

BIOSECURITY HANDBOOK



Government of South Georgia & the South Sandwich Islands

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Biosecurity Policy

Summary

This policy is designed to safeguard South Georgia & the South Sandwich Islands against the introduction and spread of invasive non-native species and pathogens.

This document is intended to draw together all GSGSSI's current biosecurity policies into a single place so it can be easily accessed and provide the basis for discussion and regular review.

Reason for the Policy

It is widely accepted that one of the greatest threats to biodiversity on island ecosystems is the introduction of invasive non-native species (INNS). With increasing numbers of people visiting South Georgia & the South Sandwich Islands for a number of reasons, the risk of introduction of INNS is increased.

In recent years several large habitat restoration projects have sought to eradicate rodents, reindeer and invasive weeds from South Georgia. Significant resources have been used in these important conservation projects and it is now more important than ever that stringent biosecurity measures are in place to prevent non-native species entering the Territory.

Who is affected by this Policy

This policy applies to all persons entering and moving within the Territory, any persons involved with the operation of vessels within the South Georgia Maritime Zone, or persons involved with sending cargo to the Territory.

Responsible Officers

Oversight

Environment Manager - Jennifer.black@gov.gs

Implementation

Visitor Manager – Allison.kean@gov.gs

Operations Manager – vicki.foster@gov.gs

Marine Environment and Fisheries Manager – sue.gregory@gov.gs

Related Information

Ultimately this biosecurity policy is enshrined in law under the Wildlife and Protected Areas Ordinance (2011 and amendment 2013) and any breach may be treated as a criminal offence.

1. Introduction

South Georgia & the South Sandwich Islands are a haven for wildlife and are home to globally important populations of marine mammals and seabirds, including five million seals of four different species, and 65 million breeding birds of 30 different species. Environmental stewardship is embodied within the [Protect, Sustain, Inspire](#) framework which guides the work of the Government of South Georgia & the South Sandwich Islands (GSGSSI).

This Biosecurity Handbook has been developed in response to our Strategy commitments, recognising biosecurity infringements represent one of the most significant risks to the future sustainable management of this UK Overseas Territory.

This Biosecurity Handbook represents a statement of current biosecurity policy. To make sure this Handbook reflect best practice, GSGSSI undertakes an annual review of biosecurity operations, in conjunction with stakeholders, to identify any emerging threats and take action to mitigate risk including the development of new and improved control measures.

Non-native species can enter South Georgia & the South Sandwich Islands through a range of pathways including ships, in cargo, with passengers and within personal baggage. To mitigate these risks, GSGSSI works across the biosecurity continuum and has procedures in place pre-border, on the border and post-border to limit the opportunities for non-native species to get to, and establish on the island (Fig. 1).

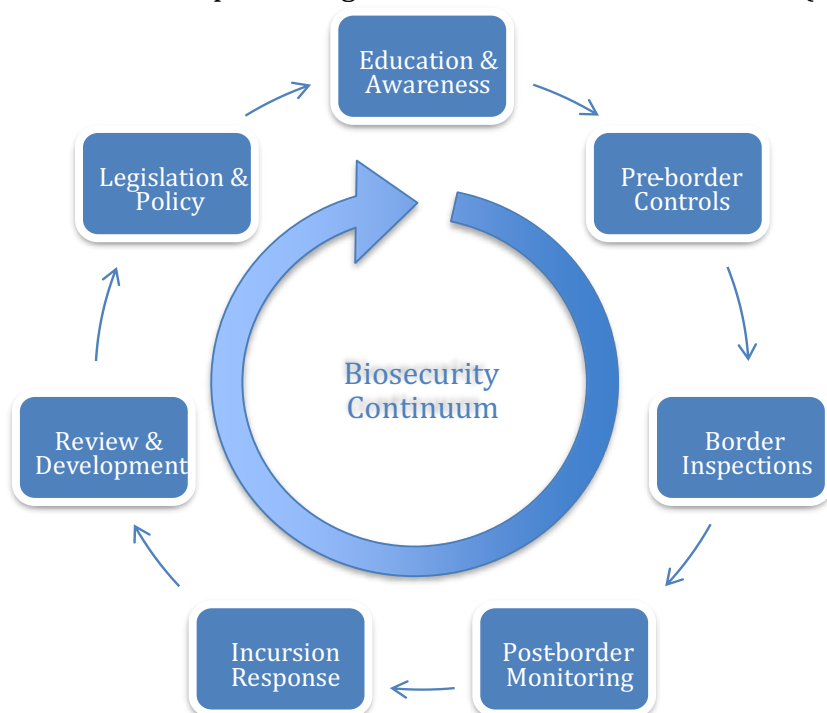


Figure 1. Effective biosecurity operates along the entire biosecurity continuum

The foundation of this process is ensuring that there is effective, comprehensive biosecurity policy in place and that it is accessible to all user groups; the purpose of this Biosecurity Handbook.

What's the risk?

A Horizon Scanning exercise undertaken by the GB Non-Native Species Secretariat, used a consensus approach with the input of over 30 experts in their field to identify a priority species list for South Georgia, based on the likelihood of their arrival, establishment and spread, with each species being subsequently scored for impacts on biodiversity (bio), economy (eco) and human health (hlth).

The following table summarises the species which are likely to be the greatest risks to South Georgia's biosecurity, or to put it another way 'South Georgia's most unwanted'.

Table 1 The greatest threats to South Georgia

Species	Common_names	Group	Impact		
			bio	econ	hlth
<i>Mytilus chilensis</i> (?)	Chilean mussel	Marine	x		
<i>Mytilus edulis</i> (?)	Blue mussel	Marine	x		
<i>Botryllus schlosseri</i>	Colonial Ascidian	Marine	x		
<i>Carcinus maenas</i>	European Shore Crab	Marine	x		
<i>Ciona intestinalis</i>	Ascidian	Marine	x		
<i>Halicarcinus planatus</i>	Decapod	Marine	x		
<i>Mytilus galloprovincialis</i>	Mediterranean mussel	Marine	x		
<i>Undaria pinnatifida</i>	Asian kelp	Marine	x		
<i>Bugula neritina</i>	Ruby bryozoan	Marine	x		
<i>Austromininus modestus</i>	Darwins Barnacle	Marine	x		
<i>Codium fragile</i> subsp <i>fragile</i>	Green sea fingers - Green Alga	Marine	x		
<i>Asciidiella aspersa</i>	European sea squirt	Marine	x		
<i>Rattus rattus</i>	black rat	Mammal	x	x	
<i>Mus musculus</i>	house mouse	Mammal	x	x	
<i>Rattus norvegicus</i>	brown rat	Mammal	x	x	
<i>Forficula auricularia</i>	European earwig (from Falklands)	Dermaptera	x		
<i>Hypogastrura manubrialis</i>	springtail	Springtail	x		
<i>Acaena lucida</i>		Plant	x		
<i>Carex trifida</i>		Plant	x		
<i>Leptinella plumosa</i>		Plant	x		

2. Visitors

Permit Holders must ensure all biosecurity measures are in place before departing for South Georgia. Failure to do so may constitute an offence under the Wildlife and Protected Areas Ordinance (2011) resulting in prosecution and could have catastrophic consequences for the ecology of the Territory.

South Georgia & the South Sandwich Islands has no native population. Everyone is therefore a visitor and has a responsibility to preserve the environment for future generations. One of the biggest threats to biodiversity is from invasive species and all visitors can help in preventing new non-native species arriving in the Territory or moving existing established non-native species between sites.

Visit permit holders must ensure that they have adequate supplies of biocide (Virkon S) for boot washing.

Vessels departing Stanley for South Georgia may be asked by the Government to undergo rodent screening by a Biosecurity Detector Dog Team. Typically, a vessel & cargo search takes the dog team less than 2 hours to perform.

Rat guards should be deployed at all times when vessels are alongside at gateway ports. Be vigilant to signs of rodents on your vessel at every stage of your visit and undertake rigorous pre-departure inspections.

GSGSSI approved rodent monitoring stations must be checked prior to entering the South Georgia Maritime Zone, and the findings reported to the Government Officers at King Edward Point. The Government Officer at King Edward Point must be contacted immediately if there is ever any concern or suspicion about the presence of rodents on a vessel. Any vessel believed to have rodents on board will be required to satisfy GSGSSI that appropriate remedial action has been taken and will be required to leave the Territory until such time as this action has been taken.

Rodent monitoring stations should be collected from the GSGSSI offices in Stanley, Falkland Islands prior to departure for South Georgia. However, if arriving via other ports the vessel may provide their own rodent bait stations after approval from GSGSSI.

2.1. General measures

All persons arriving to South Georgia are visitors, regardless of the capacity of their visit as a scientist, government personnel, expedition staff, tourist or serving in HM armed forces. It is imperative that all visitors meet their biosecurity obligations.

