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(Appendices not included

SUMMARY REPORT ON TRIP TO MARION ISLAND

AUGUST 25 - SEPTEMBER 15, 1988

Michael Cohen
Chief Directorate:
Environmental Conservation

October 1988

1. PURPOSE OF VISIT

To obtain the necessary background for the compilation of a management plan for Marion Island.

This summary report covers general impressions and areas of concern. The proposal for a management plan (Appendix 1) will be expanded at a later date and will be ready for circulation by June 1989.

This report is broad based and covers both environmental and administrative aspects. This is necessary as some of the major impacts are centred around the base, the area immediately adjacent to the base and activities conducted at the base. The major time of impact appears to be during take overs when the island population increases from between 5 - 20 to in excess of 60 people.

2. PRE-SAILING

A major concern is the lack of information given to team members and observers prior to leaving Cape Town. Discussions with members of the various teams (observer, cat, research, public works and air force) on board the Agulhas indicated that they were given little or no information on the island, its biology and the fragility of the system.

While members of the scientific community generally inform themselves about the island, their concern is centred around their projects.

To overcome this problem it is suggested that an information booklet be prepared and distributed to all persons visiting the island for the first time. The management plan must be widely distributed and should also be produced in a readable popular form. The induction course should also contain a section on the biology of the island.

2.1 Information booklet

Proposed Title: A visitors guide to Marion Island and its Environment

or

An introduction to Marion Island and its Environment

or

Understanding Marion Island and its Environment

Proposed Table of Contents:

Introduction
Purpose of Marion Island
History
Geology
Terrestrial life
  Fauna
  Flora
Marine ecosystems
Historic sites
Conservation and Protection

The purpose of the booklet is to serve as an introduction to the island and its ecosystems. The booklet produced by the Department of Transport in 1985 - A guide to the geology, limnology, fauna and flora of Marion and Prince Edward Islands can serve as a base, but needs extensive revision.

The proposed booklet can be written by members of the Chief Directorate: Environmental Conservation and by experts co-opted from the various fields. Production of the booklet can be undertaken by the Media section of the Department of Environment Affairs. Co-ordination of the project must be with the Sub-directorate: Antarctic and Islands.

2.2 Management Plan

The management plan will be based on the present code of conduct and will follow the proposal as laid out in Appendix 1.

To supplement the management plan it is proposed that a short brochure be prepared. This brochure should be a summarized version of the management plan and must be produced in a readable form. The brochure must highlight the sensitivity of the island as well as permissable activities and should be distributed to all persons visiting the island.

The brochure can be written by members of the Chief Directorate: Environmental Conservation and produced by the Media section.

2.3 Induction Course

Once the booklet and management plan have been produced, the Chief Directorate: Environmental Conservation should become involved in the induction courses. It is necessary that all teams visiting the island be given a detailed briefing on the implications of the environmental aspects of the management plan as well as an explanation of the fragility of the island.

Should the above proposals be accepted, a planning group consisting of members of the Sub-Directorate: Antarctic and Islands (Convenor), the Chief Directorate: Environmental Conservation and the Media section should be set-up. This group should be responsible for programming the above activities, decided on content and format. This group will formulate a final proposal for the production of an information package for persons visiting the island.

3. PERMITS

To further tighten up control on the island, each person entering the island should be issued with a permit which stipulates the conditions of entry and permissable actions. At present, the code of conduct requires permits for the construction of permanent and temporary installations and for research activities.

A general entry permit will highlight prohibited actions and will indicate actions required prior to departure, the time on the island, and the return to the continent. To minimize the administrative load, entry permits could in certain instances be issued to the leader of a team.

The issue of a permit will highlight the fact that persons are entering a protected area which is under the control of the Department of Environment Affairs. A draft permit is presented in Appendix 2.

4. PROTECTION STATUS

Both Marion and Prince Edward Islands must be given legal protection status as "nature reserves". The category "special nature reserve" as defined under the Draft Bill on Environmental Conservation is suggested. Prince Edward Island must then be zoned for total protection while Marion Island could be zoned as suggested in point 5 of this report.

(The protection status and zonation plan will be fully addressed in the draft management plan.)

5. ZONING

It is essential that the management plan zones the island. The following zones are suggested. These are tentative and a final proposal will be made in the management plan.

Service zone (Development zone)	The area occupied by the present base. The objective of the service zone is to centralize support and administrative facilities in one area so as to minimize their impact on the protected area.
Natural zone	This is a buffer between the service/development zone and the protected or specially protected zone. This area could include an area where free walking is permitted. Here the impact will have to be carefully monitored and reported on after each visit.
Specially Protected Areas (Protected Areas)	All sensitive sites, for example, breeding beaches and special features should be zoned for special protection. Here it is suggested that motivation

sheets be compiled and distributed to various specialists for completion. The Islands and Antarctic Environmental Conservation Committee will then decide on the final zoning status.

Rehabilitation/ restoration zone

These areas should consist of those areas in which the soils, vegetation and other natural features have been significantly altered by the past practice of man. These zones can be located in any of the primary zones. In these zones, the prime objective is to stop the degradation of the resource and to achieve the restoration or rehabilitation of the area to as near natural conditions as possible. After restoration, the area will be rezoned to one of the primary zones. (The van dem Boorgaard's dam and pipe line would fall into this category.)

6. SAILING

Ship instructions are available on board the Agulhas. It is suggested that these be made available to passengers before embarkation as an appendix to the popular version of the management plan or as a seperate leaflet. It may be advisable to include certain of the ship instructions in the entry permit.

For example, while the present code of conduct stipulates that "all necessary measures shall be taken to ensure that the relief ship is at all times free of rats, mice and insect pests ..." a great deal of equipment is brought on board by passengers. As the equipment is privately owned and packed, little or no control can be exercised. Food items and chemicals are not mentioned in the instructions. The problem should be highlighted and brought to the attention of the visitor.

7. DE-EMBARKATION

De-embarkation and offloading from the ship proceeded smoothly. The scale of operation is large and the potential for environmental impacts around the base pose a problem. With the large number of people concentrated on the landing stage and cat walks, severe damage is done to the fragile vegetation in the immediate vicinity of the base.

The Captain of the Agulhas has a vast experience in this type of operation and should be better utilized in planning the offloading phase of the operation. With his experience it will be possible to eliminate some of the congestion and trampling. For example, items are offloaded at the point. Many of these are moved to the helipad for transportation to another sector of the island. With proper planning, items could be moved directly from the ship to the sector required. This would reduce the chances of accidental spills and trampling. It may also represent a saving in helicopter flying time.

8. BASE OPERATIONS

The following aspects are covered in this section of the report:

Off-loading stage
Accommodation block
Laboratories
Kitchen
Feeding of birds
Solid waste disposal
Sewage
Information/interpretive centre
Koskassie storage
New generator hut

Each problem is briefly discussed and a recommendation is made. The various recommendations will be taken-up in the management plan.

8.1 Off-loading stage

A large quantity of rubble is located in the vicinity of the off-loading stage. This rubble is an accumulation of a number of years and consists of waste material brought in from the area surrounding the base, the field huts and excess material brought for construction purposes on previous voyages.

While some of this material has been stored under the wet-lab and store rooms, much of the material has been dumped onto the rocks alongside the landing stage. For example, during the present take-over, sand and cement brought for construction purposes and not used was left on the landing stage. It is likely that this sand and cement will be added to the existing waste pile to form the foundation for a proposed extension to the landing stage.

