The Prince Edward Islands are South Africa’s only sub-Antarctic territory. Their special and sensitive ecosystems are protected through their national designation as a Special Nature Reserve and their international designation as a Ramsar site. The islands are managed by the Directorate: Antarctica and Islands (Department of Environmental Affairs) in accordance with the new (2010) Prince Edward Islands Management Plan. This booklet summarises the information in the management plan that is of most relevance to expeditioners to the islands. It thus arms expeditioners with information that will help them to minimise their impacts on the Prince Edward Islands, or keep their footprint at the islands as small as possible.
Prince Edward Islands Conservation Handbook
Keeping your footprint at the islands small

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First edition 2011
ISBN 978-1-920338-54-1
Set in Serifa Lt BT 10/12 and in Humnst777 Lt BT 10/12
Typesetting by Marja Wren-Sargent, Animal Demography Unit, University of Cape Town
Cover design by Liezel Meintjes
SUN PRESS is an imprint of AFRICAN SUN MeDIA. Academic, professional and reference works are published under this imprint in print and electronic format.
www.africansunmedia.co.za
www.sun-e-shop.co.za

Acknowledgements
Quotation, p. 2. Attempts to contact Scribner Publishers for permission to reproduce Deborah Tall’s quotation from “The Island of the White Cow” were unsuccessful.
Map, p. 4 and digital photo editing: René Navarro (Animal Demography Unit).
Sketch, p.43: Herbarium specimen drawn by Mr C.A. van Ee.
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Recommended citation
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Even after nearly a week on the island, the landscape catches me unawares. It abruptly draws me out of myself; I empty and it replaces me with its unbridled passion of cloud and rock and water. It is wild but meditative, expanding but compact, always beckoning. I am repeatedly seduced. The island does something to me I can’t explain yet. It overrides me. I feel the shift to new ground inside, a deep excitement, a silence waiting for voice, and a great peacefulness, even when the wind and rain abuse …

Deborah Tall
The Island of the White Cow, 1986
What is this booklet for?

As an expeditioner to the sub-Antarctic Prince Edward Islands (PEIs, comprising Marion Island and Prince Edward Island), you are one of a few privileged people who will have the chance to visit South Africa’s only volcanoes, inspect 23 types of plants that you won’t find in any other part of the country, build a snowperson, find a rare flightless moth, gaze in awe at one of the largest King Penguin colonies in the world, walk for kilometres without seeing a single piece of litter, spot Killer Whales, and take photographs of relics left by sealers at the islands a hundred years ago.

But the islands’ natural systems are fragile and easily disturbed. Every action we take results in a reaction. We can do untold damage to this unique place by polluting its environment (page 29), introducing new species of plants or insects to the islands (page 37), disturbing its wildlife (page 48), or damaging its historical legacy (page 66).

For this reason, the number of visitors to the PEIs is strictly controlled. Only 80 people may overnight at Marion at any one time, and there are even greater restrictions on visits to Prince Edward (see page 6). The reason you’re going to the PEIs is that you are part of a research, conservation or weather-monitoring programme there, or are going to provide essential logistical support for such programmes, or are going to provide media coverage for events at the islands. You are definitely not a tourist – no onshore tourism is allowed at the Prince Edwards in terms of its status as a Special Nature Reserve.

The Prince Edward Islands Management Plan\(^1\) provides detailed guidance on environmental practice at the PEIs and should be read by every visitor to the islands. This booklet summarises the information in the management plan that is of most relevance to you. It thus arms you with the information that will help you to minimise your impacts on the islands, and help you to protect their amazing animals, plants and natural systems. In other words, this booklet will help you to keep your footprint at the islands as small as possible.

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\(^{1}\) Chown, S.L., Davies, S., Joubert, L. & de Villiers, M.S. 2010. Draft Prince Edward Islands Management Plan v. 0.2. DST-NRF Centre of Excellence for Invasion Biology, Stellenbosch University, South Africa.
Background to the Prince Edward Islands Special Nature Reserve

The Prince Edward Islands consist of Marion Island (46°53’S, 37°45’E) and Prince Edward Island (46°36’S, 37°57’E). Marion Island has an area of about 290 km² and about 72 km of coastline. Its highest peak (Mascarin) is 1,230 m above sea level. Prince Edward Island, 19 km to the north-east of Marion, has an area of about 45 km² and its highest peak (Van Zinderen Bakker) is 672 m above sea level. The islands lie more-or-less 2,180 km south-east of Cape Town and 1,770 km south south-east of Port Elizabeth. Their nearest neighbour in the Southern Ocean is Île aux Cochons of the French Crozet Island Group, just less than 1,000 km to the east.

The PEIs are South Africa’s most remote and unspoiled wilderness areas. Marion and Prince Edward and their surrounding waters provide molting and breeding grounds for millions of top predators, provide feeding grounds for those same predators and for migrating whales and dolphins, and support commercially exploited fish stocks.

The natural systems of the PEIs are in many ways unique and are one of the few such systems in the world. The relatively simple land-based systems are ideal for studying processes such as nutrient cycling and energy flow, and the responses of these processes to environmental change. The position of the islands in the Southern Ocean makes them a valuable platform for measuring aspects of the atmosphere and ocean that are important for weather predictions and for a better understanding of global climate change.

It is therefore fitting that the PEIs have the highest level of protection under South African law. The islands were declared a Special Nature Reserve in 1995, in order to protect their special and highly sensitive ecosystems. They also have the distinction of being a Ramsar Wetland of International Importance (declared in 2007).
However, the PEIs face some serious threats. Most important are the effects of the alien species that are already at the islands, and the risks of introducing even more such species. Not only are alien species capable of causing the extinction of local species at the islands, but they can have massive effects on entire natural systems. Alien species in the form of diseases can also have devastating effects on local species that are already at risk of extinction. Other threats at the PEIs include pollution of sea and land, and disturbance of wildlife and historical sites. Less obvious problems, and more difficult to resolve locally, are the effects of climate change and long-line fishing.

Prince Edward Island

Prince Edward Island is one of the most unspoilt of all the Southern Ocean islands. Unlike Marion, Prince Edward has never been permanently occupied by humans and has no permanent infrastructure. Because it has largely escaped human attention, Prince Edward has relatively few introduced species. Thankfully, it is rodent-free; in fact, it has never had any introduced mammals. It only hosts three alien plant species against Marion’s eighteen. Prince Edward can also boast about its 7,000 pairs of Indian Yellow-nosed Albatrosses, a species which doesn’t breed at Marion.

Because of its exceptional conservation value, visits to Prince Edward Island are extremely strictly controlled. According to the new management plan, the island may only be visited once every fourth year, by up to 10 people, for a maximum of eight days. Visits must be strongly motivated – applicants for permits have to show that the need for the visit is greater than the need to keep human impacts on the island to a minimum.

All of the quarantine measures which apply to Marion Island also apply to Prince Edward, but for the latter there are extra controls in place. There are also strict measures to prevent the transfer of organisms between the two islands.
Red scoria breaks the island mist

Grey lava clinks beneath my feet
I am Kildalkey bound, hooray!
Antarctic Terns above my head
Will red scoria break the island mist?

Over Blechnum slopes I slowly go
Skirting black lava on my way
The Soft Plume yields a welcome drink
Can red scoria break the swirling mist?

King Penguins bugle far ahead
The mountains shine in full array
I reach the hut and enter in
As red scoria breaks the passing mist.

You might well think my walk is done
As dark night follows on from day
But journeys mean much more than miles
When red scoria breaks the island mist.

JC
PART 1

What to do before you leave for the
Prince Edward Islands

The biggest enemies of the PEIs are plants and other living things that don’t occur there naturally. So the most important thing you can do to protect the islands is to make sure that no alien species hitch a ride down south on you or on your belongings.

When packing for the islands, please pay close attention to the Gear Checks Document on page 10. The measures that you need to take when packing may seem a bit extreme, but remember that even barely visible plant seeds in dried mud on the soles of your shoes, or invertebrates (“bugs”) hiding in containers or on/in food, could have devastating effects at the PEIs. The introduction of bird flu, for example, would be disastrous for the islands’ seabirds. A real-life example is that of a fungal disease which now infects entire stands of the local Kerguelen Cabbage on Marion with grey mould rot, and which is believed to have been introduced to the island via fresh fruit and vegetables.

The guidelines in the Gear Checks document also aim to reduce pollution at the islands.

Please note that the following items may NOT be taken to the islands:

- Fresh fruit and vegetables, whether whole or processed;
- Dried mushrooms and sun-dried tomatoes;
- Brewing kits;
- Mushroom-growing kits;
- Poultry products containing bones;
- Fresh, non-irradiated eggs with shells intact;
- Soil;
- Plants, including cut or dried flowers;
- Any live animals;
- Wood (including wooden walking sticks and packing cases) that is untreated according to the International Standard for Phytosanitary Measures (ISPM 15); and
- Polystyrene beads/chips.

Please also ensure that you read and sign the SANAP Conservation Certificate (page 17) before boarding the supply vessel.
SANAP VOYAGE PARTICIPANTS

GEAR CHECKS

Dear SANAP Voyage Participant

One of the most serious threats to the conservation of our sub-Antarctic islands and Antarctica is the introduction of alien plants and invertebrates. Alien species are often able to out-compete local, more vulnerable species, rapidly invading and seriously altering natural communities. The harmful effects of cats and rodents on the naturally-occurring birds on oceanic islands are well-known, but deleterious effects have been shown from the introductions of alien plants and invertebrates as well. Introduced diseases could also be potentially disastrous for Antarctica and the islands' wildlife, particularly seabirds and seals.

SANAP is trying its best to avoid introducing new species to the Antarctic and sub-Antarctic, but for this to be successful a determined and continued effort is required by all involved. YOU can help to protect our islands and Antarctica by doing the following when packing your personal effects for SANAP voyages:

GEAR (Footwear & Clothing):
- Please carefully check all footwear (inside, soles, laces) and remove any encrusted dirt or mud and any plant material, especially seeds, which you may find. Try to avoid packing or taking footwear which has Velcro strapping. Please check and thoroughly clean both your field and indoor footwear.
- In the same way, check the hems, pockets and Velcro strips of all clothing that you intend to take ashore, including socks, gloves and jerseys, for seeds and other plant material, and remove anything found using tweezers or forceps. Preferably do not take clothing with Velcro (unless unused). All clothing should be washed before packing, and the piece of luggage properly sealed once it is full.

GEAR (Luggage):
- Also, carefully check all your luggage containers, e.g. "trommies", personal kitbags, suitcases, backpacks, day packs, camera and video bags or any other bags or containers, which you plan to take ashore, for seeds, other plant material and invertebrates (organic matter). Be especially careful when checking between seams, in "hidden" pockets, underneath stiffeners and linings and all Velcro material.
- It is advisable to spray luggage containers with a domestic pyrethrin-based insecticide before packing – preferably the night before so that they can air. Moth balls can be placed in luggage containers, however, they have a strong odour.
Part 1 • What to do before you leave for the Prince Edward Islands

GEAR (Equipment & Other):
- Ensure that all equipment you are taking ashore is free of invertebrates, e.g. spiders have been known to live inside desk-top computer cases and in lab equipment. Also check any items such as camera tripods, surveying poles, walking sticks, hiking ("trek") poles, etc. for adhering soil and mud and ensure these are properly cleaned.
- Other: Check books, video cassettes, etc. for fish-moths, cockroaches or any other invertebrates.