To fully understand the importance of biosecurity, and the measures which should be taken before and during a visit to South Georgia and/or the South Sandwich Islands, all visitors must receive appropriate briefings from their trip organiser and watch the

GSGSSI visitor briefing film before arriving in the Territory. In some circumstances when audio visual facilities are not available on board a vessel, it can be arranged for a Government Officer to give a verbal briefing.

2.2. Packing guidelines for personal baggage

Visitors are asked to follow these simple guidelines when packing their personal baggage:

What are you looking for?

- Soil, seeds, organic material and invertebrates.

Purchasing considerations:

- Where possible, take new clothing and equipment, especially coats, over-trousers, boots and socks.
- Choose outdoor wear without Velcro, and boots that have open treads which will be easy to clean.
- Seeds can often become caught in the mesh back and waist belt of rucksacks so look for ones with a smooth/tight weave fabric

Before you pack:

- Used clothing and equipment should be washed before leaving home, and any remaining seeds, soil or organic material carefully picked off by hand. Pay particular attention to Velcro, fastenings, seams, folds and pockets.
- Day sacks, camera bags, tripods and walking sticks should be thoroughly cleaned.

Tips:

- A vacuum cleaner will help remove dirt from the inside of pockets, bags, nooks and crannies.
- A needle is useful to pick out seeds stuck in Velcro or in seams.
- A screwdriver is useful to remove soil and seeds from the tread of boots.
- A stiff brush or sticky tape may help to remove seeds from clothing.

After you pack:

- Once packed, bags should be kept closed and stored in a clean area (not in a shed or garage). This will reduce the risk of invertebrates or mice crawling inside.

NOTE: Import of fresh produce for personal consumption is not permitted and no such items should be packed in personal baggage. Poultry products are of particular concern since they may carry avian diseases.

2.3. Pre-border biosecurity checks

Often visitors travel to a number of other destinations before finally reaching South Georgia and/or the South Sandwich Islands. Therefore, even if the packing guidelines have been followed prior to leaving home, they will need to be repeated before making

first landing in the Territory. It is the responsibility of the Permit Holder or person in charge of the visit to ensure that all visitors carry out the following actions:

- Thoroughly inspect and clean all luggage and equipment to be brought ashore, such as daypacks and camera bags.
- Special attention should be paid to Velcro, footwear, gaiters, pockets, turn-ups in trousers and hoods of jackets (pockets to be turned inside out or vacuumed).
- Daypacks and camera bags must be brushed out and vacuumed to remove soil, seeds and organic material.



2.4. Going ashore

All visitors should note the following when planning a shore excursion:

- Boot washing is obligatory for all persons prior to going ashore and again when returning to the ship. Boots must be cleaned to remove dirt and seeds and then dipped in an approved biocide (e.g. Virkon S or other suitable biocide) which is used according to the manufacturers instructions.
- Clothing inspections and boot washing must be overseen by a competent member of the visit team, for tourist visits this must be either a member of the expedition staff or an appropriate crew member. The Visit Permit holder is responsible for ensuring that this inspection is carried out. All external surfaces of footwear, which will be worn ashore, must be washed.

Figure 2. Checks to undertake before first landing on SGSSI

NOTE: Government Officers will inspect boot washing facilities and procedures on visiting vessels (including yachts) and will inspect visitors, including staff and crew before they disembark the vessel to ensure biosecurity protocols have been undertaken properly.

- All boats and tenders must be thoroughly inspected for rodents, invertebrates and organic material before embarking passengers, and again when departing shore to return to the ship.

- No loose cargo should be landed (such as loose items in open bags or nets). All cargo should be inspected, boxed and sealed before landing.
- As far as possible, bags should not be left open and unattended ashore.
- Visitors should avoid putting day sacks or camera cases down on the ground where they may pick up soil, seeds and invertebrates which could be transferred between sites.
- Fresh fruit, vegetables, meat, eggs and unpasteurised dairy products are not to be taken ashore.
- Any permitted foodstuffs that are brought ashore must be in boxes that are robust and fully sealed. Boxes should be made from and either plastic, metal or wood.



Figure 3. Example of a zodiac being used to support visitors

2.5. Checks between sites

Different areas of South Georgia & the South Sandwich Islands are biologically unique and it is important not to move material between regions. As well as potentially spreading alien plant or invertebrate species to un-invaded sites there is the potential to spread disease between colonies of seals and seabirds.

- Boot washing facilities should be cleaned and refilled for each new landing or every time personnel move between regions.
- All personnel must inspect clothing, boots/footwear, luggage and equipment between landings and repeat cleaning procedures to minimize the risk of intra-regional transfer. Boots should be checked after scrubbing and dipping on return to ensure there is no material remaining
- All personnel are encouraged to check clothing and equipment for invertebrates and rodents after being on board a vessel that is not their usual base.

2.6. Additional measures for high-biosecurity- risk groups

Activities that involve visitors spending a large amount of time ashore such as during science or media projects, overnight trips undertaken by mountaineering expeditions or by personnel based at King Edward Point, present an increased biosecurity risk (Fig. 4).



Figure 4. Camping equipment presents a particular biosecurity risk

Therefore, the following additional biosecurity procedures should be undertaken:

- Tents should be dry brushed inside and out to remove soil, seeds or invertebrates. If needed a damp cloth or hose should be used on heavily soiled areas. Pegs should be scraped clean and then dipped in Virkon S or an appropriate biocide®.
- Field clothing should be thoroughly cleaned before being used in different areas of South Georgia and/or the South Sandwich Islands. For personnel based at King Edward Point this should be done in the biosecurity facility.
- Scientific equipment should be thoroughly cleaned according to the manufacturer's instructions. For any equipment that has been in contact with wild birds or mammals or soil, cleaning protocols must involve a suitable biocide.

For particularly high-risk projects (such as some construction work, expeditions, science/monitoring in sensitive areas) a bespoke biosecurity plan is necessary. If this is required, it will be identified in the permit application process.

2.7. The Biosecurity Audit System

The Biosecurity Audit is a check undertaken by Government Officers, on all vessels in respect of their compliance with biosecurity procedures, or more specifically the effectiveness of the procedures in place to reduce biosecurity risk.


Government Officers conduct a standardised inspection of clothing, footwear and bags to check for biosecurity risks.

The audit is scored as a percentage pass rate based on a statistically significant sample size.

Pass Rate Risk Thresholds

- **Vessels with a pass rate of less than 85%** are classed as unacceptable, and GSGSSI will require improvements to be made prior to the vessel’s next landing. Such low scoring vessels will also be required to make first landing at Grytviken for future visits, until they have shown an improved result.
- **Vessels with a pass rate between 85-94%** are classed as acceptable, but advice will be given to make further improvements where appropriate.
- **Vessels scoring pass rates of 95% or above** are classed as good, and we hope that all vessels will strive to sit within this category.

All vessels should strive to achieve a 100% pass rate, and many achieve this!

Name of Vessel	Boaty Mc Cruise Face			Government of South Georgia & the South Sandwich Islands 	
Name of Expedition	Joe Bloggs				
Leader	01/11/2019				
Date of Audit					
	Boot Failures	Clothing & Bags	Total	Failures	
	Threshold				
Sample Size	100	2	1	3	%
				✓ 97	
2018/19 pass rates <85% = Unacceptable, 85-94% = Acceptable - Requiring Improvement, 95-100% Good					

Example biosecurity audit report with traffic light system

3. Vessels

3.1. General Measures for the Prevention of Rodents

The only way goods and people can access South Georgia & the South Sandwich Islands is by ship. As a result, a wide variety of vessels operate within the Maritime Zone (MZ). The primary risk to terrestrial biodiversity associated with vessels (as opposed to the cargo they carry) is the potential for it to harbour rodents that are subsequently transferred ashore.

The following measures apply to ALL vessels that operate in the SGSSI MZ:

- A valid Ship's Sanitation Certificate must be in date on entry into the Territory.
- Effective rat guards must be fitted to mooring lines when alongside at any port; they should be fitted such that they will not blow off in strong wind, or allow rodents to pass over/around them. NOTE: spot checks may be conducted at gateway ports.
- External doors and windows should be closed whenever possible.
- Rodent bait boxes with non-toxic bait must be carried on-board in each of the areas listed in the below table where present. This means that a vessel could require up to 6 bait boxes if each location is present and distinct.

Location	Type	Bait box
Foc'sle (mooring line locker or Bosun's locker)	Rodent entry / exit point	Y/N
Aft mooring deck	Rodent entry / exit point	Y/N
Zodiac storage or shelter deck	Rodent entry / exit point	Y/N
Cargo receiving areas	Rodent entry / exit point	Y/N
Dry food & provision stores	Rodent harbourage	Y/N
Waste storage areas	Rodent harbourage	Y/N

- Rodent monitoring stations must be deployed on all vessels according to Annex 2, before entering Maritime Zone (MZ). These boxes should be checked and the results reported to the Government Officers upon entry of the SGSSI MZ.
- If rodents are discovered on board the vessel will be required to leave the MZ for remedial action and a new sanitation inspection. GSGSSI must be satisfied that the infestation is cleared before approval to re-enter the MZ is granted.