The proposal to build a larger landing stage probably stems from the fact that it is now easier to cover the rubble than to remove it and return it to the continent. A larger landing stage will assist in easing congestion during off-landing, but if extreme care is not taken during construction and future voyages it will only be a matter of time before a further extension is proposed.

Recommendation

A final decision must be taken on the extension to the landing stage. The operation must be properly planned and adequate storage facilities must be provided. Once the stage is extended, extreme care must be taken for the proper disposal of waste material.

Sand and cement. The proposal for the storage of sand and cement in specially constructed silos must be given serious consideration. These silos must be sturdy and weather proof. At present the sand and cement is packed in double plastic bags which are loosely tied or left unsealed. This constitutes a danger as alien seeds and insects can be introduced to the island via the sand.

With regard to possible invasives being brought to the island, the following alternatives are investigated:

(a) Chemical treatment

Basamid (Thiadianzin) - a soil fumigant for the control of various weeds and soil fungi. Basamid will also suppress nematodes (granules).

Methyl bromide - as above (gas).

Both of the above chemicals will kill most soft coated seeds if they are active. Dormant seeds will not be killed. Basamid will only suppress nematodes while methyl bromide will kill nematodes. Both of the above chemicals allow for bulk treatment and after a certain waiting period the sand should be free of all residues.

(b) Irradiation

Irradiation of building sand will kill both active and dormant seeds as well as all nematodes and insects. The cost of irradiation is high, but could probably be negotiated at a price of R0.60/kg. The advantage of irradiation is that sand will have to be pre-packed and sealed thus preventing re-infestation.

These aspects are being investigated and a final recommendation will be made in the draft management plan.

With regard to the storage and removal of waste and rubble from the island, some system of containerization will have to be implemented. In implementing a containerization programme, attention will have to be given to the capacity of the island and ship cranes.

8.2 Accommodation block, store rooms and generator huts

Accommodation facilities were adequate and the base area was well maintained. The team leader and his team are to be congratulated on maintaining the base and surrounding area.

During the take-over facilities are crowded and the potential for conflict is high.

Small areas of diesel spill are located around the ablution area. Diesel spills around the engine rooms and diesel storage tanks are apparently old spills. The assurance was given that no new spills have occurred over the past year. The area around the engine rooms and storage tanks is almost devoid of vegetation and it is unlikely that regrowth will be possible.

The vegetation in the area immediately surrounding the base has been trampled and in certain areas a change in species composition is evident. Some of the plants are assumed to be aliens.

Recommendations

All development at the base must be stopped until a long term plan for the island and base has been compiled. All diesel pipes and tanks must be periodically checked for leaks and repaired. It may be advisable to request the Public Works Department to conduct a major overhaul on all tanks and pipes during the April take-over. Drip trays/ tanks must be installed at all potential leak points. Spills and waste should be containerized and returned to the continent.

Cat walks must be installed where necessary and walking must be confined to the cat walks. Here base personnel must indicate their needs. Team size must be kept to the minimum necessary to conduct the work required.

8.3 Laboratories

The laboratories were found to be in a poor condition with mouse droppings covering much of the floor and shelves. The "radio-active" room in the analytical lab was left standing open with no control being exercised over stock and entry.

Recommendation

The use of ultra-sonic noise alarms for mouse control should be investigated. Before taking any decision, the possible impact of these alarms on the birds should be carefully investigated. The maintenance of the laboratories must be made the task of a specific individual on the team.

8.4 Kitchen

The kitchen area requires urgent upgrading. According to observers with a hygiene background the present facilities are not only inadequate but are also conducive to the spread of contageous disease. The installation of adequate washing facilities must be given urgent attention.

8.5 Feeding of Birds - Base

Skuas, sheathbills and gulls are being fed in the vicinity of the kitchen. This is a serious problem and has already resulted in behavioural changes among the birds in the vicinity of the kitchen. A further danger of feeding birds with fresh food is the possible introduction of a disease such as "Newcastle disease".

A further problem is the disposal of kitchen slop directly into the sea. Besides the danger of introducing a disease among the birds and changes in the behaviour of the birds in the immediate vicinity of the base, the practice is also contradictory. Persons are instructed not to feed the birds in the vicinity of the kitchen and then a "legal" mass feeding programme is conducted at the point.

These problems exist as the base is not equipped with proper waste disposal facilities. The incinerator at the base is inadequate and is not being utilized. The temporary incinerator located at the point is also unsatisfactory.

Recommendation

The problem of feeding birds must be addressed in the management plan. Both of the existing incinerators must be removed and replaced with a large functional incinerator. This incinerator must be fitted with the necessary filters and scrubbing devices to reduce particulate pollution. Residues should be sealed into containers for removal to the continent.

8.6 Solid Waste Disposal

At present all non-combustible/non-biodegradable waste generated on the island is packed into wooden "koskassies". At each take-over the koskassies are transported to the ship. Waste is then discharged overboard at a distance of some 50 m from the island.

On the island, koskassies are stacked on a platform at the landing stage for up to six months before being loaded onto the ship. Being exposed to the elements, many of the crates are in an advanced state of decay at the time of being loaded. Most of the boxes are also infested with mice.

During the waste drop observed, many of the boxes thrown overboard disintegrate before being dumped. Many of the intact boxes disintegrate on impact with the water. The majority of intact boxes do not sink. Tins are not properly crushed and bottles are not broken. The waste disposal operation must be considered unsatisfactory.

Recommendation

The waste disposal problem can be solved by a proper containerization programme being implemented on the ship and island. All foods and other items being transported to the island are packed into solid re-usable containers - waste and excess material is then returned to continental South Africa in the containers. The waste is then treated by a registered waste disposal outfit.

The feasibility of implementing such a scheme is currently being investigated. Discussions have been held with the Port Authorities and the Department of Health. Sample containers have been inspected. Before a final proposal can be presented it is suggested that members of the sub-directorate: Antarctic and Islands, the Chief Directorate: Environmental Conservation and Captain Leith meet to discuss details of the plan. Final details will then be presented in a seperate report and recommendations will be taken up in the management plan.

Appendix 3 shows the proposed containers for waste disposal and transport.

8.7 Sewage

The problem of sewage discharge is currently being investigated.

8.8 Information/Interpretive Centre

At present no interpretive material is available on the island and it is believed that several well planned interpretive displays would be well used by all visiting teams.

The possibility of a small information centre was discussed with the present team leader - Dave Baker. He indicated that he was planning a small display area which would be located in the old gym.

This area is well suited for displays and with little modification could be used for interpretive material. It is further felt that Mr Baker should be supported in his efforts and every encouragement should be given to the present team as well as future teams to develop the display area.

The Department must also work up several display posters and maps for use in the interpretive area. This will allow for a major input of base staff, but at the same time we could ensure that the interpretive message desired by the Department will be communicated. Researchers could become involved by requesting them to produce "posters" on their research. These posters could depict life histories of the various species, the problem of alien invasions etc.

It is further proposed that a small field herbarium is established at the base. This would be of value to scientists visiting the island for the first time and may also serve to stimulate an interest in base personnel. All collecting should be made by a competent botanist.

The scientific section of the library must also be upgraded. Copies of all theses produced should be housed in the library. Papers based on research conducted on the island should be housed in a small reprint library. Basic texts on the sub-antarctic islands should also be acquired for the base library.

Suggestions for an interpretive plan for the island will be made in an appendix to the management plan.