PACKING & PACKAGING:
- It is necessary to pack indoors during the day, and preferably off the floor (e.g. on a low table or bed) to avoid any invertebrates getting into your belongings. However, if you do have to pack at night, it is essential that you pack in a closed room (with all windows and doors shut) to avoid contamination. Avoid packing directly under strong lights, as flying invertebrates (such as moths) are attracted to these areas.
- Do not take any loose polystyrene packaging material ("beads" and "chips" are specifically banned, as they can easily "escape" into the environment), cardboard or unnecessary plastic wrapping to the island. Cockroaches favour corrugated cardboard boxes, and may lay their eggs between the cardboard layers. Use reusable plastic "tote" bins for gear and reusable plastic bubble-wrap to protect fragile items. Remove as much packaging as possible from your belongings, as this minimises waste carried to the island (which then needs to be returned to South Africa).

FOOD:
- No fresh produce of any description, including fruit, vegetables and meat (even though they are available on the ship) may be taken ashore to the islands.
- If you are packing any personal food items, such as energy bars containing seeds, ensure that they are well-sealed, cannot germinate and do not carry live organisms (e.g. moulds, fungi, weevils, worms, etc.).

PERSONAL PACKAGES:
- If you are an overwintering expedition member and are expecting personal packages from colleagues, friends or relatives to be sent to the island after you have arrived there, then you have an important responsibility to inform them carefully to follow these guidelines. In these ways you will be contributing to keeping Antarctica and the islands as pristine as possible.

"BOOT-WASHING CEREMONY":
- On the southbound voyage, all who are going ashore (including ship-based personnel making day visits only) must take part in a compulsory "Boot-washing Ceremony", where a register will be signed.
- Your gear (footwear, outer clothing, bags, etc.) will then be checked by the Environmental Control Officer/Conservation Officer and you will be required to scrub the soles of all your footwear (not only your field boots) in a disinfectant solution, such as bleach or Virkon S, to prevent the transmission of fungi and diseases to the continent and islands.

BIODEGRADABLE/ENVIRONMENTALLY FRIENDLY PRODUCTS:
- There is a wide variety of biodegradable/environmentally friendly products available. Where possible, try and buy these rather than conventional products when choosing your toiletries, etc.

MANY THANKS FOR YOUR CO-OPERATION
WE HOPE YOU ENJOY YOUR VISIT

SANAP Management
September 2009 (Version 4)
Additional packing instructions for Prince Edward Island

Additional banned food items
- Dried pulses and certain grains (e.g. peas, chick peas, sunflower seeds, lentils, beans, whole-grain rice and wheat with husks intact);
- Dried fruit (e.g. prunes, dates) with seeds that may be able to germinate;
- Energy bars containing whole seeds;
- Fresh bread and products made with wheat or other types of flour, including cake and freshly made biscuits (liable to carry moulds as fungal spores);
- Live yeast or products containing live yeast;
- Yoghurt and other milk and cheese products containing live bacteria or fungi;
- Dried meat (e.g. biltong, droëwors) and processed meat not sealed in cans or plastic packets (e.g. loose sliced ham and bacon); and
- Fresh meat of any description.
**Pointers regarding gear**

- Camping equipment, scientific equipment and outer clothing (including socks and boots) to be used on Prince Edward Island must either be brand new or should only ever have been previously used on Prince Edward Island.
- Do not use gear on Prince Edward that has been issued for use on Marion.
- Check gear issued by the Directorate: Antarctica and Islands (DAI). It should be clean and free of seeds, soil, etc. Refuse gear that is contaminated.
- Before packing and storing privately-owned clothing and equipment, make sure that it is clean (even new clothes can pick up seeds or soil in factories).

**Packing for Prince Edward**

- Check the packing of supplies at DAI stores. If banned items are found, remove these from the supplies.
- Remove all extra and loose packaging from food supplies before departure.
- DAI will inspect, vacuum-pack and label issue gear and private gear. Inspect packaging for damage and check irradiation certification. Refuse gear that is in damaged packaging and ask for replacements.
- Leave all items destined for Prince Edward at the DAI stores; DAI will deliver them to the vessel.
What to do during the voyage to the Prince Edward Islands

Conservation Certificate

On all voyages to the PEIs, an Environmental Control Officer (ECO) is assigned by the Directorate: Environmental Impact Evaluation to deal with all conservation issues related to the expedition. Find out who the ECO is. Hand your signed Conservation Certificate to your Group Leader, who will give it to the ECO. (See page 17; you will receive a certificate for signing from DAI.) Group Leaders should also make sure that they obtain all the necessary permits for their team members from the ECO, but note that these permits won’t be issued until the ECO has received signed Conservation Certificates from all members of the group.

Briefings

During the course of the voyage, the ECO will give a briefing outlining conservation issues at the PEIs. Please make sure you attend and sign the register – if you haven’t signed, you won’t be allowed to go ashore. You must also sit in on helicopter briefings and take part in life-boat drills.
Boot-washing Ceremony

In terms of island conservation, this is the most important activity you will take part in during your voyage to the PEIs. You should have already checked and cleaned all items going to the islands when you were at home. The boot-washing is the last barrier against alien bugs, plants, etc. that may have slipped through; this is a final chance to check and clean those items of hand luggage that pose the most risk to the islands in terms of alien introductions.

Everyone who will go ashore at the PEIs must attend the boot-washing and sign the register. You won’t be allowed ashore at the islands if you haven’t attended boot-washing.

**Take the following items with you:**

- All outer/rain gear, including brand new gear and gear issued to you by the Directorate: Antarctica and Islands (DAI) – note that aliens can find their way into pockets or attach to Velcro at factories and stores;
- All footwear, including shoes for indoor wear at the base and hiking socks;
- All bags that you will use in the field, including sleeping bags, daypacks, backpacks, and bags for cameras, video-cameras, binoculars and other field instruments;
- Any other gear that you will use in the field, including tripods, walking sticks, hiking poles and surveying or marker poles that have not been packed with cargo; and
- Any other items that contain Velcro.
At the boot-washing you should:

- Scrub and disinfect the soles and outers of all footwear, and scrub and disinfect all field gear that will have contact with the ground, e.g. tripods and hiking poles;
- Allow members of the inspection team on duty to check all your gear, including the inners of boots and shoes; and
- If the inspection team declares that your gear is not clean enough, clean it again by vacuuming (bags), by hand-picking (socks, inners, etc.) or by scrubbing.

Bird strikes

Several species of burrowing petrels feed at sea but breed at the Prince Edward islands. These birds return to their burrows at the islands after dark, to avoid predators. Especially during no-moon and/or foggy nights, they may respond to bright lights by flying towards the light source, colliding with obstacles. This can result in broken wings or other injuries, and even death. To reduce the risk of bird strikes on the vessel, ensure that all blinds are closed at dusk when within 200 nautical miles (20 hours sailing time at a speed of 10 knots) of the PEIs. There should be as little external deck lighting as possible. If you discover a “downed” bird on deck, report this to the ECO or to one of the biologists working on birds as soon as possible.

Litter

Don’t throw any litter, including cigarette butts, into the sea; make use of the rubbish bins on deck.
SANAP3 ADDENDUM

REPUBLIC OF SOUTH AFRICA
DEPARTMENT OF ENVIRONMENTAL AFFAIRS

CONSERVATION OF THE PRINCE EDWARD ISLANDS
AS A SPECIAL NATURE RESERVE

I, ............................................(full name), the undersigned, am participating in the Marion Island relief/construction voyage / officially approved voyage to the Prince Edward Islands from ...............to ............., and solemnly declare as follows:

- That I am familiar with the provisions of the Prince Edward Islands Management Plan (PEIMP);
- That the conservation of Marion and Prince Edward (as a Special Nature Reserve), in accordance with the provisions of the PEIMP, will be my priority when visiting these Islands;
- That, prior to visiting these Islands, I will check all my equipment; clothing and provisions to ensure that they are free from propagules, i.e. seeds, etc., according to the Gearchecks document;
- That I will not take any prohibited item/s ashore, e.g. fresh fruit or vegetables, plants, animals, etc.;
- That I will not pollute the environment in any way, which includes the discarding of any rubble/waste, e.g. tins, paper, plastic, bottles, cigarette butts, etc.;
- That everything carried into this Special Nature Reserve (aside from approved scientific equipment) will be carried out;
- That I will not remove anything from the Islands, unless permitted to do so; and
- That I will abide by the terms and conditions of the permit/s issued to me, should my application be successful.

* This form must be signed by all participants in the Marion Island relief/construction voyage / any other officially approved voyage to the Prince Edward Islands, and the responsible Group Leader should hand it to the DCO the day of departure. Please note that any breach of the above conditions may result in the transgressor being expelled/barred from the Island/s.

PARTICIPANT  SIGNATURE  DATE

GROUP LEADER  SIGNATURE  DATE

PRINTED IN THE INTEREST OF THE CONSERVATION AND MANAGEMENT OF THE PRINCE EDWARD ISLANDS AS A SPECIAL NATURE RESERVE
What to do before you disembark for Prince Edward Island

- Your gear will be issued to you by the expedition leader two hours before leaving the vessel.
- After issue of gear and before leaving the vessel, pack and dress in a clean, closed non-accommodation area.
- Check fellow-expeditioners for bugs, seeds, etc.
- Once dressed, remain in isolation on the helideck to avoid cross-contamination from other people or places on board.
- Helicopters or boats must be cleaned and inspected by the ECO before leaving for Prince Edward.
- Helicopters or boats will set out directly from the vessel; there will no transportation directly between Marion and Prince Edward except in emergencies.
- At the end of the expedition, all members of the Prince Edward team will be taken off the island in a single trip; the pick-up helicopter or boat will be cleaned and inspected by the ECO on the vessel before the pick-up.
- On return from Prince Edward, collect and store all your gear (i.e. all clothing, camping equipment and samples) on the vessel; do not allow any of it to be taken to Marion Island.
PART 3

What to do at the Prince Edward Islands

The PEIs Zoning Plan

To give maximum protection to the PEIs, the islands have been divided into five zones, each with its own particular limits on access and activities. Please check your permit to see which zones you may visit and what you may do there. Study the map on page 20 and the image on page 45, so that you know where the zone boundaries are. Camping is not allowed in any of the zones, unless permission has been given by DAI. Open fires are only allowed in Zone 1, and then only at the designated base braai area.

Souvenirs

As part of the principle of keeping your footprint at the PEIs as small as possible, please remember that the only souvenirs/keepsakes/trophies that you may take away from the islands are memories and photographs. No rocks, soil, plants, feathers, bones, eggs, historical artefacts or any other part of the islands may be removed without a permit.
Management Zones

Zone 1 – Service zone. Buildings and masts of the old and new bases, and a boundary extending 10 m past these structure. Includes the fuel transfer line and Transvaal Cove.

Zone 2 – Natural zone. A buffer zone around Zone 1, forming a rough triangle from the northern shore of Ship’s Cove, to the peak of Junior’s Kop, to The Fault south of Trypot Beach. Includes the coastline of this sector (including Boulder Beach) and a 50-m perimeter around each field hut. Note that Ship’s Cove beach is considered Zone 4 when Gentoo Penguins are breeding there.

