better route?

By Steve Brown

Last September saw the first Shackleton crossing on South Georgia since before the dreaded covid changed and delayed so many things in everybody's life. After a patient two year wait from the original planned departure date, the expedition finally went ahead, and the team departed from the Falkland Islands on board the yacht *Vinson of Antarctica* in early September 2022. The trip was organised and led by Skip Novak and Stephen Venables. We were a team of thirteen including the yacht's crew. On the team's arrival in Stanley equipment and kit was prepped and stowed for the passage as well as some last-minute Falklands shopping. We were ready to go!

Monday 12th September saw *Vinson of Antarctic* make her way out through the Narrow's and head in the direction of South Georgia. The weather leaving Stanley was good and for half of the passage we could have done with a bit more wind. However, it was not long before we were soon experiencing some of South Georgia's strong blows on our arrival to Undine Harbour, this helped keep the anchoring interesting!

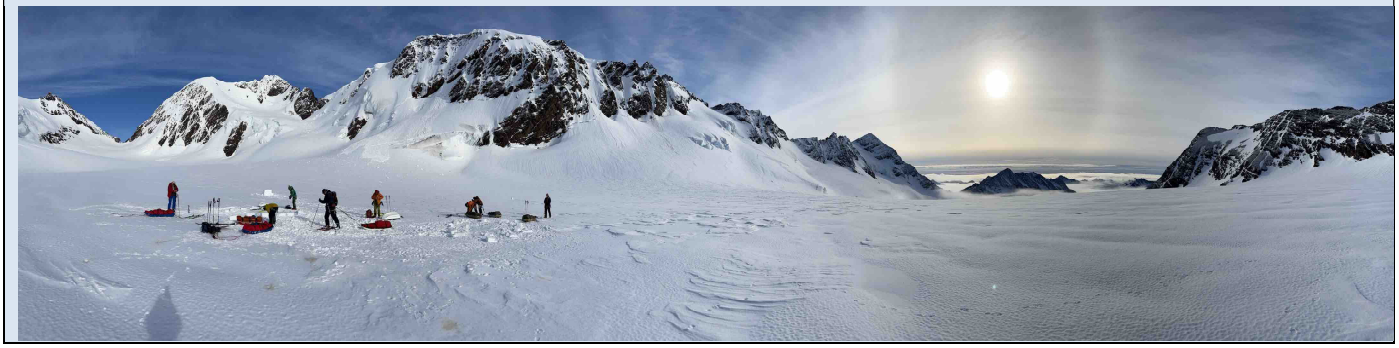
The Vinson of Antarctica in Fortuna Bay

The weather blew hard for a couple of days before we were able to sail round to King Haakon Bay in readiness to complete the ski crossing from King Haakon to Stromness. The plan was to try a different route to Shackleton and go via the Kohl Plateau. This is a route Stephen had been keen to try for a while and soon became known to the team as the "Alternative Shackleton."

After depoting our equipment ashore and testing skis and pulks with a quick trip to Pegotty Bluff we went back onboard the yacht for the night. The weather looked to be improving and a good weather window seemed to be on the horizon. The next morning as everyone excitedly completed last minute preparations the wind was still blowing quite hard. The decision was made to go. We landed ashore in 30kt winds, organised our skis and pulks and set off with the wind and spindrift blowing all around.

A break before tackling Zig Zag Pass

The next five days we were blessed with some of the best weather I have experienced on South Georgia, the wind dropped, and the skies became blue and clear. The snow conditions were near perfect and the glaciers excellent to travel on. We were even lucky with the calmest weather ever for putting our tents up. Despite this good weather I was still very keen on making sure the tent valances were covered with snow blocks, you never know what South Georgia may throw at you in the middle of the night.



The route took us up the Briggs Glacier, past the Trident and onto the top of the Esmark Glacier. Then through Zig Zag pass and onto the Kohl Plateau before crossing one final pass onto the König Glacier. This pass was challenging, it was very steep and icy on the Kohl Plateau side and a vertical rocky cliff on the König Glacier side. It took a while to cross this pass using ropes, pulleys and ice screws to heave the pulk sledges up the steep slope and down the rock face (4 hours to be exact and from then onwards was known as 4 hour pass). As crossing this pass slowed our progress and the day was closing, we camped for the night just down from the pass.