8.9 Koskassie storage

This aspect will be fully addressed with the containerization programme. Existing storage facilities will have to be upgraded and in all probability a store room located alongside the food store will be recommended.

Any construction work should take place at the same time as the upgrading of the landing stage.

8.10 New Generator Hut

The proposed site was inspected by: a member of the Public Works team, Watkins, Edwards and Cohen.

The proposed building will be placed in the centre of the second point, north of the landing stage and south of the upper atmosphere building. The size of the proposed facility will be approximately 7 x 9 m.

The location of the hut is on an unspoilt point and will have an aesthetic impact on the area. The generator hut will also "box" a breeding site for rockhopper penguins. Pollution by diesel is always a problem when installing and operating a generator.

The representative of the Weather Bureau indicated that he had no serious problem with the proposed site. Before taking a decision on the location of the facility, the real need for such a facility must be established. While on the island, the following reasons for a new facility were given:

- Noise

  This could probably be resolved by installing double insulating walls.

- Fire

  The possibility of erecting a fire screen should be investigated.

  Electrical safety precautions must be implemented.

- Present facility inadequate during take-overs

  The possibility of upgrading the present facility must be investigated.

- A larger facility will be required for a larger base.

  See general comment section.

All of the above options must be investigated before taking a final decision. Should it be decided to build the facility, plans must be presented indicating all changes to the existing infrastructure such as storage tanks and pipe lines.

It is my feeling that the facility is unnecessary and would cause a further impact on the island.

9. VAN DEM BOORGAARD'S DAM AND PIPE LINE

Inspection of the dam and pipe line showed a poorly planned and constructed installation. Rubble and waste are located around the dam site as well as at a considerable distance from any construction work. Erosion along the pipe line is severe.

It is essential that the total area be cleaned of all waste material and that the pipe line which does not serve any purpose be dismantled and removed. Material which cannot be immediately re-used on the island must be returned to the continent.

The dismantling of the pipe line and clean-up of the area must be done in a single operation and should be undertaken during the April take-over. Extreme care must be taken not to disturb new areas. The dam must be dismantled and the original flow of the river must be ensured.

A botanist, conversant with the flora of Marion Island and revegetation procedures must be requested to compile a revegetation/rehabilitation plan for the degraded site. This plan should be implemented at an early stage, preferably at the same time as dismantling the dam and pipe line. The project should be monitored (? fixed point photography at selected points) by Departmental representatives.

This development shows the importance of establishing and implementing an Environmental Impact Assessment procedure for Marion Island. This aspect will be fully addressed in the draft management plan.

10. HISTORIC ARTEFACT CONSERVATION

This matter must be given urgent attention and the visit by museum personnel scheduled for the April take-over must be given priority. Arrangements must include the provision of a guide.

The historian seated in the Chief Directorate: Environmental Conservation and members of the Legal Section should be requested to review the adequacy of existing legislation and if necessary to make recommendations for new legislation.

The Department of Environment Affairs should contract a museum or student to conduct a review of the historical record pertaining to Marion and Prince Edward Islands.

The findings of the museum visit will be taken up in the draft management plan.

11. ISLAND LOG

Discussions were held with the team leader on the feasibility of maintaining a daily log of activities and events. Mr Baker agreed on the importance of such a log and suggested that a weekly record should be maintained.

It is recommended that this log be formally requested and that it becomes a routine task of the team leader. Such a record will form a valuable document, both from a historic point and for the management of the island.

12. SHIP LIBRARY

The library on board the Agulhas must be upgraded. Relevant journals and basic texts must be acquired and housed in the library.

13. FLYING OPERATIONS

The helicopter operation on the island was well controlled and co-ordinated. In many cases the South African Airforce team took the lead in planning the daily activities.

The following problems and comments were made by the leader of the Airforce team:

- Island personnel require proper instructions in the procedures to emplane and deplane.

- General safety procedures on the island must be upgraded. For example, all persons leaving the base should be provided with smoke grenades for use in the event of an accident. The airforce can give proper safety instructions during the induction course.

- Radio instruction must be included in the induction course.

- Proper weapons training must be given to persons authorized to carry a weapon on the Island. Several cases of loaded shotguns being carried at the base were reported. In one case the gun was made safe in the helicopter.

- The radio at the base must use the frequency required by the Airforce and must be manned during all flying operations.

- Radio antennae at field huts must be painted international daylight orange.

- Gas bottles must be properly crated.

14. FIELD MARKERS

At various points on the island, experimental plot markers are seen. It is believed that some of these markers are from already completed projects. The Departmental co-ordinator should review all sites where markers are located and ensure the removal of markers no longer serving any purpose.

15. CAT ERADICATION PROGRAMME

The cat team was highly motivated and the leader, Deon Muller is to be congratulated on the handling and motivation of his team. Members of the team became active on the first night on the island and eleven cats had been shot by the end of the take-over.

The two independent observers, Drs de Vos and Randall will submit a report on their overall impressions of the programme as well as recommendations for follow-up work and this report will not discuss the cat programme. It is, however, recommended that a meeting be set up with Dr De Vos, M Bester, a member of the Antarctic and Islands sub-directorate and a member of the Chief Directorate: Environmental Conservation to discuss aspects which should be covered in the Management Plan.

It is hoped that Dr Cohen will meet with Dr Randall on December 27, 1988 to discuss aspects of the programme and management plan.

16. PROPOSED PROJECT - ALUMINUM PELLETS

On-site discussions were held with island based staff. Data are still being awaited from the Weather Bureau in Pretoria. Once the data have been analysed, a recommendation will be made on the proposed project.

Consideration must be given to a store or silo for the storage of Aluminum pellets.

GENERAL COMMENT AND RECOMMENDATIONS ON THE BASE AREA AND ACTIVITIES ON THE ISLAND

The base and area immediately surrounding the base must be considered the major impact zone on the island. The major impact time is during take-over periods when the population grows from 5 - 20 people to in excess of 60 people. It is at the base that the bulk of waste is generated, where there is the greatest danger of alien plant and animal introductions, where the greatest trampling of vegetation occurs and where other forms of pollution will be introduced.

A major concern with the base is the unplanned and unco-ordinated expansion. While on the island, mention was made of the possibility of erecting a new accommodation block. A new generator facility is planned for the April take-over. Requests for new laboratory facilities may be made in the future.

As facilities expand, greater demands **will** be made on the maintenance team. Ultimately, a larger maintenance team will be required to visit the island and/or take over times will have to be extended. With larger teams, power facilities will have to be upgraded. New or additional ablution facilities will have to be built. Drying and laundry rooms, already inadequate will have to be expanded. Kitchen, dining and living rooms will have to be extended and upgraded. More sewage, waste - solid and particulate will be produced. Without proper planning a snowball growth effect will be set in motion.

It is imperative that the Department of Environment Affairs takes a decision on the purpose of Marion Island. Based on the statement of purpose, clear and well defined objectives must be established. These objectives will dictate the type of activities required or desirable for the island. This in turn will place a limit on the size of the base. (A draft statement of purpose and objectives are presented in the proposal for a management plan (Appendix 1). These must be finalized before planning can continue.)

Once the objectives have been finalized, a detailed long-term plan for the base must be established, approved and strictly adhered to. The base must be designed to meet the objectives for the island and must be based on the carrying capacity of the island. At present the base is setting the carrying capacity.