Zone 3 – Wilderness zone. All parts of Marion Island that are not designated Zones 1, 2 or 4.

Zone 4 – Limited access zone. Historical sites and artefacts; lava tunnels; breeding colonies of Gentoo Penguins, Southern Giant Petrels and Crozet Shags; the three Wandering Albatross study colonies; the Grey-headed Albatross study colony at Grey-headed Albatross Ridge.

Marion Island, showing management zones and hut positions
Acknowledgement Note
The areas depicted by were generated by the Satellite Application Centre of the CSR, using data from the RADARSAT™ (Canadian International, Canada) and SPOT™ (Système Probatoire d’Observation de la Terre, France) earth observation satellites.
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Postal address: PO Box 10, 7706 Merebrey

Field sites:
1: Cape Daub
2: Repetto’s
3: Kadministrakou
4: Kidney
5: Watertunnel
6: Grey-headed
7: Hook’s
8: Swarkekop
9: Mixed foliage

Zone 1: Service Zone
Zone 2: Natural Zone
Zone 3: Study colonies
Zone 1 (Service Zone)

This zone on Marion Island includes the area taken up by the old and new bases, and a boundary extending 10 m past the outermost buildings and masts. Zone 1 includes the fuel transfer line and Transvaal Cove, but excludes Boulder Beach (which is in Zone 2). The permits of all expeditioners automatically give access to Zone 1, although the old base buildings and their surroundings may only be visited with the permission of the Departmental Coordinating Officer (DCO). All historical sites and objects, certain colonies of breeding birds, and certain landscape features in Zone 1 may not be developed or disturbed and have Zone 4 protection.

Zone 2 (Natural Zone)

This is the area at Marion Island that is bounded by the northern shore of Ship’s Cove, the peak of Junior’s Kop and its entire crater lake, The Fault south of Trypot Beach, and the coastline – including Boulder Beach – of this sector (see image on page 45). This zone forms a buffer between Zones 1 and 3, and you can explore here if your permit allows access. Seals and birds on Boulder Beach may be viewed as long as the minimum approach distance of 15 m is maintained (see Code of Conduct regarding marine mammals and birds, page 54). Note that the beach at Ship’s Cove is treated as a Zone 4 area when Gentoo Penguins are breeding there (in winter). The sites of the field huts and a 50-m wide buffer around each hut are also part of Zone 2. There are nine field huts (see map of Marion zones, page 20):
• Cape Davis,
• Repetto’s Hill,
• Katedraalkrans,
• Kildalkey Bay,
• Watertunnel Stream,
• Grey-headed Albatross Ridge,
• Rook’s Bay,
• Swartkop Point,
• Mixed Pickle Cove.

**Zone 3 (Wilderness Zone)**

The rest of Marion Island, except for Zone 4 sites, is classified as Zone 3. Access is for research, site rehabilitation and management (including waste removal) activities that are approved by DAI. There is no general access to this zone but research personnel with Zone 3 permits may ask DAI to allow non-researchers to go with them on field trips when help is needed and/or for safety purposes.

**Zone 4 (Limited Access Zone)**

All especially sensitive sites are declared Zone 4 areas for maximum protection. Zone 4 access will only be given to researchers involved in DAI-approved projects; to the DCO, Team Leader, ECOs (voyage ECO and overwintering team ECO) and support personnel where their job requires access to the zone; and to emergency personnel.
Access to Zone 4 areas is specified by the type of zone (e.g. Wandering Albatross study colonies) and by activity (e.g. banding Wandering Albatrosses). Colonies and features have buffer zones of varying widths:

- All Gentoo Penguin, Southern Giant Petrel and Crozet Shag colonies during the breeding seasons of these species – 100 m;
- The three Wandering Albatross study colonies (except for the coastal path from The Fault to Archway Bay which skirts the Macaroni Bay study colony, and which is considered Zone 3) – 100 m;
- Grey-headed Albatross colony at Grey-headed Albatross Ridge (except the path from Santa Rosa Valley to Rook’s Bay, which is considered Zone 3) – 200 m;
- All historical sites – 2 m; and
- All lava tunnels and tubes – 20 m.

DAI may also declare any other area as a temporary Zone 4 site, for conservation or wildlife disease control purposes.

**Zone 5 (Protected Area)**

Because of its unique and unspoilt nature, the whole of Prince Edward Island (see map on page 25) is considered Zone 5. Permits are only given for one visit every fourth year for a maximum of 10 people and for up to eight days. However, visits at shorter intervals may be allowed under exceptional circumstances and for valid conservation management issues, such as the control of an alien species. Applicants must show that the need to visit the island is greater than the need to keep human impact on the island to a minimum.
Infrastructure at Marion Island

For over 60 years, housing and support facilities were supplied by the old base at Transvaal Cove. However, the buildings have deteriorated over time because of the harsh environment and by the 2000s, several structures had degraded so much that they became unserviceable. DAI thus began the replacement of the old base. The construction of an adjacent new, much larger facility began in 2003 and was completed in 2010. The old base, except for certain buildings and all historical objects nearby, will eventually be decommissioned and removed.

The new base consists of modular units including a science centre, living centre, accommodation blocks, recreation area and technical centre. There is also a medical facility, operations room, helipad, cargo-handling area and helicopter hangar. The science centre has three laboratories (wet, dry and analytical), dry room, isotope room, offices, library, conference room and workshop. The living centre has a dining area that can accommodate 40 people at a sitting, and a kitchen with separate washing-up area, freezer/cold rooms, pantry and bulk store room. There are also lounges, a bar, games room and an enclosed braai area. There are sleeping quarters and bathroom facilities for 80 people. Untreated sewage and grey water are contained in a holding tank before being discharged directly into the sea at night. Kitchen waste is discharged in the same way but is first macerated. The recreational area has a gymnasium, sauna and jacuzzi. The technical centre includes offices, maintenance and technical stores, work area, power generation room with diesel generator engines, boiler room, electrical controller room, electrical store and waste and compaction room. The technical centre also has a computer room, balloon room and store for the South African Weather Service. The whole base is a non-smoking zone.

External facilities that used to form part of the old base and that will be kept include the crane at Gunner’s Point, satellite dome, museum
Marion Island infrastructure

**New base**
1. Helipad
2. Technical centre
3. Living centre
4. Hub (operations)
5. Science centre
6. Accommodation & recreation
7. Accommodation
8. Helicopter hangar

**Old base (black: retained; red: to be removed)**
9. Crane
10. Diesel tanks
11. Emergency power shack
12. Satellite dish
13. Flammables store
14. Entomology lab
15. Weather platform
16. Museum (old Mammal lab)
17. Doris beacon
18. Technical block, food store, gym
19. Accommodation, recreation & living blocks
20. Bird lab
21. Emergency base

**Features:**
22. Gentoo Lake;
23. Boulder Beach;
24. Gunner’s Point;
25. Gamtoos Point;
26. Cabbage Point;
27. Seagull Point
(converted mammal laboratory) and emergency generator facility (previously the power shack). Other external facilities include diesel tanks, water tanks and various masts and aerials.

Water is supplied to the base via a pipeline from a dam on the Van den Boogaard River. Lower down on the river is a building (nicknamed the “hydroshack”) from an abandoned hydroelectric scheme dating back to 1981. The hydroshack and the old base’s water supply pipeline from the dam are to be removed along with the old base.

There are nine four-bed huts around the island (page 23) and these are used for research field work. Eight huts are located around the coastline and one hut is inland at Katedraalkrans, at about 750 m above sea level. Huts rest on raised metal grids and have a main section with a sleeping and kitchen area, linked by a covered porch to a separate pantry section. Coastal hut toilets currently consist of a nearby hole dug in the ground (a “short drop”) with a wooden box seat, but there are plans to change this to a more environmentally-friendly system. A “porta-loo” adjacent to the Katedraalkrans hut uses a “barrel and bag” system and human waste from this system is removed once a year. Urination close to field huts is discouraged because it enriches the soil, encouraging the establishment of alien plants.
Pollution

Marion and Prince Edward islands are among the most unspoilt parts of South Africa. There has never been a major oil spill at sea at the islands, and the water in the rivers and lakes is pure and drinkable. Sewage generated at Marion base is discharged into the sea at night and is quickly broken up and dispersed.

The few artificial items that you are likely to come across outside of Zones 1 and 2 include temporary markers that are part of ongoing scientific studies, a few safety aids (wooden planks, ladders and fixed ropes), weathered stone cairns on the tops of hills and on a few coastal headlands, the dam and its associated pipelines, the remains of the old hydroelectric scheme on the Van den Boogaard River, and historical artefacts such as trypots (see page 66). None of these may be disturbed or removed, and new items may not be added, without a permit. Along the shoreline, you may also come across driftwood and other sea-borne debris such as fishing floats.

The unspoilt appearance and wilderness nature of the islands are because of the small number of people who visit them and the strict measures in place to control pollution. The latter have included concerted efforts (“country clean-ups”) over the last decade to remove accumulated waste around Marion.

All waste generated at the PEIs, except sewage, is returned to South Africa; no burning of waste at the islands is allowed. To ensure a clean and healthy environment and to maintain the wilderness aesthetic of the Special Nature Reserve, please follow the procedures summarised in this section. Because of the threat of introducing wildlife diseases, particularly strict measures are in place for the use and disposal of poultry products, meat and dairy products.
## Domestic waste generated at Base

This waste is separated in the “blikkieskamer” (waste room) as follows:

<table>
<thead>
<tr>
<th>Bin</th>
<th>Description</th>
<th>Treatment before disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper, cardboard &amp; wood</td>
<td>All paper products EXCLUDING tetrapacks (e.g. milk cartons); toothpicks.</td>
<td>Flatten boxes.</td>
</tr>
<tr>
<td>Plastic</td>
<td>All plastic products including tetrapacks (e.g. milk cartons).</td>
<td>Rinse.</td>
</tr>
<tr>
<td>Glass</td>
<td>Bottles, jars, etc.</td>
<td>Rinse; do not crush.</td>
</tr>
<tr>
<td>Metal</td>
<td>Tins, aluminium foil.</td>
<td>Rinse and remove labels, and crush tins.</td>
</tr>
<tr>
<td>Slop</td>
<td>Food waste EXCLUDING hazardous food waste (see below). Includes particles of food waste in blikkieskamer drain filter.</td>
<td>Remove any toothpicks (which will injure birds that may swallow them) and treat these as paper waste. Macerate food waste and discharge at sea after dark. Vary time of discharge to avoid attracting scavenging birds.</td>
</tr>
<tr>
<td>Hazardous food waste</td>
<td>Uncooked meat and fish; uncooked and cooked poultry waste; uncooked yeast; all bones; pips; eggshells and egg products; melt water from chicken, eggs, meat and fish.</td>
<td>Place in the containers provided and freeze for return to South Africa. Clean all containers used to defrost chicken, fish, meat or egg products using a concentrated bleach solution, before flushing into the grey water system. Kill all unused yeast by boiling, including the boiling of equipment (bowls, utensils) used with yeast.</td>
</tr>
<tr>
<td>Cooking oil</td>
<td>Used and unused cooking oil.</td>
<td>None (return to South Africa).</td>
</tr>
</tbody>
</table>
## Other waste generated at Base