NOTE: Rodent monitoring stations are provided to all vessels and may be collected in the GSGSSI office in Stanley, prior to departure for South Georgia, on their first call of the season. Vessels which do not enter the MZ via the Falkland Islands must contact GSGSSI before departure to make necessary arrangements.

3.2 Use of jetties

There are a variety of pathways that a rodent may leave a vessel once in South Georgia but one of the most likely is when a vessel is alongside at a jetty. There are only two jetties on South Georgia and their use is restricted.

Only vessels discharging or loading cargo (or for other, agreed activities or circumstances such as health and safety issues which require them to be alongside) should be alongside the jetties at KEP and Grytviken.

The jetty at King Edward Point may be used by the vessels listed below, when there is an operational, logistics or safety reason as follows:

- The GSGSSI fisheries patrol vessel *Pharos SG*.
- GSGSSI/BAS harbour launches (permanently based on South Georgia).
- The BAS vessel *RRS Sir David Attenborough*.
- Royal Navy vessels *HMS Forth* and *HMS Protector*.
- Yachts (small sailing or motor vessels) with a load line length of 24 m or less at the discretion of the Government Officer.
- In emergency situations where a serious mechanical failure threatens the safety of those on board.
- Vessels with specific permission detailed on a Regulated Activity Permit or with special permission from GSGSSI, and where a biosecurity risk assessment has been conducted.

The Tijuca jetty at Grytviken may only be used by passenger tenders and yachts (small sailing or motor vessels) with a load line length of 24 m or less.

Use of the jetty is allowed for the above vessels as it is deemed operationally necessary to discharge cargo, transfer personnel, conduct vessel maintenance, allow for crew rest periods or vessel safety during inclement weather. The following biosecurity measures must be in place when a vessel is alongside:

- Gangways should be lifted at night where it is possible to do so. Where this is not possible (i.e. because 24h access is needed to the vessel), consideration should be given to lighting the gangway to reduce the chances of it being used by rodents. However, this must be weighed against the chances of bird strike.

Because of the increased likelihood of transferring rodents when alongside, vessels which are authorised to use jetties are required to have enhanced biosecurity measures in place which are described in the relevant sections below.

3.3 *Pharos SG*

The *Pharos SG* is the Government fishery patrol vessel (Fig. 5) and is engaged in a range of tasks including delivery of cargo and personnel to the station at King Edward Point and sometimes Bird Island, undertaking at sea inspections of fishing vessels and supporting

a range of environmental, heritage and scientific projects at sites around the island. Because of this diverse range of tasks, and because the vessel is often working close to the shore at a range of locations, it is imperative that the highest standards of rodent biosecurity are in place at all times on the vessel. The following additional measures are in place on board:

- The ship will be subject to a search by the rodent detection dog team prior to departure from the Falklands.
- The ship's company is regularly briefed on biosecurity policy and any particular biosecurity considerations for upcoming tasking.
- Rodent control stations are placed at FIPASS, the home port in the Falklands, to limit the local abundance of rodents and reduce the likelihood of one boarding the vessel.
- Rodent bait stations are placed at key locations on the vessel which are checked by the Master before arriving in the South Georgia Maritime Zone and reported to the Government Officers at KEP.
- Insect traps (sticky and UV) are placed in food storage areas and accommodation areas and are regularly checked by the master. This information should be reported to the Government Officers
- When transferring observers or fishery officers between vessels, personal clothing and equipment is required to be checked and cleaned immediately upon arrival on board. If there is any suspicion that the previous vessel had an invertebrate infestation, these checks should be made on deck, not inside the accommodation space. Insecticide should be on hand.



Figure 5. Pharos SG the GSGSSI fisheries patrol vessel

3.4 British Antarctic Survey and other UK Science vessels

British Antarctic Survey vessel *RRS Sir David Attenborough* visits South Georgia during annual re-supply operations and in support of science projects. During annual re-supply, a large volume of cargo is discharged and the vessel may be alongside for several days and so enhanced biosecurity procedures are required. These include:

- The ship will be subject to a searched by the rodent detection dog team prior to departure from the Falklands.
- Personnel traveling on the BAS vessels are briefed on environmental matters, including biosecurity, prior to travel.
- At least two rodent bait stations are placed at key locations on the vessel which are checked by the Master the day before the vessel comes alongside at KEP and the findings reported to the Government Officers.
- Sticky and UV insect killers are placed inside all food storage areas.
- Ultrasonic rat deterrents are placed on gangways.

3.5 Royal Navy vessels

Royal Navy vessels visit the Territory and undertake a range of tasks. A range of Royal Navy vessels visit the Territory throughout the year but the most common visitor is the South Atlantic patrol ship *HMS Forth* (Fig. 6)



Figure 6. HMS Forth

When Royal Navy vessels require to use the jetty at King Edward Point, to mitigate the risk of transferring rodents the following enhanced biosecurity measures are in place:

- The ship will be subject to a search by the rodent detection dog team prior to departure from the Falklands.
- Military vessels will appoint a 'Biosecurity point person' who will be responsible for ensuring that the vessel's visit, complies with the biosecurity procedures detailed in the Biosecurity Handbook.
- Rodent control stations are placed at Mare Harbour, the home port in the Falklands, to limit the local abundance of rodents and reduce the likelihood of one boarding the vessel.
- The vessel will maintain best practices at gateway ports, including the use of rodent guards on mooring lines, to reduce the risk of a rodent getting on board.
- Rodent bait stations are placed at key locations on the vessel and must be checked by a designated Officer prior to entry into the South Georgia Maritime Zone and the findings reported to the Government Officers.

3.6 Yachts

A range of yachts visit South Georgia & the South Sandwich Islands each year. The majority are members of IAATO but a small number are independent travellers making a one-off visit. Yachts present a particular risk of transferring rodents because they may be alongside/overwinter in harbours that contain rodents and on arrival to the Territory utilize anchorages that are much closer to the coast line than those used by larger vessels such as cruise ships.

- Yachts will be subject to a search by the rodent detection dog team prior to departure from the Falklands.
- Yachts travelling to the Territory via the Falklands must collect rodent monitoring stations and receive a briefing from the GSGSSI office in Stanley if required. Yachts not passing through the Falklands must source GSGSSI approved rodent monitoring stations prior to entering the South Georgia Maritime Zone and should make contact with GSGSSI at the earliest opportunity.
- Rodent bait stations must be checked before entry in to the SGSSI MZ and findings reported to the Government Officer.
- Although permitted to anchor en-route, yachts (unless otherwise permitted) must make their first landing at Grytviken and on arrival, as part of the customs clearance process, Government Officers will carry out a visual inspection of the interior of all yachts, to identify signs of rodent and invertebrates.
- Yachts that have either not come via Stanley or are not members of IAATO, must, make Grytviken their first landing for briefing and biosecurity checks. On arrival the Government Officer will direct the vessel to an anchorage or a jetty to await their arrival. No person should leave the vessel until being cleared to do so.

3.7 General measures for invertebrate detection and deterrence

Invertebrates such as cockroaches, earwigs, spiders, moths and flies can enter vessels in association with personal baggage, when loading provisions or simply by flying on board when the vessel is in port. The large variety of microhabitats on board ships mean that once on board, some species can thrive. To reduce the likelihood of invertebrates entering the vessel initially, and to reduce the risk of subsequent transfer between vessels or to the shore, the following measures should be adopted:

- When in port, where possible, windows and doors should be closed and deck lighting kept to a minimum.
- Cardboard packaging, especially on fresh produce should be minimised and incinerated as soon as possible.
- Crawling and flying insect traps should be fitted in high-risk areas such as food storage area and checked regularly so that infestations can be detected early and dealt with.

Government officials may ask to inspect invertebrate traps when on board. If an infestation is discovered, additional biosecurity measures may be required to prevent spread to other vessels or the shore.

4. Cargo

4.1 Guidelines for packing facilities

Reducing the likelihood of seeds, soil, invertebrates and rodents becoming entrained in cargo at the source destination is a vital step in the biosecurity continuum. If a packing facility is clean and free from potential contamination sources, it is likely that the cargo will also remain clean. For commercial packing facilities that ship materials to the Territory, the following guidelines apply:

- There should be active rodent control in the warehouse facility and surrounding area. As appropriate this should involve different types of bait station and detection devices. If there is evidence of rodent activity, use of the facility should be discontinued until the problem is solved. There should be a clear checking and response protocol in place.
- Seeds can sometimes be brought into warehouses on equipment or on air currents and then become entrained in cargo. Efforts should be made to reduce the densities of weed species around warehouse facilities. This can most easily be achieved using a glyphosate-based herbicide.
- If crawling invertebrate's access packing materials, they can lay eggs that are hard to detect and pose a biosecurity threat. Crawling and flying insect traps should be installed in packing facilities.
- Cargo should be stored inside wherever possible. Ideally it should be stored in a dedicated biosecurity area/room/container.
- If stored outside, cargo should be placed on a hard standing to avoid contamination with soil. Cargo should not be placed under overhanging vegetation or trees such that organic material might fall onto the cargo. If items become contaminated with soil and organic material, they should be cleaned before onward transport.
- Warehouse doors and windows should remain shut as far as possible, but especially at night when flying insects may be attracted to the lights.