A further problem is that the Department of Environment Affairs is not controlling the activities on the island. During the past take-over, schedules of work to be conducted by the Department of Public Works and Land Affairs were not submitted prior to the voyage. This may contribute to unnecessary large teams being sent to the island. It must also be accepted that with the unco-ordinated growth of the base, it is difficult for Public Works to plan properly for take-overs. The setting of clear objectives and a long term plan for the base and management of the island will assist in reducing the size of teams on the island.

Take-over team size can probably be reduced by including a trained and competent "handyman" in the resident team. More attention must be given to the selection of members of the resident team. For example, the present "diesel mechanic" is a trained fitter and turner and it is doubtful if he can maintain the power generating equipment in peak condition.

The current system of deciding on and funding of research should be reviewed with the Department taking a more active role. The island provides the opportunity to study areas which are relatively unmodified and which have high intrinsic values because of the unique communities which occur there. Natural systems on the continent are becoming more insular in character and an understanding of island ecosystems may provide key elements for general environmental management in the future.

The Department must ensure that the research being undertaken is relevant to its needs. If management is to be effective it must be based on adequate knowledge. Detailed biological inventories are required and attention must be given to those areas which have not been adequately studied.

Ecological studies and long term monitoring programmes must be undertaken to ensure that a sound base exists on which a management decision can be made. Rare and endangered species as well as aliens should receive priority. The interaction between elements of terrestrial and marine environments must also be studied. The effects of human activities should also be monitored. I am not advocating a reduction in research activities but rather a rethink on the direction.

The Department should consider including an environmental conservation officer in the permanent team. This officer would be tasked with implementing the management plan and ensuring that regulations and management prescriptions are complied with. He would also be responsible for routine monitoring and reporting.

The Department of Environment Affairs must carefully analyse the needs for the island. We must take a decision on what size the base should be. What limits should be placed on support people? What type of research and monitoring is required? Residents at the base must accept more responsibility around the base and island. While this may reduce output in certain areas - a balance must be found.

It is essential that a total plan be compiled for the base and the management of the island. A limit on the growth of the base must be established. This must be based on the needs of the island and the carrying capacity of the natural environment.

A G E N D A

WORKING GROUP FOR THE DRAFTING OF A MANAGEMENT PLAN FOR MARION AND PRINCE EDWARD ISLANDS

PLACE: *Department of Environment Affairs*
Room 813
Fedlife Forum

DATE: *30 January 1992*

TIME: *10:00*

1. ***WELCOME***

2. ***PURPOSE OF MEETING***

3. ***TERMS OF REFERENCE***

   - a draft terms of reference will be tabled at the meeting. Once finalized the terms of reference will be forwarded to the Departmental Management for approval.

4. ***CURRENT STATUS OF THE ISLANDS AND FUTURE PLANS***
   Cohen & Van Schalkwyk

5. ***MEMBERSHIP***

6. ***MANAGEMENT PLAN***

   - Two documents "***Proposal for the visit to Marion Island by a member of the Chief Directorate: Environmental Conservation - August/September 1988: A Draft brief for the responsible officer and a proposal for a Management plan***" & "***Summary report on trip to Marion Island August 15 - September 15, 1988***" are provided as background information.

6.1 Table of contents

Members to discuss the draft table of contents - see page 11 - 21 Doc 1.

6.2 Proposed Management Objectives

Members to revise the proposed objectives for submission to Departmental Management for ratification. See page 14 - 15 Doc 1.

7. ***PROGRAMME AND TASK ALLOCATION***

8. ***SCHEDULE OF MEETINGS FOR 1992***

9. ***GENERAL***

Please submit points for inclusion in the Agenda to Mr D J van Schalkwyk by 20 January 1992.

10. ***CLOSURE***

Doc. 1

PROPOSAL FOR THE VISIT TO MARION ISLAND BY A MEMBER OF THE CHIEF DIRECTORATE: ENVIRONMENTAL CONSERVATION - AUGUST/SEPTEMBER 1988: A DRAFT BRIEF FOR THE RESPONSIBLE OFFICER AND A PROPOSAL FOR A MANAGEMENT PLAN

MICHAEL COHEN
JULY 1988

DRAFT MANAGEMENT PLAN FOR MARION ISLAND

INTRODUCTION

Marion and Prince Edward Islands are located halfway between the continents of Africa and Antarctica. Their oceanographic and climatic settings have moulded these islands into typical examples of the sub-Antarctic region. Van Zinderen Bakker (1978) states that "the surrounding ocean with its abundance of life and the stormy, wet and cool climate have made these two small islands, with their millions of bird and thousands of seals, a rare, untouched and extremely interesting paradise which should be preserved for posterity".

Island environments are distinctive and markedly different from those of continental areas. Islands reflect the overwhelming influence of their oceanic surroundings and are characterised by limitations of space, restricted habitats, impoverished floras and faunas compared to continental areas of similar ecological diversity, and a high degree of species endemism stemming from their geographical and ecological isolation. (Clark and Dingwall 1985)

These authors point out that the insular characteristics also underlie the intrinsic values of islands as protected areas. Paramount among these values is the uniqueness of flora and fauna due to the presence of endemic, relict and/or specialized species. Their isolation also means that islands are ideally suited as refugia for threatened plants and animals and as reservoirs for the preservation of genetic resources.

Islands also offer scope for the study, understanding and appreciation of intact and complete natural ecosystems. Marion and Prince Edward Islands have a high scientific value and have attracted scientists from as early as 1873 when scientists from the Challenger Expedition landed on Marion Island. The first organized scientific research was initiated in 1963 when the Van Zinderen Bakkers underlook a reconnaissance trip to Marion Island. This was followed by the Biological and Geological Expedition of 1965 - 1966.

Much of the research undertaken have shown that the islands and their indigenous biota, having evolved in isolation from mainland biota, are often specialised and consequently highly vulnerable and sensitive to change, especially man-induced impacts. Because of their special qualities and vulnerability to change, the islands require certain constraints to be placed on their management.

It is the purpose of this management plan to overcome the dangers of improper use and to find a way which will permit appropriate activities while still retaining the special features of the island. This management plan is intended to guide the use and management of the island. While the plan is not ridgid it should remain the guiding document until such time as the recommendations are superceded by new information or changing conditions and become redundant. Constant review of the plan is, therefore, needed and should be undertaken at 5 to 8 year intervals.

This document defines a brief for the visit to Marion Island by Dr M Cohen of the Chief Directorate: Environmental Conservation as well as a proposal for a management plan for the Island.

Purpose of a Management Plan

Foster (1973) writing under the auspices of the International Union for the Conservation of Nature and Natural Resources (IUCN), states that, the basic purpose of the Master (Management) Plan is "to ensure that all implementation plans and projects evolve from an understanding of the resources of the area and relate to the central concept of the Park itself. It sets forth a sensitively balanced range of objectives and all the necessary policies, plans, legislative controls, investment requirements and other development incentives plus the organizational means to carry them out ...

The master (management) plan consists of a report or series of reports and maps dealing with various aspects of the management program. It is a control document which constitutes a long-range policy guide for the management of park programmes and services to the people. It sets forth the physical and intangible resources upon which the park is based, the purpose and objectives, a management concept for how the park's resources are to be administered and how they are to be used by the public and made more meaningful to them. It establishes the philosophical basis and the rationale whereby the use of the park is reconciled with the conservation (protection) of its resources. It identifies necessary control measures and strategies for implementing long-term development and day to day administration and use consistent with the objectives."