For other waste at base, follow these procedures:

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxic &amp; environmentally hazardous waste</td>
<td>E.g. batteries (vehicle-type and other; use rechargeable dry cell batteries where possible) and laboratory, photographic and radiographic chemicals.</td>
<td>Place toxic and environmentally hazardous waste in clearly-marked, separate receptacles. Check all batteries with a voltmeter and re-use partially used-up batteries in other equipment if possible.</td>
</tr>
<tr>
<td>Light bulbs</td>
<td>The phosphorus contained in light bulbs is a potentially hazardous contaminant of ground water and is released when bulbs are broken.</td>
<td>Place dead bulbs in black bags and store bags carefully inside sturdy, clearly marked cardboard boxes.</td>
</tr>
<tr>
<td>Oil and fuel</td>
<td>Old machine or vehicle oil, petrol, diesel.</td>
<td>Place all waste oils and fuels in clearly marked 20-litre containers.</td>
</tr>
<tr>
<td>Sharps</td>
<td>Needles, darts, ampoules.</td>
<td>Place any sharps, ampoules and other medical and sanitary waste in the containers provided by the Medical Officer.</td>
</tr>
<tr>
<td>Base rubble</td>
<td>Any unused items lying around the base (litter, wire, poles, planks, etc.) or in the field.</td>
<td>Collect rubble as you find it or during the annual “chicken run” (general clean-up outside base buildings at the end of the relief period), and correctly containerise.</td>
</tr>
<tr>
<td>Polystyrene</td>
<td>Note that polystyrene chips/beads may not be taken to the PEIs.</td>
<td>Seal blocks in bags to avoid the release of broken-off beads.</td>
</tr>
</tbody>
</table>
Field and hut waste

Refer to pages 30-31 for general procedures to be followed at field huts. Also, note the following directions for dealing with waste in the field and at huts.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field rubble</td>
<td>E.g. plastic bottles, wooden planks, buoys, nets, fishing hooks and lines, nylon strapping.</td>
<td>Remove items which may cause injury to animals or are an eyesore, or record their position for removal during the relief period. Free entangled animals if this is safe to do, or report the entanglement to people studying those animals. Report these activities to an ECO.</td>
</tr>
<tr>
<td>Unused project markers</td>
<td>E.g. poles, pegs, painted rocks.</td>
<td>Keep an updated record of the descriptions and GPS positions of all project markers you are responsible for and give a copy to the Science Coordinator. Remove your markers from the field at the end of your research programme and report their removal. Do NOT remove markers belonging to any other research projects.</td>
</tr>
<tr>
<td>Litter</td>
<td>E.g. sweet wrappers, cigarette butts, packaging from sampling equipment.</td>
<td>Put into bins at base or huts; do not bury or burn any waste in the field. As far as possible, defaecate only in hut toilets. If this isn’t possible, choose a secluded site and bury faeces and toilet paper.</td>
</tr>
<tr>
<td>Grey water</td>
<td>Dirty washing-up water.</td>
<td>Sieve cooking and washing-up water and throw sieved water into the hut toilets.</td>
</tr>
<tr>
<td>Food waste</td>
<td>Note that NO uncooked meat, fish, chicken or egg products may be taken to huts.</td>
<td>Do not waste food – cook only what can be immediately eaten, and eat or carry away any leftovers before leaving the hut. Seal all solid waste that you can’t take away with you (e.g. sieved food particles and used cooking/sardine oil) in plastic refuse bags or used screw-top food containers, and place in hut wheelie bins.</td>
</tr>
<tr>
<td>General waste</td>
<td>Non-food waste but including bones.</td>
<td>Bag all solid waste (including cigarette butts, matchsticks and bones) and put into the hut bins; put weights on bin lids to keep out mice. Whenever possible, carry out your solid waste and enter it into the base waste stream. When leaving huts, check around and underneath huts for any small items of litter, and collect and add these to the hut waste.</td>
</tr>
</tbody>
</table>
Dealing with waste on Prince Edward Island

- Bag solid human waste, including used toilet paper.
- Sieve grey water and containerise any remaining solid particles.
- Separate all solid waste, including food, into sealed containers.
- Take all solid waste with you when you leave the island.
- Enter all removed waste into the vessel waste stream or store for disposal in South Africa; do not take any waste to Marion Island.

Swartkop “Short-drop”

At Swartkop lives an albatross
Who’s calm and peaceful, seldom cross.
Far from the maddening crowd is she
But not averse to company,

And when a human comes to rest
Atop the nearby strange white nest,
She dips her head and turns her gaze
And wonders at its horrid ways,

For not even a chick, newly fed,
Would make a mess INSIDE its bed ...

MdV
MARION ISLAND FIELD HUTS & PANTRIES

GENERAL PROCEDURES

THANK YOU FOR HELPING TO KEEP MARION ISLAND A SPECIAL PLACE

1. HUT ETIQUETTE:

1.1 For the duration of your stay, place a small container/bucket in the hut, lined with a plastic bag, for all solid waste (e.g. crushed cans, fruit pips, meat bones, cigarette butts placed in sealable bottles, e.g. empty mayonnaise, etc.), paper, plastics, crumbs, etc.

1.2 Do NOT put any loose, unbagged items into the large dustbins.

1.3 Use another container/bucket for all liquid waste (washing-up water, beverages, waste food ("slops"), etc.) and dispose of in the earth toilets ("long drops") or in the sea. At Katidraal, liquid waste is to be disposed of at the designated metal marker (no food).

1.4 Open the window (if operational) above the stove to prevent condensation in the hut while cooking. Point the kettle spout towards the open window.

1.5 Charge the radio battery for at least 30 minutes before and after use, and switch OFF after use.

1.6 Do NOT walk over the old hut scar (to facilitate the revegetation of the area).

1.7 Reduce solid food waste to a minimum, by cooking smaller meals, eating leftovers for breakfast, and/or carrying leftovers in lunch boxes to the next hut or to Base.

1.8 Check that the radio antenna wires are intact.

2. SAFETY ASPECTS:

2.1 No smoking in the huts (fire hazard).

2.2 Switch OFF the gas at night, at the cylinder and all levers.

2.3 Always leave a message in the hut book (even if you are only passing by), regarding your well-being and plans for the next day.

Version 2 – January 2011
3. **BEFORE YOU LEAVE:**

3.1 Check hut surrounds for any loose waste and bag with solid waste (see 1.1).

3.2 If the small container/bucket is full, place the tied-up solid waste bag in the large dustbins. If it is not full, seal the small container/bucket and place in the pantry.

3.3 Fill the water containers.

3.4 Ensure that there is water in the kettle on the stove.

3.5 Store all opened food (e.g. coffee, tea, rusks, sauces, etc.) in tote boxes that are stored in the left hand side of the racks in the pantry.

3.6 Wash, dry and pack away all pots, dishes and cutlery used.

3.7 Clean any candle wax and wipe down surfaces (shelves, table, etc.) and stove.

3.8 Sweep and mop the hut, dry room and pantry.

3.9 To keep the pillows dry, do not leave them next to the walls and spread them out on the beds (do NOT stack them).

3.10 Store the mops and brooms bottom side up so that they can dry.

3.11 Wash the dishcloths in disinfectant, rinse and hang in dry room to dry.

3.12 As necessary, take the mattress covers and/or dishcloths back to Base to wash.

3.13 Make sure the gas and radio (bin closed properly, if possible) are switched OFF (refer to "Marion Field Huts & Pantries Gas and Generator Operations Procedures" and the procedures on the radio itself).

3.14 Open all the blinds.

3.15 Ensure that the outer doors of the hut and pantry are closed properly.

3.16 Replace the generator in the pantry after use.

3.17 Replace cover over generator power plug.

3.18 Going back to base from Kildalkey, Repetto’s or Katedraal? If possible, carry your rubbish back with you to dispose of at base.

**REPORT ANY HUT DEFECTS TO THE MARION OVERWINTERING TEAM LEADER**
Light pollution

As mentioned on page 16, burrowing petrels can become disorientated by artificial lights at night, colliding with obstacles such as buildings. To avoid bird strikes, turn off all outside lights at sunset. At Marion base and at the field huts, close window blinds at sunset or on misty days when lights are in use, and switch off all unnecessary lights.

If “downed” birds are found, inform an ECO or one of the biologists who works on birds. If you take photographs of the downed birds, don’t use a flash. Stunned birds should be held in a well-aerated box in a quiet, dark place and released after dark. Leave badly injured birds for natural processes to occur. Dispose of carcasses from bird strikes at sea at night (to avoid attracting scavenging birds), unless the carcasses can be used for research or sampling.

Fuel spills

Report all fuel spills without delay to an ECO and to the DCO (during reliefs) or Team Leader (outside reliefs). They will ensure that the spill, and any animals that are contaminated as a result, are dealt with according to the procedures in the PEIs contingency plan for dealing with pollution events.

Inspecting a “downed” diving petrel (above) and White-chinned Petrel (right) for injuries
 Introduced aliens

Throughout the world, one of the greatest threats to biodiversity is that of introduced alien species. Alien microbes, fungi, plants or animals occur on virtually all sub-Antarctic islands. The numbers of alien species on islands in the Southern Ocean are related to the numbers of human visitors over the last 200 years, and alien introductions are the result of the movement of people and cargo associated with research and commercial and tourist activities.

At the PEIs, most alien introductions occurred on Marion Island after it was claimed by South Africa in 1948. Some introductions were deliberate. Pigs were kept in the La Grange Villa cave above Boulder Beach, chickens were kept at base, sheep grazed around Gentoo Lake and in Nellie Humps, and trout were introduced to the Van den Boogaard River. Fortunately, few of these introduced animals could survive the harsh climate and they either died out on their own, or were killed and not replaced.

Other introductions were accidental. House Mice hitched rides on sealing vessels and reached Marion Island (but fortunately not Prince Edward Island) in the early 1800s. The aggressive invasive grass, the Creeping Bent (*Agrostis stolonifera*), was probably introduced with sheep fodder and was first noticed on the island in 1965. The Procumbent Pearlwort (*Sagina procumbens*) is now so widespread on both Marion and Prince Edward that it is probably impossible to eradicate.
The deliberate introduction of Domestic Cats to Marion in 1948, in an attempt to control the mouse population at the base, had disastrous consequences. The cats soon became feral and killed many thousands of burrowing petrels. It took 13 years and a huge amount of effort and money to get rid of all the cats. The mice, however, are still present. They burrow into and destroy indigenous cushion plants, eat the seeds of other local plants, prey on local insects such as the Marion Flightless Moth which occurs at the Prince Edwards and nowhere else in the world, compete for food with Lesser Sheathbills (the only non-seabird that breeds on the islands), and prey on chicks of seabirds such as Wandering Albatrosses and sooty albatrosses. They also damage buildings and property. Fortunately, Prince Edward Island is mouse-free.