4.2 Cargo packing requirements

The type of packing material and storage location can have a significant effect on the biosecurity risk posed by cargo items. To reduce this risk, the following requirements should be met:

- As far as possible, cardboard packaging should be avoided as it can harbour invertebrates and is easily breached by rodents.
- For routine cargo operations on the Pharos SG rodent proof pallet boxes made from high density plastic will be utilized as far as possible.
- Plastic or metal boxes should be used if possible and cleaned between each use.
- If cardboard boxes are to be used, they should be in good condition (or new if possible) and sealed using packing tape on ALL edges and across all potential openings, so as to make them impenetrable.

- As far as is practicable, all wood packaging likely to be off-loaded in the Territory (such as cases, crates, dunnage, pallets and timbers for the purpose of bracing, separating, protecting or securing cargo) should be new and comply with the International Standards for Phytosanitary Measures No. 15 (ISPM 15). Wooden packaging that remains on the ship (i.e. is not off-loaded) does not have to comply with ISPM 15.
- No soil, moss, used sacking, hay, straw, chaff or wood shavings shall be used in packing materials. Acceptable alternatives include shredded paper, vermiculite, bubble wrap and other air-filled cushioning materials.
- Cargo will, where logistically possible, be subject to a search by the rodent detection dog team prior to departure from the Falklands.

4.3 Procedure for packing containers

Shipping containers are universally used to transport goods around the world and some simple precautions can vastly reduce the biosecurity risk they pose. The following standards should be met for any shipping containers that are being transported directly to the Territory:

- Containers should be in good condition with effective door seals that would prohibit passage of rodents and invertebrates.
- Containers should be cleaned before being packed. Ideally this should be done using a commercial steam cleaning service but otherwise being swept out and insecticide spray used in the corners and along the door threshold will suffice.
- Container doors should not be left open and unattended at any time.
- Containers should be placed on hard standing to prevent soil and mud and organic material contaminating the container and cargo.
- Cargo should be packed so that cargo can't fall against the doors and prevent re-closure in case propagules are discovered on opening.
- Once cargo loading is complete, before the container is sealed for shipping, a rodent bait station and crawling insect trap should be placed inside next to the door so it can be easily accessed on opening.
- Unless it contains food, the container should be fumigated with a pyrethrum based insecticide prior to being sealed.
- The number of containers with food should be minimised i.e. not spread across multiple containers, to reduce the number of un-fumigated containers that are transported.
- Unless required by Customs Officers, sealed containers should not be opened enroute to the Territory.
- Containers will, where logistically possible, be subject to a search by the rodent detection dog team prior to departure from the Falklands.

4.4 Procedure for cleaning vehicles

Biological material and soil can become attached to vehicles such as quad bikes, 4x4 vehicles such as Land Rovers, construction vehicles, bicycles etc. during everyday use.

When vehicles are moved from one location to another, these materials may also be transferred. The following procedures should be employed to reduce the risk of biological material being transported to the Territory:

- Vehicles should be inspected to ensure that they are free of visible soil and biological material (e.g. plant fragments, seeds and insects) and if necessary thoroughly cleaned before being loaded onto the re-supply ship. This should include all external and internal surfaces as well as the undercarriage.
- Where practicable, high-pressure steam/hot water cleaning of vehicles is recommended. Alternatively, vehicles may be cleaned manually, such as with a bucket of water and brush.
- Any external surfaces of the vehicle that come in to contact with the ground i.e. tyres, tracks, skis should be washed with Virkon S or an appropriate biocide.
- Vehicle interiors, upholstery and mats should be brushed and/or vacuum cleaned to remove any soil or biological material.
- Engine compartments should be carefully checked for the presence of biosecurity risks such as rodents, seeds, invertebrates and organic material.
- The interior of vehicles should be fumigated with a pyrethrum-based insecticide prior to being shipped.

Any vehicles being transported through the Falkland Islands, should be presented to a GSGSSI official with at least 3-working days before cargo loading in order for checks to be carried out and any necessary remedial measures carried out. Consignees should work through the vehicle cleaning checklist and sign the declaration (see annex 1).

If vehicles are not being transported through the Falkland Islands, the shipper should contact GSGSSI to make alternative arrangements. Note that the Falkland Islands have stringent import health standards controlling vehicle imports, and advice should be sought from the Biosecurity Officer at the Department of Agriculture (biosecurity@doa.gov.fk) to ensure that these can be met before importing a vehicle.

4.5 Pre-border checks for cargo

The majority of cargo on the British Antarctic Survey vessel and some fully-loaded containers of construction material from SATLAN are consigned directly from the UK to South Georgia. Other cargo is either purchased in the Falkland Islands or arrives in the Falklands from the UK as consolidated cargo and needs to be re-packed for onward transport. It is therefore imperative that imported goods meet the Falkland Islands' import health standards and do not pose a threat to the biosecurity of the Falkland Islands. Also, under these circumstances there is the potential for non-native species to become entrained with the cargo whilst in storage in the Falkland Islands so a GSGSSI official must undertake some additional checks prior to loading. These include:

- Making sure packaging meets packing guidelines (see above).

- Checking to ensure packaging is still intact and repairing any holes if needed. The contents of any boxes which have been breached will require inspecting to ensure that rodents or invertebrates have not been able to enter.
- Ensuring the inside of containers is clean and the outside of containers have been washed.

If cargo is received at the dock-side and a biosecurity risk is identified, the GSGSSI official has the authority to prevent it being loaded onto the vessel until remedial action has been undertaken.

4.6 Border inspections for cargo and personal equipment

Although every effort is made to prevent non-native species being accidentally brought into the Territory, it is important that cargo and personal equipment receives a final inspection on arrival in the Territory. During routine operations i.e. not annual re-supply, the following protocols apply:

- Smaller items of cargo from Pharos SG and personal bags must be taken straight to a designated biosecurity facility on arrival. There are dedicated biosecurity facilities at both King Edward Point and Bird Island.
- Post bags are taken to the post office where crawling insect traps and insecticide spray are on hand.
- On arrival in the biosecurity facility, bags and boxes are opened and thoroughly checked for soil, organic material, seeds and invertebrates.
- Individuals must sign to say they have completed these checks before the item is released.
- If an item of cargo contains a small amount of biological material it may be possible to take remedial action on site to reduce the biosecurity risk. The Government Officer is responsible for making this decision but will consult with the Biosecurity Officer to determine appropriate mitigation measures.
- If an item is heavily infested, it should be sealed inside a container. The Government Officer will identify the best method for destroying or treating the item in conjunction with the Operations Manager and/or Environment Manager.

At the current time facilities do not exist to place entire shipping containers inside a biosecurity area. To ensure appropriate biosecurity checks can be undertaken, the following measures should be in place.

- When shipping containers come ashore they should remain sealed until there is time/space to unpack them fully.
- At no point should a partly unpacked container be left open and unattended.
- A Government official should be present when containers are first opened to monitor for any non-native species and check the rodent and invertebrate traps within.
- In the event that a biosecurity hazard is detected, the container should be sealed immediately and returned to the ship for remedial action or removal from the territory.

Once a year, the British Antarctic Survey vessel *RRS Sir David Attenborough* re-supplies the stations at KEP and Bird Island with the majority of the food and equipment needed for the year. Because of the large quantities of cargo, not everything can be processed within the usual biosecurity facility.

During re-supply the following protocols are in place:

- A random sample of 10% of all cargo is comprehensively searched in the biosecurity facility
- If any breaches are found in the 10% a further 10% should be checked
- If further breaches are found, the Government Officer (or Station leader at BI) will decide if 100% of cargo, or all cargo of a particular kind must be checked.

The remaining cargo at KEP is processed through the boatshed, and additional biosecurity devices are installed for the resupply period. These include:

- At least five sticky invertebrate/mouse traps stationed around the periphery of the building.
- Four additional rodent bait stations positioned within the building

Staff are briefed to remain vigilant for biosecurity breaches and a box containing insecticide spray is available. If a suspicious box is found, it should be taken to the biosecurity shed before it is completely unpacked and the magnitude of the infestation is established.

4.7 Aggregate

Aggregate is defined as any coarse particulate material used in construction, including sand, gravel, crushed stone, boulders, pebbles or slag. It may present a biosecurity risk because biological material such as seeds, soil and invertebrates can become entrained during production and transport.

Decisions will be made on a case-by-case basis, following an Environmental Impact Assessment which includes consideration of biosecurity, on if it is appropriate to source aggregate locally or if it should be imported from outside the Territory.