Based on Foster's (1973) description, the management plan for Marion Island can be defined as a comprehensive plan for the preservation, development and management of the Island and its resources.

The legal status of the Prince Edward Islands (Marion and Prince Edward) and environmental protection of the Islands

The Prince Edward Island Act, 1948 (Act No 43 of 1948), declared the Islands to have been formally annexed to, and to form part of, the Union (now Republic) of South Africa.

Responsibility for the administration of the Islands is vested with the Department of Environment Affairs. For the purpose of the administration of the laws of the Republic of South Africa, the islands are considered to be part of the Cape Town magisterial district. The Roman Dutch law as applied in the Cape Province is the common law of the island.

The Prince Edward Island Act provides that a number of laws enumerated in the schedule thereto, to be in force on the island in so far as they are applicable, and provides further that the State President may, by proclamation in the Government Gazette declare any law in force in the Cape Province to be in force on the Prince Edward Islands.

The Sea Birds and Seal Protection Act, 1973 (Act No 46 of 1973) provides for the protection and the control of the capture and killing of most species of seabirds and seals occurring on the Prince Edward Islands. While this Act originally placed the responsibility of its execution, with respect to the Prince Edward Islands, under the Minister of Transport, this responsibility has now been transferred to the Minister of Environment Affairs and of Water Affairs.

The Sea Fisheries Act, 1973 (Act No 58 of 1973) provides for the control and conservation of sea fisheries in the territorial (12 nautical miles) and fishing zone (200 nautical miles) of the Islands. The Fishing Industry Development Act, 1978 (Act No 86 of 1978) provides for the development of the fishing industry and the marketing of fish and fish products also applies to the Islands.

Apart from the limited protection afforded through the above mentioned Acts, no other statutory form of environmental protection exists for the Islands. The draft Bill on Environmental Conservation allows the protection of the Islands to be addressed in that it provides for the declaration of Protected Natural Areas and Special Nature Reserves.

As an interim measure the Department of Environment Affairs has drafted a "Code of Conduct" for Environmental Protection of the Prince Edward Islands. This Code of Conduct is to serve as a guideline for all organizations and their staff operating at or in the vicinity of the Islands.

The CSIR on behalf of South Africa has been a member of the Scientific Committee on Antarctic Research of the International Council of Scientific Unions (SCAR). This committee has made several recommendations for environmental protection in the Antarctic. South African membership of SCAR implies compliance with their principles of environmental protection.

Although the Prince Edward Islands lie outside of the Antarctic Treaty Area (south of 60°S) and are therefore not subject to the provisions of the Antarctic Treaty, section 5 - Protection of Fauna and Flora - of the Department's Code of Conduct states that activities at the Islands shall be conducted in accordance with the "Agreed Measures for the Conservation of Antarctic Fauna and Flora" of the Antarctic Treaty.

South Africa is also a founder member of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLAR) which came into force on April 7, 1982. The marine living resources of the waters of the Prince Edward Islands are included in the Convention Area.

Policy and Goals for Marion Island - The Code of Conduct of the Department of Environment Affairs

The Code of Conduct clearly indicates the desire by the Department of Environment Affairs to protect to the greatest extent possible the environment of the Prince Edward Islands. At present the Code of Conduct is the only document in which the long-term protection goals for the Islands are mentioned.

The need for a management plan and a review of SCAR and IUCN proposals for the management of islands in the Southern Ocean

Although the Code of Conduct gives a clear indication of the Department of Environment Affairs desire to protect to the greatest extent possible, the environment of the Prince Edward Islands, no clearly stated policy and long-term goals on the use of the Islands exist. In the absence of such a policy and plan for the implementation of this policy there is always the danger of ad hoc type decisions being taken.

Because subantarctic islands are considered areas of outstanding scientific interest and of great natural beauty and because they are vulnerable to man-induced impacts, they require formal management plans to ensure their protection at the highest level.

The Prince Edward Islands support a diverse range of biological communities containing many endemic species of plant and animals and provide important breeding areas for many birds and seals. The islands are little modified by human activities and their ecosystems are fragile and vulnerable to change.

The SCAR/IUCN report (1987) "Conservation of Subantarctic Islands" states that the principle objective of conservation of the subantarctic islands must be to maintain and protect their indigenous flora and fauna in natural associations, both by active management and by all necessary legal instruments. This report recommends that policies, legislation and operational practices should be developed to constrain modification of the ecosystems, and encourage and promote a greater scientific understanding and public awareness of the importance of these unique islands.

The SCAR/IUCN (1987) workshop makes nine broad recommendations for the improvement of protection of the subantarctic islands. As all of the recommendations are relevant to Marion Island, they are listed below.

Recommendation 1. The severity of the impact of introduced plants and animals on these sensitive island ecosystems be urgently assessed, that appropriate control measures be instituted as soon as possible to minimize damage and that the ecosystems be monitored to assess recovery.

The workshop encourages national authorities to conserve under strictly controlled conditions, a sample of those introduced species whose genetic resources are regarded as potentially useful, if this does not conflict with the conservation of endangered indigenous species.

Recommendation 2. That the islands be protected from any new accidental introductions by man and that all necessary inspections and quarantine procedures to ensure this be brought into use as soon as possible.

They encourage national authorities to consider very carefully any voluntary or planned introductions of flora, fauna or soil to the islands, to subject such plans to rigorous and prior Environmental Impact Assessments, to monitor the effect of the introduction and, whenever practicable, to destroy or remove the introduction once its original purpose is complete.

Recommendation 3. That particular consideration be given when considering fishery controls, to the dependence of these terrestrial ecosystems on nutrient input from the Southern Ocean; that marine buffer zones should be instituted (where practicable under extant legislation) to provide some limited protection of food sources.

The workshop encourages the appropriate national authorities to develop agreements for protection of these food chains under the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLAR).

The workshop recognized that mortality in some birds and seal species during fishing operations or by the ingestion of plastic debris gives cause for serious concern and could be minimized by appropriate national action.

Recommendation 4. That each national authority develops and implements conservation policies and plans, devised specifically for each island or island group, and incorporating a full consideration of the control of human impact on the natural ecosystem.

The workshop encourages the implementation of scientific research and monitoring programmes necessary for the conservation management of island ecosystems; and recognizes, that although achievement of the objectives of conservation plans will be subject mainly to self-assessment, the use of independent observers appointed by each national authority is likely to contribute to greater success.

Recommendation 5. That island ecosystems as well as specific sites are accorded special legal protection to ensure their integrity is maintained.

The workshop encourages national authorities to identify a fully representative series of strictly protected areas of restricted access, as well as sites of special scientific interest, and to consider which areas might be proposed for international designation, as World Heritage Sites or Biosphere Reserves.

Recommendation 6. That organization and control stations, logistics and scientific programmes be exercised to ensure minimal impact on the natural ecosystem, and that station development be constrained within a designated area.

The workshop encourages national authorities to follow the SCAR guidelines on pollution control publised for the Antarctic Treaty Area.

Recommendation 7. That historical sites and artefacts of shipwreck, sealing, whaling or other human activities are mapped, documented and conserved (protected) as far as possible.

The workshop encourages the involvement of specialist advisors on archaeology and history on this.

Recommendation 8. That national authorities give immediate consideration to ensuring adequate education for all their island and ship personnel in the conservation objectives for each island in all their island groups. The workshop encourages both scientists and administrators to provide public education on the significance and value of subantarctic islands; and encourages responsible and controlled tourism. The workshop recognized that SCAR and especially IUCN could make an important contribution to global awareness of subantarctic conservation.