Because of the damage they can do to species and entire natural systems, and the difficulty of getting rid of them, determined efforts must be made to stop alien invertebrates, plants and rodents from reaching or spreading at the PEIs.
Mouse damage to cushion plant, 
Azorella selago

Sooty albatross chick injured by mice

Graffiti at old Kildalkey hut
### Main introduced species at the Prince Edward Islands

<table>
<thead>
<tr>
<th>Species</th>
<th>Common name</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alien plants with widespread distributions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agrostis castellana</td>
<td>Highland Bent</td>
<td>Marion only. Research base, Albatross Lakes and Trypot Beach. Distribution not well-known.</td>
</tr>
<tr>
<td>Agrostis gigantea</td>
<td>Black Bent</td>
<td>Marion only. 1994: 4 m² at research base; 1996: 200 m². Eradication programme (regular herbicide spraying and removal of plants) in progress.</td>
</tr>
<tr>
<td>Agrostis stolonifera</td>
<td>Creeping Bent</td>
<td>Marion only. First collected 1965; now very widespread but in certain habitats only.</td>
</tr>
<tr>
<td>Cerastium fontanum</td>
<td>Common Mouse-ear</td>
<td>All over Marion. On Prince Edward, confined to the western side.</td>
</tr>
<tr>
<td>Poa annua</td>
<td>Annual Meadow Grass</td>
<td>Common in coastal and inland (bird burrow entrances) areas on Marion and Prince Edward.</td>
</tr>
<tr>
<td>Poa pratensis</td>
<td>Smooth Meadow Grass</td>
<td>Marion only, between Ship’s Cove and Stony Ridge.</td>
</tr>
<tr>
<td>Sagina procumbens</td>
<td>Procumbent Pearlwort</td>
<td>First collected at Marion in 1965; now very widespread. Also widespread on Prince Edward, where first seen in 1997.</td>
</tr>
<tr>
<td>Stellaria media</td>
<td>Common Chickweed</td>
<td>Marion only. Widespread but not abundant.</td>
</tr>
<tr>
<td><strong>Alien plants with restricted distributions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alopecurus geniculatus/australis</td>
<td>Marsh Fox-tail</td>
<td>At Mixed Pickle Cove on Marion, one small patch, &lt;1 m².</td>
</tr>
<tr>
<td>Elytrigia/Agropyron repens</td>
<td>Couch Grass</td>
<td>One large patch at Ship’s Cove on Marion, about 250 m². Eradication programme by regular herbicide spraying in progress.</td>
</tr>
<tr>
<td>Festuca rubra</td>
<td>Red Fescue</td>
<td>On Marion only. One patch at Ship’s Cove and a 250 m² group of patches 1,500 m inland.</td>
</tr>
<tr>
<td>Luzula cf. multiflora</td>
<td>Heath Woodrush</td>
<td>Several large and many small patches in an area of about 400 m² north of Sealer’s Cave, Marion.</td>
</tr>
<tr>
<td>Rumex acetosella</td>
<td>Sheep Sorrel</td>
<td>On Marion at Gentoo Lake near the research base and on Goney Plain.</td>
</tr>
<tr>
<td><strong>Plants that may be aliens</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Juncus cf. effusus</td>
<td>Soft Rush</td>
<td>Three patches on Marion: near Trypot Beach, east of Ship’s Cove and Goney Plain.</td>
</tr>
<tr>
<td>Unidentified thorny shrub</td>
<td></td>
<td>One site on Marion between Arthur’s Hill and Kildalkey Bay (46°57.67’S, 37°50.034’E).</td>
</tr>
</tbody>
</table>
### Alien invertebrates

<table>
<thead>
<tr>
<th>Taxon</th>
<th>Description</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Porcellio scaber</em></td>
<td>Common Woodlouse (isopod)</td>
<td>On Marion at Boulder Beach and above Gunner’s Point. Currently controlled by regular “search and destroy” missions, but a dedicated eradication programme is urgently needed.</td>
</tr>
<tr>
<td><em>Agrotis cf. ipsilon</em></td>
<td>Cutworm</td>
<td>On Marion, seen at base and close to Macaroni Bay. The population may have disappeared.</td>
</tr>
<tr>
<td><em>Plutella xylostella</em></td>
<td>Diamond-backed Moth</td>
<td>Scarce but widespread on Marion. Most common in the sheltered areas of Kerguelen Rise.</td>
</tr>
<tr>
<td><em>Calliphora vicina</em></td>
<td>Urban Bluebottle Blowfly</td>
<td>Seen at Kildalkey Bay beach, Marion.</td>
</tr>
<tr>
<td><em>Deroceras panormitanum</em></td>
<td>Longneck Field Slug</td>
<td>On Marion, widespread below 250 m.</td>
</tr>
</tbody>
</table>

### Alien vertebrates

<table>
<thead>
<tr>
<th>Taxon</th>
<th>Description</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Mus musculus sensu lato</em></td>
<td>House Mouse</td>
<td>All over Marion but concentrated at base and field huts. None at Prince Edward.</td>
</tr>
</tbody>
</table>

How to prevent aliens from spreading

Introduced plants cover 5-10% of Marion's surface area. Some species, e.g. *Sagina procumbens*, are now so widespread that there is little we can do to limit or control them. It is not always possible to avoid areas infested by these plants but if you can, please do so.

Other alien plants have relatively restricted distributions and efforts are being planned or are in progress to stamp them out. The places where these restricted aliens occur have mostly been marked out with white plastic poles, and you should stay out of these marked areas to prevent spreading the species concerned. At Marion base, avoid the marked stand of *Rumex acetosella* between the old Bird Lab and Gentoo Lake. When walking in the field, look out for other unmarked areas that are infested with *Rumex*. If you are on Boulder Beach and happen to spot any of the tiny woodlice (also referred to as isopods), please collect these for one of the entomologists (or “gogga” biologists). At Ship’s Cove on the northern border of Zone 2, stay out of the marked stand of *Elytrigia repens* (also called *Agropyron repens*). Also, watch out for unmarked patches of *Festuca rubra*. At Ship’s Cove, Trypot Beach (Zone 2) and Goney Plain (Zone 4 Wandering Albatross study colony), avoid unmarked patches of *Juncus cf. effusus*. Between Arthur’s Hill and Kildalkey Bay (Zone 3), stay away from the small marked patch of an unknown thorny shrub that may have reached Marion with human assistance.

As well as avoiding areas infested with aliens, do the following to help prevent further introductions and the spread of harmful species:

- Keep doors at base and field huts firmly closed, especially when unpacking newly-arrived containers.
- Don’t leave loose food items lying around.
- Make sure that there are rodent traps in and around the base, including the helicopter hangar, whenever ships are at the island and especially during cargo and personnel offloading operations during the annual relief.
- An ECO must be present when containers are opened; if you are helping to unload, ensure that there are containers (bags, nets, jars) and insecticide sprays nearby to collect or kill any aliens that are found.
- Open and empty containers from the top only, not via the side panels.
Part 3 • What to do at the Prince Edward Islands

- Disturb natural vegetation and soil as little as possible, particularly in high traffic areas around base and huts – at base, stay on the platforms and catwalks.
- Clean your boots at the designated area before leaving base and when you get back from the field.
- In the field, when moving between zones, clean equipment that has been in close contact with soil or plants where possible, otherwise take special care with field equipment in such areas.
- Wherever possible, clean sampling equipment in infested areas before moving elsewhere.
- Thoroughly and regularly clean Velcro on gear and clothing that is used in the field – or even better, don’t use items with Velcro.
- Volunteer to assist the ECOs with alien eradication/control programmes (get your Group Leader’s approval first).
- If you notice what appears to be a bird or seal disease outbreak, stop work in the area immediately, bag or clean any gear or clothing that might have been infected, make notes of disease symptoms and photograph or videotape affected animals if possible, and inform an ECO and one of the biologists working on those animals as soon as possible.
Additional quarantine measures on Prince Edward Island

- Landing is limited to Cave Bay on the east coast (boat and helicopter) and Kent Crater on the west coast (helicopter), except in emergencies.
- Only camp at Kent Crater and Cave Bay, except in emergencies.
- When crossing the Escarpment on foot from the west coast to the eastern side of the island, make sure that you don’t accidentally carry plants or seeds of *Cerastium fontanum*, by inspecting your kit and clothing and cleaning your boot soles prior to the ascent.
- Upon arrival and before setting up camp, put out bird-protected rodent snap traps and poison bait stations in a circle around off-loading and camping sites.
- Maintain these traps throughout your stay on the island.
- Humanely kill any live rodents that are trapped and try to work out how they got to the island.
- When you leave the island, collect and return traps and dead rodents to the vessel, and report any rodent sightings/captures to the ECO.
Landmarks in the vicinity of Marion base. Zone 2 border in blue.
Disturbance

At least 28 types of seabirds breed at the PEIs, and 14 of these may be at risk of extinction in the near future. Many of the islands’ seabird populations make up a significant percentage of the global population. The Lesser Sheathbill (or “Paddy”) is the only non-seabird that breeds at the islands, and the subspecies (*Chionis minor marionensis*) that occurs at the PEIs is found nowhere else in the world. Three types of seals breed at the islands, and various types of whales and dolphins have been sighted in the waters of the PEIs. On page 52, there is a table listing some of the bird and seal species that you are likely to see at the islands.

Animals at the PEIs regard approaching humans as a potential threat. Many animals at the islands live in densely-packed groups, or colonies, so a disturbance to one animal can cause a chain-reaction that affects many other animals nearby. Animals at the PEIs are slow breeders; many species are only able to produce one chick/pup every one or two years. Producing chicks or pups takes a lot of energy since the climate is harsh and some animals have to travel far to find food, so the loss of offspring can be very costly. Animals may respond to an approaching human by:

- Deserting nests with eggs or chicks;
- Panicking, fleeing and trampling nearby eggs, chicks or pups;
• Standing up on their nests, leaving eggs or chicks exposed to the cold or to predators such as skuas;
• Throwing up their stomach contents, thereby losing a hard-earned meal;
• Delaying going back to their nest and taking over the care of offspring from their partner, who may already have been on the nest without food for days or even weeks;
• Deserting an area where they were about to settle down to breed, and moving to an area that is less disturbed but also less suitable; and
• Experiencing stress which, if it happens often, can damage health and fertility.

Non-human animals express themselves differently from humans, so an animal that looks calm to us may in fact be distressed. Animals that are very afraid can respond by freezing, and humans often misinterpret this lack of movement as a sign that the animal is not bothered. When on foot at the islands, it is thus important to follow the **Code of Conduct regarding marine mammals and birds** (page 54) and to bear in mind the guidelines for approaching wild animals (page 56). Note that Ship’s Cove on Marion, usually accessible to everyone with a Zone 2 permit, may be closed during the Gentoo Penguin breeding season (winter) so that the 100 m minimum approach distance can be applied.

Guidelines are also in place to minimise disturbance of animals during helicopter operations (page 60). Helicopters are only used around the islands for authorised activities such as re-supplying the base and field huts, waste removal, search and rescue, helping with research projects,
and management operations. Boat operations at the PEIs follow the South African National Antarctic Programme (SANAP) Boat Procedures and the International Association of Antarctic Tour Operators’ Marine Mammal Watching Guidelines.\(^4\) Boat landings are limited to Boulder Beach at Marion Island and Cave Bay at Prince Edward Island.