4.8 Movement of cargo between King Edward Point and Bird Island

On occasion goods are shipped between the research stations at King Edward Point and Bird Island. King Edward Point is home to several species of introduced plants and invertebrate that are not found on Bird Island. Bird Island is home to dense aggregations of wildlife and there is potential for spread of disease. For any cargo/equipment which has been brought ashore and opened/used on station, or cargo which has been brought ashore and stored outside, extreme caution must be exercised and the following steps taken to reduce risk:

- Prior to loading on a re-supply vessel, cargo should be checked and where necessary unpacked, cleaned and re-packed in clean, intact packaging.
- At King Edward Point and Bird Island, small items should be checked in the biosecurity facility.
- Any items which are too large to fit inside a biosecurity facility must be checked on board the vessel.
- Personal effects should be checked and cleaned following methods described in section 2.3.

5. Fresh Produce

5.1 General measures

Fresh produce such as vegetables, fruit, salad etc. poses a biosecurity risk as it may contain soil, seeds, pests or diseases. No fresh produce should be brought ashore at any location other than King Edward Point and Bird Island station.

At King Edward Point the Government Officers are responsible for ensuring the biosecurity checks are correctly implemented and deciding if an infested shipment should be returned to the supplier or if it can be dealt with locally. At Bird Island the Station Leader fulfils this role.

5.2 Guidelines for ordering fresh produce

Only quantities of fresh food produce sufficient to meet the stations needs between provisioning calls are to be ordered so to reduce the burden of biosecurity checking for station personnel.

It has been deemed that some fresh produce items cannot be checked adequately on receipt in the biosecurity facility and therefore should not be ordered. This includes loose leafy vegetables such as:

- Broccoli
- Cauliflower
- Lettuce
- Kale
- Spinach
- Cabbages (white cabbage and red cabbage are acceptable providing the outer leaves are removed)
- Leeks
- Globe artichokes
- Celery
- Pineapples
- Fresh herbs

NOTE: The list is illustrative not exhaustive. Check with GSGSSI if in doubt.

Root vegetables should only be ordered if they are pre-washed and do not contain surface soil.

Cruise ships may gift fresh produce, this policy applies and such donations should not be accepted unless they are pre-washed and do not contain soil. The Government Officer should ensure that cruise ships are aware of this policy and do not send fresh produce ashore without authorisation.

5.3 Biosecurity checks on arrival in on station

Upon arrival, all fresh produce must be taken directly to a biosecurity facility where it should be checked for signs of infestation by fungus, non-native invertebrates, soil from outside the territory, or non-native plant seeds.

At King Edward Point and Grytviken, produce should be taken to the biosecurity shed (Fig. 8) which is equipped with crawling insect traps and UV flying insect traps. At Bird Island, produce should be kept in the biosecurity shed which has been prepared prior to offload.



Figure 8. Checking fresh produce in the biosecurity shed at King Edward Point

If a shipment is heavily infested, the responsible officer should determine if the produce should be returned to the sender/re-supply ship for disposal/incineration. If only a few items are affected, the responsible officer may decide that remedial action can be taken to reduce the biosecurity risk. Depending on the type of infestation the following actions may be taken:

- If an item has fungal growth, the infected part should be cut out and stored until such time as it can be rendered inert*.
- If live invertebrates are found they should be killed immediately with insecticide spray or placed in ethanol. Be aware that if live or dead invertebrates are seen, there may also be microscopic eggs that could hatch at a later date (timing will depend on species and temperature). Extra vigilance should be exercised including weekly checks of sticky traps in food storage areas.
- If there are non-native plant seeds associated with the packaging or outer surface of the produce they should be rendered inert. Seeds may be stored in a sealed container and batch processed if necessary.
- For items with a small amount of surface soil, it may be removed either by removing the skin/peel or by using a dry brush. The material should be rendered inert*.
- Under no circumstances should food or food scraps be fed to local birds.

Onions and garlic should have all outer skins removed such that only the edible bulb remains. The discarded skins should be rendered inert.

*At King Edward Point, material which needs to be rendered inert should be sent to the Falkland Islands for incineration. Waste will be kept double bagged in the freezer before being shipped to Stanley. At Bird Island, material which needs to be rendered inert should be heated in a pressure cooker for 10 minutes.

A log of all biosecurity checks and biosecurity breaches should be kept. The responsible officer is to take photographs of the consignment for evidence if the fresh produce is to be returned to the supplier.

Once processed in the biosecurity facility fresh produce should be taken to a designated food storage area i.e. food store, kitchen.

6. Post-Border Monitoring

6.1 King Edward Point and Grytviken rodent monitoring procedures

Although the focus of biosecurity efforts is to prevent non-native species entering the Territory, the vital last stage in the biosecurity continuum is to monitor the efficacy of those efforts and be in a position to take action in the event of an incursion. In the case of rodents, this is particularly important as early detection and rapid response has a high probability of success.

As the majority of visitors and cargo comes ashore at King Edward Cove and it is the only place ships are allowed to come alongside stringent biosecurity and monitoring is in place. The following monitoring devices have been installed in this area:

- At KEP there are a minimum 17 rodent monitoring stations consisting of a DOC 200 trap, an oil-soaked gnaw stick, a wax tag and a poison bait block.
- At the KEP jetty there are a minimum of 3 'rat hotels' (Fig. 9).
- A line of at least 24 wax tags radiating out at 25 m intervals from the jetty through the station complex.
- At Grytviken there are at least 14 rodent monitoring stations consisting of a DOC 200 trap, an oil-soaked gnaw stick, a wax tag and a poison bait block.
- Around Grytviken there are a minimum of 2 'rat hotels' (one close to Tijuca, the others(s) at zodiac landing sites).



Figure 9. Rat hotels have a DOC 200 trap, mouse traps, wax tags, poison bait (formulated for rats and mice) and a poison bait block

The Government Officers are responsible for checking the rodent monitoring devices which is done as follows:

- October and April – every 2 weeks. In this time the greatest number of pathways are present and so the risk is greatest.
- May to September - every 4 weeks. Lower number of pathways present so lower risk.

The Government Officers keep a record of checks that are made.

6.2 Sticky traps for monitoring invertebrate and mouse incursions

Occasionally invertebrates arrive in cargo, personal baggage or mail. Although every effort is made to detect these creatures in the biosecurity shed their cryptic nature means they can escape into the station facilities. They are often then contained within a building and because only a single animal is present they do not reproduce and spread. However, there is the potential for multiple individuals or species that are capable of colonising the natural environment to be introduced. Earwigs are prolific in the Falkland Islands and it is thought that South Georgia could provide a suitable environment for their breeding success. The most effective traps to detect crawling insects are also effective at trapping mice and so serve a dual purpose (Fig. 10). Sticky traps are placed on the ground, alongside walls in areas where the Government Officers deem the risk of an incursion to be highest:

- Crawling insect traps are installed in all habited buildings, food and waste storage areas.
- Particular attention is paid to rooms that receive large amounts of luggage, cargo or mail including the museum storerooms and workshops where building supplies are stored.
- Traps are checked by the Government Officers each month and recorded.



Figure 10. Sticky traps used to monitor for invertebrates and mice

7. Reporting

7.1 General Principal

Keeping records of the number and type of biosecurity inspections undertaken and any incursions that are detected is vital for accurate reporting. In turn this forms the basis of regular biosecurity reviews that are necessary to ensure that policies remain fit for purpose (Fig. 11).

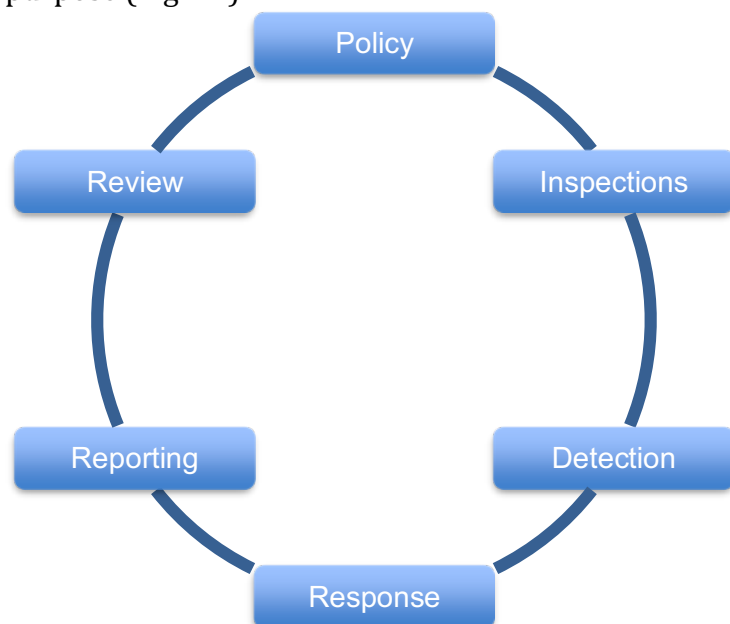


Figure 11. Biosecurity cycle

All visitors have a responsibility to undertake biosecurity checks and report findings. Findings are typically reported to the Government Officer who collates this information and reports to the Environment Manager and Operations Manager. The Environment Officer will chair a Biosecurity Working Group which will act as the forum for reviewing policy, ensuring that procedures are in place to mitigate biosecurity threats facing the Territory. Any significant changes in policy are discussed with stakeholders and signed off by the Chief Executive Officer.