Map of the crossing from King Haakon Bay to Cumberland Bay

Departing Peggoty Bluff

This was an unplanned bonus as we awoke the next morning to absolutely dingle weather, no wind, blue skies and a dusting of overnight snow. This provided the most amazing 6.5 km ski down to Fortuna Bay. As we descended, Cumberland Bay West could be seen and this was just like a mirror it was so calm. The final day we skied the last leg from Fortuna to Stromness where the *Vinson* was waiting to collect us. Some Champagne was enjoyed on the shore and the "Alternative Shackleton" was complete, snow line on the beach at King Haakon to snow line on the beach at Stromness.

To complete the trip, we sailed around to Grytviken for a well-deserved celebration, a bit more skiing and of course the important toast to the Boss. A final fine weather day was had visiting St Andrews Bay and the one or two penguins before the embarking on the passage back to the Falklands.

Time to start planning the next South G trip!

The author in the South Georgia Museum

A winter on Bird Island

Imogen Lloyd, Erin Taylor, Marine Quintin & Heidi Burrows

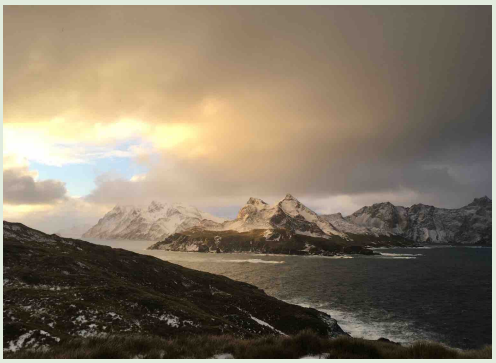
Our winter started properly in early May when we became a team of four, Erin (Albatross Biologist), Marine (Seal Biologist), Heidi (Technician) and Imogen (Penguin and Giant Petrel Biologist). The winter started out busy for all of us with some of the summer's work yet to be completed including fledging rounds of the albatrosses and giant petrels, weighing of mollymawk chicks and the last few white-chinned petrel monitoring sessions.

The start of winter saw a wandering albatross GPS tagging project for Erin to go alongside data which was being collected from birds on Prion Island looking at the spatial segregation of seabirds around South Georgia. This required twice daily visits up to Wanderer Ridge to deploy and retrieve tags from the adults returning to feed their chicks which meant lots of beautiful sunrises and sunsets!

Bird Island research station in winter

It was a busy winter for Marine too with the daily leopard seal round with lots of regulars in the coves around base and lots of young newcomers especially later in the winter. Photo analysis meant that individuals could be identified from their pattern of spots, a few became firm favourites around base as they were seen so often.

Meanwhile Heidi was busy with maintenance jobs around the station and in the huts. This included indenting all the tech equipment, testing all the electrical equipment, replacing the Fairy Point hut stove, doing all the weekly and monthly maintenance jobs and generally just keeping us all alive! It was Midwinter before we knew it, traditionally a week full of celebrations, decorations, games, food and a midwinter bar crawl. Despite almost forgetting to cook our roast on Midwinter day until late in the afternoon the day was great fun including the giving of the beautiful handmade Midwinter gifts.



Sunrise over South Georgia

Highlights of the winter included the monthly wandering albatross census, a wonderful excuse to walk to every corner of the island to see how the chicks were doing. This was followed by the annual ringing of all the chicks which everyone got involved with and thoroughly enjoyed.

Wandering albatross chick

The gentoo colony in evening light

It has been an incredible winter, with the best possible people, however spring has now well and truly sprung on the island. The new team has arrived, the beach is full of big male fur seals and the number of pups on the beach is increasing rapidly. Meanwhile on Main Bay our eight elephant seal pups have rapidly turned into weaners and appear to be doing well. The black-browed and grey-headed albatrosses are all now sitting on eggs, the wandering albatross chicks are starting to fledge, the northern giant petrels are hatching and the brown skuas and white-chinned petrels have started laying too.

South Georgia's Terrestrial Protected Areas

In July 2022, the Government of South Georgia & the South Sandwich Islands announced the designation of the entire landmass of South Georgia & the South Sandwich Islands as Specially Protected Areas.

This Terrestrial Protected Area covers over 3,800 km^2 and complements the Marine Protected Area which covers the whole 1.24m km^2 maritime zone, thus ensuring that the whole of SGSSI lies within a protected area system. Together, these Protected Areas will be an exemplar in delivering holistic ecosystem management, sustainable use and world-class protection.

The Lönnberg Valley with the Nordenskjold Glacier in the background.