You may not keep seals and seabirds in captivity, or feed them, or keep specimens of seals or seabirds, unless you have a DAI permit allowing you to do so. Feeding animals or otherwise encouraging them to remain near the base or field huts can sign their death warrants, since animals that learn to take food from humans or that become tame are likely to become unwanted pests. Don’t even dispose of dead mice where birds such as skuas, Paddies or giant petrels are likely to find them.

**Watching your step at the PEIs**

Watch out for bird burrows when you are walking off catwalks. Some burrows can be identified by the little ponds outside their entrances; avoid stepping onto the ground above these ponds because you might collapse the burrow and crush eggs or chicks inside.

Also, take care not to disturb soil and plants unnecessarily at the islands, since alien plants take advantage of disturbed areas. If you can’t avoid stepping on cushion plants (*Azorella selago*), try not to damage them with your boots or walking sticks, especially in low altitude areas where the cushions are not very compact. Mice and other aliens can gain access to the cushions via the injured section (see photo on page 39), and strong winds can worsen the damage.

In Zone 1, stay on the walkways or catwalks. When walking around the rest of Marion, stick to established footpaths wherever possible. Don’t open up new paths unnecessarily.

Wind games

The wind on Marion throws rain in your face,
It grabs from behind in a boisterous embrace,
It twirls you on hilltops with effortless grace,
Then arrives, out of breath, before you at base.

MdV
## Seals and birds you are likely to see at the Prince Edward Islands

<table>
<thead>
<tr>
<th>Common name</th>
<th>Season</th>
<th>IUCN status, global</th>
<th>PEIs population, Dec 2008</th>
<th>Population trend at PEIs, last decade</th>
<th>% of global population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southern Elephant Seal</td>
<td>Summer</td>
<td>Least Concern</td>
<td>3,000 individuals</td>
<td>Stable</td>
<td>±0.5</td>
</tr>
<tr>
<td>Antarctic Fur Seal</td>
<td>Summer</td>
<td>Least Concern</td>
<td>5,600 individuals</td>
<td>Increasing</td>
<td>±0.1</td>
</tr>
<tr>
<td>Sub-Antarctic Fur Seal</td>
<td>Summer</td>
<td>Least Concern</td>
<td>150,000 individuals</td>
<td>Stable</td>
<td>±48</td>
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<tr>
<td>King Penguin</td>
<td>Summer</td>
<td>Least Concern</td>
<td>220,000 pairs</td>
<td>Stable</td>
<td>13</td>
</tr>
<tr>
<td>Gentoo Penguin</td>
<td>Winter</td>
<td>Near Threatened</td>
<td>1,000 pairs</td>
<td>Increasing</td>
<td>&lt;0.5</td>
</tr>
<tr>
<td>Macaroni Penguin</td>
<td>Summer</td>
<td>Vulnerable</td>
<td>370,000 pairs</td>
<td>Decreasing</td>
<td>4</td>
</tr>
<tr>
<td>Southern Rockhopper Penguin</td>
<td>Summer</td>
<td>Vulnerable</td>
<td>100,000 pairs</td>
<td>Decreasing</td>
<td>17</td>
</tr>
<tr>
<td>Wandering Albatross</td>
<td>Summer</td>
<td>Vulnerable</td>
<td>3,650 pairs</td>
<td>Stable</td>
<td>40</td>
</tr>
<tr>
<td>Grey-headed Albatross</td>
<td>Summer</td>
<td>Vulnerable</td>
<td>9,500 pairs</td>
<td>Stable</td>
<td>10</td>
</tr>
<tr>
<td>Indian Yellow-nosed Albatross</td>
<td>Summer</td>
<td>Endangered</td>
<td>7,000 pairs (PE only)</td>
<td>Stable</td>
<td>17</td>
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<tr>
<td>Dark-mantled Sooty Albatross</td>
<td>Summer</td>
<td>Endangered</td>
<td>2,900 pairs</td>
<td>Decreasing</td>
<td>&gt;20</td>
</tr>
<tr>
<td>Light-mantled Sooty Albatross</td>
<td>Summer</td>
<td>Near Threatened</td>
<td>800 pairs</td>
<td>Increasing</td>
<td>4</td>
</tr>
<tr>
<td>Northern Giant Petrel</td>
<td>Winter</td>
<td>Least Concern</td>
<td>750 pairs</td>
<td>Stable</td>
<td>6</td>
</tr>
<tr>
<td>Southern Giant Petrel</td>
<td>Summer</td>
<td>Least Concern</td>
<td>2,800 pairs</td>
<td>Stable</td>
<td>6</td>
</tr>
<tr>
<td>Crozet Shag</td>
<td>Summer</td>
<td>Least Concern (regional: Endangered)</td>
<td>600 pairs</td>
<td>Increasing</td>
<td>33</td>
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<tr>
<td>Sub-Antarctic Skua</td>
<td>Summer</td>
<td>Least Concern</td>
<td>600 pairs</td>
<td>Decreasing</td>
<td>11</td>
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<tr>
<td>Kelp Gull</td>
<td>Summer</td>
<td>Least Concern</td>
<td>&lt;150 pairs</td>
<td>Stable</td>
<td>1–2</td>
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<tr>
<td>Antarctic Tern</td>
<td>Summer</td>
<td>Least Concern</td>
<td>&lt;150 pairs</td>
<td>Stable</td>
<td>&lt;0.4</td>
</tr>
<tr>
<td>Kerguelen Tern</td>
<td>Summer</td>
<td>Near Threatened</td>
<td>&lt;150 pairs</td>
<td>Decreasing</td>
<td>1–2</td>
</tr>
<tr>
<td>Lesser Sheathbill/Paddy (PEIs race)</td>
<td>Summer</td>
<td>Not assessed</td>
<td>1,400 pairs</td>
<td>Decreasing on Marion</td>
<td>10</td>
</tr>
</tbody>
</table>
Code of Conduct regarding marine mammals and birds

In order to grant the animals of the PEIs the protection guaranteed under the various laws of the land, a code of conduct has been drawn up to regulate visitor behaviour when encountering seals and birds on the islands, or marine mammals in the waters around the islands.

Background

Many seals and birds appear to be fearless, or even “tame” and are easily approached (e.g. Southern Elephant Seals and Wandering Albatrosses). Others, such as Gentoo Penguins, are prone to fright (and flight) when encountering humans. Some, such as Sub-Antarctic Skuas, are curious and learn quickly that human habitation often presents a source of food or nesting materials.

Any disturbance of these animals can interfere with the natural processes on the islands. Close approaches may put animals on the defensive, causing them to attempt to flee or attack. In both cases animals and humans may be injured as a result. Elephant seal bulls can crush pups inadvertently when defending their harems and distressed penguins can trample their own eggs. Eggs, chicks or pups may be deserted by fleeing parents, leaving them vulnerable to predators. All animals are vulnerable to disturbance during the breeding season and when moulting. Even animals
which appear outwardly unaffected may undergo harmful physiological changes or may be affected on the long term, e.g. may not return to the nest site in the next breeding season.

**Guidelines for behaviour in the vicinity of seals and birds**

The following rule applies to everyone visiting the PEIs, and to individual animals, as well as colonies of seals and birds on the island.

*In general, the minimum approach distance for seals and breeding birds is 15 m (but 50 m for courting Wandering Albatrosses). However, if someone is further than this distance from an animal and it reacts, then the person should withdraw if possible.*

Exceptions to this rule of thumb apply to breeding colonies of certain sensitive species:

- All Gentoo Penguin, Southern Giant Petrel and Crozet Shag colonies during the breeding seasons of these species – 100 m;
- The three Wandering Albatross demographic study colonies (except for the coastal path from The Fault to Archway Bay which skirts the Macaroni Bay study colony, and which is considered Zone 3) – 100 m;
- The Grey-headed Albatross colony at Grey-headed Albatross Ridge (except the path from Santa Rosa Valley to Rook’s Bay, which is considered Zone 3) – 200 m.

No-one may harm breeding animals and seals by disturbing them through persistent attention. Under no circumstances may visitors supply food to the animals or leave food in the open. In the event of curious animals approaching a visitor, the visitor should withdraw.
Additional guidelines for approaching wild animals

Human behaviour

- Approach the animal slowly – one step per second is a good speed.
- Approach at an angle to the animal rather than directly.
- If you talk, do so quietly and calmly.
- Don’t make sudden movements. If you want to take a photo of the animal, move slowly before and after.
- Don’t stare at the animal – most animals take this as a sign of aggression.
- If you are in a group, stay close together; don’t spread out (it makes you look more threatening) and don’t surround the animal.
- Always leave the animal an escape-route (don’t back it up against a cliff or any other barrier).
- Don’t try to touch an animal, even if it comes to you.
- If the animal appears nervous, stop approaching or retreat slowly (see ‘Animal behaviour’ below).
- Once you have finished watching the animal, move slowly and quietly away.

Animal behaviour

Not all animals are the same – what works for most may not work for all. The minimum approach distances specified in the Code of Conduct may be too close for some individuals, so watch out for telltale signs that the animal is uncomfortable with your presence and if you see these signs, respond accordingly:

- Rapid head-turns. This is a sign that the animal is becoming nervous. Stop for a bit and allow the animal to calm down before continuing your approach slowly.
- Vocalisations. This may be a sign of aggression or nervousness – the animal is warning you not to come any closer. Don’t go any closer.
- Standing up. If a resting animal stands up, it is either getting ready to flee or getting ready to attack. Either way, retreat slowly until the animal turns its attention away from you and starts to settle down. Don’t go any closer.
- Moving away. If the animal moves away from you, it means you are too close for comfort. Retreat slowly until the animal stops moving.
- A bird flapping its wings, shaking itself, touching its nest or offspring with its bill, or preening itself or its chick. This usually happens after
you have retreated, and is the bird’s way of expressing relief that you are no longer so close. Watch the bird from this distance; don’t go any closer.

- Aggression towards nearby animals. This is common in tightly-packed colonies of animals, and is usually the result of one animal moving away from you into the space bubble of another nearby animal, which responds by attacking the intruder. If this happens, you are MUCH too close. Move away slowly until the animals calm down. Don’t go closer.

- Aggression towards you. Even if you stick to the minimum approach distances, some animals may become aggressive. Breeding skuas are extremely protective of their offspring, and may dive-bomb you. Protect your head and move away fast. Breeding seals can also be quite intolerant of humans. If a seal starts to approach you, move away slowly and keep an eye on the culprit. This will usually be enough to prevent a chase.
Marion Island, showing no-flight zones and preferred flight paths
Guidelines for the use of aircraft (adapted from the Prince Edward Islands Management Plan)

Animals in remote sub-Antarctic regions can be extremely sensitive to disturbance by aircraft operations. The level of disturbance varies according to the intensity, length and frequency of flight operations, the species in question and the timing of operations relative to the species' breeding season. At the PEIs, late September to early May is the time when seals and birds are most sensitive to disturbance. But variations in noise levels experienced by animals also depend on height at which aircraft fly over, the type of aircraft and engine, the flight profile, the weather and the geography of the location (e.g. flat or hilly).

The following guidelines are based on the Scientific Committee on Antarctic Research (SCAR) guidelines for aircraft operations, modified to account for the unique conditions and geographical size of the PEIs. Note that flying conditions at the PEIs are often marginal and aircraft operators must act within the safe limits of prevailing conditions. If this is likely to put any sensitive bird or seal colonies at risk, then DAI will halt all flight operations.