7.2 Reporting procedures for visitors

The first and most important element of reporting rests with individuals themselves. Depending on the nature of the visit and a visitor's role on the island there are different reporting requirements:

- Every individual is expected to sign the self-audit checklists.
- Visit Permit holders (or equivalent) are responsible for ensuring self-audit checks have been completed by all and pass these on to the Government Officer.

- Ships Masters are responsible for ensuring rodent monitoring stations on their vessel (see section 3) are checked and reporting findings to the Government Officer on arrival into the MZ. For vessels that are in the MZ for an extended stay (e.g. fishing vessels, yachts, Pharos SG), after the initial report, Masters are also responsible for ensuring that bait stations are checked and findings reported to the Government Officers on the 1st and 15th of each month for the duration on their visit.
- All visitors should report any suspicious sightings of rodent or reindeer sign, and any invertebrates or plants not already known from the islands to the Government Officers via the visit permit holder (or equivalent). As much information as possible should be included such as a photograph and GPS location.

7.3 Reporting procedures for Government Officers

Government Officers are responsible for consolidating biosecurity reports/declarations from visitors and the day-to-day monitoring of compliance with biosecurity policies at KEP. As part of this role they are to keep records of checks made on the various biosecurity devices installed around station and ensure that electronic records are completed accurately.

In the absence of any major biosecurity breaches, a monthly biosecurity report is sent to the Environment Manager and Operations Manager. This report contains the following information:

- Dates of vessels alongside jetties (KEP and Grytviken).
- Dates of rodent monitoring checks.
- Rodent monitoring resources used e.g. bait stations.
- Dates of invertebrate monitoring checks.
- Invertebrate monitoring resources used.
- Number of cargo/personal baggage checks undertaken and any breaches.
- Details of fresh produce checks and any remedial action taken.
- Number of rodent bait stations deployed on vessels (name of vessels).
- Collation of reports from vessel masters checking bait stations deployed on their vessel.
- Collation of (potential) sighting reports from other parts of the island by visitors.
- Details of biosecurity building management e.g. cleaning, replacement of insect traps etc.

NOTE: Breaches involving a rodent or invertebrate incursions would be reported immediately.

Biosecurity related incidents which are reported through the British Antarctic Survey Accident Incident Near Miss Environment (AINME) system should be forwarded to GSGSSI from the BAS Environment Office as appropriate.

7.4 Annual biosecurity review

Biosecurity will be reviewed on an annual basis by the Biosecurity Working Group, which includes all members of GSGSSI who have biosecurity within their portfolio of responsibility. This will involve gathering all records together from all parts of the biosecurity continuum and consolidating these into a single document. As part of the review items and or activities that have been the most frequent causes of breaches are to be identified and action plans developed to mitigate this risk in the future. The report contains the following sections:

- Pre-departure biosecurity checks.
- Cargo at King Edward Point.
- Intra-regional movements.
- Rodent Monitoring.
- Insect monitoring.
- Biosecurity Audit results.

The Biosecurity Working Group will work together to ensure that action plans are implemented and, where needed, that biosecurity policy is updated. For major changes to biosecurity policy appropriate stakeholder consultation will be held.

8. Incursion Response

8.1 Rodent incursion

The South Georgia Heritage Trust (SGHT) led a successful project to eradicate rodents from South Georgia. In March 2011, bait was spread on the Thatcher, Greene, and Mercer Peninsulas and Teie Point. Systematic monitoring undertaken in the three years since baiting indicate that the operation was a success and it is considered that these areas are now rat free. In 2013 SGHT returned to South Georgia to spread bait over the rat infested areas to the north of the Phase 1 area (from the Busen area to Peggotty Bluff). In addition, areas infested with mice (Cape Rosa and the Nunez Peninsula) were baited in 2013. The remaining rat infested areas (to the south of the Phase 1 area from the Barff Peninsula to Cooper Bay) were baited in 2015.

The SGHT eradication project involved a significant amount of planning and the cost was in the region of £10 million. It is therefore vital that the right protocols are in place to reduce the risk of any future rodent incursion. GSGSSI seeks to continue to develop and enhance these protocols changes to which will be published in future editions of the Biosecurity Handbook.

Most effort should be focused on ensuring that rodents do not enter the Territory and this Biosecurity Handbook details the measures GSGSSI has in place to prevent any reintroduction. However, in the event that a rodent does get ashore, a comprehensive incursion response plan has been prepared that details actions to be taken to prevent rodents becoming established and spreading beyond the point of introduction.

This incursion response would be led by Government Officers who would co-ordinate the response using personnel available on station. The plan is practiced each year to ensure that all the equipment is in place and staff are familiar with procedures. The plan is available from GSGSSI on request.

8.2 Non-native plant incursion

GSGSSI is engaged in a programme to manage non-native plants in the Territory. With the assistance of UK Government funding through the Darwin initiative, great progress has been made in controlling target species around King Edward Point and Grytviken and limiting the spread of species elsewhere. Recently GSGSSI committed £250,000 over 5 years to continue this work and it is vital that this is not undermined by the introduction of new species.

As with other groups, the focus of biosecurity is to ensure that new species are not introduced. With plants this is particularly important because their cryptic nature means in some cases it may be some time before they are discovered by which time a seed bank could have established.

With the support of the Darwin funding, GSGSSI has prepared a non-native plant management strategy that, in addition to detailing controls measures for existing species,

details the process on discovering a new unidentified plant species and the steps needed to make a decision on how to manage the incursion.

8.3 Non-native invertebrate introduction

Plans for dealing with an incursion of non-native invertebrates are focused on measures which can be taken inside accommodation blocks and storage areas. The response will be tailored to the specific invertebrate species that has been detected but would likely involve fumigation followed by a period of intense trapping.

8.4 Marine non-native species

A Blue Belt funded project is underway to assess the risk of marine non-native species and develop suggestions of how GSGSSI may minimise any potential risk

9. Special measures for Highly Pathogenic Avian Influenza

*Based on advice published in: Dewar, M., Wille, M., Gamble, A., Vanstreels, R., T., Smith, A., Varsani, A., Ratcliffe, N., Black, J., Lynnes, A., Barbosa, A. & Hart, T. (2022) **The Risk of Avian Influenza in the Southern Ocean: A practical guide** [10.32942/osf.io/8jrbu](https://doi.org/10.32942/osf.io/8jrbu)*

9.1. Background

Avian influenza is a viral disease that primarily affects birds but has also been found in humans, pigs, and horses. Low pathogenic avian influenza viruses are common in wild birds and often cause no signs of disease. However, some strains of the virus including H5 and H7 are highly pathogenic in domestic poultry and can cause high mortality if they escape into wild bird populations. These are known as highly pathogenic avian influenza (HPAI).

The current outbreak of H5N1 HPAI has resulted in the death of high numbers of seabirds in the Northern Hemisphere, the south of Africa and around the Atlantic and Pacific Oceans. It is expected that this outbreak will spread to Southern Ocean bird populations in the 2022/23 and 2023/24 austral summers.

In readiness for this, the Government of South Georgia & the South Sandwich Islands (GSGSSI) has developed the following guidance on HPAI risk and response in the territory. The guidance describes what enhanced biosecurity procedures, signs to be vigilant for, how to report these to the GSGSSI and what action we will take on receiving that report.

Detailed information on the background, mode of transmission and risks associated with HPAI can be found in Dewar et al. (2022)

9.2. Enhanced biosecurity measures for HPAI

In addition to all protocols listed in the 'Biosecurity Handbook', enhanced biosecurity provision will be in force from 01/11/2022*. This includes:

* Prior to this date people are encouraged to adopt enhanced biosecurity protocols as a matter of good practice where possible

9.2.1 Before landing/entering a site of high wildlife density

- Extra caution must be taken when cleaning any clothing or equipment which has been used in other wildlife areas especially at northern hemisphere sites where bird flu has been confirmed/suspected.
- All biological material should be removed from boots and outer clothing and non-porous surfaces should be treated with Virkon S, Bioguard, or soap followed by 10% bleach.
- If clothing or equipment cannot be adequately cleaned, it should not be brought to SGSSI
- Conduct an **observation period** as described below for at least 5 minutes prior to entering an area with high seabird densities. Although some mortality is natural, especially of juveniles, you should note if there are unusually high levels of mortality or birds exhibiting any of the common signs of HPAI. These include:
 - Neurological issues such as loss of coordination and balance,
 - Trembling head and body,
 - Sudden and rapid increase in the number of birds found dead between visits,
 - Swollen head,
 - Closed and excessively watery eyes,
 - Lethargy and depression, unresponsiveness, lying down, drooping wings, dragging legs,
 - Twisting of the head and neck,
 - Haemorrhages on shanks of the legs and under the skin of the neck,
 - Respiratory distress such as gaping (mouth breathing), nasal snicking (coughing sound), sneezing, gurgling or rattling,
 - Discoloured or loose watery droppings, bright green in some species.