Recommendation 9. That IUCN convene a meeting of island management authorities to discuss implementation of these recommendations. The workshop encourages national authorities, operating agencies and scientists to promote free and full exchange of all information and data, especially on those aspects which concern conservation and environmental protection of these unique islands.

In their discussion of the conservation of islands in the Southern Ocean, Clark and Dingwall (1985) highlight several areas of concern. For the purpose of completeness, these concerns are discussed below.

1. The 22 major oceanic islands or island groups, which incorporate over 800 individual islands and islets, cover a total land area of almost 32 000 km². Approximately 1 600 km² or some 5 percent of the total area is set apart within legally protected areas.

Clark and Dingwall (1985) state that consideration should be given to protecting more and larger areas of the islands under Specially Protected Area status (Agreed Measures, Article VIII).

2. The need to prevent introductions of alien plants and animals and to maintain undisturbed habitat is of paramount importance for the survival of many indigenous species.

3. There is a strong need for strictly controlled access to protected areas on uninhabited and unmodified islands, and the employment of stringent precautionary measures against inadvertent animal or plant introductions. Standardisation of procedures for all people entering these islands and constant surveillance to ensure compliance with regulations are necessary.

Rangers or conservation officers, with full authority from administrating agencies, should be included in staff of permanent meteorological stations and in scientific parties visiting islands. Alternatively, suitably qualified scientists or others could be appointed as honorary rangers or wardens.

Regular monitoring of floral and faunal composition of islands is necessary to ensure that entry of aliens is immediately discovered. This in itself may increase human contact with an island which increases also the risk of inadvertent introduction of alien plants and animals. In spite of this added risk, the possibility of unofficial and unapproved landings of people requires constant vigilance. Contingency plans to deal with accidental introductions, particularly of mammals, need to be prepared by island administrators to ensure that immediate action can be taken.

4. The islands of the Southern Ocean are not isolated independent units .... For conservation purposes it is desirable that a system of ecologically representative protected areas is established on the islands ... International co- operation and co-ordinated efforts are needed to achieve this goal.

5. Coastal waters are of vital importance to island fauna, in particular as feeding grounds for marine mammals and birds. Hence, changes in the nearshore environment can have significant consequences for the biota ... There are no comprehensive provisions for protection of the marine environment in the vicinity of the islands in the Southern Ocean. Consideration may need to be given to be establishment of formal marine buffer zones or reserves around islands. Regulation of activities such as fishing, anchoring of vessels, discharge of wastes, refuelling of vessels and exploitation of minerals on the seabed would reduce the potential for oil spills, fire, illegal landings and introduction of alien species and would protect the feeding grounds of seabirds and marine mammals which breed on the islands.

Clark and Dingwall (1985) state that although there appears to be little immediate prospect of development of either oil or mineral resources, such possibilities need to be taken into account in conservation and management policies for islands in the Southern Ocean.

7. One of the most significant developments in Antarctica and the Southern Oceans over recent years has been the onset of commercial tourism. Clark and Dingwall (1985) state that it is unrealistic to lock-up the southern islands exclusively for meteorological and scientific purposes and that tourism has a valid place in the Southern Ocean, as long as it is regulated and carefully supervised. (See also Heymann et al. 1987 p 18 - 19)

8. Although islands of the Southern Ocean have few inhabitants and there is currently little pollution, contingency plans to deal with oil spills and other pollutants should be prepared by all authorities.

9. Management to protect island ecosystems must be based on adequate knowledge if it is to be truly effective (Clark and Dingwall 1985). This requires active and extensive research, especially that which has application to management problem-solving. A priority for attention in the Southern Ocean is completion of detailed biological inventories of all island groups. Ecological studies and long-term monitoring are also required, especially for species and populations of birds, mammals and introduced mammals to ensure that a sound scientific base exists on which management decisions can be made. Priority should be given to obtaining information on species which are rare or endangered. Interactions between elements of terrestrial and marine environments warrant extensive research.

In their evaluation of an emergency landing strip for Marion Island, Heymann et al (1987) make the following observations:

1. The Prince Edward Islands are considered to be managed as a nature reserve equivalent to the IUCN category I scientific/strict nature reserve. Clark and Dingwall (1985) consider the overall conservation prospects for Marion Island as good.

2. The Islands are considered worthy of formal special protection by the South African Council for the Environment (Robinson et al 1985).

Benninghoff and Bonner (1985) point out that environmental protection in the Antarctic and subantarctic region has two components - "one concerned with the maintenance of the high productivity and ecological relationships in the Southern Ocean; the other with the maintenance of the unspoiled environment and the fragile ecosystems of the terrestrial areas. The region's prime value is as a unique source of information that it continues to provide in areas of biological, geophysics, geology and oceanography usefull to all of mankind. Its greatest value

resides in the wealth of information it contains and yields about planet Earth. Attention to the protection of the environment, particularly of the biological components, needs to be intensified, if for no other reason than to keep the environment in the best possible condition for further scientific study".

Cooper and Condy (in press) point out that "The Prince Edward Islands are, compared to many oceanic islands, relatively pristine. They do not support any farming or mining activities, and there is only one site of regular human habitation on Marion Island. The human population is small and non-breeding, there is no surface vehicular transport and very few sources of human pollution. Away from the station and in the immediate vicinity of field huts, man's disturbance of the environment is evident by little more than occasional footpaths and scientific markers. Human disturbance, in the absence of military, tourist, commercial fishing, farming or mining activities, is presently restricted mainly to that produced by scientific and support personnel. Despite the absence of legally institutionalized status and measures, the combination of remoteness of the Islands and the voluntary practices adopted through the Code of Conduct means that the de facto status of environmental protection is at the present time relatively healthy, though in terms of practise or application there is room for improvement."

The above statements clearly indicate that the subantarctic islands are important preserves for nature and science. The major areas of concern are also highlighted.

If the Department of Environment Affairs is to fulfil its national and international obligations to protect the rich but vulnerable communities of the Prince Edward Islands, it is essential that they formalize a policy and consolidate the recommendations of the various agencies, the Code of Conduct and the relevant Conventions into a management plan for the Islands.

The Management Plan

Management objectives are required to establish the framework for the management of each island. These objectives should set out the conditions to be achieved in realizing the protection purpose. They will provide the basis for all management actions taken to perpetuate the natual resources, facilitate appropriate use and deal with the many influences that affect the island and its management.

The management plan should be prepared by the Department of Environment Affairs. An interdisciplinary team should be established to co-ordinate the production of the plan. This team should include specialists with the necessary expertise to address the various planning concerns. Affected government agencies should be consulted during plan preparation. Persons possessing specialized knowledge of the islands should be consulted as necessary and desirable and may be members of the planning team.

The management plan should be seen as dynamic and its components should periodically be subjected to re-evaluation and should be revised as necessary to reflect changes in management objectives or in ecological, social or economic conditions. As the plan is developed, more specific proposals for action will be made. The plan should allow for associated plans to be developed for specific management and development actions. These associated plans will not always be prepared concurrently with the management plan, but will be consistent with it. Until the management plan is completed and approved, the management objectives as established in a statement for the management of the island and the Code of Conduct will guide the day-to-day operations.