To minimise disturbance to wildlife:

- Do not land aircraft on the islands except during search and rescue operations, for the gathering of scientific information, during re-supply and waste removal or for any operation which promotes the proper management of the islands.

• Avoid all no-fly zones (see map, page 58). Note that these zones are not fixed but may vary between and within years, so no-fly zones should be confirmed with an ECO before the start of flight operations for each voyage. Pilots may have to enter no-fly zones in emergencies or for the sake of safety, e.g. to avoid low visibility or severe turbulence. Any entry into these areas must be reported to the DCO and ECO as soon as the aircraft returns to base.

• Stick to the recommended flight paths where possible (see map, page 58). Alternative flight paths can be used if they have been approved by the ECO.

• Avoid flying over colonies of birds and seals (where a colony is defined as 20 or more animals close to each other).

• Don’t fly below 600 m above ground level over bird and seal colonies except in emergencies.

• Never hover or make repeated passes over wildlife colonies or fly lower than necessary.

• Avoid landing within 250 m of bird and seal colonies.

• Because most animals congregate along the coastline, where possible avoid flying directly along the coastline; rather fly 500 m inland or seaward of the coastline and 600 m above ground level.

• When flying over the coastline, maintain a vertical separation of 600 m above ground level and a horizontal separation of 500 m from wildlife.

• Where possible, land downwind of concentrations of animals, and behind a physical barrier such as a hill.

• Avoid flying towards concentrations of animals immediately after take-off; avoid steep banking turns in flight because these significantly increase the amount of noise generated.
- Don’t fly over Zone 4 and 5 areas, or within the prescribed distances of these, without a permit from DAI; pilots must familiarise themselves with maps of the islands and their zones.
- Keep flights close to bird or seal colonies to a minimum.
- Avoid flying after dark to avoid bird strikes.
- Avoid flying when poor conditions such as low cloud or strong winds make the maintenance of flight distances difficult.
- Where possible, and in keeping with flight distances from bird and seal colonies, maintain flight paths that are as low on the horizon as possible.
- Apply the above recommendations maximally during the main wildlife breeding and moulting seasons.
- Take all the necessary precautions to avoid disturbing or endangering flora and fauna. In this regard, low-flying over seal and bird colonies, especially when these animals are breeding, is strictly prohibited.
- The DCO is responsible for ensuring that aircraft operators comply with these regulations.

Also, note the following guidelines to minimise damage to vegetation and prevent the spread of alien species:

- Try not to land on vegetation – use helipads wherever possible.
- Where possible, lower containers onto landing platforms rather than directly onto vegetation.
- Don’t land on areas infested with alien and invasive vegetation; if such landing is unavoidable then return directly to the helipad and thoroughly clean and check skids and wheels before redeploying aircraft or landing at any other sites.
- Keep wheels and skids propagule-free; clean and check wheels and skids before redeploying aircraft.
- Helicopter landings on Prince Edward Island may only take place at Cave Bay on the east coast and Kent Crater on the west coast, except in case of emergency.

The above guidelines should be adhered to in all except emergency situations, when the SANAP guidelines for search and rescue should be used.
Research

Research conducted at the PEIs should be guided by the South Africa Medical Research Council’s (MRC) ethics policy on animal experimentation (see page 65). Researchers whose proposed research may affect the welfare of vertebrates at the PEIs must obtain ethical clearance from their home institutions by filling in SANAP’s ethics questionnaire, which is a supplement to the home institution’s ethics committee review process and guidelines. The form is based on the National Code for the Handling and Use of Animals in Research, Education, Diagnosis and Testing of Drugs and Related Substances in South Africa.

When DAI assesses research proposals for the PEIs, it takes into account the impact that the research could have on the physical, biological and spatial environment of the islands. All researchers undertaking research with bio-hazardous material that could potentially cause harm to humans, animals or the environment should familiarise themselves with appropriate bio-safety and containment procedures. Such research includes working...
with recombinant DNA techniques or genetically modified organisms, organisms that are pathogenic to humans and/or animals, radiation, and any research which may cause harm to the natural environment.

Researchers should also take into account the IUCN Red List status of the species they are studying, if the work they wish to carry out will involve considerable interference with large numbers of individuals.

These factors will be considered by DAI, or any committee appointed to deal with such matters, when considering research proposals.

No organisms or samples may be removed from the PEIs without SANAP authorisation and a collection permit issued by DAI. All researchers, in addition to producing papers for publication in scientific journals, must provide management recommendations to SANAP where possible. They should submit copies of research reports and scientific findings (published and unpublished) to SANAP within 30 days of finalising these documents.
Summary of the South Africa Medical Research Council’s (MRC) ethics policy on animal experimentation

- The MRC recognises the moral dilemma posed by the use of sentient organisms (i.e. organisms with a sensory nervous system) for research, teaching and testing.

- It subscribes to the ethic of only supporting studies which promise to contribute to the understanding of biology and environmental principles and to the acquisition of knowledge that can reasonably be expected to benefit humans, animals or the environment.

- It insists that animals may only be used when the researcher’s best efforts to find a non-sentient alternative have been unsuccessful.

- It requires optimal standards of animal health and care being observed to provide good quality results that enhance credibility and reproducibility.

- It requires the “Three R” principles of “Replacement, Reduction and Refinement” to be adhered to in the planning and conduct of animal studies. These uphold the principles and practice of using the most humane methods on the smallest number of animals that will permit valid scientific information to be acquired.

- It accepts that the use of animals in science critically depends on maintaining public confidence in the mechanisms and processes used to ensure justified and humane animal use.

- It recognises that laboratory animals are protected by law in South Africa and their use for education, testing and research must be justified.
**Historical conservation**

Imagine dried grass substituting for socks, seal skin moccasins instead of gumboots, fried elephant seal tongue as an alternative to boerewors, a bed of feathers in a cold wet cave rather than a cosy sleeping bag in a fully kitted field hut, and relief voyages delayed by months or even years. Life was tough for the sailors, sealers and castaways who were the first visitors to the PEIs. Not much of their legacy remains – an anchor, an old rifle, a few trypots (cast-iron pots used to extract oil by boiling seal blubber) on beaches, the remains of a carved ship’s frame and some stoneware fragments.

There are, however, also signs of the islands’ more recent history to be seen. While at Marion, take the opportunity to look at the historical sites at Transvaal Cove, including those dating back to the annexation of the islands by South Africa in 1947-1948 (see page 69). Visit the Marion Island Museum (in the old Mammal Lab), and inspect interesting old items on display in the new base. The names of many of the landmarks on the islands pay homage to members of the first Marion teams. Crawford Bay is named after Allan Crawford, who produced the first topographical map of Marion Island. Bob Rand Peak is a reminder of Robert Rand, the author of the first suite of scientific papers on the island’s birds and seals. And intriguing features such as Nellie Humps, Piew Crags and Black Haglet Valley reflect the names used...
by team members to describe birds (in this case, giant petrels, sooty albatrosses and Great-winged Petrels) from their home-island, Tristan da Cunha.

A fascinating account of the human history of the PEIs can be found in the book *Marion and Prince Edward: Africa’s southern islands*.  

Although it may be tempting to take fascinating historical objects back home with you, this is an action which is not only selfish, but illegal under South African law. It is also potentially destructive – some of these items are in a fragile state and can easily be damaged. So if you come across an interesting historical object at the islands, please admire it and take nothing but photos (remember that the minimum approach distance for historical sites and objects is 2 m). If you suspect that you have made a brand-new find, take a photo, record the position (using a GPS if possible) and describe your find to the DCO and ECO.

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6 by A. Terauds, J. Cooper, S.L. Chown & P. Ryan. Published in 2010 by SUN PReSS, Stellenbosch.
The raised platform protected by a stone wall at Sealer’s Cave offered protection to 19th century sealers and was still being used as a camp site during the 1948 topographical survey by Allan Crawford, First Team Leader.

Flag flown on Marion Island by the 14 members of the military occupying party who were left to live under canvas on Gunner’s Point for three weeks in January 1948 after the H.M.S.A.S. Transvaal annexed the Prince Edward Islands. The flag is now on display in St George’s Naval Dockyard Church, Simon’s Town.
Preliminary list and description of historical objects above Transvaal Cove (full list to be made available in the Marion Island Museum)

1. Crawford Survey beacons

Three small concrete blocks (A, B1 and B2) were part of the first mapping exercise on Marion, carried out by Allan Crawford in 1948. B1 and B2 are above Seagull Point to the north of the Prion Valley stream bed mark, and A is above Gunner’s Point. The origin of a similar block on a rock near the old Bird Lab isn’t known.

2. Remnants of early cranes

These consist of at least four separate items: the cross-shaped steel base platform at Gunner’s Point, the stump of a wooden beam and its metal bracket beside the catwalk at the same point, and at least two large wooden beams on Boulder Beach adjacent to La Grange Villa.

3. La Grange Villa

La Grange Villa is at the back of Boulder Beach in a small cave. It consists of wooden walls and flooring partially closing off the cave. The cave was used for some years in the early 1950s to house pigs. There are a few names painted on the rock walls of the cave from soon after occupation. Although Boulder Beach has been listed in the literature as a sealer’s site, no sealer’s artefacts are known. Three concrete blocks are post-occupation.

4. Beach ladders

Beneath the current ladder from Boulder Beach to the cliff top are the remains of two earlier wooden ladders, ages unknown.
5. Remnants of the food store and other early buildings and structures

All that remains of the original food store are a number of concrete pillars immediately inland of the platform at Gunner’s Point. The places where two of the original buildings stood (the wireless stations behind the old emergency base and partially behind the flammables store) show signs of the fires that destroyed them. Other remains from or near the time of occupation include the stumps of wooden poles leading up to the original wireless station and two large embedded wooden planks adjacent to the cliff top on Cabbage Point, near to where the first weather balloon ("bolug") hut stood (now marked by a burnt site). A wooden catwalk leading to this site is partially exposed near the Cabbage Point power shack. There are also old wooden catwalk sections below the metal catwalk leading to the old wireless hut site. A number of scattered blocks with embedded steel rings mark the sites of previous aerials, some of which might have been constructed prior to 1950.

6. Annexation shell case, flag pole stump and plaque

A concrete pillar and base at Gunner’s Point carries the annexation plaque of the H.M.S.A.S. *Transvaal* (dated 28.12.1947) and has the original shell case and stump of a metal flag pole cemented into it. The names of NDPW members who presumably erected the structure are faintly visible, inscribed in the pillar’s base. The rock immediately above it is the site (marked with concrete and metal straps) of the plaque now mounted on the Fairbairn Memorial.

7. Winch

A hand-operated winch on the slope above Boulder Beach has been there since at least the late 1970s. It might date from much earlier since there is a report of a winch being used to move items upslope in 1948.
8. Upper General Purpose ("Mammal") Laboratory – now the Museum
This is the oldest standing building on the island, built in the early 1950s. It is not one of the original buildings that were erected in early 1948. This building is planned to be kept to house the island museum.

9. Wooden stumps
Several (at least two) wooden stumps at ground level beside the catwalk below the flammables store are remnants of the beams that carried the original 1948 Stevenson Screens.