If any of these signs are noted, or there is concern of mass mortality at the site:

- **Do not approach** the site or make a landing
 - Continue observations and complete the reporting procedures outlined below.
 - Ensure all clothing and equipment is decontaminated
- If there are no signs of HPAI and no unusual levels of mortality are noted, landings/site visits can proceed

9.2.2 When visiting/working in an area of high wildlife density

- Maintain the recommended IAATO wildlife approach distances, unless you have a specific Regulated Activity Permit (RAP) which allows you to approach closer
- Do not sit on the ground or place equipment on the ground unless it is unavoidable

- Remain vigilant for signs of HPAI and be prepared to leave the site if any behavioural signs of mortality above baseline are noted

9.2.3 Working within 5 metres of wildlife

If you have been granted permission under a RAP to approach seabirds closer than 5 metres or undertake any animal handling, regardless of whether HPAI is suspected to be present or not, personnel must:

- Wear the following enhanced PPE
 - fluid resistant face mask
 - disposable overalls or outwear that can be decontaminated with Virkon S or Bioguard i.e. oilskins
 - safety glasses/eye protection
 - gloves or/alcohol hand cleaner
- Be appropriately trained in working with potentially infectious animals, and correctly wear/remove/dispose of PPE.
- Not move between colonies/areas of high seabird density or work in colonies of different species of bird without first decontaminating all clothing and equipment

9.2.4 Bird strike

If bird strike occurs on a vessel or on shore, depending on the level of injury, it may not be possible to determine if the bird has signs of HPAI or not. Therefore, a precautionary approach should be adopted

- If personnel are handling birds (alive or dead) which have struck *vessel or structure*, it is advised to follow the same precautions as detailed in section 9.2.4.
- Birds which have struck a vessel or structure and are diseased should not be retained unless a specific RAP is held. Carcasses should be disposed of via incineration (where available), as biological waste, or disposed of overboard.
- If birds are still alive, they should be released as soon as is practical in order to minimise the time personnel are in contact/exposed
- All bird strike should be reported to the Government Officers on the GSGSSI bird strike pro-forma

9.2.5 After a visit / when returning to base

- Clean all clothing and equipment thoroughly before progressing to the next site ensuring all biological material is removed and surfaces are disinfected with Virkon S or Bioguard

9.2.6 Personnel based at King Edward Point or Bird Island

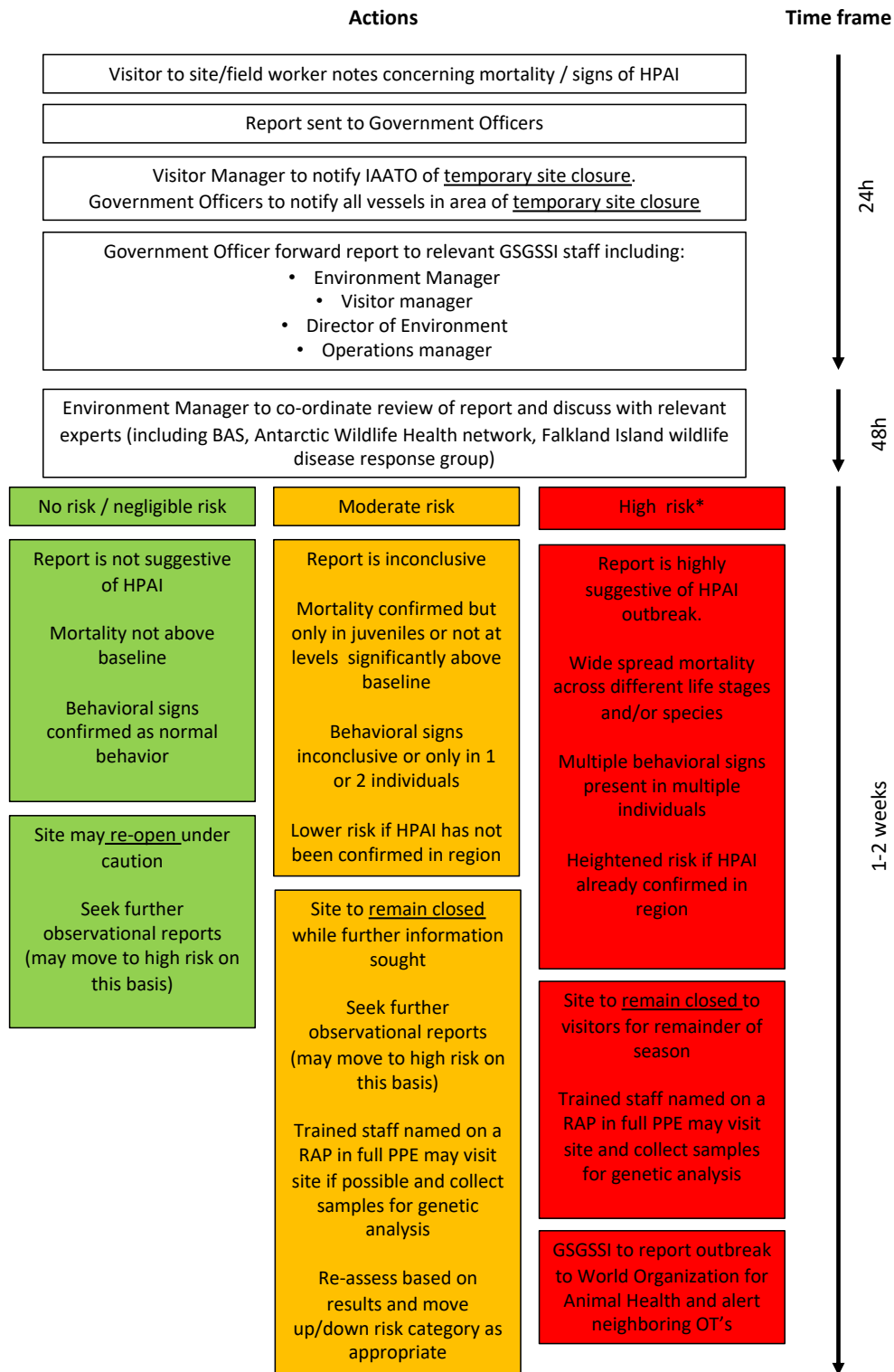
- Personnel working within the footprint of existing station buildings do not need to wear enhanced PPE listed in 9.2.3 as it is not considered to be an area of high wildlife density
- When transiting to field sites or work areas outside station, routes should be chosen that avoid areas of high wildlife density. If personnel are ordinarily greater than 5m from wildlife when transiting to a field site or work area, enhanced PPE does not need to be worn. If areas of high wildlife density must be transited on route to a field site or work area where personnel are closer than 5 metres to wildlife for a prolonged period, enhanced PPE should be donned for that period and decontaminated before moving to a different site

9.3. Reporting

If there are any suspicions about the potential for a disease outbreak at a site, the report form in section 9.7 should be completed and sent to go@gov.gs.

Reports should be submitted as soon as practical, but must be submitted within 24 hours. If e-mail is not available, the information should be relayed by satellite phone or VHF

9.4. Action on suspected outbreak



Any collection of biological material (whole organism, faecal or tissue samples) from sites where HPAI is suspected MUST be done ONLY be undertaken by staff acting under Regulated Activity Permit RAP/2022/046.

Full PPE as described below MUST be worn

- Tyvek 400/ fluid resistant suit
- FFP2 mask
- Double layered latex gloves
- Face visor/eye protection
- Non-porous boots (which may be cleaned with Virkon S or bioguard)

All samples from sites where HPAI is suspected must be packaged following instructions for biologically infectious samples (three layers of leakproof containment, disinfect outer surface of each container, one layer must be rigid).

Samples from sites where HPAI is suspected will be returned to the UK where they can be safely handled and cultured in laboratories which are able to operate under Biosafety Level-3 (BSL-3) conditions

9.5. Action if HPAI is confirmed / strongly suspected

In the event HPAI is confirmed or strongly suspected to be present in South Georgia or the South Sandwich Islands

- All Regulated Activity Permits for work which animal handling for that area will be revoked
- Field work under a Regulated Activity Permits which involves observational studies working or working closer than 5 metres from wild birds will be reviewed by GSGSSI. If the work is deemed essential for the long-term management of the Territory, it may proceed with caution and the enhanced biosecurity measures described in section 9.2.

9.6. Review

It is expected these measures will be in place until at least 31/03/2023 at which point they will be reviewed and an assessment made if they need to endure through the winter period. This assessment will account for any reports of HPAI in the region and relevant data from northern hemisphere studies.

If HPAI is confirmed in South Georgia, or in the South Atlantic region, the measures detailed here may be updated according to the best available data and recommended best practice.