The Specially Protected Areas Order prohibits all entry to the South Sandwich Islands without a permit and lays the foundation for enhanced protection measures across South Georgia which will be the subject of further consultation.

The South Georgia Terrestrial Protected Area will conserve, protect and preserve the ecosystem and restore native biodiversity. It will ensure that activities are managed sustainably and those activities, such as research and media operations are assessed for their impact on the ecosystem and managed accordingly. It will help deliver a sustainable tourist industry so that people will have the opportunity to experience these amazing habitats and develop collective knowledge about the biodiversity of the island. The Government aims to deliver a truly sustainable visitor experience, supporting this global rarity; an ecosystem in recovery.

Within the next 12 months, GSGSSI, in partnership with stakeholders, will develop a detailed management plan and enhanced regulations for the Protected Areas to ensure that the unique terrestrial ecosystems in the Territory enjoy the high level of protection they deserve.

Looking across Penguin River towards Hestersletten, with Mt Paget in the background.

South Georgia News

Toothfish fishery controversially blocked by Russia at CCAMLR

GSGSSI's Sue Gregory with a large toothfish

The South Georgia Patagonian toothfish fishery has been controversially blocked for a second year at the recent meeting of the Commission for the Conservation of Antarctic Living Resources (CCAMLR) in Hobart. CCAMLR operates by consensus and Russia blocked agreement on the Conservation Measure that regulates the toothfish fishery in 2021 and again in 2022. To justify their position, Russia cited spurious scientific reasons, that were rejected by all other CCAMLR member states.

In the absence of an agreed measure, GSGSSI with support from the UK Government, operated a domestic fishery in the South Georgia Maritime Zone in 2022. Other CCAMLR members, such as France, also operate domestic fisheries in the CCAMLR area. The fishery implemented all the usual CCAMLR measures along with a suite of additional domestic measures, and licences were only taken up by UK flagged vessels. The operation of a domestic fishery has upset some CCAMLR members, notably Argentina, who disagree with UK's interpretation of the CCAMLR Convention and the US has refused to accept toothfish imports from the South Georgia fishery. For more information on the issues see AP News (https://apnews.com/article/russia-ukraine-texas-georgia-fish-business-39c55831822a62d966f9c9b307cdd62d).

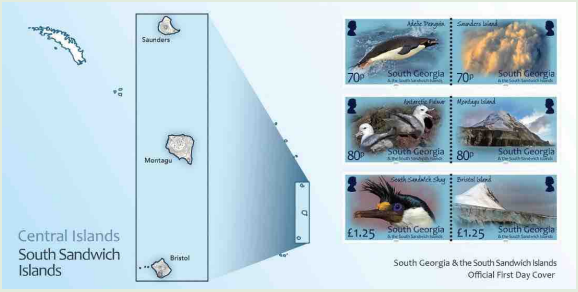
FV Argos Helena being inspected during the 2022 fishing season.

All female South Georgia Museum Team

An all-female team has recently arrived on South Georgia to re-open the South Georgia Museum for the 2022/23 season. The team is led by Deirdre Mitchell and include Shetland-islander, Helen Balfour, whose two grandfathers and a great grandfather were whalers on the island. Visitors to South Georgia will be able to see Shackleton's original crow's nest, a lookout barrel from his fourth and final voyage, on the *Quest* as part of the Shackleton-Rowett Antarctic Expedition.

South Sandwich Islands stamps released

The Government of South Georgia & the South Sandwich Islands has the released the second in a four- part series of stamps set to celebrate the South Sandwich Islands. Parts 1 and 2 of this series were approved by Her Majesty Queen Elizabeth II and printed together in 2021. This issue features the central islands of the group (Saunders, Montagu and Bristol), with images of the islands paired with associated wildlife.