10. Burnt wooden stumps
Below the old base bedroom wing known as "Squatters" are two rows of burnt wooden stumps, all that remain of the main base building that burnt to the ground on 26 June 1966.

11. Waste dumps
At the bottom of the slope to the south of the old invertebrate ("gogga") laboratory is an overgrown waste dump thought to date from the time of occupation. Beer bottles dated 1948 and broken Royal Navy crockery have been removed from it for safe-keeping.

12. Gentoo Lake cross
This cross bears no inscription and its origin remains unknown despite enquiry. Another cross, situated towards Trypot Beach, marked the 1948 grave of Joseph Daniels and was removed in 2010 for safe-keeping after it rotted and fell over.

13. Kapua Bridge
It is not known when the wooden bridge over the Prion Valley stream bed was first built, but it was present in 1971. It has been widened since it was first erected.

14. Wally’s Dam
The concrete walls and the remains of what is thought to be a steel water tank can be found in the Prion Valley stream bed. Wally’s Dam was erected in the first half of 1948 and might be named after Captain Wally Finlayson of the S.S. Gamtoos.
Haikuchief!

Suppose the drop on
The end of your nose is rain
Suppose it is not.

JC
PART 4

Safety tips

Remember: if you act carelessly at the islands, you not only put your own life in danger but also the lives of those who have to try to rescue you!

Please familiarise yourself with the SANAP safety procedures for Marion Island field visits (page 76). In addition, take note of the following safety tips.

At base

- Most injuries on Marion occur at base rather than in the field. Don’t run inside buildings or on catwalks.
- Make yourself familiar with the emergency evacuation procedure. If the base has to be evacuated, put on cold weather gear and go to the muster area where you will be sent to the appropriate areas by the health and safety team. The emergency plan is available at all exits in the base.
- The helicopter landing platforms are off-limits during flight operations to everyone except authorised personnel.

In the field

- Make sure that you are hiking-fit before you leave for the islands. The most likely danger of hiking on the PEIs is that of hypothermia (see page 78). Barring an accident (a serious injury or falling in a river), you are unlikely to become hypothermic as long as you can keep walking and keep generating body heat.
- Expect to take at least twice as long to walk a given distance at the islands as you would on a hiking trail back home. Mires, black lava, steep slopes, gumboots, driving ice rain, snow and gale-force winds are all factors that will slow you down. Make sure you leave on your hike early enough to reach your destination before dark (by about 5 pm during relief periods).
- Make sure that you know how to read a map and use your compass and/or hand-held GPS, and know how to navigate by these tools.
- Dress in layers, ideally with a zipped fleece. Avoid cotton clothing, especially jeans, which insulate poorly when wet and dry very slowly.
- Even on short walks, wear gumboots and take wet weather gear, a whistle, torch and handheld radio with you.
Map of the island, with major landmarks (hills, rivers, etc.). A compass and/or, if you have one, a hand-held GPS with accurate coordinates of huts and landmarks and several spare sets of batteries;

- Satellite phone if you have one, or hand-held radio if there is one available;
- At least two pencil flares (ask the Team Leader for these);
- Padkos (high-energy snacks for short walks and “proper” food, e.g. sandwiches for longer hikes) and water;
- Torch (headlamps are very convenient) and spare batteries (if you are caught on the trail after dark, a torch can help you find your way and can be used to signal rescuers);
- Whistle (three blasts of a whistle is the universal signal for help);
- Knife or multi-purpose tool, and duct tape, for emergency repairs; and
- Water-resistant sunscreen and/or sunglasses (even though you don’t see much sun on Marion, you can get sunburnt, including from reflected light off snow).

- On **overnight** walks, also take the following:
  - Small first aid kit, including lots of plasters (sticky plaster works well for blisters);
  - Rain gear (the weather on Marion can change very quickly) and a spare set of warm clothes including thermals, socks and beanie, in a waterproof bag;
  - Space/emergency blanket and sleeping bag in a waterproof bag;

- Before you leave base to overnight at a hut, find out how to operate the petrol generators and hut radios.
Before you leave base, tell a colleague where you are going and sign out on the trip log register at the radio room, indicating the route that you will be taking and the time (day trips) or date (overnight trips) when you expect to return. Remember to sign back in when you get back to base.

Preferably walk with at least one other person and, if you are new to the islands, make sure that this is someone with Marion experience. Keep your group together; walk as fast as the slowest person.

Stay on established footpaths where possible. This will make it easier to find you, should you get lost or injured.

Stick strictly to the hut booking register. There is limited sleeping space in huts and you will be extremely unpopular if you overstay your booking or gatecrash a hut party for the night without warning.

Remember to turn on the hut radio in time for the nightly radio schedule at 18h45. If base cannot hear you, ask another hut to relay your message to base and if necessary, try again the next morning.

Before you leave the hut in the morning, write your next destination and approximate route in the hut book and on the white-board.

In the event of serious injury or other trouble in the field, try to find shelter. Make a detailed note of where the injured person is; look out for landmarks and take a GPS position. Preferably leave one person with the injured person while another (preferably two others) go for help.

Keep a respectful distance from seals; they have sharp teeth and can move fast!
MARION ISLAND FIELD VISITS

SAFETY PROCEDURES

REMEMBER TO BE SAFE AND AWARE AT ALL TIMES
AND ENJOY YOUR STAY IN THE FIELD

1. DAY TRIPS:

1.1 Log your trip on the day trip log sheet inside the radio room before leaving base, indicating the route you will be taking and estimated time back at the base.

1.2 There are foot paths to certain areas on the island, please remain on the foot paths whenever possible. If you plan not to follow the paths, please indicate this to your Group Leader and indicate the direction and route you will be heading.

1.3 Always wear/take along the necessary protective gear - gumboots, wet weather clothing, whistle and a torch. The weather on the island is very unpredictable and it is of utmost importance that you are always prepared for a day out in the field. Please speak to the experienced personnel for more advice in this regard, e.g. hypothermia, due to excessive sweating and chilling if dressed too warmly.

1.4 Collect a hand held radio from the Team Leader or Radio Technician before leaving base to take with you to the field. If there is not a radio available, please make certain that your Group Leader is aware of your route.

1.5 Newcomers to the Island, please ensure that you have an experienced field assistant or team member with you to guide you to your destination and back.

1.6 Upon your return, please complete your day trip log sheet in the radio room.

1.7 If you are going to arrive back at the base after the time indicated on the day trip log, if possible, contact the radio room to inform them of your revised arrival time.

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2. **OVERNIGHT / HUT TRIPS:**

2.1 Please ensure that your hut nights are scheduled on the hut board in the radio room.

2.2 Ensure that you have a map or GPS with charged batteries, and the correct coordinates to take to the field.

2.3 Ensure that you have been briefed by the Radio Technician regarding the operation of the radios in the huts.

2.4 Ensure that you have your protective clothing, a sleeping bag, a waterproof sleeping bag cover or emergency blanket, a whistle, a torch and enough food for the trip to the hut.

2.5 Take at least two pencil flares to the field. These can be obtained from the Team Leader.

2.6 Upon arrival at the hut, ensure that the frequency of the radio is set on 2006 - this is the transmission frequency to the base. Place the batteries on charge for at least 30 minutes before and after use, and switch the radio OFF after use.

2.7 Communication with base is at 18:45 every night for the duration of your stay in the field.

2.8 Speak slowly, loudly and clearly. Follow correct radio procedures.

2.9 If you are unable to establish contact with base at 18:45, remain on air until 20:00.

2.10 If you have not established contact by 20:00, then try again at 08:00 the next morning.

2.11 If this still remains unsuccessful, try again at 12:00. If you are not in difficulty please try to make alternative arrangements (i.e. communicate with a nearby hut which has contact with base) to let base know this.

2.12 A search party will be sent out to you if no communication has been established by 12:00 the following day.

2.13 Always leave a message in the hut book (even if you are only passing by), regarding your well-being and plans for the next day (i.e. route/s to be traversed and an indication of any deviations).
Hypothermia

Hypothermia occurs when your body temperature drops below normal, causing blood circulation, breathing and nervous systems to slow down.

Hypothermia can happen from accidental exposure to cold, sitting still for long periods of time, immersion in cold water or trauma from a serious accident. Wearing wet clothes greatly increases your risk of hypothermia. Hypothermia often happens gradually, but it can also happen within minutes, e.g. if you fall into cold water, your body loses heat faster than it can produce it. Severe hypothermia can cause an irregular heartbeat which can lead to heart failure and coma or death.

Note that you don’t need sub-zero temperatures to get hypothermia and, if you are hypothermic, your judgement will be impaired and you will be more likely to have an accident.

Signs and symptoms

- Skin that is cold to the touch;
- Shivering at first, then the absence of shivering;
- Lethargy, drowsiness;
- Weakness, clumsiness;
- Irritability, combativeness;
- Confusion, irrationality, delirium, hallucinations;
- Slow reflexes;
- Seizure, stupor or coma;
- Slowed, shallow or arrested breathing; and
- Slowed, irregular or arrested heartbeat.

If you observe any of these signs in yourself or anyone in your party, take immediate action before it becomes a severe emergency:

- Poor articulation of words;
- Disorientation;
- Decrease in shivering followed by rigidity of muscles;
- Blueness of skin; and
- Slowness of pulse, irregular or weak pulse.
Treatment

- In mild cases of hypothermia, warm the person. Note that in some cases, re-warming the patient can cause cold blood from the peripheral circulation to stop the heart.
  - Get them out of the cold.
  - Replace wet clothing with dry, warm clothing and blankets.
  - Get them into a sleeping bag.
  - Give them something warm to drink (but not alcohol).
  - Apply hot water bottles or heat packs under their arms and on the chest, neck and groin, but don’t rub or otherwise warm up their arms and legs.
  - Share body heat by huddling together, or position them with their knees bent up against their chest.
- Watch the person’s breathing. If they stop breathing and have no pulse, give CPR if you are trained to do so. But be careful, because a person with hypothermia may have a very slow heart rate and you should not give CPR if their heart is still beating. You may need to check for a pulse for as long as a minute.
- Back at the base hospital, the medical team will use heated intravenous fluids to warm up the patient, who may also be wrapped with blankets in a warm room or put into a large tub of warm water.
Repetto’s Ghost

Socks over stove, wet and smelly,
   Chicken breyani in full belly,
   Gentle snores, interspersed
   By choir of petrels, well-rehearsed.

Dreams are shattered! Rude awakening!
   Repetto’s hut is madly shaking.
   Footsteps on the porch resound,
   Repetto’s ghost on door does pound!

Cowering in my sleeping bag
   I shout, “Retreat, you filthy hag!”
   A cross reply: “You have no right;
   ‘Tis SEALERS booked this hut tonight!”

MdV
The Prince Edward Islands are South Africa’s only sub-Antarctic territory. Their special and sensitive ecosystems are protected through their national designation as a Special Nature Reserve and their international designation as a Ramsar site. The islands are managed by the Directorate: Antarctica and Islands (Department of Environmental Affairs) in accordance with the new (2010) Prince Edward Islands Management Plan. This booklet summarises the information in the management plan that is of most relevance to expeditioners to the islands. It thus arms expeditioners with information that will help them to minimise their impacts on the Prince Edward Islands, or keep their footprint at the islands as small as possible.