9.7 Report form for suspected disease outbreak in wild birds



Government of South Georgia & the South Sandwich Islands

Report for suspected disease outbreak in wild birds

Name of reporter	
Name of vessel (if applicable)	
Contact details	
Site name	
Site description (lat/lon, extent of affected area, habitat type)	
Date of visit	
TIME OF REPORT (UTC)	
Length of observation period	
General description / reason for concerns	
Species affected	
Life stage(s) affected	
Approximate number of dead birds (per species / life stage)	
Estimation/description of time since death i.e. fresh, skeletal remains only, mixture	
Description and number of any symptomatic birds (behaviours etc)	
Estimation of what proportion of birds were affected at the site	
Photos / video (as attachment) (yes/no)	
Any additional relevant information (environmental conditions etc)	

Please return to go@gov.gs

Reports should be submitted as soon as practical, but must be submitted within 24 hours. If e-mail is not available, the information should be relayed by satellite phone or VHF

Annex 1 vehicle cleaning checklist

Before submitting your vehicle for inspection prior to cargo loading, make sure you can answer YES to all these questions:

- Has the under -carriage has been inspected and is it free of soil and plant material?
- Are all tyres (including the spare) clean with particular care paid to deep treads?
- Has the engine compartment has been checked (and steam cleaned where possible) to ensure there are no rodents, invertebrates or signs they may have been there?
- Have all tyres, tracks, skis been cleaned and washed with Virkon S?
- Has the interior, including upholstery, underneath seats and in storage compartments been cleaned and any biological material removed?
- Has the vehicle been fumigated with a pyrethrum based insecticide?

Vehicle description	
Name of consignee	
Organisation	
Date	

I certify that I have cleaned the above vehicle(s) as described in the GSGSSI biosecurity handbook and to the best of my knowledge it is free from all biological material.

I understand that failure to comply with biosecurity protocols may result in a delay in my vehicle being loaded.

Signed (consignee)

Date:

Internal use only

<i>Vehicle checked on (date)</i>	
<i>Action taken</i>	
<i>Signed</i>	
<i>Date</i>	

Annex 2 Government of South Georgia & the South Sandwich Islands Number and placement of rodent bait boxes on vessels

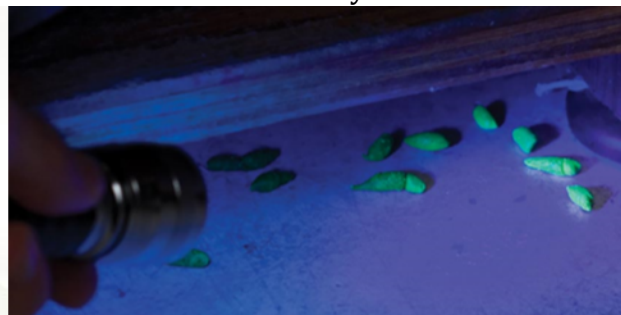


We have switched from traditional toxic rodent bait, to a non-toxic formulation. The non-toxic bait is highly palatable to rats and mice. It is advantageous as it avoids the risk of non-target mortality, reduces the chance that animals become 'bait-shy'/de-sensitised to toxic bait if it is needed and reduces the amount of harmful toxins that could end up in the environment.

It is a safer and more effective method for monitoring however, **it should be noted that non-toxic bait will only indicate the presence of rodents and cannot be used to deal with a rodent problem.** The aim of monitoring is not to eliminate a rodent infestation. Monitoring tools are only there to tell us if there is an issue – if a vessel has signs of rodents on board, further additional measures will be agreed with GSGSSI to manage the problem.

Minimising the risk of rodents getting on board is essential, and includes the use of well-fitting rodent guards to mooring lines at gateway ports prior to arrival in SGSSI.

The new non-toxic bait is yellow and has an ingredient which fluoresces under ultraviolet light; not only does this better show crumbs of bait, but also stains rodent faeces and urine so they may be more easily detected.



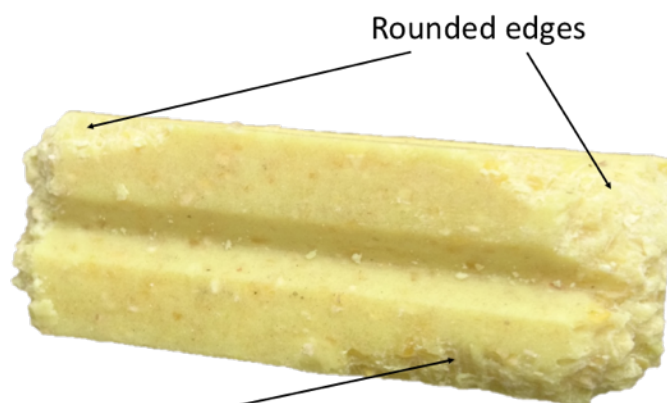
What to Do

You will be provided with a copy of this document along with the pre-baited boxes or stations and a key to open them with. The boxes should be deployed as soon as possible (according to the instructions overleaf), and at least 24 hours prior to entering the SGSSI Maritime Zone. The boxes should remain in board throughout your visit to South Georgia, and for vessels which will return to South Georgia again, should remain in place until the next visit.

On entry to the Maritime Zone you will be asked to declare if your vessel is rodent-free. To do that, you must first check all the bait stations and look to see if the bait has been nibbled or damaged; If it has you must report it. The yellow non-toxic bait is perfectly safe to handle. You should also check to see if there are any other signs of rodents on board such as chewed food packaging or droppings in the galley or waste storage area. On arrival to Cumberland Bay, Government Officers will check the bait stations again.

What to Look For

Check the bait block for any signs of chew marks; it should have fairly crisp edges; if it has become rounded something may have chewed it. Rodents may leave paired grooves or tooth marks in the surface of the bait. Look for other rodent signs nearby,



such as faeces and chewed food, packaging and wood.

The picture (left) shows the relative size and shape of rat and mouse faeces, (right) shows a non-toxic block that has been nibbled by mice. Rats will leave heavier chew marks and take more (or all) of the bait.

A number of discrete areas on vessels are more favourable to rodents for entry, exit or to live should they become established on board. These areas should be the focus of monitoring.

Rodent monitoring stations should be placed in quiet, sheltered areas, and fixed where necessary to prevent movement in heavy seas. Stations should not be placed on deck where they will get drenched by breaking seas.

Table 1 Locations of Rodent Monitoring Stations (for vessels LOA >24 metres)

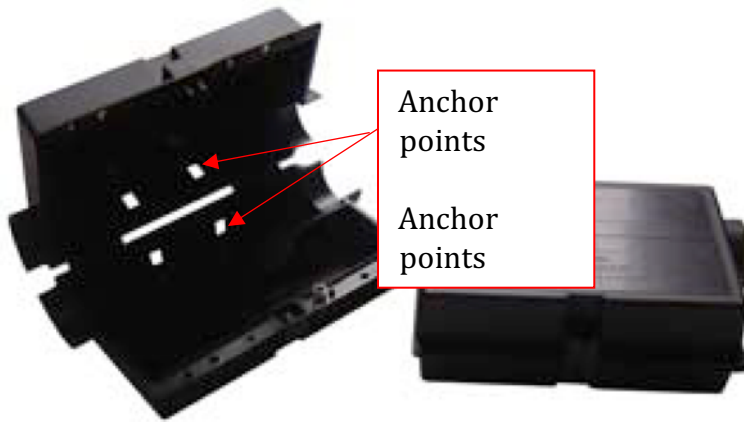
Location	Type
1 Foc'sle (mooring line locker or Bosun's locker)	Rodent entry / exit point
2 Aft mooring deck	Rodent entry / exit point
3 Zodiac storage or shelter deck	Rodent entry / exit point
4 Cargo receiving areas	Rodent entry / exit point
5 Dry food & provision stores	Rodent harbourage
6 Waste storage areas	Rodent harbourage

Vessels with a load line length of more than 24 metres:

Rodent monitoring stations should be placed in each of the areas described in Table 1 where those areas exist, such that a vessel may have up to a maximum of 6 rodent monitoring stations. Note that some vessels will not have all of these distinct areas, and will require fewer bait boxes.

Yachts less than 24 metres LOA:

Yachts should place 1 rodent monitoring station inside the vessel in an area with suitable conditions for rodents, and 1 rodent monitoring station on a sheltered area of deck while at anchor or alongside.



Rodent monitoring stations can be collected from the GSGSSI offices in Stanley, Falkland Islands, prior to departure for South Georgia.

If the vessel will not be calling in the Falklands prior to landing in South Georgia, it is the responsibility of the vessel to ensure that alternative rodent monitoring stations are in place,

and that these are acceptable to GSGSSI.

If you need to source your own bait boxes and bait, you must use solid bait blocks, ideally non-toxic like ours- Detex (<https://www.belllabs.com/bell-labs/product/us/pest-control/detex-with-lumitrack>), otherwise traditional toxic solid wax bait blocks are acceptable but must be used according to manufacturer's safety instructions. Loose bait such as pellets or grains are unsuitable as they will not readily show signs of disturbance by rodents.



SOLID WAX TOXIC BAIT BLOCKS (acceptable alternative)



LOOSE BAIT PELLETS (unacceptable)

www.gov.gs/biosecurity

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