First day cover of the South Sandwich stamp issue

For those interested in the South Sandwich Islands, a special issue of *Deep-Sea Research* was published in early 2022 and features 12 papers on oceanography, ecology and fisheries. Most of the papers are open access and available at: https://www.sciencedirect.com/journal/deep-sea-research-part-ii-topical-studies-in-oceanography/special-issue/10C3G0D4N5Q

Underwater South Georgia

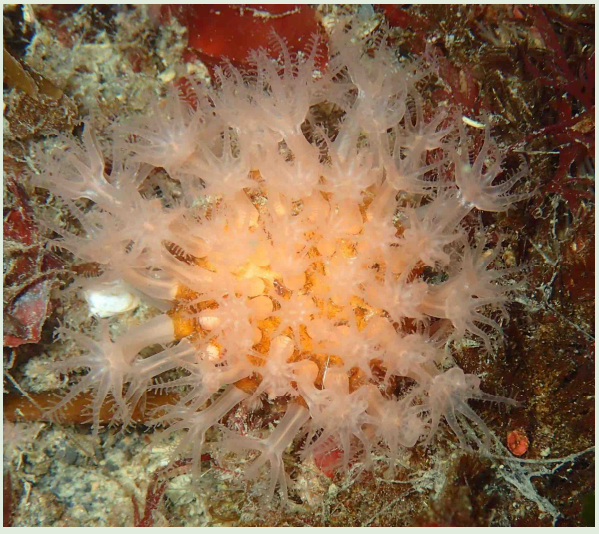
Below are a selection of underwater images from shallow water around South Georgia, taken during a scuba-diving trip on the *Golden Fleece* in 2016. Most dives were in sheltered bays on the north coast, including a dive on the wreck of the whaling supply ship, *Ernesto Tornquist*, which sank in 1950.

A nudibranch, Flabellina *sp.*

A sea spider (Pycnogonida)

Anemone

Tube worms probably Perkinsiana *sp.*



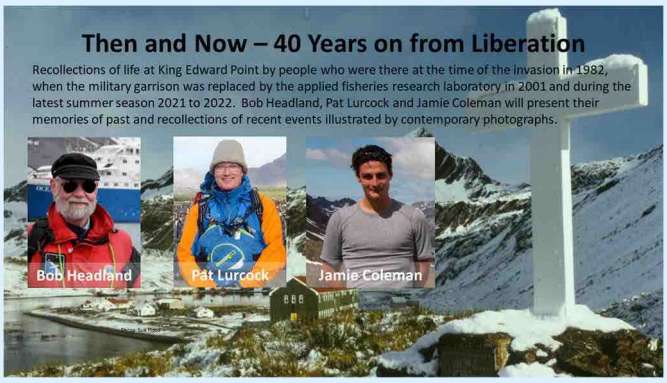
Soft coral (Octocorallia): probably Anthomastus

Crocodile fish, Parachaenichthys*, camouflaged on the wreck of the* Ernesto Tornquist

South Georgia Association News

SGA Online Meetings

The SGA have continued to hold a series of on-line talks. In April Bob Headland, Pat Lurcock and Jamie Coleman reflected on life at King Edward Point in 1982 when the Argentine invasion took place, in 2001 when the miliary garrison was replaced and in 2022. The talks were once again well attended, with others watching the recording, which is still available via the SGA website:



https://southgeorgiaassociation.org/whaling-talk-is-online/. Further online events will be announced on the SGA website.

Nominations Invited for Sixth Morag Husband Campbell Medal

The South Georgia Association is inviting nominations for the award of the Morag Husband Campbell medal for the sixth year. The Medal has been made possible by a generous bequest from a long-standing and enthusiastic supporter of the Association, Miss Morag Husband Campbell. It comprises a Sterling silver relief medallion, 60mm in diameter. The name of the recipient and the year will be inscribed on the reverse. It is intended to award the Medal every year or every other year depending upon nominations.

The Association has agreed that the Medal should be awarded to individuals who have contributed significantly to the understanding, appreciation and promotion of South Georgia. This would encompass i) scientific studies as well as in the arts and humanities including culture, history, heritage, artistic endeavour etc., ii) adventurous travel and "exploration", iii) activities which enhance the wider appreciation of South Georgia (e.g. in the media or through administrative functions).

Nominations (self-nominations are not permitted) should be made on an official Nomination Form available on the website and from the Secretary of the Association to whom they should be sent no later than 28th February 2023. The award would be made at the Annual General Meeting of the Association.

Professor David J Drewry, Chair SGA

Editor's Note

Thanks to the contibutors to this edition, notably Cecilia Liszka, Steve Brown, Meghan Goggins, Kate Owen, Adrian Fox, Imogen Lloyd, Nathan Fenney and Jamie Coleman. Thanks Fran Prince for proof-reading and fact checking. The South Georgia Association newsletter is produced twice a year, in April and November. Contributions should be submitted, at least one month before publication, to the editors: Martin Collins (e-mail: only1martincollins2@gmail.com) and Adrian Fox.