Components of the Management Plan

A management plan can only be compiled with a sound information background, and part of the purpose of the management plan should be to document all relevant information which exists about the islands. Such data will serve as an information base for formulating proposals and administrative decisions in planning for the achievement of the protection objectives. This information is required for the preparation of the management plan, environmental impact assessments and specific plans. It is also required for the review of specific projects and for the development of specific management actions. In the absence of adequate information for planning and management decisions, its acquisition becomes a prerequisite to action.

Based on the above, PART 1 of the plan should be a review of the resource information.

PART 2 of the plan should contain a clear statement of purpose and the management objectives for the island.

PART 3 of the plan should contain the management policies and the guidelines necessary for their implementation.

PART 4 of the management plan should contain details such as faunal and floral species lists, examples of permits and any other details deemed necessary for the management of the island.

For the purpose of discussion an annotated Table of Contents is provided here for part 1 of the plan. The statement of purpose and the management objectives are more fully discussed in part 2 of the plan. It is essential that the objectives are finalized prior to the proposed visit to the island as it is these objectives which will serve to guide the reconnaissance of the island. Part 3 of the document contains draft policies for certain aspects of the management of the islands. This section should be checked for completeness prior to the visit to the island as it will serve as the check list for discussions. Details of the policies can be adjusted prior to or after the proposed visit to the island. Part 4 of the document lists several of the appenndices which will be included in the final document. This section of the document is not complete and will be developed as progress is made with the plan.

MANAGEMENT PLAN FOR MARION ISLAND

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liverworts) will be discussed. Endemic and introduced species will be indicated. Where possible significant changes brought about through natural or man-caused activities will be noted. Rare and endangered species will be noted.

10. Fauna

10.1 Terrestrial

10.2 Littoral and Marine

important species will be listed and associated with ecological assemblages and habitats. Broad classes, Mammals, Birds, Freshwater fauna

Invertebrates - will be documented. Where possible notes will be made on the population history and trends will be noted. Introduced species will be noted and their impact recorded.

11. Research

- programme overview

12. Economic resources

broad overview - seals, whales, krill and other (minerals and tourism?)

13. Tracks, buildings and structures

broad overview

14. Administration

a broad overview of the present situation and the relationship between the Department of Environment Affairs, its antarctic committees and the South African Scientific Committee for Antarctic Research (SASCAR). The relationship between the Department of Environment Affairs and other co-operating departments should be discussed. (Aspects such as budget, helicopter use and landing pads, water supply, domestic regulations and emergency procedures will also be discussed.).

15. Resource evaluation

Part 1 of the management plan should conclude with a review of the island resources. This section could be broken down into:

Ecological importance
Scientific importance
Meteorological importance
Historic importance
Economic importance

Information documented in this part of the plan will form the basis for later decision making. The bulk of the information required for this part of the plan will be obtained from a search, review and analysis of existing literature and through interviews with persons who have research and/or administrative experience of the Island.

Part 2 Statement of Purpose and Management Objectives for Marion Island

A review of the resource information presented in Part 1 of the Plan will provide an understanding of the Islands values. A review of these values should allow for the formulation of a clear statement of purpose specifically for Marion Island. This statement of purpose is important as it will establish the frame of reference for the management plan.

Based on the statement of purpose, management objectives will be formulated which will describe the principle aims of management. These aims and the more detailed policies will provide the framework for decision-making and will influence and direct change towards the desired goals.

Corrick (1960 and 1964), Holdgate and Wace (1961), Holdgate (1970) and Roberts (1977) have all addressed the subject of conservation in the Southern Ocean. Holdgate (1970) in his review of conservation requirements in Antarctica and the Southern Ocean identified three principal management objectives:

1. The general protection of scenic beauty and the biota of the antarctic region south of 60°S latitude.

2. The protection of remaining undisturbed ecosystems of oceanic islands north of 60°S, and as far as possible the restoration or stabilisation of those ecosystems that have been disrupted by actions of man.

3. The wise management of the biological resources of the Southern Ocean, to enable a sustainable harvest to be taken.

Based on the second objective, Clark and Dingwall (1985) in their review of the 22 major islands in the Southern Ocean provide the following statement of purpose: "The principal objectives in management of the islands in the Southern Ocean must be protection in perpetuity of their natural landscapes and biota, and prevention of any further man-included modifications." They state further that the best means of achieving these objectives is through the formal establishment of protected areas, and their effective management according to scientific principles.

Walton (1987) provides the following statement of purpose: "The principal objectives of conservation for these islands must be to maintain and protect their indigenous flora and fauna in natural associations, both by active management and by all necessary legal instruments. Policies, legislation and operational practices should be developed to constrain modification of the ecosystems, and encourage and promote a greater scientific understanding and public awareness of the importance of these unique islands.

It is proposed here that the statement of purpose of Walton (1987) be accepted as the guiding statement for the purpose of this management plan.

Based on the broad statement of purpose and the recommendations of Clark and Dingwall (1985), the SCAR/IUCN workshop (Walton 1987) and the Code of Conduct, the following management objectives are proposed for Marion Island.

Proposed Management Objectives

1. To manage the island or part of the island as an integral part of the South African Network of protected areas.*

2. To preserve the island and surrounding waters in as close to its original state as possible. Consequently all natural processes, indigenous flora and fauna should be left undisturbed by man, whose use of the area must be unconsumptive. (This objective recognizes that all natural, physical and ecological processes will be allowed to operate without interferance.)

3. To protect and manage biological, geological and scenic features and objects and to prevent the modification or acceleration of natural processes or the destruction or degradation of natural features on the island resulting from human interference.

4. To protect and manage historic features and objects to the extent compatible with the primary objectives (2 & 3).

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* To achieve this objective, the island or part of the island will be placed into an appropriate legal category and zoned for various uses. The emphasis of management will be on the protection of the islands special and/or unique natural features. Where necessary and based on the resource analysis, areas will be designated as "Sites of Scientific Interest" or "Specially Protected Areas" and will be protected under the Environmental Conservation Act.

5. To encourage research and to provide facilities to conduct such research. Permitted research activities should not have any permanent detrimental effects on the island or its biota. The research should contribute to the knowledge base which will further the protection and management of the island. The research programme should include projects for the monitoring of the floral and faunal components of the island.

6. To promote co-operation among those conservation agencies operating in the Southern Ocean.

7. To create an understanding of the island's ecosystems and to inform island and ship personnel of the values and fragile nature of the island.

(If necessary these objectives should be expanded prior to the proposed visit to Marion Island.)

Based on the above set of objectives and the recommendations of the various reports a series of sub-objectives are developed in Part 3 of the document. These sub-objectives address specific concerns.

Part 3 Guidelines and sub-objectives

A review of the literature indicates the following areas of concern for Marion Island:

Special legal protection
Constrained development and pollution control
Control of human impact
Control of introduced plants and animals
Prevention of new introductions
Controlled access
Regular monitoring and research
Education of ship and island personnel
Historical sites and artefact protection
Marine buffer zone
International co-operation

The Code of Conduct addresses the following areas:

Construction and maintenance activities
Disposal of waste material and prevention of pollution
Visits to the Prince Edward Islands
Protection of Fauna and Flora
Protected Areas
Aviation operations at the Prince Edward Islands
Ship and Boat operations at the Prince Edward Islands

Based on the Code of Conduct and the review of the literature the proposed management plan can be divided into the following sections.

For each section, sub-objectives consistent with the primary objectives should be developed. Guidelines must then be developed to allow for the implementation of all sub-objectives.

Proposed breakdown of the sub-objectives

The main areas of concern for Marion Island can be broken down into the following categories. Sub-objectives indicated with a * are those areas of concern indicated in the literature and/or the Code of Conduct.

Administration

Administrative Control

To provide the level of management necessary to achieve the primary and secondary objectives.

This section will address the Department of Environment Affairs control of the island, the administration of Acts relevant to the management of the island and the co-ordination of departmental and interdepartmental activities.

Special legal protection*

To place the island or part of the island in an appropriate legal category of protected area to ensure that it is afforded the desired degree of protection.

To zone the island into management zones necessary to achieve the primary and secondary objectives.

Controlled access and visits to Marion Island

To permit entry to Marion Island for scientific, research, management and other legitimate purposes, consistent with the protected status of the island, its use as a meteorological station and the management objectives of this plan.

To authorise and regulate the number of visitors to the island.

The island's ecosystems are fragile and vulnerable to disturbance. This section will address the type and number of persons permitted to visit the Island. It will also detail procedures for application to visit the island and the conditions under which a person will be permitted to visit the island.

Support services

To ensure co-operation with those agencies providing support services.

All services provided should be consistent with the management objectives. This section of the management plan will address aspects such as facility maintenance (Department of Public Works and Land Affairs), helicopter services (SADF), meteorological services (Weather Bureau) and co-ordination of research activities (SASCAR).

The following aspects will also be considered:

To co-ordinate planning and management of financial resources
To co-ordinate the management of manpower resources including such elements as manpower planning, administration and personnel matters (ship, clothing, radio, scientific equipment, personnel needs).

Protection and Management of Flora and Fauna

Protection of flora and fauna*

To ensure the protection and survival of the island's indigenous plant and animal taxa.

This section will address the implementation of the Agreed Measures for the Conservation of Antarctic Fauna and Flora and the Convention for the Conservation of Antarctic Marine Living Resources.

Control of introduced plants and animals*

It is estimated that a total of 27 non-marine aliens presently occur on the island (Condy and Cooper in press). This total is made up of 10 vascular plants, 14 macro-invertebrates, one fish and two mammals. The general policy should be:

To exterminate alien plants and animals as far as possible (where this can be achieved without undue disturbance or damage to indigenous taxa or natural features).

Specific sub-objectives are:

To exterminate all feral cats on the island

To exterminate all alien plants

To elucidate the ecological impact of the introduced house mouse (Mus musculus) population and to make recommendations for its control.

To elucidate the ecological impact of the introduced macro-invertebrates and to make recommendations for their control.

To exterminate the brown trout (Salmo trutta) on Marion Island.

To ensure that all control methods used are ecologically safe and that the control method will not create an adverse impact on the island or its biota.

Prevention of new introductions

To prevent the introduction of any new species of plant or animal to the island.

To embark promptly on effective extermination programmes in the event of the discovery of a new introduction. All extermination methods should be ecologically safe and should not cause adverse impacts on indigenous taxa or natural features.

Liberation of rehabilitated individuals of indigenous species

To prohibit the liberation of rehabilitated indigenous species.

Rescue operations and reintroduction of endangered species

To permit the removal of any plant or animal where this is considered necessary for species or sub-species survival and where there is no threat to other taxa.

To permit the reintroduction of indigenous plants and animals for the purpose of restoring ecological communities on the island.

This section will address the principle of rescue operations. With any introduction there is always the danger of introducing alien diseases and/or parasites. Such operations should be carefully considered and if deemed necessary should be conducted under expert guidance.

Marine buffer zone

To investigate the declaration of a marine buffer zone around Marion Island and to provide the appropriate protection to this buffer zone.

Historic site and artefact protection

To record and preserve in the appropriate manner those sites or objects which have cultural or historic significance.

These investigations and recommendations must be made by experts in the field of cultural historic conservation.

International co-operation

To seek and maintain contact with all agencies operating in the Southern Ocean.

To co-operate with agencies operating in the Southern Ocean.

To exchange scientific data and information where this will lead to an understanding of Southern Ocean ecosystems.

Research and Monitoring

To encourage and support research which will lead to a better understanding of the Marion Island ecosystems.

To give preference to research which will enhance scientific and effective management knowledge of Marion Island.

To ensure that research is carried out in such a manner that:

- protection of the natural ecosystems is ensured;
- it will not cause any lasting change to indigenous plant or animal population or community relationships;
- it does not conflict with the primary and secondary management objectives.

To prohibit the collection of specimens of plant or animal exept where this is specifically approved and justified as part of a registered research project or for the purpose of management of the island.

To ensure that all specimens collected are housed in appropriate museums or herbaria.

To establish and maintain an ongoing programme to monitor changes in the natural ecosystems of the island.

To establish and maintain a programme to monitor the effects of human impacts on the island and the surrounding marine area.

To support the meteorological research and monitoring programmes.

To ensure that the results of all research are published in recognized scientific journals.

Information and Education

To ensure that ship and island personnel are properly informed of the fragility and vulnerability of the Island.

This aspect of the management plan must also address an information programme aimed at the general public of South Africa. Visits to the island will be confined to members of the scientific community and a programme must be established which will provide the South African public with:

- information about the island
- reviews of activities on the island
- information on the national and international importance of the island
- information on threats to the island
- management actions on the island
- reasons for restricting public access

The Department of Environment Affairs should encourage and assist scientists to produce popular accounts of their research and produce interpretive literature on the island, its history and management.

Facilities and Controls

Buildings and tracks

To properly maintain existing facilities and structures and to permit the provision of new structures and facilities which are necessary for the proper management of the island.

To ensure that all development is confined to the appropriate management zone.

To ensure that all facilities and structures are located where they will not cause undue disturbance to plants, animals or natural processes.

To ensure that all redundant facilities and structures are removed and sites rehabilitated.

This section will address proposals for Environmental Impact Assessments.

Land vehicles and motorized equipment

To prohibit the use of motorized vehicles on the island, except work machines restricted to the development zone.

Waste disposal and prevention of pollution

To ensure that activities at Marion Island do not lead to undue, unsightly or irreversible pollution, marring of the environment or to the build-up of waste or debris on the island.

To remove all non-biodegradable waste material from the island.

To dispose of biodegradable waste in a way which does not modify or endanger the natural ecosystems.

To prohibit the lighting of all fires except for the purpose of waste disposal.

Search and Rescue

To minimize disturbance of natural features and objects, plants and animals during search and rescue operations.

Aviation operations

To prohibit helicopters from landing on the island except for search and rescue operations, for gathering scientific information or for other purposes which promote the proper management of the island.

To ensure that all necessary precautions are taken not to endanger or disturb plant and animal life.

Plants, pets and holding of indigenous animals

To prohibit the keeping or holding of domestic or wild animals on the island except for the purpose of research and then with the prior approval of the Department of Environment Affairs.

To prohibit the growing of domestic plants on the island.

Ship and boat operations

To ensure that anchor sites, landing sites and steaming routes are chosen to minimize disturbance of or damage to the marine and near shore environment.

To ensure that adequate measures are taken to prevent fuel spillage during fuel transfer from ship to shore.

To ensure that adequate precautions are taken to protect against pollution in waters surrounding the island (waste from ship).

Management plan review

To maintain the management plan under continuous review to ensure relevance to current situations.

To complete a comprehensive review at 3 yearly intervals.

In the final document an overview of the problem will be included with each sub-objective. A series of guidelines will then be formulated for the implementation of each sub-objective.